1 **Supplemental data 1**: **Cutoff points of Young Age by X-tile analysis.**

2 All possible cutoff values of age were assessed. Associations were calculated at cutoff

3 values by the log-rank test for survival. The data are represented graphically in a right-

4 triangular grid where each point (pixel) represents the data from a given set of cutoff

5 values. The vertical axis represents all possible "high" populations (oldest), with the size of

6 the high population increasing from top to bottom. Similarly, the horizontal axis represents

7 all possible "low" populations (youngest), with the size of the low population increasing

8 from left to right. Data points away from the hypotenuse define an additional "middle"

9 population (older), which increases in size with greater distances from the hypotenuse.

10 Coloration of the plot represents the strength of the association at each cutoff value,

11 ranging from low (black) to high (green or red). Indirect associations between age and

12 survival (e.g., oldest connotes poorer survival) are colored red, whereas direct associations

13 are colored green. The rectangular X-tile plot below the triangular plot allows the division

14 of the cohort into "older" and "younger" subsets (two-population). The optimal cutoff

15 value highlighted by the black circle in the rectangular X-tile plot (A) is shown on a

16 histogram of the entire cohort (B) and a Kaplan-Meier plot (C).

17 C: Cancer-specific survival (CSS) curve of younger and older patients. $P<0.001$, P value

18 calculated by the log-rank test.

19 D: Relative risks (RRs) for all cutoff values from low to high (left to right, x-axis). RRs are

20 calculated as event in older group/event risk in younger group. An RR of 2 indicates the

older group is two times more likely to have an event (breast cancer) than the younger

group. An RR of 0.5 indicates the younger group is two times more likely than the older

group to experience the event. An RR of 1.0 indicates no difference in the event rate

between the older and younger groups. The Y-axis of the graph is log (base 2) and

normalizes the relative risks approximately 1.0.
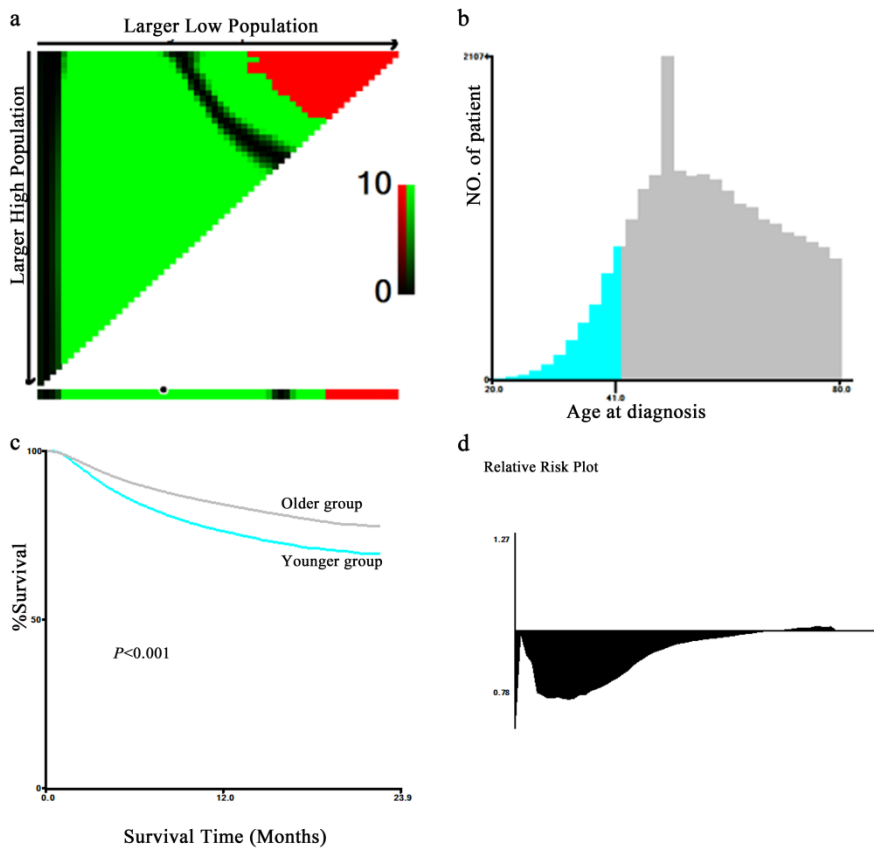
**Supplemental data 2**: **Grouping according to the risk score by X-tile analysis.**

The detailed interpretation is similar to that for Supplemental data 2 above.

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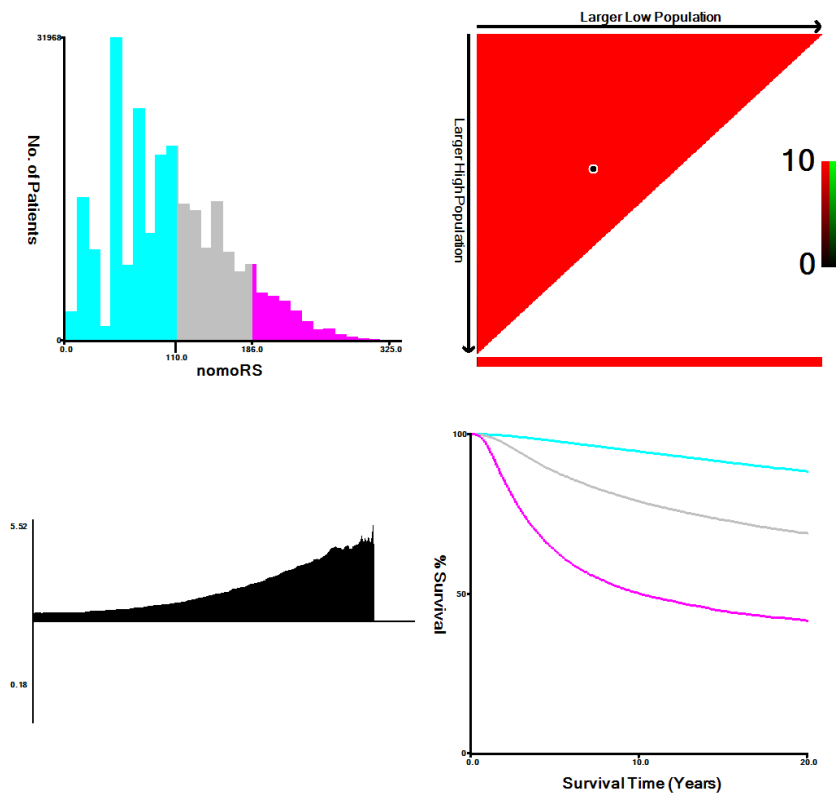
Supplemental data 3: **External validation (2008-2014) of Nomogram .**

A. Calibration curve for predicting patient of 2008-2014

B. Forest plot of stratification analysis by the risk score for the probability of breast cancer-specific death in younger and older women with breast cancer (2008-2014).
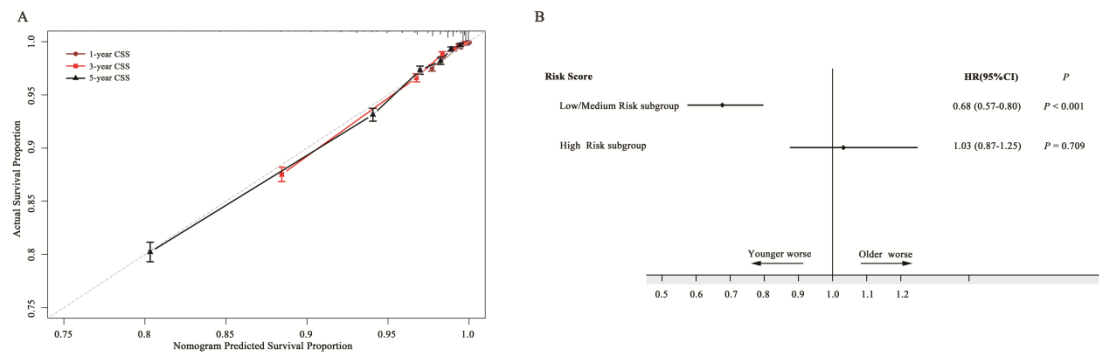
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38 **Supplemental data 4：Point assignment and prognostic score in nomogram**

Variables	Score	Estimated 5-year CIF (%)
Race		
White	9	
Black	26	
Other	0	
Marital status		
Married	0	
Unmarried	8	
Divorced	16	
Location		
Left colon	2	
Right colon	0	
Histology		
Adenocarcinoma	4	
Mucinous adenocarcinoma	2	
Signet ring cell carcinoma	0	
Differential grade		
Grade I	0	
Grade II	41	
Grade III	61	
	65	

T classification [a]

T1	0	
T2	39	
	54	
	83	

N classification [a]

0	0	
0-3	41	
3-6	72	
6-12	100	

ER

0	15	
1	0	

PR

	16	
	0	

Total score (10-year Survival)

302		0.05
265		0.2
231		0.40
174		0.70
146		0.80
57		0.95

39   [a] T classification according to 7th AJCC staging system.

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