

# Survival patterns in patients with malignant mesothelioma and other rare thoracic cancers in Germany and the United States

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## Background

Rare thoracic cancers (RTC) include epithelial tumours of the trachea (Etra), epithelial tumours of the thymus (Ethy) and malignant mesothelioma (MM). Apart from MM which has been linked to asbestos exposure, little information is available on the risk factors and survival of the other RTC.

We assessed 5-year relative survival (RS) by cancer type, age group and sex in Germany (GER), and compared results with data from the United States (US).

## Methods

### Data – Germany

Pooled dataset from 12 German cancer registries of the federal states of Bremen, Hamburg, Schleswig-Holstein, Saarland, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Brandenburg, Saxony, Saxony-Anhalt, Mecklenburg-Western Pomerania and Thuringia, covering a population of 28.3 million residents. Patients aged 15 years and older diagnosed with a primary malignant RTC in 1997-2013 and followed up until the end of December 2013 were extracted from the pooled dataset. Patients still alive in December 2013 were censored. Death certificate only (DCO) cases were excluded.

### Data – US

Data was extracted from the Surveillance, Epidemiology, and End Results (SEER-13) database. Same inclusion criteria as in Germany.

### Statistics

Analysis was done according to RARECARE study listing<sup>1</sup>, which is based on ICD-O-3 classifications: Etra (C33), Ethy (C37) and MM (C38, C48, C63.7); ICD-10 codes: C33, C37, C45 (all cancer sites with morphology code M9050/3-M9053/3). Standard and model-based period analysis were used to derive 5-year RS for the time period 2002-2013. Expected survival was computed by the Ederer II method. Age adjustment was conducted according to the International Cancer Survival Standards. Differences in RS were statistically tested.

## Results

A total of 7,917 and 7,970 patients in Germany and the US, respectively were analyzed. The median ages (years) at diagnosis for both sexes combined in Germany vs. US were 70 vs. 71 for Etra, 63 vs. 60 for Ethy and 71 vs. 73 for MM. The majority of cases were MM (Germany 86%, US 73%).

## Results

Overall, patients with Ethy had the best age-standardized 5-year RS in both countries, with patients in the US showing better survival (69.1% vs. 63.7%,  $p=0.0249$ , Fig. 1 A), partially explained by a significantly better survival in men in the US (68.3% vs. 60.6%,  $p=0.0205$ , Fig. 1 C). Even though younger patients (15-64 years) with Etra in the US showed significantly better survival compared to their counterparts in Germany (53.3% vs. 34.2%,  $p=0.0010$ , Fig. 1 B), survival was comparable overall (34.4% vs. 33.6%,  $p=0.0685$ , Fig. 1 A). Survival for MM patients was poor overall in both countries (Germany 11.8%, US 12.1%) and at all sublevels. Patients with MM originating from retro- and peritoneum (PT) survived better compared to pleural (PP) origin in both countries (Fig. 1 D). In Germany and the US, survival in women was better by each cancer type compared to men (Fig. 1B, 1C, 1D).

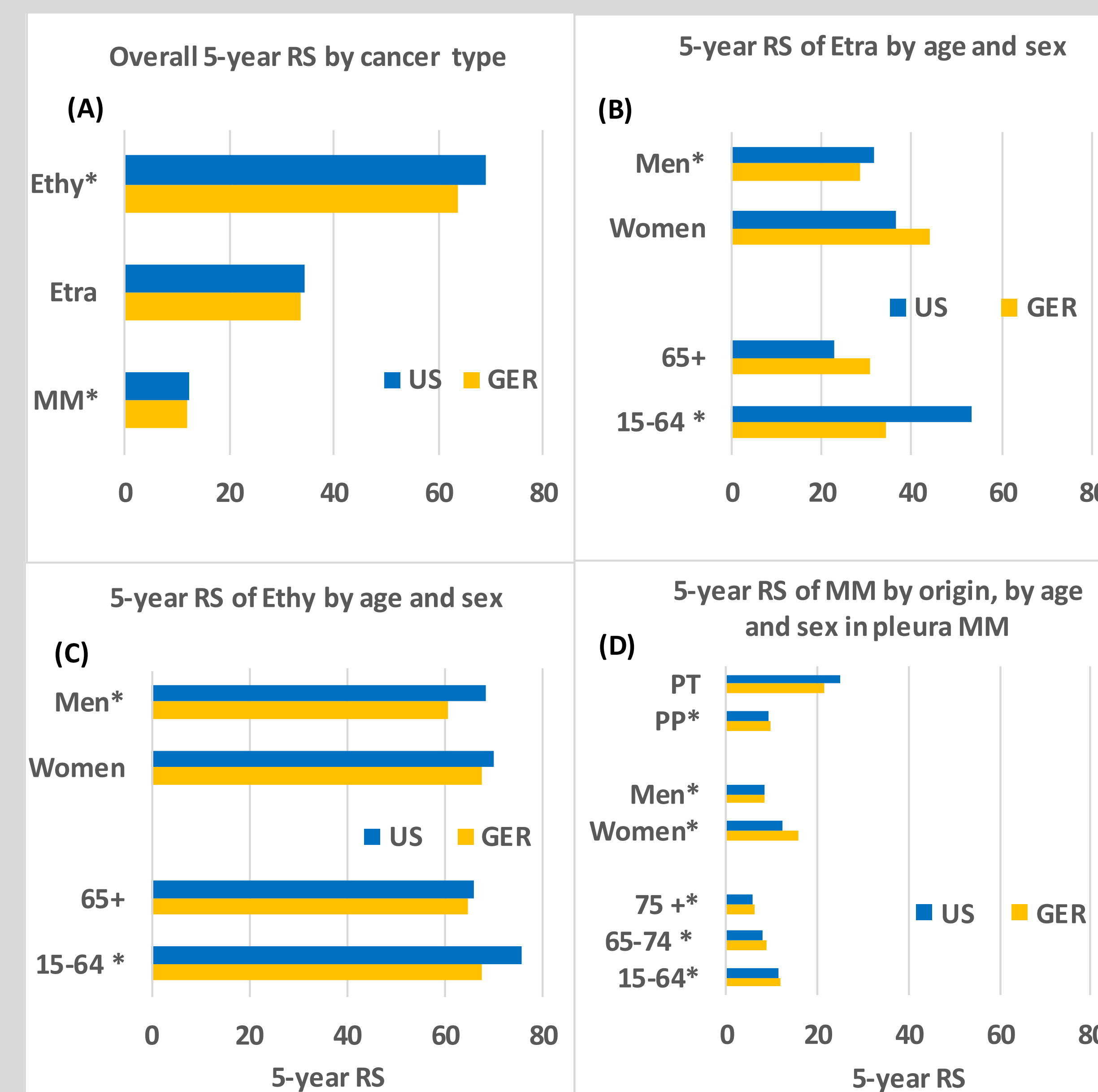


Figure 1.: Comparison of 5-year RS by cancer type, by age groups and sex within each cancer type and between Germany and the US, period 2002-2013  
\*Statistically significant

## Results

Overall, 5-year RS slightly improved in Germany for MM patients (10.5% in 2002-2007 vs. 13.1% in 2008-2013,  $p=0.0004$ , Fig. 2 A). In the US, no significant progress was observed during the study period (Fig. 2 B).

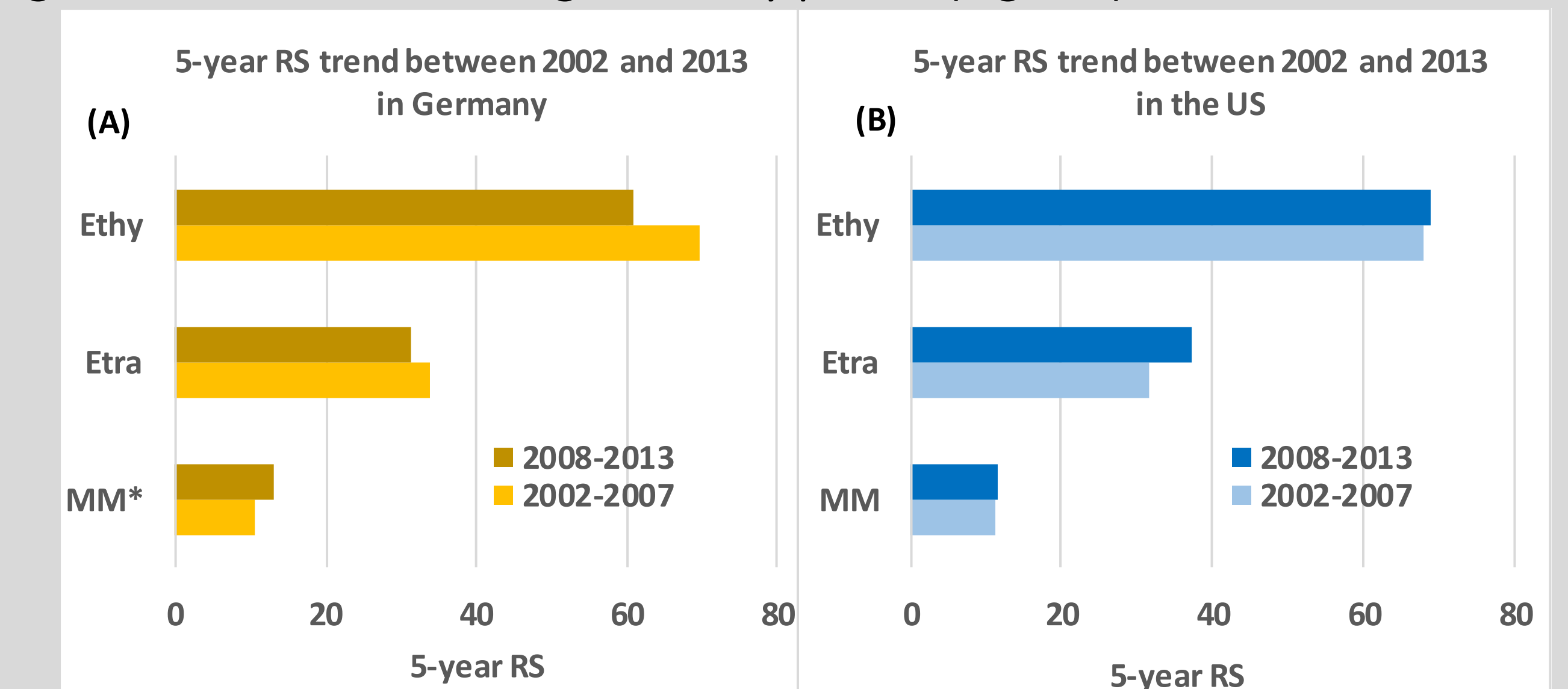


Figure 2.: Comparison of 5-year RS trends between 2002 and 2013 by cancer type in Germany and the US \*Statistically significant

## Discussion/Conclusion

This is the first most comprehensive population-based survival study on malignant mesothelioma and other rare thoracic cancers in Germany and especially in comparison to the SEER-13 dataset. A moderate 5-year RS of over 60% for patients with cancer of the thymus in Germany and the US concurs with literature. Also the poor survival of epithelial cancer of the trachea and malignant mesothelioma has been reported. Little or no progress in RTC survival has been achieved in the last decade. This observation concurs with poor prognosis seen with comparable cancers like lung cancer. Better survival in women compared to men may be related to less comorbidity and/or hormonal differences. Our results should open up new discussions on how to improve patients care and more importantly to prevent the occurrence of these cancers.

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