

COHORT DESIGN AND ATOPIC STATUS IN RECRUITED MOTHERS

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EU project PLUTOGRACY
„Placental Uptake and Transfer of Environmental Chemicals Relating to Allergy in Childhood Years“

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Aim -To determine whether there is a link between *in utero* exposure to environmental xenobiotics and the development of allergy during early childhood and to identify risk factors

Fundamental assumptions:

- ➔ Allergy is a multifactorial disease, determined by the interaction between genotype and environment.
- ➔ The mother has an important role in influencing the development of foetal and infant immune responses to allergens during gestation.

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COHORT DESIGN

- ↳ **Participants** - mother/infant pairs residents of 5 environmentally different regions:
 - Belgium - Mol (urban) region,
 - Romania - Bucharest (urban/industrial) and Giurgiu (agricultural) regions,
 - Slovakia - Bratislava (urban/industrial) and Stara Lubovna (rural) regions.
- ↳ **Enrolment criteria** - physiological full-term pregnancies (37-42 weeks); healthy babies with no prenatal/perinatal pathology, BW_≥2500 grams
- ↳ **Follow up** from birth up to 18-months of age

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COHORT DESIGN

- ↳ **Collection of biological samples:**
 - placenta,
 - cord blood,
 - maternal peripheral blood,
 - breast milk, and
 - peripheral blood of 18-month-old childrenfor further immunological and toxicological analyses.
- ↳ **Clinical examination** of 18-month-old infants by regional paediatric allergists.
- ↳ Activities divided into workpackages WP1-WP8

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METHODS

WP1.1: Recruitment of pregnant women and evaluation of atopic status (in order to objectify genetic background of newborns with respect to atopy)

- ↳ Recruitment of 200 mothers per region at the maternity hospitals in Belgium, Romania and Slovakia.
- ↳ Administration of questionnaires - information on socio-economic status (parental education, occupation), household characteristics (type of residing, heating, carpeting), environmental exposures (e.g. to environmental tobacco smoke in the family, pets ownership, traffic pollution), and history of allergy in immediate family members.

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METHODS

- ↳ Collection of the samples of maternal blood sera (3 ml) for total and specific IgE (against the most common respiratory allergens) analysis.
- ↳ Determination of total IgE using ELISA method, with the cut-off level for positive result 250 ug/L.
- ↳ Determination of allergen specific IgE using Pharmacia CAP System™ Phadiatop FEIA technique (Kabi Pharmacia Diagnostics AB, Uppsala, Sweden). Cut-off level for positive result was 0.35 kU/L.
- ↳ Determination of maternal atopic/non-atopic status based on questionnaire data and total/specific IgE analyses in maternal blood sera.
- ↳ Selection of 100 mothers per region for further immunological and toxicological analysis.

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CHILD HEALTH AND THE ENVIRONMENT: RESULTS FROM EU FRAMEWORK 5

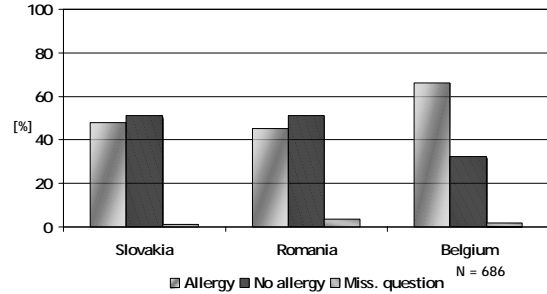
DEFINITIONS:

Definition of **atopic** mother:
questionnaire data (clinical history) are **positive** for
asthma OR atopic eczema OR allergic rhinitis
AND
concentrations of specific IgE > 0,35 kU/L

Definition of **non-atopic** mother:
questionnaire data (clinical history) are **negative** for
asthma AND atopic eczema AND allergic rhinitis
AND
concentrations of total IgE are <= 250 ug/L
AND
specific IgE <= 0.35 kU/L

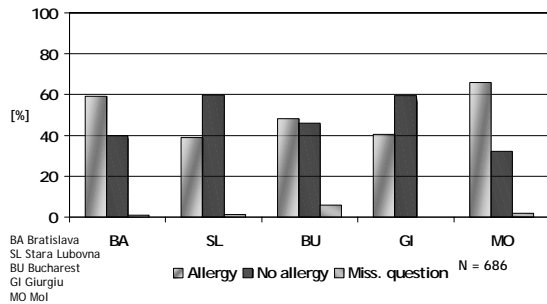
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ALLERGY IN MOTHERS ACCORDING TO QUESTIONNAIRES - countries



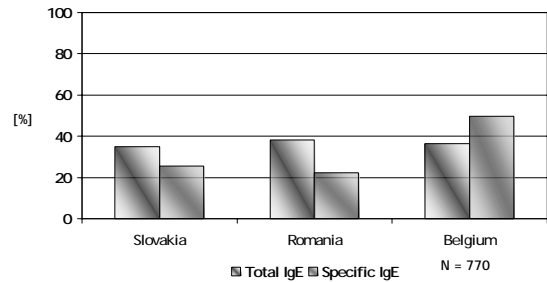
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ALLERGY IN MOTHERS ACCORDING TO QUESTIONNAIRES - regions



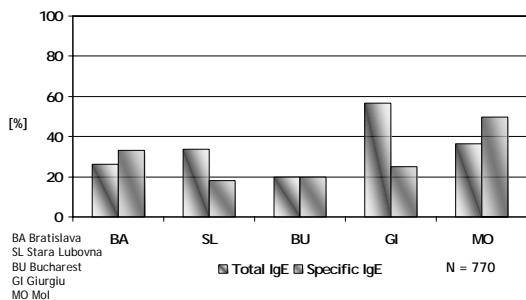
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POSITIVITY OF TOTAL AND SPECIFIC IgE IN MOTHERS - countries



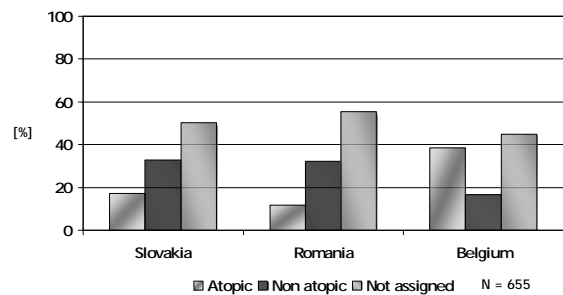
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POSITIVITY OF TOTAL AND SPECIFIC IgE IN MOTHERS - regions



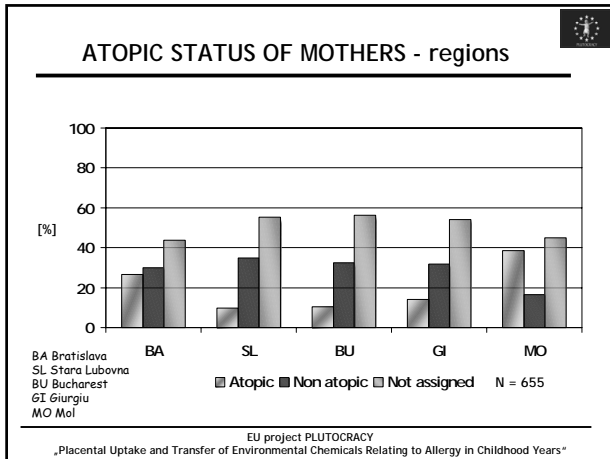
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ATOPIC STATUS OF MOTHERS - countries



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CHILD HEALTH AND THE ENVIRONMENT: RESULTS FROM EU FRAMEWORK 5



RESULTS

Prevalence of allergy using different sources of data and definitions (questionnaires - subjective assessment, laboratory analysis, and combination of both).

Partner	Maternal questionnaire	Specific IgE positivity	Atopy definition
Slovakia	47.8	25.6	17.1
Bratislava	59.3	33.1	26.5
Stara Lubovna	39.0	18.2	9.9
Romania	45.2	22.4	11.8
Bucharest	48.2	19.8	10.3
Giurgiu	40.4	25.0	14.1
Belgium Mol	66.1	49.7	38.6

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DISCUSSION AND CONCLUSION

- Significant differences were found among regions with respect to both, allergy symptoms and laboratory results on allergic sensitisation in mothers.
- Results from Belgian mothers likely biased by selection bias (mothers with allergy in the family more likely to participate), so results do not represent the unbiased prevalence of atopy in pregnant women.
- Data from WP1.1 served as the basis for selection of mother/child pairs for further laboratory analyses

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