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Supplementary Methods to

A comparison of comorbidity indices and estimates of life expectancy for men with prostate cancer

Summary

This supplement contains details regarding our adaptation of the PCCI to ICD-10 for use in a Swedish setting.

Data from The National Patient Register was used to compute the CCI, PCCI, and MDCl using 10 years of lookback period. The National Patient Register is held by the Swedish National Board of Health and Welfare and contains information on all in-hospital care and out-patient specialist care (i.e. at hospital clinics, but not visits with family physicians) in Sweden with a nation-wide coverage of in-patient care since 1987 and specialist out-patient care since 2001.¹ Diagnoses were recorded according to the Swedish modification of ICD-10 (ICD-10-SE) during the period of this study (including a 10-year lookback period from the date of diagnosis). ICD-10-SE has few modifications compared to the original ICD-10 version. Coding accuracy is diagnosis-specific.²⁻⁴

ICD-10 codes in disease categories of the Charlson Comorbidity Index (CCI) were obtained from an adaption of the CCI to the Swedish setting.⁵ For the other disease categories in the PCCI⁶, that previously were defined by ICD-9 codes⁷, we instead created a similar list of ICD-10 codes. Codes that appeared both in the new categories of the PCCI and in the old CCI categories were removed from the old CCI categories (**Table S1**)

Table S1. Comorbidity indices included in the study

Method	Full Name	Data Source	Details	Additional Notes
CCI	Charlson Comorbidity Index	ICD-10 codes from The National Patient Register (10-year lookback)	Sum of weighted scores for a predefined set of diagnoses (presence: Yes/No)	Original index not prostate cancer-specific; many men with prostate cancer have CCI = 0
PCCI	Prostate Cancer Comorbidity Index	ICD-10 codes (adapted from original ICD-9 version) from The National Patient Register (10-year lookback)	Modified version of CCI tailored for men with prostate cancer	Designed to improve CCI's discrimination in this patient group
AAPCCI	Age-Adjusted PCCI	ICD-10 codes + age	PCCI score + 1 point for every 6 years of age above 60	Used to estimate life expectancy: 0–4 = >10 years, 5–9 = 5–10 years, ≥10 = <5 years
MDCl	Multidimensional Diagnosis-based Comorbidity Index	ICD-10 codes from The National Patient Register (10-year lookback)	Incorporates presence, recency, frequency, and hospital stay duration of diagnosis codes	Developed specifically to improve prediction of death beyond CCI
DCI	Drug Comorbidity Index	ATC codes (5-digit) from The Prescribed Drug Register (365-day lookback)	Score based on presence of specific drug prescriptions filled in the prior year	Reflects comorbid conditions through drug fillings

PCBase Method	PCBase Method of Estimation of Life Expectancy	Combination of MDCl, DCI, and age	For use in men with prostate cancer and computed based on register data	
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Codes for PCCI

Here we list the ICD-10 codes in our adaption of the PCCI. Category names in **bold** indicates those also present in the original CCI.

Moderate-severe liver disease

ICD-10 codes were obtained from “Moderate or severe liver disease” in the adaption of the CCI to the Swedish setting⁵:

I859, I982

I850 and I983 were removed since they were included in the new category “Gastrointestinal bleed”.

Metastatic solid tumor

ICD-10 codes were obtained from “Metastatic cancer” in the adaption of the CCI to the Swedish setting⁵:

C77, C78, C79, C80

If prostate cancer (C61) was present, then metastases were disregarded.

Lymphoma

ICD-10 codes corresponding to lymphoma were obtained from “Any malignancy including leukemia and lymphoma” in the adaption of the CCI to the Swedish setting⁵:

C81, C82, C83, C84, C85, C86, C88, C89

Leukemia

ICD-10 codes corresponding to leukemia were obtained from “Any malignancy including leukemia and lymphoma” in the adaption of the CCI to the Swedish setting⁵:

C91, C92, C93, C94, C95

Moderate-severe COPD (Chronic obstructive pulmonary disease)

ICD-10 codes were obtained from “Chronic obstructive pulmonary disease (COPD)” in the adaption of the CCI to the Swedish setting⁵:

J43, J44

Moderate-severe renal disease

ICD-10 codes were obtained from “Moderate or severe kidney disease” in the adaption of the CCI to the Swedish setting⁵:

I120, I131, N032, N033, N034, N035, N036, N037, N052, N053, N054, N055, N056, N057, N11, N18, N19, N250, Q611, Q612, Q613, Q614, Z49, Z940, Z992

except N181, N182 (included in mild renal disease)

Dementia

ICD-10 codes were obtained from “Dementia” in the adaption of the CCI to the Swedish setting⁵:

F00, F01, F02, F03, F051, G30, G311, G319

Hemiplegia

ICD-10 codes were obtained from “Hemiplegia, tetraplegia” in the adaption of the CCI to the Swedish setting⁵:

G114, G80, G81, G82, G830, G831, G832, G833, G838

Congestive heart failure

ICD-10 codes were obtained from “Congestive heart failure” in the adaption of the CCI to the Swedish setting⁵:

I110, I130, I132, I255, I420, I426, I427, I428, I429, I43, I50

Mild liver disease

ICD-10 codes were obtained from “Mild liver disease” in the adaption of the CCI to the Swedish setting⁵:

B15, B16, B17, B18, B19, K703, K709, K73, K746, K754

Peripheral vascular disease

ICD-10 codes were obtained from “Peripheral vascular disease” in the adaption of the CCI to the Swedish setting⁵:

I70, I71, I731, I738, I739, I771, I790, I792, K55

Other neurological disease

The following ICD-10 codes were included:

R25, R26, R27, R28, R29, R40, R41, R47, R48,

G00-G99

except G114, G30, G311, G319, G45, G80, G81, G82, G830, G831, G832, G833, G838
(included in cvd, hemiplegia or dementia)

F00-F09

except F00, F01, F02, F03, F051(included in dementia)

Mild renal disease

The following ICD-10 codes were included:

N181, N182

Angina

The following ICD-10 codes were included:

I20

Mild COPD

ICD-10 codes were obtained from “Other chronic pulmonary disease” in the adaption of the CCI to the Swedish setting⁵:

J45, J41, J42, J46, J47, J60, J61, J62, J63, J64, J65, J66, J67, J68, J69, J70

Arrhythmia

The following ICD-10 codes were included:

I44, I45, I46, I47, I48, I49, R00

Valve disease

The following ICD-10 codes were included:

I05, I06, I07, I08, I091, I33, I34, I35, I36, I37, I38, I39

Connective tissue disease

ICD-10 codes were obtained from “Rheumatic disease” in the adaption of the CCI to the Swedish setting⁵:

M05, M06, M123, M070, M071, M072, M073, M08, M13, M30, M313, M314, M315, M316, M32, M33, M34, M350, M351, M353, M45, M46

Gastrointestinal bleed

The following ICD-10 codes were included:

K250, K252, K254, K256, K260, K262, K264, K625, K266, K270, K272, K274, K276, K312, K920, K921, K922, I850, I860, I983

Inflammatory bowel disease

The following ICD-10 codes were included:

K50, K51, K52

Peptic ulcer disease

ICD-10 codes were obtained from “(Peptic) Ulcer disease” in the adaption of the CCI to the Swedish setting⁵:

K25, K26, K27, K28

except K250, K252, K254, K256, K260, K262, K264, K625, K266, K270, K272, K274, K276 (in gastrointestinal bleed)

Cerebrovascular disease

ICD-10 codes were obtained from “Cerebrovascular disease” in the adaption of the CCI to the Swedish setting⁵:

G45, I60, I61, I62, I63, I64, I67, I69

Any tumor

ICD-10 codes were obtained from “Any malignancy, including leukemia and lymphoma” except leukemia and lymphoma in the adaption of the CCI to the Swedish setting⁵:

C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10,
C11, C12, C13, C14, C15, C16, C17, C18, C19,
C20, C21, C22, C23, C24, C25, C26, C27, C28, C29,
C30, C31, C32, C33, C34, C35, C36, C37, C38, C39,
C40, C41, C42, C43, C44, C45, C46, C47, C48, C49,
C50, C51, C52, C53, C54, C55, C56, C57, C58, C59,
C60, C62, C63, C64, C65, C66, C67, C68, C69,
C70, C71, C72, C73, C74, C75, C76, C90, C96, C97

Prostate cancer (C61) was removed.

Diabetes with end organ damage

ICD-10 codes were obtained from “Diabetes with end organ damage” in the adaption of the CCI to the Swedish setting⁵:

E102, E103, E104, E105, E107, E112, E113, E114, E115, E116, E117, E122, E123, E124, E125, E126, E127, E132, E133, E134, E135, E136, E137, E142, E143, E144, E145, E146, E147

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