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Gruppo per l'Epidemiologia e Registrazione del cancro nei paesi di Lingua Latina | Grupo para a Epidemiologia e Registo de cancro nos países de Língua Latina  
Grupul de Epidemiologie și înregistrare cancerului în țările de Limbă Latină

## O\_21.

### THE EFFECT OF BREAST CANCER SCREENING ON A POPULATION LEVEL: THE IMPACT STUDY

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#### Introduction

The efficacy of breast cancer screening in reducing specific mortality has been documented by several clinical trials.

#### Objectives

The IMPACT study (supported by the Italian League Against Cancer and the Italian Ministry of Health and coordinated by Cancer Prevention and Research Institute – ISPO, Florence Italy) aims to evaluate the impact of mammographic service screening in terms of change of stage-specific incidence rate, use of conservative surgery in the screening areas and finally reduction of breast cancer mortality.

#### Materials and Methods

The study included about 81.000 breast cancers (both in situ and invasive) diagnosed among women aged 40-79 years between 1988 and 2005 in 22 areas located in various areas of Italy. All breast cancer were classified by size and nodal status according to the TNM classification. Moreover, for each case, the following variables were collected: surgical treatment, grading, histological type, presence of metastasis, dissection and sentinel lymph node. Follow-up for status alive or deceased and cause of death was updated at 31 December 2006. All breast cancer were linked to the screening database and the invited cases were classified by method of detection either as screen-detected vs not screen-detected case or as ever screened vs never screened.

#### Results

The IMPACT project has now a significant list of publications evaluating how the epidemiology of breast cancer in Italy has changed after the service screening introduction. We conducted a matched case-control study [Puliti D et al. *Br J Cancer* 2008] to evaluate the effectiveness of service screening programme in reducing breast cancer mortality in the Italian areas participating in the IMPACT study.

The results of the study show that service screening is associated with a 25% reduction in the probability of dying for breast cancer by allocation for screening invitation and with a 45% reduction when comparing screened with never-respondent women after correction for selection bias.

In a recent paper published on the European Journal of Cancer [Paci E et al *Eur J Cancer* 2008], we present the 10-year survival data of breast cancer cases in the Italian areas participating in the IMPACT study with the aim of evaluating the impact of service screening.

Using more recent statistical approaches for modelling hazards, we have tried to investigate survival rates as predictors of the real effect of screening on mortality. Although breast cancer mortality reduction is certainly the main benefit of screening, the reduction of mastectomies is an important secondary outcome. Using data from the IMPACT database, we evaluated the changes introduced by service screening in the use of breast conserving surgery and mastectomies [Zorzi M et al *Br J Cancer*. 2006].

The debate on the overdiagnosis of breast cancer due to mammographic screening is today very heated in the scientific literature. Using the IMPACT dataset, we estimated the overdiagnosis using the adjusted for lead-time method [Paci E et al. *Breast Cancer Research*. 2006].

#### Conclusions

The Impact study represents an example of a collaborative study between service screening and cancer registries to measure the breast cancer screening effect at a population level. The possibility to extend such study to other Grell countries should be evaluated.