

Metabolisches Syndrome und Krebserkrankungen

MeCan- Projekt

Kooperation mit Schweden und Norwegen

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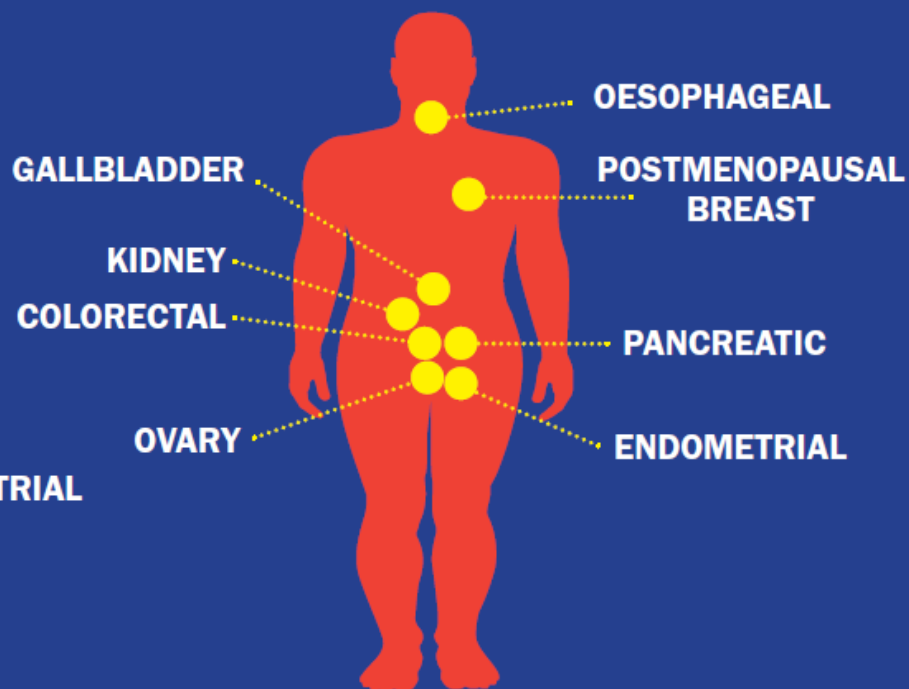
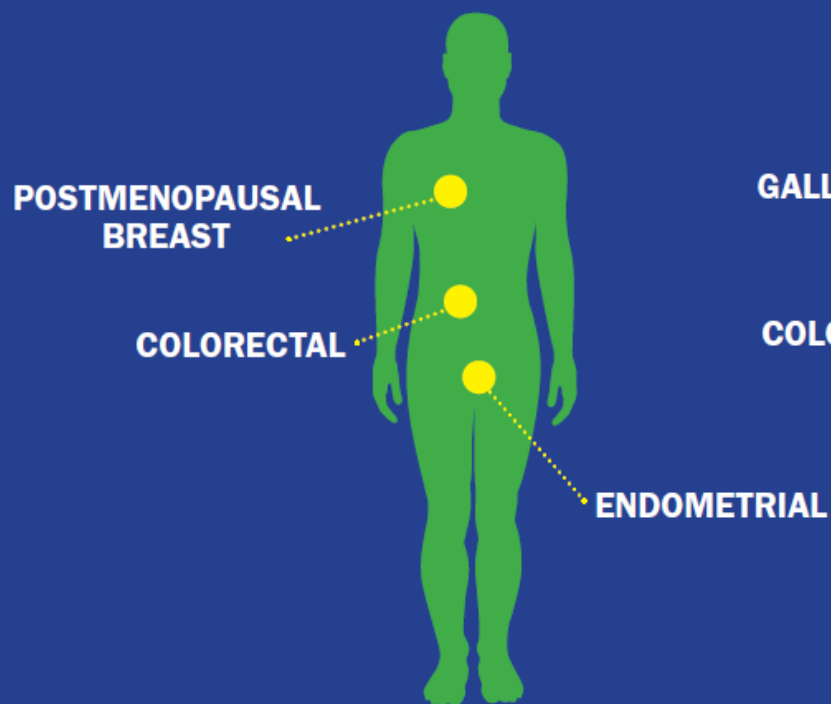
ONE BILLION

**ADULTS WORLDWIDE ARE
CURRENTLY OVERWEIGHT
AND A FURTHER 475
MILLION ARE OBESE.
COMBINED, THIS EXCEEDS
THE POPULATION OF CHINA**

THERE IS A STRONG LINK

between physical activity
and a **decreased risk** of
these cancers:

between body fatness and
an **increased risk** of these
cancers:




<http://me-can.se/>

Me-Can

Metabolic Syndrome and Cancer Project

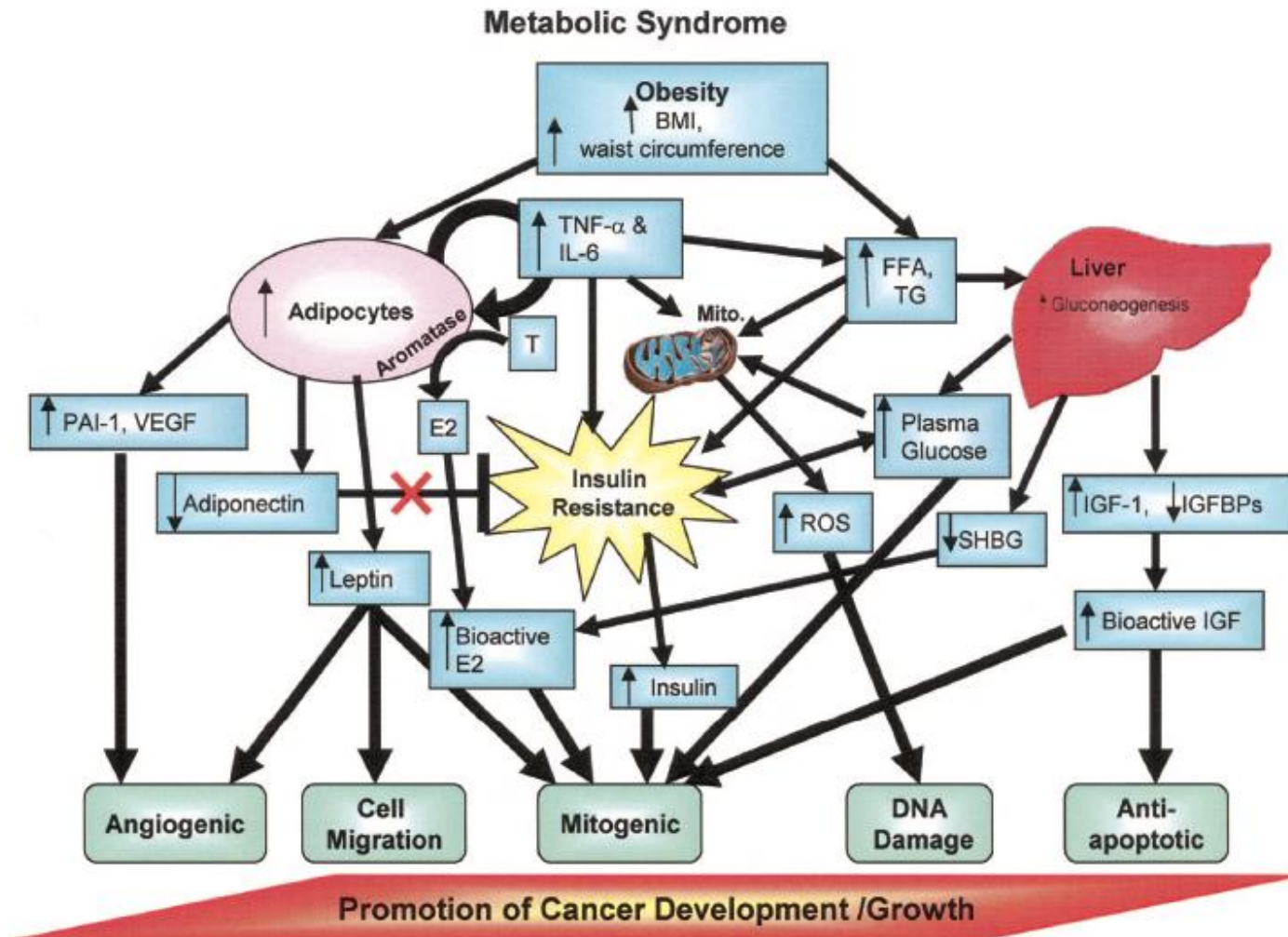
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Welcome to
Metabolic Syndrome and Cancer project

[Read more about Me-Can](#) 

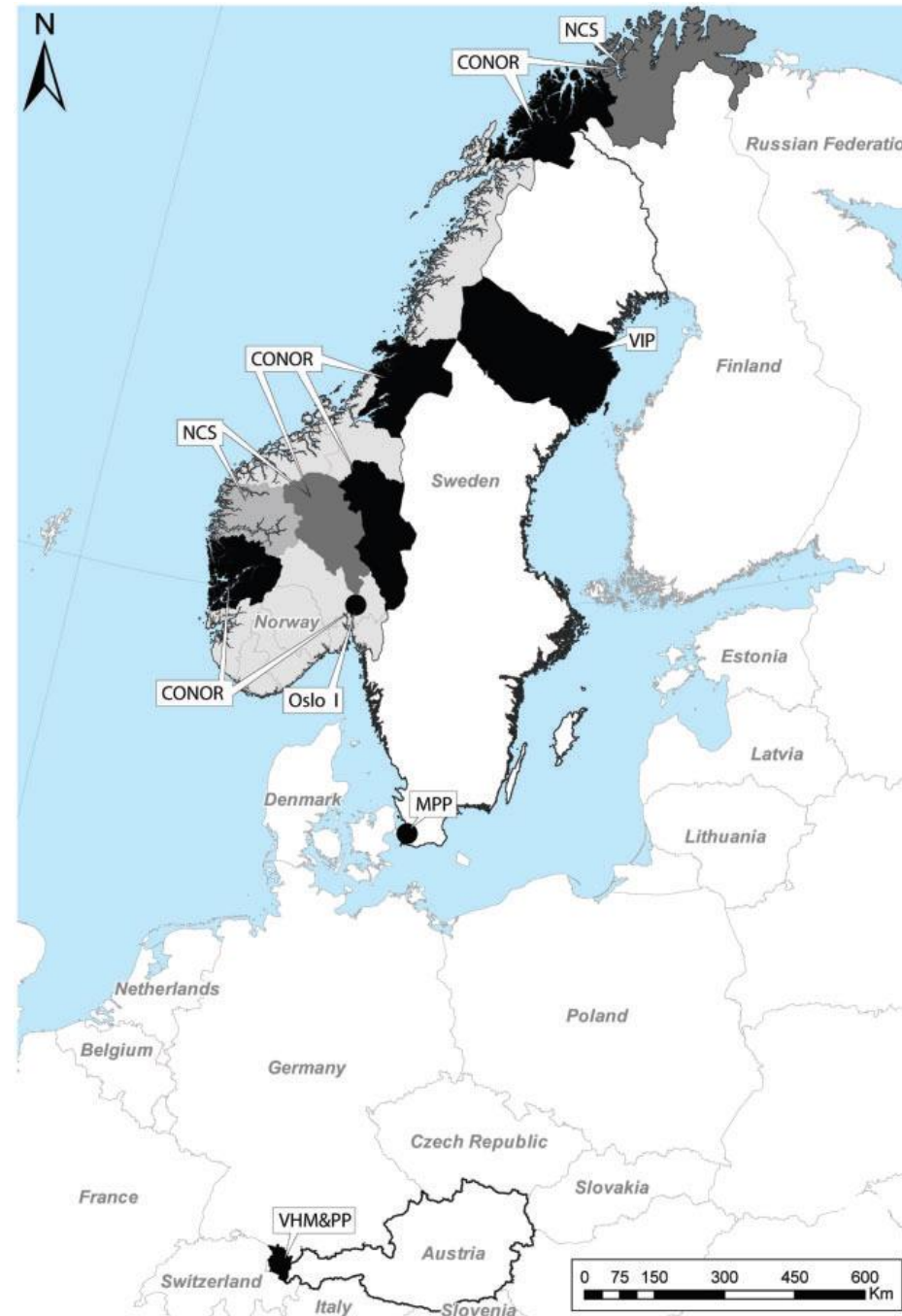


Pfade zwischen Metbolischem Syndrom und Krebserkrankungen



Studien Design

- Gepoolte Analyse
- (N= 578.000)
- prospektive Kohorten aus
Österreich
Norwegen
Schweden



Beschreibung der Kohorten

	Norway				Austria	Sweden	
Variable	Oslo	NCS	CONOR	40-year	VHM&PP	VIP	MPP
Height	No shoes	No shoes	No shoes	No shoes	No shoes	No shoes	No shoes
Weight	Light clothes	Light clothes	Light clothes	Light clothes	Light clothes	Light clothes	Light clothes
Blood pressure							
Number of measurements	2 ^a	2 ^{a,b}	3 ^a	3 ^a	1	1	1–2 (mean value was recorded)
Rest before measurement	4 min, 1 min between each measurement	4 min, 1 min between each measurement ^b	2 min, 1 min between each measurement	2 min, 1 min between each measurement	5 min	5 min	10 min
Position	Sitting	Sitting	Sitting	Sitting	Sitting	Supine	Supine
Instrument	Mercury sphygmomanometer	Mercury sphygmomanometer	Automatic device	Automatic device	Mercury sphygmomanometer	Mercury sphygmomanometer	Mercury sphygmomanometer
Fasting status before measurement	Non-fasting	Non-fasting	Non-fasting	Non-fasting	Fasting from 1988	Fasting from 1992	Fasting
Glucose							
Substance	Serum	Serum	Serum	Serum	Plasma	Plasma	Whole blood
Method	Non-enzymatic ^c	Non-enzymatic ^c	Enzymatic ^c	Enzymatic ^c	Enzymatic	Enzymatic	Enzymatic
Cholesterol and triglycerides							
Substance	Serum	Serum	Serum	Serum	Serum	Serum	Serum
Method	Non-enzymatic ^d	Non-enzymatic Enzymatic from year 1980 ^d	Enzymatic ^d	Enzymatic ^d	Enzymatic	Enzymatic	Enzymatic

^aIn accordance with previous studies in Norway,^{10,17} the second blood pressure out of two measurements is used in Me-Can studies, and the mean value of the second and third measurement is used if three measurements were recorded.

^bFrom 1985, i.e. the third screening in the NCS, blood pressure was measured as described for the CONOR and 40-year cohort.

^cLevels from the non-enzymatic method yielded 0.8–1.1 mmol/l higher levels than the enzymatic method.

^dLevels from the non-enzymatic method have been compared with the enzymatic method^{18,19} and accordingly, levels measured with the non-enzymatic method have been transformed according to formulas: 0.92 (cholesterol level) + 0.03, and 0.90 (triglyceride level) – 0.11.

Studienpopulation

Table 2 Description of baseline observations in Me-Can studies of the metabolic syndrome and cancer risk

Variable	Norway				Austria	Sweden		Total
	Oslo	NCS	CONOR	40-year	VHM&PP	VIP	MPP	
Year of health examination (range)	1972–73	1974–83	1995–2003	1994–99	1988–2002	1985–2005	1974–1992	1972–2005
Subjects (<i>n</i>)								
Men	16 760	25 952	52 181	60 676	73 213	38 843	22 241	289 866
Women		25 072	57 687	68 211	86 671	40 669	10 524	288 834
All	16 760	51 024	109 868	128 887	159 884	79 512	32 765	578 700
Age, mean (SD)								
Men	44.1 (5.6)	40.3 (6.9)	47.7 (14.7)	41.5 (2.0)	42.6 (14.8)	47.6 (9.6)	43.7 (6.6)	43.9 (11.1)
Women		40.3 (7.0)	47.4 (15.2)	41.5 (1.9)	42.8 (16.0)	47.5 (9.6)	49.6 (7.5)	44.1 (12.3)
All	44.1 (5.6)	40.3 (7.0)	47.5 (15.0)	41.5 (1.9)	42.7 (15.4)	47.6 (9.6)	45.6 (7.4)	44.0 (11.7)
Fasting status (%)								
<4h	81	78	78	79	0	3	0	42
4 to <8h	10	19	16	17	0	7	0	10
≥8h	9	3	6	4	100	90	100	48
Data coverage (%)								
BMI	100	100	100	100	100	100	100	100
Blood pressure	100	100	100	100	100	99	100	100
Glucose	100	100	100	100	100	99	100	100
Cholesterol	100	100	100	100	100	99	100	100
Triglycerides	100	100	100	100	100	85	100	98

Metabolisches Syndrom (MetS) – Definitionen

Tab. 2 Definitionen des metabolischen Syndroms nach WHO [22], NCEP-ATP_{III} [25] und IDF [26]

WHO (1999)	NCEP ATP _{III} (2002)	IDF (2005)
NGT: 2 der folgenden Kriterien + Insulinresistenz (höchste Quartile des HOMA-IR-Index) IFG/IGT: 2 der Kriterien	3 oder mehr der folgenden Kriterien	Zentrale Adipositas (definiert als Taillenumfang 94 bzw. 80 cm) + 2 der folgenden Kriterien
Dyslipidämie TG: $\geq 1,7$ mmol/l und/oder HDL-C: $< 0,9$ mmol/l (Männer); $< 1,0$ mmol/l (Frauen)	Hypertriglyzeridämie $\geq 1,7$ mmol/l	Hypertriglyzeridämie $\geq 1,7$ mmol/l o. Therapie
Hypertonie $\geq 140/90$ mmHg	HDL-C $< 1,04$ (Männer); $< 1,29$ mmol/l (Frauen)	HDL-C $< 1,04$ mmol/l (Männer); $< 1,29$ mmol/l (Frauen) oder Therapie
Adipositas BMI: > 30 kg/m ² WHR: $> 0,9$ (Männer); $> 0,85$ (Frauen)	Hypertonie $\geq 130/85$ mmHg	Hypertonie $\geq 130/85$ mmHg o. Therapie
Mikroalbuminurie ≥ 20 µg/min	Zentrale Adipositas Bauchumfang > 102 cm (Männer); > 88 cm (Frauen)	Nüchtern-PG $\geq 5,6$ mmol/l (oGTT empfohlen)
	Nüchtern-PG $\geq 6,1$ mmol/l	

Metabolisches Syndrom in Me-Can

- Body Mass Index (BMI)
- Blutdruck
- Blutzucker
- Gesamtcholesterin
- Triglyzeride

Auswertungsstrategie

Exposition

Body mass index (BMI), mittlere Blutdruck , Blutzucker , Gesamtcholesterin, Triglyzeride

- Kontinuierlich
- Quintile
- Z-score : einzelne metabolische Faktoren und kombiniert (MetS score)
- Korrektur für Meßfehler

Cox proportional Hazard Models

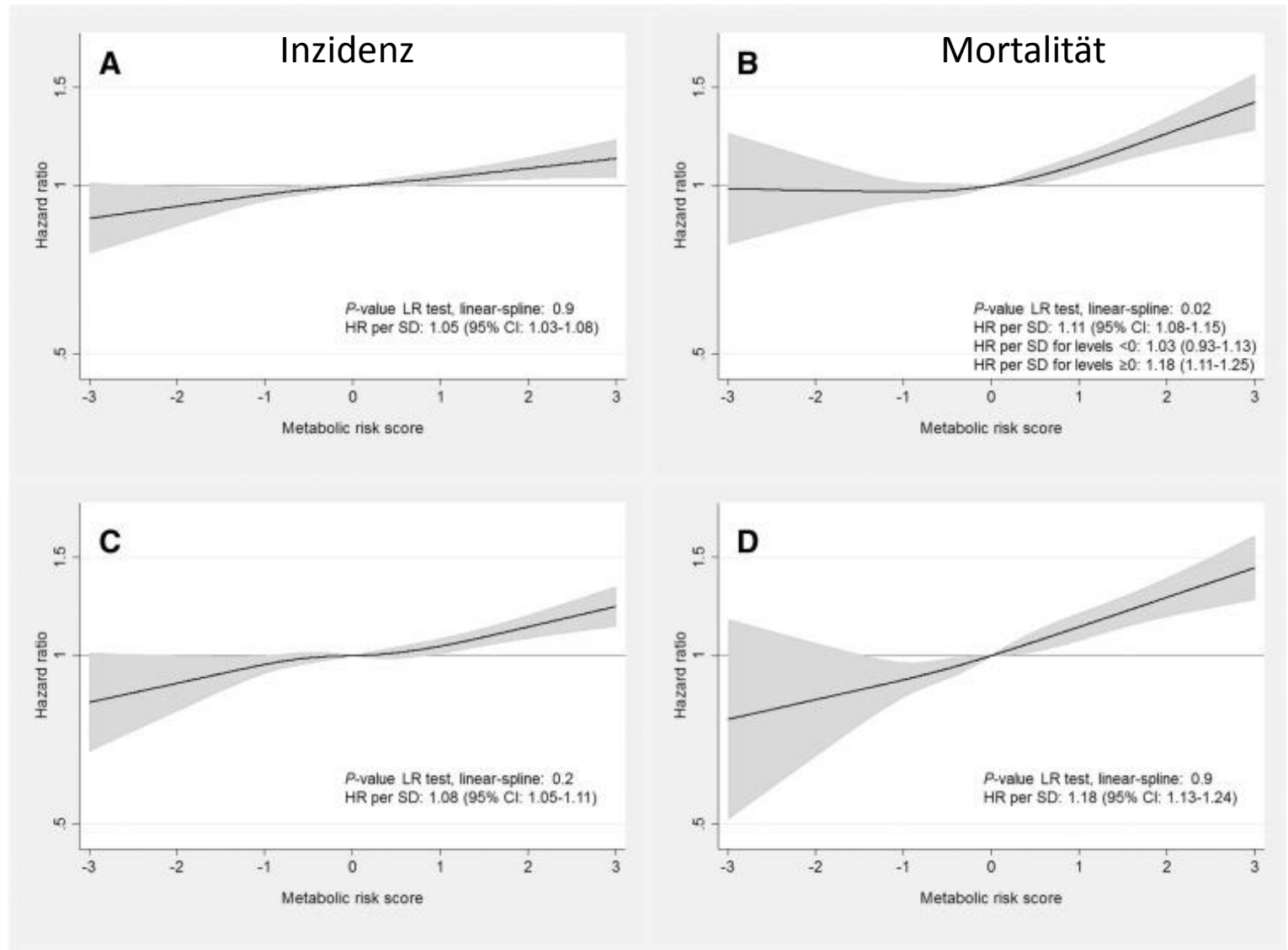
Adjustierung: Rauchstatus, Alter bei Rekrutierung (Jahre)

Zielgrößen

Krebsinzidenz und -mortalität

Metabolisches Syndrom und Krebserkrankungen

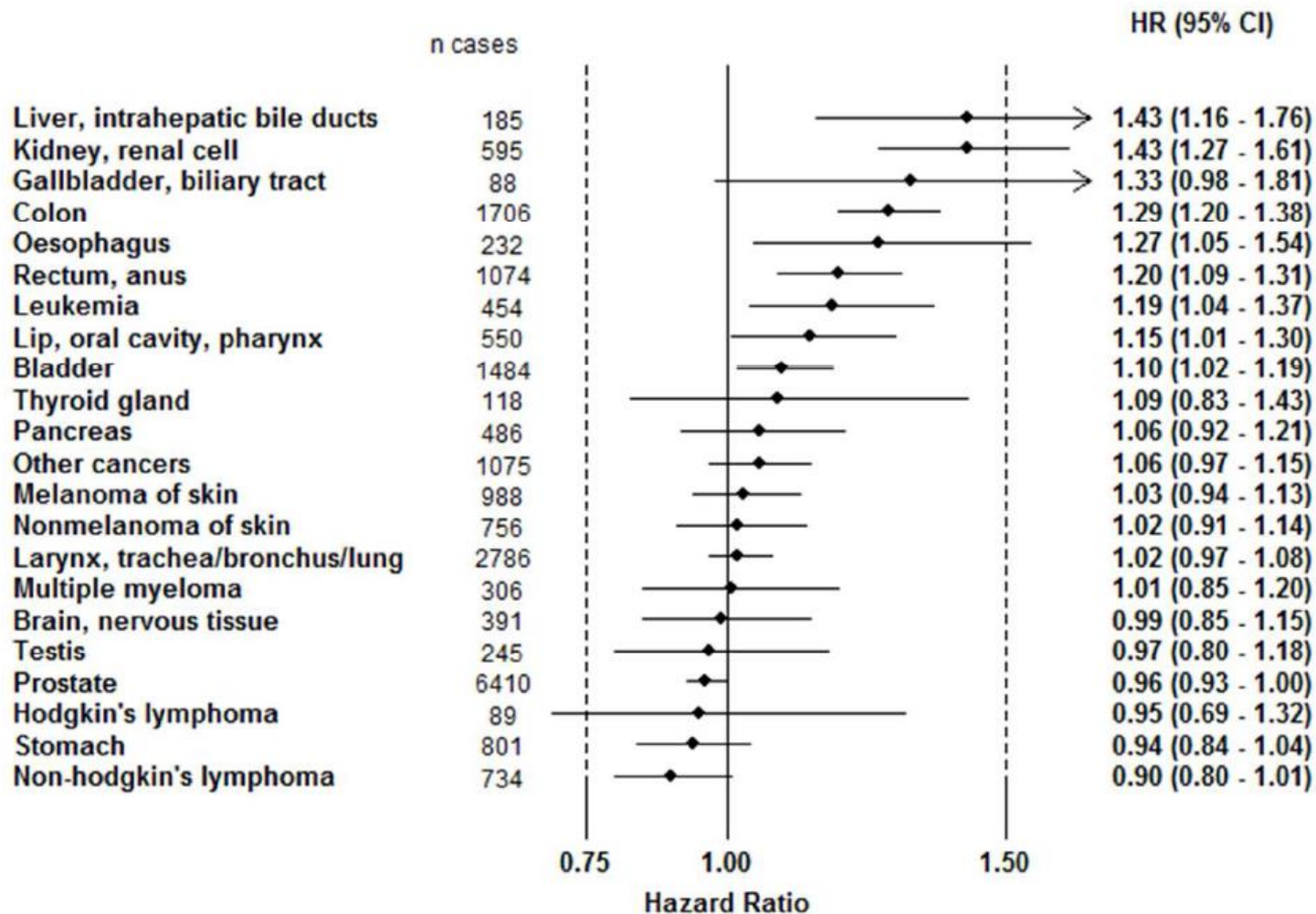
Männer



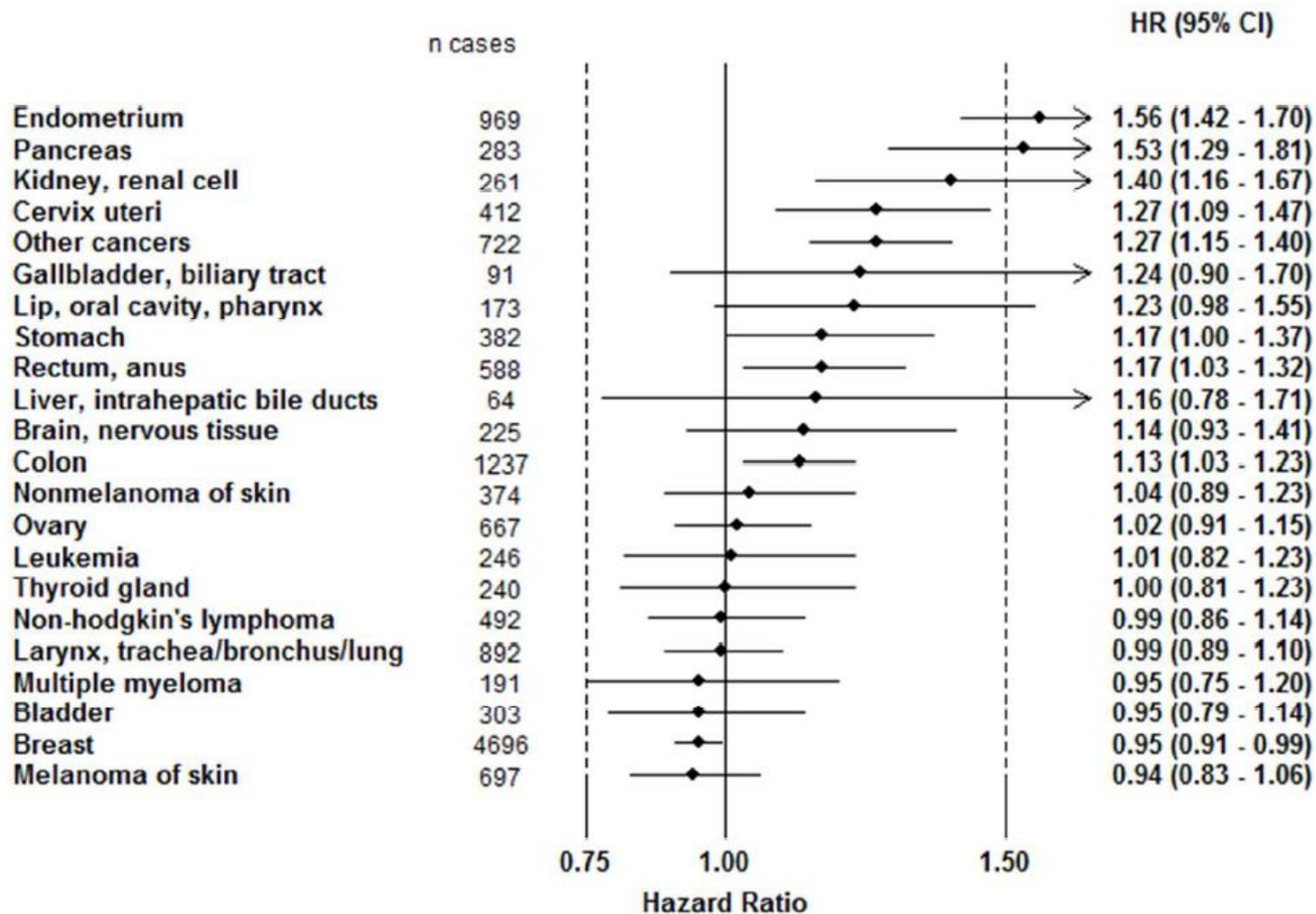
Frauen

Metabolisches Syndrom und Krebs

Männer

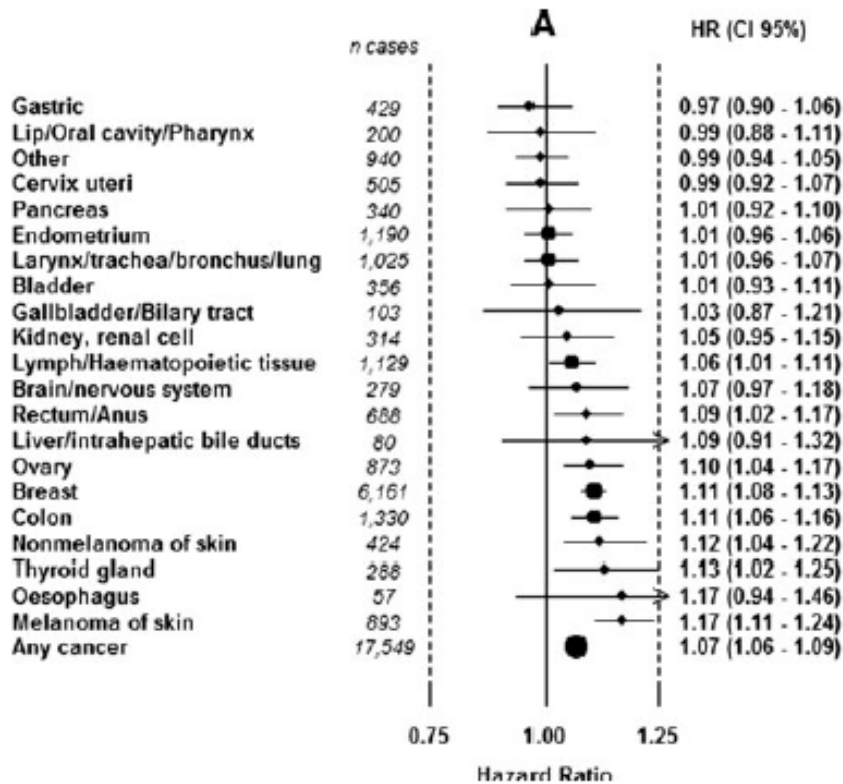


Metabolisches Syndrom und Krebs Frauen

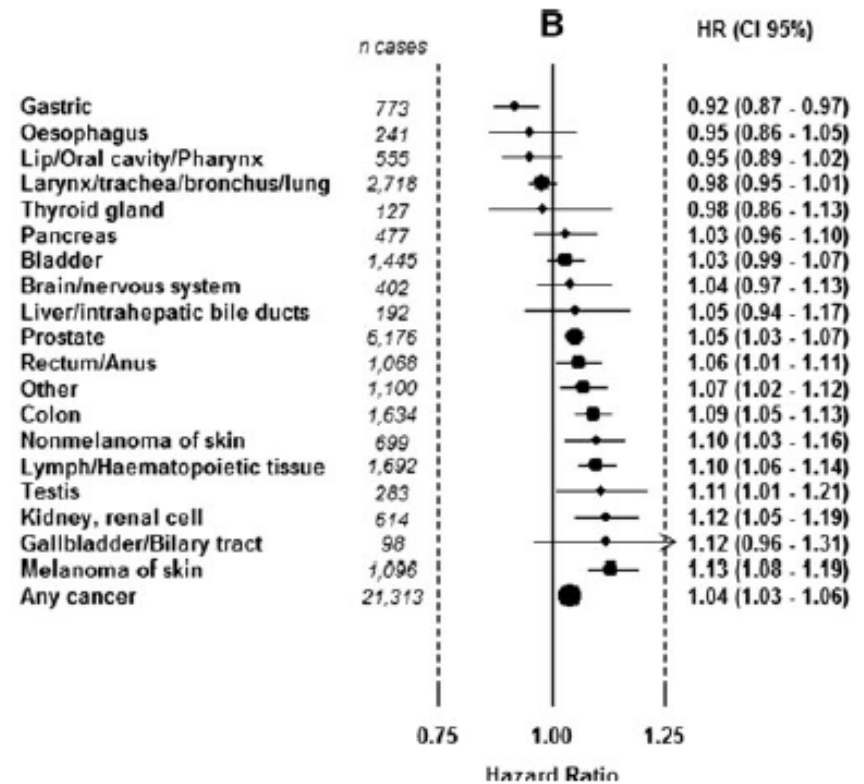


Körpergröße und Krebsinzidenz (pro 5 cm Zunahme)

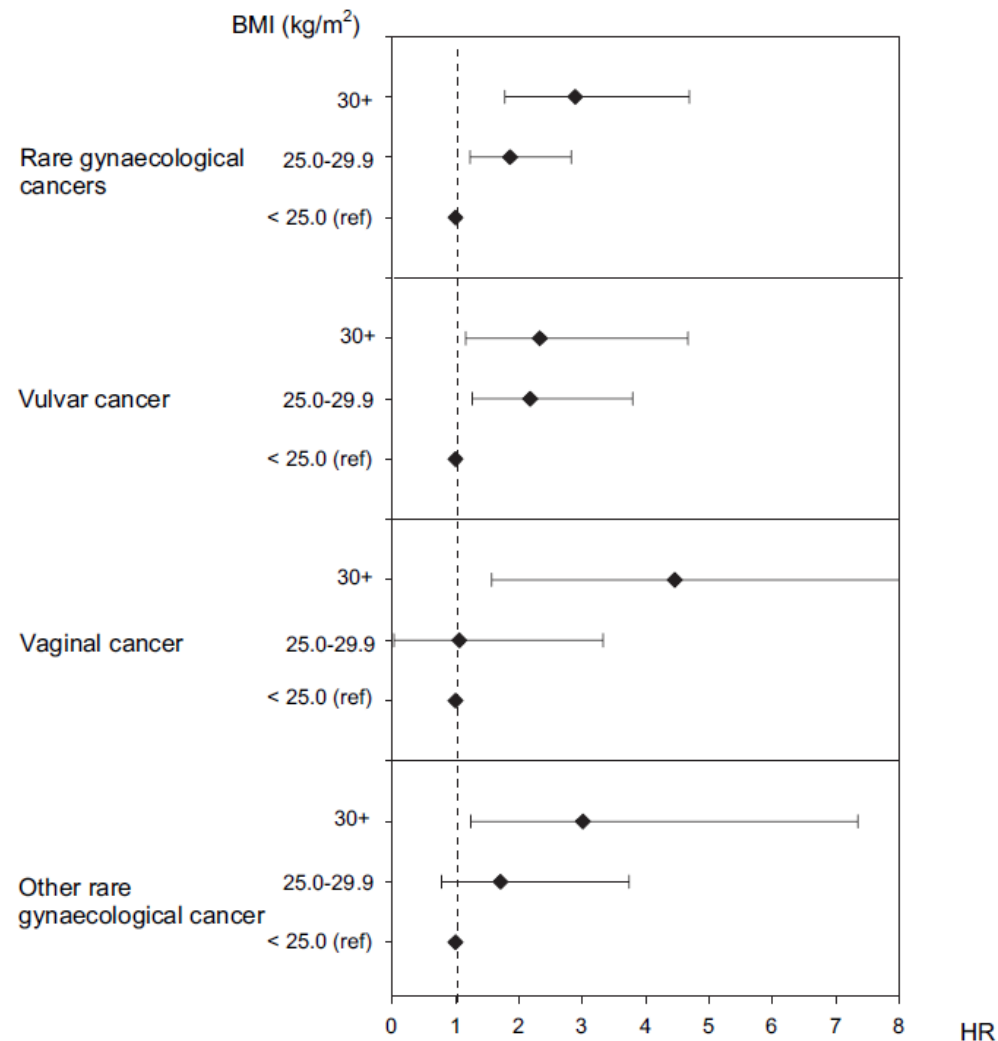
Frauen



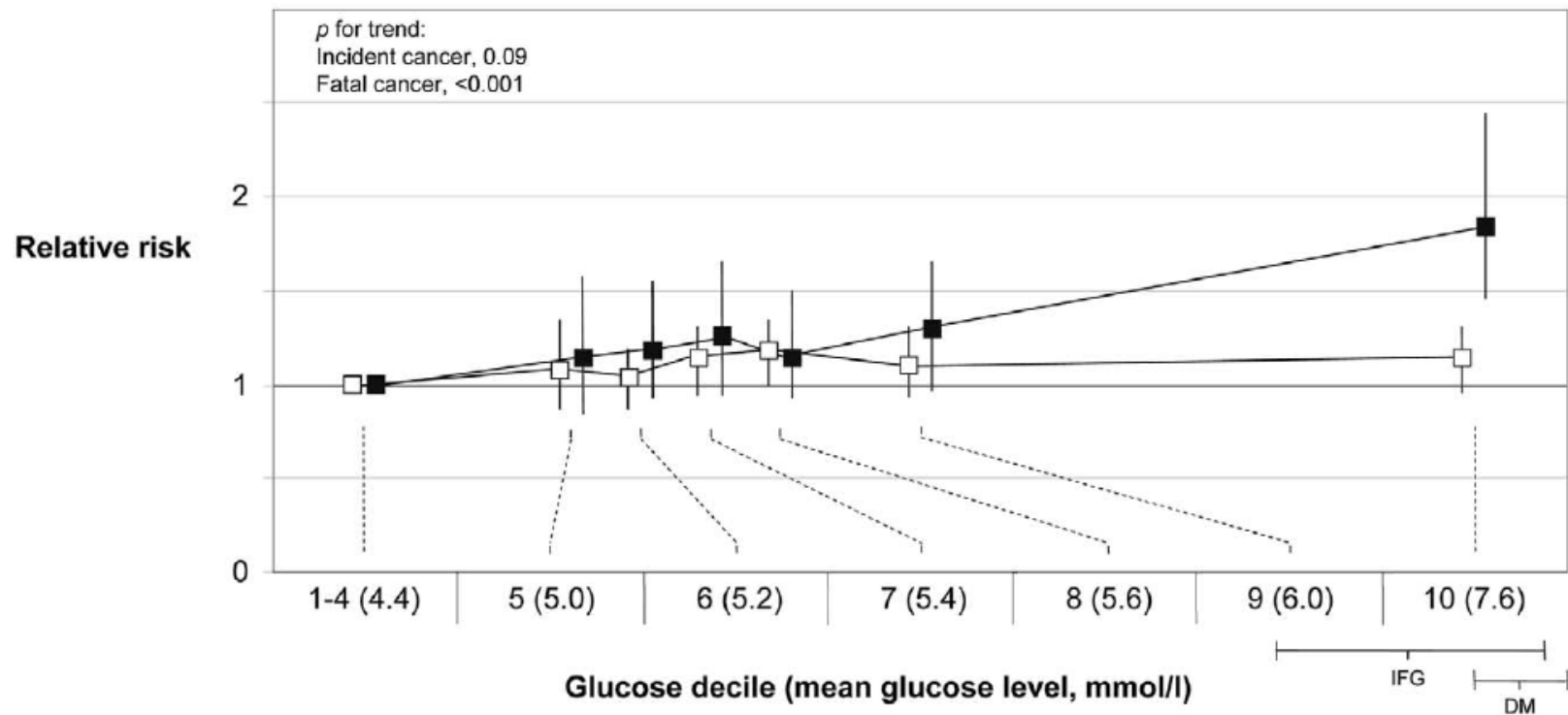
Männer



Body Mass Index und seltene gynäkologische Krebserkrankungen



Blutzuckerkonzentration und Krebsinzidenz und Mortalität – Männer

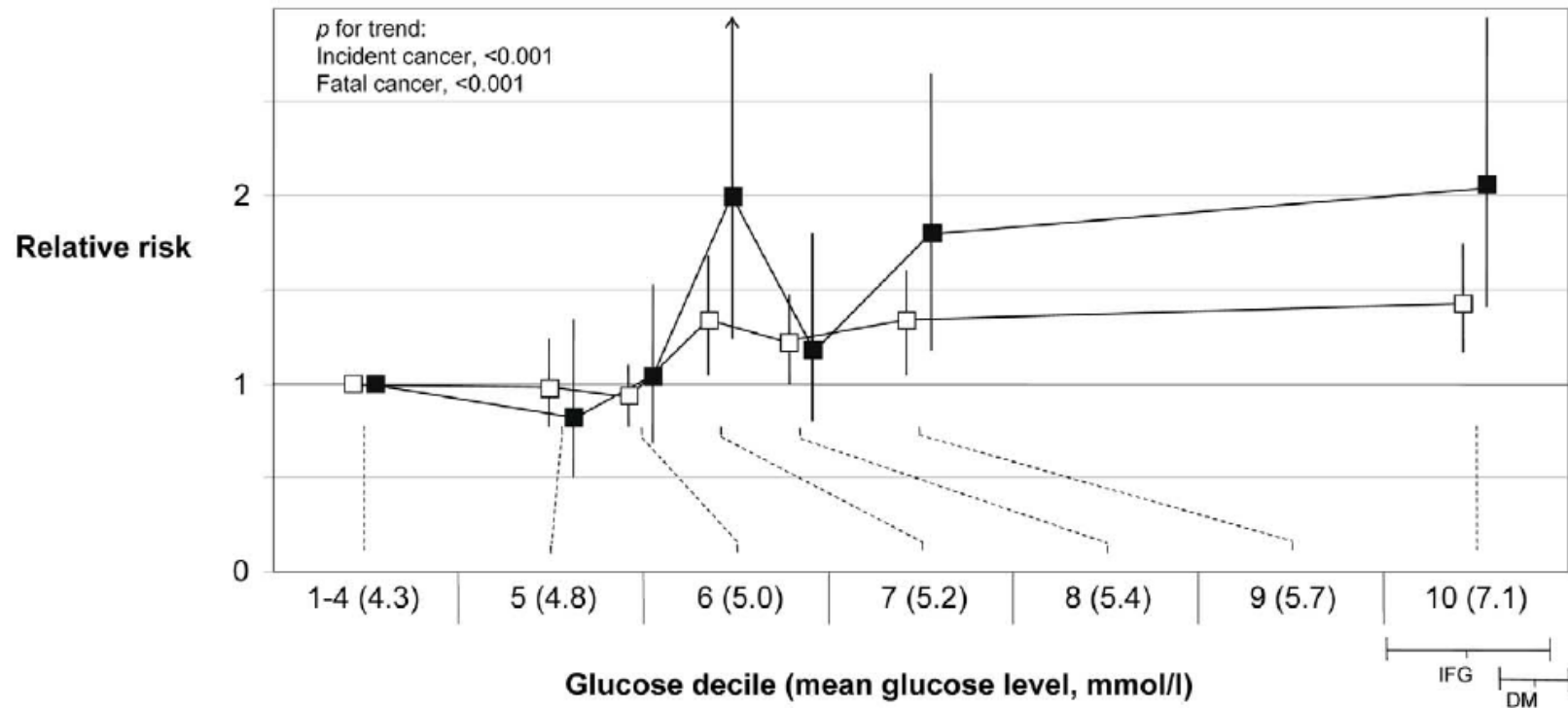


—□— Incident cancer	1 (referent)	1.07 (0.87-1.33)	1.03 (0.87-1.21)	1.14 (0.93-1.33)	1.18 (1.00-1.37)	1.10 (0.93-1.33)	1.14 (0.97-1.33)
—■— Fatal cancer	1 (referent)	1.14 (0.81-1.59)	1.18 (0.90-1.55)	1.25 (0.93-1.69)	1.14 (0.90-1.50)	1.29 (0.97-1.69)	1.84 (1.46-2.40)

Increased RR of incident and fatal cancer of the liver, gallbladder, and respiratory tract, for incident thyroid cancer and multiple myeloma

Stocks et al. 2009

Blood glucose and risk of incident and fatal cancer in Me-Can – women



incident and fatal cancer of the pancreas, for incident urinary bladder cancer, and for fatal cancer of the uterine corpus, cervix uteri, and stomach

Stocks et al. 2009

Ergebnisse seltenerer Krebserkrankungen

- **Gehirn:** Pos. Assoziation für Blutdruck (BP), am stärksten für Meningiom, für Triglyceride und hochgradiges Gliom
- **Blutkrebs:** BMI war positiv mit lymphatischen Neubildungen bei Frauen verbunden, aber nicht bei Männern
- **Blase:** bei Männern Blutdruck 13% erhöhen RR und MetS Score 10%
- **Schilddrüse:** inverse Assoziation für Glukose und positive Assoziation für BMI
- **Haut:** BP wurde in erhöhter RR des Vorfalls und des tödlichen malignen Melanoms assoziiert

Erkenntnisgewinn

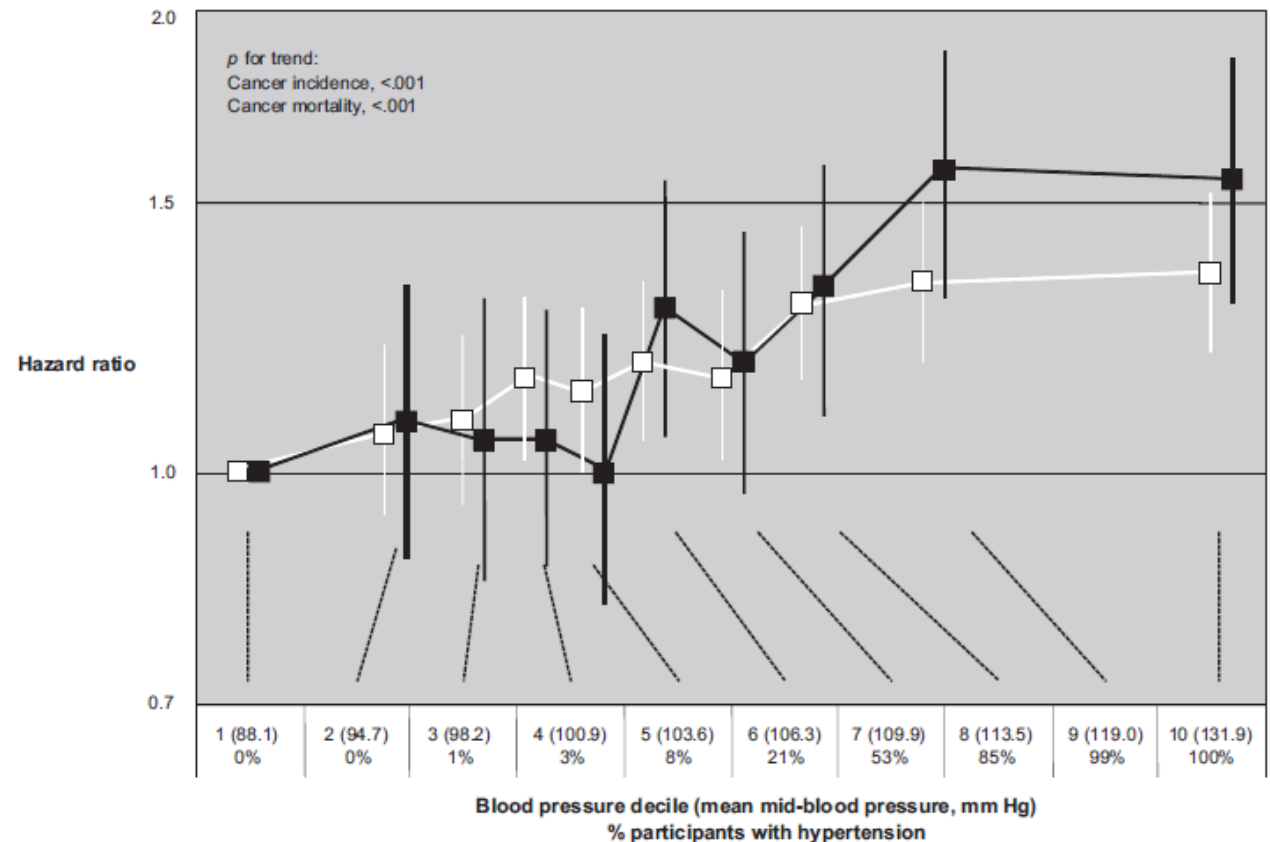
- Analyse der einzelnen und kombinierten Stoffwechselfaktoren des Metabolischen Syndroms
- Auswertung morphologischer Subtypen
- Korrektur des Messfehlers
- Untersuchung von seltenen Krebserkrankungen

Danke für ihre Aufmerksamkeit!



Blood pressure and risk of incident and fatal cancer in Me-Can – men

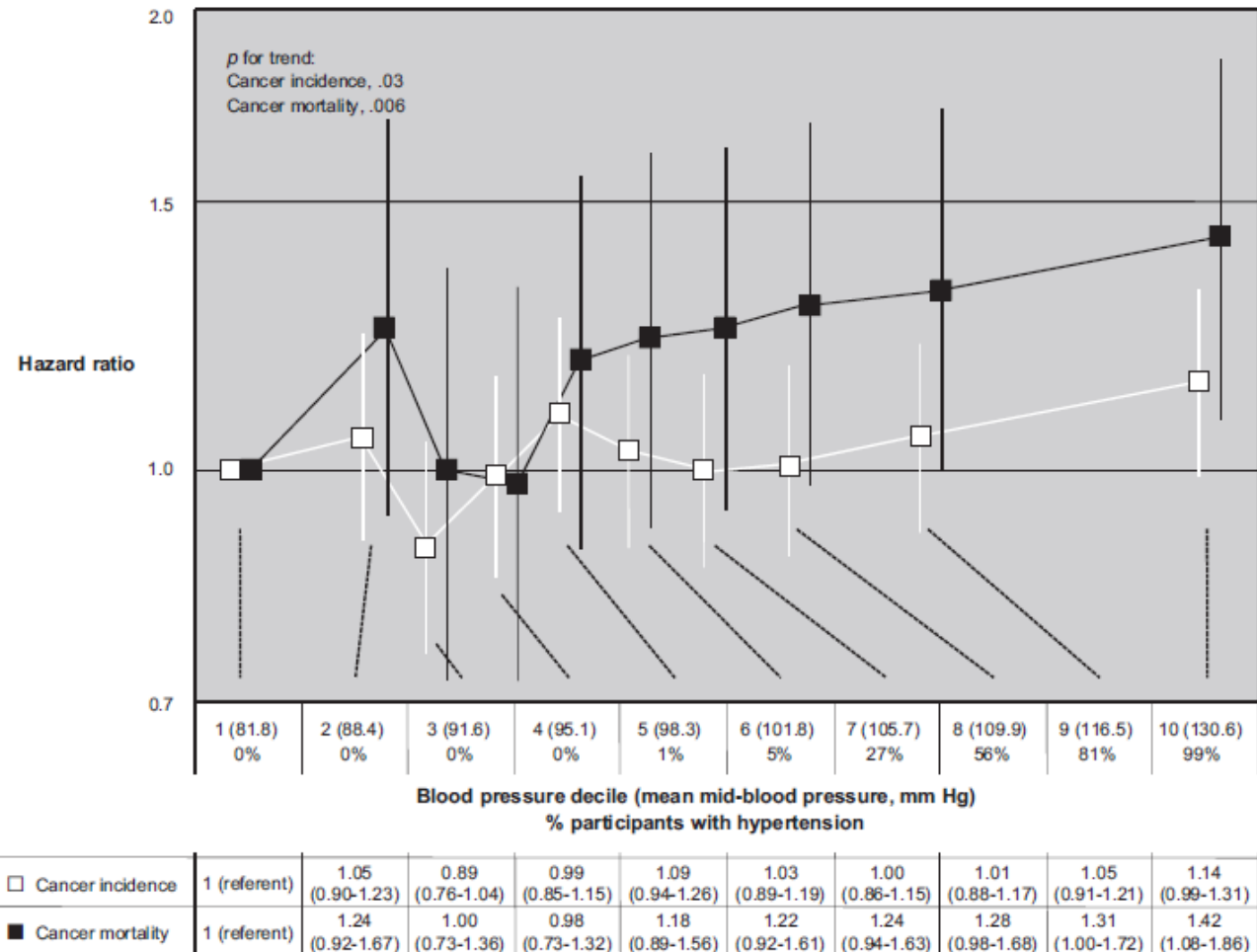
Increased HR for
oropharynx, colon,
rectum, lung, bladder,
kidney, malignant
melanoma, and
nonmelanoma skin
cancer



□ Cancer incidence	1 (referent)	1.06 (0.94-1.21)	1.08 (0.95-1.23)	1.15 (1.02-1.30)	1.13 (1.00-1.28)	1.18 (1.05-1.33)	1.15 (1.02-1.31)	1.29 (1.15-1.45)	1.33 (1.18-1.50)	1.35 (1.20-1.52)
■ Cancer mortality	1 (referent)	1.08 (0.88-1.32)	1.05 (0.85-1.30)	1.05 (0.87-1.28)	1.00 (0.82-1.23)	1.28 (1.06-1.55)	1.18 (0.97-1.44)	1.32 (1.09-1.59)	1.57 (1.30-1.88)	1.55 (1.29-1.86)

Blood pressure and risk of incident and fatal cancer in Me-Can – women

Increased HR for
liver, pancreas, cervix,
uterine corpus cancer
and malignant
melanoma



Female cancers

- **Breast:** <50 years MetS score inversely related, 60+ positively associated breast cancer mortality, also blood pressure and glucose
- **Endometrial:** MetS score as well as metabolic factors except cholesterol were associated with increased RR
- **Ovarian:** BMI pos. association, cholesterol and blood pressure increased the risks of mucinous and endometrioid tumours
- **Cervical:** MetS score was associated with 26% increased RR, BMI (per 1SD increment) was associated with 12%, increase of cervical cancer risk, blood pressure with 25% and triglycerides with 39%
- **Rare gynecological cancers:** MetS was associated with 78% increased risk of vulvar and 87% of vaginal cancer

Gastro-intestinal cancers

- **Pancreas:** positive associations for mid-BP and glucose in men and for body mass index, mid-BP, and glucose in women.
- **Liver:** MetS was positively associated 35% increased RR, BMI and glucose were positively and cholesterol negatively
- **Colorectal:** increase MetS score (per increment) 25% RR increase RR in men and 14% in women. in men pos. associations for BMI, Blood pressure and triglycerides, in women BMI

Doctoral thesis

Metabolic Factors and Cancer Risk

Prospective studies of hormonal
and life-style related factors and
risk of cancer

Prospective Studies on Prostate Cancer,
Colorectal Cancer, and Cancer Overall

Tanja Stocks

Lifestyle Markers in Cancer Epidemiology

Michael Edlinger

Sara Wirén

METABOLIC AND LIFESTYLE RELATED
RISK FACTORS FOR PANCREATIC CANCER

Metabolic factors and risk of
prostate, kidney, and bladder cancer

Dorthe Johansen

Christel Häggström

Diskussion

- BMI ist ein Indikator für das Körpervolumen, gibt keine Information über Körperfettverteilung
- Cholesterin hatte
-

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Cohort Profile: The Metabolic syndrome and Cancer project (Me-Can)

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