

SENT BRYSTKRÆFT RECIDIV

RISIKO, PROGNOSE OG FOREBYGGELSE

RIKKE NØRGAARD PEDERSEN
KLINISK EPIDEMIOLOGISK AFDELING

STUDIE I-IV

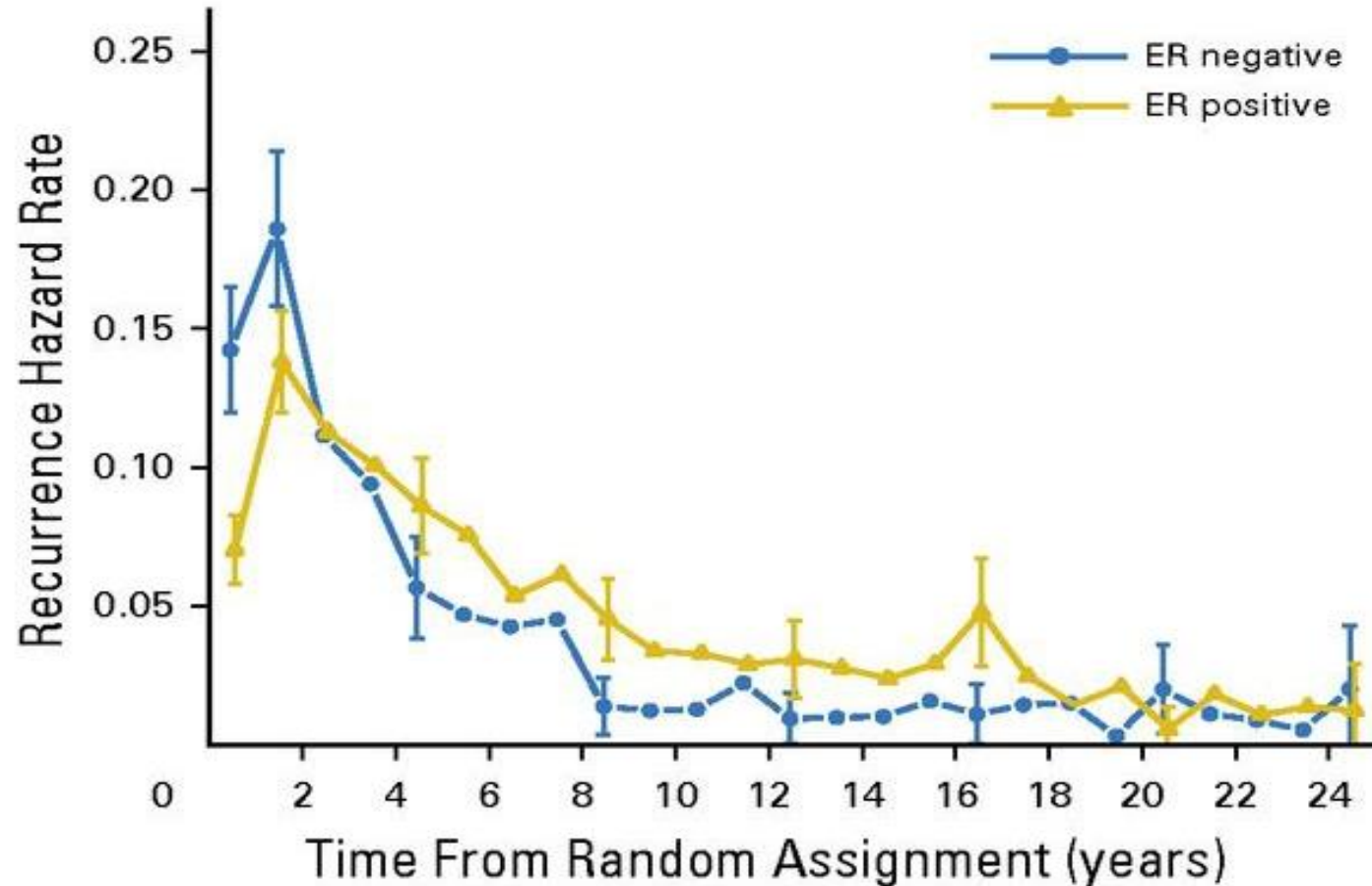
- I. **Pedersen RN, Öztürk B, Mellemkjær L, Friis S, Tramm T, Nørgaard M, Cronin-Fenton D. Validation of an Algorithm to Ascertain Late Breast Cancer Recurrence Using Danish Medical Registries. *Clin Epidemiol.* 2020;12:1083-1093. <https://doi.org/10.2147/CLEP.S269962>**

- II. **Pedersen RN, Esen BÖ, Mellemkjær L, Christiansen P, Ejlersen B, Lash TL, Nørgaard M, Cronin-Fenton DP. The incidence of breast cancer recurrence 10-32 years after primary diagnosis. 2021, *JNCI: Journal of the National Cancer Institute*, 2021; djab202, <https://doi.org/10.1093/jnci/djab202>**

- III. **Pedersen RN, Mellemkjær L, Ejlersen B, Nørgaard M, Cronin-Fenton DP. Mortality after late breast cancer recurrence in Denmark. 2022, *JCO: Journal of Clinical Oncology* [ACCEPTERET].**

- IV. **Pedersen RN, Mailhac A, Mellemkjær L, Friis S, Ejlersen B, Ahern TP, Nørgaard M, Cronin-Fenton DP. Statins and breast cancer recurrence: A Danish nationwide cohort study with up to 23 years of follow-up.**

BRYSTKRÆFT RECIDIV



No. at risk

—	1,148	657	517	438	373	314	175
—	1,808	1,159	828	635	501	363	192

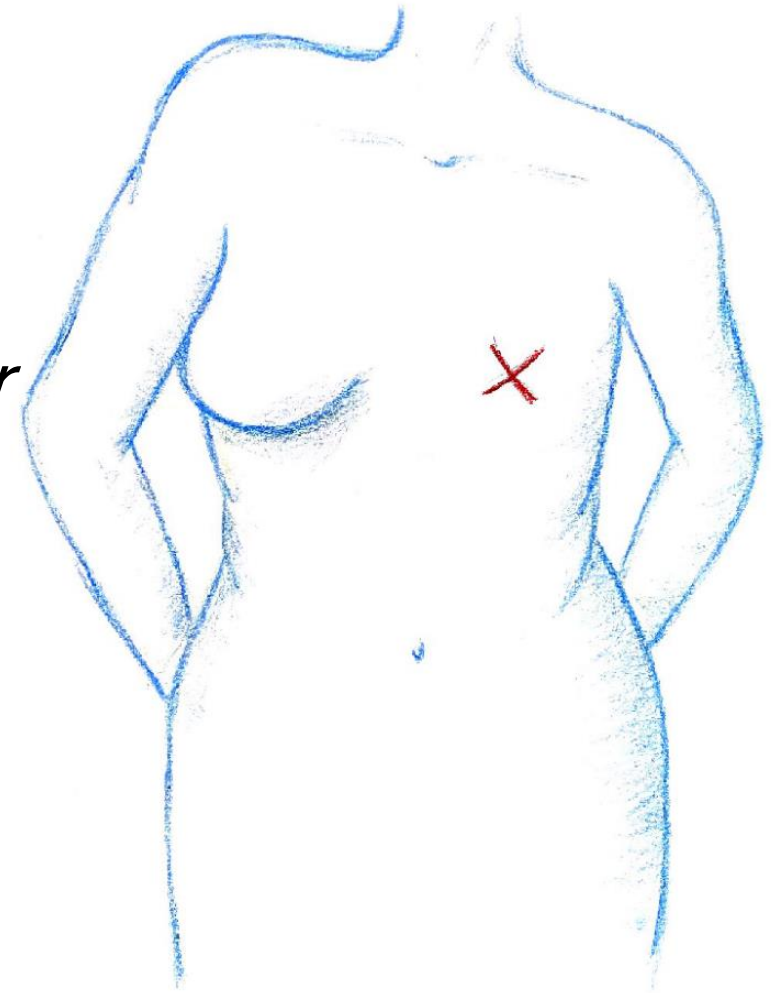
Colleoni M, Sun Z, Price KN, et al. Annual Hazard Rates of Recurrence for Breast Cancer During 24 Years of Follow-Up: Results From the International Breast Cancer Study Group Trials I to V. *J Clin Oncol.* 2016;34(9):927-935. doi:10.1200/JCO.2015.62.3504

FORMÅL FOR AFHANDLINGEN

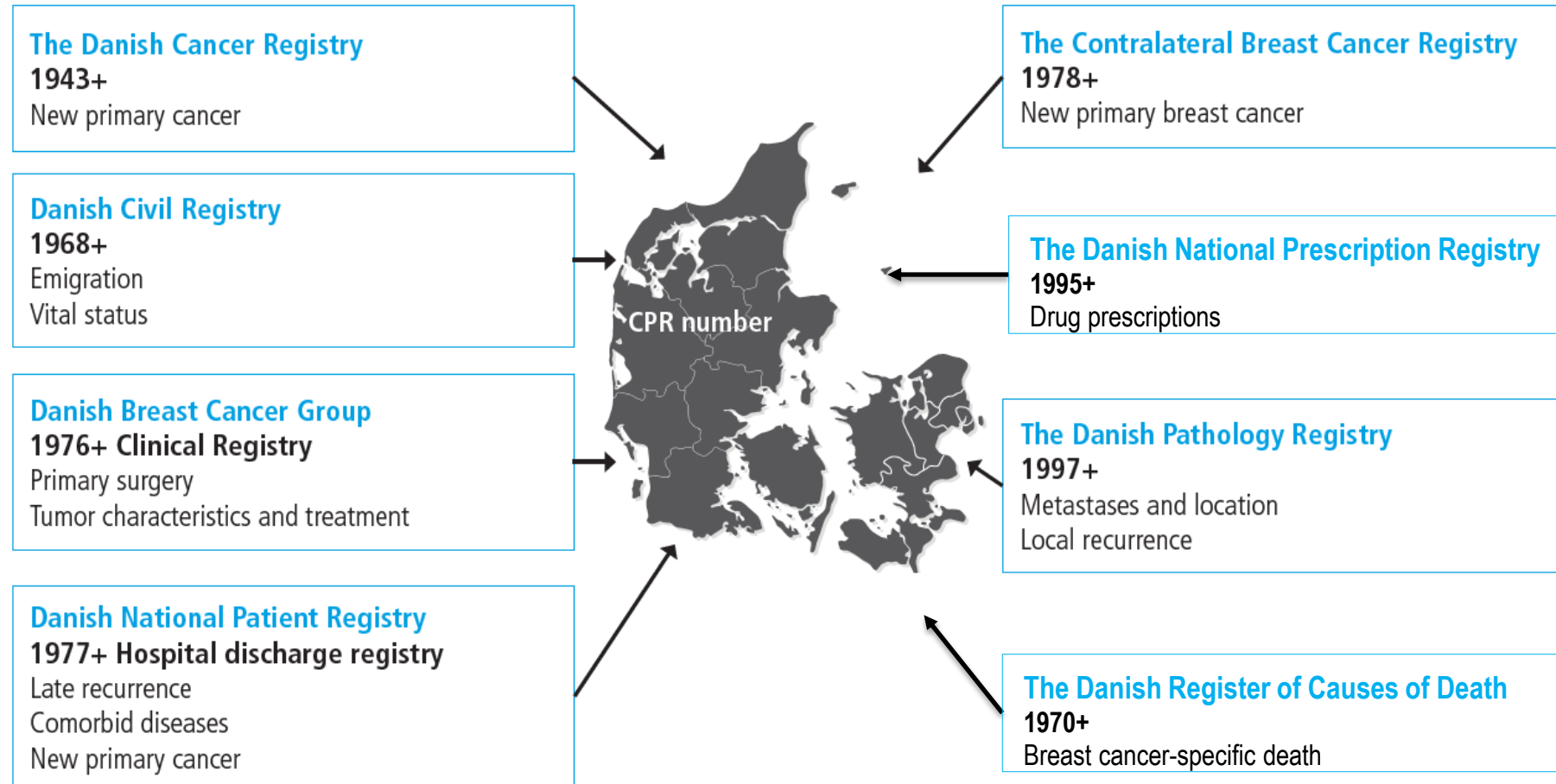
At opnå viden omkring

sent brystkræft recidiv i

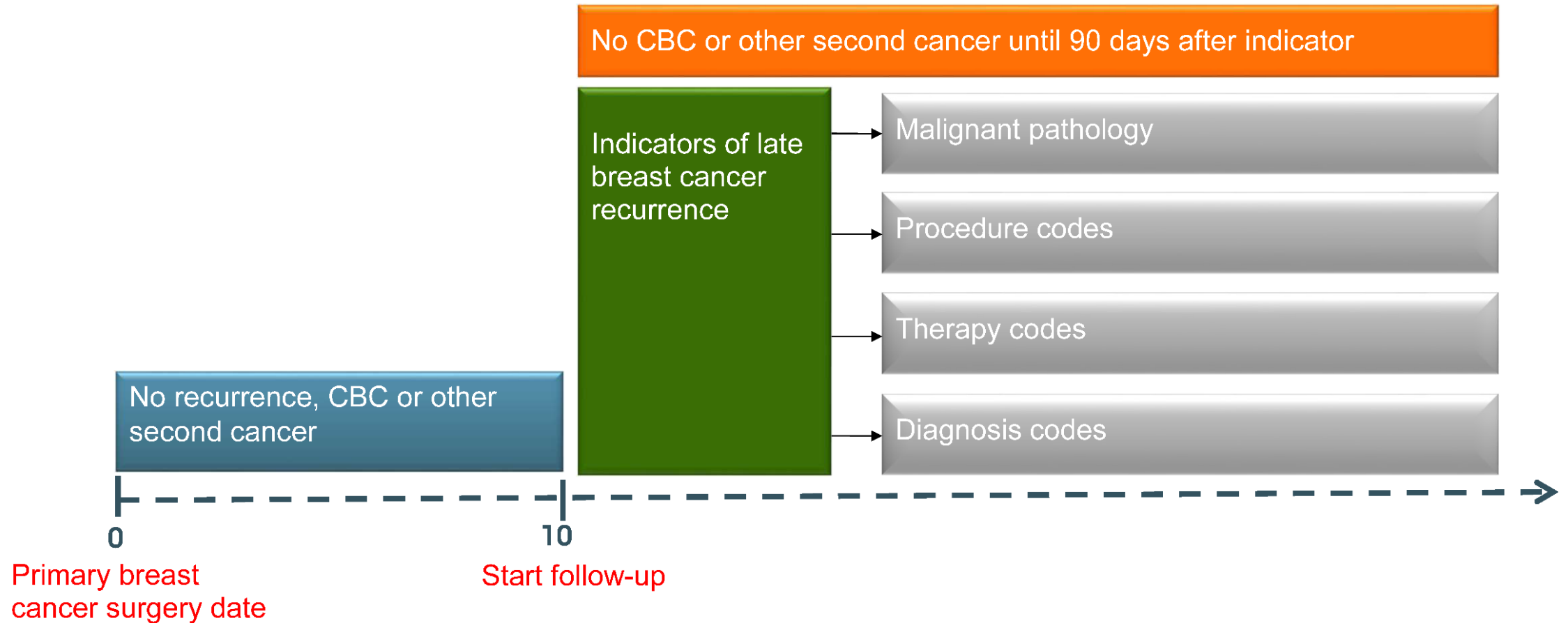
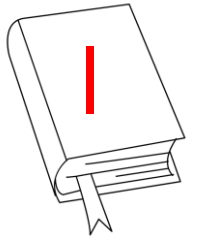
Danmark – defineret som *recidiv ≥ 10 år efter den primære diagnose* – med fokus på incidens, prognose og potentielle risiko- og forebyggende faktorer.



DATA

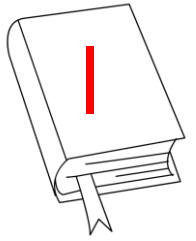


SENT RECIDIV ALGORITME



Figur fra Pedersen RN, et al. Validation of an Algorithm to Ascertain Late Breast Cancer Recurrence Using Danish Medical Registries. *Clin Epidemiol.* 2020;12:1083-1093.⁹⁷ Original publisher Dove Medical Press. Abbreviations: CBC, contralateral breast cancer

RESULTATER-VVALIDERING



Clinical Epidemiology

Dovepress

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ORIGINAL RESEARCH

Validation of an Algorithm to Ascertain Late Breast Cancer Recurrence Using Danish Medical Registries

This article was published in the following Dove Press journal:
Clinical Epidemiology

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Purpose: About 70% of women with breast cancer survive at least 10 years after diagnosis. We constructed an algorithm to ascertain late breast cancer recurrence—which we define as breast cancer that recurs 10 years or more after primary diagnosis (excluding contralateral breast cancers)—using Danish nationwide medical registries. We used clinical information recorded in medical records as a reference standard.

Methods: Using the Danish Breast Cancer Group clinical database, we ascertained data on 21,134 women who survived recurrence-free 10 years or more after incident stage I–III breast cancer diagnosed in 1987–2004. We used a combination of Danish registries to construct the algorithm—the Danish National Patient Registry for information on diagnostic, therapeutic and procedural codes; and cancer diagnoses from the Danish Pathology Registry, the Danish Cancer Registry and the Contralateral Breast Cancer database. To estimate the positive predictive value (PPV), we selected 105 patients who, according to our algorithm, had late recurrence diagnosed at Aarhus University Hospital. To estimate the sensitivity, specificity and negative predictive value (NPV), we selected 114 patients diagnosed with primary breast cancer at Aalborg University Hospital. We abstracted clinical information on late recurrence for patients with medical record-confirmed late recurrence at Aarhus University Hospital.

Results: Our algorithm had a PPV of late recurrence of 85.7% (95% CI: 77.5–91.3%), a sensitivity of 100.0% (95% CI, 39.8–100.0%), a specificity of 97.3 (95% CI, 92.2–99.4) and a NPV of 100% (95% CI, 96.6–100.0%).

Conclusion: Our algorithm for late recurrence showed a moderate to high PPV and high sensitivity, specificity and negative predictive value. The algorithm could be an important tool for future studies of late breast cancer recurrence.

Keywords: algorithm, late breast cancer recurrence, breast cancer neoplasm, PPV, sensitivity

Introduction

In 2018, about 2.1 million women were diagnosed with breast cancer worldwide, accounting for 1 in 4 cancer cases among women.¹ The aging population and the improvements in diagnosis and treatment have increased the number of breast cancer (BC) survivors.^{2–5} Today, close to 70% can expect to live for at least ten years after primary diagnosis and treatment.⁶ Therefore, it is necessary to extend the focus to identify patients at risk of late breast cancer recurrence, which we define as breast cancer recurrence 10 years or more after the primary breast cancer diagnosis.

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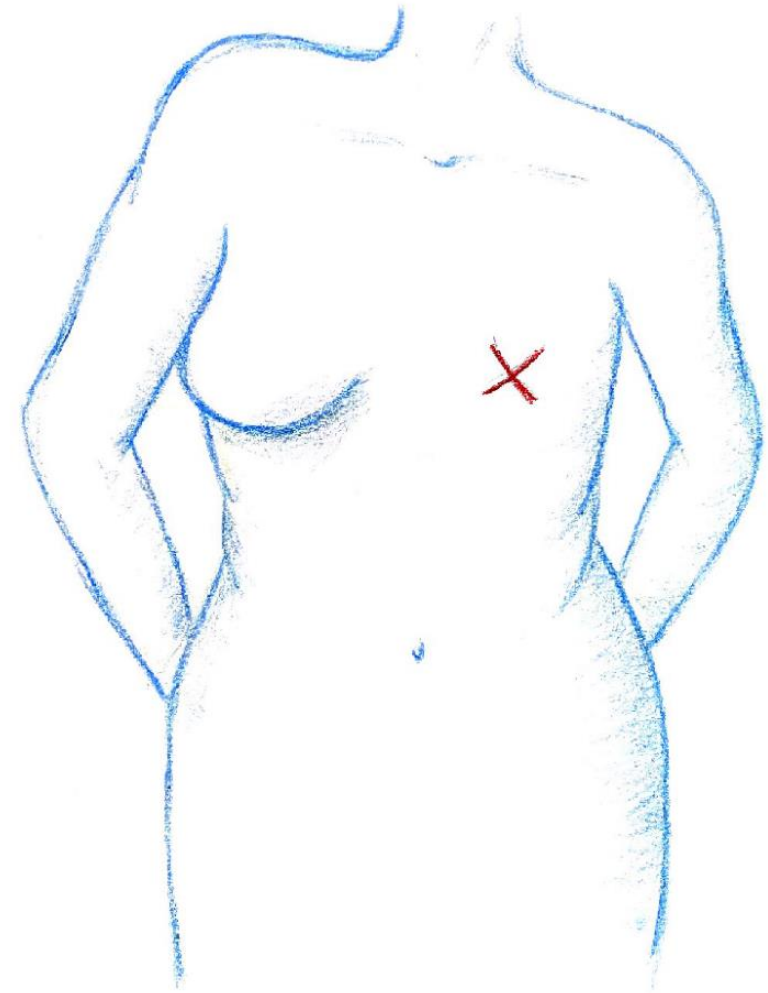
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<https://doi.org/10.1155/2021/3281983>

Clinical Epidemiology 2020:12 | 1083–1093 | 1083
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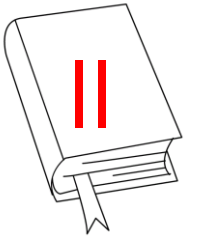
- PPV= 86% (95% CI; 77%-91%).
- PPV= 90% hvis CBC var inkluderet.
- Sensitivitet= 100% (95% CI; 40%-100%).
- Specificitet=97% (95% CI; 92%-99%).
- NPV= 100% (97%-100%).

STUDIE II

At opnå viden omkring
sent brystkræft recidiv i Danmark – defineret
som *recidiv* ≥ 10 år efter den primære
diagnose – med fokus på **incidens**,
prognose og potentielle **risiko**- og
forebyggende faktorer.



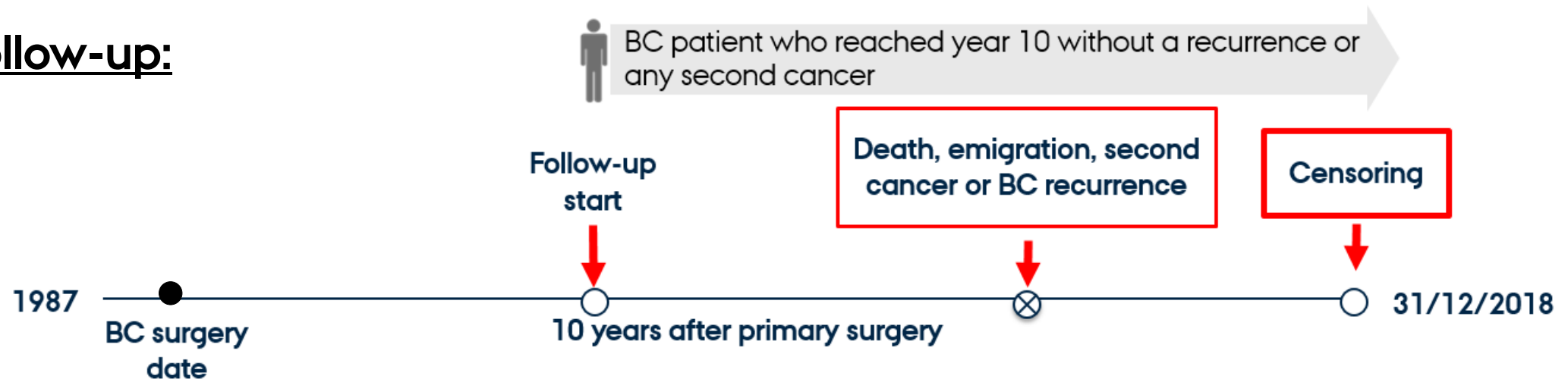
STATISTISKE ANALYSER



Studie design: Kohorte studie

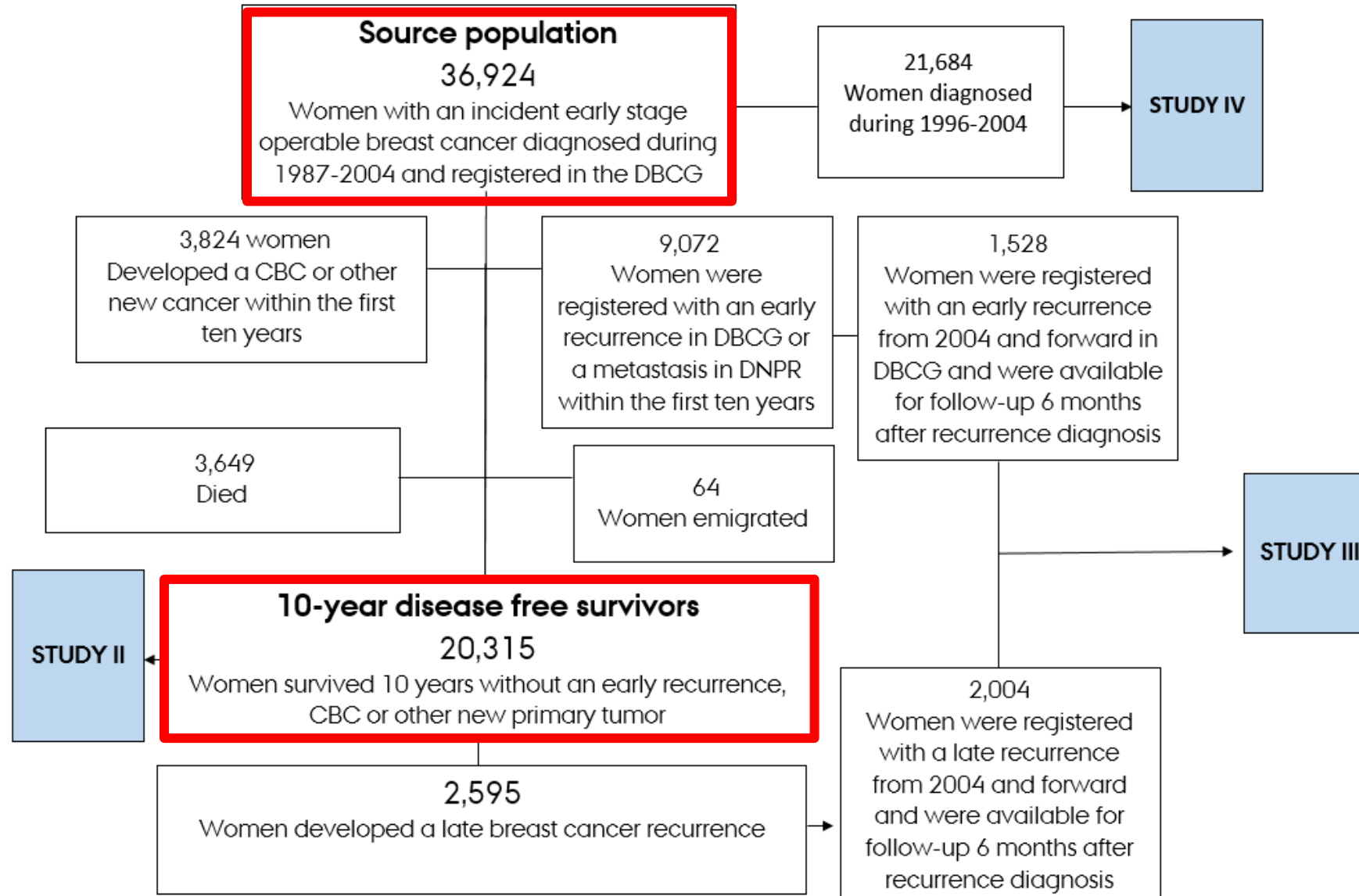
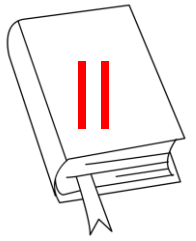
Eksponering: Primær karakteristika på diagnosetidspunktet fra DBCG

Follow-up:

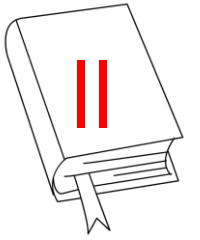


Analyser: Incidens rater (IRs) for sent recidiv, stratificerede kumulerede incidenser, stratificerede Cox regression modeller, sensitivitetsanalyser

RESULTATER

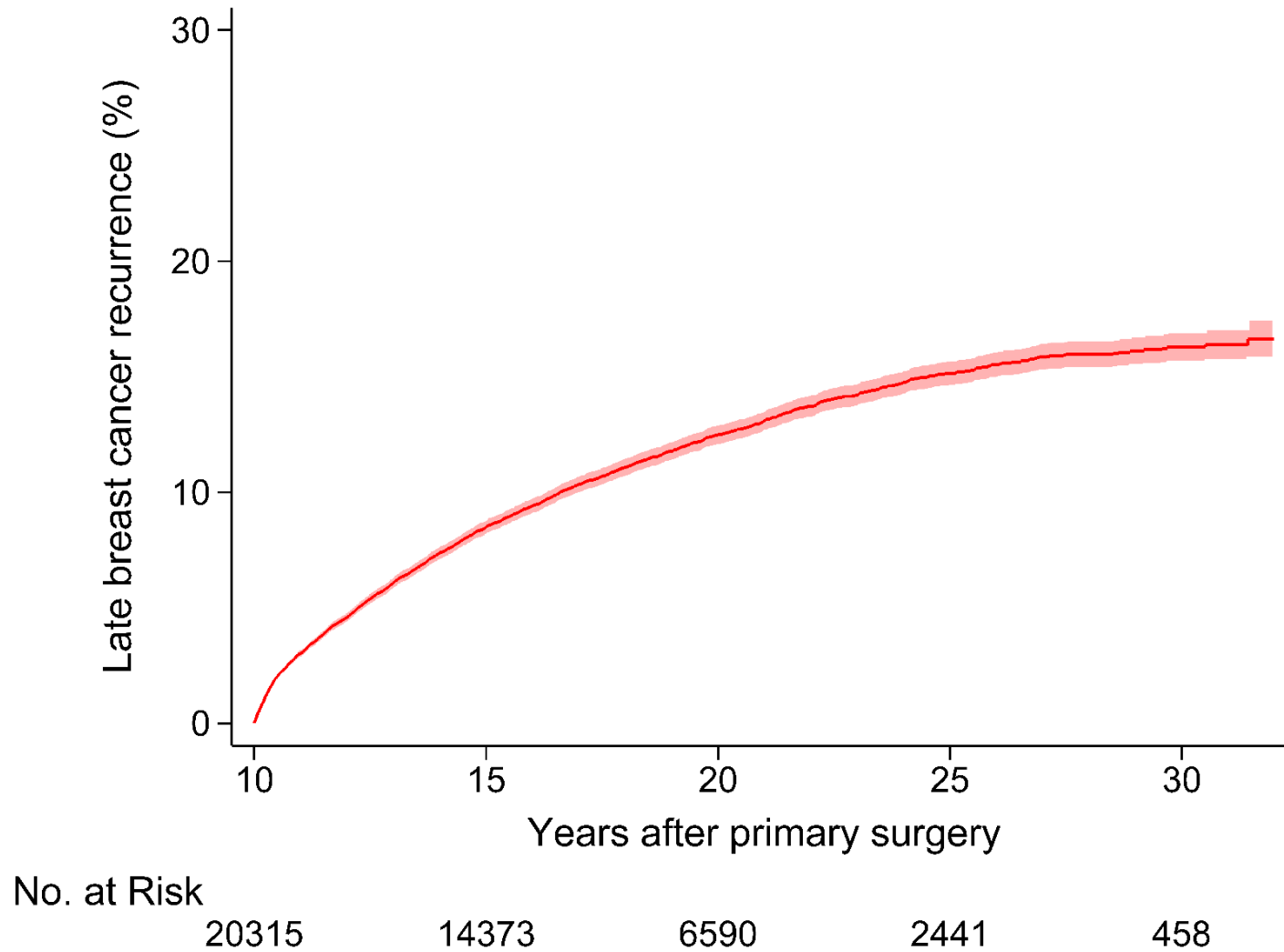
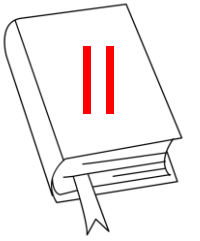


RESULTATER



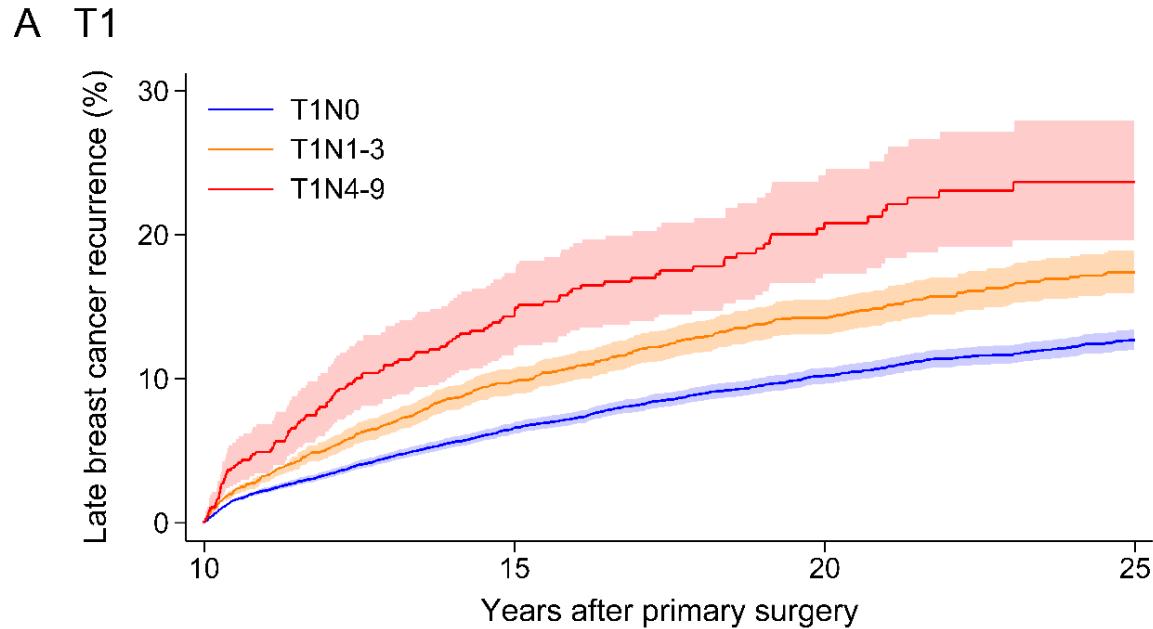
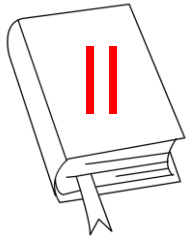
- 167,091 person-år.
- Median follow-up: 7 år (*i.e.*, 17 år efter den primære diagnose)
- 2,595 udviklede et sent recidiv
- IR: 15.5 (95% CI, 14.9-16.1) per 1,000 person-år.

RESULTATER

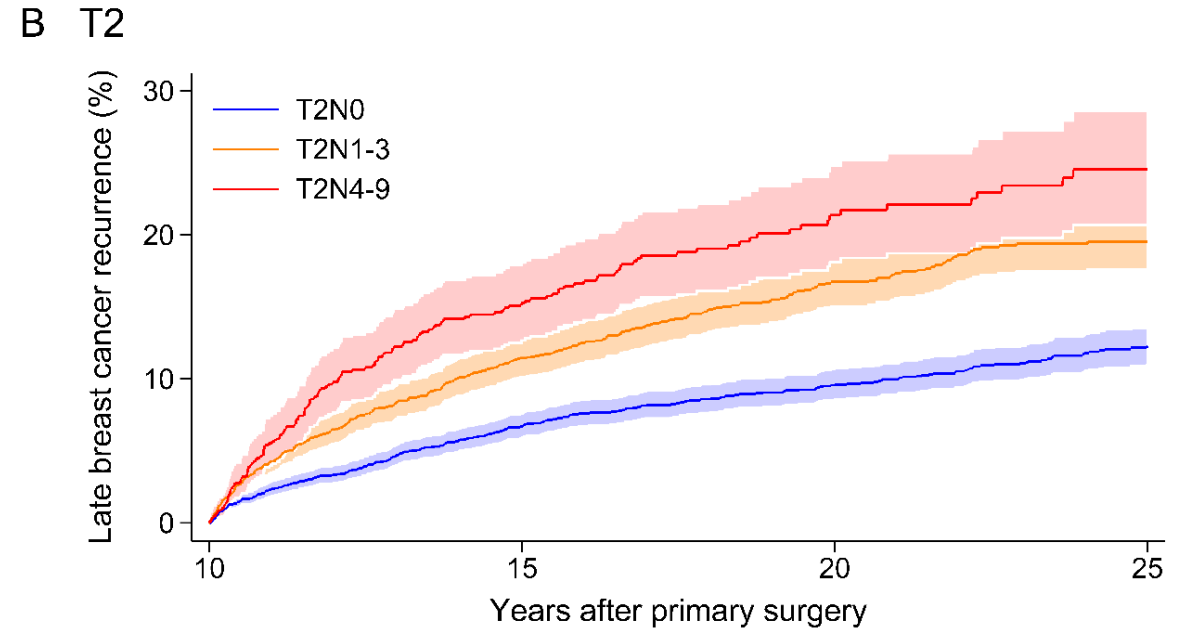


Figur fra Pedersen RN et al. The incidence of breast cancer recurrence 10-32 years after primary diagnosis. 2021, *JNCI: Journal of the National Cancer Institute*, 2021; djab202, <https://doi.org/10.1093/jnci/djab202>

RESULTATER



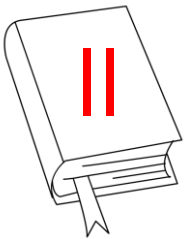
No. at Risk		10	15	20	25
T1N0	9381	6898	3353	1226	
T1N1-3	3310	2240	908	320	
T1N4-9	547	345	129	46	



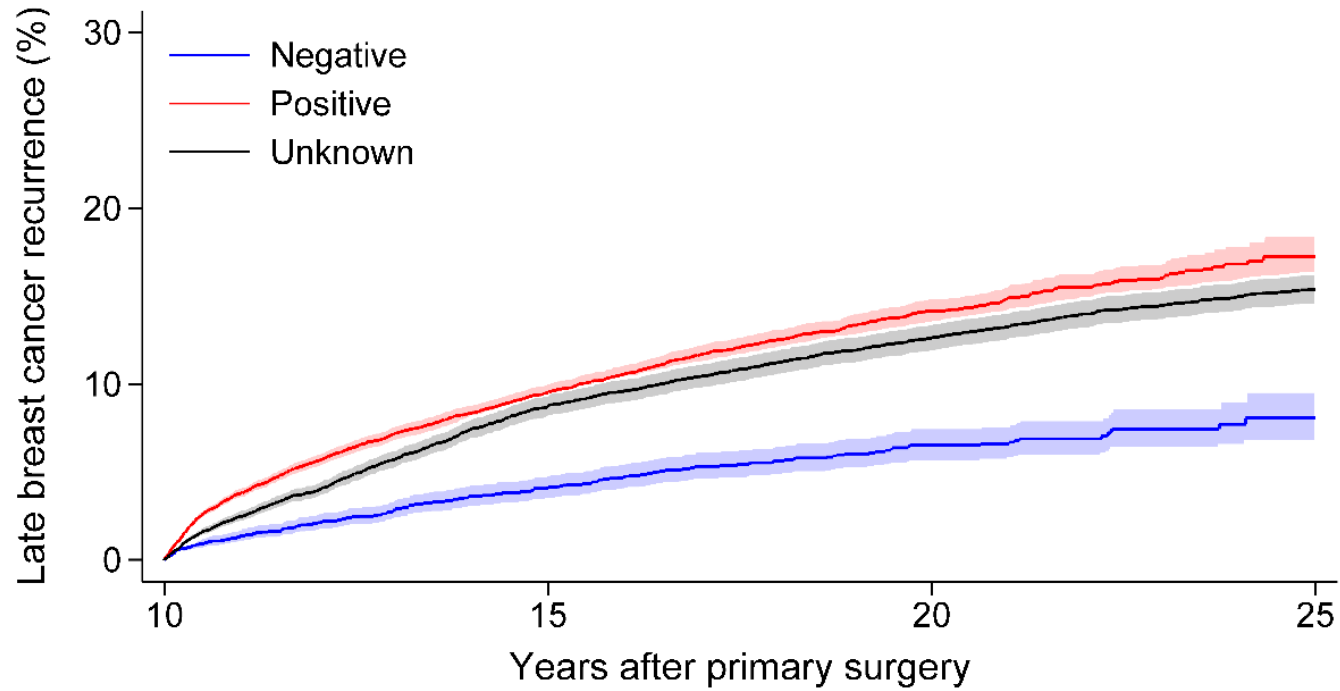
No. at Risk		10	15	20	25
T2N0	3216	2312	1092	420	
T2N1-3	2098	1433	591	215	
T2N4-9	685	420	144	52	

Figure fra Pedersen RN et al. The incidence of breast cancer recurrence 10-32 years after primary diagnosis. 2021, *JNCI: Journal of the National Cancer Institute*, 2021; djab202, <https://doi.org/10.1093/jnci/djab202>

RESULTATER



D Estrogen receptor status

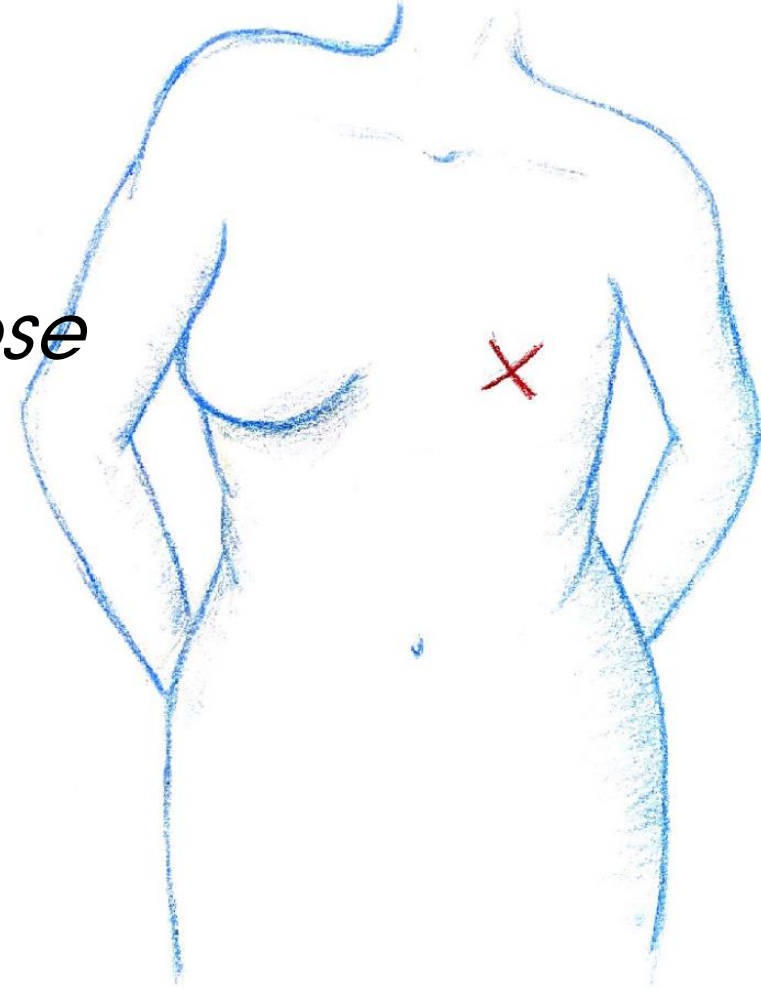


No. at Risk				
Negative	2982	2275	889	72
Positive	10963	7205	2007	84
Unknown	6370	4893	3694	2285

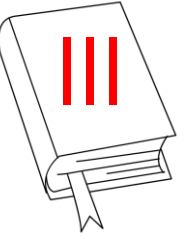
Figur fra Pedersen RN et al. The incidence of breast cancer recurrence 10-32 years after primary diagnosis. 2021, *JNCI: Journal of the National Cancer Institute*, 2021; djab202, <https://doi.org/10.1093/jnci/djab202>

STUDIE III

At opnå viden omkring
sent brystkræft recidiv i Danmark – defineret
som *recidiv ≥ 10 år efter den primære diagnose*
– med fokus på incidens, **prognose** og
potentielle risiko- og forebyggende faktorer.



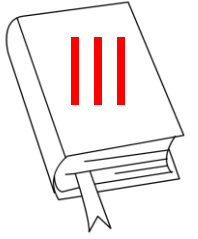
STUDIE POPULATION



Alle kvinder diagnosticeret med brystkræft mellem 1987 og 2004
som:

- Udviklede tidlig (indenfor de første 10 år) eller sen recidiv mellem 2004 og 2018.
- Og som var I live 6 måneder efter brystkræft recidiv datoen.

STATISTISKE ANALYSER



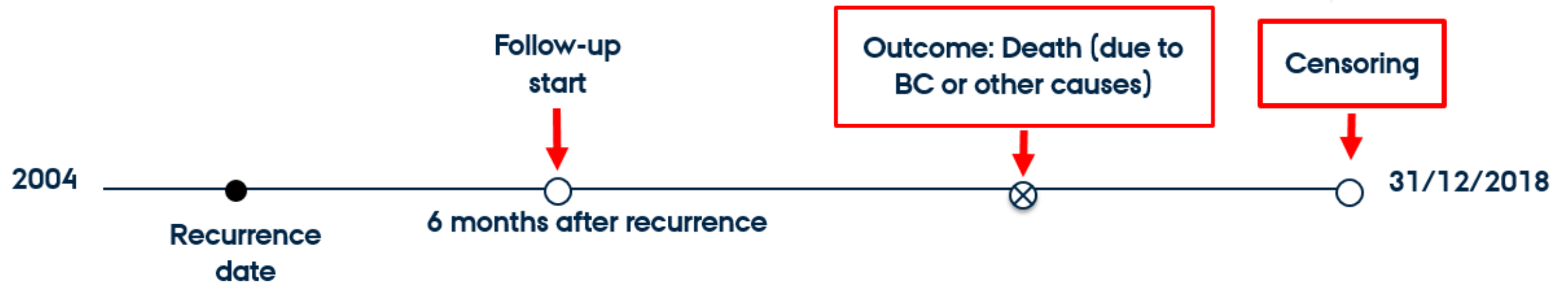
Studie design: kohorte studie

Eksponering: tumor, behandling og patient karakteristika på tidspunktet for den primære diagnose og for tidspunktet for recidiv

Follow-up:

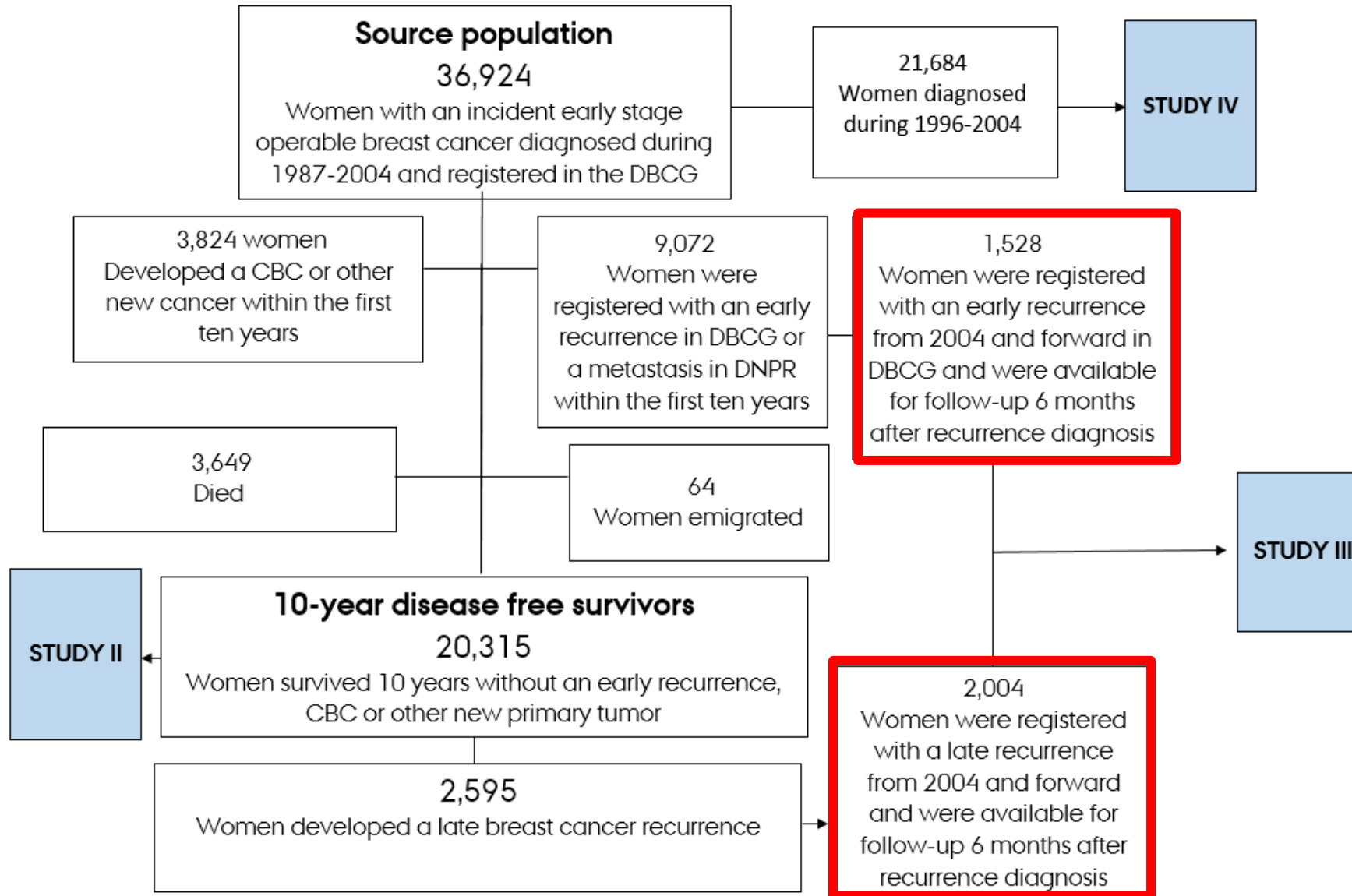
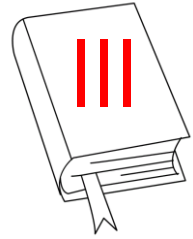


BC patient who developed a recurrence and were alive 6 months after the recurrence date

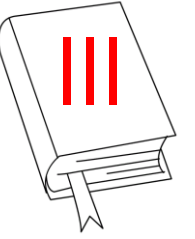


Analyser: Mortalitetens rater, kumuleret mortalitet, Cox regression modeller.

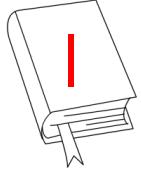
RESULTS



RESULTATER – TIDLIG VERSUS SENT

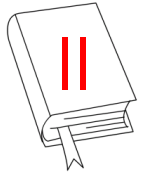


KONKLUSION



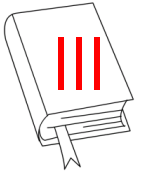
Validering

- Vi udviklede en sen brystkræftrecidiv algoritme med **moderate PPV og høj NPV, sensitivitet og specificitet** – hvilket kan være brugbar i fremtidige studier.



Incidens

- Vi fandt at **recidiv af brystkræft kan ses lang tid efter den primære brystkræft diagnose** og med højest incidens blandt patienter med en stor ER+ tumor med lymfeknude involvering.



ACKNOWLEDGEMENTS

Kollegaer, familie og venner

Fonde: Kræftens Bekæmpelse - KNÆK CANCER R147-A10100 (DCF), Aarhus Universitet (RNP), The International Society for Pharmacoepidemiology (ICPE)(Travel scholarship) (RNP).

Samarbejdspartnere: Buket Öztürk Esen, Søren Friis, Trine Tramm, Peer Christiansen, Bent Ejlersen, Timothy Lash, Thomas Ahern, Aurelie Mailhac, Anders Kjærsgaard.

Vejledere: Deirdre Cronin Fenton (hovedvejleder), Mette Nørgaard, Lene Mellemkjær.



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