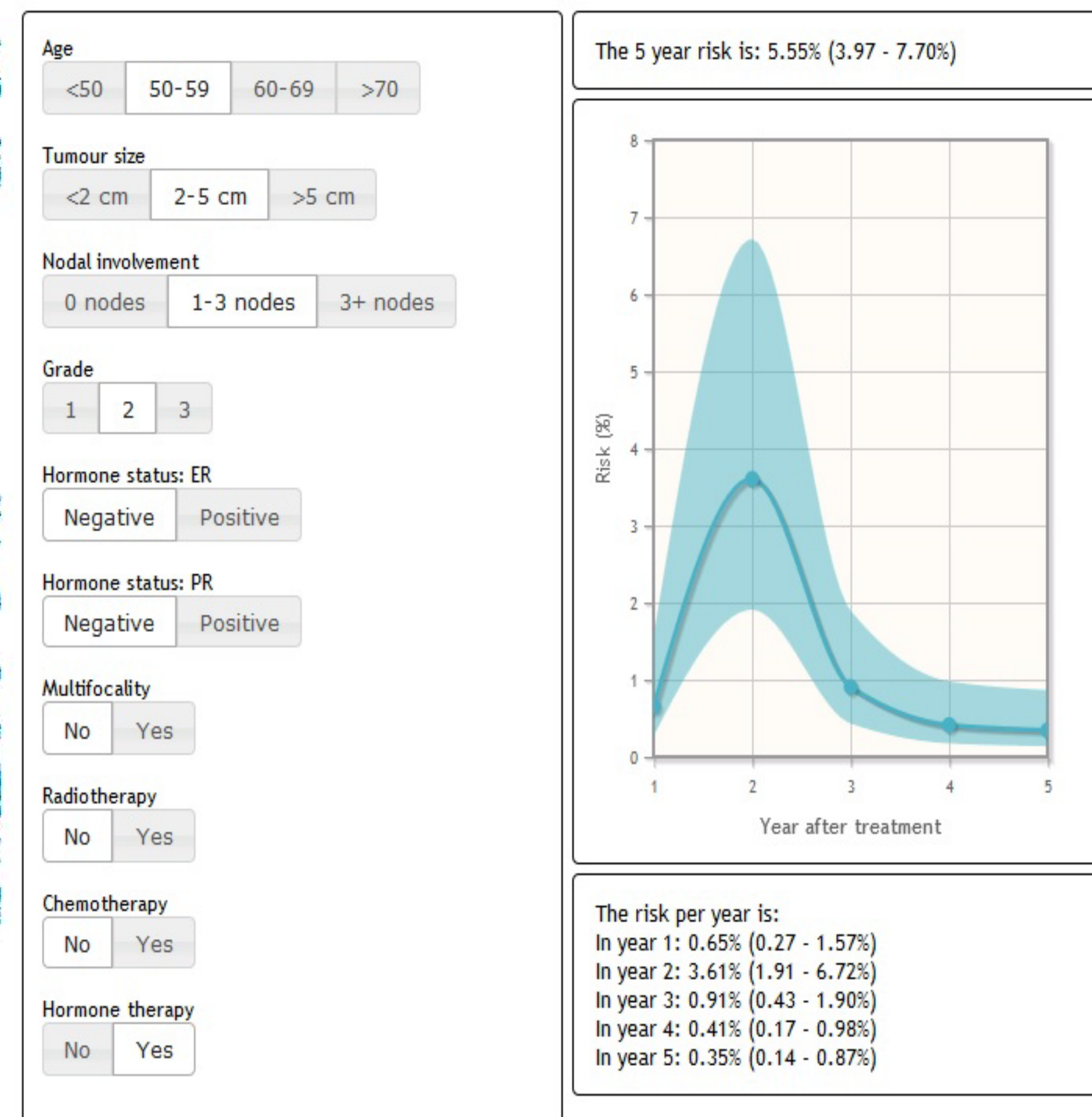


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BACKGROUND

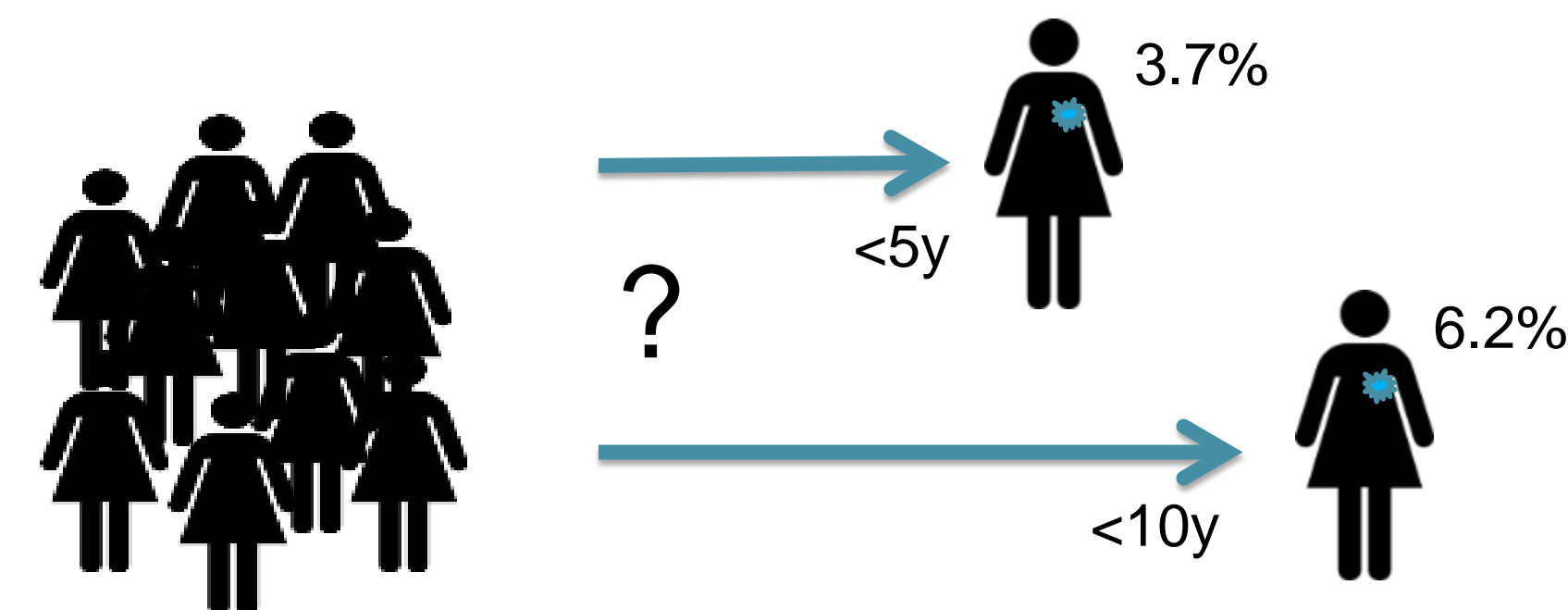
The objective was to extend the recently developed and validated time-dependent logistic regression model and web-based INFLUENCE nomogram. This nomogram is suitable for the annual long term risk prediction of locoregional recurrence (LRR) in individual breast cancer patients and can support clinical decisions with regard to the follow-up



Print screen of the nomogram, from : www.utwente.nl/influence

PATIENTS AND METHODS

Netherlands Cancer Registry (NCR):

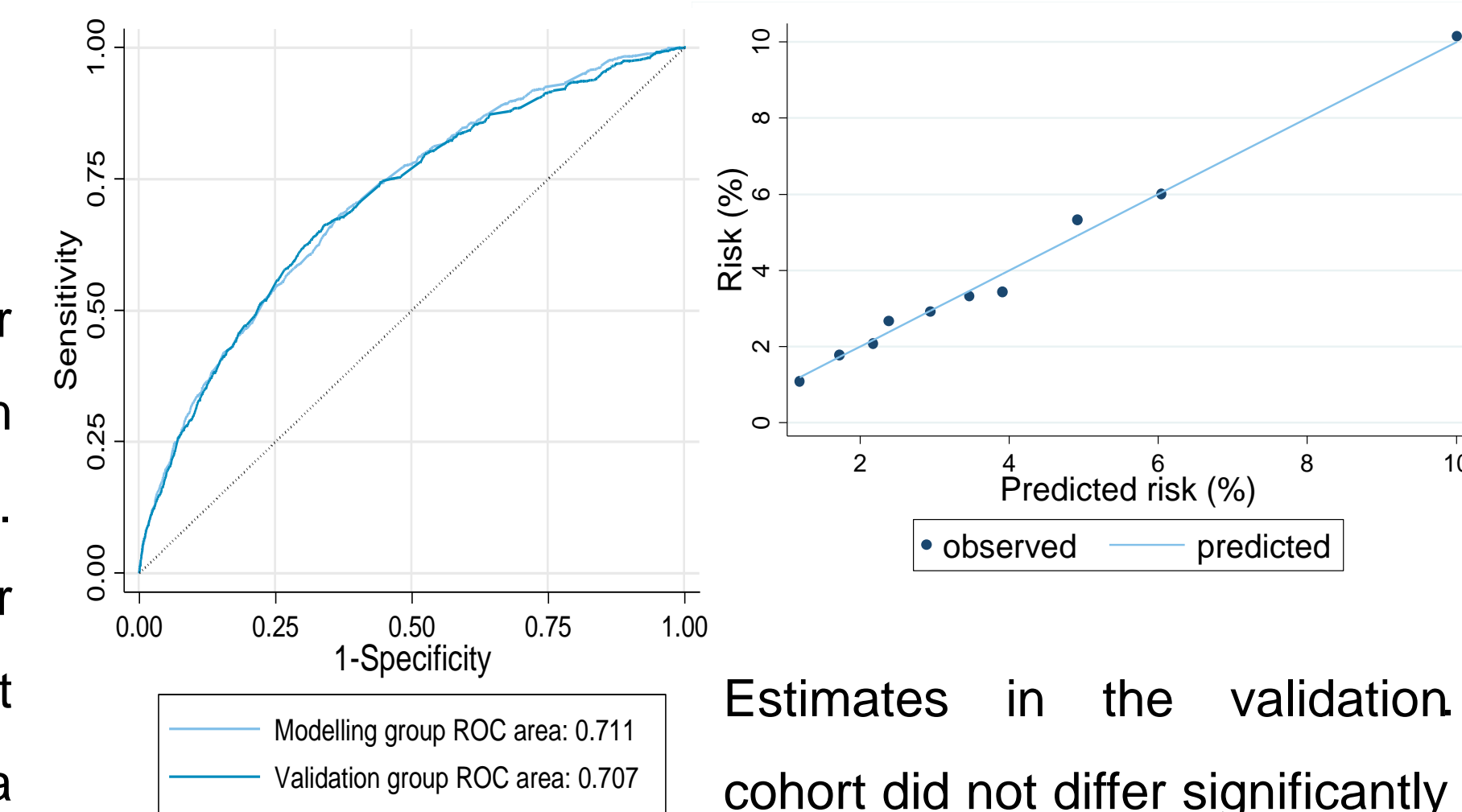


Patients - Women first diagnosed with early breast cancer between 2003-2006 in all Dutch hospitals were selected from the NCR with five year of recurrence follow-up (n=37,230). For patients diagnosed in 2003 follow-up was complete for ten years. In the first five years following primary breast cancer treatment 3.7% of the selected patients developed a LRR as a first event, in ten years 6.2%. **Risks** - Risk factors were determined using logistic regression and the five year risks were calculated per year, conditional on not being diagnosed in the previous year. Cox regression was used for the ten year follow-up. **Validation** - Internal validation was performed by bootstrapping. Data on primary tumors diagnosed between 2007-2008 in 43 Dutch hospitals was used for external validation of the nomogram (n=12,308).

Thresholds - Based on the current follow-up, the lower risk boundary and quantiles for intervals were determined. With these thresholds redistribution of visits was established for a low, middle and high risk group, over ten years of follow-up.

RESULTS

The final model included the variables grade, size, multifocality, and nodal involvement of the primary tumor, and whether patients were treated with radio-, chemo- or hormone therapy. Model predictions were well calibrated.



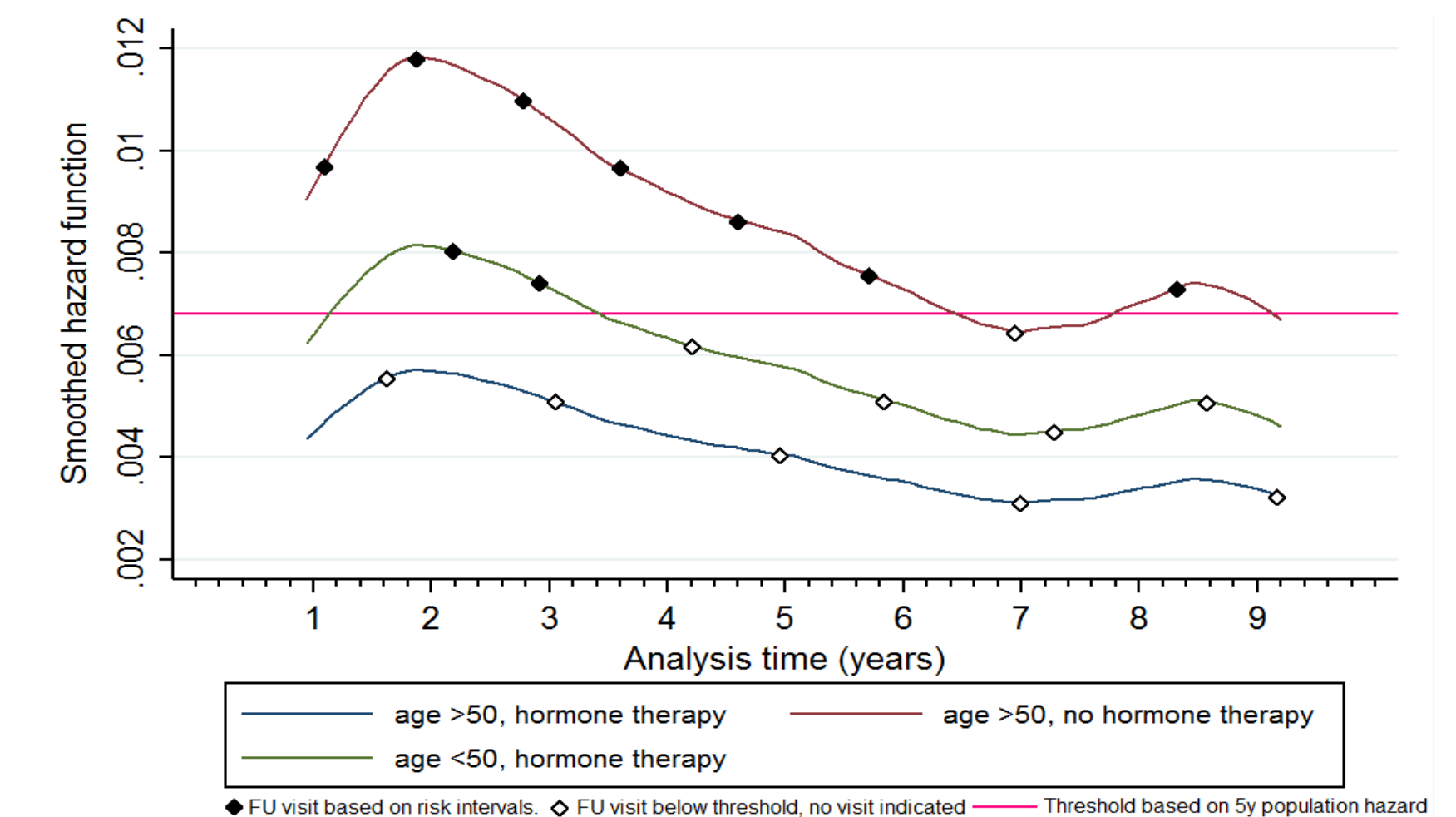
In 0.7% of the patients, the risk of LRR between year 5-10 was higher than the average risk of all patients in the first five years. All of these patients were aged below 50, had a tumor size larger than 2 cm, non-negative hormone status, received radiotherapy, but no hormone therapy and 19% developed a recurrence during ten years.

The cumulative hazard of the population after five year was 0.0448, (→ hazard interval of 0.00896 per visit), the hazard after five years was 0.0068 (→ lower boundary for follow-up).

Given the thresholds, the medium (<50, hormone therapy) risk group should receive two follow-up visits, and the high risk group (>50, no hormone therapy) seven during the follow-up period of ten years. The low risk group (>50, hormone therapy) remained below the threshold for all the ten years.

CONCLUSIONS

This validated and time-dependent nomogram for the prediction of annual LRR risks over ten years is simple to use and shows a good predictive ability in the Dutch population. It can be used as an instrument to identify patients with a low or high risk of LRR who might benefit from a less or more intensive and longer follow-up after breast cancer and to aid clinical decision-making for personalized follow-up.



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