



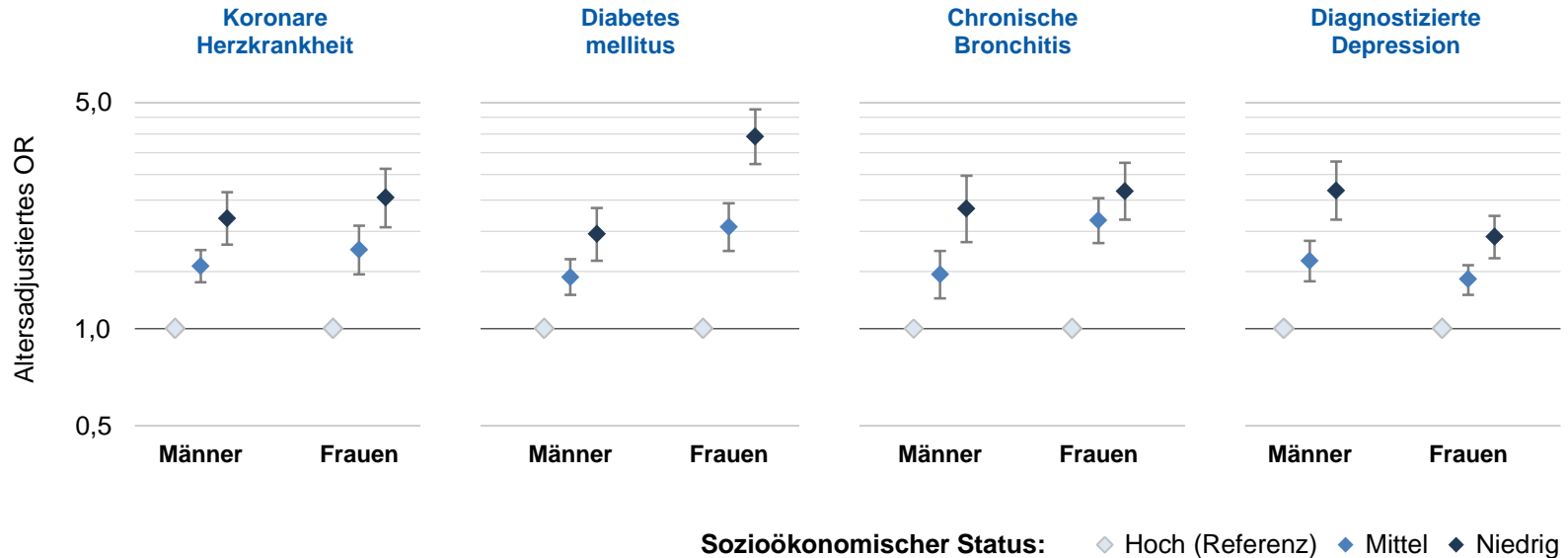
# Soziale Unterschiede im Krebsrisiko: Mehr Neuerkrankungen in deprivierten Regionen?

Dr. Jens Hoebel (Robert Koch-Institut)

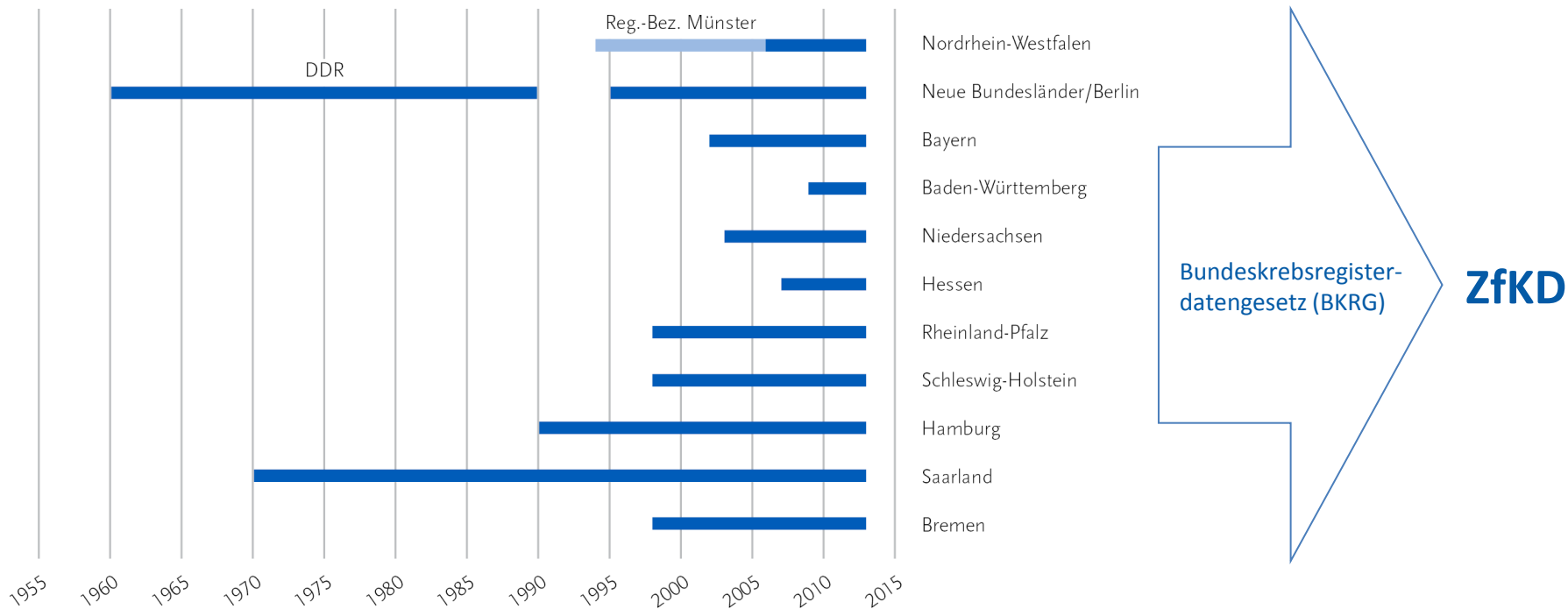
Fortbildung für den Öffentlichen Gesundheitsdienst  
Bundesinstitut für Risikobewertung, Berlin, 11.04.2019

# Ausgangslage: Sozialer Gradient für Vielzahl chronischer Erkrankungen

Datenbasis: Studie „Gesundheit in Deutschland aktuell“ (GEDA) des RKI



# Epidemiologische Krebsregister in Deutschland



# Gepoolte Daten der epidemiologischen Krebsregister in Deutschland des ZfKD (2010–2013)

## » **Krebsinzidenz:**

Zwischen 2010–2013 registrierte Krebsneuerkrankungen je 100.000 Einwohner pro Jahr

## » **Krebsdiagnosen nach ICD-10 (Primärtumoren)**

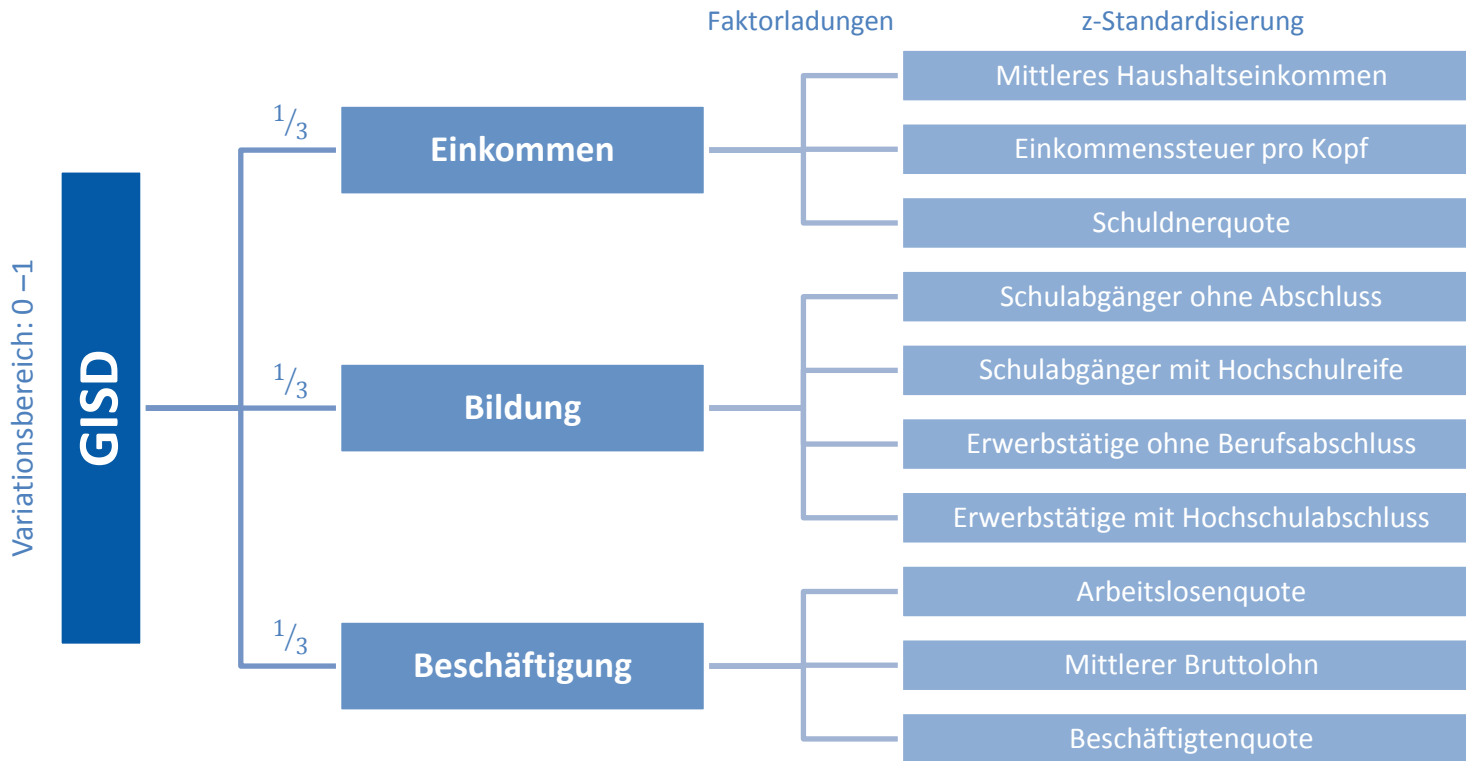
- Teilweise Diagnosegruppen:  
z.B. Krebs gesamt, Mund/obere Atemwege, Leukämien und Lymphome
- Krebs gesamt:  
C00–C97 ohne C44 (nicht-melanotische Hauttumoren) und C77–C79 (Sekundärtumoren)

## » **Sozioökonomische Deprivation**

- German Index of Socioeconomic Deprivation (GISD) [Kroll et al. 2017, 2018]

# German Index of Socioeconomic Deprivation (GISD)

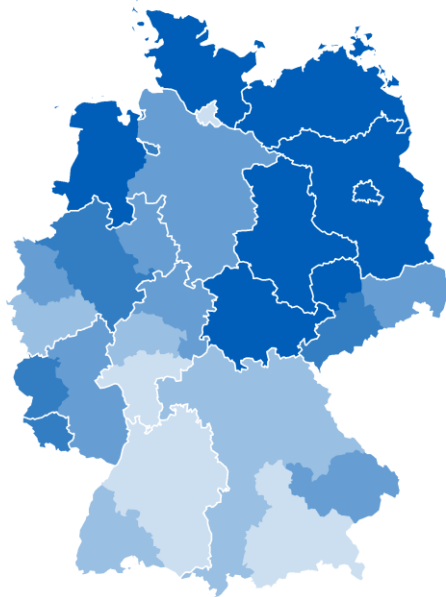
Datenbasis: INKAR-Regionaldatenbank (Kroll, Schumann, Hoebel, Lampert 2017, 2018)



# German Index of Socioeconomic Deprivation (GISD)

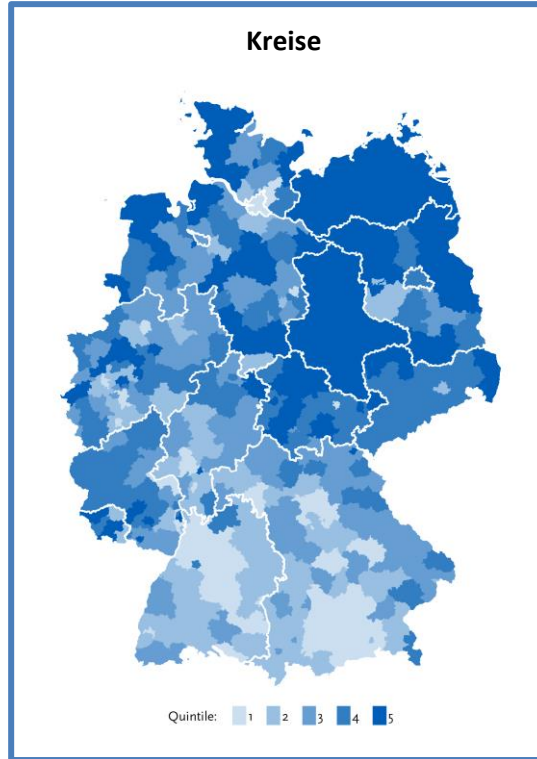
Datenbasis: INKAR-Regionaldatenbank (Kroll, Schumann, Hoebel, Lampert 2017, 2018)

NUTS-2



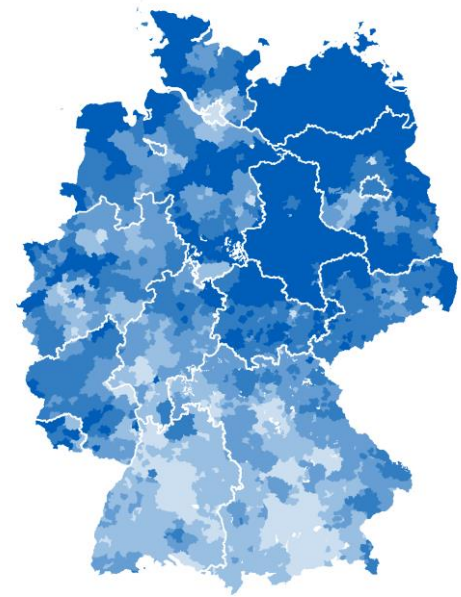
Quintile: 1 2 3 4 5

Kreise



Quintile: 1 2 3 4 5

Gemeindeverbände



Quintile: 1 2 3 4 5



## » Datenbasis

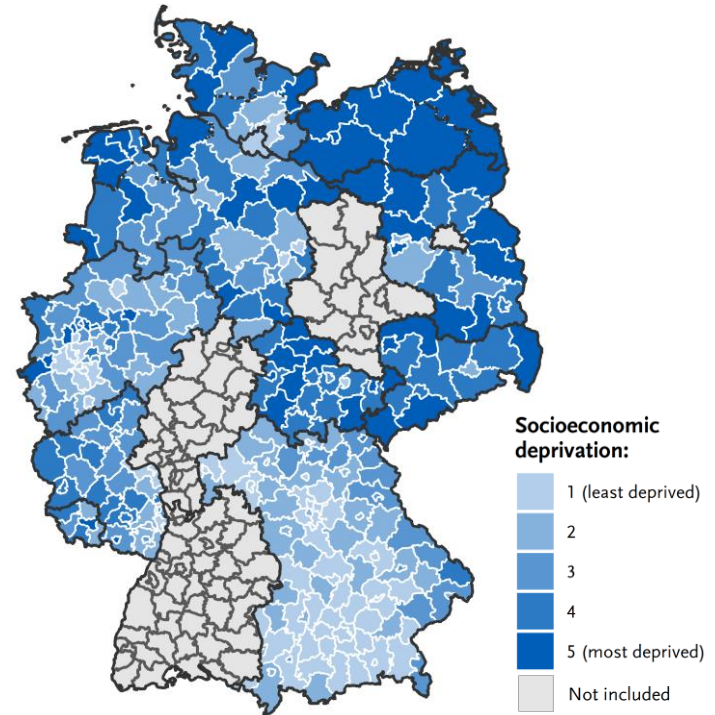
- Ausschluss von Registern mit geschätzter Vollständigkeit <90%
- Eingeschlossene Kreise: 317 von 402

## » Altersstandardisierung

Europastandardbevölkerung 2013

## » Statistische Modelle

Poisson-Regressionen (Mehrebenenmodelle)  
mit logarithmierter Einwohnerzahl als Offset-Term





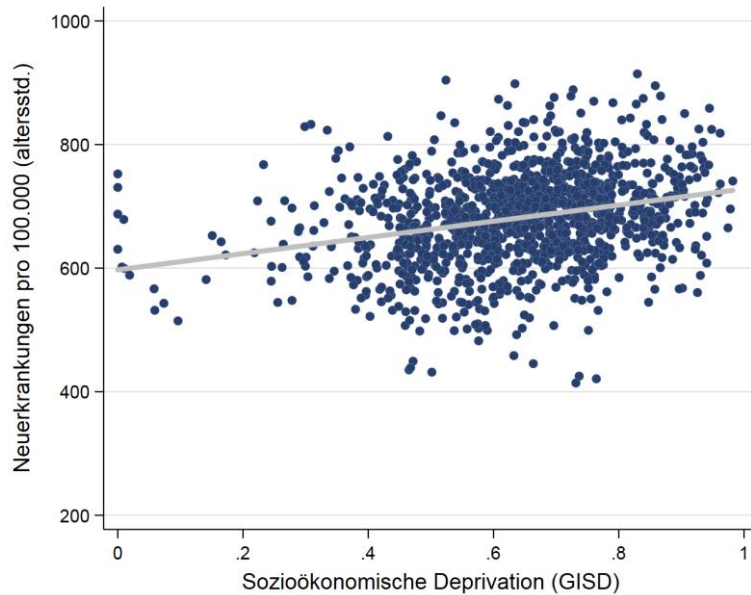
## Ergebnisse



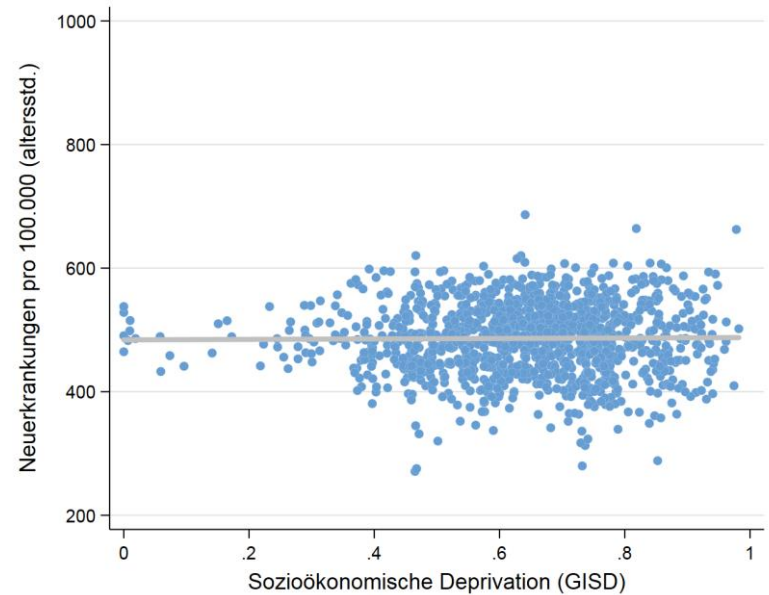
# Ökologischer Zusammenhang zwischen Krebsinzidenz und sozioökonomischer Deprivation auf Kreisebene

Datenbasis: Epidemiologische Krebsregister 2010–2013

**Männer**

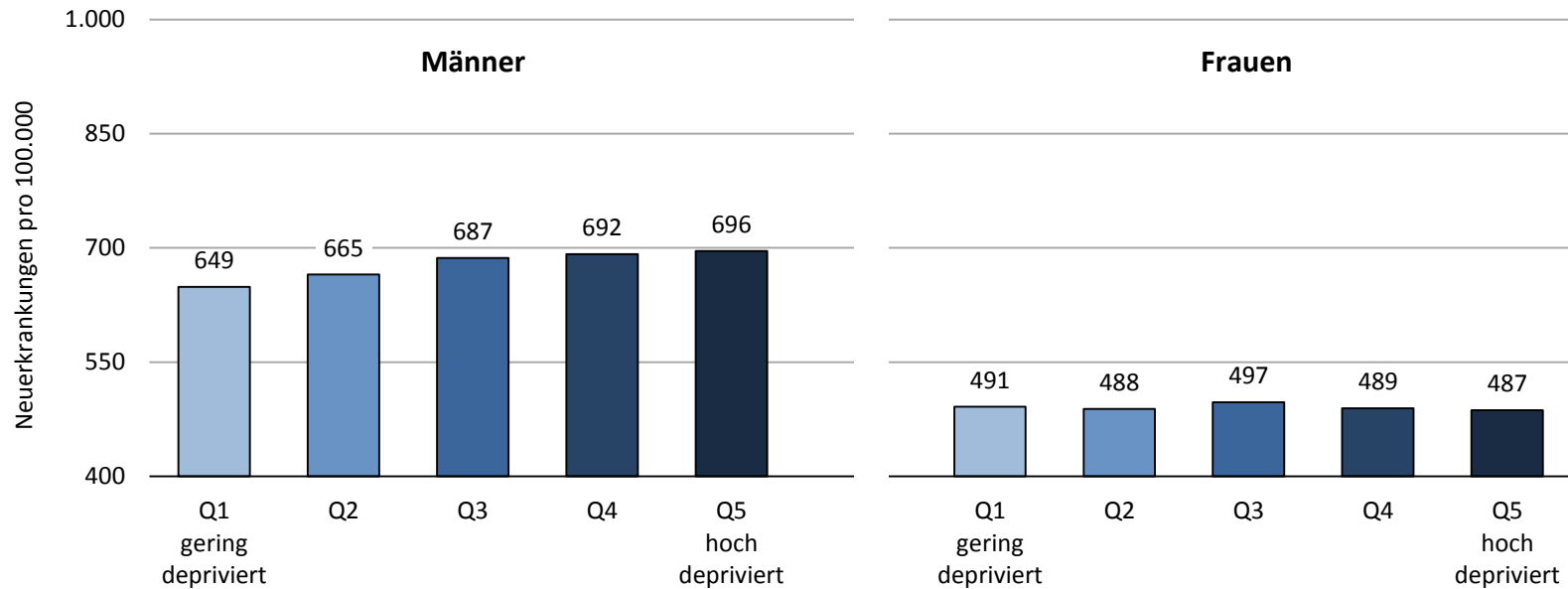


**Frauen**



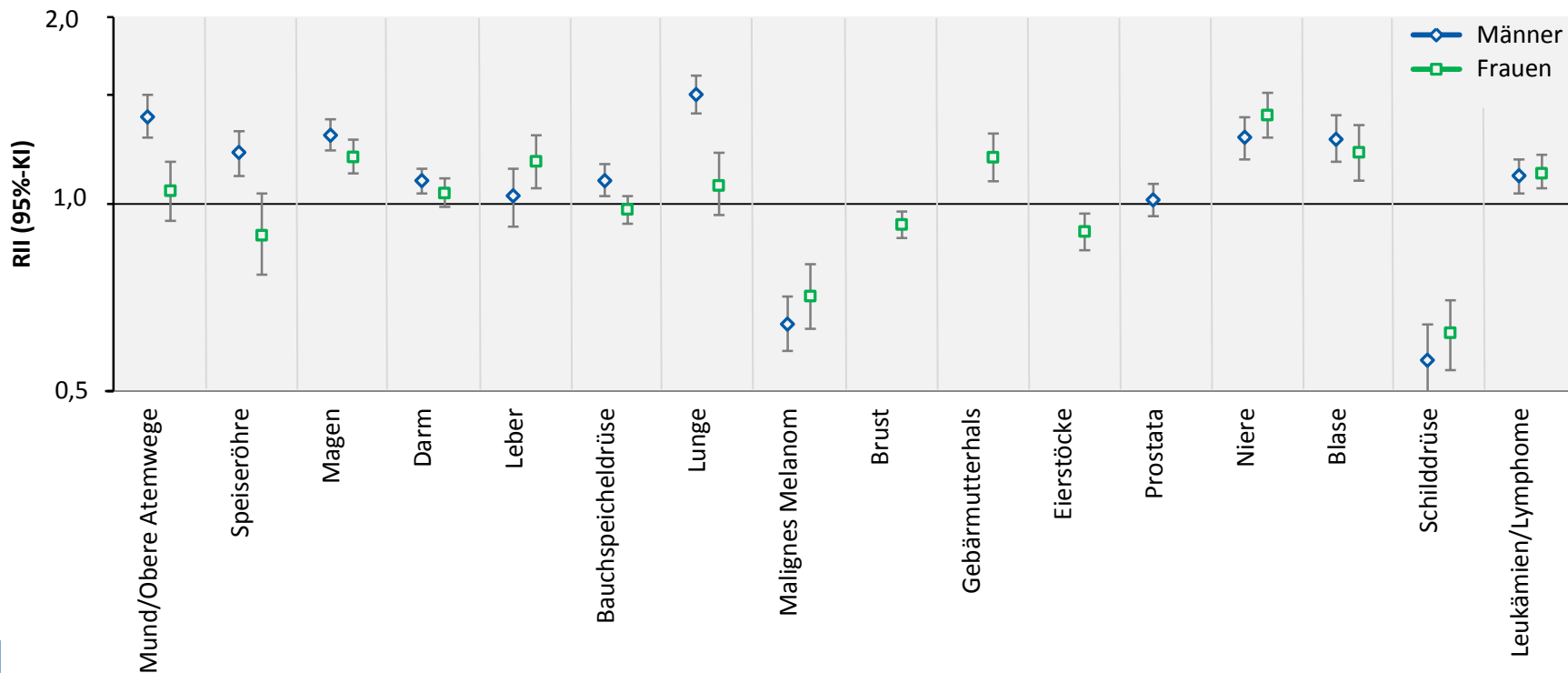
# Altersstandardisierte Inzidenz für Krebs gesamt nach sozioökonomischer Deprivation (in Quintilen)

Datenbasis: Epidemiologische Krebsregister 2010–2013 (Hoebel et al. 2018, Frontiers in Oncology)



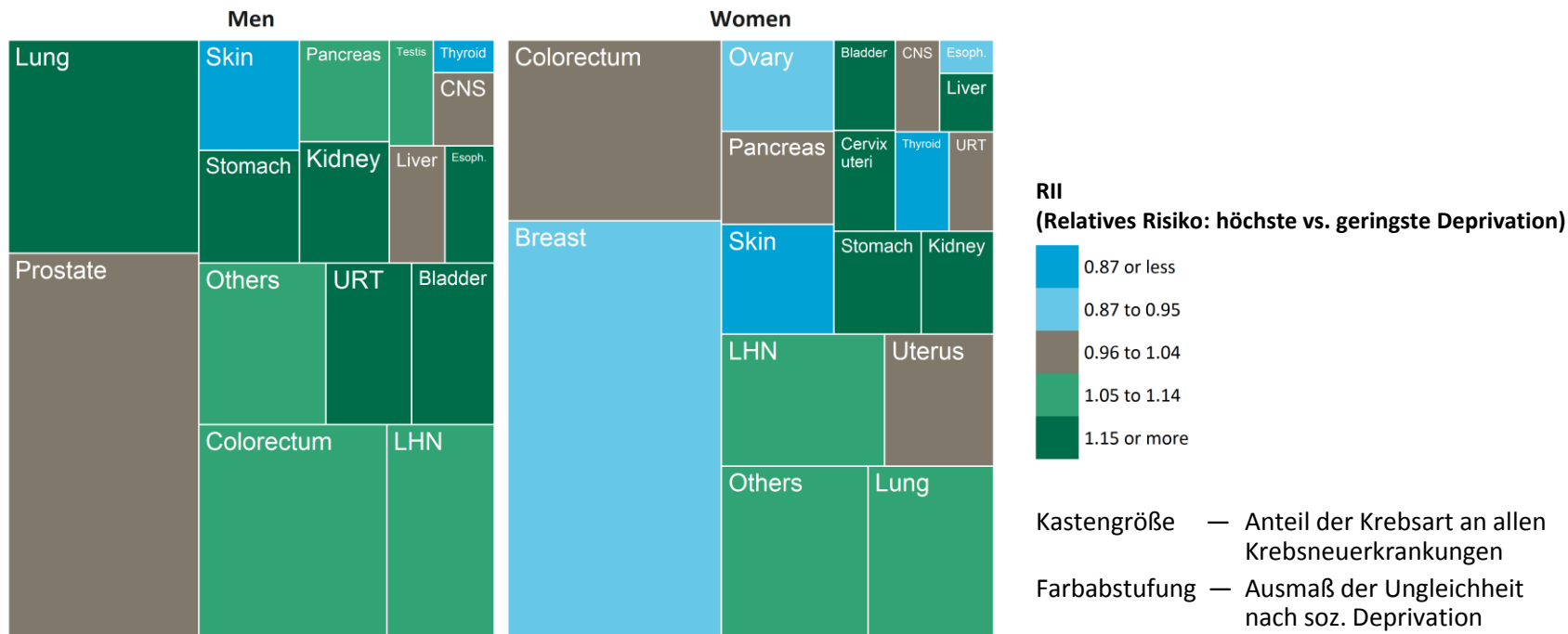
# Relative Risiken für verschiedene Krebsdiagnosen nach sozioökonomischer Deprivation (höchste vs. geringste Deprivation)

Datenbasis: Epidemiologische Krebsregister 2010–2013 (Hoebel et al. 2018, Frontiers in Oncology)



# Häufigkeit spezifischer Krebsdiagnosen und Ausmaß der sozioökonomischen Ungleichheit in ihrer Inzidenz

Datenbasis: Epidemiologische Krebsregister 2010–2013 (Hoebel et al. 2018, Frontiers in Oncology)





## Stärken

- » Erste bundeslandübergreifende Analyse zu sozialen Unterschieden in der Krebsinzidenz in Deutschland
- » Einschluss von 73 % der Gesamtbevölkerung
- » Breites Spektrum verschiedener Krebsdiagnosen

## Limitationen

- » Ausschluss von 4 Bundesländern: Berlin, Hessen, Ba-Wü, Sachsen-Anhalt
- » Ökologische Analyse (räumliche Aggregation)
- » Keine Individualdaten zum sozioökonomischen Status, keine Info über Expositionsdauer (→ Unterschätzung der Assoziationen)



- » Der soziale Gradient zeigt sich auch im Krebsrisiko, wobei er sich in Richtung und Ausprägung deutlich zwischen verschiedenen Krebsarten unterscheidet, bis hin zu „umgekehrten“ Gradienten
- » Die ZfKD-Daten der epidemiologischen Krebsregister ermöglichen Analysen zu sozialen Ungleichheiten im Krebsgeschehen auf sozialräumlicher Ebene
- » Ansatzpunkte für regionale Strategien zur Krebsprävention  
→ Zielgruppenorientierte und adressatengerechte Maßnahmen

# Weitere Beteiligte und Kooperationspartner



Dr. Lars Kroll (RKI/Zi)

PD Dr. Thomas Lampert (RKI)

Prof. Dr. Alexander Katalinic (GEKID)

Julia Fiebig (ZfKD am RKI)

Dr. Benjamin Barnes (ZfKD am RKI)

Dr. Klaus Kraywinkel (ZfKD am RKI)

# Vielen Dank!

Dr. Jens Hoebel  
FG Soziale Determinanten der Gesundheit  
Abt. Epidemiologie und Gesundheitsmonitoring  
Robert Koch-Institut, Berlin  
E-Mail: j.hoebel@rki.de



## Socioeconomic Inequalities in Total and Site-Specific Cancer Incidence in Germany: A Population-Based Registry Study

Jens Hoebel<sup>1\*</sup>, Lars E. Kroll<sup>1</sup>, Julia Fiebig<sup>2</sup>, Thomas Lampert<sup>1</sup>, Alexander Katalinic<sup>2</sup>, Benjamin Barnes<sup>2</sup> and Klaus Kraywinkel<sup>1</sup>

<sup>1</sup>Division of Social Determinants of Health, Department of Epidemiology and Health Monitoring, Robert Koch Institute, Berlin, Germany; <sup>2</sup>German Centre for Cancer Registry Data, Department of Epidemiology and Health Monitoring, Robert Koch Institute, Berlin, Germany; <sup>3</sup>Institute for Social Medicine and Epidemiology, University of Lübeck, Lübeck, Germany

Most chronic diseases follow a socioeconomic gradient with higher rates in lower socioeconomic groups. A growing body of research, however, reveals cancer to be a disease group with very diverse socioeconomic patterning, even demonstrating reverse socioeconomic gradients for certain cancers. To investigate this matter at the German national level for the first time, this study examined socioeconomic inequalities in cancer incidence in Germany, both for all cancers combined as well as for common site-specific cancers. Population-based data on primary cancers newly diagnosed in 2010–2013 was obtained from the German Centre for Cancer Registry Data. Socioeconomic position was assessed at the district level using the German Index of Socioeconomic Deprivation, which is a composite index of area-based socioeconomic indicators. Absolute and relative socioeconomic inequalities in total and site-specific cancer incidence were analyzed using multilevel Poisson regression models with the logarithm of the number of residents as an offset. Among men, socioeconomic inequalities in cancer incidence with higher rates in more deprived districts were found for all cancers combined and various site-specific cancers, most pronounced for cancers of the lung, oral and upper respiratory tract, stomach, kidney, and bladder. Among women, higher rates in more deprived districts were evident for kidney, bladder, stomach, cervical, and liver cancer as well as for lymphoid/hematopoietic neoplasms, but no inequalities were evident for all cancers combined. Reverse gradients with higher rates in less deprived districts were found for malignant melanoma and thyroid cancer in both sexes, and in women additionally for female breast and ovarian cancer. Whereas in men the vast majority of all incident cancers occurred at cancer sites showing higher incidence rates in more deprived districts and cancers with a reverse socioeconomic gradient were in a clear minority, the situation was more balanced for women. This is the first national study from Germany examining socioeconomic inequalities in total and site-specific cancer incidence. The findings demonstrate that the socioeconomic patterning of cancer is diverse and follows different directions depending on the cancer site. The area-based cancer inequalities found suggest potentials for population-based cancer prevention and can help develop local strategies for cancer prevention and control.

**Keywords:** cancer registry data, socioeconomic factors, health inequalities, social class, cancer epidemiology

### OPEN ACCESS

#### Edited by:

Frederik Edrman,  
Danish Cancer Society, Denmark

#### Reviewed by:

Josiane Lalet, Institut  
International Agency For Research On  
Cancer (IARC), France

Jen Hovanic,  
Institut für Prävention und  
Arbeitsmedizin der Deutschen  
Gesetzlichen Unfallversicherung,  
Germany

#### \*Correspondence:

Jens Hoebel  
jhoebel@rki.de

#### Specialty section:

This article was submitted to  
Cancer Epidemiology and Prevention,  
a section of the journal  
Frontiers in Oncology

#### Received: 29 June 2018

Accepted: 03 September 2018

Published: 25 September 2018

#### Citation:

Hoebel J, Kroll LE, Fiebig J,  
Lampert T, Katalinic A, Barnes B and  
Kraywinkel K (2018) Socioeconomic  
Inequalities in Total and Site-Specific  
Cancer Incidence in Germany: A  
Population-Based Registry Study.  
Front. Oncol. 8:402.  
doi: 10.3389/fonc.2018.00402