



## Biomonitoring of newborn babies – reference values for the exposure biomarkers

| exposure biomarker                       | number | reference mean<br>(95 % CI) | reference P90<br>(95 % CI) |
|--|--------|-----------------------------|----------------------------|
| dioxin-like substances<br>(pg TEQ/g fat) | 871    | 23 (21-24)                  | 55 (44-67)                 |
| total PCBs (ng/g fat)                    | 1 054  | 64 (61-68)                  | 166 (140-192)              |
| p,p'-DDE (ng/g fat)                      | 1 112  | 110 (104-116)               | 332 (237-428)              |
| HCB (ng/g fat)                           | 1 044  | 18.9 (17.9-20.0)            | 48.0 (39.2-56.8)           |
| lead (µg/L)                              | 1 107  | 14.7 (14.0-15.5)            | 42.6 (27.7-57.5)           |
| cadmium (µg/L)                           | 1 107  | 0.21 (0.19-0.23)            | 1.28 (0.87-1.68)           |

95 % CI: 95 % confidence interval, p,p'-DDE: metabolite of DDT

Dioxin-like substances (dioxins, furans, PCB and dioxin-like PCBs) are measured using the DR- Calux® bioassay. Total PCBs: total of marker PCBs 138, 153 and 180. All markers were corrected for the age and smoking behaviour of the mother.

Source: Centre of expertise for Environment & Health (2005)

### Biomonitoring and the Flemish Human Biomonitoring Programme

Within the framework of the Centre of expertise for Environment & Health, in 2001 and 2008 the Flemish Human Biomonitoring Programme (VHBP) was started. Via biomonitoring an attempt is being made to estimate the total exposure in humans. For this, the concentration of pollutants and their degradation products – exposure biomarkers – and/or early biological effects in humans – effect biomarkers – are measured. The reference mean and reference P90 are not targets or standards based on health risks, but can serve as a comparison for specific exposure situations (e.g. local environmental incident). The reference mean indicates an average exposure, the reference P90 indicates the peak values.

In an initial VHBP the differences are looked for between eight types of area in three age groups (newborn, young people and adults). In June 2008 a second measurement series started. This can be divided into two parts. A reference biomonitoring where the focus is on the average inhabitant of Flanders and a biomonitoring in *hot spots* that examines the local impact on people.

### Reference values for newborns

The exposure of the mother and the initial burden on the newborn are investigated in the first Flemish Human Biomonitoring Programme using the blood from the babies' umbilical cord. The reference mean and reference P90 were calculated for the exposure markers. When compared with measurement values from foreign countries, the average values from the first VHBP are similar. For cadmium the average value is higher than the European measurement values, but nevertheless lower than the measurement values from major world cities in India, Egypt, Taiwan and Mexico.