

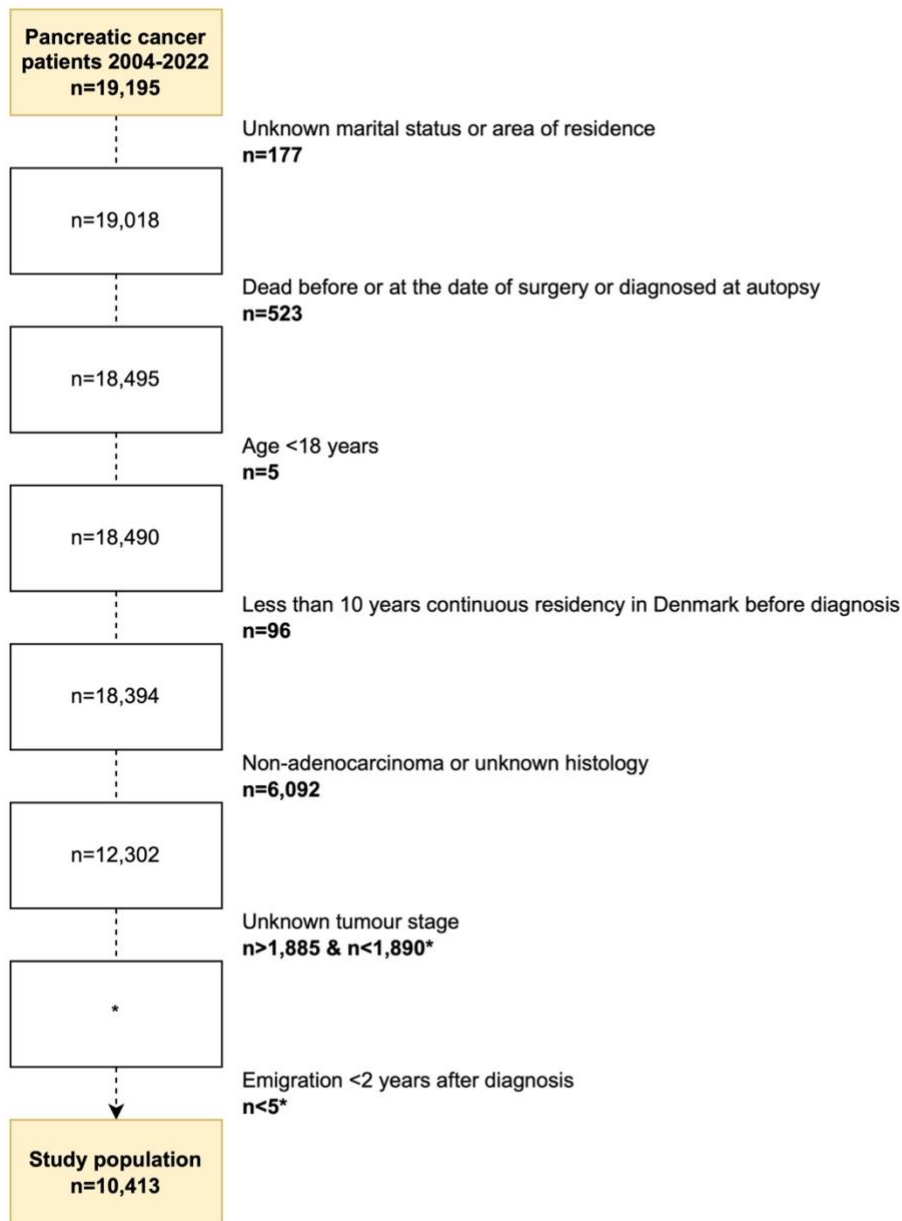
Supplementary Table 1. Distribution and performance of comorbidity scores when excluding malignant diagnoses from the comorbidity indices.

Comorbidity index	Percentiles							C-statistic (95% CI)
	1st	10th	25th	50th	75th	90th	99th	
Basis models								
Model 1: Age, sex, year of diagnosis	-	-	-	-	-	-	-	0.64 (0.63-0.65)
Model 2: As model 1 + marital status and area of residence	-	-	-	-	-	-	-	0.65 (0.64-0.66)
Model 3: As model 2 + tumour stage	-	-	-	-	-	-	-	0.82 (0.81-0.83)
Basis model 3 + Charlson comorbidity index score								
1-year lookback	0	0	0	0	0	1	4	0.82 (0.81-0.83)
5-year lookback	0	0	0	0	1	2	5	0.82 (0.81-0.83)
10-year lookback	0	0	0	0	1	2	6	0.82 (0.81-0.83)
Basis model 3 + Elixhauser comorbidity index score								
1-year lookback	0	0	0	0	1	2	4	0.82 (0.81-0.83)
5-year lookback	0	0	0	1	2	3	6	0.82 (0.81-0.83)
10-year lookback	0	0	0	1	2	3	7	0.82 (0.81-0.83)
Basis model 3 + Van Walraven comorbidity index score								
1-year lookback	-3	0	0	0	0	5	14	0.82 (0.81-0.83)
5-year lookback	-4	0	0	0	2	6	16	0.82 (0.81-0.83)
10-year lookback	-4	0	0	0	3	7	17	0.82 (0.81-0.83)
Basis model 3 + Gagne score	-1	0	0	0	0	1	3	0.82 (0.81-0.83)
Basis model 3 + Nordic multimorbidity score	-3	0	1	4	10	16	33	0.83 (0.82-0.84)

Supplementary Table 2. Descriptive characteristics of 2,032 Danish patients operated for pancreatic adenocarcinoma during 2004-2022.

	N (%)
Total	2,032
Age, median (IQR)	69 (62-74)
Age group	
<60 years	456 (22.4%)
61-70 years	756 (37.2%)
71-80 years	756 (37.2%)
>80 years	64 (3.1%)
Sex	
Men	1,098 (54.0%)
Women	934 (46.0%)
Marital status	
Married/registered partner	1,335 (65.7%)
Unmarried	147 (7.2%)
Divorced	314 (15.5%)
Widowed	236 (11.6%)
Area of residence	
Remote municipality	200 (9.8%)
Rural municipality	559 (27.5%)
Regional municipality	331 (16.3%)
Urban/metropolitan municipality	942 (46.4%)
Calendar period of diagnosis	
2004-2008	204 (10.0%)
2009-2013	438 (21.6%)
2014-2018	696 (34.3%)
2019-2022	694 (34.2%)
Tumor location	
Head	1,494 (73.5%)
Body	131 (6.4%)
Tail	136 (6.7%)
Other/multiple	44 (2.2%)
Unknown	227 (11.2%)
AJCC stage	
Ia	108 (5.3%)
Ib	211 (10.4%)
IIa	294 (14.5%)
IIb	1,310 (64.5%)
III	109 (5.4%)

Supplementary Figure 1. Flowchart of the study population.



* Numbers collapsed due to patient confidentiality

Supplementary Table 3. Distribution and performance of comorbidity scores stratified by tumour stage (stage I).

Comorbidity index	Percentiles							C-statistic (95% CI)
	1st	10th	25th	50th	75th	90th	99th	
Basis models								
Model 1: Age, sex, year of diagnosis	-	-	-	-	-	-	-	0.71 (0.66-0.76)
Model 2: As model 1 + marital status and area of residence	-	-	-	-	-	-	-	0.73 (0.68-0.76)
Basis model 2 + Charlson comorbidity index score								
1-year lookback	0	0	0	0	1	2	9	0.74 (0.69-0.78)
5-year lookback	0	0	0	1	2	3	9	0.74 (0.69-0.79)
10-year lookback	0	0	0	1	2	4	10	0.74 (0.69-0.79)
Basis model 2 + Elixhauser comorbidity index score								
1-year lookback	0	0	0	0	2	2	6	0.75 (0.70-0.79)
5-year lookback	0	0	0	1	2	3	7	0.74 (0.69-0.79)
10-year lookback	0	0	0	1	3	4	8	0.75 (0.70-0.79)
Basis model 2 + Van Walraven comorbidity index score								
1-year lookback	-3	0	0	0	4	8	21	0.74 (0.69-0.78)
5-year lookback	-4	0	0	0	5	11	21	0.74 (0.69-0.78)
10-year lookback	-4	0	0	0	5	12	26	0.74 (0.69-0.78)
Basis model 2 + Gagne score								
1-year lookback	-1	0	0	0	1	2	7	0.74 (0.70-0.81)
Basis model 2 + Nordic multimorbidity score								
1-year lookback	-4	-1	0	4	11	22	51	0.76 (0.72-0.81)

Supplementary Table 4. Distribution and performance of comorbidity scores stratified by tumour stage (stage II).

Comorbidity index	Percentiles							C-statistic
	1st	10th	25th	50th	75th	90th	99th	(95% CI)
Basis models								
Model 1: Age, sex, year of diagnosis	-	-	-	-	-	-	-	0.63 (0.61-0.66)
Model 2: As model 1 + marital status and area of residence	-	-	-	-	-	-	-	0.64 (0.61-0.66)
Basis model 2 + Charlson comorbidity index score								
1-year lookback	0	0	0	0	1	2	6	0.65 (0.63-0.68)
5-year lookback	0	0	0	0	1	3	8	0.65 (0.63-0.68)
10-year lookback	0	0	0	0	2	3	9	0.65 (0.62-0.67)
Basis model 2 + Elixhauser comorbidity index score								
1-year lookback	0	0	0	0	1	2	5	0.65 (0.63-0.68)
5-year lookback	0	0	0	1	2	3	6	0.65 (0.63-0.68)
10-year lookback	0	0	0	1	2	4	7	0.65 (0.63-0.68)
Basis model 2 + Van Walraven comorbidity index score								
1-year lookback	-3	0	0	0	2	6	21	0.64 (0.62-0.67)
5-year lookback	-4	0	0	0	4	8	21	0.64 (0.62-0.67)
10-year lookback	-4	0	0	0	4	10	21	0.64 (0.62-0.67)
Basis model 2 + Gagne score	-1	0	0	0	0	1	5	0.64 (0.62-0.67)
Basis model 2 + Nordic multimorbidity score	-3	0	0	3	8	16	39	0.66 (0.64-0.69)

Supplementary Table 5. Distribution and performance of comorbidity scores stratified by tumour stage (stage III).

Comorbidity index	Percentiles							C-statistic
	1st	10th	25th	50th	75th	90th	99th	(95% CI)
Basis models								
Model 1: Age, sex, year of diagnosis	-	-	-	-	-	-	-	0.64 (0.61-0.67)
Model 2: As model 1 + marital status and area of residence	-	-	-	-	-	-	-	0.65 (0.62-0.69)
Basis model 2 + Charlson comorbidity index score								
1-year lookback	0	0	0	0	1	2	6	0.66 (0.62-0.69)
5-year lookback	0	0	0	0	1	3	7	0.66 (0.63-0.69)
10-year lookback	0	0	0	0	2	3	8	0.67 (0.64-0.70)
Basis model 2 + Elixhauser comorbidity index score								
1-year lookback	0	0	0	0	1	2	5	0.66 (0.63-0.69)
5-year lookback	0	0	0	1	2	3	6	0.66 (0.63-0.69)
10-year lookback	0	0	0	1	2	3	7	0.67 (0.64-0.70)
Basis model 2 + Van Walraven comorbidity index score								
1-year lookback	-2	0	0	0	0	6	21	0.65 (0.62-0.69)
5-year lookback	-4	0	0	0	4	7	21	0.66 (0.62-0.69)
10-year lookback	-4	0	0	0	5	10	23	0.66 (0.63-0.69)
Basis model 2 + Gagne score	-1	0	0	0	1	2	5	0.65 (0.62-0.69)
Basis model 2 + Nordic multimorbidity score	-3	0	0	4	10	18	39	0.68 (0.65-0.71)

Supplementary Table 6. Distribution and performance of comorbidity scores stratified by tumour stage (stage IV).

Comorbidity index	Percentiles							C-statistic
	1st	10th	25th	50th	75th	90th	99th	(95% CI)
Basis models								
Model 1: Age, sex, year of diagnosis	-	-	-	-	-	-	-	0.66 (0.64-0.68)
Model 2: As model 1 + marital status and area of residence	-	-	-	-	-	-	-	0.67 (0.65-0.69)
Basis model 2 + Charlson comorbidity index score								
1-year lookback	0	0	0	0	1	2	8	0.67 (0.65-0.69)
5-year lookback	0	0	0	0	2	3	9	0.67 (0.65-0.69)
10-year lookback	0	0	0	0	2	4	9	0.67 (0.65-0.69)
Basis model 2 + Elixhauser comorbidity index score								
1-year lookback	0	0	0	0	1	2	4	0.67 (0.66-0.69)
5-year lookback	0	0	0	1	2	3	6	0.68 (0.66-0.69)
10-year lookback	0	0	0	1	2	4	7	0.68 (0.66-0.69)
Basis model 2 + Van Walraven comorbidity index score								
1-year lookback	-2	0	0	0	3	8	21	0.68 (0.66-0.69)
5-year lookback	-4	0	0	0	4	11	23	0.67 (0.65-0.69)
10-year lookback	-4	0	0	0	5	12	25	0.67 (0.65-0.69)
Basis model 2 + Gagne score	-1	0	0	0	1	2	6	0.67 (0.66-0.69)
Basis model 2 + Nordic multimorbidity score	-3	0	1	5	12	23	43	0.69 (0.66-0.69)