

INEQUALITIES IN ACCESS TO HEALTHCARE SERVICES BEFORE,
DURING AND AFTER THE GREEK SOVEREIGN DEBT CRISIS

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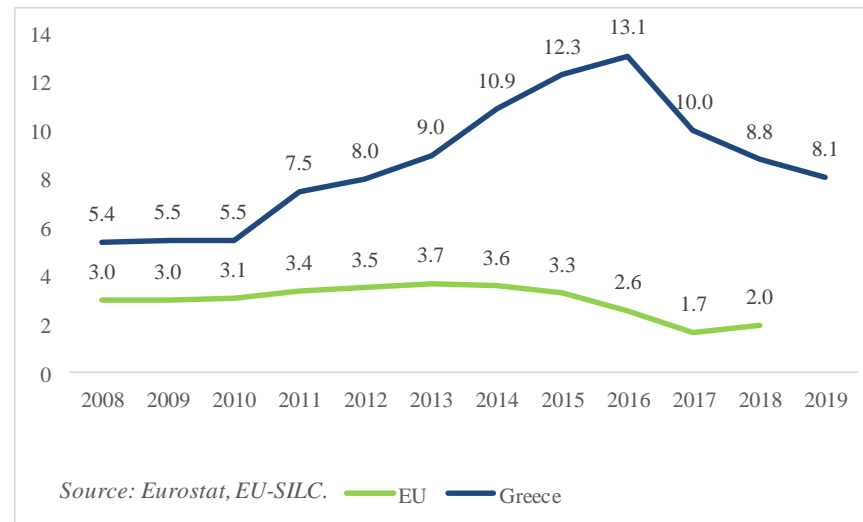
Inequalities in access to HC: definition.

- One of the three main aspects of health inequalities examined in the health economics literature [alongside inequalities in health (status) and inequalities in healthcare payments].
- WHO: when access to HC is not distributed across the population according to medical need but according to socioeconomic characteristics (that should otherwise be unrelated to access and, eventually, treatment).

In Greece, unmet needs for HC are too high.

- Unmet needs in Greece have chronically exceeded the EU average. They reached their peak in 2016 and started to decline after that year but are still the second highest in Europe (EU-SILC).

Unmet Need for Healthcare (too Expensive, too Far to Travel or Waiting List), 2008-2019.



Why? (1/2)

Greek HC system particularities:

- System based on social insurance (at odds with ESY founding law).
- System too hospital-centered (under-developed PHC and gaps in public provision).
- One of the lowest number of GPs/family doctors in the EU/OECD (and no gatekeeping).
- The highest number of specialists amongst EU/OECD countries.

[And many other vulnerabilities: low transparency, low patient satisfaction, low generic penetration, over-prescription, very high antibiotic consumption (and AMR), too many pharmacists and imaging equipment (possible induced demand issues).]

Why? (2/2)

Health expenditure asymmetries:

- Public HE broadly in line with EU/OECD prior to crisis (at 6.5% of GDP in 2009, although GR lower in per capita terms). But chronically asymmetrical:
 - Low spending on outpatient services, prevention and long-term care (LTC).
 - Public pharmaceutical spending at 2.2% of GDP vs. 1% in EU/OECD in 2009 (and still an outlier today).
- Private HE higher than EU/OECD (over 3% of GDP vs. 2.2%). Mainly a problem of composition:
 - Very low private insurance (0.3% of GDP vs. 10% in EU/OECD).
 - Very high OOP payments (3% of GDP vs. 1.6% in EU/OECD).

Economic crises and access barriers.

Access barriers increase during economic crises:

- (i) Public HE and disposable income decrease.
- (ii) Unemployment and demand for public services increase.
- The Greek 2010-2018 crisis:
 - ✓ Health spending cuts, increases in user charges, rapid or incomplete reforms in service provision.
 - ✓ Reductions in wages/pensions and tax hikes.
 - ✓ Soaring unemployment rates, no effective measures to protect the uninsured during the crisis.

Aim of the paper.

- To analyze inequalities in access to healthcare services using data from National Health Surveys (EHIS) carried out by EL.STAT in 2009, 2014 and 2019.
- To assess whether any changes in inequality are observed during this period (3 survey years: before the crisis, around the peak of the recession and in its aftermath).

Data.

- Cross-sectional data from EL.STAT's National Health Survey carried out in 2009, 2014 and 2019 (2019 data released in December 2020).
- Part of a wider European statistical program (the European Health Interview Survey - EHIS). Data collection initially scheduled to take place every five years starting in 2009. Next survey wave expected in 2025.
- The survey contains individual and household-level health-related data from a fully representative sample across Greece. Variables on physical and mental health status, use of healthcare services, behavioral factors that influence health, demographic and socioeconomic status characteristics of the individuals and households interviewed.
- Observations: 6,077 individuals in 2009, 8,105 in 2014 and 7,969 in 2019.

Variables: Access to HC.

- We use ten (10) **access/use variables**:
 - ✓ Binary variable (1) on self-reported **unmet need for healthcare** (GP, specialist or hospital visit) due to financial reasons, waiting list or distance in the last 12 months.
 - ✓ Binary variable (1) on self-reported **unmet need for dental care** (same reasons) in the last 12 months.
 - ✓ Three (3) binary variables indicating **doctor visits** in the last 12 months (GP, specialist, dentist).
 - ✓ Five (5) binary variables for **basic preventive exams** in the last 12 months (blood pressure measurement, cholesterol measurement, blood sugar measurement, mammogram, pap-smear test).

Variables: Socioeconomic status.

- Main measure of socioeconomic status: **total equivalized household income**.

[Desirable statistical properties but also for conceptual reasons].

- But we also examine associations with **additional household- and individual-level characteristics** in the context of multivariate regression analyses.

Methods (1 / 2)

- Machenbach & Kunst (1997) and Regidor (2004) provide an overview of basic tools for health inequality measurement.
- We use:
 1. **Frequency ratios**
 - Q5/Q1 (for “positive” characteristic) and Q1/Q5 (for “negative” characteristic).
 - Ratios above 1: presence of pro-rich inequalities.
 2. **The Concentration Index (CI)**
 - Derives from the Concentration Curve (CC)/ bivariate analogue of the Gini Index (O’ Donnell et al, 2016).
 - A continuous (or at least ordinal) socioeconomic background variable is used to rank individuals or groups from the least to the most advantaged. Then cumulative proportions of the health-related (outcome) variable are plotted against cumulative proportions of the ranked population.
 - The CI: twice the area between the CC and the diagonal. Can be computed in terms of covariance between the health variable and the fractional rank in the socioeconomic distribution:

$$CI = \frac{2cov(y_i, R_i)}{\mu}$$

where y_i is the individual i ‘s health-related status, μ its mean and R_i is the individual’s fractional rank in the socioeconomic distribution.

Methods (2/2).

- CI: assumes values between -1 and 1. A zero (0) value means that the CC coincides with the diagonal (“line of equality”)/ no inequality to report.
- Negative value of CI : CC lies above the diagonal (variable disproportionately concentrated amongst the poor). Positive value of the CI: CC lies below the diagonal and (variable disproportionately concentrated amongst the rich).
- In the presence of “pro-rich” inequalities: negative CI signs expected for unmet need, positive CI signs expected for service use variables.

3. Probit models

- Thirty (30) probit regressions for the ten (10) unmet need/ service use variables in 2009, 2014 and 2019.
- Aim: to examine associations between the access/ use indicators and individual/ household characteristics (commonly used in the empirical literature on socioeconomic determinants of access to healthcare).
- Explanatory variables: age, gender, household income, level of education, unemployment, citizenship status and degree of urbanization of the primary residence area.

Sample statistics: Access to HC.

- Self-reported unmet medical need increased sharply during the crisis. Even larger increase in unmet dental need. Both decreased in 2019 (but still at a higher level compared to 2009).
- Drop in occurrence of blood pressure, cholesterol and blood sugar measurement (by over 20 percentage points in 2014). Noticeable increase in the aggregate use of women's tests such as mammograms and pap-smears.

Access to healthcare.

	2009		2014		2019	
	N	%	N	%	N	%
Sample size	6,077	100	8,105	100	7,969	100
Access and use of healthcare services						
<i>Unmet needs in last 12 months</i>						
Self-reported unmet need for medical care (GP, specialist or hospital visits)	484	8.0	1,778	22.8	869	10.9
Self-reported unmet need for dental care	275	4.5	1,230	15.7	741	9.3
<i>Doctor visits in last 12 months</i>						
GP	3,935	65.0	4,707	58.3	4,676	58.9
Other specialties	2,913	48.4	3,774	47.2	3,759	47.4
Dentist	2,729	45.6	3,741	46.6	3,951	49.8
<i>Basic preventive tests in last 12 months</i>						
Blood pressure measurement	4,133	79.3	4,357	55.9	4,746	59.7
Cholesterol measurement	4,121	78.3	4,436	56.8	5,014	63.0
Blood sugar measurement	4,092	78.2	4,404	56.4	4,966	62.4
Mammogram	595	21.4	1,194	34.1	1,231	36.4
Pap-smear	997	26.8	1,860	40.7	1,718	41.1

Source: ELSTAT (EHIS), own calculations.

Access to HC by income quintile.

- Unmet needs more pronounced amongst lower income groups.
- But deterioration in unmet needs during the crisis evident across the entire income distribution.

Access to and use of healthcare services	2009						2014						2019					
	q1	q2	q3	q4	q5	total	q1	q2	q3	q4	q5	total	q1	q2	q3	q4	q5	total
<i>Unmet needs in last 12 months</i>																		
Self-reported unmet need for medical care	10.8%	8.6%	7.1%	6.9%	6.2%	8.2%	35.6%	28.0%	23.2%	20.6%	16.2%	24.4%	18.8%	14.3%	12.2%	8.7%	5.3%	11.9%
Self-reported unmet need for dental care	5.8%	5.4%	4.7%	3.6%	2.3%	4.7%	25.6%	20.7%	16.0%	11.7%	5.9%	16.1%	22.2%	14.5%	7.9%	3.4%	1.0%	9.4%
<i>Doctor visits in last 12 months</i>																		
GP	65.5%	59.6%	65.4%	63.9%	60.2%	63.1%	59.7%	60.0%	60.6%	62.1%	67.6%	61.4%	54.8%	60.6%	64.6%	66.4%	70.7%	63.5%
Other specialties	42.9%	44.5%	46.6%	51.1%	59.0%	47.2%	41.2%	48.9%	47.6%	51.0%	56.2%	49.0%	44.1%	45.6%	50.8%	52.9%	59.5%	50.0%
Dentist	39.9%	41.5%	47.7%	51.0%	63.2%	46.3%	32.7%	38.4%	44.8%	49.9%	57.1%	44.5%	31.7%	38.3%	44.7%	54.8%	66.6%	46.2%
<i>Basic preventive tests in last 12 months</i>																		
Blood pressure measurement	78.7%	76.8%	77.0%	80.2%	77.4%	77.9%	56.1%	59.1%	59.3%	62.7%	67.1%	60.6%	56.2%	62.4%	64.0%	67.6%	69.7%	64.2%
Cholesterol measurement	74.8%	76.4%	77.0%	78.7%	82.0%	77.1%	55.5%	60.2%	59.4%	63.7%	67.7%	61.1%	57.0%	63.8%	66.7%	71.7%	73.4%	66.8%
Blood sugar measurement	74.0%	76.6%	77.1%	78.5%	82.0%	77.0%	54.7%	59.5%	59.7%	63.0%	67.1%	60.7%	57.3%	63.3%	65.9%	70.6%	73.3%	66.2%
Mammogram	8.9%	8.4%	10.9%	15.4%	26.4%	11.6%	7.5%	14.3%	13.8%	23.1%	29.2%	17.2%	3.6%	8.3%	14.8%	22.3%	39.0%	15.7%
Pap-smear	15.2%	12.2%	19.1%	22.1%	33.9%	17.8%	6.1%	16.2%	21.4%	30.0%	34.1%	21.6%	6.2%	12.6%	20.3%	25.6%	37.4%	19.1%

Source: ELSTAT (EHIS), own calculations.

Access to HC by age group.

- Unmet needs more prevalent amongst younger respondents in 2009 (but the opposite is observed in 2014 and 2019).
- Doctor visits and exams: use increases with age as a result of increased needs for healthcare in older age (but not for dental care and women's tests- possibly due to lower health awareness?).

	2009						2014						2019					
	18-30	30-50	50-65	65-75	75 or above	total	18-30	30-50	50-65	65-75	75 or above	total	18-30	30-50	50-65	65-75	75 or above	total
Access to and use of healthcare services																		
<i>Unmet medical needs in last 12 months</i>																		
Self-reported unmet need for medical care	10.3%	9.8%	6.3%	5.9%	7.9%	8.0%	17.9%	19.5%	25.3%	31.6%	29.5%	23.3%	6.9%	8.4%	11.4%	17.0%	14.7%	11.0%
Self-reported unmet need for dental care	5.0%	3.8%	3.0%	4.2%	7.7%	4.6%	15.7%	15.3%	18.8%	16.1%	13.5%	16.0%	7.7%	8.7%	11.0%	11.7%	7.1%	9.3%
<i>Doctor visits in last 12 months</i>																		
GP	47.2%	48.7%	65.6%	78.6%	81.0%	64.4%	46.7%	49.1%	61.4%	75.7%	78.4%	58.7%	34.6%	47.8%	64.9%	77.6%	82.0%	59.0%
Other specialties	48.9%	47.6%	45.5%	46.4%	46.7%	46.9%	42.0%	49.8%	54.9%	50.1%	44.6%	49.2%	43.0%	50.2%	51.9%	51.2%	49.7%	49.7%
Dentist	60.5%	57.4%	50.5%	36.4%	21.3%	45.3%	55.7%	53.1%	49.9%	37.1%	22.3%	46.9%	59.4%	57.2%	54.6%	39.9%	22.2%	49.8%
<i>Basic preventive tests in last 12 months</i>																		
Blood pressure measurement	60.5%	64.2%	83.6%	88.0%	88.6%	79.0%	31.1%	43.9%	64.4%	80.4%	84.5%	56.4%	33.5%	49.3%	68.6%	79.8%	76.0%	59.8%
Cholesterol measurement	66.5%	67.0%	80.3%	86.0%	84.2%	77.8%	35.5%	45.7%	67.6%	78.8%	79.0%	57.5%	38.5%	54.9%	71.2%	81.7%	74.8%	63.1%
Blood sugar measurement	67.2%	65.8%	80.5%	85.8%	84.8%	77.7%	35.1%	45.4%	66.9%	78.3%	78.5%	57.1%	38.6%	53.8%	70.6%	81.2%	74.7%	62.5%
Mammogram	-	43.0%	31.7%	14.2%	2.3%	21.4%	-	46.1%	44.1%	25.2%	8.2%	34.1%	-	50.9%	48.4%	26.9%	7.2%	36.4%
Pap-smear	36.9%	53.0%	34.5%	10.3%	1.5%	26.8%	47.6%	55.4%	44.5%	21.0%	5.1%	40.7%	39.6%	61.0%	48.7%	21.3%	3.7%	41.1%

Source: ELSTAT (EHIS), own calculations.

Concentration Indices.

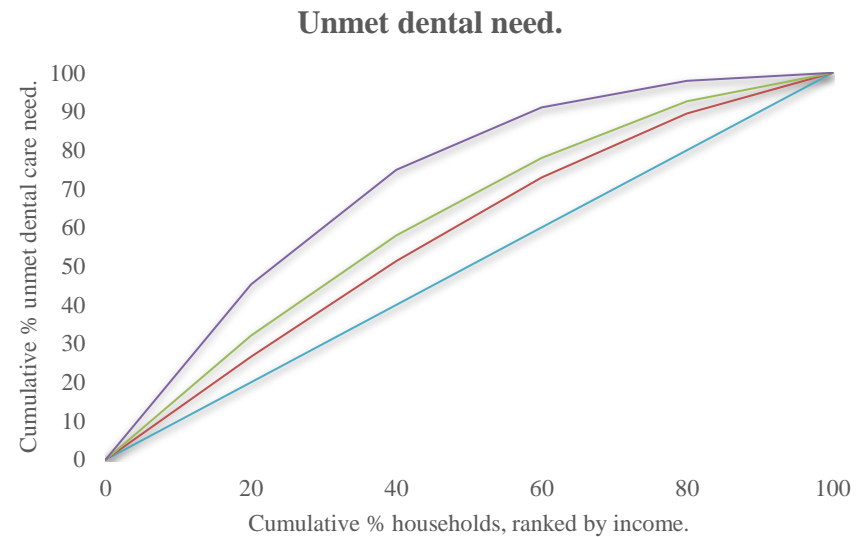
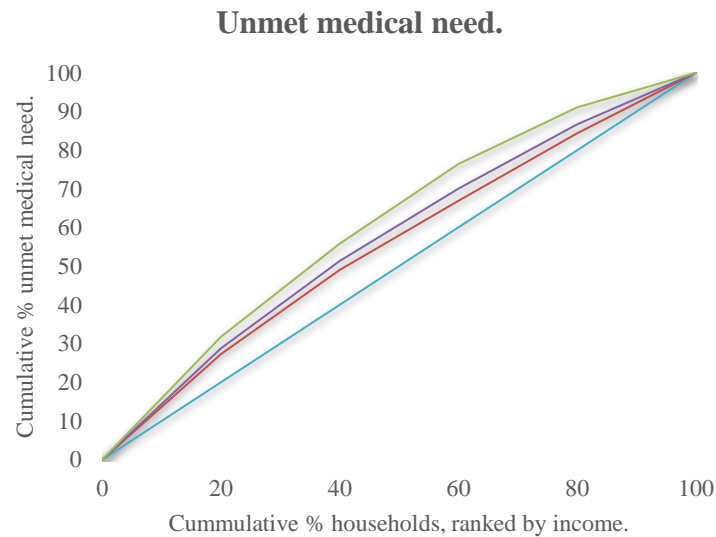
- Unmet needs: disproportionately concentrated amongst lower income groups in all survey years. CIs for unmet needs larger in 2014 and 2019 compared to 2009 (difference statistically significant). Inequality in unmet needs increased during and after the crisis.
- Visits/ tests: Positive and statistically significant CIs for 4/8 indicators in 2009. All CIs larger, positive and statistically significant in 2014 and 2019 (variables concentrated amongst higher income groups).

	Index values			Difference	
	2009	2014	2019	2014 vs 2009	2019 vs 2009
	Wagstaff CI				
Access to healthcare services					
<u>Unmet medical needs in last 12 months</u>					
Self-reported unmet need for medical care	-0.077***	-0.112***	-0.109***	**	**
Self-reported unmet need for dental care	-0.076***	-0.177***	-0.284***	***	***
<u>Doctor visits in last 12 months</u>					
GP	-0.004	0.029**	0.051***	*	***
Other specialties	0.067***	0.045***	0.065***		
Dentist	0.097***	0.111***	0.150***		*
<u>Basic preventive tests in last 12 months</u>					
Blood pressure measurement	0.005	0.037***	0.050***	**	**
Cholesterol measurement	0.038**	0.041***	0.070***		
Blood sugar measurement	0.041***	0.041***	0.066***		
Mammogram	-0.009	0.079***	0.128***	***	***
Pap-smear	-0.001	0.063***	0.113***	***	***

Source: ELSTAT (EHIS), own calculations.

Concentration Curves (1/2).

- CCs for unmet needs lie above the diagonal (negative CIs).
- CCs in 2014 and 2019 have moved further away from the diagonal (line of equality) compared to 2009.



— Line of Equality

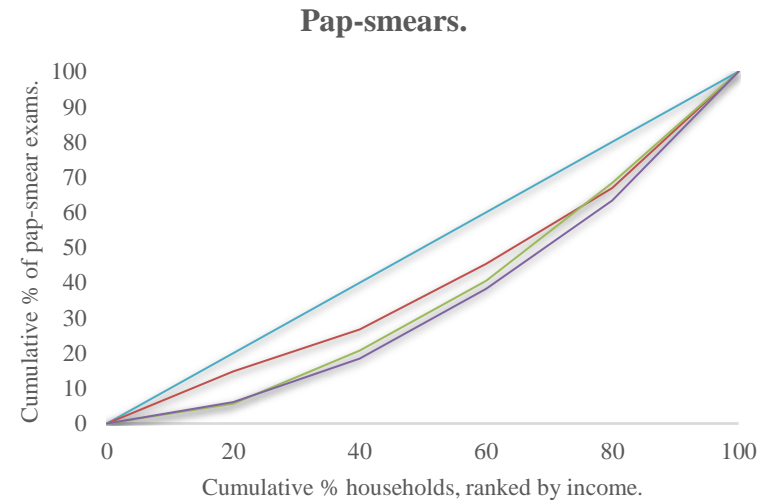
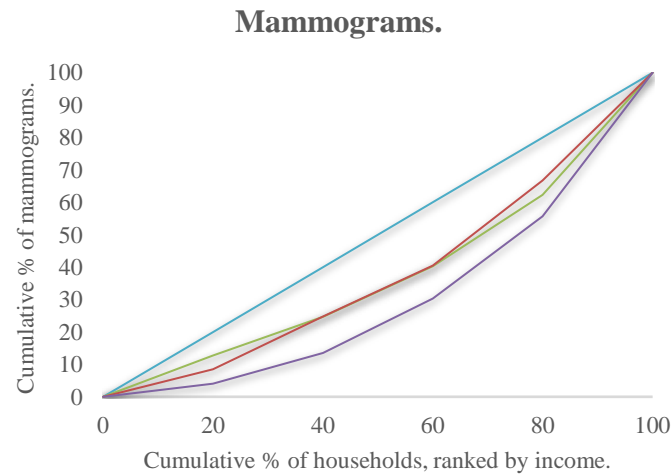
— Concentration Curve 2009

— Concentration Curve 2014

— Concentration Curve 2019

Concentration Curves (2/2).

- CCs for service use lie below the diagonal (positive CIs).
- CCs in 2014 and 2019 have moved further away from the diagonal (line of equality) compared to 2009.



— Line of Equality

— Concentration Curve 2009

— Concentration Curve 2014

— Concentration Curve 2019

Probit models (unmet needs).

- Unmet medical need: Negative associations with household income (all years) and education (in 2014), positive with unemployment (in 2014). Associations with citizenship and degree of urbanization disappear in 2014 (possible levelling down effects).
- Unmet dental need: Similar results, effect of education is more prominent.

	Probits for unmet medical need			Probits for unmet dental need		
	2009	2014	2019	2009	2014	2019
			association [statistical significance]			
Male		negative [***]	negative [***]	positive [*]	negative [***]	
Age [Overall effect]	negative [**]	positive [***]	positive [***]	negative [**]	positive [**]	positive [***]
Household income [Overall effect]	negative [*]	negative [***]	negative [**]	negative [*]	negative [***]	negative [***]
Education [Overall effect]		negative [*]		negative [**]	negative [**]	negative [***]
Unemployed		positive [***]			positive [***]	positive [*]
Non-Greek citizenship [Overall effect]	positive [*]			positive [***]		
Non-urban area [Overall effect]	positive[*]		negative [***]	positive[**]		negative [***]

Notes: * for $p < .05$, ** for $p < .01$, and *** for $p < .001$.

Probit models (doctor visits).

- Association with gender (all years, all variables). Same with (older) age except for dentist visits (opposite effect). Income positively associated with visits to GPs (2019), to specialists (2014 and 2019) and dentists (all years). Being unemployed shows a negative association with all three visit variables in 2019.
- Negative association between visits to specialists and non-urban residence statistically significant in all years.

	Probits for GP visits			Probits for specialist visits			Probits for dentist visits		
	2009	2014	2019	2009	2014	2019	2009	2014	2019
	association [statistical significance]								
Male	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]
Age [overall effect]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	negative [***]	negative [***]	negative [***]
Household income [Overall effect]			positive [**]	positive [**]	positive [*]		positive [***]	positive [***]	positive [***]
Education [Overall effect]	negative [**]						positive [***]	positive [***]	positive [***]
Unemployed			negative [**]			negative [*]			negative [**]
Non-Greek citizenship [Overall effect]	negative [***]	negative [*]	negative [**]	negative [**]		negative [*]	negative [**]		negative [***]
Non-urban area [Overall effect]		negative [*]		negative [***]	negative [***]	negative [***]	negative [**]		positive [***]

* for $p < .05$, ** for $p < .01$, and *** for $p < .001$.

Probit models (diagnostics 1/2).

- Positive association with gender (female) and older age.
- More prominent effect of SES variables in 2019 (especially education and unemployment).

	Blood pressure			Cholesterol			Blood sugar		
	2009	2014	2019	2009	2014	2019	2009	2014	2019
	association [statistical significance]								
Male	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]
Age [Overall effect]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]
Household income [Overall effect]			positive [*]						
Education [Overall effect]			positive [***]			positive [***]			positive [***]
Unemployed			negative [*]			negative [***]			negative [***]
Non-Greek citizenship [Overall effect]					positive [*]		negative [*]	positive [**]	
Non-urban area [Overall effect]	positive [***]								

* for $p < .05$, ** for $p < .01$, and *** for $p < .001$.

Probit models (diagnostics 2/2).

- Negative association between women’s screening tests and age.
- Significant positive effect of income and education (points to socioeconomic inequality).
- Negative, significant effect between mammograms and living in non-urban areas.

	Mammogram			Pap-smear		
	2009	2014	2019	2009	2014	2019
	association [statistical significance]					
Male						
Age [Overall effect]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]	negative [***]
Household income [Overall effect]	positive [*]	positive [*]	positive [*]	positive [***]		
Education [Overall effect]	positive [**]	positive [***]	positive [***]	positive [***]	positive [***]	positive [***]
Unemployed						
Non-Greek citizenship [Overall effect]						
Non-urban area [Overall effect]	negative [*]	negative [*]	negative [***]			

* for $p < .05$, ** for $p < .01$, and *** for $p < .001$.

Discussion (1 / 2).

- Greeks reported much higher unmet medical needs in 2014 compared to 2009. Unmet needs decreased in 2019 but are still higher compared to 2009.
- Income-related inequalities present and statistically significant for unmet needs and most utilization indicators. Inequality particularly large for unmet dental need and women's screening tests.
- Indices of income-related inequality for unmet medical (and dental) need increased considerably during this period. Larger indices also for most visits to doctors and diagnostic exams.
- Other gradients also present (by education, unemployment, geographic location, gender and age).

Discussion (2/2).

- Analysis implications:
 - Population health (aggregate): Decreased access (and prevention!) during the crisis and in its aftermath may have an adverse impact on population health in the years ahead.
 - Inequality (distribution): Access disparities are eventually reflected in poorer health outcomes for the more disadvantaged individuals and groups, i.e. inequality in health outcomes may also deepen.

Thank you for your attention.

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