

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Geographic and socioeconomic differences in uptake of Pap test and mammography in Italy: results from the National Health Interview Survey
<b>AUTHORS</b>	Petrelli, Alessio; Giorgi Rossi, Paolo; Francovich, Lisa; Giordani, Barbara; Di Napoli, Anteo; Zappa, M.; Mirisola, Concetta; Gargiulo, Lidia

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Alexander Labeit Research Fellow Centre for Health Economics Division of Population Health, Health Services Research and Primary Care Faculty of Biology, Medicine and Health University of ManchesterOxford Road Manchester, UK
<b>REVIEW RETURNED</b>	16-Feb-2018

<b>GENERAL COMMENTS</b>	<ol style="list-style-type: none"><li>1. The research aim/objectives are not mentioned in the abstract, only in the last paragraph of the introduction.</li><li>2. Introduction: p4 lines 8-27: it could help to summarize characteristics of the breast and cervical cancer screening programme in Italy in a table for a better understanding (i.e. the characteristics of the population-based free screening programme by the Italian National Health Service (NHS))</li><li>3. data sources (p 5): Two datasources are mentioned for the analysis in the abstract (NHIS and ISTATATA). However, in the methods section (data sources) only the NHIS is mentioned and discussed. Please explain also the ISTATATA dataset.</li><li>4. outcomes (p5). It is not clear what the the analysis sample is sometimes. First you mention Italy, however a few lines later it is mentioned that the uptake in Piedmont and Emilia-Romagna is calculated.</li><li>5. analysis sample (p5): included women under 1), 2) and 3). It is well explained how sample 2) was generated: "upon invitation by the public health service". It could be better explained how the sample 3) was generated and in more detail (e.g. using questions from the questionnaire).</li><li>6. p 6 (using hierarchical logistical models): it would be helpful if it is explained why this statistical model is used and if alternative approaches also exist.</li><li>7. Certain determinants and variables are used in the multilevel regression and results are presented and then interpreted in the</li></ol>
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	<p>discussion. However, in my opinion a section in the introduction is missing in which the authors present a theoretical model which generate hypotheses for the used variables. As an example: which influence can age and education have on uptake. So it could be helpful that you discuss at least shortly that such models exist (e.g. Grossman model) .</p> <p>8. Using the variable citizenship: is it possible to separate foreign nationals into several categories? It could be also sensible to explain why this variable could have an effect on uptake. Cultural or language barriers?</p> <p>9. It could be helpful that uptake rates for cervical cancer screening and mammography are presented for the analysis period in Italy (downward/upward trend over the analysis period)</p> <p>10. The discussion part (p9 ), especially sections socioeconomic differences, associations with other preventive health behaviours could be extended with further literature (e.g. Sabates R, et al. Soc Sci Med. 2006; Sabates. Int J Public Health. 2008, and further literature) and discussed in further detail. Also mentioning omitted variable bias could be sensible.</p> <p>11. p11 limitations: dataset has a rich description including family related variables. Why have been no family or partner related variables included in the regressions?</p> <p>12. p11 I would drop the following sentence: "...This is the first scientific paper analysing the association between screening uptake and different sections of the NHIS questionnaire."</p> <p>13, p17 table 1: the difference between preventative medical examinations in the preceding 4 weeks and general prevention medical tests should be explained. A table legend should have information how many observations are the base for the descriptive analysis.</p> <p>14. p19/20 table 2 and 3: why have been the variable "Reasons hampering pursuit of hobbies or interests" been included in the regression? Any hypotheses about them?</p>
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<b>REVIEWER</b>	Maureen Sanderson Meharry Medical College, USA
<b>REVIEW RETURNED</b>	08-Mar-2018

<b>GENERAL COMMENTS</b>	Tables 2 and 3 are difficult to interpret since the outcome is not having been screened which necessitates the need of a double negative. The investigators should consider rewriting as more or less likely to have been screened.
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Alexander Labeit

Institution and Country: Research Fellow, Centre for Health Economics, Division of Population Health, Health Services Research and Primary Care, Faculty of Biology, Medicine and Health, University of Manchester, Oxford Road, Manchester, UK Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

1. The research aim/objectives are not mentioned in the abstract, only in the last paragraph of the introduction.

**Response: We thank the reviewer for the suggestion; we have modified the abstract accordingly.**

2. Introduction: p4 lines 8-27: it could help to summarize characteristics of the breast and cervical cancer screening programme in Italy in a table for a better understanding (i.e. the characteristics of the population-based free screening programme by the Italian National Health Service (NHS))

**Response: We have added a box summarizing the characteristics of the screening programmes in Italy.**

3. data sources (p 5): Two data sources are mentioned for the analysis in the abstract (NHIS and ISTAT). However, in the methods section (data sources) only the NHIS is mentioned and discussed. Please explain also the ISTAT dataset.

**Response: We used data both from the Italian National Health Interview Survey (NHIS) conducted by the National Institute of Statistics (ISTAT) in 2012-2013 and from the Italian National Centre for Screening Monitoring (for the information on screening invitation coverage at the regional level). We have clarified this in the abstract and in the methods section.**

4. outcomes (p5). It is not clear what the analysis sample is sometimes. First you mention Italy, however a few lines later it is mentioned that the uptake in Piedmont and Emilia-Romagna is calculated.

**Response: The analysis was conducted on the entire national sample using 25-64 as the age target group for the Pap test and 50-69 for the mammography. The latter age group was used for the regions of Emilia-Romagna and Piedmont, which extended the age of the target population for breast screening to 45-74, with annual intervals for women aged 45-49, as described in the introduction. We eliminated a sentence in the outcome section in order avoid misunderstanding.**

5. analysis sample (p5): included women under 1), 2) and 3). It is well explained how sample 2) was generated: "upon invitation by the public health service". It could be better explained how the sample 3) was generated and in more detail (e.g. using questions from the questionnaire).

**Response: We thank the reviewer for the comment. We have modified the text to clarify the three uptake indicators:**

**1) total uptake, including services delivered in all types of healthcare facilities (public or private) and performed upon invitation of public screening programme, on suggestion of general practitioner or private doctor or on own initiative;**

**2) uptake in a public healthcare facility, upon the suggestion of a general practitioner or private doctor or on own initiative;**

### 3) uptake in a public healthcare facility, upon invitation to public screening programme.

6. p 6 (using hierarchical logistical models): it would be helpful if it is explained why this statistical model is used and if alternative approaches also exist.

**Response: We clarify that the hierarchical models were used because it can be hypothesized that the Pap test and mammography uptakes have a structure of correlation among individuals that differs between the regions of residence both in terms of the effect of the heterogeneity of the public screening programme organization and in terms of the greater homogeneity in the resident population's socio-economic and demographic characteristics.**

7. Certain determinants and variables are used in the multilevel regression and results are presented and then interpreted in the discussion. However, in my opinion a section in the introduction is missing in which the authors present a theoretical model which generate hypotheses for the used variables. As an example: which influence can age and education have on uptake. So it could be helpful that you discuss at least shortly that such models exist (e.g. Grossman model) .

**Response: We completely rewrote the rationale of the study. We realized that the first version could be improved, including eliminating some concepts that were more appropriate as conclusions. In the new rationale we report results from previous studies about some of the known determinants of screening uptake and how their effect differs in organized screening and opportunistic screening. The Italian situation, with a mixed model in which organized and opportunistic screening coexist and with regions having different levels of organized screening implementation, permits studying the interaction between the two models of providing screening and the known determinants of screening uptake.**

8. Using the variable citizenship: is it possible to separate foreign nationals into several categories? It could be also sensible to explain why this variable could have an effect on uptake. Cultural or language barriers?

**Response: We thank the reviewer for the comment. We have introduced a paragraph discussing the lower uptake observed for immigrant women. We have also cited a recent paper that evaluated differences in uptake by area of origin using data from the same survey.**

9. It could be helpful that uptake rates for cervical cancer screening and mammography are presented for the analysis period in Italy (downward/upward trend over the analysis period)

**Response: Unfortunately, in the previous editions of the HNIS the information on date of the test was not collected, so no temporal comparison with our outcome was possible. However, comparing the total uptake of Pap test and mammography is certainly useful. We have thus added a sentence in the introduction that describes the phenomenon.**

10. The discussion part (p9), especially sections socioeconomic differences, associations with other preventive health behaviours could be extended with further literature (e.g. Sabates R, et al. Soc Sci Med. 2006; Sabates. Int J Public Health. 2008, and further literature) and discussed in further detail.

Also mentioning omitted variable bias could be sensible.

**Response: We thank the reviewer for the request and the suggested citations. We have added a more in-depth discussion of the inequalities in uptake, particularly concerning immigrant status (measured by citizenship in our study) and economic condition (indirectly measured by perceived economic resource), mentioning the unavailability of a direct measure of income, which would have been a more powerful item of information.**

11. p11 limitations: dataset has a rich description including family related variables. Why have been no family or partner related variables included in the regressions?

**Response: Unfortunately, not all the variables of the questionnaire were available in the dataset. We have mentioned the unavailability of family- and partner-related variables among the limitations of the study.**

12. p11 I would drop the following sentence:

"...This is the first scientific paper analysing the association between screening uptake and different sections of the NHIS questionnaire."

**Response: We have modified this accordingly.**

13, p17 table 1: the difference between preventative medical examinations in the preceding 4 weeks and general prevention medical tests should be explained.

**Response: We have clarified the meaning of preventive medical examinations, describing the categories used.**

A table legend should have information how many observations are the base for the descriptive analysis.

**Response: We have modified Table 1 accordingly.**

14. p19/20 table 2 and 3: why have been the variable "Reasons hampering pursuit of hobbies or interests" been included in the regression? Any hypotheses about them?

**Response: We have specified that the variable "reasons hampering the pursuit of hobbies and interests" was introduced as a proxy of availability of time.**

Reviewer: 2

Reviewer Name: Maureen Sanderson

Institution and Country: Meharry Medical College, USA Please state any competing interests or state 'None declared': None declared

**Response: we modified accordingly**

Please leave your comments for the authors below

Tables 2 and 3 are difficult to interpret since the outcome is not having been screened which necessitates the need of a double negative. The investigators should consider rewriting as more or less likely to have been screened.

**Response: We have modified Tables 2 and 3 and the results section accordingly.**

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Alexander Labeit University of Manchester Institute of Population Health, Division of Population Health, Health Services Research and Primary Care
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<b>REVIEW RETURNED</b>	24-Apr-2018
<b>GENERAL COMMENTS</b>	<p>The second draft has been much improved.</p> <p>The only thing which is missing in my opinion (previous point 7 of my review) is a section in the introduction which presents a theoretical model which could generate hypotheses for the used variables in your study.</p> <p>Mentioned as an example: which variables can influence uptake in a theoretical model (age and education)?</p> <p>So it could be helpful that you discuss at least shortly that such models exist (e.g. Grossman model) or another model.</p> <p>It is in my opinion sensible not only to reference and discussing empirical study results.</p>

### **VERSION 2 – AUTHOR RESPONSE**

We sincerely thank the reviewer for insisting on this point. We completely modified the paragraph on the theoretical model, with a brief description of how each determinant, intervention and policy is thought to act on participation as the final behavior we want to observe. As already mentioned we adopted the Green and Kreuter model and we hope that this brief description gives a suggestive picture of the adaptation of the model to screening participation. Unfortunately, most of the papers we wrote on the application of Green and Kreuter model to screening are in Italian.

We thank the editors for their consideration.