Complementary report on Social inequalities in participation in cancer screening in Europe between 2005-2011
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This study is framed in the European Partnership for Action Against Cancer (EPAAC), financed by DG SANCO, and within Work Package (WP) 6 on “Screening and Early Detection”. The general objective of this WP is to alleviate key barriers, to ensure cancer screening is of appropriate quality, according to the Council Recommendation on Cancer Screening.
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1. JUSTIFICATION OF THE STUDY

The expected outcome of cancer screening programmes is a decrease in mortality rates and the incidence of some types of cancer (1). However different barriers to participation related to organizational aspects of the screening programmes, people's knowledge, beliefs and attitudes about the disease and the programmes have been identified, as well as lack of screening opportunities in some regions of Europe (2). As a result all these barriers are shaping inequalities in cancer.

The European Union Council recommendation recognises the need to ensure equal access to screening and also to increase the participation rate in this type of programmes, since most still fail to reach the recommended percentages (65-70%) (1).

Inequalities in the current European context must be carefully monitored, since a restructuring process of the welfare state that affects the healthcare system is taking place. This process is characterized by: the re-commodification of social relations in the field of health, the increasing role of the market as manager and provider of healthcare services or as an initiator of specialized offers for the high-income population and the growing presence of the third sector in the subsidiary tasks. Moreover the trend towards segmented universalism in detriment of citizen universalism threatens progress in the horizontal distribution of health.

That is worrying in the cancer screening context, because it could difficult to reach the goal of ensuring equal access to screening for the entire target population. It may affect the implementation of population base cancer screening programmes in regions currently without coverage and could worsen access to existing screening programmes.

“In a broader economic context of rescue packages, deficits and cutbacks to government entitlements, health professionals must intensify their advocacy for the protection of vital
preventive health services by fighting for quality services with clear benefits for population health outcomes” (3).

This study aims at better understanding the mechanisms and structural factors that lead to differences in participation, thus inequalities in screening.

This report is complementary to a previous report “Social inequalities in participation in cancer screening programmes. The state of the art of the research” (4).
2. OBJECTIVE

General objective:

To review the literature published between 2005 and 2011 on inequality in participation in screening for breast, cervical and colorectal cancer, among different population subgroups, in order to identify barriers to and facilitators of equity in participation in screening and to detect structural variables of inequality in the European screening context.

Specific objectives:

1. To identify different theoretical frameworks from which the study of the differences in participation is addressed, and to analyze if the health inequalities approach is thought-out and how.

2. To identify the type of methodologies (qualitative, quantitative), the population or the scope of the study, the sources (primary or secondary), etc. that were defined in the articles.

3. To identify which structural determinants (explainers of inequalities) and intermediary determinants (barriers and facilitators) are associated with low participation and the direction of this association.
3. METHODOLOGY

The general methodology of this study is shown in detail in the previous report “Social inequalities in participation in cancer screening programmes. The state of the art of the research” (4).

3.1. Study design

The main characteristics of the methodology used in this report are described below:

A Literature Review was conducted through the electronic databases PubMed and Embase. Articles published in both databases, between 1st January 2005 and 1st June 2011, were included. The search strategy was defined through MeSH terms, for Medline database, and Emtree terms, for Embase database.

3.2. Eligibility Criteria

The Eligibility Criteria were: a) observational studies; b) conducted in the context of European cancer screening programmes; c) participation-related factors, both structural (any of the inequality axes: sex, age, ethnic groups, socioeconomic status etc.) and intermediary (barriers and facilitators).

3.3. Reading Guide

The valid articles were reviewed reading the full text using a Reading Guide. The Reading Guide was designed in an opened process (5), since different typology of articles appeared, the reading guide was modified and enlarged. This process allowed us to point out congruence and contradictions in current literature, to describe conceptualizations and methods, in addition to helping us to summarize and group the equivalent results and to describe specific cases in detail.
The final version of the Reading Guide includes:

1. **Identification of the article:** number identifying the articles.
2. **Complete reference:** the complete reference in Vancouver format.
3. **Type of cancer:** the articles were classified as “breast”, “cervical” and “colorectal cancer”. In some cases the articles included more than one cancer.
4. **Theoretical framework of the articles**
   a. **Type of social determinant approach**
      i. **Structural determinants approach:** the analysis was done studying only structural determinants, which are those that determine social position and are in turn determined by the socio-political context (10).
      ii. **Intermediary determinants:** the analysis was done studying only intermediary determinants, which are those that lead to unequal exposure to risk factors, on the one hand due to biological, material, psychosocial factors and social cohesion and, on the other hand, due to the response of the health care services to the promotion, prevention and treatment of disease (10).
      iii. **Multi-determinants:** the analysis was done studying more than one type of social determinant, such as for example, structural determinants and intermediary determinants, or structural determinants and macro determinants (structural conditions such as type of programme or programme maturity) or even combining all of them.
   b. **Equity approach:** if the article included the words “inequality” or “inequity” (and derivatives) into the full text it was classified as “equity approach”, and if not it was classified as “non-equity approach”.
   c. **Target Population/Health Professional approach:** the articles were classified in “Target Population approach” if the sample of the study was the target population of the screening programmes; on the other hand the “Health Professional approach” was defined when the sample was general practitioners or other health professionals related to the screening programmes.
5. Methodology

a. **Quantitative /Qualitative:** The studies were classified as “quantitative” when they used quantitative techniques (questionnaires, analysis of secondary database…) or qualitative if they used qualitative techniques (focus groups, interviews…).

6. **Results:** The factors related to inequalities in participation were classified in the following dimensions:

a. **Structural determinants (explainers of inequality).** The variables analysed were: socioeconomic status (social class, deprivation –geographic or individual-, educational level, occupation, income, house characteristics), sex, ethnic-cultural groups (ethnicity, country of origin, religion), cohabitation status, age and territory (city size, specific region, urban/rural).

b. **Intermediary determinants (barriers or facilitators).** The variables analysed were: behavioural factors, psychosocial factors, health system factors, health status and material circumstances and health system factors.

7. **Conclusions:** The main conclusions of the articles.

### 3.4. Compilation of the results

A **Descriptive Summary Table** of each cancer (Annex 1, 2 and 3) was designed in order to compile the results of the analysis.

The results of the study are presented for the three cancers together, organised in following dimensions:

1. Selection process of the articles
2. Theoretical framework of the articles
3. Methodology of the articles
4. Structural determinants of inequalities in cancer screening participation (explainers of inequalities)
5. Intermediary determinants of inequalities in cancer screening participation (barriers and facilitators).

The main results are referenced by the numbers in brackets that correspond to the identification number of the article, included in Annexes 1, 2 and 3.
4. Results

4.1. Selection process of the articles

As you can see in the Algorithm 1, following the Eligibility Criteria in the first phase of the study (4) 699 articles were selected. Taking into account the new Eligibility Criteria defined in the methodology of this report 92 papers were selected.

From these 92 articles, 7 were duplicated in more than one cancer. Moreover 26 (8 from CCR, 11 breast and 7 cervical) were ruled out for different reasons: after full text reading we detected that the articles didn’t meet the criteria for inclusion in the first phase, translation was not available, or we couldn’t get the full text of the article.

In this new phase of the literature review articles selected from all those valid were 59, 18 colorectal articles, 23 breast articles and 18 cervical articles (see Annexes 1, 2 and 3).

Some articles (8/59) focused on more than one type of cancer so we studied them separately and they are repeated in the different annexes. The correspondences are detailed below:

- Szczepura A, Price C, Gumber A. Breast and bowel cancer screening uptake patterns over 15 years for UK south Asian ethnic minority populations, corrected for differences in socio-demographic characteristics. BMC Public Health 2008 Oct 2;8:346. (Annex 1; 17 and annex 2; 5)


Algorithm 1. Number of valid and non-valid articles and reasons for exclusion (three types of cancer)

Articles 699

Not Valid 607

Reasons to exclude:
- Not Published between 2005-2011
- And/or
- No european

92 Duplicated

85

Not Valid 7

Not valid 607

Not valid 92

Not valid 8

Not valid 11

Not valid 7

CCR
Nº articles 26

Not valid 8

Reasons to exclude
- No european 2
- No inequalities 2
- No observational study 2
- Not found 2

Valid 18

BREAST
Nº articles 34

Not valid 11

Reasons to exclude
- No european 6
- No inequalities 1
- No observational studies 2
- Translation from txec not available 1

Valid 23

CERVICAL
Nº articles 25

Not valid 7

Reasons to exclude
- Not found 3
- No european 2
- No inequalities 1
- Translation not available 1

Valid 18

59 eligible articles included in full text review
4.2. Theoretical framework of the articles

4.2.1. Type of social determinant approach

Most articles aimed to analyse inequalities in participation but not all placed themselves theoretically into the inequalities framework and there were different approaches.

According to the variables analysed we found that just over half, 29 out of 59, took a multi-determinant approach (annex 1, articles: 1,3,4,6,8,12,14,18; annex 2, articles: 3,4,7,12,13,14,16,20,21,22,23; annex 3, articles: 1,2,4,6,7,8,9,11,15,18).

However, a considerable number of articles took just one type of determinant for the analysis: 27 out of 59 articles took the structural determinants approach (annex 1, articles: 2,5,7,11,13,15,16,17; annex 2, articles: 1,5,6,8,9,10,11,15,17,18,19; and annex 3, articles: 3,5,10,12,13,14,16,17). And 3 out of 59 took the intermediary determinants approach (annex 1, articles: 9, 10; annex 2, articles: 2), focusing in factors such as psychosocial, behavioural, informational factors, etc.

Some of the articles did not measure participation directly (annex 1, articles: 3,6,7,14; annex 3, article: 9) instead, they measured attitudes towards screening, knowledge or ability to seek information about screening.

4.2.2. Equity approach

To attempt to objectify if articles place themselves into the inequalities framework consciously, we searched for the words “inequality” or “inequity” (and derivatives) in the full text of the articles.

31 out of 59 articles did not contain either of the two words, so we classified them as non inequality approach (annex 1, articles: 1,4,7,8,9,10,11,12,13,15,16; annex 2, articles: 1,2,4,6,7,8,9,12,13,15,16,18,20; annex 3, articles: 5,8,10,12,13,14). The rest of them, 28 out of 59, used the word inequality or inequity so we considered them as placed in the inequality approach (Annex 1, articles: 2,3,5,6,14,17,18, annex 2, articles: 3,5,10,11,14,17,21,22,23 and annex 3,
articles; 1,2,3,4,6,7,9,11,15,16,17,18) to different degrees since some articles explain the topic in the introduction and conclusion and some referred to it in one phrase only (ex: “ensuring equal access”).

4.2.3. Target Population/Health Professional approach

Most of the studies analysed in this review focused on participants’ perceptions of barriers, rather than health professional perceptions, meaning that they used the target population approach (57/59) (Annex 1, articles: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18; annex 2, articles: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23; annex 3, articles: 1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17).

Only a small number of studies focused on healthcare professionals’ attitudes using a health professional approach (2/59) (annex 1, article: 14; annex 3, article: 2). Whichever target population or health professional approach, barriers and facilitators concerned individual or health system factors.

4.3. Methodology of the articles

Regarding the methodology, articles reviewed mostly used quantitative methods (58/59) (Annex 1, articles: 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18; annex 2, articles: 1,2,4,5,6,7,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23; and annex 3, articles: 1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18). Only one paper, (annex 3, article: 2) used qualitative techniques such as semi-structured interviews.
4.4. Structural determinants of inequalities in cancer screening participation (explainers of inequalities).

The main explainers of inequitable participation across the papers reviewed within this study were socio-economic status and age, for all types of cancer screening, followed by territory and ethnicity. Other main explainers for specific types of cancer were sex and marital status, for colorectal and breast cancer screening respectively.

These predictors are discussed below.

4.4.1. Socioeconomic status (37/59) (Annex 1, articles; 1,2,4,5,7,12,13,18, annex 2, articles; 1,2,4,5,7,8,9,11,13,15,16,17,18,20,21,22,23 and annex 3, articles: 1,3,4,5,6,10,11,14,15,16,17,18).

Educational level, income, and occupational level were mainly used to operationalize SES. Most of the studies found a significant socioeconomic gradient with people from lower educational level, lower income and disadvantaged occupational positions being less likely to undertake screening. One study, however, found a tendency to a lower participation rate in breast screening among women with postgraduate education and in the highest income bracket.

4.4.2. Age (25/59) (Annex 1, articles; 4,6,7,10,11,12,13,15, annex 2, articles; 1,5,10,12,13,16,18,19,20,21 and annex 3, articles; 1,3,5,7,8,14,16)

21 studies explored age inequality in utilisation of screening and 15 out of 21 found a lower rate of screening participation among the highest age group. Nevertheless three papers found a lower rate among younger groups and also three out of 25 found a “U” shaped function with lowest rates of participation in the youngest and oldest groups.

4.4.3. Territory (16/59) (Annex 1, articles; 1,2,5,11,18, annex 2, articles; 6,7,10,12,15,16 and annex 3, articles; 1,5,12,13,17)

Regarding the territory axis, 8 out of 16 explored rurality and there was no consensus: 5 found lower participation rates in rural areas and 4 studies, however, found lower rates in
metropolitan areas (urban). 3 out of 16 explored city size, also without agreement: 1 found large city size at higher risk versus 2 articles that found small city size disadvantaged.

Also with regard to territory, 7 out of 16 explored specific regions: 4 articles found territorial inequality in participation in Italy, with the centre and south of Italy disadvantaged. One study found that west Netherlands had a higher risk of non-participation compared with the rest of the Netherlands, another study found that Republic of Ireland was disadvantaged compared with Northern Ireland (UK) and another found some regions in Spain (Cantabria, Andalucía, Castilla la Mancha and Extremadura) to have lower participation rates than the rest of the regions.

4.4.4. Ethnicity (14/59) (Annex 1, articles; 2, 6, 7, 17, annex 2, articles; 5, 6, 12, 18, 20 and annex 3, articles; 1, 7, 8, 10, 16)

14 studies examined ethnic disparities in screening participation, all of them found that either ethnic minority groups (non Caucasian) as well as country of origin (immigrant condition) were explainers of disadvantage in participation.

Two of these studies found also that Muslim religion groups were at higher risk of non-participation.

4.4.5. Cohabitational/marital status. (13/59) (Annex 1, articles; 1, annex 2, articles; 7, 12, 13, 14, 16, 18, 21, 22 and annex 3, articles; 1, 10, 11, 14)

13 out of 59 articles studied cohabitational status and 12 found that being single was associated with lower rates of participation, only one article found that the non single population was at higher risk of non participation.

This inequality axis was mainly studied for mammographic screening: 8 out of 23 breast articles studied this and 7 found that single people were in a higher risk of non-participation vs one article that found non single people to be at higher risk.
4.4.6. Sex (12/59) (Annex 1, articles; 1,2,4,6,7,8,10,11,13,15,16,17)

In colorectal screening sex (female/male) was a main variable: 12 out of 18 analysed this and 10 out of 12 found lower participation rates among men.
4.5. Intermediary determinants of inequalities in cancer screening participation (barriers and facilitators).

4.5.1. Barriers to participation (16/59) (Annex 1, articles, 4,1,6,9,7 annex 2, articles; 4,7,13,14,20,21 and annex 3, articles; 1,4,5,8,11).

In total 16 articles analysed barriers to participation.

The main barriers to participation were related to health status (9/16), psychosocial factors (8/16), health system factors and behavioural factors (7/16). To a lesser extent material circumstances (4/16) were also significant barriers to screening participation.

The health status barriers most often identified were poor health self-evaluation, osteomuscular disease and obesity.

Included in psychosocial determinants were; gender burdens, non vulnerability perception and negative feelings towards screening, were the main factors affecting participation.

The main health system factors were physician referral required and long timeouts.

And among behavioural factors, unhealthy lifestyle such as “sedentary lifestyle“ or “unhealthy diet“, were most often identified.

Lack of information was the main factor regarding material circumstances.

4.5.2. Facilitators of participation (17/59) (Annex 1, articles; 2,4,8,1,7,9,12 annex 2, articles; 7,12,14,16,21,9 and annex 3, articles; 4,7,11,15).

In total 17 articles analysed facilitators of participation.

The main facilitators of participation were related to behavioural factors (12/17), followed by health-system factors (10/17) and psychosocial factors (5/10).
Previous health service use and talk with cancer patient were the most expressed facilitators among behavioural factors, followed by previous screening and previous gynaecologist visit.

Physician recommendation and supplementary private insurance were the most expressed facilitators among health-system facilitators.

Positive feelings was the most expressed as a psychosocial facilitator.

Also, family history of cancer, among health status factors, was an important facilitator of screening participation.
5. Discussion

The previous report showed us how and to what extent inequalities in participation in cancer screening have been studied in the last decade in Europe and North America.

In this appendix we have focused on analyzing the European articles published during the last five years to see how inequality behaves, that is: in what direction, which social groups it affects, and which barriers and facilitators are expressed by stakeholders.

Moreover, reading the full text of the articles has allowed us to identify different approaches in the study of inequalities.

Regarding the theoretical framework

Our results highlight that the study of social inequalities in participation in cancer screening does not always imply a social approach as would be required by this issue. Studies did not always place themselves in the inequalities framework, rather, some of the articles aimed simply at analysing coverage and participation rates and studied this by stratified variables available on the programmes, so differences were found but the meaning of inequality shown by these figures was not emphasized. This fact has been highlighted in our results since more than half of the studies did not include the words “inequality” or “inequity”.

This would imply that in spite of the results we cannot assure that some of the articles are actually concerned with inequality.

As argued in Graham’s articles (6) more emphasis on social inequalities is required for a determinants-oriented approach to be able to inform policies to address health inequalities.
Some studies also analysed differences in diagnosis and survival, and participation was not analysed in detail.

Furthermore, most of the studies used participants as the study sample, with few addressing the study of health professionals’ actions and attitudes, or the evaluation of programmes strategies. That could express the preference for psychosocial explanations about participation, giving greater weight to individual actions and not so much to organizational aspects. It is complex to separate them, because the social system influences both individuals as well as health systems.

**Regarding methodology**

Most of the studies used quantitative methodology providing evidence to support the existence of inequalities, with the tools widely accepted by the scientific world. However to better understand the mechanisms behind structural determinants **qualitative methodology would be helpful.** To describe the ways in which qualitative evidence would contribute to the evidence base for policymaking there are two different models (7): The enhancement model, which assumes that qualitative research adds something ‘extra’ to the findings of quantitative research – by generating hypotheses to be tested, by helping to construct more sophisticated measures of social phenomena, and by explaining unexpected findings generated by quantitative research. And the epistemological model views qualitative evidence as making an equal and parallel contribution to the evidence base through: focusing on questions that other approaches cannot reach; increasing understanding by adding conceptual and theoretical depth to knowledge; and shifting the balance of power between researchers and the researched. Moreover the epistemological model views qualitative evidence as not necessarily complementing quantitative evidence, but sometimes conflicting with it.

**Regarding structural and intermediary determinants of inequalities in participation.**

This review evidences the existence of inequalities in colorectal, breast and cervical screening participation, mostly in the same direction as social inequalities. Disadvantaged
socioeconomic groups, older people, ethnic minorities or immigrants and specific regions were at higher risk of non-participation.

Results about socioeconomic inequality in participation are supported by previous reviews (8, 9) and can be explained by the interaction of the social determinants of health addressed at the Commission on Social Determinants of Health’s Model, WHO (10).

Regarding age inequalities, the heterogeneity of age intervals of all the studies reviewed, of different types of cancer screening programmes, represents a limitation to consider results without reservation.

Regarding ethnic minorities and the immigrant population, results could be explained by cultural differences (such as length of time in the country, language limitations, lack of familiarity with western concepts of prevention and cultural beliefs) as is supported in previous studies (11) or as is suggested in previous reviews (12). Another study analysing breast and bowel cancer screening uptake patterns over 15 years for UK Asian ethnic minorities found that lower screening uptakes cannot be attributed to other socio-demographic differences (13).

However another North American study found that socioeconomic position can explain inequalities in colorectal screening participation for immigrants (14).

Therefore, although the explanation for ethnical differences in participation remains unclear, these results highlight the importance of focusing on ethnic-cultural minority groups to target interventions.

Inequalities regarding territory may be explained by the socioeconomic and political characteristics of these regions and relations with the central government policies, most of the regions with lower uptakes were in a disadvantaged socioeconomic position regarding the rest of the country. A dynamic approach would be needed to better understand the ways in which the social differences in a society are linked to economic and social development (5).
Although the results clearly show that inequality remains despite the implementation of screening programmes, longitudinal studies about bowel and breast screening proved that it has diminished over the years. (13)

However an article carried out in UK (15) found that, after 10 years of implementation of a national cervical screening programme, uptake had decreased. The programme had been a victim of its own success: the decreasing mortality could have caused a lower perception of risk and the decline of participation rates, specially among younger cohorts and the deprived population.

Another review regarding interventions is also in line with our results: “The available evidence supports the hypothesis that while organized population screening programs are successful in increasing overall participation rates, they may not per se substantially reduce social inequalities. Some strategies were consistently found to enhance access to screening among lower socioeconomic groups” (9)

6. Recommendations

Therefore it is advisable:

1. To encourage population based screening programmes and, simultaneously, to implement mechanisms that reinforce the participation of vulnerable population (such as disadvantaged socioeconomic groups, older people, ethnic minorities or immigrants) and to level up participation in disadvantaged regions.

2. To promote research from a social framework in health cancer with a critical political economy approach.

3. To develop community based participatory research to create a culturally grounded intervention for cancer primary and secondary prevention.
Although strengthening health care and social services and encouraging people to make “healthy choices” and adopt “healthy lifestyles” are important activities, access to health care and quality of services are not the primary causes of health inequalities in most developed nations. If research and policy activity are limited to these issues, there may be neglect of the social determinants of health and how their inequitable distribution results in health inequalities. It can reinforce already dominant public policy approaches toward health care, outshining the role that living circumstances play in creating health inequalities (16).

Available evidence suggests that public policy on the basis of universalism and social rights is especially effective in reducing social inequalities and promoting health, with no adverse effects upon the operation of their market economies (17,18).

Consequently to fully address cancer health inequalities it is necessary to propose macro-recommendations:

4. To analyse how the political economy of a nation creates inequalities and to identify roads for social and political action.
5. To develop critical analysis that empowers the majority in order to gain understanding of and increase their influence and power.
6. To build a European model of healthcare based on a universalism of social-citizenship, to stop market interferences in public policies and to boost policies in order to achieve socioeconomic equality, that is the main explainer of inequality in cancer participation in Europe.

What does this Appendix add?

- Analyses extensively (literature search process that started revising 699 Abstracts) and intensively (Reading full text and detailed analysis), the state of the art of
inequality in participation in three types of cancer screenings in Europe in the last five years: in what direction, what social groups are negatively affected, what are the barriers and facilitators expressed by stakeholders, and which are the research approaches.

- Reviews the approaches on cancer screening participation inequalities research and highlights the importance of framing into a social inequalities approach, encouraging a critical and socio-political analysis.

<table>
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<th>№</th>
<th>Ref</th>
<th>Aim</th>
<th>Method</th>
<th>Key points</th>
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<tr>
<td>1</td>
<td>Blom J et al 2008</td>
<td>Understanding the reasons for nonparticipation in cancer screening to improve compliance. To investigate characteristics of all participants and nonparticipants in a pilot program for colorectal cancer screening with sigmoidoscopy.</td>
<td>Quantitative. A population-based sample of 1986 Swedish residents. Uppsala and Lund. 771 invitees (39%) participated and 1,215 (61%) did not. Source: Sweden's comprehensive demographic and health care registers Questionnaire. Occupation, physical activity and diet. (Primary).</td>
<td>Explainers of inequality Gender: Men. Marital status: single and divorced. SES: Low (low tertile) Barriers: &gt;10day hospital stays (previous 5 years), Area of residence big city Facilitators: Living in the countryside or in small communities and having a documented family history of colorectal cancer was associated with better participation. Conclusions: General participation in screening with sigmoidoscopy low. The results suggest that psycho-cultural barriers of risk groups group. Should be studied to design information that will increase adherence to colorectal screening.</td>
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<td>2</td>
<td>Frederiksen BI et al 2010</td>
<td>To investigate differences in CRC screening participation using register-based individual information on education, employment, and income to encompass different but related aspects of socioeconomic status</td>
<td>A feasibility study on CRC screening was conducted in two Danish counties in 2005 and 2006. Screening consisted of a self-administered FOBT kit mailed to 177114 inhabitants aged 50-74 years. Information on individual socioeconomic status was obtained from Statistics Denmark.</td>
<td>Explainers of inequality Gender: men. Educational level: low. Income: low (lowest quintile). Occupational status: Unemployed, self-employed, pensioners disability. Ethnicity: non-Western Immigrants. (adjusted model for socioeconomic factors) Area of residence: City, Copenhagen. Conclusion: The results show a strong association between low socioeconomic status and low participation. Also in the non-Western immigrant origin, but also the gradient can be attributed to socioeconomic status. Unequal participation can increase the socioeconomic inequality also in stage diagnosis and survival.</td>
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<td>von Wagner C et al (2009)</td>
<td>To document the association between health literacy and willingness and ability to seek information about the new colorectal cancer (CRC) screening program in the UK. (1) and to determine the impact of health literacy on perceived confidence to take part in screening.</td>
<td>Quantitative descriptive transversal. questionnaire TOFHLA (test of functional Health Literacy in adults) n=96.</td>
<td>Did not measure participation directly. Health Literacy: low The written invitation can be problematic for adults with low health literacy, this may increase inequalities in participation in screening. The introduction of new technologies may increase these inequalities.</td>
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<td>Assessment of colorectal screening pilot programme. (n=78,083) Pilot programme, province of Lecco. 38,693 (49.6 per cent) of 78,083 individuals had a FOBT and 2,392 (6.2 per cent) had a positive result. + Questionnaire</td>
<td>Explainers of inequality Gender: men. Age: &gt; 60. Educational level: low. Occupational status: blue collar. Barriers: Lack of time. Fear to test results Conclusions: Major determinants of compliance were age less than 59 years, female sex, high education level and non-manual work. Facilitators: Programme organization: interventions; associations transport fobt kits from rural areas to laboratories. Sent to home: kit + invitation letter + reminder letter.</td>
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<td>401,197 individuals were sent an FOBT kit. Uptake was defined as return of a completed test kit within 3 months. Area-level deprivation in each postcode sector was indexed with the Townsend Material Deprivation Index. Analyses controlled for area-level household mobility, ethnic diversity and poor health, each of which was associated with lower return rates.</td>
<td>Explainers of inequality: strong socio-economic gradient in FOBT uptake, which declined from 49% in the least deprived quintile of postcodes to 38% in the middle quintile and 32% in the most deprived quintile. Little attenuation as a result of controlling for ethnic diversity, household mobility or health status. Area-level socio-economic deprivation in line with non-participation in FOBT screening. Necessary to build comprehensive explanatory models. Opportunity to tackle, through educational materials and instruction, the barriers that maintain inequalities in participation.</td>
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<td>Taskila T, et al (2009)</td>
<td>To Identify which factors contribute more strongly to negative attitudes toward screening (and therefore, probably to the low turnout.)</td>
<td>Quantitative, questionnaire. People aged 50-69 years general practices in the West Midlands. N= 11 355 people (53%)</td>
<td>Multivariable logistic regression analyses were performed to identify those factors (gender, age, ethnicity, deprivation, number of symptoms, and their duration)</td>
<td>Negative attitude towards screening. Gender: Men. Age: older. Ethnicity: Indian backgrounds. Psychological factors, modesty, fear of cancer and lack of knowledge. Also related to low participation. Positive attitude towards screening. Black-Caribbean ethnic background, people with multiple symptoms and those reporting abdominal pain, bleeding, and tiredness were more likely to have a positive attitude. Conclusion: Must develop culturally relevant strategies that increase awareness of the signs and symptoms of colorectal cancer among ethnic groups South Asians. Also increase acceptance of screening among asymptomatic patients.</td>
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<td>8</td>
<td>Sieverding M, et al (2008)</td>
<td>To examine the prevalence and correlation of participation in colorectal cancer screening using (FOBT)</td>
<td>Quantitative. questionnaire. Sample of men and women aged 50 to 70 years without a personal history of cancer (n=15,810). Data collected in 2004 through the Health Care Access Panel (HCAP), a nationally generalizable survey of German households.</td>
<td>Explainers of inequality: Gender: men (29.6% never)(46% men regular participation /63% women) Facilitators: checkups (26%men “never”/ 14%women “never”) Medical recommendation (66%women /54%men), Family history of cancer (48%women/39%men) (Non strong effect) Conclusion: Almost half of the men in the sample did not receive a medical recommendation to participate in early cancer detection test and a quarter of men in the sample had never had a medical check-up. Need to intensify systematic consultation about cancer screening preventive behaviours especially among men.</td>
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<td>9</td>
<td>Gili M, et al (2006)</td>
<td>To identify psychosocial factors related with participation in cancer screening examinations, in a sample of siblings of CRC patients</td>
<td>Adherence to screening by faecal occult blood test, flexible sigmoidoscopy and colonoscopy was the relevant factor. Socio-demographic variables, health locus of control (HLOC), perceived social support, knowledge about CRC and coping strategies were independent measures. Quantitative. Questionnaire.</td>
<td>Barriers: HLOC powerful others (believing that others such as physicians influence their health rather than themselves) Facilitators: younger, pensioners, Knowledge about CRC of the sibling, Psychosocial measures: Positive thinking, Search for solutions, Coping strategies composed. Social Support: Participants in screening: +listening, + emotional support, material support, higher satisfaction with support received. Adherents show higher level of social support. Women/men (contradictory results) Conclusion: The findings suggest that effective strategies to increase participation in CRC screening may include efforts to improve knowledge of sibling's illness, material social support and advice from health staff.</td>
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Sex: Women: 76’3% never screened/Men: 75’5% never screened 
Age, men: 40-49 16’5% participation. Age, women: 50-59 
Facilitators Age men: 50-59 31’2% participation Age women: 60-69 
Article not directly concerned about inequalities. Conclusion: Opportunistic screening with FOBT test and follow up, in positive cases, with colonoscopy since 1980 shows benefit in fight against cancer in Austria |
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<td>10</td>
<td>L.Le Retraite, Et al (2010)</td>
<td>To investigate the effects of individual determinants and geographic variables in rates of participation in colorectal cancer screening</td>
<td>Quantitative. Study population 183,978 first round and 175,596 second round, residents of Marseille, France. Multilevel analysis Variables: age, gender, regional characteristics (proportion of migrants, property prices per square meter)</td>
<td>Explainers of inequality: Gender: Men, Age: women 70-74, Regional characteristics: proportion of migrants: Higher. Facilitators: Age: 65-69. Gender: Women Conclusion: Besides individual factors, geographical factors characterized by socioeconomic variables are important determinants of participation rates in urban colorectal screening programs. Therefore communication measures targeted specifically for residential areas where participation is low need to be developed and evaluated. Also educational campaigns aimed at medical personnel who are key players in organized screening programs.</td>
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<td>12</td>
<td>Kamposior as K, et al (2006)</td>
<td>To index the current CCS practices among a large sample of Greek healthy adults.</td>
<td>Quantitative. Cross-sectional survey. Screening practice habits of 5,259 healthy adults, aged 50-80, were surveyed. Both overall and screening practices of stool occult blood test (SOBT), digital rectal examination (DRE), and colonoscopy or sigmoidoscopy (COL/SIG) were analyzed.</td>
<td>Explainers of inequality: FOBT: Educational level: primary and secondary. Professional status: Farmers, craftsmen, clerks and employees. Col/SIG: Educational level: upper studies. Facilitators: FOBT /COL /SIG: Family history of colorectal Conclusion: discouraging results, only 4.77% of the sample participated in FOBT (in the last 2 years) and only 1’74% participated in Col/SIG (in the last 10 years) Colorectal population based programmes and Implementation guidelines are required.</td>
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<td>13</td>
<td>Steele RJ, et al (2010)</td>
<td>To assess the effect of gender, age and deprivation on key performance indicators in a colorectal cancer screening programme.</td>
<td>Quantitative Populations were subdivided, by gender, into four age groups and into five deprivation categories according to the Scottish Index of Multiple Deprivation (SIMD), and key performance indicators analysed within these groups. Participation in FOBT and COL.</td>
<td>Explainers of inequality: Deprivation index: increasing deprivation (negatively association with uptake). Gender: Men. Age: younger(50-54) Conclusion: Need to improve participation focusing on male subgroups and deprived communities. Observation: Results concerning follow up with colonoscopy (diagnostic confirmation) are not shown in this table because our review is focused on the participation phase.</td>
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<td>14</td>
<td>Damery S, et al (2010)</td>
<td>To investigate GPs' attitudes in relation to colorectal cancer screening and the use of FOBT in routine practice.</td>
<td>Quantitative Cross-sectional postal survey of GPs in the UK. An 'attitude' score was calculated, and binary logistic regression used to evaluate the association of socio-demographic and general practice attributes with attitudes towards CRC screening and FOBT. Sample: health professionals NOT participation measured.</td>
<td>Barriers (perceived by GPs): Patient Lack of awareness. Shame and anxiety of patients. Lack of trained providers for screening. Facilitators (positive attitudes): GP Personal experience with screening GP Ethnicity: Asian or Asian British. Medical practice on deprived sites Evidence published in medical literature and national policies (positively influenced referrals). Conclusion: Success of population based CRC screening will be determined by GP attitudes, beliefs and support. Previous research found Asian GPs are more likely to negative attitudes towards FOBT, but not the present research.</td>
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<td>15</td>
<td>Zorzi M, et al (2010)</td>
<td>To present the main results from the fifth survey of the Italian screening programmes for colorectal cancer carried out by the National Centre for Screening Monitoring (Osservatorio Nazionale Screening, ONS) on behalf of the Ministry of Health.2008</td>
<td>Quantitative. Descriptive. Survey of the Italian programmes. 2007</td>
<td>Explainers of inequality: Gender: Women(80%) (vs Men 82.3%) Territory: Centre and south of Italy (Abruzzo, Lazio, Campania) Age: &gt; 70 Facilitators: Territory: Basilicata, Valle d’Aosta and Veneto Age: intermediate: 55-59 i 60-64 Conclusion: Improved adherence compared to previous years. Observation: general screening report, it is not focused on inequality. Just a small section about participation.</td>
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<td>16</td>
<td>Zorzi M, et al (2009)</td>
<td>To present the main results from the fourth survey of the Italian screening programmes for colorectal cancer carried out by the National Centre for Screening Monitoring (Osservatorio Nazionale Screening, ONS) on behalf of the Ministry of Health. 2007.</td>
<td>Quantitative. Descriptive. Survey of the Italian programmes.2008</td>
<td>Explainers of inequality: Territory: Lazio (26’5%). Gender: Men (43’9%) vs Women (48’4%) Facilitators: Territory: Veneto (65%) Observation: general screening report, it is not focused on inequality. Just a small section about participation.</td>
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<td>17</td>
<td>Szczepura A, et al (2008)</td>
<td>To analyse uptake patterns in a common UK population for two cancer screening programmes over time: breast screening (beginning with round 1 in 1989) and bowel cancer screening which started in 2000. Uptake patterns for South Asian minority groups have been compared to those for the majority population, adjusted for differences in demographics and socio-economic status.</td>
<td>Quantitative. Bowel screening data were analysed for 123,367 invitees in round 1 and 116,773 in round 2 (total 240,140 cases). Breast screening data were analysed for 61,934, 62,829 and 86,749 invitees in rounds 1, 2 and 5 respectively (total 211,512 cases). Univariate and multivariate analyses examined screening uptake and various demographic attributes of invitees, including age, gender, deprivation and ethnic group.</td>
<td>Explainers of inequality: Age: decreasing age. Gender: men. SES: Higher deprivation. Ethnicity: South Asian population, specially for Muslim subgroup. Barriers: South Asian ethnicity of GP, especially for Muslim subgroup. Conclusion: The lower cancer screening uptakes observed for the South Asian population cannot be attributed to socio-economic, age or gender population differences. Although breast screening disparities have reduced over time, significant differences remain. We conclude that both programmes need to implement and assess interventions to reduce such differences.</td>
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<td>18</td>
<td>Polasek O, et al (2007)</td>
<td>To investigate the utilization of breast, colon and prostate cancer screening in the adult Croatian population in a period without national cancer screening programs, with a special interest in colorectal cancer.</td>
<td>Quantitative. Self-reported screening utilization Croatian Adult Health Survey, which collected health-related information from a representative sample of the adult Croatian population. For colorectal, respondents aged over 50 years.</td>
<td>Barriers: Access to health care. Conclusion: This study reports an unsatisfactory cancer screening uptake among the adult population of Croatia. Overall results suggest that ensuring easier access to screening could increase the frequency of screening services utilization, with a final goal of cancer burden reduction.</td>
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respondents' rural versus urban origin.

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To investigate the ecological influence of socioeconomic status and healthcare supply on compliance with organized breast cancer screening programs, on an unbiased sample based on data from the entire target population within a French geographical area, Quantitative. Individual data on participation and aggregate data on healthcare supply and socioeconomic status, respectively obtained from the structure responsible for organizing screening and the French census, were analyzed simultaneously using a multilevel model. Calvados (n=98,822 women) Homeless women and mobile homes excluded.  
Explainers of inequality: Age: younger(50-54) and older(70-74), SES area residence: high deprivation. Conclusion: The results confirm positive statistical association between low SES and the low participation rates. Socioeconomic ecological factors have more significant impact than service provision (nº radiologists/100,000inhabitants). Targeting populations, in accurate geographical areas where women are less likely to participate, as identified socially and geographically in this study, could be adopted to reduce disparities in screening.

To investigate whether increased awareness of breast cancer, due to a positive family history (FH), reduces diagnostic, therapeutic, and survival differences between women of low versus high socioeconomic status (SES). Quantitative. All breast cancer patients registered between 1990 and 2005 at the population-based Geneva Cancer Registry were included. With multivariate logistic and Cox regression analysis, we estimated the impact of SES and FH on method of detection, treatment, and mortality from breast cancer.  
Explainers of inequality: SES: low (between women without a breast cancer family history there are big socioeconomic differences in the detection method: symptoms and others). Barriers: Not having a family cancer history. Facilitators: SES: High. Higher detection rates for high SES. Conclusion: The presence of a positive in family history eliminates inequality in access to screening and optimal treatment. However women with low SES are still at higher risk of mortality of breast cancer than higher SES women despite having a family history of cancer.

Mailed survey of 30-60 year old residents of Geneva, Switzerland, that included questions about screening for five cancers (breast, cervix uteri, prostate, colon, skin) in the past 3 years, attitudes toward screening, health care use, preventive behaviours and socio-demographic characteristics. Cancer screening practice was dichotomised as having done at least one screening test in the past 3 years versus none.

Explainers of inequality: In multivariate analysis, reporting at least one cancer screening test in the past 3 years was associated with female gender, older age, higher income and having visited a doctor for a health problem in the last 6 months.

Observation: Results refer to general screening. Results show a participation of women much higher than men in general screening, but breast and cervix are included.


Quantitative. Case-control study, 274 women aged 50 to 64 years included in a population-based mammography screening program were personally interviewed. Socio-demographic characteristics, health beliefs, health service utilization, insurance coverage, prior mammography and other preventive activities were examined.

Explainers of inequality: Educational level: High.

Barriers: Preventive activities: annual dental checks-ups prior mammography at a private health centre
Health services variables: Supplemental private insurance, Gynaecologist recommendation of mammography. Not invitation letter.

Conclusion: Our data indicate that factors related to the type of insurance coverage (such as prior mammography at a private health centre and supplemental private insurance) influenced non-participation in the screening program. Health authorities should encourage health professionals in order to promote participation in PPCM. Screening guidelines should be spread among professionals in the private sector in order to promote participation in organized screening programs with established quality criteria.
5 Szczerpura A, et al (2008) To analyse uptake patterns in a common UK population for two cancer screening programmes over time: breast screening (beginning with round 1 in 1989) and bowel cancer screening which started in 2000. Uptake patterns for South Asian minority groups have been compared to those for the majority population, adjusted for differences in demographics and socio-economic status.

Quantitative.
Bowel screening data were analysed for 123,367 invitees in round 1 and 116,773 in round 2 (total 240,140 cases). Breast screening data were analysed for 61,934, 62,829 and 86,749 invitees in rounds 1, 2 and 5 respectively (total 211,512 cases). Univariate and multivariate analyses examined screening uptake and various demographic attributes of invitees, including age, gender, deprivation and ethnic group.

Explainers of inequality: Age: increasing age. Deprivation: increasing deprivation.
Conclusion: The lower cancer screening uptakes observed for the South Asian population cannot be attributed to socio-economic, age or gender population differences. Although breast screening disparities have reduced over time, significant differences remain. We conclude that both programmes need to implement and assess interventions to reduce such differences.

6 Vermee B, et al (2010) To provide national data about the attendance of migrant women at the national breast cancer screening in the Netherlands and the development of these attendance rates over time.

Quantitative SPSS 17.0, $\chi^2$ test; participation immigrants/Dutch natives, 1997-98/2007-08.
Scope of the study: vulnerable population and general population.

Explainers of inequality: Ethnicity immigrant women: non-occidentals: Africa, America Latina, Asia (especially Moroccan immigrants). To a lesser extent: occidentals: Europe, USA, Australia, Japan.) Territory: Residence in west region (IKA) (where most of Moroccan immigrants live) vs North and east Holland.
Conclusion: These national figures show that the attendance rates of migrant women at the breast cancer screening have increased substantially over the past 10 years. However, specific efforts to increase the attendance rates of this target group are needed because the current attendance rates of this group are still far below the overall attendance rates.
To examine the relationship between informal care giving and uptake of breast screening and to determine if socio-economic gradients in screening attendance were explained by care giving responsibilities.

A database of breast screening histories was linked to the Northern Ireland Longitudinal Study, which links information from census, vital events and health registration datasets. The cohort included women aged 47 - 64 at the time of the census eligible for breast screening in a three-year follow-up period. Cohort attributes were recorded at the Census. Multivariate logistic regression was used to examine the relationship between informal care giving and uptake of screening using STATA version 10.

Explainers of inequality: SES: Low. (Socio-economic gradient). Territory: Residents in BMA (Belfast metropolitan area) are 40% less probably to attend than residents of the rest of Northern Ireland. Marital status: single, widows, separated, divorced. Barriers: (Most of the caregivers > +50h/week belong to the three most deprived groups) Facilitators: Marital status: married. Residence area: non BMA area. Women care-giving <20h/week.

Conclusion: While those providing the most significant amounts of care tended to be more deprived, care giving responsibilities themselves did not explain the known socio-economic gradients in breast screening attendance. More work is required to identify why more deprived women are less likely to attend breast screening.

To assess the difference between using the woman's own socioeconomic status (SES) and using that of her household or partner as determinant of participation in mammography screening.

Quantitative.

Participation data from two mammography screening programs in Denmark were linked to a national SES classification system providing data for each citizen, their partner, and household. We calculated the odds ratio of non-participation across SES levels using the woman's own, the household's, and her partner's SES status, respectively.

Explainers of inequality: using the woman's own SES, the odds ratio of non-participation showed a clear U-shape across SES levels. Higher occupational levels (self-employed) and lower (non-qualified, out of workforce).

Partner's SES the difference in non-participation across SES levels was significantly smaller.

Household's SES: difference in non-participation across SES smaller.

Conclusion: To what extent SES was a determinant for screening participation strongly depended on whether using the woman's own SES or that of her partner. In a public health perspective it is important to take this into account when addressing the problem of non-attendance in screening.
To examine the association between socioeconomic deprivation, travel distance, urban-rural status, location and type of screening unit, and breast screening uptake. Screening was provided at 13 locations—1 fixed and 12 mobile (3 at non-health locations).

The study examined data from 1998 to 2001 for 34,868 women aged 50-64 years, calculated road travel distance, used 1991 enumeration district level Townsend socioeconomic deprivation scores, and a ward level urban-rural classification. n=34,868 women

Explainers of inequality: SES: higher deprivation. (82%–depr./73%+depr)
Facilitator: Screening Location at non-healthcare facility
Conclusion: Socioeconomic inequality in breast screening uptake seems to persist in an established service. There was a small decrease with increasing distance, no difference between fixed and mobile units, and no difference between urban and rural areas but uptake seemed to be higher at non-health sites. Further work is needed to identify effective methods of decreasing socioeconomic inequalities in uptake and to confirm if non-health locations are associated with higher screening uptake.

To investigate the utilization of breast, colon and prostate cancer screening in the adult Croatian population in a period without national cancer screening programs, with a special interest in respondents' rural versus urban origin.

Quantitative.
Self-reported screening utilization Croatian Adult Health Survey, which collected health-related information from a representative sample of the adult Croatian population
For colorectal, respondents aged over 50 years.

Conclusion: Participation at opportunistic screening is low among Croatian population; moreover the results show socioeconomic disparities at breast screening participation. Rural origin was directly associated with breast screening participation. Access to health services is the best predictor of screening participation and must play a prominent role to develop a systematic national screening programme.
To investigate the relation between women's reported use of breast and cervical screening and socio-demographic characteristics.
Explainers of inequality: Breast screening: Household without a car. House on rental basis. No significant differences by ethnicity, education, occupation, or region were found.
Results Cervical and Breast together: Household without a car. House on rental basis. And also significant: Educational level: lower education. And Ethnicity: non British.
Facilitators: Household with car (one, two or more). Home owner.
Conclusion: Some inequalities exist in the reported use of screening, which differ by screening type; indicators of wealth were important for breast screening and ethnicity for cervical screening. The routine collection within general practice of additional socio-demographic information would aid monitoring of inequalities in screening coverage and inform policies to correct them.

To use individual data on socio-demographic characteristics to identify predictors of participation in mammography screening and control to what extent they can explain the regional difference.
Data from mammography screening programmes in Copenhagen, 1991-1999, and Funen, 1993-2001, Denmark. Target groups were identified from the Population Register, screening data came from the health authority, and socio-demographic data from Statistics Denmark. Included were women eligible for at least 3 screens
Variables: Origin, marital status, educational level, Hospitalization, use of primary care.
Explainers of inequality: Origin: Non Danish. Marital status: Not being married/ single cohabitation. Age: increasing age. Area residence: Copenhagen (capital vs mixed areas rural-urban)
Barriers: Non use of other primary healthcare services.
Facilitators: Use of other primary healthcare services. Stay at hospital 5days/year.(subgroups particularly aware, diabetics...)
Conclusion: To enhance participation in mammography screening programmes special attention needs to be given to women not using other primary healthcare services. All women in Copenhagen, irrespective of their socio-demographic characteristics, had low participation. Screening programmes have to find ways to handle this urbanity factor.

Quantitative. Descriptive. Epidemiological. N=784 invitees, 710 interviews, 462 participants (58.9%) Scope of the study: general population


Barriers: Non perception of need - Not having husband’s permission - being ill other than cancer.

Conclusion: mammographic screening programmes should focus on older women, single, widowed or divorced, illiterate and postmenopausal.

Dupor N, et Al (2008) To analyse the role of women’s socio-demographic and healthcare access characteristics according to breast cancer screening practices (organized, individual or no screening).

A cross-sectional study was set up in seven French districts using a self-administered postal questionnaire. Randomization was stratified proportionally on age and urban/rural status in each district separately among attendees and non-attendees to the organized breast cancer screening programme (OS).

Explainers of inequality: Civil status: single

Barriers: Renunciation of basic health care for financial reasons, Non Regular general practitioner, Non Regular gynaecologist visit, Non HPV Test in the last 3 years, 100% coverage for medical fees: Yes

Facilitators: Civil status: living with partner. Non renunciation of basic health care for financial reasons, Regular general practitioner, Regular gynaecologist visit, HPV Test in the last 3 years, Non 100% coverage for medical fees.

Conclusion: the main differences between breast cancer screening practices were largely associated with difficulties in healthcare access, considering regular gynaecological visits in particular.

The expected fair access to screening has been achieved for the middle class but the extreme classes remain excluded. The privileged classes exclude themselves from the public health programme, and for the more deprived, mammography is not a priority.
To test the hypothesis that nonparticipation in organized mammography screening is due to insufficient understanding of the information in the invitation letter by relating educational level to user pattern.

Quantitative. Data from two Danish mammography screening programmes in Copenhagen, 1991-1999, and Funen, 1993-2001 were taken for this study. The Danish Central Population Register was used to define target groups; screened participation data were provided by the health authority, and data on highest obtained education came from Statistics Denmark. Data on all breast imaging in 2000 outside organized screening were provided by radiology clinics. Included were all women eligible for at least three screens, and participation was classified into four mutually exclusive user groups. Organized mammography screening programmes in Copenhagen and Funen, Denmark were used as field of this study.

Explainers of inequality: Educational level: U shape, university (high) and primary (low)
Residence area: Copenhagen (urban)
Conclusion: In conclusion, our results did not support the hypothesis that lack of understanding the information in the invitation letter explains nonparticipation. ‘Never use’ was not inversely associated with the level of education, but showed a U-shaped association, even when use of breast imaging outside organized screening was taken into account.
16 Lueng o-Matos S, et al (2006) To measure the use of mammography and the factors associated with testing among Spanish women, after the introduction of screening programmes in Spain. Cross-sectional population survey of a representative sample of women aged 40-70 (2409 women). Data collection took place in October 2000, using a questionnaire addressing the dependent variable (mammography use) and the independent variables (socio-demographic and socio-health factors, and women's knowledge and attitudes). Scope of the study: general population

Explainers of inequality: Age: >65anys, 40-45. Civil status: single. Size of the residence city: 10.001-50.000h, 2001-10.000h. Educational level: >= primary. Occupational status: unemployed. SES: Low (gradient) Facilitators: gynaecologist visit last 2 years, Primary healthcare doctor visit last 2 years, Invitation to mammography screening, Physician referral for the screening, Intention to undergo future mammography, Perception of necessity of mammography despite feeling well, Perception of mammography as secure, Believing in high probability of cure with early detection, Not rejecting the test for fear of diagnosis, Not rejecting the test for discomfort reasons, Talk with healthcare professionals about mammography, Talk with healthcare professionals about mammography perceived as positive, Friends participants in mammography, Having undergone mammography before 1998 for any reason, Absence of breast illness, Family history of breast cancer, Other family members and acquaintances with breast cancer. Conclusion: after the introduction of screening programmes, almost half of Spanish women aged 40-70 had received mammography. Invitation to screening, gynaecologist visit and women's attitudes are the main reasons for undergoing testing. Women over 65 years of age and/or those in a lower socio-economic level warrant special attention.

17 Walsh B, et al (2010) To investigate differences in uptake of breast and cervical cancer screening relating to socio-economic characteristics in the Republic and Northern Ireland. Descriptive transversal. Multivariate analyses were performed using data from population-based surveys that detail breast and cervical cancer screening participation in the preceding 12 months in the two jurisdictions. Ireland Republic (RI)/Northern Ireland (NI)

Explainers of inequality: Age: >65anys, 40-45. Civil status: single. Size of the residence city: 10.001-50.000h, 2001-10.000h. Educational level: >= primary. Occupational status: unemployed. SES: Low (gradient) Facilitators: gynaecologist visit last 2 years, Primary healthcare doctor visit last 2 years, Invitation to mammography screening, Physician referral for the screening, Intention to undergo future mammography, Perception of necessity of mammography despite feeling well, Perception of mammography as secure, Believing in high probability of cure with early detection, Not rejecting the test for fear of diagnosis, Not rejecting the test for discomfort reasons, Talk with healthcare professionals about mammography, Talk with healthcare professionals about mammography perceived as positive, Friends participants in mammography, Having undergone mammography before 1998 for any reason, Absence of breast illness, Family history of breast cancer, Other family members and acquaintances with breast cancer. Conclusion: after the introduction of screening programmes, almost half of Spanish women aged 40-70 had received mammography. Invitation to screening, gynaecologist visit and women's attitudes are the main reasons for undergoing testing. Women over 65 years of age and/or those in a lower socio-economic level warrant special attention.

Possible explanation: implementation population based programmes
To investigate the effect of individual socioeconomic and area-level determinants on variations in non-attendance among geographic areas in an urban mammographic service screening programme.

32,119 women invited for mammographic screening in 1990-93, residing in 97 neighbourhoods in the city of Malmö in Sweden. The influence of individual factors age, marital status, education, housing accommodation, household income, and area-level circumstances, e.g. rate of migration and rate of being gainfully employed, on the rate of non-attendance was assessed by multilevel analysis.

Explainers of inequality: Age increasing age. Country of origin: non-Sweden
Civil status: single, divorced, widowed. House overcrowding: higher overcrowding. SES: lower quartile.
Multilevel Models, effect of neighbourhood in NON-part individual:
Model 2: tots els factors redueixen la variança del barri en la NO-part.
Nationality: foreign explained 26%, Civil status explained 17%, Income explained 26%, Neighbourhood with High migration rate explained 67%, Neighbourhood with low rate of full employment explained 77%
Model 3: Age and socio-economic individual factors. Explained 51% variation
Model 4: (model 3 + migration (area) + rate of being gainfully employed (area))
Explained 85% variation between neighbourhood.
Facilitators: being married, SES: higher quartile.
Conclusion: In addition to individual socioeconomic factors, area-level factors seem to be important determinants of neighbourhood rates of non-attendance in an urban mammographic screening programme. In a public health perspective neighbourhoods may be targeted in order to affect the problem of non-attendance in mammographic screening.
The objective was to compare the data of mammary screening check-up attendance and the breast cancer detection among the different age groups of elderly women. 18588 women, age between 45-69 years with medical insurance of Metallurgical employee's insurance company during the years 2003-2005 (19115 women during years 2002-2005).
Screened women were divided into 5 groups according to age (45-49, 50-54, 55-59, 60-64, 65-69) and the data of attendance to mammary screening and breast cancer detection were obtained from the database of medical operations and expenses of Metallurgical employee's insurance company.

Explainers of inequality: Age: older (65-69 i 60-64)
Barriers: Decision of the doctor to send a patient to mammary screening.
“The Czech law regulates that the first-contact doctors should send the elderly female patients to preventive mammary screening as a part of preventive medical control carried by first-contact doctor. However, the majority of mammary screenings were carried out per order of a gynecologists (45%), followed by X-rays specialists (30%) and the minor part per order of a the first-contact doctor”.
Conclusion: Metallurgical employee's insurance company completely covers the medical expenses connected to mammary screening, however there is no government regulation how the first-contact doctor should invite the elderly women on mammary screening. The mammary screening attend mostly women in age 50-54 years, but on recommendation of gynecologist or X-rays specialists.

To assess the use of mammography and Pap smear and analyzed predictors of attendance at these cancer screenings in a large metropolitan area in Spain.
Quantitative.
Women surveyed in the Madrid City Health Survey 2005. Cancer screening included mammography in the last 2 years and Pap smear in the last 3 years. Independent variables included sociodemographics, chronic diseases, and lifestyles. Predictors of mammography or Pap smear attendance were explored using logistic regression.

Explainers of inequality: Obesity
Barriers: Unhealthy lifestyles.
Facilitators: increasing age, higher educational level and osteomuscular disease.
Conclusion: Attendance at gynaecological cancer screening in a large metropolitan area in Spain is acceptable in the age group for which it is recommended. An effort must be made, however, to recruit those women who are less likely to undergo screening, as they are at the highest risk of having these diseases.
To assess the use of mammography and Pap smear and analyze predictors of screening adherence.

Women surveyed in the Spanish National Health Survey 2006. Cancer screening included mammography in the last 2 years and Pap smear in the last 3 years. The target age range of the screening programmes was 50-69 years in breast cancer screening and 25-64 years in cervical cancer screening. Independent variables included: socio-demographics, chronic diseases and lifestyles. Predictors of mammography or Pap smear adherence were explored using logistic regression. n=3840 Breast n=9725 Cervical.

Conclusion: adherence to breast cancer screening in Spain is acceptable in the target age group; nevertheless Pap smear screening must be improved. In both cases, an effort must be made to recruit those women who are less likely to undergo screening, as they are those who are at higher risk of suffering these diseases.

The two aims of the study were, first to estimate the declared two-year coverage of breast cancer and cervical cancer screenings, and second to determine the main factors influencing female cancer screening behaviors.

Three groups of women from the 2003 French decennial health interview survey were analyzed: 3378 women aged 50-74 years who answered the question on mammography use, 7912 women aged 25-65 years who answered the question on Pap-smear use, and 2528 women aged 50-65 years who answered both questions.

Conclusion: The study showed that it is appropriate to communicate on both screenings at the same time since they have a positive effect on each other. Finally, practitioners continue to play a central role in collecting information on cancer screenings and encouraging screening in
The aim of this study was to describe inequalities in the use of breast and cervical cancer screening services according to educational level in European countries in 2002, and to determine the influence of the type of screening program on the extent of inequality.

A cross-sectional study was performed using individual-level data from the WHO World Health Survey (2002) and data regarding the implementation of cancer screening programmes. The study population consisted of women from 22 European countries, aged 25-69 years for cervical cancer screening (n = 11,770) and 50-69 years for breast cancer screening (n = 4,784). Dependent variables were having had a PAP smear and having had a mammography during the previous 3 years. The main independent variables were socio-economic position (SEP) and the type of screening program in the country. For each country the prevalence of screening was calculated, overall and for each level of education, and indices of relative (RII) and absolute (SII) inequality were computed by educational level. Multilevel logistic regression models were fitted.

Explainers of inequality: SEP inequalities in screening were found in countries with opportunistic screening [comparing highest with lowest educational level: RII = 1.28, 95% confidence interval (CI) 1.12-1.48 for cervical cancer; and RII = 3.11, 95% CI 1.78-5.42 for breast cancer] but not in countries with nationwide population-based programmes. Inequalities were also observed in countries with regional screening programs (RII = 1.35, 95% CI 1.10-1.65 for cervical cancer; and RII = 1.58, 95% CI 1.26-1.98 for breast cancer).

Conclusion: Inequalities in the use of cancer screening according to SEP are higher in countries without population-based cancer screening programmes. These results highlight the potential benefits of population-based screening programmes.

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<th>Aim</th>
<th>Methodology</th>
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<td>1</td>
<td>Todorova I, et al (2009)</td>
<td>to delineate the inequalities in cervical cancer screening in Romani a and Bulgaria and identify explanations for these inequalities.</td>
<td>Representative samples of women - 1,099 in Bulgaria and 1,053 in Romania, were interviewed through a structured questionnaire. + qualitative interviews , to design the structured questionnaire. Variables: SES, screening history, last smear, perceived barriers, psychosocial construction, cognitive construction (model health beliefs), attitudes towards screening</td>
<td>Explainers of inequality: multivariate analysis. Model 1(SES + control variables: Age, ethnicity, education and perceived health status) SES Effect in screening history significant. Model 2((SES + control variables and psychosocial/system variables). odds ratio SES, effect mediated by psychosocial/ systemic variables. Model 3(SES + control variables and cognitive variables). Bulgaria: similar reduction odds ratio NSE, effect mediated by cognitive variables. Rumania: SES effect not mediated by cognitive variables. Model 4 (SES, control variables, psychosocial and cognitive variables). SES insignificant, system barriers and costs most important predictors. “Attitudes”; significant for Bulgarian sample. “Susceptibility; significant for Rumanian sample. Barriers: System, Psychosocial and cognitive:* Barriers related to socio-demographic variables: Turkish and Roma women reported greater barriers. The place of residence in small village, primary school studies, as well as lower income were also associated with greater barriers to access. Conclusion: The study concludes that the effect of SES on screening is mediated mainly by the structural barriers in accessing the healthcare system, as well as women's perceptions of the multiple costs of the smear. These conclusions are relevant to the development of national screening programs and health promotion in the two countries. Providers in Bulgaria are obliged to limit preventive services in order to use fewer resources.</td>
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<td>Tie between positive attitudes towards screening and participation; fear and historical dislike of healthcare system, badly organised and centred on the curative not preventive dimension. Stress, beliefs regarding test. Structural changes are required concerning policies and laws, as are efforts to promote health and empower women.</td>
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<td>To focus on how providers construct women and their role in prevention of cervical cancer through their accounts.</td>
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<td>Qualitative. semi-structured interview (Grounded Theory principles) Bulgaria: 28 gynaecologist, 16 general doctors, 5 cytologists, 2 nurses, and 1 gynaecological surgeon. (29=women, 23=men) Romania: 23 general doctors, 11 gynaecologists, 6 cytologists, 5 family planning doctors, 4 oncologists i 1 epidemiologist. (27= women, 23=men) nB=50 nR=50</td>
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<td>The analysis identified several discourses and themes in providers' constructions of women's responsibility for prevention of disease. These include responsible women as 'intelligent' and 'cultured'; non-attenders as 'irresponsible' and 'negligent'; women as needing monitoring and sanctioning; and women as 'victims' of health. Extended resumé annexed.</td>
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<td>Quantitative. Variables: Age, area deprivation index (Old health authority areas) Ethnicity, Religion. Scope of the study: geographic area NEYH regions. General population (women 25-64 years)</td>
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<td>Explainers of inequality: Rates of change of participation 1995-2005: Age: younger, decreasing participation. / Older 55, change positive tendency, increasing (similar in all areas). Area deprivation index: more deprived areas = major decline / lesser deprived areas = lesser decline. (Correlation repeated for each age group). Ethnicity: and Religion: Non significant. Conclusion: possible explanation: Screening Programme is now &quot;a victim of its own success&quot;: the lower incidence of cancer means that young women have fewer friends or relatives who have had the disease, so decreases their perception of risk, which is related to participation. Increasing participation in higher age groups may be partially explained by the cohort effect. If the trend continues, the decline in participation rates will be faster in areas with high levels of deprivation. The non-significance of ethnicity or religion can be explained because the region NEYH is not as diverse as other areas of England. Therefore, interventions could be targeted at younger women and those who live in deprived areas to prevent the widening of inequalities.</td>
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|   | Matejic B, et al (2011) | To Identify the factors that deter or stimulate the women to participate in screening activities in order to design effective education and motivation strategies, particularly important in the countries without an organized |
|   |   | Quantitative. Case-control design. The participants were recruited in four primary health care institutions in Belgrade over a month. The study group comprised all women aged 18-70 years, who demonstrated an initiative for a PAP-smear. The controls were women with no Pap smears within the last 4 years, matched by age (±2 years), |
| 4 |   |   |
To assess inequity in prevention and to compare socioeconomic inequity in preventive medicine with that in health care.

Quantitative. Cross sectional Health Interview Survey face to face interview and self administered questionnaire. Two types of health care utilisation were considered (contacts with GPs and with specialists) and four preventive care mostly delivered in a GP setting (flu vaccination, cholesterol screening) or in a specialty setting (mammography and pap smear).

Explainers of inequality: Medical Contacts: Lower SES group=lesser specialist contact and more GP’s contact. Preventive medicine: SES: inequity favouring rich group in mammography and cervical screening. Increasing Gradient SES and participation. Lower Quintile less probability of mammography (OR=0’43) and pap test (OR=0’3). Cn(inequity in need index): The lowest quintile have higher needs for both: GP’s contact and specialists in general practice but not in preventive medicine, as the need for pap tests and mammograms is defined by age group. Cu (inequity in use index): The lowest quintiles are favoured in use of GP but in preventive medicine the highest group are favoured. HIwp: There is significant inequality by SES group in specialized medicined and in four preventive medicine procedures. General Practice: Inequity in prevention is higher in care medicine. Specialties: inequality in prevention does not show statistical differences of inequity in health care services, but this was higher than in general practice.

Conclusion: If inequity in preventive medicine is to be lowered, the role of the GP must be fostered and access to specialty medicine increased, especially for cancer screening. Inequality is higher in the specialty sector. There is more inequality in Preventive medicine than in healthcare attendance. If inequality is not recognized as a public health goal, promotion of screening will increase health inequalities.
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<th>7</th>
<th>Sabates R, et al (2006)</th>
<th>To report about findings on the relationship between education and the take-up of screening for cervical cancer, as an example of preventive health-care activity.</th>
<th>The empirical analysis uses data from the British Household Panel Survey (BHPS) and applies techniques for discrete panel data to estimate the parameters of the model. N=4275 (22-65 years old.) Scope of the study: general population</th>
<th>Explainers of inequality: Age; negative gradient. Increasing age. Ethnicity; Asian (compared to white ethnic group). Socio-demo; having sons under 5 years old. Barriers: System barriers: living in regions with longer timeouts. Facilitators: Education: Registration for qualification courses. Participation in general education (significant only at 10%). initial learning (non significant, maybe due to colinearity with adult learning). Health behaviours: Being smoker (significant at 10%) Poor Self-perceived health status. Past screening: screening each 3 years in the past. Conclusion: These findings enrich existing evidence on the socio-economic determinants of screening for cervical cancer and enable policy makers to better understand barriers to service uptake.</th>
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<td>8</td>
<td>López-de-Andrés A, et al (2010)</td>
<td>To assess the use of mammography and Pap smear and analyzed predictors of attendance at these cancer screenings in a large metropolitan area in Spain.</td>
<td>Quantitative. Women surveyed in the Madrid City Health Survey 2005. Cancer screening included mammography in the last 2 years and Pap smear in the last 3 years. Independent variables included socio-demographics, chronic diseases, and lifestyles. Predictors of mammography or Pap smear attendance were explored using logistic regression.</td>
<td>Explainers of inequality: Obesity Barriers: Unhealthy lifestyles. Facilitators: increasing age, higher educational level and osteomuscular disease. Conclusion: Attendance at gynaecological cancer screening in a large metropolitan area in Spain is acceptable in the age group for which it is recommended. An effort must be made, however, to recruit those women who are less likely to undergo screening, as they are at the highest risk of having these diseases.</td>
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<td>Author</td>
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<td>Robb K, et al (2010.)</td>
<td>The aim of the study was to examine awareness of the three National Cancer Screening Programmes (breast, cervical, bowel) among white and ethnic minority groups in the UK. “Knowledge gap hypothesis”</td>
<td>Quantitative. sample consisted of 2216 adults selected using stratified probability sampling to obtain a population-representative sample. The Ethnibus™ sample was obtained by quota sampling and included 1500 adults from the six largest ethnic minority groups in England (Indian, Pakistani, Bangladeshi, Caribbean, African and Chinese). Participants completed questions on awareness of cancer screening programmes as part of the wider Cancer Awareness Measure (CAM) in home-based, face-to-face interviews.</td>
<td>Explainers of inequality in knowledge about screening programmes: Cervical and breast. Ethnicity: ethnic minorities; lower awareness regarding screening and lower knowledge about age intervals. Chinese population lower knowledge of all screening programmes. SES: lower SES groups (For both ethnic groups) Facilitators: Breast and cervical. White ethnic group: major knowledge about existence of screening. White ethnic group: major knowledge about starting age of breast screening. Caribbean population: major knowledge about breast and cervical screening programmes. High occupational status. The awareness about breast screening is higher than for other screenings. Conclusion: Ethnic disparities in knowledge of breast and cervical cancer screening should be addressed. Strategies to engage ethnic minority and socioeconomically deprived groups in bowel cancer screening should be instigated to avoid the emergence of disparities.</td>
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<td>Ronco G, et al (2010)</td>
<td>To collect from Italian organised cervical screening programmes aggregated tables of data in order to centrally compute process indicators.</td>
<td>Quantitative. Data on women invited during 2008 and screened up to April 2009 were considered. In 2008, the target population of Italian organised screening programmes included 13,094,025 women, corresponding to 78.4% of Italian women aged 25-64 years.</td>
<td>Explainers of inequality: Territory: decreasing tendency North_South Conclusion: Coverage has increased to the 80% of the target population. Growth of invitation rates from 2007 to 2008 in the southern region. 20% non implemented regions are: South Italy, Sicily, Sardinia, and some regions of the North; Lombardy and Liguria.</td>
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<td>Seidel D, et al (2009)</td>
<td>To analyse participation in the German cervical cancer screening programme by socio-demographic characteristics.</td>
<td>Quantitative. EPIC-Heidelberg cohort study. 13,612 women aged 35-65 years. Recruited between 1994 and 1998. Follow-up questionnaires were used to analyse participation in cervical cancer screening. Subjects were categorised according to age (birth cohort), education, vocational training, employment status, marital status and household size. Associations between socio-demographic characteristics and participation in cervical cancer screening were analysed using multinomial logistic regression.</td>
<td>Explainers of inequality: Age: oldest cohort (Born between 1930-1940) Educational level: &lt;secondary. Professional qualification.: without professional training Civil Status: widowed and single. Household size: mononuclear. Non significant Variables: occupational status Conclusion: Knowledge on the characteristics of women with a lower attendance to cervical cancer screening could be used to improve the effectiveness of the current (opportunistic) programme by dedicated health promotion programmes. However, an organized screening programme with written invitation of all eligible women would be the preferred option.</td>
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15 | Duport N, et al (2008) | The two aims of the study were, first to estimate the declared two-year coverage of breast cancer and cervical cancer screenings, and second to determine the main factors influencing female cancer screening behaviours. | Three groups of women from the 2003 French decennial health interview survey were analyzed: 3378 women aged 50-74 years who answered the question on mammography use, 7912 women aged 25-65 years who answered the question on Pap-smear use, and 2528 women aged 50-65 years who answered both questions. | Explainers of inequality: household income: low, <900, and home ownership: rental status. Facilitators: Those linked to Pap-smear use were mainly socioeconomic and socio-demographic variables: women with partner, managerial or professionals, household income: >900€ per month, educational level: > BEPC, Home ownership: urban residence. Diet: Fruit consumption, physical activity and tobacco consumption (risk behaviour). System factors: healthcare and practitioner access variables being also linked. Conclusion: The study showed that it is appropriate to communicate on both screenings at the same time since they have a positive effect each other. Finally, practitioners continue to play a central role in collecting information on cancer screenings and encouraging screening in women not regularly screened. |

| 17 | Walsh B, et al (2010)  | To investigate differences in uptake of breast and cervical cancer screening relating to socio-economic characteristics in the Republic and Northern Ireland. | Descriptive transversal. Multivariate analyses were performed using data from population-based surveys that detail breast and cervical cancer screening participation in the preceding 12 months in the two jurisdictions. Ireland Republic (RI)/Northern Ireland(NI) | Explainers of inequality: Territory: Irish Republic, SES (RI): 3 lowest socio-economic groups, Educational level (RI): Low Conclusion: Differences in participation across socio-economic groups in respect of breast and cervical cancer screening were not replicated in Northern Ireland. These differences may contribute to inequalities in treatment and outcomes across socio-economic groups in the Republic of Ireland. Possible explanation: implementation population based programmes since 90’s in NI. In RI opportunistic until 2008 (implementation cervical PBS) |
| 18 | Palència L, et al (2010)  | The aim of this study was to describe inequalities in the use of breast and cervical cancer screening services according to educational level in European countries in 2002, and to determine the influence of the type of screening program on the extent of inequality. | A cross-sectional study was performed using individual-level data from the WHO World Health Survey (2002) and data regarding the implementation of cancer screening programmes. The study population consisted of women from 22 European countries, aged 25-69 years for cervical cancer screening (n =11 770) and 50-69 years for breast cancer screening (n = 4784). Dependent variables were having had a PAP smear and having had a mammography during the previous 3 years. The main independent variables were socio-economic position (SEP) and the type of screening program in the country. For each country the prevalence of screening was calculated, overall and for each level of education, and indices of relative (RII) and absolute (SII) inequality | Explainers of inequality: SEP inequalities in screening were found in countries with opportunistic screening [comparing highest with lowest educational level: RII = 1.28, 95% confidence interval (CI) 1.12-1.48 for cervical cancer; and RII = 3.11, 95% CI 1.78-5.42 for breast cancer] but not in countries with nationwide population-based programmes. Inequalities were also observed in countries with regional screening programs (RII = 1.35, 95% CI 1.10-1.65 for cervical cancer; and RII = 1.58, 95% CI 1.26-1.98 for breast cancer). Conclusion: Inequalities in the use of cancer screening according to SEP are higher in countries without population-based cancer screening programmes. These results highlight the potential benefits of population-based screening programmes |
Multilevel logistic regression models were fitted.
Annex 4. List of complete reference of the articles included in the study

Colorectal cancer articles


**Breast cancer articles**


Cervical cancer articles


References


