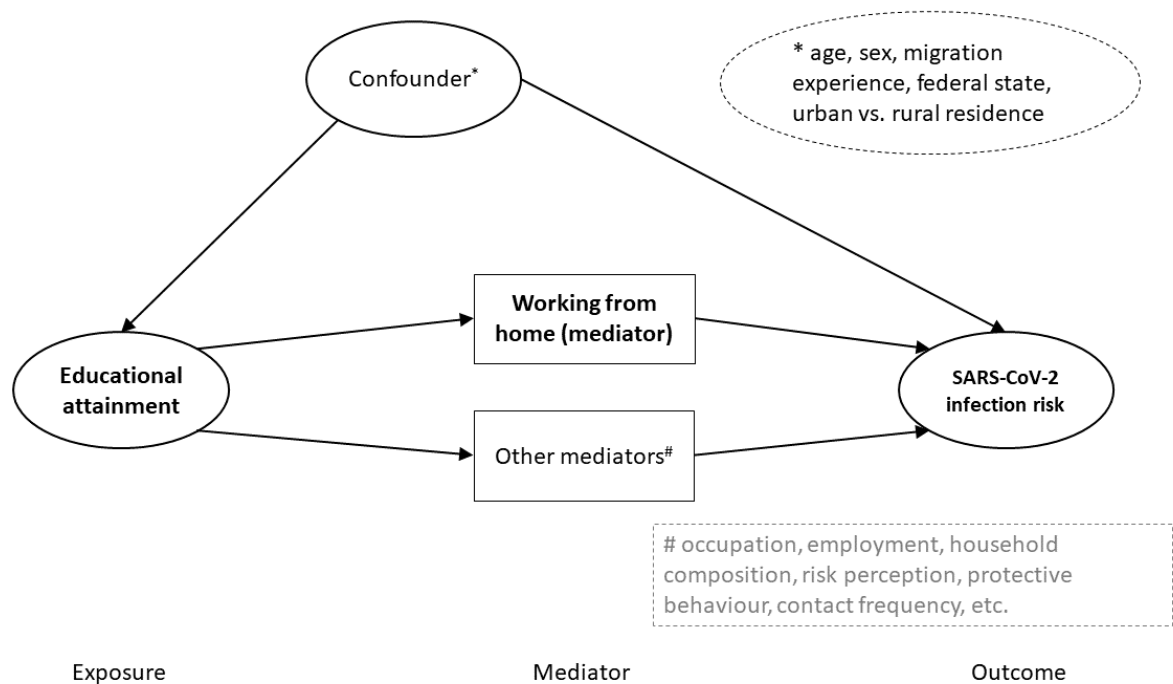


Education and pandemic SARS-CoV-2 infections in the German working population – the mediating role of working from home¹

by Benjamin Wachtler, MD, MSc,¹ Florian Beese, MPH,¹ Ibrahim Demirel, PhD, MSc,² Sebastian Haller, MD, MPH, MSc,³ Timo-Kolja Pförtner, PhD, MSc,⁴ Morten Wahrendorf, PhD, MSc,⁵ Markus M Grabka, DrPH, MA,⁶ Jens Hoebel, DrPH, MSc¹

1. Supplementary material
2. Correspondence to: Dr Benjamin Wachtler, ORCID ID 0000-0002-3959-5676, Department of Epidemiology and Health Monitoring, Robert Koch Institute, Nordufer 20, 13353 Berlin, Germany. [E-mail: wachtlerb@rki.de]

Supplementary Material 1 Simplified directed acyclic graph (DAG) for the mediation analysis



Supplementary Material 2 Model code for the comprehensive directed acyclic graph (DAG) for the mediation analysis for the use with the R package dagitty or online (www.dagitty.net)

```
dag {  
  bb="-1.478,-1.935,2.008,1.677"  
  "Contact Frequency" [pos="0.285,0.712"]  
  "Date of Participation" [pos="1.479,-1.770"]  
  "Household Composition" [pos="-0.476,-1.649"]  
  "Infection risk" [outcome,pos="1.491,0.247"]  
  "Migration Status" [adjusted,pos="-0.015,-1.784"]  
  "Mobility / Mode of Transport" [latent,pos="0.337,0.421"]  
  "Place of Residence" [adjusted,pos="0.483,1.158"]  
  "Protective Behaviour" [latent,pos="0.285,-1.065"]  
  "Risk perception" [latent,pos="0.279,-0.843"]  
  "Urban vs. Rural dwelling" [adjusted,pos="0.634,1.360"]  
  "Working from Home" [pos="0.296,-0.030"]  
  Age [adjusted,pos="-0.953,1.067"]  
  Education [exposure,pos="-1.024,0.205"]  
  Employment [pos="-0.457,-1.261"]  
  Housing [pos="0.285,-0.470"]  
  Occupation [pos="-0.434,1.184"]  
  Sex [adjusted,pos="-0.943,-0.960"]  
  "Contact Frequency" -> "Infection risk"  
  "Date of Participation" -> "Infection risk"  
  "Household Composition" -> "Infection risk"  
  "Household Composition" -> "Working from Home"  
  "Household Composition" -> Employment  
  "Migration Status" -> "Date of Participation"  
  "Migration Status" -> "Infection risk"  
  "Migration Status" -> Housing  
  "Migration Status" <-> Education
```

"Mobility / Mode of Transport" -> "Infection risk"

"Place of Residence" -> "Contact Frequency"

"Place of Residence" -> "Date of Participation"

"Place of Residence" -> "Infection risk"

"Place of Residence" -> "Working from Home"

"Place of Residence" <-> Education

"Protective Behaviour" -> "Infection risk"

"Risk perception" -> "Infection risk"

"Risk perception" -> "Protective Behaviour"

"Urban vs. Rural dwelling" -> "Contact Frequency"

"Urban vs. Rural dwelling" -> "Infection risk"

"Urban vs. Rural dwelling" -> "Working from Home"

"Urban vs. Rural dwelling" <-> Education

"Working from Home" -> "Infection risk"

Age -> "Infection risk"

Age -> "Protective Behaviour"

Age -> "Risk perception"

Age -> "Working from Home"

Age -> Education

Age -> Employment

Age -> Housing

Age -> Occupation

Education -> "Contact Frequency"

Education -> "Household Composition"

Education -> "Infection risk" [pos="0.105,0.237"]

Education -> "Mobility / Mode of Transport"

Education -> "Protective Behaviour"

Education -> "Risk perception"

Education -> "Working from Home"

Education -> Employment

Education -> Housing

Education -> Occupation

Employment -> "Contact Frequency"

Employment -> "Mobility / Mode of Transport"

Employment -> "Protective Behaviour"

Employment -> "Risk perception"

Employment -> "Working from Home"

Housing -> "Infection risk"

Occupation -> "Contact Frequency"

Occupation -> "Infection risk"

Occupation -> "Mobility / Mode of Transport"

Occupation -> "Working from Home"

Sex -> "Infection risk"

Sex -> "Protective Behaviour"

Sex -> "Risk perception"

Sex -> "Working from Home"

Sex -> Education

Sex -> Employment

Sex -> Occupation

}

Supplementary Material 3 Odds ratios (OR) and 95% confidence intervals (95% CI) for SARS-CoV-2 infections by educational attainment, frequency of working from home and the interaction between education (exposure) and frequency of working from home (outcome)

		OR	95% CI	p-value
Educational attainment	Very high (ref.)			
	High	1.66	0.76 – 3.59	0.202
	Medium	1.78	0.87 – 3.63	0.112
	Low	1.63	0.71 – 3.77	0.251
Work from home	No possibility (ref.)			
	≤ Every two weeks	1.56	0.54 – 4.47	0.407
	Several times per week	0.62	0.2 – 1.91	0.403
	Daily	0.70	0.28 – 1.77	0.252
Educational attainment # work from home	Low # ≤ Every two weeks	0.31	0.04 – 2.21	0.231
	Low # Several times per week	empty		
	Low # Daily	empty		
	Medium # ≤ Every two weeks	0.32	0.1 – 1.07	0.063
	Medium # Several times per week	1.29	0.37 – 4.49	0.693
	Medium # Daily	0.75	0.25 – 2.26	0.610
	High # ≤ Every two weeks	0.79	0.22 – 2.84	0.717
	High # Several times per week	1	0.27 – 3.72	0.997
	High # Daily	0.97	0.28 – 3.36	0.370

Chi square test (null hypothesis: Educational attainment # Work from home = 0):

Chi square = 11.12, p-value = 0.677

Supplementary Material 4 Relative risk of SARS-CoV-2 infection by educational attainment and frequency of working from home -Comparison of the estimates from a Model without adjustment for household composition (Model1) and with adjustment for household composition (Model 2)

		Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
		PR	PR	PR	PR	PR	PR
Education	Very high (ref.)	(ref)	(ref)			(ref.)	(ref.)
	High	1.51	1.51			1.34	1.34
	Medium	1.66	1.68			1.34	1.36
	Low	1.76	1.71			1.27	1.26
Possibility to work from home	No possibility			(ref.)	(ref.)	(ref.)	(ref.)
	≤ Every two weeks			0.85	0.85	0.88	0.88
	Several times per week			0.61	0.60	0.65	0.64
	Daily			0.55	0.55	0.59	0.60

PR = prevalence ratio

Model 1 = Poisson regression model adjusted for age, sex, migration experience, federal state and urban versus rural residence.

Model 2 = Poisson regression model adjusted for age, sex, migration experience, federal state, urban versus rural residence and household composition.