



Human biomonitoring around the metal shredders targeted on metals and others hazardous chemicals in Wallonia (Belgium)

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- Since 2016, warning following air quality monitoring
→ Shredding plants = ? emission of dust contaminated by several compounds (ETM, POPs..)
- Since 2019, environmental monitoring & risk analysis around two metal shredders in Wallonia

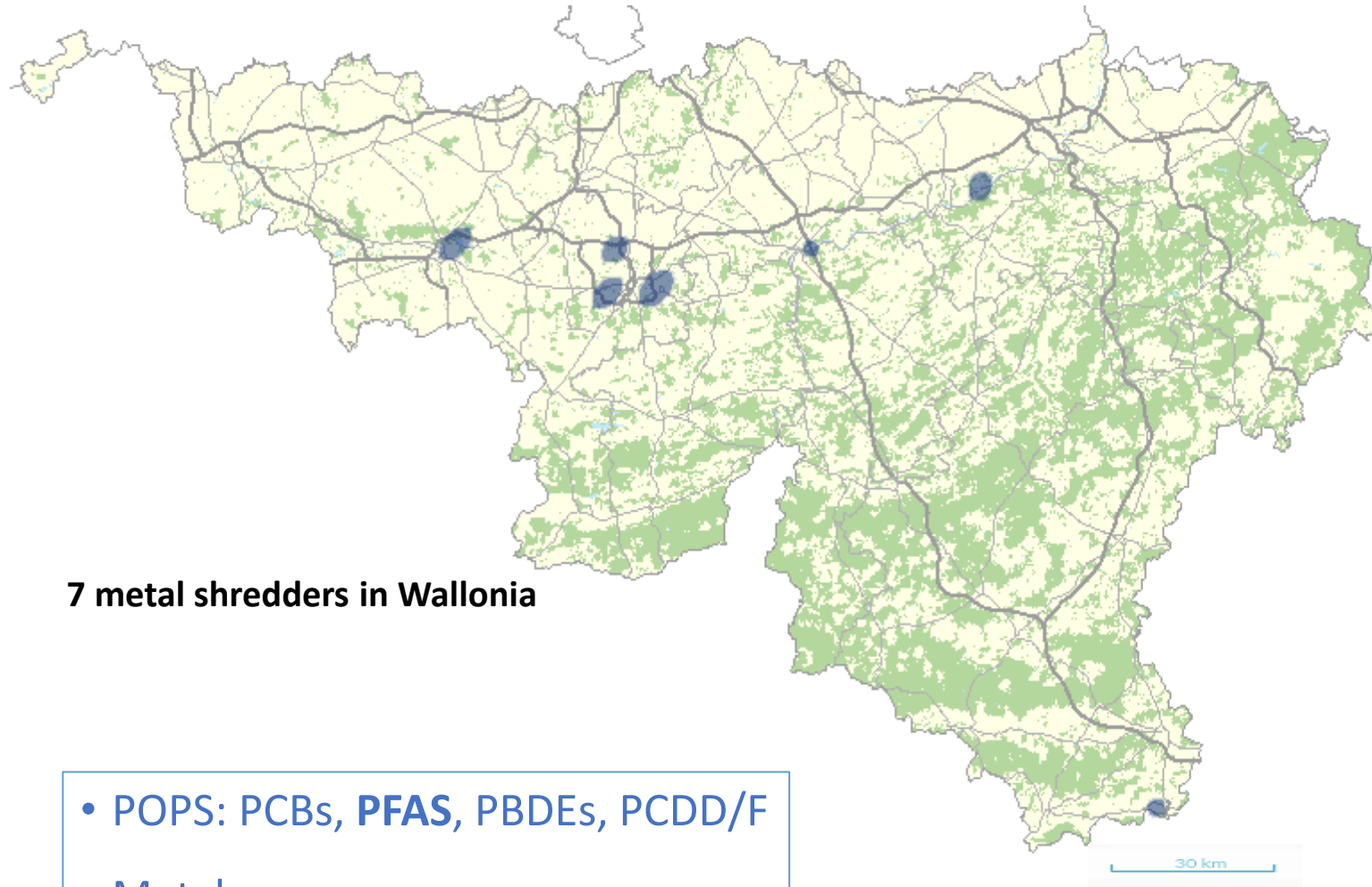
Results:

- Contamination of different environment: atmospheric deposition, soils, indoor dust, vegetables, eggs
- Pollutants: PCB-dl, PCB-ndl, PBDE & metals

- New regulations imposed to the shredder plant operator
- New high-performance filters



- To assess the exposure of residents near metal shredders to hazardous chemicals
- To compare it with the general Walloon population
- To assess the risk to human health
- And also, to assess the impact of shredder plants on the indoor dust



- POPS: PCBs, **PFAS**, PBDEs, PCDD/F
- Metals
- PAHs

➤ Teenagers (12-19y)

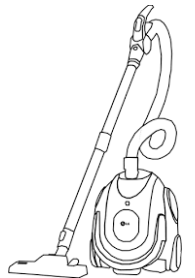
Urine
Blood
self-administered questionnaire



Teenagers = sentinels of their local living environment + representative of recent exposure

➤ All residents

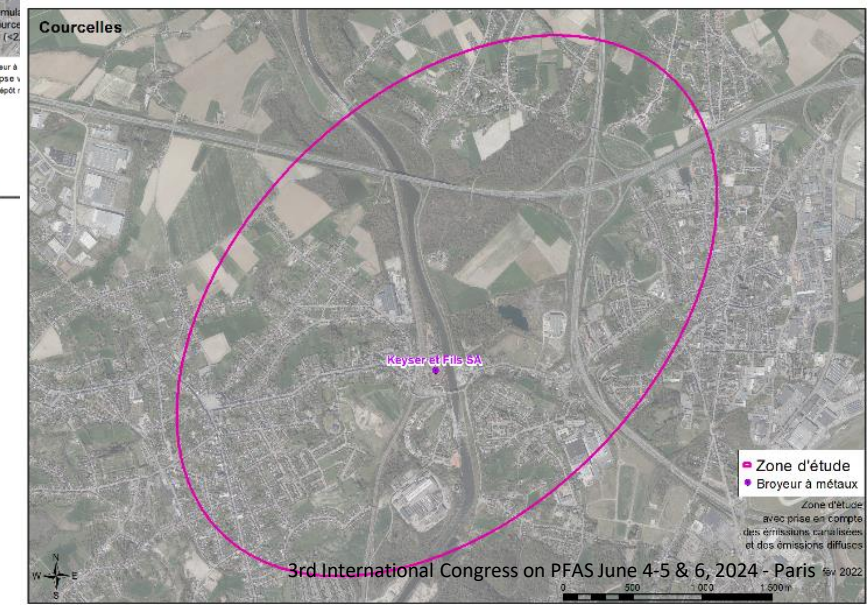
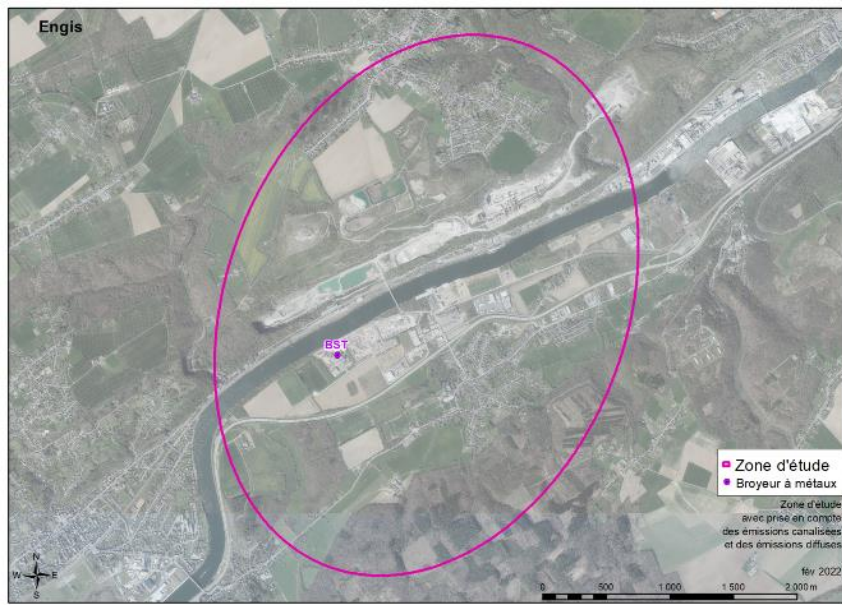
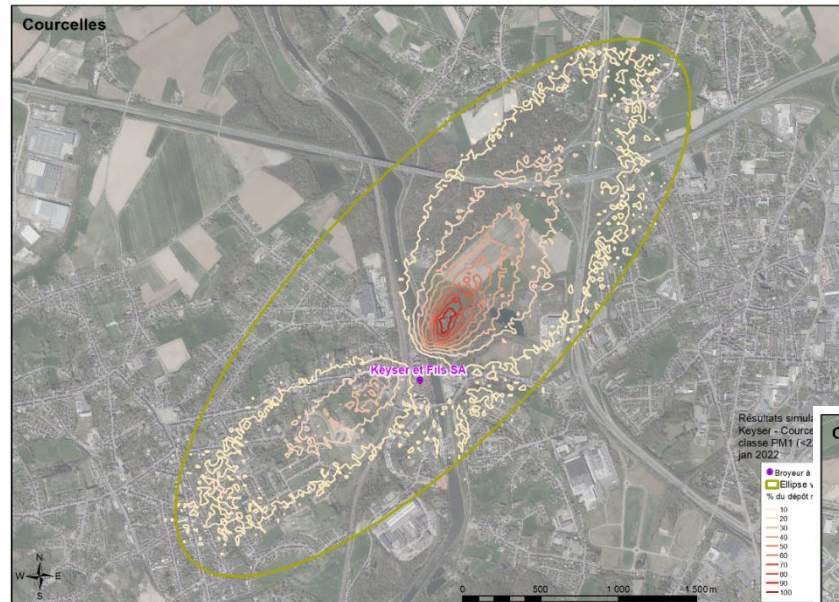
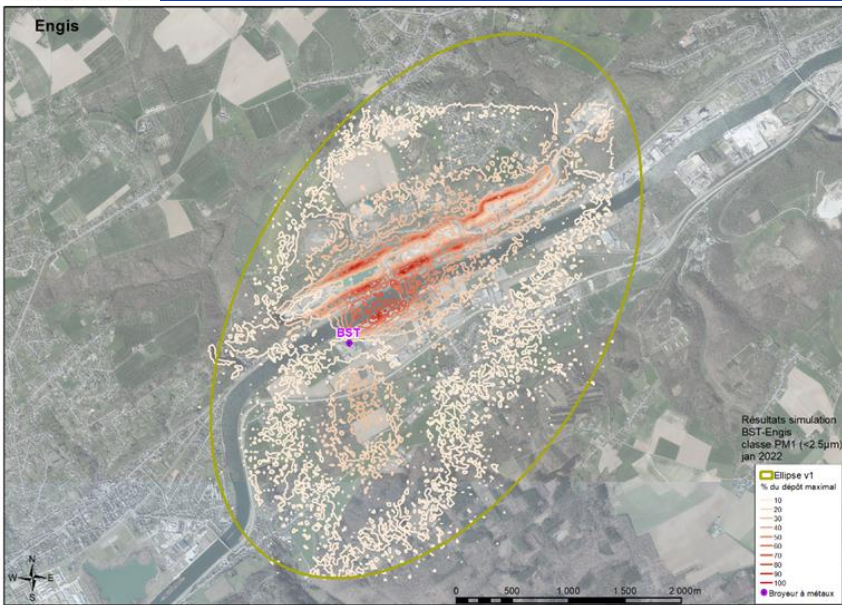
Vacuum cleaner
Questionnaire



Study area

where ? who ? what ?

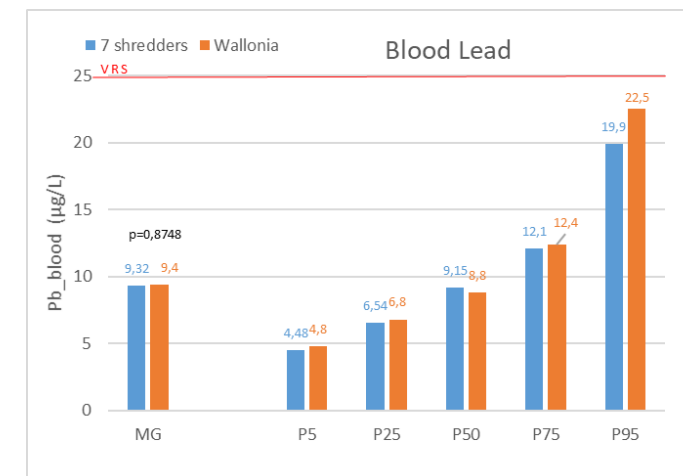
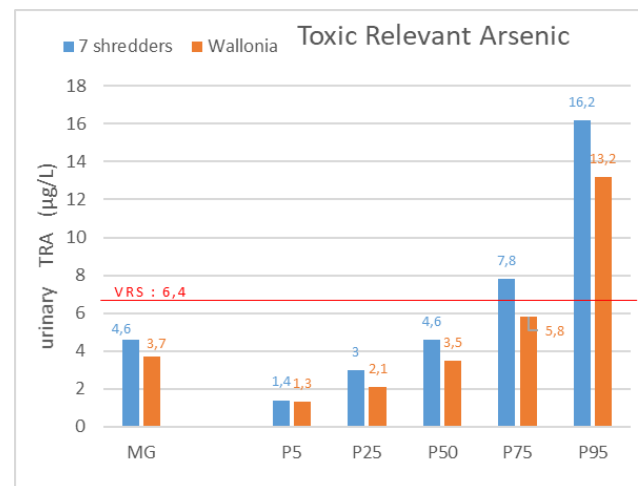
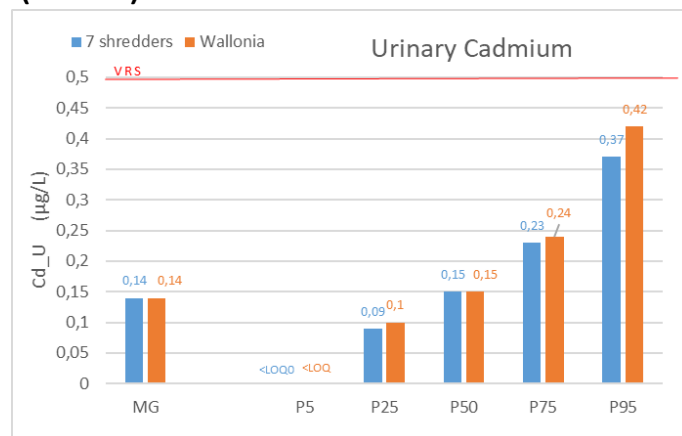
Determination of the potential impact zone of each
in terms of exposure of residents



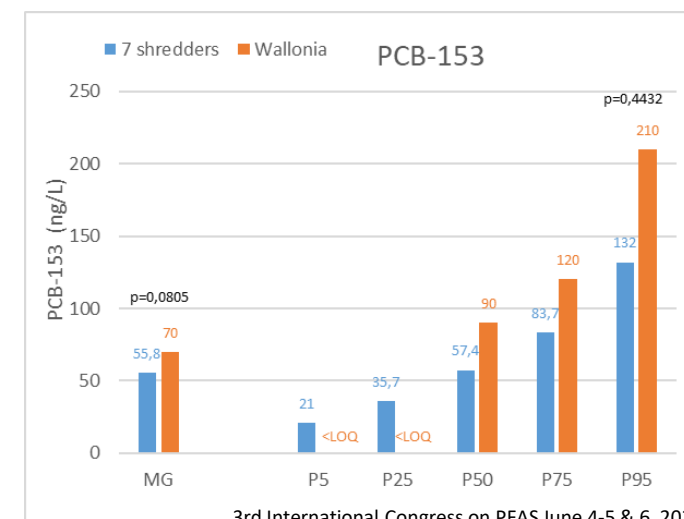
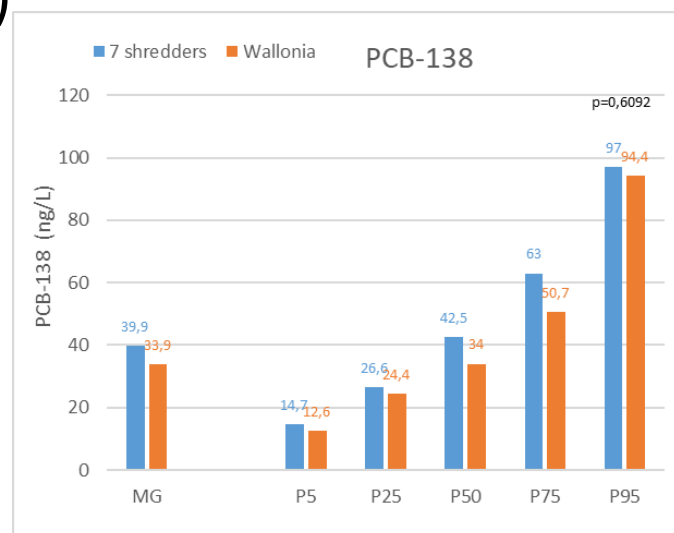
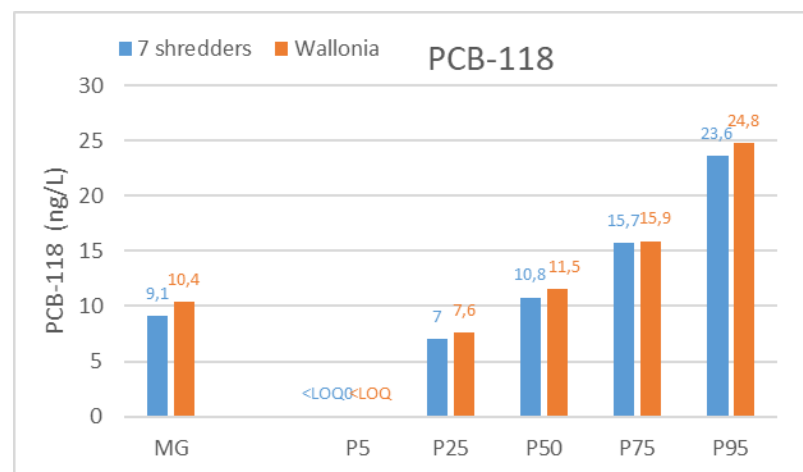
- **Blood & Urine : 121 teenagers / 500**
 - 5 groups of substances: PCBs, metals, PBDEs, PAHs & PFAS
- **Indoor dust : 159 residents + 19 controls / unlimited**
 - 5 groups of substances: PCBs, PCDD/F, metals, PBDEs & PFAS

Comparison with reference group (general Walloon population)

Metals (12+2)

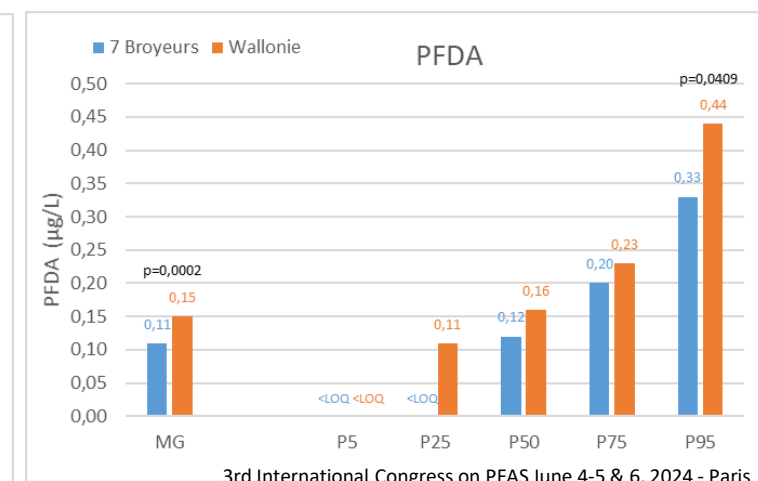
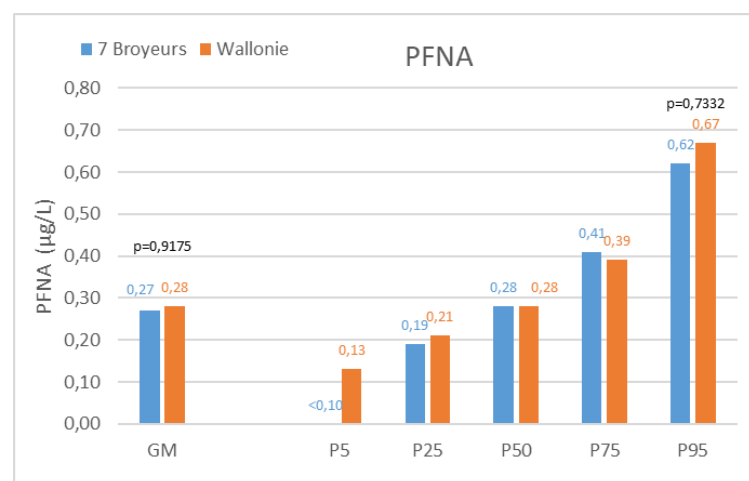
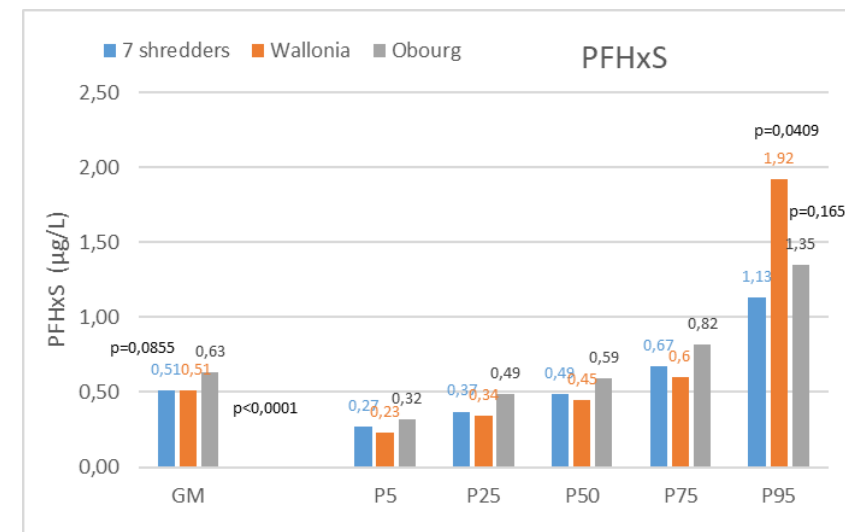
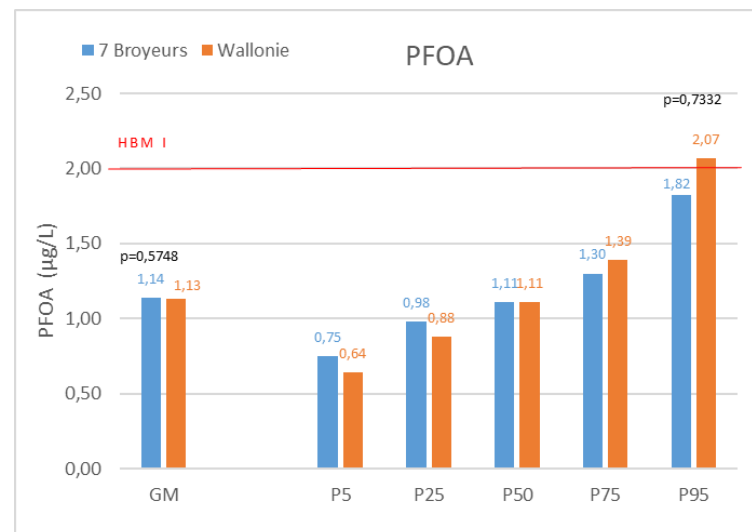
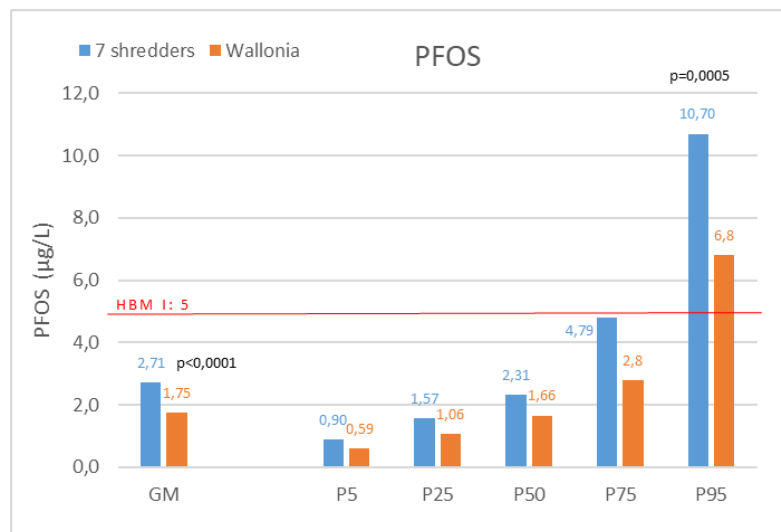


PCBs (18)



Comparison with reference group (general Walloon population)

PFAS (7)



Health reference values for PFAS



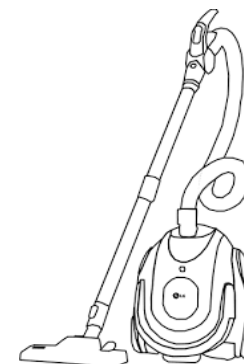
	Chemical substance	HBM values (µg/L)	Teenagers in the vicinity of shredding plants		Walloon teenagers (control group)
			< HBM I	> HBM I	> HBM I
			no risk for adverse health effects	Health effects not excluded	Health effects not excluded
blood	PFOA	2 / 10-5	95,7 %	4,3 %	5,8 % with 0,4 % > HBM II
	PFOS	5 / 20-10	75,9 %	24,1 % with 5,1 % > HBM II	8,3 % with 1,4 % > HBM II

Study area



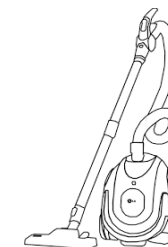
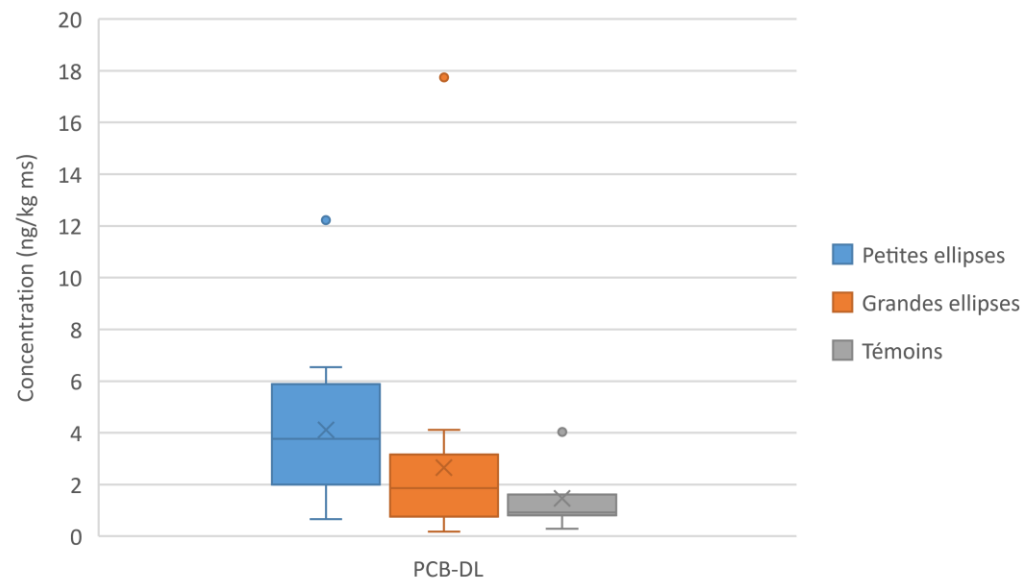
Sampling according three distances vicinity shredders: close; distant; outside

Method



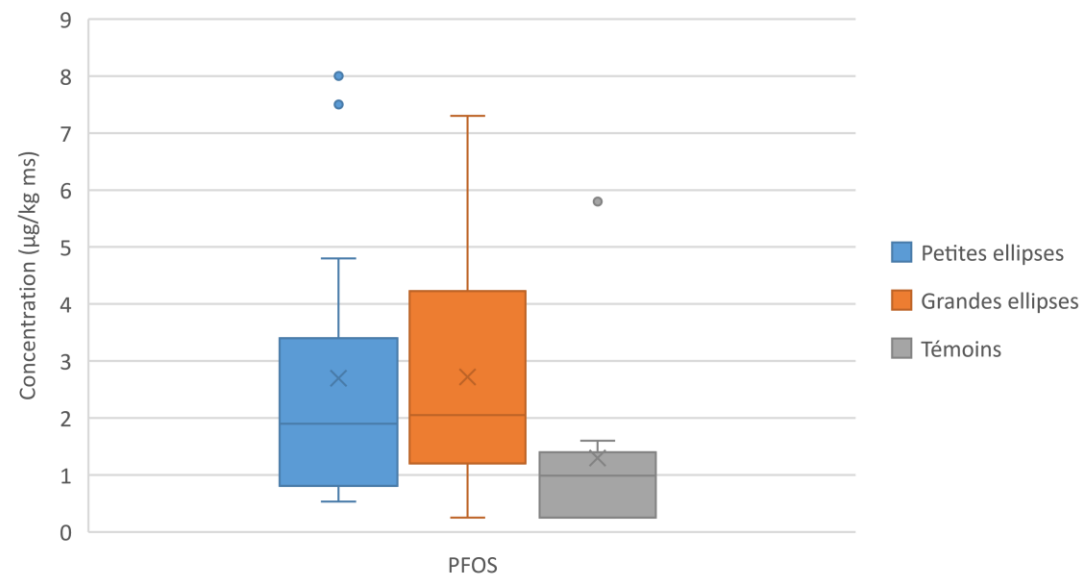
Citizen science : sampling of residents cleaner vacuum.
250 μm : fraction analyzed because responsible of dust ingestion

Concentrations of PCB-DL (TEQ OMS 2005)



« Closer the shredders, greater is house dust pollutants concentrations »

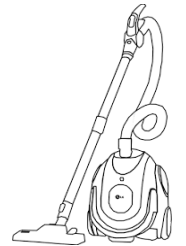
Concentrations of PFOS



Living near a site with a metal shredder seems to have an impact on levels in local populations with some pollutants.



→ Specific recommendations for population living close to these plants



→ To increase existing policies, to take action to reduce risk

For more information: <https://www.issep.be/biobro/>