

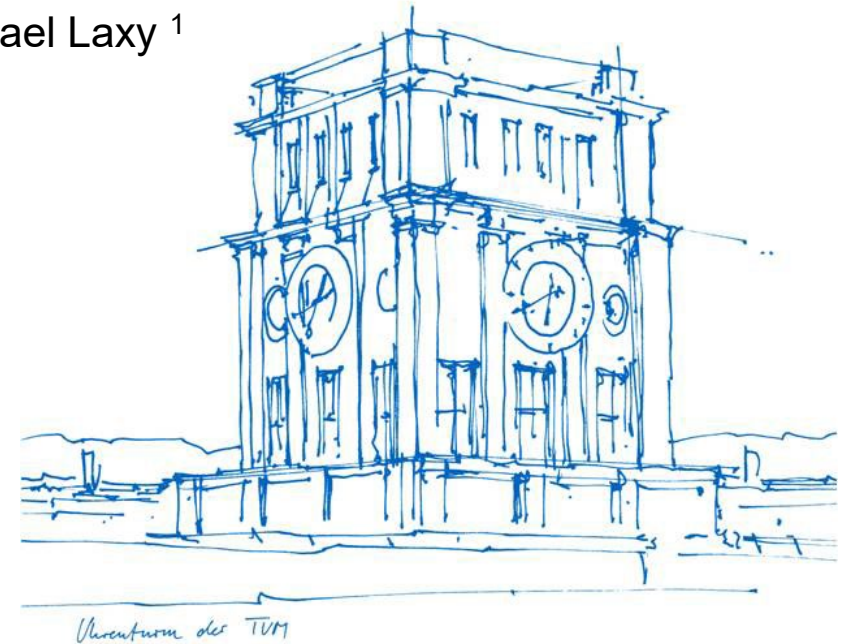
Establishing the long-term health and economic effects of screening interventions for type 1 diabetes

Katharina Schoder, MSc¹

Project Team: Dr. Renee Stark¹, Dr. Michael Hanselmann¹, Prof. Dr. Michael Laxy¹

¹ Professorship of Public Health and Prevention
School of Medicine and Health
Technical University of Munich

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Katharina Schoder has no conflicts of interest.

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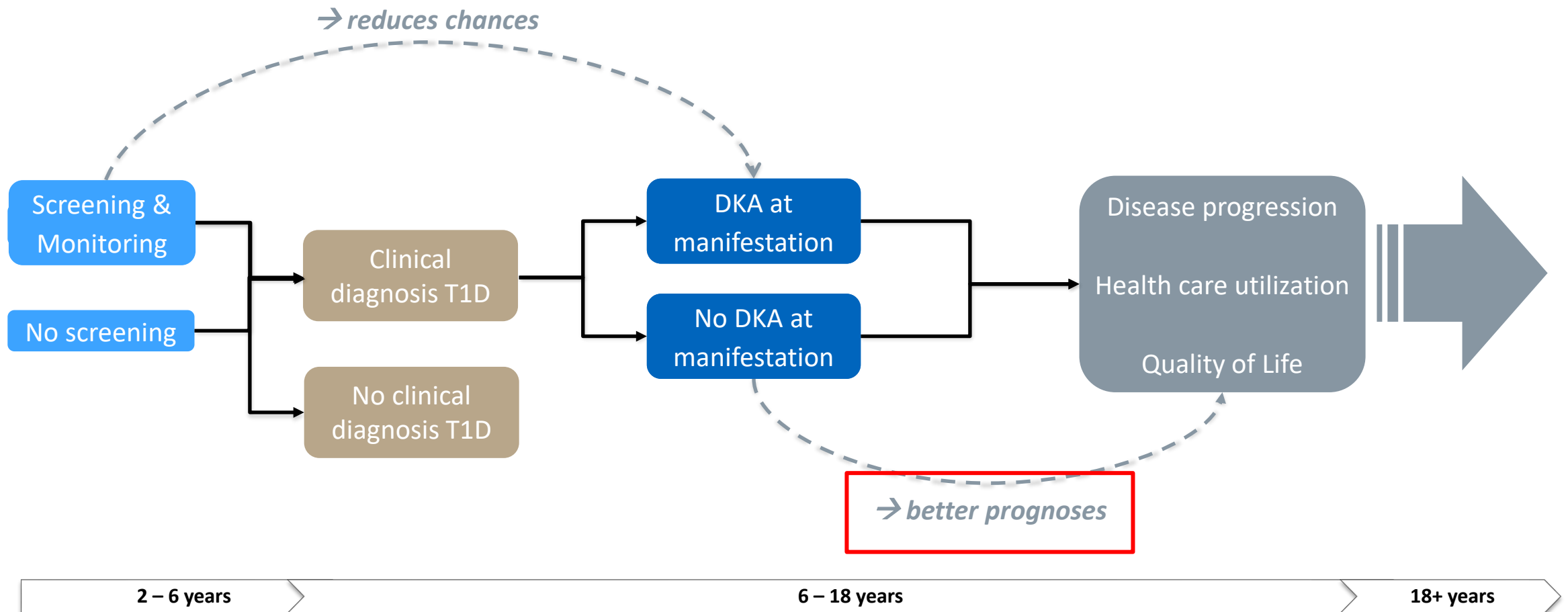
Background

- Public health screening of children for islet autoantibodies as implemented in Fr1da is feasible and is linked to better clinical presentation at manifestation of type 1 diabetes (*Ziegler et al. JAMA 2020, Hummel et al. Diabetologia 2023*)
- Screening comes with additional costs and the long-term cost-effectiveness of the screening is unknown (*Karl et al. Diabetes Care 2022*)

Objective

To analyze the cost-effectiveness of the Fr1da Public Health Screening in children for pre-symptomatic type 1 diabetes (T1D)

Model conceptualization



Data Source

Diabetes Patient Registry



Longitudinal data
registry of diabetes
patients in Germany,
Austria, Switzerland and
Luxembourg since 1995



Patient-level data

- patient characteristics
- medical treatments
- inpatient and outpatient care
- therapy results
- concomitant diagnoses and complications



Information on over
90% of pediatric T1D
patients in Germany

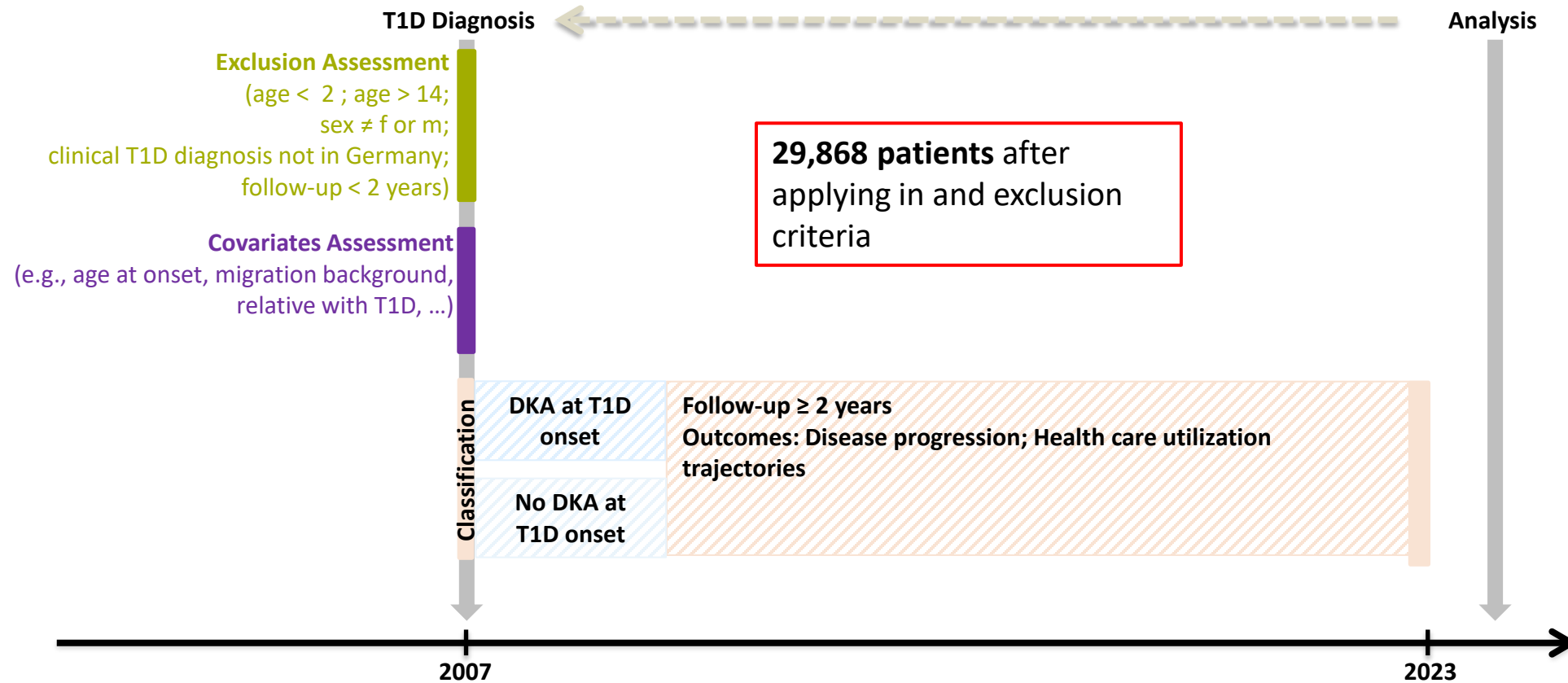


Retrospective cohort
study

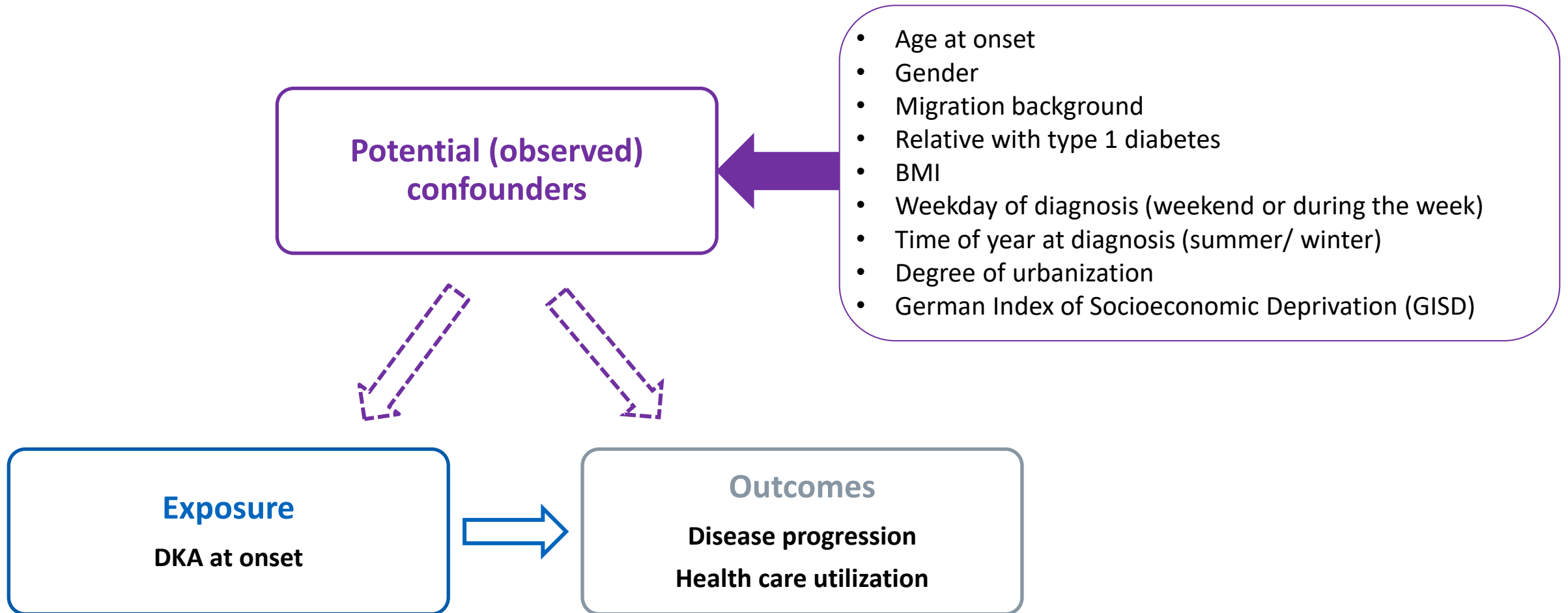


Long-term effects of
DKA at manifestation

Retrospective cohort study: Effect of DKA



Assessment of Variables for Matching

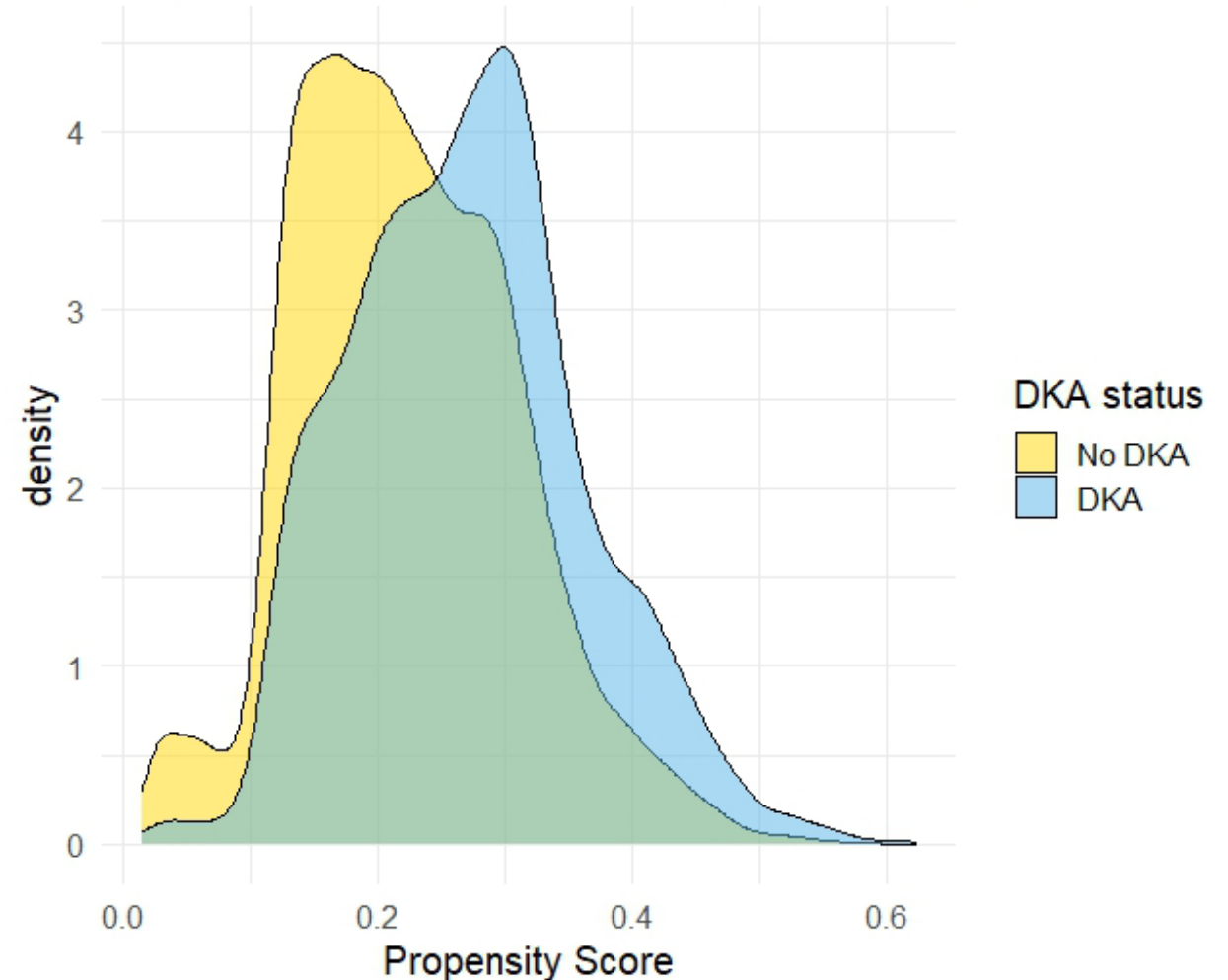


Baseline Characteristics at onset of T1D

	Unmatched	
	DKA	No DKA
total	6,932	22,936
Age at onset	8.98 (± 3.64)	8.83 (± 3.53)
Gender		
<i>Male</i>	3,655 (53%)	12,308 (54%)
<i>Female</i>	3,277 (47%)	10,628 (46%)
Migration background	1,973 (28%)	5,020 (22%)
Degree of urbanization		
<i>Urban</i>	2,320 (33%)	7,767 (34%)
<i>Suburban</i>	2,523 (36%)	8,561 (37%)
<i>Rural</i>	2,039 (29%)	6,460 (28%)
GISD*		
<i>Low</i>	2,170 (31%)	7,284 (32%)
<i>Middle</i>	2,382 (34%)	8,030 (35%)
<i>High</i>	2,380 (34%)	7,622 (33%)
Weekday of diagnosis		
<i>Weekend</i>	1,196 (17%)	2,675 (11%)
<i>In the week</i>	5,736 (83%)	20,261 (88%)
Time of year at diagnosis		
<i>Summer (Apr. - Sept.)</i>	3,315 (48%)	10,491 (46%)
<i>Winter (Oct. - March)</i>	3,617 (52%)	12,445 (54%)
Relative w/ T1D	99 (1%)	1,115 (5%)
BMI SDS 3 months after onset	0.07 (± 1.15)	0.03 (± 1.07)

Mean(SD), N(%); *German Index of Socioeconomic Deprivation

Propensity Score Distribution (All Patients)

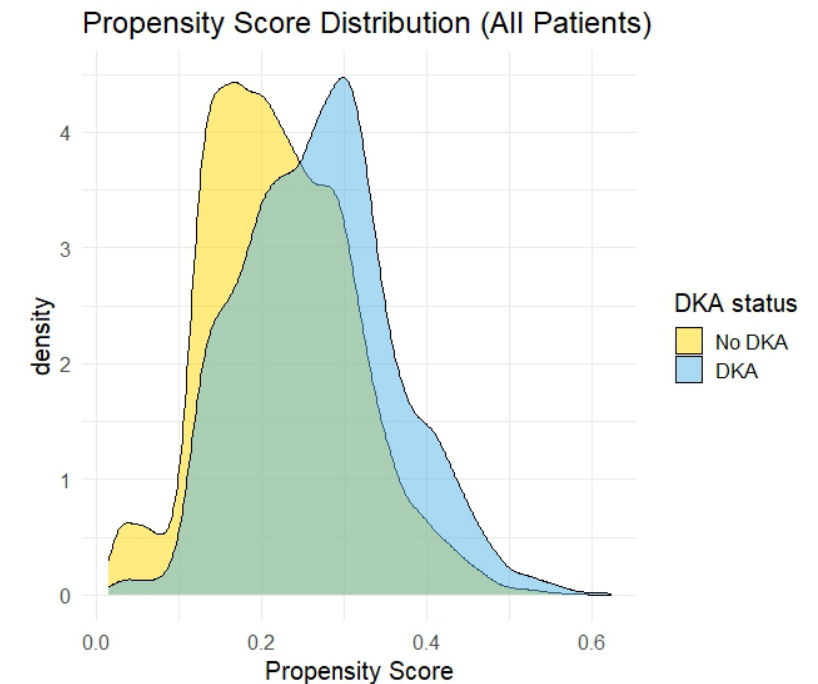


Model parametrization

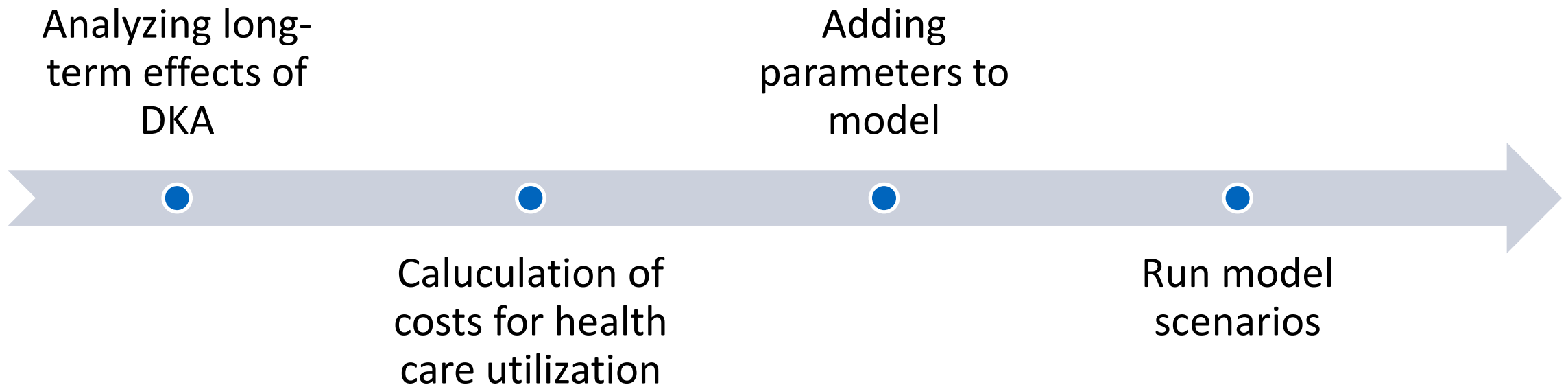
Baseline Characteristics at onset of T1D

	<u>Unmatched</u>		<u>Matched</u>	
	DKA	No DKA	DKA	No DKA
total	6,932	22,936	6,547	6,547
Age at onset	8.98 (± 3.64)	8.83 (± 3.53)	8.99 (± 3.64)	9.03 (± 3.50)
Gender				
<i>Male</i>	3,655 (53%)	12,308 (54%)	3,441 (53%)	3,436 (52%)
<i>Female</i>	3,277 (47%)	10,628 (46%)	3,106 (47%)	3,111 (48%)
Migration background	1,973 (28%)	5,020 (22%)	1,884 (29%)	1,904 (29%)
Degree of urbanization				
<i>Urban</i>	2,320 (33%)	7,767 (34%)	2,204 (34%)	2,206 (34%)
<i>Suburban</i>	2,523 (36%)	8,561 (37%)	2,398 (37%)	2,437 (37%)
<i>Rural</i>	2,039 (29%)	6,460 (28%)	1,945 (30%)	1,904 (29%)
GISD*				
<i>Low</i>	2,170 (31%)	7,284 (32%)	2,074 (32%)	2,040 (31%)
<i>Middle</i>	2,382 (34%)	8,030 (35%)	2,264 (35%)	2,298 (35%)
<i>High</i>	2,380 (34%)	7,622 (33%)	2,209 (34%)	2,209 (34%)
Weekday of diagnosis				
<i>Weekend</i>	1,196 (17%)	2,675 (11%)	1,127 (17%)	1,109 (17%)
<i>In the week</i>	5,736 (83%)	20,261 (88%)	5,420 (83%)	5,438 (83%)
Time of year at diagnosis				
<i>Summer (Apr. - Sept.)</i>	3,315 (48%)	10,491 (46%)	3,148 (48%)	3,102 (47%)
<i>Winter (Oct. - March)</i>	3,617 (52%)	12,445 (54%)	3,399 (52%)	3,445 (53%)
Relative w/ T1D	99 (1%)	1,115 (5%)	99 (2%)	366 (6%)
BMI SDS 3 months after onset	0.07 (± 1.15)	0.03 (± 1.07)	0.07 (± 1.15)	0.08 (± 1.08)

Mean(SD), N(%); *German Index of Socioeconomic Deprivation



RESULTS SUBJECT TO CHANGE



Florian M. Karl, Christiane Winkler, Anette-Gabriele Ziegler, Michael Laxy, Peter Achenbach; Costs of Public Health Screening of Children for Presymptomatic Type 1 Diabetes in Bavaria, Germany. Diabetes Care 1 April 2022; 45 (4): 837–844. <https://doi.org/10.2337/dc21-1648>

Hummel, S., Carl, J., Friedl, N. et al. Children diagnosed with presymptomatic type 1 diabetes through public health screening have milder diabetes at clinical manifestation. Diabetologia 66, 1633–1642 (2023). <https://doi.org/10.1007/s00125-023-05953-0>

Ziegler A, Kick K, Bonifacio E, et al. Yield of a Public Health Screening of Children for Islet Autoantibodies in Bavaria, Germany. JAMA. 2020;323(4):339–351. doi:10.1001/jama.2019.21565