# PROGRAM

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**Title**: Cadmium exposure and risk of breast cancer: a meta-analysis

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**Text**:
**Background and aims**: Cadmium (Cd) is a toxic metal with estrogenic activity and established human carcinogenicity, but several uncertainties still exist about the amounts of relevant exposure and particularly the cancer types involved.
**Methods**: We carried out a systematic search in the PubMed-Medline database in April 2015, using as MeSH terms 'cadmium', 'breast cancer', or 'breast tumor'. We identified 24 eligible studies, 16 case-control and 8 cohort ones. We performed a meta-analysis according to study design and type of Cd exposure assessment, using random-effects model considering the moderate heterogeneity between these investigations.
**Results:** The exposure assessment methodology influenced the meta-analysis results, which however generally indicated an increased risk of breast cancer. For studies using urine Cd concentrations for exposure assessment, we found a summary relative risk (RR) of 2.14 (95% CI 1.37-3.34) and 1.39 (0.67-2.92) for case-control and cohort studies, respectively. For cohort studies using dietary Cd intake for exposure assessment, summary RR was 1.00 (0.87-1.15). Stratified analysis according to Estrogen Receptor (ER) status showed a summary RRs of 1.05 (0.94-1.16) and 1.00 (0.82-1.21) for positive and negative cancer types, respectively. For Progesterone Receptor (PR), RRs were 0.87 (0.69-1.10) and 1.10 (0.83-1.45) for positive and negative status, respectively. Considering body mass index (BMI) as effect modifier, RR was 1.08 (0.96-1.23) and 0.99 (0.93-1.05) for BMI<25 and BMI≥25, respectively.
**Conclusions**: Despite the limitations of this meta-analysis, such as the differences in exposure assessment methods and the statistical imprecision of the point estimates, overall results appear to suggest a direct association between cadmium exposure and breast cancer, with higher RR in subgroups such as ER-positive, PR-negative and normal weight women.