Registerbasierte Überwachung der direkten und indirekten Auswirkungen der COVID-19 Pandemie in Schweden

DOMINIK DIETLER, LUND UNIVERSITY

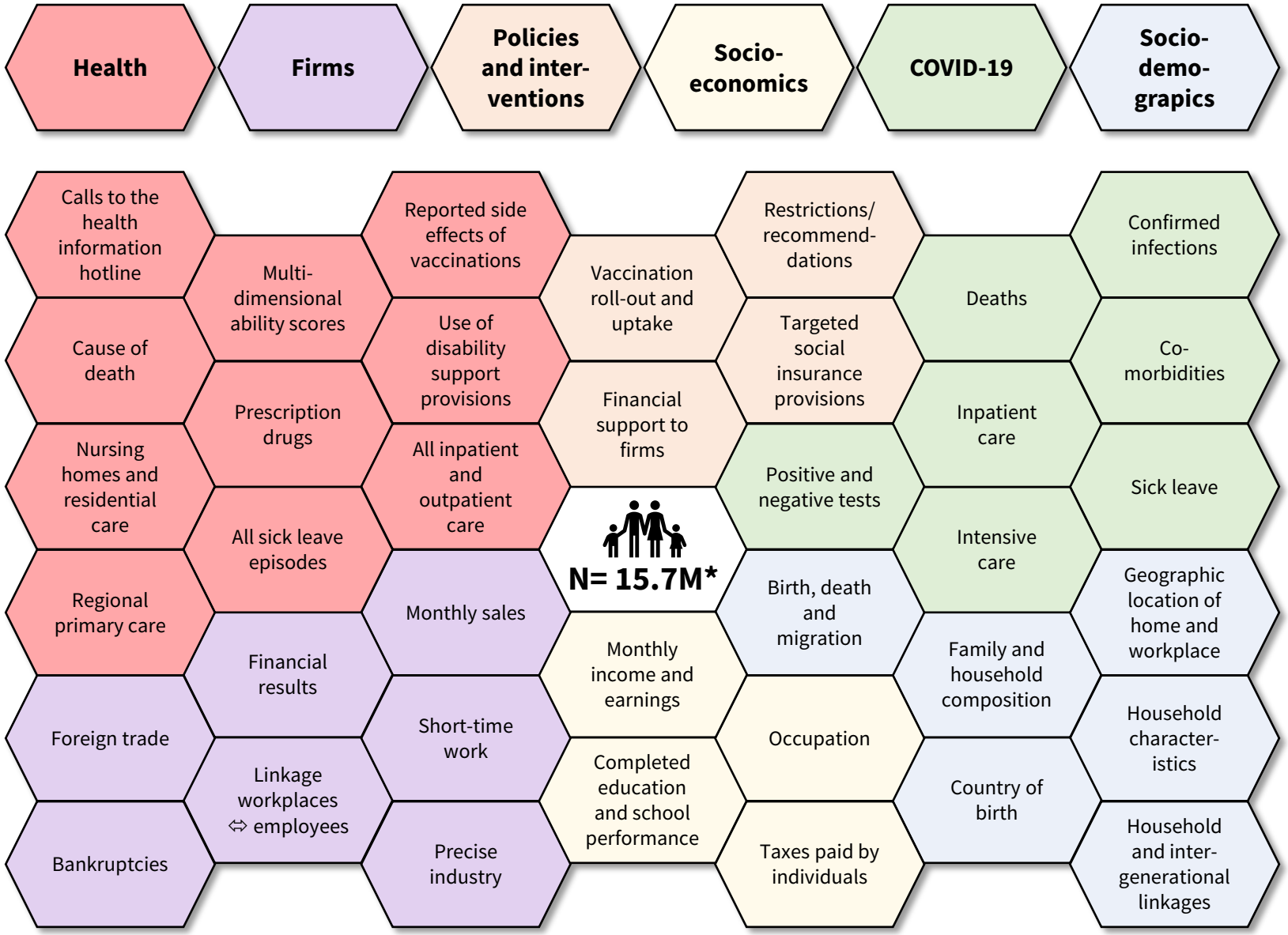
Coronakommissionen

- Unabhängiges Konsortium zur Beratung der Regierung während der Pandemie
- Februar 2022: Schlussraport der Kommission

SWECOV Projekt

- Fortsetzung von Forschungsaktivitäten der Kommission
- Laufzeit: 2022-2028
- Übergreifende Forschungsfragen:
  1. What are the **consequences of COVID-19**—as well as the interventions and reforms implemented to stop the spread of the virus—**on public health**, in terms of mortality and morbidity, but also on psychological and physiological well-being more broadly?
  2. What are the **consequences of the pandemic**—as well as the interventions and reforms implemented to stop the spread of the virus—on **central social and economic outcomes**, such as jobs, income, and equality?

SWECOV Daten



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SWECOV Organisation

Steering group






Koordinatoren



Teilnehmende

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Fallbeispiel: COVID-19 und Diabetes Typ 1

Research Letter

FREE

Type 1 Diabetes Incidence and Risk in Children With a Diagnosis of COVID-19

Andreas Weiss, MSc[1]; Ewan Donnachie, MSc[2]; Andreas Beyerlein, PhD[3]; et al

Weiss A, Donnachie E, Beyerlein A, Ziegler A, Bonifacio E. Type 1 Diabetes Incidence and Risk in Children With a Diagnosis of COVID-19. JAMA. 2023;329(23):2089–2091. doi:10.1001/jama.2023.8674

THE LANCET
Diabetes & Endocrinology

ARTICLES | VOLUME 12, ISSUE 8, P558-568, AUGUST 2024

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Incidence of diabetes after SARS-CoV-2 infection in England and the implications of COVID-19 vaccination: a retrospective cohort study of 16 million people

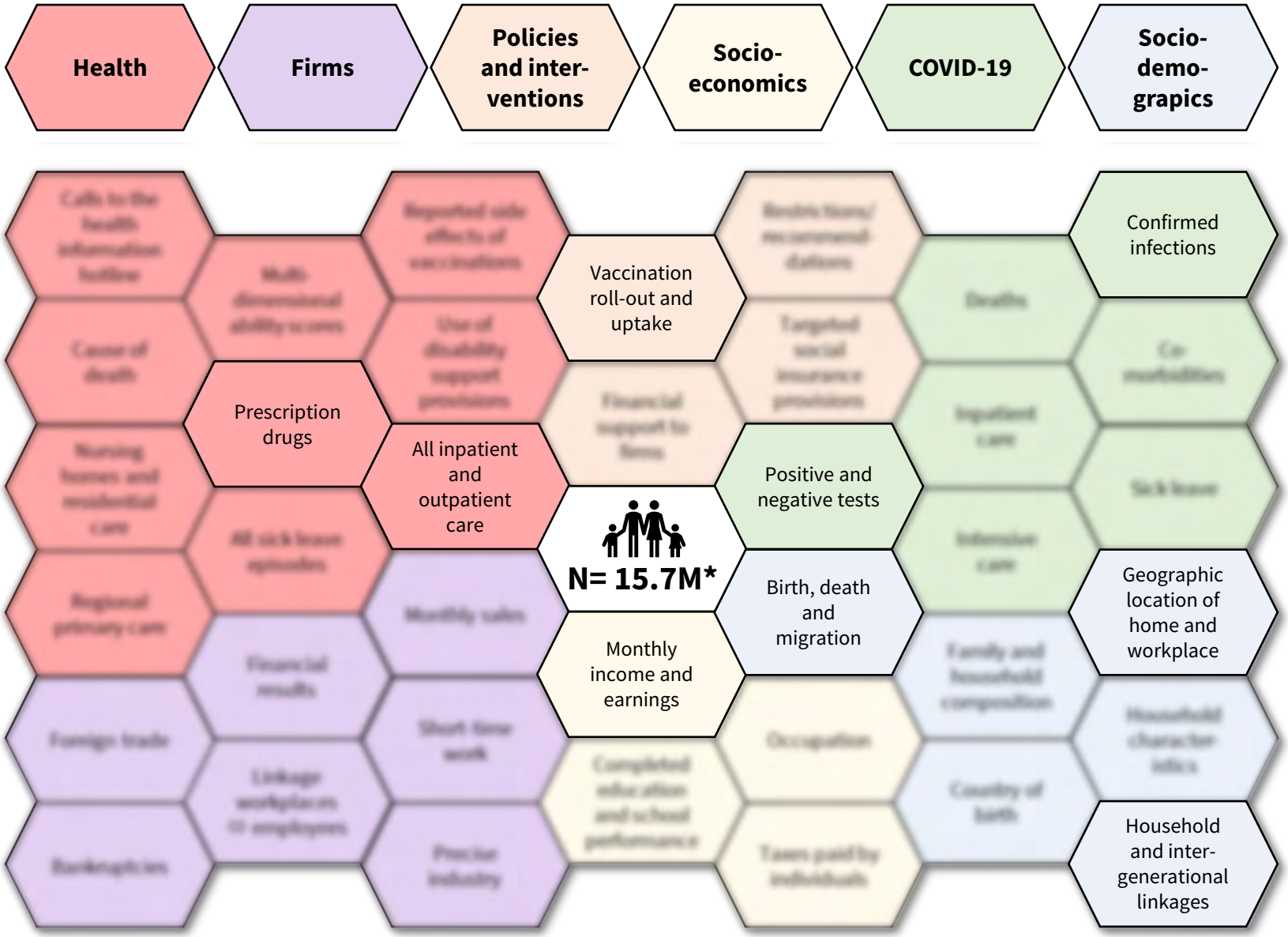
Kurt Taylor, PhD * • Sophie Eastwood, PhD * • Venexia Walker, PhD * • Genevieve Cezard, PhD • Rochelle Knight, MSc • Marwa Al Arab, PhD • et al. Show all authors • Show footnotes

Taylor, K., et al. (2024). "Incidence of diabetes after SARS-CoV-2 infection in England and the implications of COVID-19 vaccination: a retrospective cohort study of 16 million people." The Lancet Diabetes & Endocrinology **12(8): 558-568.**

Inwiefern beeinflusste die COVID-19 Pandemie die Inzidenz von Diabetes Typ 1 in Schweden?

Welchen Effekt hatten SARS-CoV-2 Infektionen?

Fallbeispiel: Daten



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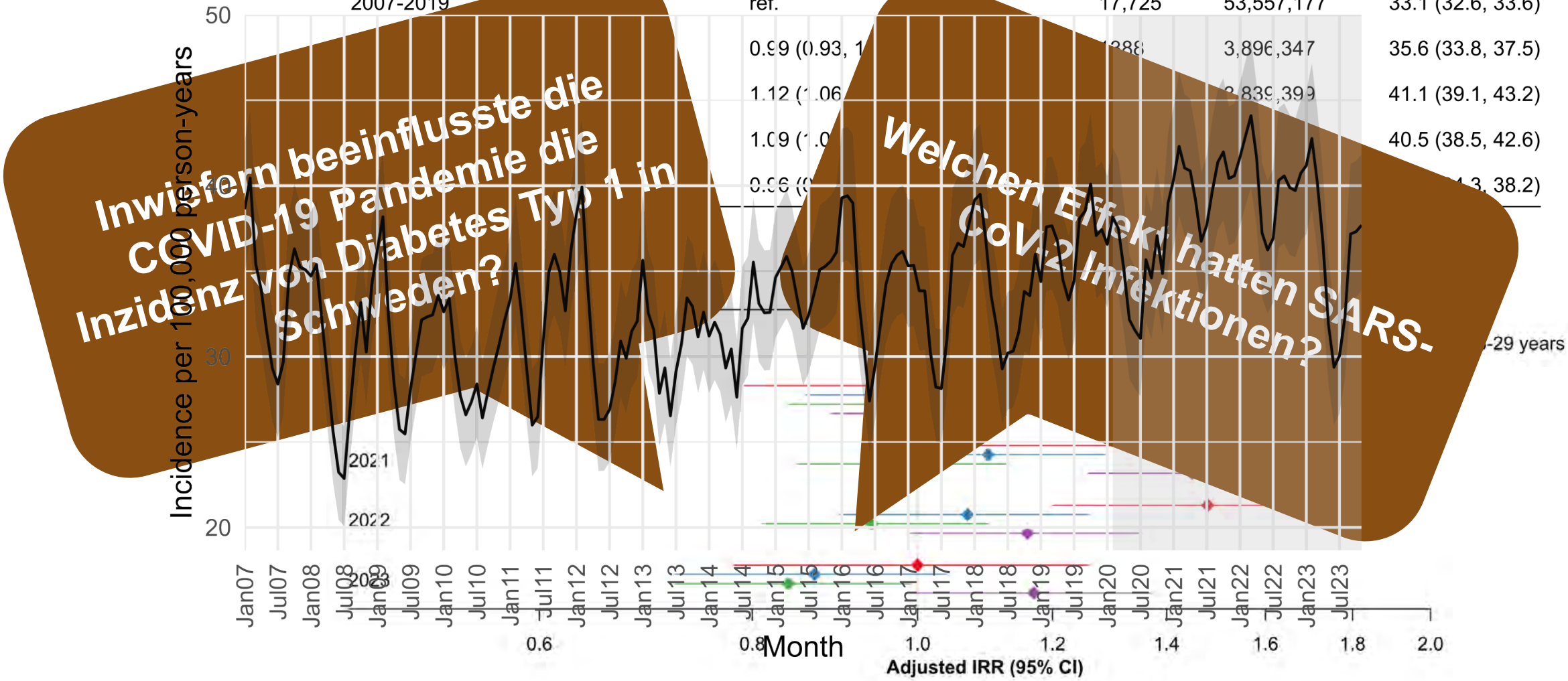
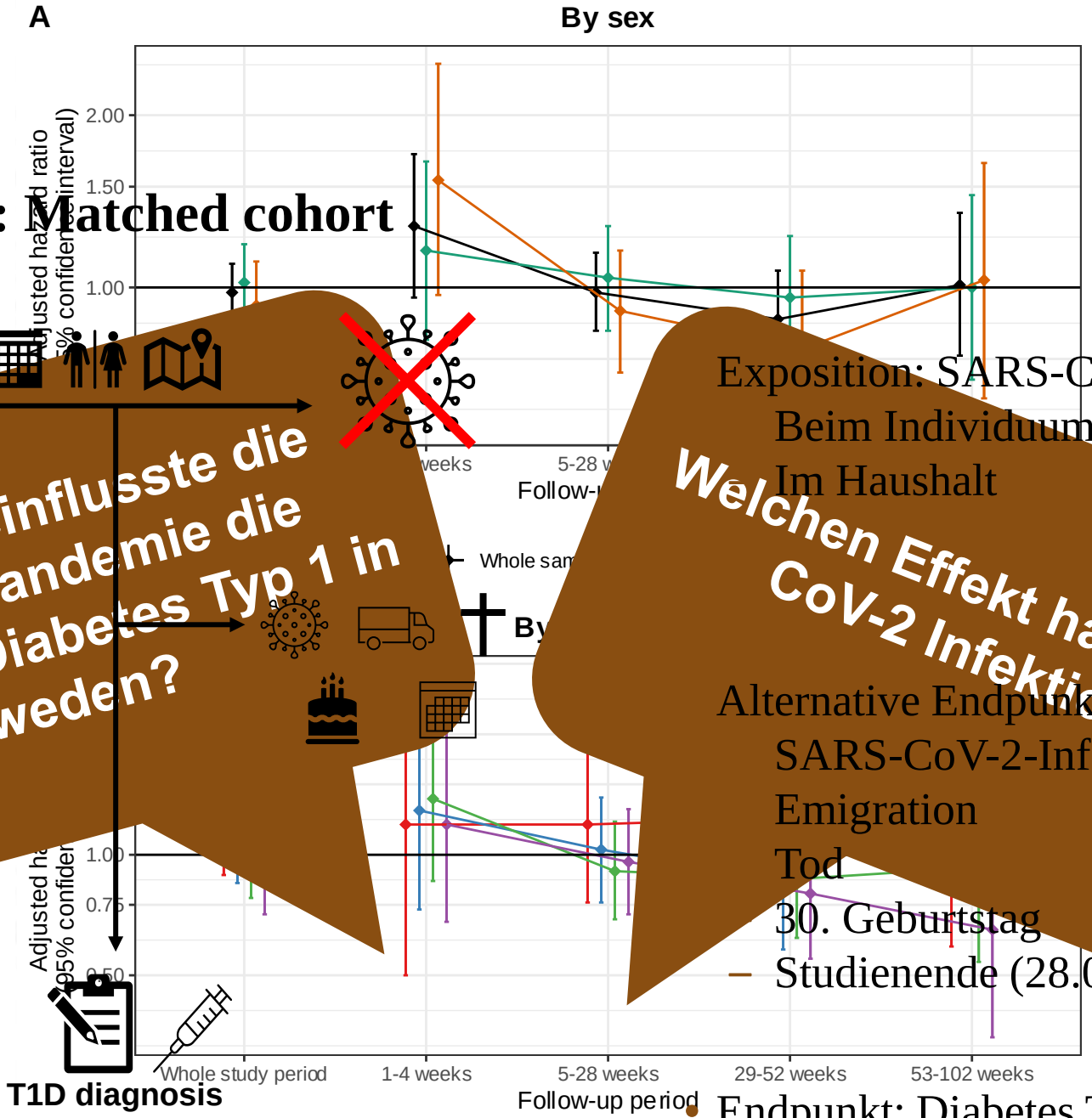
Year	Adj. IRR (95%CI)	*p*	Cases	Pyrs	IR (95%CI)
2007-2019	ref.		17,725	53,557,177	33.1 (32.6, 33.6)
2020	0.99 (0.93, 1		388	3,896,347	35.6 (33.8, 37.5)
2021	1.12 (1.06			3,839,399	41.1 (39.1, 43.2)
2022	1.09 (1.0				40.5 (38.5, 42.6)
2023	0.96 (0				3, 38.2)

Inwiefern beeinflusste die COVID-19 Pandemie die Inzidenz von Diabetes Typ 1 in Schweden?

Welchen Effekt hatten SARS-CoV-2 Infektionen?



Studiendesign: Matched cohort



Inwiefern beeinflusste die COVID-19 Pandemie die Inzidenz von Diabetes Typ 1 in Schweden?

Welchen Effekt hatten SARS-CoV-2 Infektionen?

Exposition: SARS-CoV-2 Infektion
- Beim Individuum
- Im Haushalt

Alternative Endpunkte:
- SARS-CoV-2-Infektion im Haushalt
- Emigration
- Tod
- 30. Geburtstag
- Studienende (28.02.2022)

T1D diagnosis

Endpunkt: Diabetes Typ 1 Diagnose

Diskussion

- Die **Diabetes Typ 1 Inzidenz war in 2021 und 2022 erhöht**, vor allem bei Kindern under 5 Jahren und jungen Männern.
- **SARS-CoV-2 Infektionen** können allenfalls die Entwicklung klinischer Symptome **beschleunigen**
- Der mögliche Effekt von SARS-CoV-2 Infektionen kann **nicht den ganzen Anstieg der Inzidenz erklären**.
- Mögliche **alternative Ursachen**:
  - Verschlechtertes Gesundheitsverhalten (“accelerator hypothesis”)
  - Weniger Infektionen in der frühen Kindheit (“hygiene hypothesis”)
- Die **schnelle Evaluation** der Trends in Diabetes Typ 1 war nur möglich dank einer **existierenden Dateninfrastruktur**

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Herzlichen Dank!!

Elsa Palmkvist

Jonas Björk

Annelie Carlsson

SWECOV
Swedish COVID-19 Research

RIKSBANKENS JUBILEUMSFOND
FRÄMJAR HUMANIORA OCH SAMHÄLLSVETENSKAP

Vetenskapsrådet

VINNOVA

Stockholms universitet

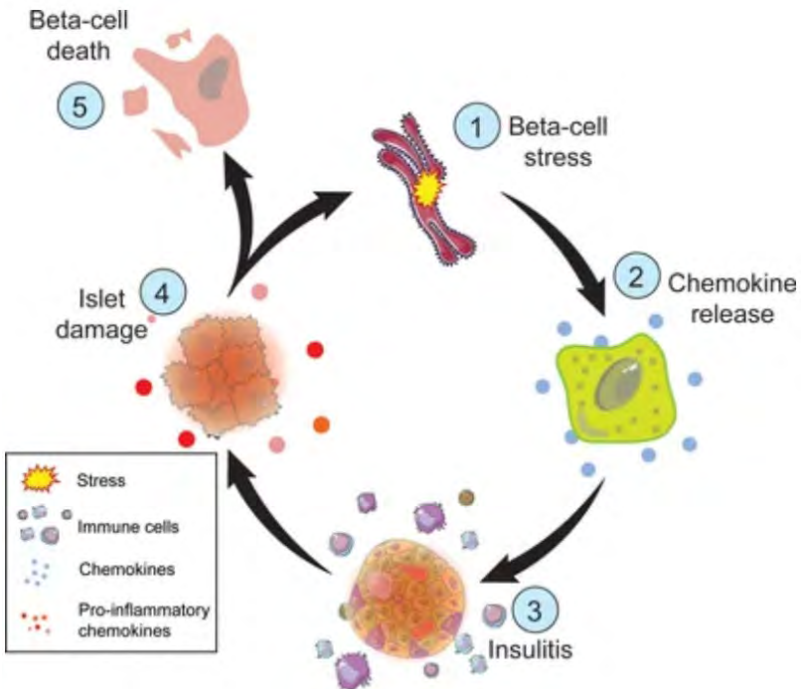
Barndiabetesfonden
För kampen mot typ 1-diabetes

Stiftelsen för Strategisk Forskning

Lund University

Type 1 Diabetes

- Type 1 diabetes (T1D) is an auto-immune disease affecting insulin-producing cells in the pancreas
- Pathogenesis of T1D is not fully understood
  - Genetic disposition plays a mayor role
  - Social and environmental factors can trigger the development of T1D
  - These also include viral infections



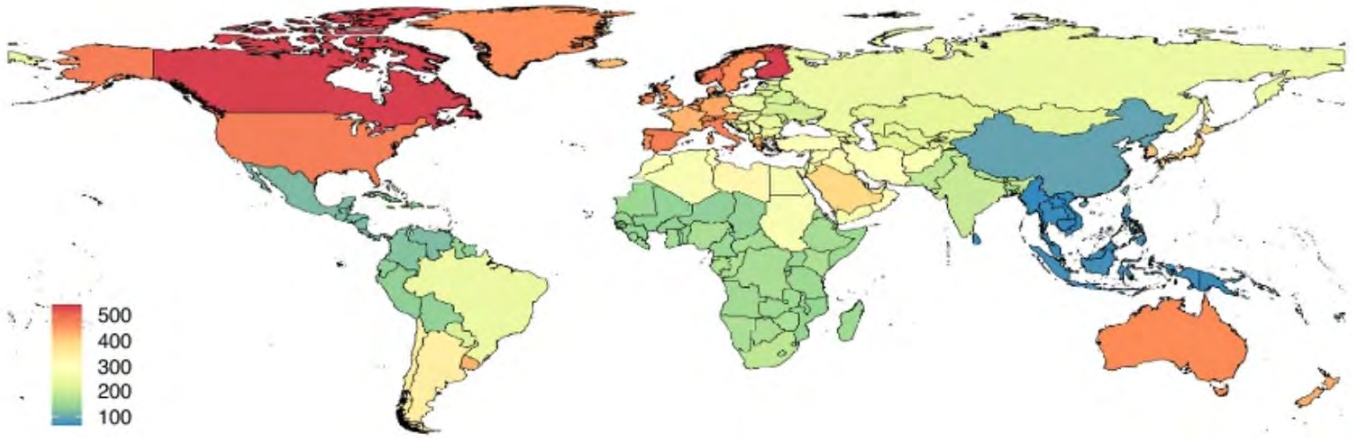
Toren E, Burnette KS, Banerjee RR, Hunter CS and Tse HM (2021) Partners in Crime: Beta-Cells and Autoimmune Responses Complicit in Type 1 Diabetes Pathogenesis. *Front. Immunol.* 12:756548. doi: 10.3389/fimmu.2021.756548

COVID-19 and T1D

- Evidence on the association of SARS-CoV-2 infections and new-onset T1D is inconclusive
- Early reports from the CDC, a recent study in England as well as some multi-country studies and meta-analyses reported increases in the risk of new-onset T1D after SARS-CoV-2 infection among children and adolescents
- Other studies in Denmark and Scotland did not find such associations

Type 1 Diabetes

- Incidence rate in 2019:
  - Globally: 11 per 100 000
  - Sweden: 27 per 100 000
- Accelerated increase in T1D incidence during the first pandemic years

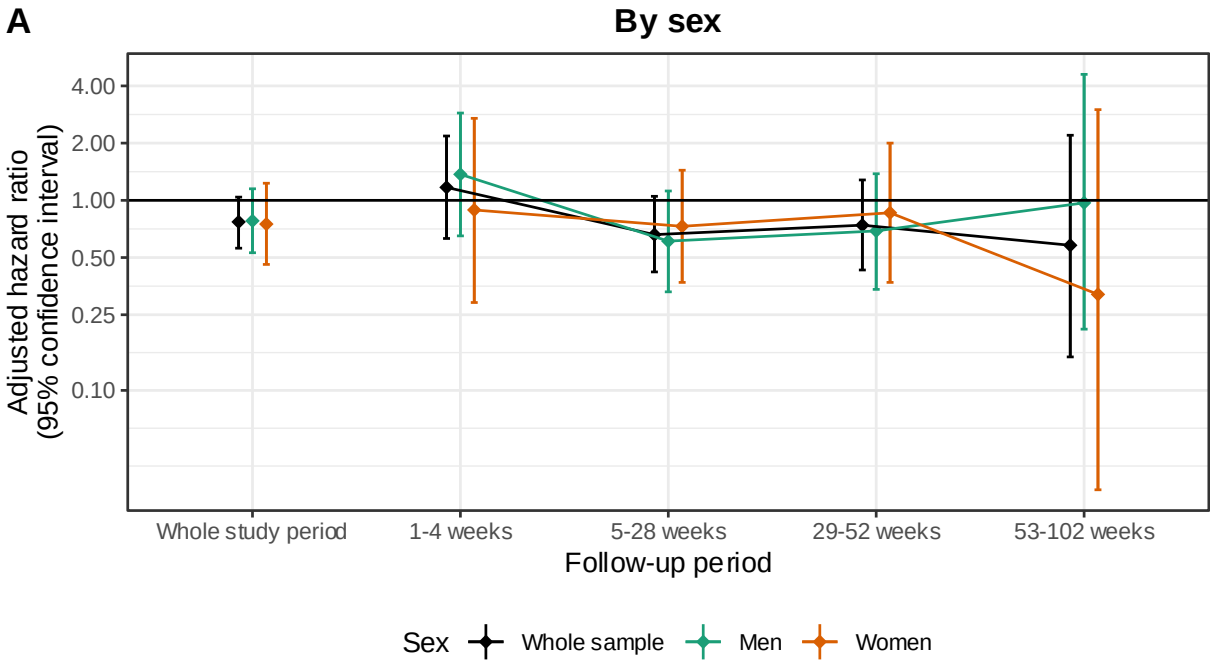


Gong, B., Yang, W., Xing, Y. *et al.* Global, regional, and national burden of type 1 diabetes in adolescents and young adults. *Pediatr Res* (2024). https://doi.org/10.1038/s41390-024-03107-5

Data sources and study population

- Data sources:
  - T1D
    - Patient register
    - Prescribed drugs register
    - National diabetes register
  - SARS-CoV-2 infections
    - SMINet
  - Socio-demographic factors / household + family composition
    - Total population register
    - Multi-generation register
    - LISA
- Study population
  - All individuals under 30 years
  - Resident in Sweden at some point during the study period
  - No prior T1D diagnosis

A



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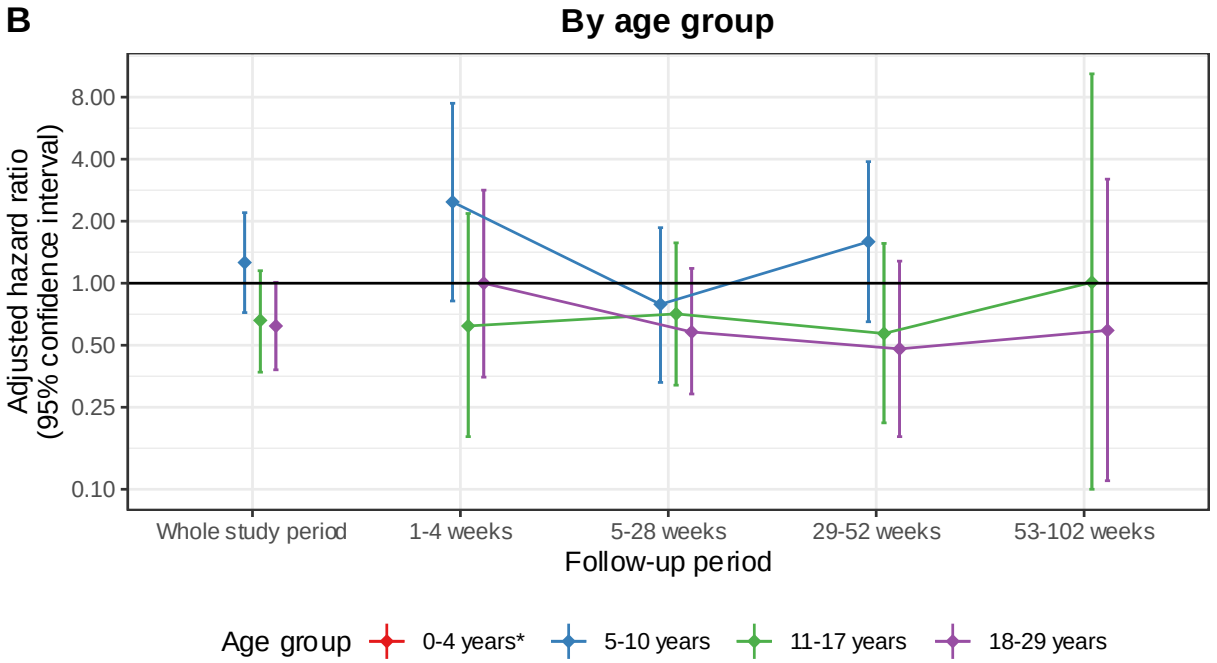

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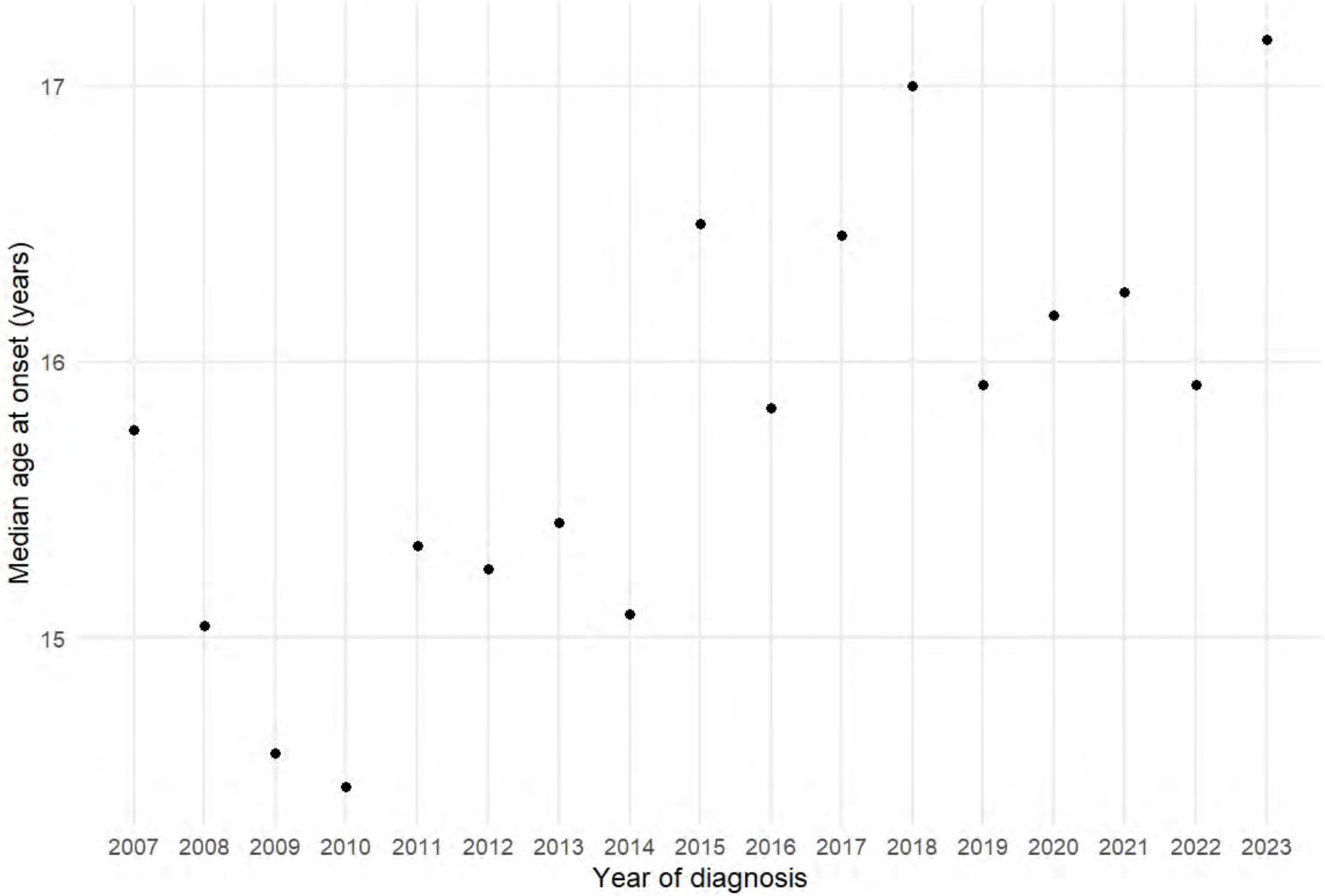

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