

Male and female breast cancer: A comparison of a 15-year population-based cohort

Simone Schrodi^{a*}, Michael Braun^b, Anne Andrulat^b, Sven Mahner^c, Nadia Harbeck^c, Marion Kiechle^d, Stefan Paepke^d, Andreas Schnelzer^e, Christian Schindlbeck^f, Ingo Bauerfeind^g, Claus Belka^h, Stefanie E. Combsⁱ, Doris Mayr^j, Wilko Weichert^k, Jutta Engel^a

^a Munich Cancer Registry (MCR), Bavarian Cancer Registry – Regional Centre Munich (LGL) at the Institute for Medical Information Processing, Biometry and Epidemiology (IBE), University Hospital, Munich, Germany
^b Red Cross Breast Centre, Munich, Germany
^c Department of Gynecology and Obstetrics, Breast Centre, University Hospital, LMU Munich, Germany
^d Department of Obstetrics and Gynecology, University Hospital, Technical University Munich, Germany
^e Department of Obstetrics and Gynecology, RoMed Kliniken, Breast Centre, Rosenheim, Germany

^f Department of Obstetrics and Gynecology, Breast Centre, Traunstein, Germany
^g Klinikum Landshut, Breast Centre, Landshut, Germany
^h Department Radiation Oncology, University Hospital, LMU Munich, Germany
ⁱ Department Radiation Oncology, Technical University Munich, Germany
^j Department of Pathology, LMU Munich, Germany
^k Department of Pathology, Technical University Munich, Germany

Introduction

The aim was to compare prognostic factors, treatment, and outcome of male and female breast cancer patients.

Methods

The Munich Cancer Registry (MCR) is the population based clinical cancer registry of Upper and a part of Lower Bavaria (Southern Germany), with a catchment area of 4.9 million inhabitants.



Fig. 1: Catchment area of the Munich Cancer Registry (MCR)

The analysis included **48,983 women** and **386 men** with invasive breast cancer (M0), diagnosed between 2002 and 2016. Survival was assessed using the Kaplan–Meier method, relative survival (RS) analysis, and Cox proportional hazards regression models.

Results

Prognostic factors

At the time of diagnosis affected men were about 5 years older than women (mean age 68 vs. 63 years). The proportion of T3/4- tumors (16% vs.11%), positive lymph nodes (45% vs. 36%), and primary metastases (9% vs. 7%) was higher in men. Biologically, 99% of male tumors were endocrine sensitive (vs. 87%) and 6% were HER2/neu positive (vs. 15%). Men underwent more mastectomies (90% vs. 27%) and less radiotherapy (44% vs. 71%). Frequencies of axillary surgery, chemotherapy, and endocrine therapy were not statistically different.

Table 1: Prognostic factors for men and women with breast cancer

	Men n = 386	Women n = 48,983
Mean age (years)	68,1	62,6
Tumor diameter (mm)	23,6	21,5
pN/cN+ (%)	44,0	33,9
HR+ (%)	100,0	87,2
HER2/neu+ (%)	5,8	13,7
Ki67 ≥ 25 (%)	45,6	37,2

Time to local recurrence and time to metastasis

The time to local recurrence (TTL) was similar in both groups. The CI in time to metastasis (TTM) was higher in men (12% vs. 8% after 5 years), however this difference was not statistically significant. Respective multivariate cox-regression analysis also showed no significant gender differences.

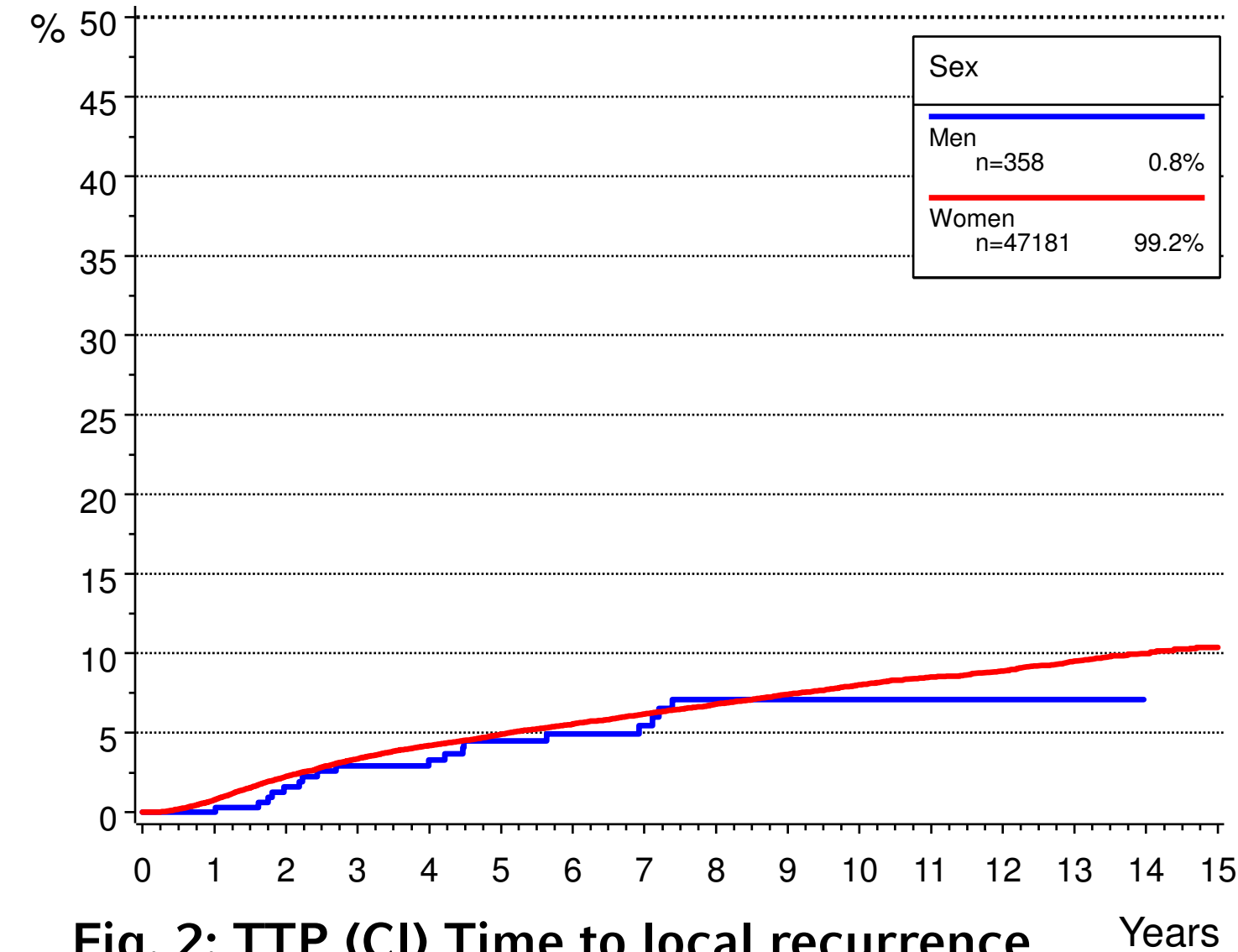


Fig. 2: TTP (CI) Time to local recurrence for men and women

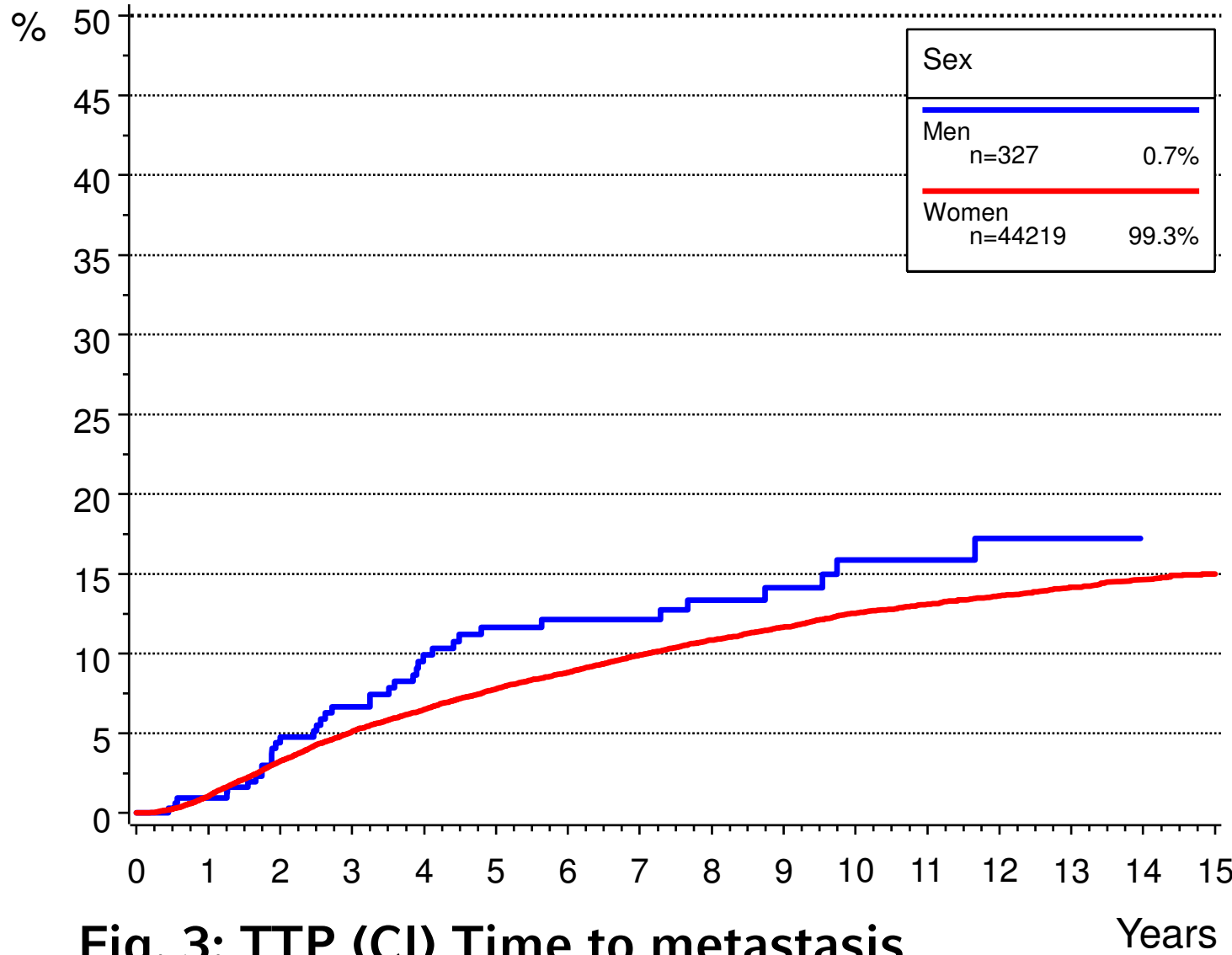


Fig. 3: TTP (CI) Time to metastasis for men and women

Survival

Survival improved slightly between 2002-2008 and 2009-2016, but only in female patients. Survival was lower in men than in women, and this difference was greater for overall survival (OS) than for relative survival (RS) (10-year-OS: 56% vs. 70%; 10-year-RS: 78% vs. 81%).

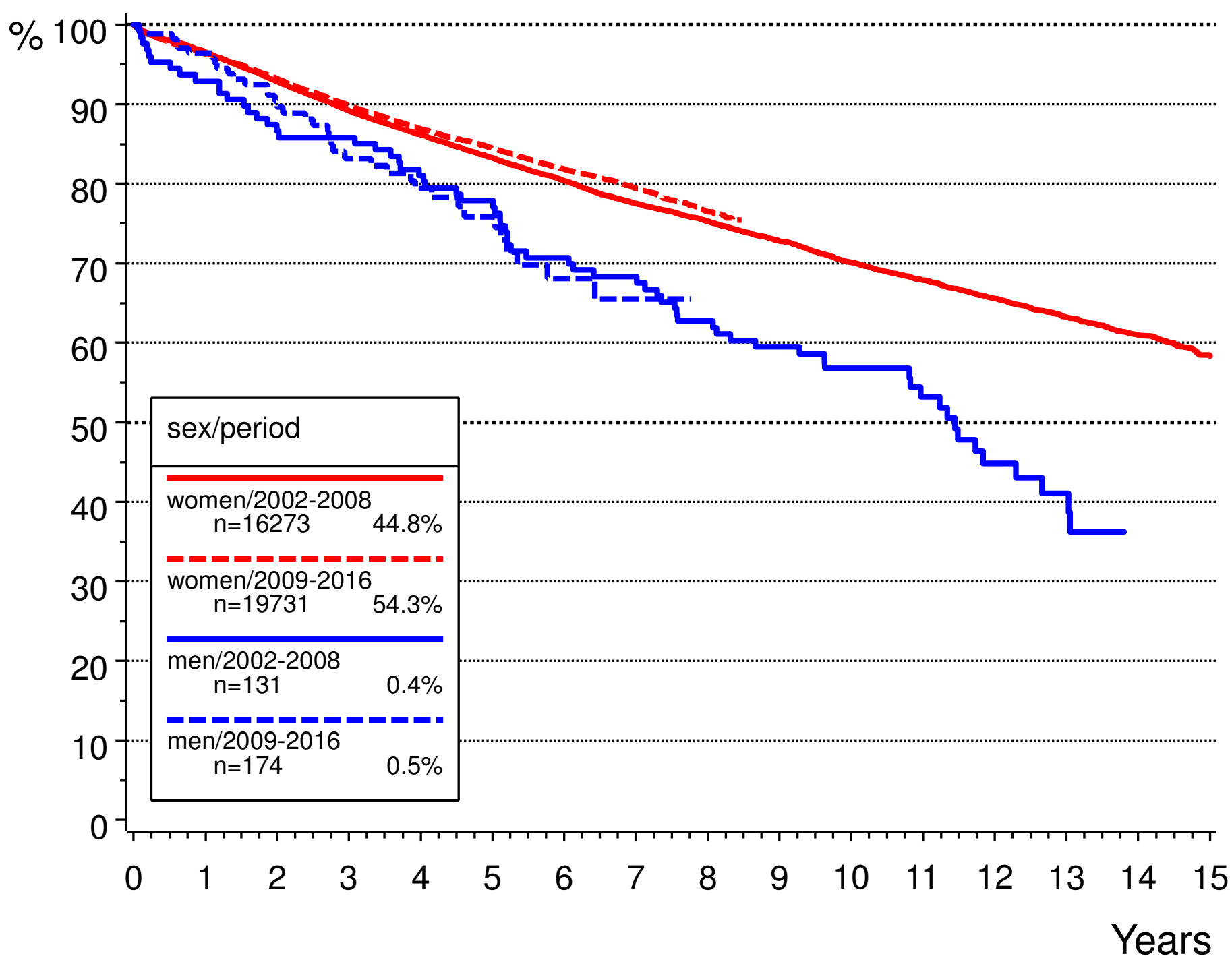


Fig. 4: Overall survival for men and women and for two time periods

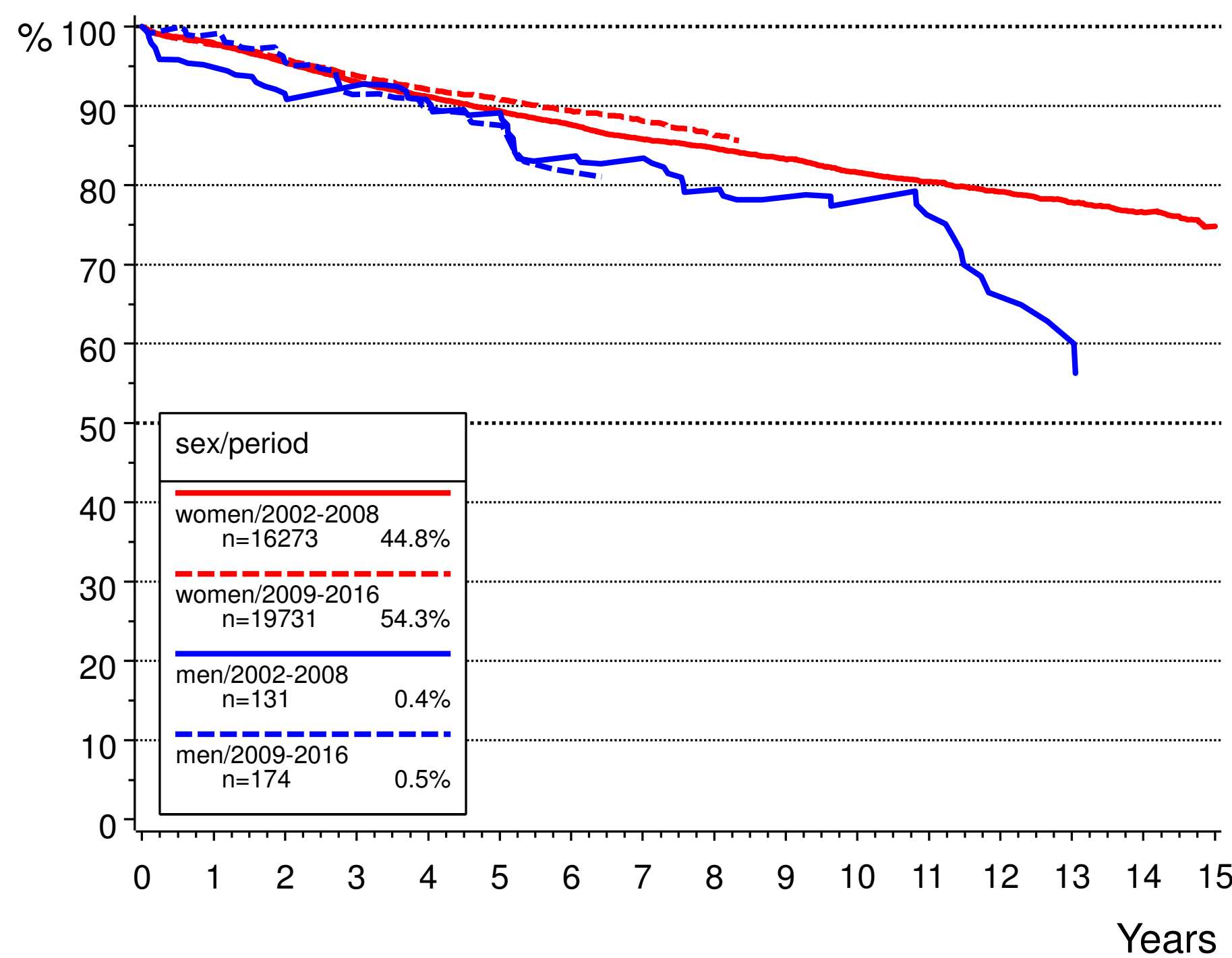


Fig. 5: Relative survival for men and women and for two time periods

Cox Regression analysis

The univariate hazard ratio was 1.8 (95%-CI 1.5-2.1). After adjusting for prognostic factors, the hazard ratio declined to 1.4, but remained statistically significant.

Table 2: Adjusted hazard ratios for men vs. women for different Cox regression models

Adjusted by	Hazard Ratio (95%-Confidence interval) For men vs. women n = 40 311
Age, pT/cT, pN/cN, grading	1,36 (1,12-1,65)
Age, pT/cT, pN/cN, grading, ER, PR, HER2/neu	1,45 (1,20-1,76)
Age, pT/cT, pN/cN, subtype	1,42 (1,17-1,72)
Age, pT/cT, pN/cN, subtype, therapies	1,36 (1,12-1,64)

Conclusions

Probably, delayed diagnosis of breast cancer in male patients lead to a more advanced tumor stage. After adjusting for prognostic factors, time to metastasis (TTM) was similar, whereas a statistically significant difference in overall survival (OS) remained. Whether this finding is attributable to differences in health/lifestyle/other factors remains to be seen.

