

## SUPPLEMENTARY MATERIAL

S1: Adjusted and unadjusted multiple logistic regression model for the association of nickel allergy or pierced ears with incident wheezing for males and females, non-imputed data, excluding those with wheezing at baseline

	male (n=759)				female (n=1009)			
	n=736		n=715		n=972		n=913	
	cOR*	95 %CI	aOR**	95 %CI	cOR*	95 %CI	aOR**	95 %CI
<b>nickel allergy</b>								
never		1		1		1		1
ever	3.08	1.41-6.72	2.71	1.17-6.30	1.78	1.10-2.88	1.64	0.99-2.72
<b>pierced ears</b>								
no		1		1		1		1
yes	2.24	1.20-4.18	2.22	1.07-4.62	1.56	0.62-3.97	1.23	0.47-3.18

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

\*cOR: crude (unadjusted) Odds Ratio

\*\*Odds Ratio adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of asthma

S2: Adjusted and unadjusted multiple logistic regression model for the association of nickel allergy or pierced ears with incident asthma for males and females, non-imputed data, excluding those with asthma at baseline

	male				female			
	n=767		n=743		n=1073		n=1006	
	cOR*	95 %CI	aOR**	95 %CI	cOR*	95 %CI	aOR**	95 %CI
<b>nickel allergy</b>								
never		1		1		1		1
ever	5.25	1.61-17.08	5.01	1.42-17.70	1.01	0.41-2.49	0.97	0.38-2.47
<b>pierced ears</b>								
no		1		1		1		1
yes	3.03	1.06-8.64	2.95	0.86-10.11	1.02	0.24-4.45	0.94	0.21-4.22

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

\*cOR: crude (unadjusted) Odds Ratio

\*\*Odds Ratio adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of asthma

S3: Adjusted and unadjusted multiple logistic regression model for the association of nickel allergy or pierced ears with incident rhinoconjunctivitis for males and females, non-imputed data, excluding those with rhinoconjunctivitis at baseline

	male				female			
	n=643		n=619		n=872		n=832	
	cOR*	95 %CI	aOR**	95 %CI	cOR*	95 %CI	aOR**	95 %CI
<b>nickel allergy</b>								
never		1		1		1		1
ever	1.41	0.63-3.14	1.46	0.64-3.33	1.11	0.75-1.67	1.01	0.66-1.55
<b>pierced ears</b>								
no		1		1		1		1
yes	0.96	0.54-1.71	1.03	0.54-1.94	1.36	0.66-2.79	1.40	0.67-2.91

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

\*cOR: crude (unadjusted) Odds Ratio

\*\*Odds Ratio adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of rhinitis

S4: Effect estimates for potential confounders, multiple logistic regression model for the association of self-reported nickel allergy and incident wheezing, asthma and rhinoconjunctivitis for males and females, imputed data, excluding those with <sup>†</sup> wheezing, <sup>‡</sup> asthma and <sup>§</sup> rhinoconjunctivitis at baseline

incident wheezing <sup>†</sup>				
	male (n=759)		female (n=1009)	
	OR	95 %CI	OR	95 %CI
ever smoking	2.27	1.22-4.24	2.34	1.43-3.86
low parental SES <sup>¶</sup>	0.97	0.51-1.86	1.12	0.67-1.89
low participant's SES <sup>¶</sup>	0.87	0.45-1.69	1.49	0.89-2.52
study centre (Dresden)	0.65	0.35-1.18	0.93	0.57-1.50
present parental history of asthma <sup>+</sup>	3.30	1.55-7.02	1.13	0.49-2.60
incident asthma <sup>‡</sup>				
	male (n=801)		female (n=1124)	
	OR	95 %CI	OR	95 %CI
ever smoking	1.71	0.56-5.16	1.24	0.51-3.00
low parental SES <sup>¶</sup>	0.71	0.22-2.24	1.60	0.62-4.15
low participant's SES <sup>¶</sup>	2.00	0.59-6.74	1.38	0.54-3.54
study centre (Dresden)	0.61	0.21-1.78	1.18	0.49-2.81
present parental history of asthma <sup>+</sup>	7.50	2.47-22.79	2.86	0.90-9.02
incident rhinoconjunctivitis <sup>§</sup>				
	male (n=666)		female (n=912)	
	OR	95 %CI	OR	95 %CI
ever smoking	1.19	0.72-1.95	0.94	0.63-1.40
low parental SES <sup>¶</sup>	0.84	0.52-1.38	0.86	0.57-1.30
low participant's SES <sup>¶</sup>	0.84	0.51-1.38	1.20	0.79-1.82
study centre (Dresden)	0.71	0.45-1.10	1.03	0.71-1.50
present parental history of rhinitis <sup>+</sup>	1.49	0.95-2.34	1.43	0.97-2.12

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

<sup>¶</sup>SES (socioeconomic status) high: at least 12 years of school attendance for participant or at least one parent

<sup>+</sup> At least one parent ever had asthma or rhinitis

S5: Effect estimates for potential confounders, multiple logistic regression model for the association of earpiercing and incident wheezing, asthma and rhinoconjunctivitis for males and females, imputed data, excluding those with † wheezing, ‡ asthma and § rhinoconjunctivitis at baseline

incident wheezing †				
	male (n=759)		female (n=1009)	
	OR	95 %CI	OR	95 %CI
ever smoking	2.08	1.12-3.87	2.42	1.48-3.96
low parental SES¶	0.87	0.44-1.71	1.13	0.67-1.92
low participant's SES¶	0.81	0.41-1.60	1.51	0.90-2.54
study centre (Dresden)	0.64	0.35-1.16	0.90	0.56-1.46
present parental history of asthma <sup>+</sup>	3.36	1.59-7.12	1.19	0.52-2.74
incident asthma ‡				
	male (n=801)		female (n=1124)	
	OR	95 %CI	OR	95 %CI
ever smoking	1.40	0.45-4.37	1.24	0.51-3.01
low parental SES¶	0.54	0.16-1.80	1.63	0.64-4.15
low participant's SES¶	1.84	0.54-6.27	1.35	0.53-3.46
study centre (Dresden)	0.59	0.20-1.76	1.25	0.53-2.95
present parental history of asthma <sup>+</sup>	7.36	2.45-22.05	3.39	1.06-10.87
incident rhinoconjunctivitis §				
	male (n=666)		female (n=912)	
	OR	95 %CI	OR	95 %CI
ever smoking	1.16	0.70-1.94	0.96	0.65-1.44
low parental SES¶	0.82	0.49-1.37	0.87	0.57-1.32
low participant's SES¶	0.86	0.52-1.41	1.16	0.77-1.75
study centre (Dresden)	0.70	0.45-1.09	1.05	0.72-1.52
present parental history of rhinitis <sup>+</sup>	1.49	0.95-2.33	1.42	0.95-2.11

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

¶SES (socioeconomic status) high: at least 12 years of school attendance for participant or at least one parent

<sup>+</sup> At least one parent ever had asthma or rhinitis

S6: Adjusted and unadjusted multiple logistic regression model for the association of nickel allergy (never/persistent/ remittent/ incident) and pierced ears with incident wheezing, asthma and rhinoconjunctivitis for males and females, imputed data, excluding those with <sup>†</sup> wheezing, <sup>‡</sup> asthma and <sup>§</sup> rhinoconjunctivitis at baseline

incident wheezing <sup>†</sup>								
male (n=759)				female (n=1009)				
	cOR*	95 %CI	aOR <sup>1</sup>	95 %CI	cOR*	95 %CI	aOR <sup>1</sup>	95 %CI
nickel allergy								
never		1		1		1		1
persistent	4.87	1.70-13.93	4.31	1.47-12.62	1.25	0.64-2.44	1.07	0.54-2.12
remittent	3.68	1.19-11.40	3.81	1.16-12.52	2.60	1.20-5.63	2.51	1.14-5.53
Incident <sup>¶</sup>					2.51	1.23-5.10	2.26	1.09-4.69
pierced ears								
no		1		1		1		1
yes	2.22	1.19-4.15	2.26	1.10-4.62	1.56	0.61-3.96	1.27	0.49-3.27
incident asthma <sup>‡</sup>								
male (n=801)				female (n=1124)				
	cOR*	95 %CI	aOR <sup>2</sup>	95 %CI	cOR*	95 %CI	aOR <sup>2</sup>	95 %CI
nickel allergy								
never		1		1		1		1
persistent	6.39	1.32-30.78	6.12	1.21-30.89	0.83	0.24-2.90	0.74	0.21-2.62
remittent	3.42	0.42-27.97	3.16	0.35-28.87	0.70	0.09-5.35	0.65	0.08-5.06
incident	6.33	0.74-53.86	5.20	0.45-60.11	1.90	0.53-6.79	1.68	0.47-6.08
pierced ears								
no		1		1		1		1
yes	3.19	1.11-9.11	3.19	0.91-11.15	1.03	0.24-4.47	0.96	0.21-4.33
Incident rhinoconjunctivitis <sup>§</sup>								
male (n=666)				female (n=912)				
	cOR*	95 %CI	aOR <sup>3</sup>	95 %CI	cOR*	95 %CI	aOR <sup>3</sup>	95 %CI
nickel allergy								
never		1		1		1		1
persistent	0.45	0.06-3.63	0.40	0.05-3.25	0.96	0.56-1.65	0.99	0.57-1.70
remittent	1.51	0.44-5.11	1.56	0.45-5.39	1.14	0.52-2.51	1.14	0.51-2.52
incident	4.05	1.12-14.69	4.45	1.19-16.67	1.50	0.79-2.84	1.55	0.82-2.94
pierced ears								
no		1		1		1		1
yes	0.97	0.54-1.73	1.08	0.58-2.02	1.35	0.65-2.77	1.43	0.69-2.97

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

\*cOR: crude (unadjusted) Odds Ratio

<sup>1,2</sup> adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of asthma

<sup>3</sup> adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of rhinitis

<sup>¶</sup> Due to a lack of male participants, incident nickel allergy was excluded from the regression models in males

S7: Adjusted and unadjusted multiple logistic regression model for association between

nickel allergy and pierced ears with incident wheezing, asthma and rhinoconjunctivitis, imputed data, excluding those with † wheezing, ‡ asthma and § rhinoconjunctivitis at baseline			
incident wheezing † (n=1768)			
	cOR*	(95% CI)	aOR 1 (95% CI)
nickel allergy			
never	Reference		Reference
ever	1.99	(1.35-2.96)	1.75 (1.15-2.68)
pierced ears			
no	Reference		Reference
yes	1.55	(1.05-2.30)	1.60 (0.91-2.80)
incident asthma ‡ (n=1925)			
	cOR*	(95% CI)	aOR 2 (95% CI)
nickel allergy			
never	Reference		Reference
ever	1.55	(0.75-3.19)	1.36 (0.62-2.95)
pierced ears			
no	Reference		Reference
yes	1.58	(0.78-3.23)	1.95 (0.72-5.27)
incident rhinoconjunctivitis § (n=1578)			
	cOR*	(95% CI)	aOR 3 (95% CI)
nickel allergy			
never	Reference		Reference
ever	1.14	(0.81-1.61)	1.16 (0.81-1.66)
pierced ears			
no	Reference		Reference
yes	1.05	(0.79-1.40)	1.17 (0.75-1.82)

OR: odds ratio; CI: confidence interval; SES: socioeconomic status

\*cOR: crude (unadjusted) Odds Ratio

<sup>1,2</sup> adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of asthma

<sup>3</sup> adjusted for potential confounders: smoking status, parental SES, participant's SES, study centre and parental history of rhinitis

S8: P-values of the adjusted multiple logistic regression model with interaction term for association between nickel allergy and pierced ears with incident wheezing, asthma and rhinoconjunctivitis, imputed data, excluding those with † wheezing, ‡ asthma and § rhinoconjunctivitis at baseline		
	p-value of the adjusted multiple logistic regression model with interaction term nickel allergy*sex	p-value of the adjusted multiple logistic regression model with interaction term pierced ears*sex
Incident wheezing †	0.38	0.70
Incident asthma ‡	0.06	0.35
Incident rhinoconjunctivitis §	0.73	0.45

