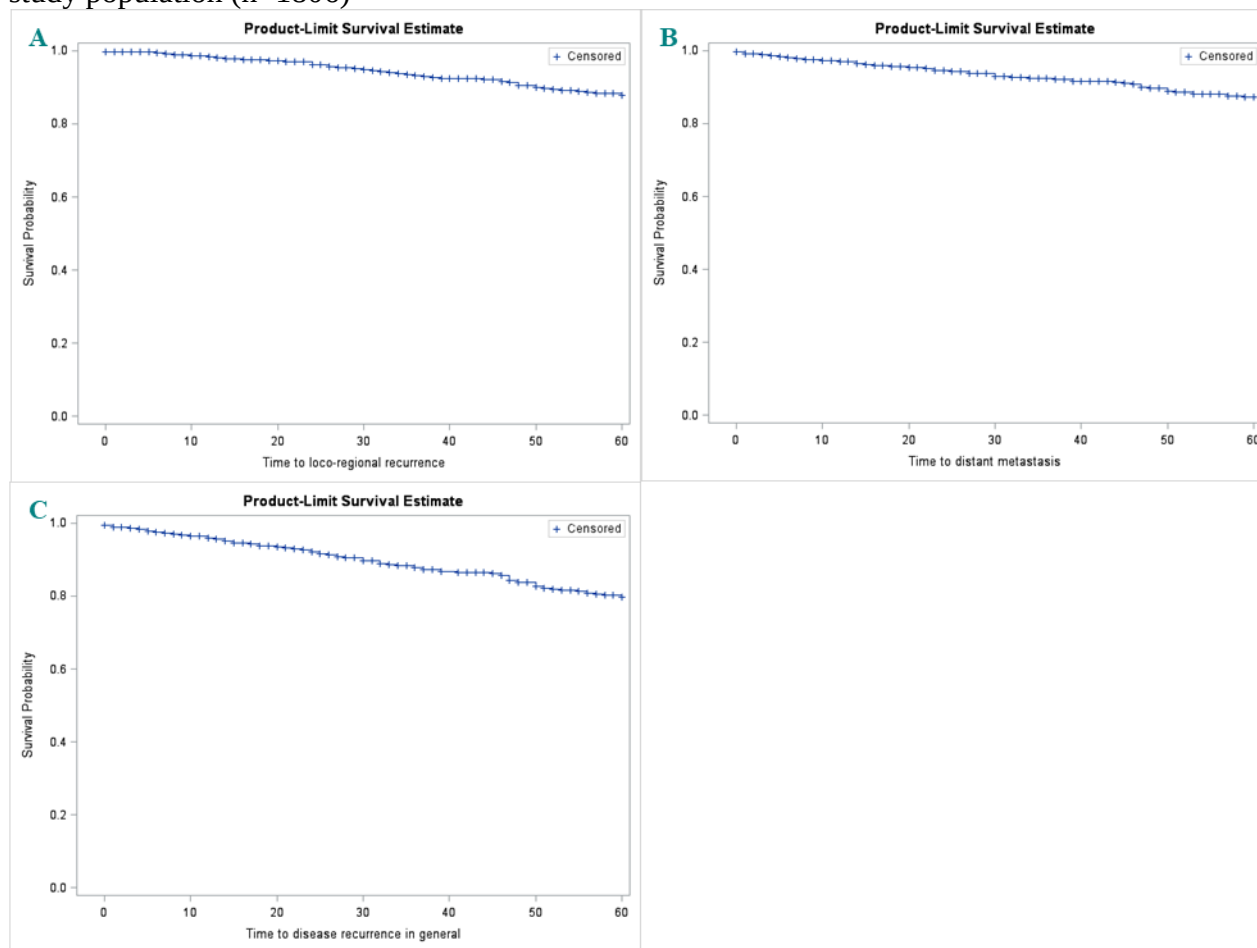


Supplementary Material

Supplementary Figure 1. Kaplan-Meier curves for 5-years LRRFS (A), DMFS (B), DFS (C) in the study population (n=1806)



Supplementary Table 1. Optimal cutoff values of pre-operative NLR, PLR, LMR for prediction of 5-years LRRFS, DMFS, DFS in the study population (n=1806)

	LRR			DM			DF		
	NLR	PLR	LMR	NLR	PLR	LMR	NLR	PLR	LMR
AUC	0.56	0.59	0.61	0.58	0.56	0.60	0.54	0.54	0.59
Cutoff	2.01	130.5	3.48	2.21	124.1	3.49	2.21	126.8	3.49

Supplementary Table 2. Hazard ratios (HR) and 95% confidential intervals (CI) for 5-years LRRFS, DMFS, DFS in low vs. high NLR, PLR and LMR groups (n=1806)

	LRRFS			DMFS			DFS		
	HR	95%CI	p-value	HR	95%CI	p-value	HR	95%CI	p-value
NLR	1.62	1.06-2.49	0.03	1.48	1.01-2.17	0.04	1.6	1.00-1.85	0.05
PLR	1.79	1.17-2.74	0.007	1.69	1.13-2.52	0.01	1.35	0.99-1.84	0.06
LMR	0.43	0.29-0.65	<0.0001	0.47	0.32-0.69	0.0001	0.51	0.38-0.69	<0.0001

Supplementary Table 3. Agreement calculation (K-Cohen) between clinical risk assessment and NLR, PLR, LMR

	LRR			DM			DF		
	CRS		K-Cohen	CRS		K-Cohen	CRS		K-Cohen
	Low	High		Low	High		Low	High	
NLR									
Low	445	378	0.008	521	437	0.02	521	437	0.02
High	421	370		345	311		345	311	
PLR									
Low	509	424	0.02	463	385	0.02	483	399	0.02
High	357	323		403	362		383	348	
LMR									
Low	313	292	-0.03	321	295	-0.02	321	295	-0.02
High	553	456		545	453		545	453	

Supplementary Table 4. Clinical and pathological characteristics of early breast cancer population (n=1547). Data are expressed as mean $\pm$ standard deviation or total numbers; range and frequency distribution are shown within square and round parentheses, respectively

Variable	Early BC (n=1547)	Variable	Early BC (n=1547)
Age at diagnosis (years)	61 $\pm$ 13 [26-90]	pN	
BMI	24.9 $\pm$ 4,9 [14.2-46.1]	0	1197 (77.4%)
Hormonal Status		1	350 (22.6%)
Fertile	390 (25.2%)	Biological portrait	
Pregnancy	1 (0.1%)	ER+/HER2–	1185 (81.5%)
Menopause	1141 (73.7%)	ER+/HER2+	122 (8.4%)
Replacement therapy	15 (1.0%)	ER-/HER2+	50 (3.4%)
Type of surgery		ER-/HER2-	97 (6.7%)
Conservative surgery	1200 (77.6%)	PG	
Mastectomy	347 (22.4%)	Negative	322 (20.8%)
Axillary dissection		Positive	1225 (79.2%)
No	1088 (70.3%)	Ki67	
Yes	459 (29.7%)	$\leq 14\%$	1035 (66.9%)
LNS biopsy		$> 14\%$	512 (33.1%)
No	136 (8.8%)	Radiotherapy	
Yes	1411 (91.2%)	No	418 (27.2%)

Type of breast cancer		Yes	1118 (72.8%)
Microinvasive	23 (1.5%)	Chemotherapy	
Invasive	1524 (98.5%)	No	1111 (72.7%)
Histological type		Yes	418 (27.3%)
Ductal	1226 (79.3%)	Biological therapy	
Lobular	225 (14.5%)	No	1288 (89.7%)
Others	96 (6.2%)	Yes	148 (10.3%)
Grading		Hormonal therapy	
I	176 (11.4%)	No	233 (15.3%)
II	999 (64.9%)	Yes	1295 (84.8%)
III	364 (23.7%)	Exitus	
Lymphovascular invasion		No	1526 (98.6%)
No	959 (62.3%)	Yes	21 (1.4%)
Yes	581 (37.7%)	DM	
Tumor dimension (mm)	14±7 [0-50]	No	1481 (95.7%)
pT		Yes	66 (4.3%)
1	1322 (85.5%)	Time to DM (months)	24±25 [0-60]
2	225 (14.5%)	LRR	
		No	1473 (95.2%)
		Yes	74 (4.8%)
		Time to LRR (months)	25±25 [0-60]

Supplementary Table 5. Optimal cutoff values of preoperative NLR, PLR, LMR for prediction of 5-years LRRFS, DMFS, DFS in early breast cancers (n=1547)

	LRRFS			DMFS			DFS		
	NLR	PLR	LMR	NLR	PLR	LMR	NLR	PLR	LMR
AUC	0.54	0.57	0.57	0.55	0.53	0.57	0.51	0.51	0.55
Cutoff	2.01	145.88	3.75	2.18	132.95	3.61	2.08	130.99	3.75

Supplementary Table 6. Multivariate analysis of inflammatory and clinical characteristics in relation to 5-years LRRFS, DMFS, DFS in early breast cancers (n=1547)

Variables	LRRFS			DMFS			DFS		
	HR	95%CI	p	HR	95%CI	p	HR	95%CI	p
NLR									
Low	0.57	0.34-0.95	0.03	0.67	0.39-1.16	0.15	0.77	0.52-1.13	0.18
High	Ref.			Ref.			Ref.		
Age	1.03	1.01-1.05	0.01	1.02	1.00-1.05	0.02	1.03	1.01-1.04	0.001
pT									
pT1	0.83	0.42-1.65	0.60	0.53	0.29-0.97	0.04	0.67	0.41-1.09	0.10
pT2	Ref.			Ref.			Ref.		
pN									
pN0	0.96	0.54-1.72	0.89	0.44	0.25-0.76	0.004	0.69	0.45-1.06	0.09
pN1	Ref.			Ref.			Ref.		
Ki67									
≤14%	0.59	0.32-1.07	0.08	0.48	0.25-0.91	0.02	0.48	0.30-0.75	0.001
>14%	Ref.			Ref.			Ref.		
Biological portrait									
ER+/HER2–	0.34	0.15-0.80	0.01	0.41	0.18-0.95	0.04	0.41	0.22-0.77	0.005
ER+/HER2+	0.29	0.08-1.07	0.06	0.72	0.25-2.05	0.54	0.44	0.18-1.09	0.08
ER-/HER2+	0.60	0.19-1.9	0.38	0.31	0.07-1.41	0.13	0.49	0.19-1.25	0.14
ER-/HER2–	Ref.			Ref.			Ref.		
Grade									
G1/2	1.35	0.62-2.94	0.45	1.08	0.53-2.21	0.83	1.28	0.74-2.24	0.38
G3	Ref.			Ref.			Ref.		
Histological type									
Lobular	1.06	0.52-2.13	0.88	1.10	0.51-2.4	0.80	1.03	0.59-1.78	0.93
Others	1.10	0.39-3.12	0.85	0.38	0.05-2.82	0.35	0.67	0.24-1.83	0.43
Ductal	Ref.			Ref.			Ref.		
PLR									
Low	0.55	0.33-0.91	0.02	0.85	0.49-1.46	0.55	0.85	0.58-1.26	0.42
High	Ref.			Ref.			Ref.		
Age	1.03	1.01-1.05	0.01	1.03	1.00-1.05	0.02	1.03	1.01-1.04	0.001
pT									
pT1	0.82	0.41-1.63	0.57	0.50	0.27-0.92	0.03	0.66	0.41-1.07	0.09
pT2	Ref.			Ref.			Ref.		
pN									
pN0	1.01	0.56-1.80	0.99	0.44	0.25-0.78	0.005	0.71	0.46-1.08	0.11
pN1	Ref.			Ref.			Ref.		
Ki67									
≤14%	0.55	0.30-1.01	0.06	0.47	0.25-0.88	0.02	0.47	0.30-0.75	0.001
>14%	Ref.			Ref.			Ref.		
Biological portrait									
ER+/HER2–	0.35	0.15-0.81	0.01	0.43	0.19-0.98	0.05	0.42	0.22-0.78	0.006
ER+/HER2+	0.31	0.08-1.14	0.08	0.74	0.26-2.09	0.57	0.46	0.19-1.13	0.09
ER-/HER2+	0.58	0.18-1.85	0.36	0.30	0.06-1.37	0.12	0.48	0.19-1.22	0.12

ER-/HER2-	Ref.			Ref.			Ref.		
Grade									
G1/2	1.40	0.64-3.04	0.40	1.09	0.53-2.23	0.82	1.28	0.73-2.22	0.39
G3	Ref.			Ref.			Ref.		
Histological type									
Lobular	1.03	0.51-2.07	0.94	1.09	0.50-2.37	0.82	1.03	0.59-1.78	0.92
Others	1.13	0.40-3.19	0.82	0.37	0.05-2.75	0.33	0.66	0.24-1.83	0.43
Ductal	Ref.			Ref.			Ref.		
LMR									
Low	1.86	1.12-3.09	0.02	1.39	0.81-2.39	0.23	1.38	0.94-2.03	0.11
High	Ref.			Ref.			Ref.		
Age	1.03	1.01-1.05	0.02	1.02	1.00-1.05	0.03	1.03	1.01-1.04	0.001
pT									
pT1	0.77	0.39-1.53	0.46	0.50	0.27-0.92	0.03	0.65	0.40-1.05	0.08
pT2	Ref.			Ref.			Ref.		
pN									
pN0	1.00	0.56-1.80	1.00	0.45	0.25-0.78	0.005	0.71	0.46-1.08	0.11
pN1	Ref.			Ref.			Ref.		
Ki67									
≤14%	0.59	0.33-1.08	0.09	0.48	0.25-0.91	0.02	0.48	0.31-0.76	0.002
>14%	Ref.			Ref.			Ref.		
Biological portrait									
ER+/HER2-	0.33	0.14-0.77	0.01	0.41	0.18-0.95	0.04	0.40	0.21-0.75	0.004
ER+/HER2+	0.31	0.08-1.14	0.08	0.72	0.25-2.05	0.54	0.46	0.19-1.12	0.09
ER-/HER2+	0.53	0.17-1.68	0.28	0.29	0.06-1.34	0.11	0.47	0.19-1.19	0.11
ER-/HER2-	Ref.			Ref.			Ref.		
Grade									
G1/2	1.35	0.62-2.92	0.45	1.08	0.53-2.21	0.83	1.29	0.74-2.25	0.38
G3	Ref.			Ref.			Ref.		
Histological type									
Lobular	1.06	0.53-2.14	0.87	1.11	0.51-2.41	0.79	1.03	0.60-1.79	0.90
Others	1.15	0.41-3.27	0.79	0.39	0.05-2.85	0.35	0.69	0.25-1.89	0.47
Ductal	Ref.			Ref.			Ref.		