

AIR POLLUTION DURING PREGNANCY AND LOW BIRTH WEIGHT IN DOROG, HUNGARY

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INTRODUCTION

Low birth weight is known to have negative impact on the children's health in later life, too. Therefore risk factors contributing to low birth weight should be eliminated. We studied the associations between foetal exposure to some air pollutants and the frequency of low birth weight in a small industrial town of Hungary.

METHODS

Study area: DOROG

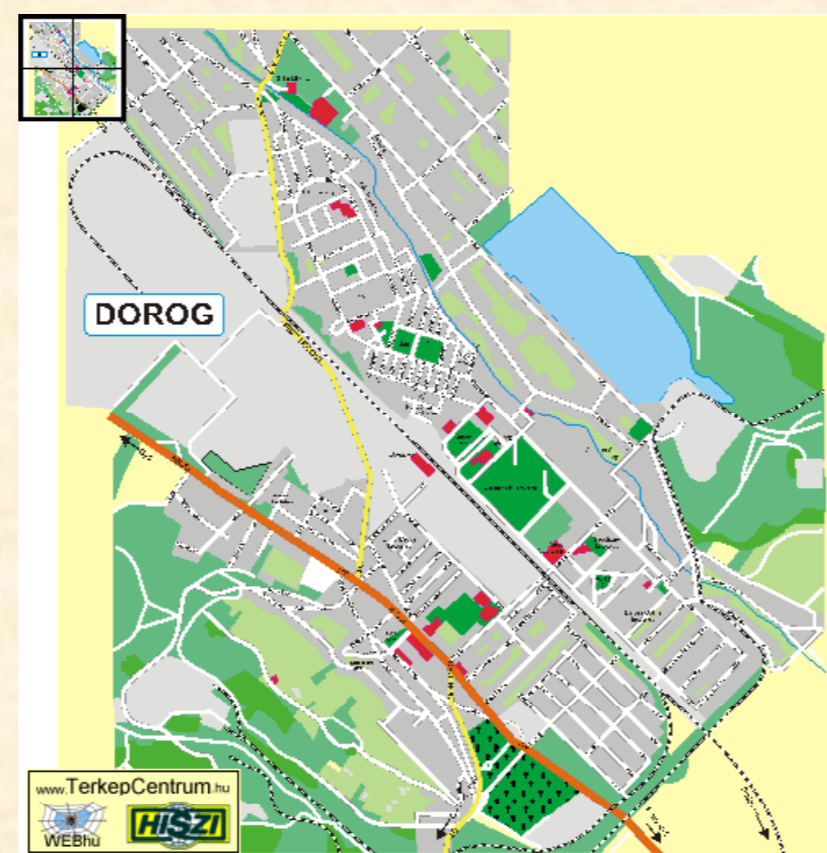
~ 13,000 inhabitants.

Present sources of pollution:

- a toxic waste incinerator
- pharmaceutical industry
- production of building material
- car assembling
- transport

Study population:

Pregnancy care documents for the years 2000-2004 of all women living in Dorog were considered and all full-term, singleton pregnancies were included in the analysis.



Exposure assessment:

PM10, SO2, NO2, CO and O3 data from the National Air Monitoring Network were used for creating weekly average and weekly maximum values. Weekly foetal exposure for each pollutant was determined for each pregnancy.

Analysis: Associations between air pollution and birth weight were analysed by logistic regression models with adjustments for the mother's age, her previous pregnancies and smoking

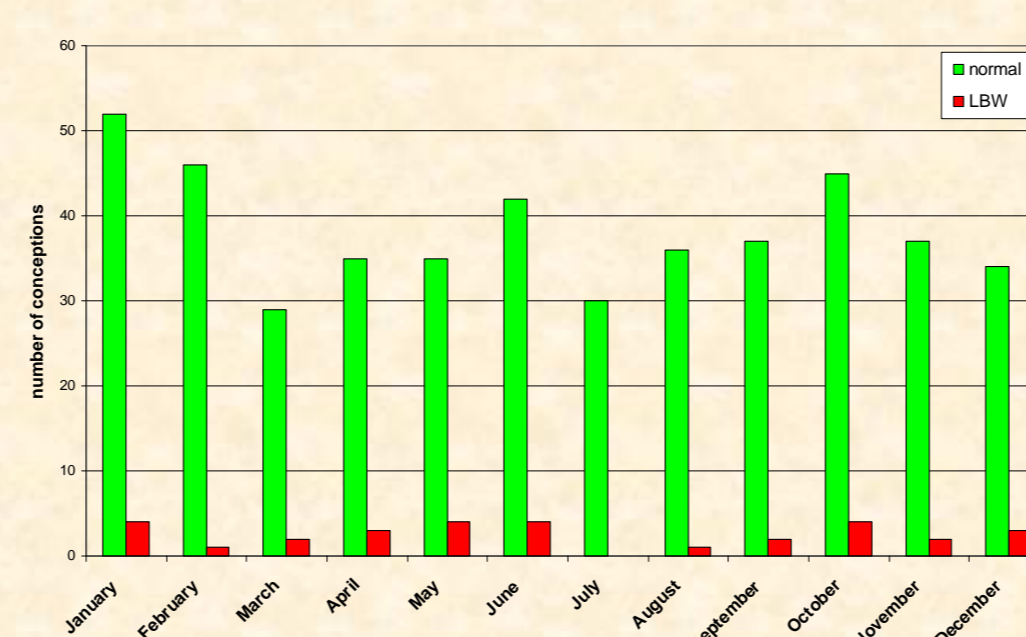
RESULTS

From the 479 pregnancies evaluated the number of singleton births were 472.

34 babies (7.2%) were born with birth weight <2500 g.

The distribution of conception months does not show any significant variations among babies born either with normal or low birth weight.

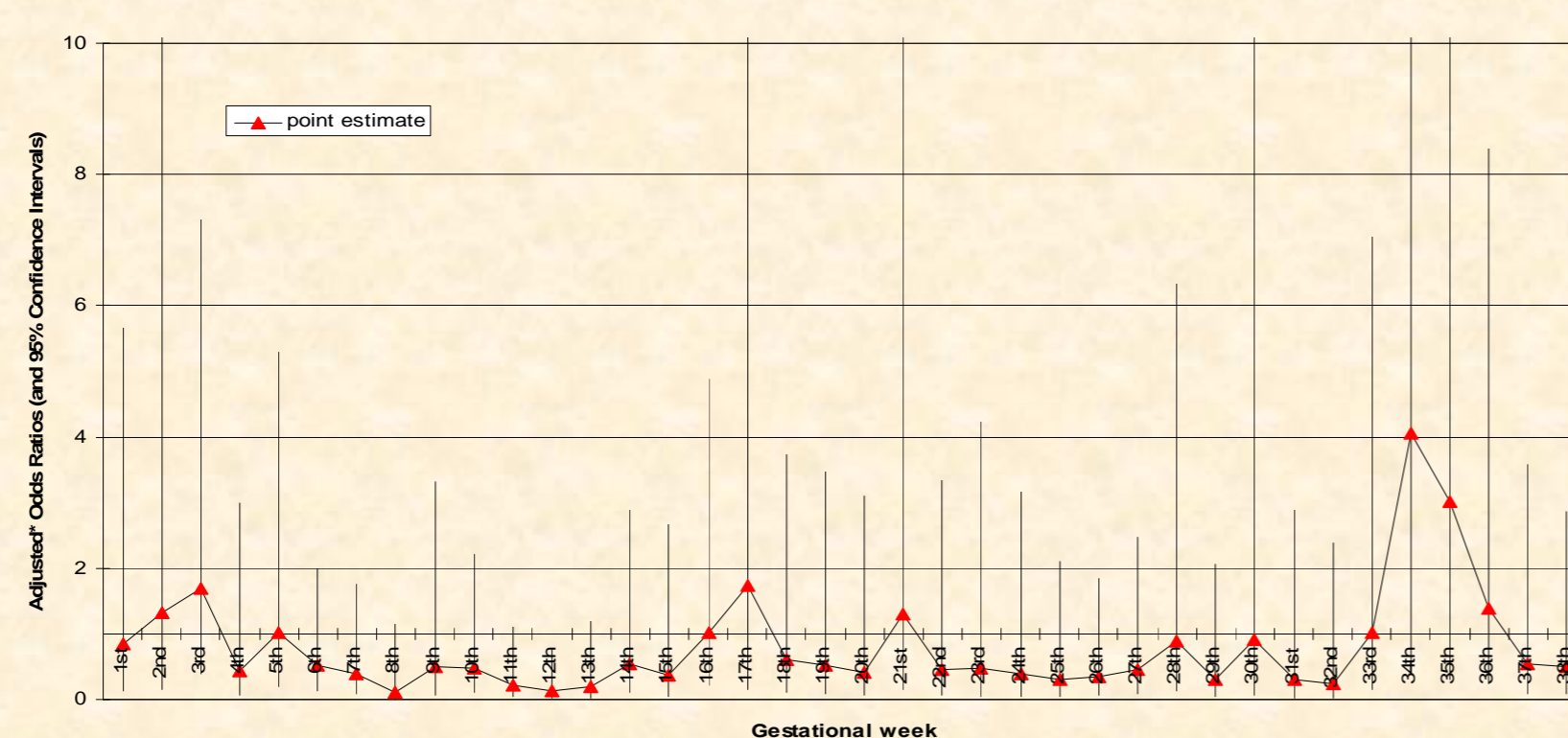
Distribution of conceptions in months of the years 2000-2004



Mean concentrations of PM10, SO2 and CO during the whole period of pregnancy by birth weight categories				
Pollutants	NBW	LBW	OR* (95%CI)	a**OR* (95% CI)
PM10 (ug/m3)	40.4	37.7	0.97 (0.94-1.01)	0.98 (0.93-1.02)
SO2 (ug/m3)	15.1	17.5	1.07 (1.006-1.14)	1.05 (0.95-1.17)
CO (ug/m3)	915	1030	1.000 (0.999-1.001)	1.000 (0.999-1.001)

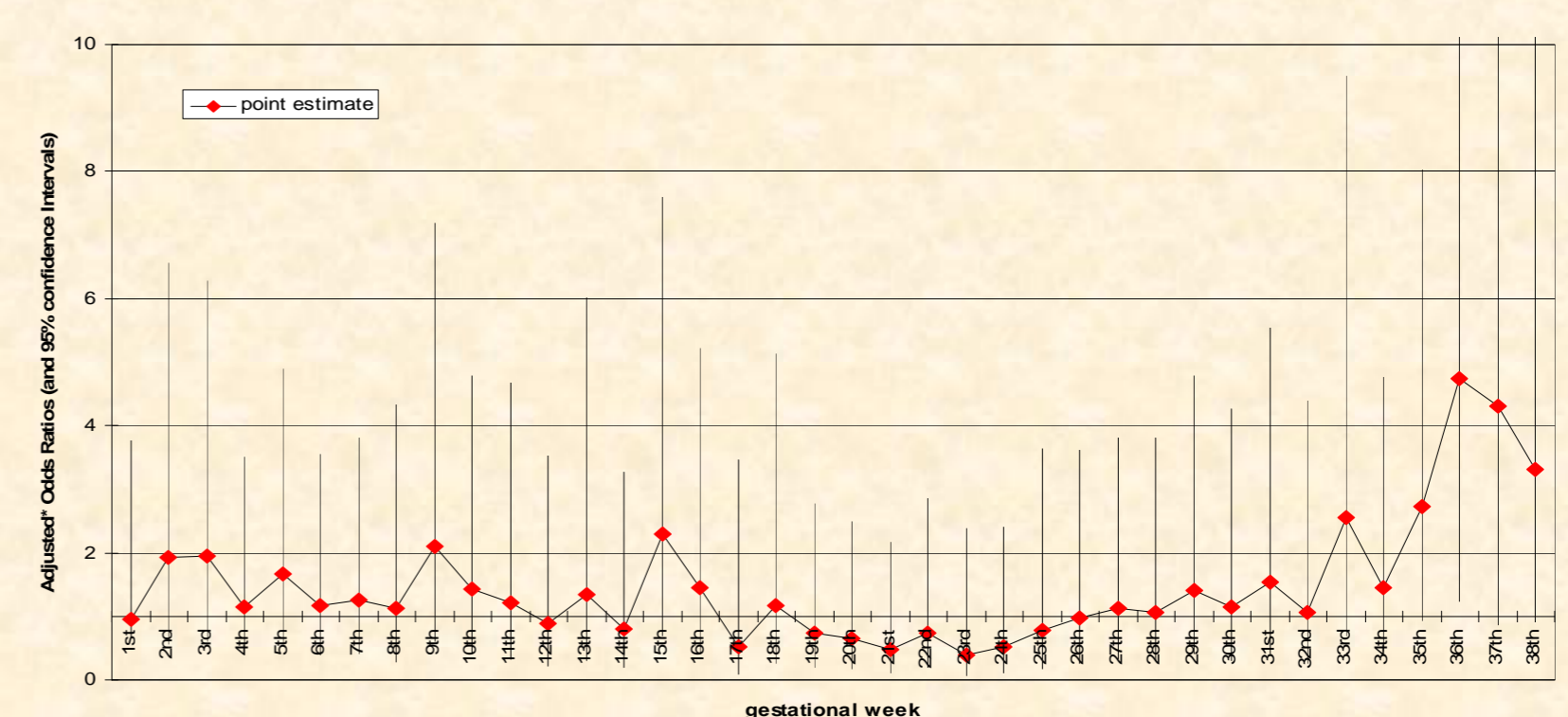
*Odds Ratio for 1 µg/m3 increase in concentration NBW= Normal birth weight
** adjusted for smoking of the mother LBW= Low birth weight

Associations between weekly mean PM10 concentrations and low birth weight



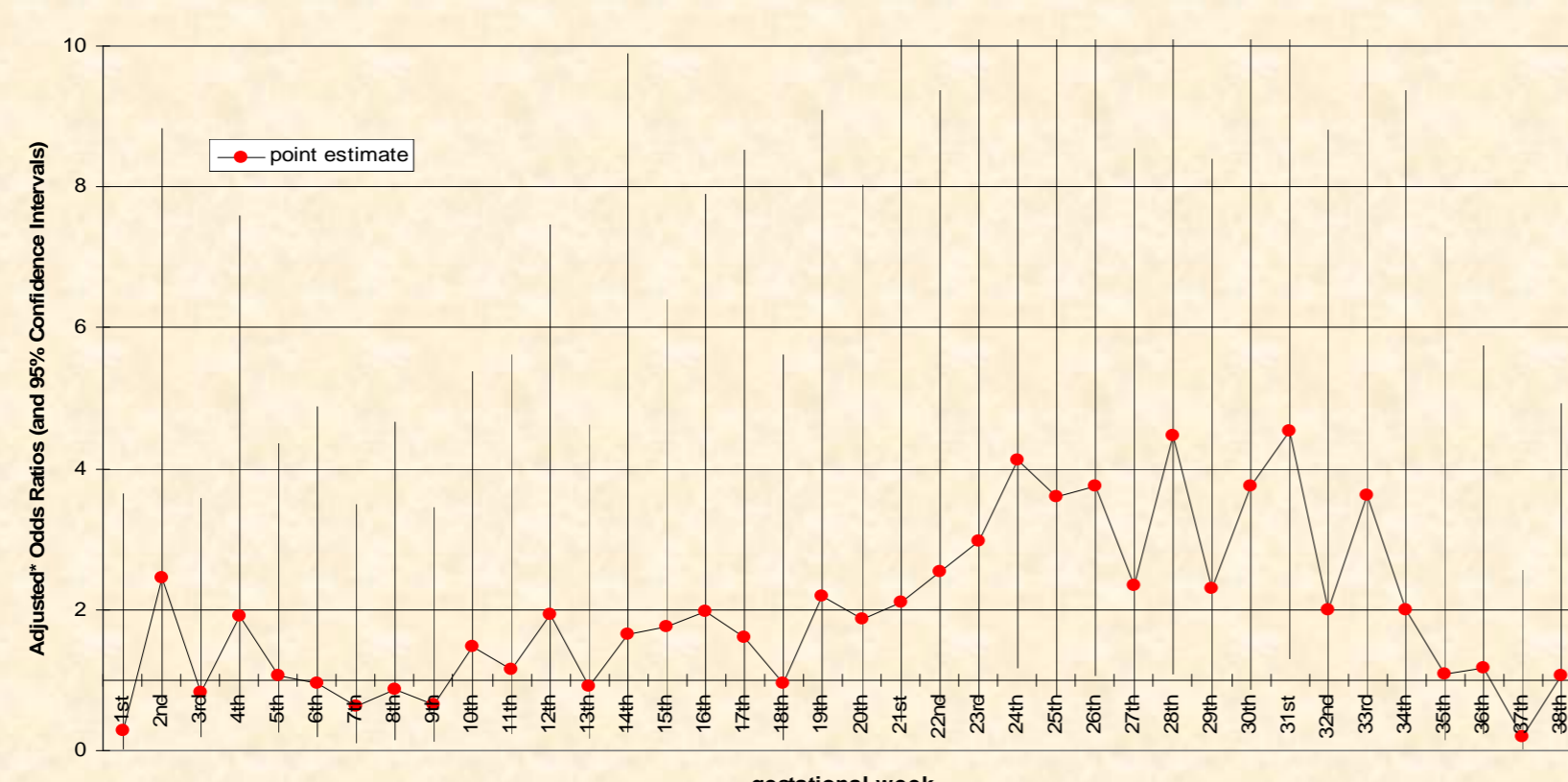
There was a statistically non-significant increase in the PM10 concentration during the weeks 34th-36th

Associations between weekly mean SO2 concentrations and low birth weight



There was a pronounced increase of SO2 concentration during the last 6 weeks of the pregnancies (on week 36th p<0.05)

Associations between weekly mean CO concentrations and low birth weight



There was a substantial, and in some weeks statistically significant, increase in the CO concentration between weeks 24th and 32nd

CONCLUSION

Increased levels of certain air pollutants during different periods of pregnancy may increase the risk of low birth weight: significant increase of CO concentrations at the end of 2nd and beginning of the third trimester was observed, while SO2 and PM10 concentrations were increased during the final period of pregnancy.