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CORRECTION

Correction to: The education gradient in cancer screening participation: a consistent phenomenon across Europe?

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The authors would like to correct the errors in the publication of the original article. More specifically, it concerns some misclassifications of countries into organised vs. opportunistic. In the case of cervical cancer screening, Croatia had an opportunistic instead of organised screening strategy in 2006, while Denmark had an organised screening strategy instead of opportunistic screening. In the case of breast cancer screening, Germany had an organised programme instead of opportunistic screening in 2006. Lastly, with regards to colorectal cancer screening Poland had no organised programme in 2006. Due to correction of the cross-level interactions for breast and colorectal cancer screening (these changed from marginally significant to significant with the correct classification), some sentences were rephrased. Although the misclassifications did not hamper the interpretation of the results, the authors sincerely apologize for the errors. The corrected details are given below for your reading.

In the Abstract, 2nd sentence of result section should read as:

Educational inequalities in cancer screening participation were significantly smaller in countries with organised screening for cervical (OR = 0.696, 95% CI 0.531–0.912), breast (OR = 0.628, 95% CI 0.438–0.900) and colorectal (OR = 0.531, 95% CI 0.303–0.932) cancer than they were in countries with opportunistic screening.

In the Results, 1st sentence of 2nd paragraph should read as:

For cervical cancer screening, overall participation ranged from 9.4% in Romania to 69.3% in Austria, with a similar overall participation rate in countries with organised (45.1%) and opportunistic screening (49.9%) (Table 1). Overall, breast cancer screening participation varied between 8.5% in Romania to 72.1% in Austria and France, with 12.1% (51.9–39.8%) more participation in countries with organised screening strategies (Table 2). In comparison with cervical and breast cancer screening, participation in colorectal cancer screening was much lower, ranging from 2.5% in Sweden to 31.8% in Germany. In addition, only 4 of the 27 European countries had organised screening strategies for colorectal cancer (Table 3).

In the Results, 3rd sentence of 3rd paragraph should read as:

Table 4 provides the results of the multilevel logistic regressions. Educational inequalities in screening participation were significant for the three cancer types. Compared to the lowest educational group, the probability of an individual from the highest educational group participating in screening was 1.770 times higher for cervical cancer (95% CI 1.540–2.034), 1.383 times higher for breast cancer (95% CI 1.159–1.649) and 1.486 times higher for colorectal cancer (95% CI 1.212–1.822). In addition, being employed and having a partner significantly increased the probability of participating in cervical cancer screening and breast cancer screening. The cross-level interactions indicate that educational inequalities in cancer screening participation varied significantly according to a country's screening strategy: educational inequalities were smaller in countries with organised screening strategies for cervical (OR = 0.696, 95% CI 0.531–0.912), breast (OR = 0.628, 95% CI 0.438–0.900) and colorectal (OR = 0.531, 95% CI 0.303–0.932) cancer, than they were in countries with opportunistic screening strategies.

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In the Discussion, 1st sentence of 6th paragraph should read as:

With regard to the second research question ('Do educational inequalities in cancer screening participation vary according to country-specific screening strategies?'), the results of this study clearly indicate that countries with organised cancer screening for cervical, breast and colorectal cancer allow for more equality in cancer screening participation between groups with lower and higher education than do countries with opportunistic screening.

Corrected Tables 1, 2, 3 and 4 provided here (corrected values are bold):

Table 1 Number of cases, participation rate (%) (overall and by educational level), participation rate difference (PRD = participation tertiary − participation primary) and participation rate ratio (PRR = participation tertiary/participation primary) of cervical cancer screening in the preceding 12 months in women within the appropriate age range, by country of residence and type of cancer screening strategy. Source: Eurobarometer 66.2 (European Union 2006)

Cervical cancer screening								
Screening type and country	*N*	Age range	Overall participation (%)	Participation by educational level			PRD (%)	PRR
				Primary (%)	Secondary (%)	Tertiary (%)		
Organised	**3735**		**45.1**	**41.9**	**44.2**	**47.7**	**5.9**	**5.8**
Netherlands	304	30–60	31.6	14.8	31.2	35.3	20.5	2.39
Denmark	**258**	**23–59**	**41.9**	**20**	**25.9**	**44.2**	**24.2**	**2.21**
Estonia	257	30–59	29.2	30.8	31.7	25.7	− 5.1	0.83
Finland	327	25–65	51.7	30.6	46.2	58.1	27.5	1.9
Sweden	297	23–60	44.1	54.5	40.2	45.2	− 9.3	0.83
UK	460	20–64	41.7	37.5	42	45.2	7.7	1.21
Portugal	353	25–64	50.7	50.9	52.6	45.7	− 5.2	0.90
Italy	475	25–64	52	48.2	51.7	57.8	9.6	1.20
Slovenia	382	20–64	55.8	46.8	54.1	63.8	17	1.36
Lithuania	258	30–60	40.7	25	36.2	47.3	22.3	1.89
Hungary	364	25–65	46.2	28.9	52.8	58.5	29.6	2.02
Opportunistic	**6230**		**49.9**	37	**50.9**	**57.7**	**20.7**	**1.56**
Austria	440	20+	69.3	64.5	72	66.1	1.6	1.02
Germany	706	20+	54.5	40	58.2	66.7	26.7	1.67
Luxembourg	244	15+	66	59.1	63.9	74.1	15	1.25
France	359	20–65	61.8	48.8	62	65.1	16.3	1.33
Belgium	358	25–64	63.7	51.9	55.3	72.4	20.5	1.39
Latvia	487	20–70	61	53.5	58.3	68.5	15	1.28
Ireland	343	25–60	38.2	24.5	37.7	47	22.5	1.92
Spain	373	18–65	41.6	34.4	38.9	59.8	25.4	1.74
Croatia	**369**	**–**	**53.1**	**34.7**	**56.3**	**59.8**	**25.1**	**1.72**
Greece	487	20+	46	29.2	53.8	68.4	39.2	2.34
Cyprus	167	30–60	49.1	46.7	52.4	44	− 2.7	0.94
Poland	308	25–59	40.6	26.5	34.8	51.3	24.8	1.94
Czech Republic	484	25–69	47.5	25.6	50.3	45.7	20.1	1.79
Slovakia	502	23–64	56	25	57.6	57.6	32.6	2.30
Romania	318	25–65	9.4	3.1	10.2	12.7	9.6	4.10
Bulgaria	285	31–65	19.6	8.1	12.7	34.7	26.6	4.28
Europe	9965		48.1	38.8	48.7	53	14.2	1.37

Table 2 Number of cases, participation rate (%) (overall and by educational level), participation rate difference (PRD = participation tertiary − participation primary) and participation rate ratio (PRR = participation tertiary/participation primary) for breast cancer screening in the preceding 12 months in women within the appropriate age range, by country of residence and type of cancer screening strategy. Source: Eurobarometer 66.2 (European Union 2006)

Breast cancer screening								
Screening type and country	*N*	Age range	Overall participation (%)	Participation by educational level			PRD (%)	PRR
				Primary (%)	Secondary (%)	Tertiary (%)		
Organised	**3292**		**51.9**	**52.2**	**51.8**	**51.7**	**− 0.5**	**0.99**
Germany	**237**	**50–69**	**46.4**	**48.3**	**42.2**	**52.1**	**3.8**	**1.08**
Luxembourg	78	50–69	71.8	87.5	63.9	66.7	− 20.8	0.76
France	154	50–74	72.1	76.4	65.2	78.8	2.4	1.03
Belgium	148	50–69	66.2	60	66.2	69.8	9.8	1.16
Netherlands	200	50–75	60.5	59.6	52.3	73.7	14.1	1.24
Denmark	161	50–69	21.1	8.3	21.7	22.2	13.9	2.67
Estonia	102	50–59	53.9	40	52.8	59	19	1.48
Finland	185	50–69	54.6	61.5	57.8	48.8	− 12.7	0.79
Sweden	277	40–74	55.2	38.5	52.4	59.3	20.8	1.54
UK	218	50–70	40.4	39.6	42.1	37.5	− 2.1	0.95
Portugal	229	45–69	69	69.3	72	60	− 9.3	0.87
Spain	188	45–70	46.3	43	43.6	71.4	28.4	1.66
Italy	152	50–69	62.5	61.4	60.3	70.8	9.4	1.15
Croatia	171	50–69	41.5	34.8	44.9	47.2	12.4	1.36
Cyprus	108	50–69	44.4	41.3	47.5	60	18.7	1.45
Lithuania	197	50–69	23.4	20.6	22.1	26	5.4	1.26
Czech Republic	281	45–69	53.4	42.1	54.1	59.6	17.5	1.42
Hungary	206	45–65	61.7	51.3	71	57.5	6.2	1.12
Opportunistic	**2035**		**39.8**	**29.7**	**43.1**	**44.5**	**14.8**	**1.5**
Austria	240	40–69	72.1	63.6	76.1	71.9	8.3	1.13
Latvia	171	50–69	38	37.9	34.7	44.7	6.8	1.18
Ireland	119	50–64	44.5	51.5	42	41.2	− 10.3	0.80
Slovenia	200	50–69	37	29.8	39.4	40.8	11	1.37
Greece	195	40–64	45.6	33.7	51.6	65.8	32.1	1.95
Poland	160	50–69	39.4	24.4	40	53.3	28.9	2.18
Slovakia	453	40+	49.7	36.4	52.9	48	11.6	1.32
Romania	164	50–69	8.5	4	1.8	29.4	25.4	7.35
Bulgaria	333	40+	15.9	9	13.6	26.7	17.7	2.97
Europe	5327		47.3	44.7	47.9	49.4	4.7	1.11

Table 3 Number of cases, participation rate (%) (overall and by educational level), participation rate difference (PRD = participation tertiary − participation primary) and participation rate ratio (PRR = participation tertiary/participation primary) for colorectal cancer screening in the preceding 12 months in men and women within the appropriate age range, by country of residence and type of cancer screening strategy. Source: Eurobarometer 66.2 (European Union 2006)

Colorectal cancer screening								
Screening type and country	*N*	Age range	Overall participation (%)	Participation by educational level			PRD (%)	PRR
				Primary (%)	Secondary (%)	Tertiary (%)		
Organised	**1937**		**7.7**	**8.1**	**7.4**	**7.5**	**− 0.6**	**0.93**
Finland	183	60–69	11.5	19.6	12.1	5.6	− 14	0.29
UK	575	45–74	5.6	7	5.1	3.2	− 3.8	0.46
Italy	278	50–74	8.6	9.4	4.9	15.4	6	1.64
Czech Republic	446	50+	9	11.9	9.2	5.6	− 6.3	0.47
Opportunistic	**7706**		**10.3**	**9.8**	**10.1**	11.2	**1.4**	**1.14**
Austria	372	50+	27.2	19.7	29.3	38.8	19.1	1.97
Germany	592	50–74	31.8	28.9	31.8	37	8.1	1.28
Luxembourg	172	–	19.2	17	22.2	17	0	1
France	317	50–74	16.1	18.6	14.3	16.3	− 2.3	0.88
Belgium	353	50–75	10.5	13.1	9.9	9.4	− 3.7	0.72
Netherlands	298	55–75	4.7	1.3	3.3	9.4	8.1	7.23
Denmark	459	45–75	8.3	6.3	8.3	8.4	2.1	1.33
Latvia	327	50–74	16.5	18	9.4	30.6	12.6	1.7
Estonia	389	50–74	3.3	1.6	4.6	2.3	0.7	1.44
Sweden	201	50–60	2.5	0	3.4	2.5	2.5	–
Ireland	224	55–74	10.3	6.7	10.1	20	13.3	2.99
Portugal	297	50–70	12.8	11.5	17.9	20	8.5	1.74
Spain	215	50–69	7	5.1	7.5	22.2	17.1	4.35
Slovenia	313	50–69	3.5	6.4	2.1	2.7	− 3.7	0.42
Croatia	335	50–74	3.6	7	2.2	1.2	− 5.8	0.17
Greece	455	50+	7	5.9	6.7	13.3	7.4	2.25
Cyprus	260	50+	3.1	3.8	2.7	0	− 3.8	0
Lithuania	384	–	7.3	3.2	7.5	10	6.8	3.13
Poland	**217**	**50–65**	**6.9**	**3.8**	**6.7**	**10**	**6.2**	**2.63**
Slovakia	491	50+	9.4	3.9	10.2	11.1	7.2	2.85
Hungary	365	50–70	4.9	7.6	3.8	2.1	− 5.5	0.28
Romania	353	50–74	3.1	3.7	2.1	4.2	0.5	1.14
Bulgaria	772	31+	4.4	0.6	5.2	6	5.4	10
Europe	9643		9.8	9.4	9.5	10.7	1.3	1.14

Table 4 Multilevel logistic regressions using logistic odds ratios (OR > 1 = more participation) for cervical cancer screening participation ($N_{individuals}$ = 9965, $N_{country}$ = 27), breast cancer screening participation ($N_{individuals}$ = 5327, $N_{country}$ = 27), and colorectal cancer screening participation ($N_{individuals}$ = 9643, $N_{country}$ = 27). Source: Eurobarometer 66.2 (European Union 2006)

	Cervical cancer screening		Breast cancer screening		Colorectal cancer screening	
	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)	Model 1 OR (95% CI)	Model 2 OR (95% CI)
Education (primary)						
Secondary	**1.342 (1.186–1.518)**	**1.454 (1.245–1.697)**	1.121 (0.966–1.301)	**1.412 (1.099–1.815)**	1.141 (0.953–1.367)	**1.214 (0.994–1.483)**
Tertiary	1.770 (1.540–2.034)	2.034 (1.702–2.431)	1.383 (1.159–1.649)	**1.883 (1.398–2.537)**	1.486 (1.212–1.822)	**1.649 (1.319–2.062)**
Age	0.988 (0.984–0.992)	0.988 (0.984–0.992)	0.979 (0.970–0.989)	0.980 (0.971–0.990)	1.005 (0.993–1.017)	1.005 (0.993–1.017)
Work status (employed)						
Unemployed	**0.829 (0.702–0.980)**	**0.829 (0.702–0.980)**	0.457 (0.338–0.620)	**0.459 (0.338–0.623)**	0.944 (0.639–1.394)	**0.942 (0.638–1.391)**
Non-employed	0.796 (0.719–0.882)	0.797 (0.720–0.882)	**0.815 (0.703–0.944)**	**0.811 (0.700–0.939)**	1.077 (0.889–1.305)	**1.081 (0.892–1.310)**
Partner (no partner)	1.395 (1.272–1.530)	**1.394 (1.271–1.528)**	1.358 (1.198–1.539)	**1.354 (1.194–1.535)**	1.006 (0.862–1.174)	**1.008 (0.863–1.177)**
Good self-reported health (bad)	1.049 (0.949–1.159)	**1.050 (0.950–1.161)**	**0.883 (0.775–1.007)**	**0.881 (0.772–1.004)**	**0.729 (0.624–0.851)**	**0.732 (0.627–0.855)**
Organised screening (opportunistic)	**0.796 (0.480–1.320)**	**1.003 (0.585–1.719)**	**1.944 (1.080–3.501)**	**2.555 (1.375–4.746)**	**1.012 (0.480–2.136)**	**1.324 (0.599–2.929)**
Female (male)					0.914 (0.789–1.059)	**0.914 (0.789–1.059)**
Organised screening × secondary education		**0.804 (0.629–1.027)**		**0.707 (0.521–0.960)**		**0.723 (0.458–1.142)**
Organised screening × tertiary education		**0.696 (0.531–0.912)**		**0.628 (0.438–0.900)**		**0.531 (0.303–0.932)**
Country variance (SE)	**0.421 (0.118)**	**0.426 (0.119)**	**0.513 (0.147)**	**0.504 (0.144)**	**0.541 (0.162)**	**0.550 (0.164)**

Correction to the references

Kaminski MF, Kraszewska E, Rupinski M, Laskowska M, Wieszczy P, Regula J (2015) Design of the Polish Colonoscopy Screening Program: a randomized health services study. Endoscopy 47(12):1144–1150

Lynge E, Andersen B, Christensen J, Ejersbo D, Jochumsen K, Johansen T et al (2017) Cervical screening in Denmark—a success followed by stagnation. Acta Oncol 1–8

Malek D, Kääb-Sanyal V (2016) Implementation of the German Mammography Screening Program (German MSP) and first results for initial examinations, 2005–2009. Breast Care 11(3):183–187

Petry KU, Menton S, Menton M, van Loenen-Frosch F, de Carvalho Gomes H, Holz B et al (2003) Inclusion of HPV testing in routine cervical cancer screening for women above 29 years in Germany: results for 8466 patients. Br J Cancer 88:1570. https://doi.org/10.1038/sj.bjc.6600918

Vrdoljak-Mozetič D, Verša Ostojić D, Štemberger-Papić S, Janković S, Glibotić-Kresina H, Brnčić-Fischer A, Benić-Salamon K (2010) Cervical Cancer Screening Programme in Primorsko-Goranska County, Croatia—the results of the pilot study. Coll Antropol 34(1):225–232