

## Temporal trends in incidence rates of Type I diabetes in Germany: birth cohort and calendar period effects

Dear Sir,

Temporal increases in incidence rates have been shown in various geographical areas with a recent reported worldwide annual increase of 2.2% from 1960 to 1996 [1]. Few studies, however, have analysed trends disentangling age, birth cohort and period effects [2–4].

In a recently published Short communication J. Rosenbauer et al. show temporal trends in the incidence of Type I (insulin-dependent) diabetes mellitus in children less than 5 years of age from 1993 to 1995 in Germany [5]. The authors used Poisson regression modelling to assess time trends adjusting for the effect of age, sex, and calendar period. They did not report an overall calendar period effect but only an age-period interaction resulting in a significant increase among 3 and 4 year old children.

We have reanalysed their data (Table 2 in the original paper) to assess whether the temporal pattern of incidence rates is attributable to calendar period or birth cohort effects [6–7]. As shown in Table 1, an increase in relative risks (RRs) by birth cohort is evident. With respect to children born in 1989, the RR increases up to 2.8 in those born in 1993, with a slight decline in 1994 and 1995 birth cohorts. Using Poisson regression models (Table 2), only the age-cohort model adequately fit the data, whereas no effect of calendar period is evident.

We suggest that temporal trends in incidence of Type I diabetes in children younger than 5 years of age from 1993 to 1995 in Germany are explained by different risks by birth cohort. The underlying biological model could imply the importance of an early exposure to environmental agents such as infections or increased protein intake. Change in the time of prevalence

or the intensity of such early exposures, or both, could be the determinant of the birth cohort effect.

Yours faithfully,

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### References

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**Table 1.** Incidence rates (per 100,000 person-years) of Type I diabetes in children younger than 5 years old in Germany from 1993 to 1995, by birth cohorts

Age (years)	Birth cohorts						
	1989	1990	1991	1992	1993	1994	1995
0					2.63 (21)	1.43 (11)	1.96 (15)
1				7.21 (59)	8.22 (66)	8.25 (64)	
2			9.29 (79)	9.36 (77)	10.40 (84)		
3		8.97 (84)	10.88 (93)	12.92 (107)			
4	5.85 (54)	8.72 (82)	14.06 (121)				
RR <sup>a</sup>	1	1.61	2.31	2.44	2.76	2.52	2.53
(95% CI)		(1.17–2.22)	(1.69–3.15)	1.71–3.48)	(1.86–4.07)	(1.60–3.98)	(1.21–5.26)

Number of cases on which rates are based in parenthesis. CI: confidence Interval

<sup>a</sup>  $p < 0.001$  for linear trend

**Table 2.** Summaries of different age-period-cohort models fitted to data of Table 2 in Rosenbauer et al. (1999)

Model	Deviance	Degrees of freedom	Goodness-of-fit $p$ -value
Age	43.21	10	< 0.001
Age + linear trend	21.67	9	0.008
Age + period	21.35	8	0.004
Age + cohort	4.65	4	0.500

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