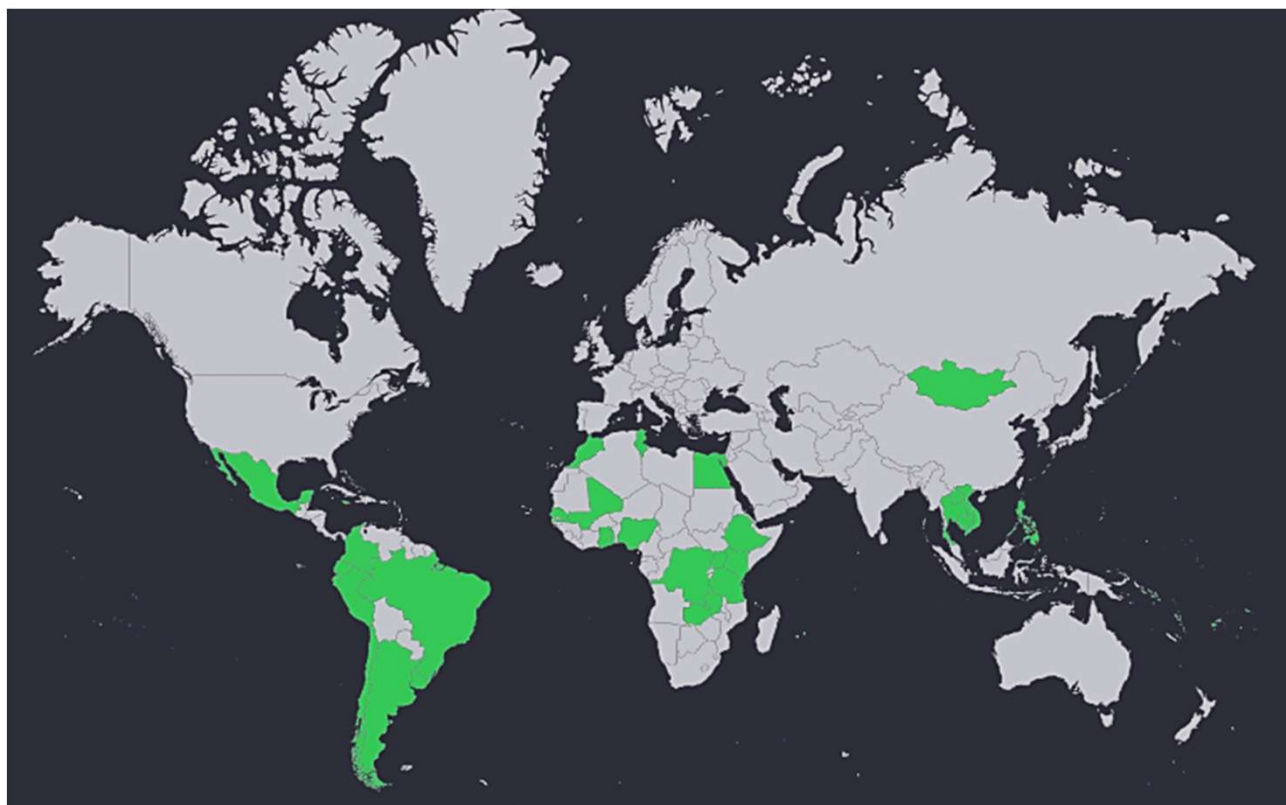


GMP2 GRULAC Virtual Meeting on Analytical Results of POPs in Air and Water

Dr. Esteban Abad, Dr. Manuela Ábalos
Laboratory of Dioxins, IDAEA-CSIC



9th October 2020

GMP2 GRULAC Virtual Meeting on Analytical Results of POPs in Air and Water

The journey from 2016:

Training Capacity Building
Procurements
POPs Survey in core matrices
National Samples



GMP2 GRULAC Virtual Meeting on Analytical Results of POPs in Air and Water

Training and Capacity Building – 7 countries, around 100 people instructed



Antigua and Barbuda



Argentina



Barbados



Brazil



Colombia



Jamaica



Uruguay

Ecuador, Chile and Peru

On-line training

Mexico ????

GMP2 GRULAC Virtual Meeting on Analytical Results of POPs in Air and Water

Sampling: 2 years, 8 campaigns, 400 PUFs, 12 PAS, more than 5,000 data of POPs in AIR in GRULAC



Antigua and Barbuda



Argentina



Barbados



Brazil



Chile



Colombia



Ecuador



Jamaica



Mexico



Uruguay

COMPOUNDS

PUF-1

OCPs & Toxaphenes

PUF-3

Indicator PCBs

PUF-5 / 7

dl-POPs (i.e. PCDD/Fs & dl-PCBs)

PUF-9

BFRs (i.e. PBDEs, PBB 153 & HB

BCD)

Vrije University
Amsterdam -Netherlands-
Prof. Dr. Jacob de Boer

PUF-11

PFAS

Örebro University -Sweden-
Prof. Dr. Heidi Fiedler

CAMPAIGNS

2017
(I, II, III, IV)

2018
(I, II, III, IV)

PUF-1

Campaigns of ≈3 months (84 to 98 days)

PUF-3

ARG

BRB

ATG

→ 2017- I was not carried out

COL

JAM

CHL

→ 2017- II 104 days
2017- III 79 days

PUF-5 / 7

URY

BRA

ECU

MEX

→ 2017- I 36 days

PUF-9

PER

May 2018 ← → June 2020

2018 **2019** **2020**
(III, IV) (I, II, III, IV) (I, II)

Instrumental analysis with GC-HRMS → High selectivity & High sensitivity

↓
Low LODs & LOQs

Reports include LOQs

Sum of compounds in **lowerbound** → Conc. below LOQ are set equal to 0

- **LOD is related to S/N 3; LOQ is related to S/N 10**
- **Blank contribution shall also be considered**

dl-POPs: S/N 3; **LOQ for each congener and individual sample**

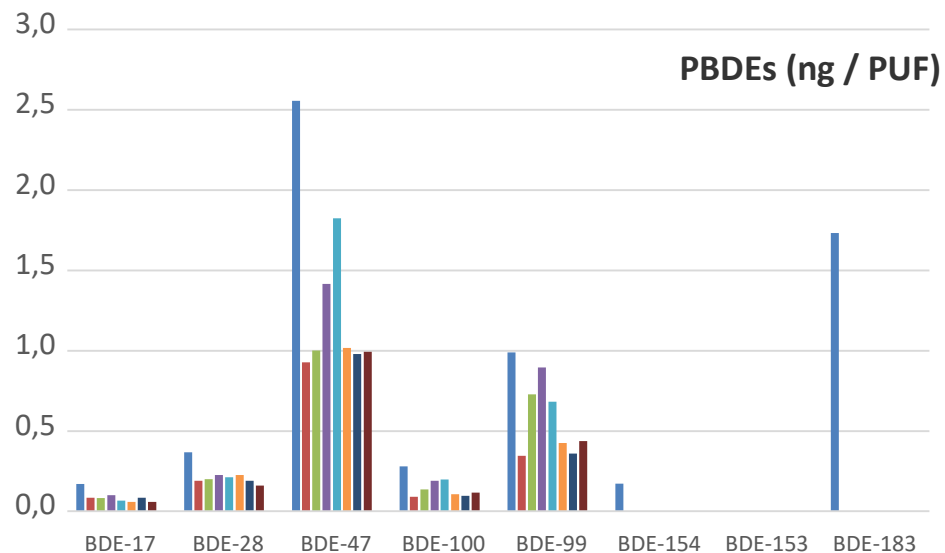
Ind. PCBs: Blank contribution (Mean + 10 SD); **LOQs (0,20 – 0,25 ng/PUF)**

PBDEs: Blank contribution (Mean + 10 SD); **LOQs (0,02 – 1,00 ng/PUF)**

OCPs: S/N 10; Low R%, quality of the extract,... were considered
Blank contribution (Mean + 10 SD) for PeCB, HCB, g-HCH
LOQs (0,08 – 1,00 ng/PUF)



ARGENTINA

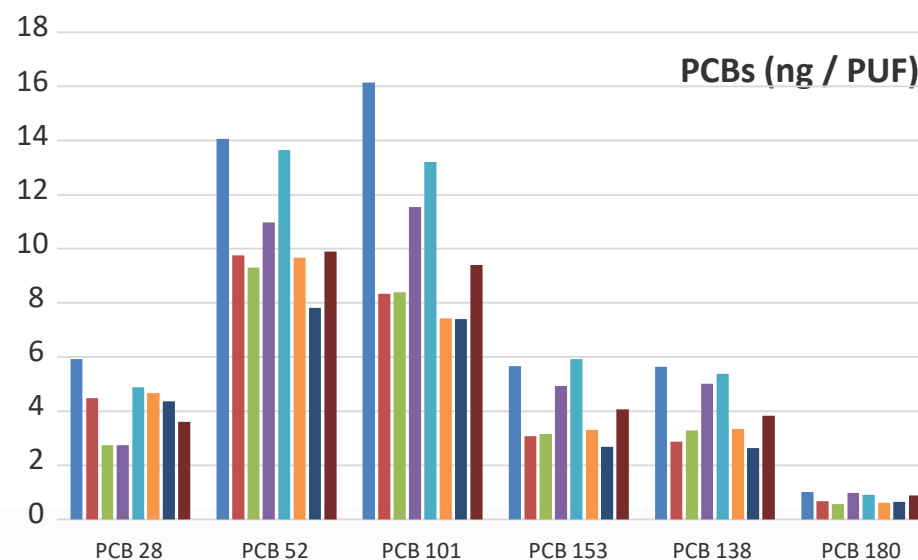


■ ARG (2017-I) ■ ARG (2017-II) ■ ARG (2017-III) ■ ARG (2017-IV) ■ ARG (2018-I) ■ ARG (2018-II) ■ ARG (2018-III) ■ ARG (2018-IV)

PCDD/Fs & dl-PCBs (pg / 4 PUF)

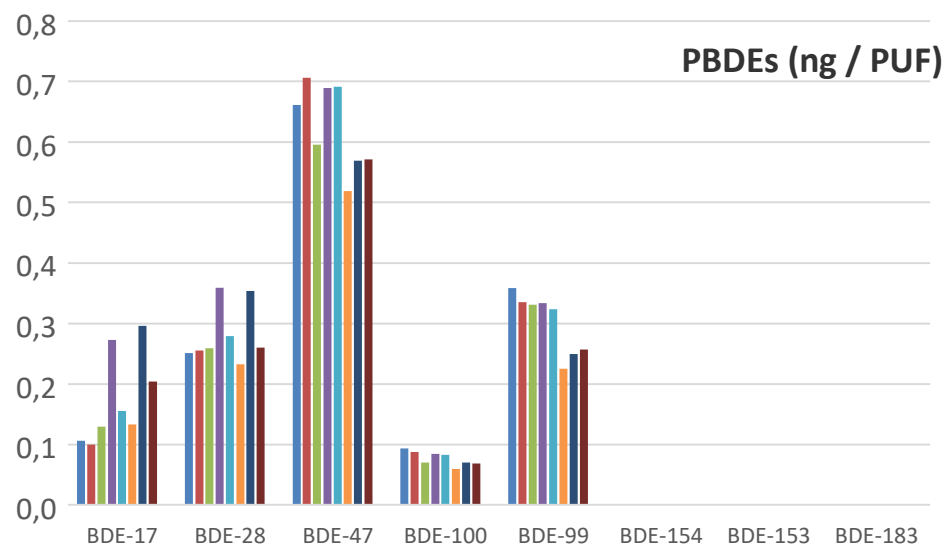
WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	17	24
WHO ₂₀₀₅ -TEQ _{PCB}	21	20
WHO ₂₀₀₅ -TEQ _{total}	38	45

Annual-2017 Annual-2018





URUGUAY

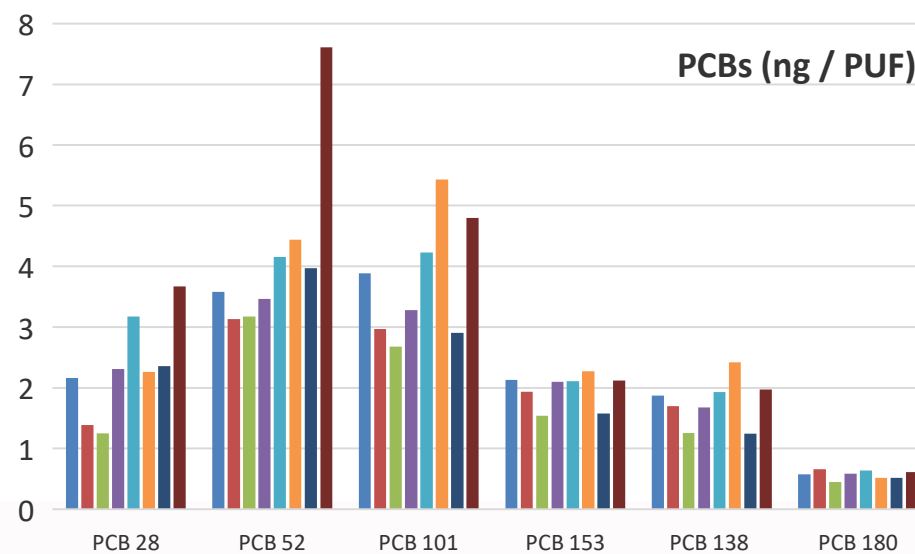


URY (2017-I) URY (2017-II) URY (2017-III) URY (2017-IV) URY (2018-I) URY (2018-II) URY (2018-III) URY (2018-IV)

PCDD/Fs & dl-PCBs (pg / 4 PUF)

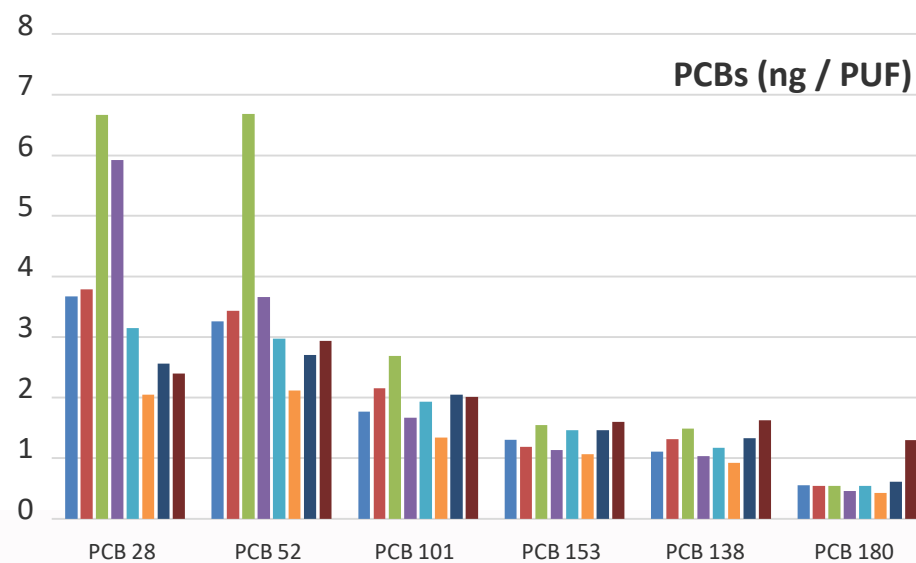
WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	65	63
WHO ₂₀₀₅ -TEQ _{PCB}	16	20
WHO ₂₀₀₅ -TEQ _{total}	81	84

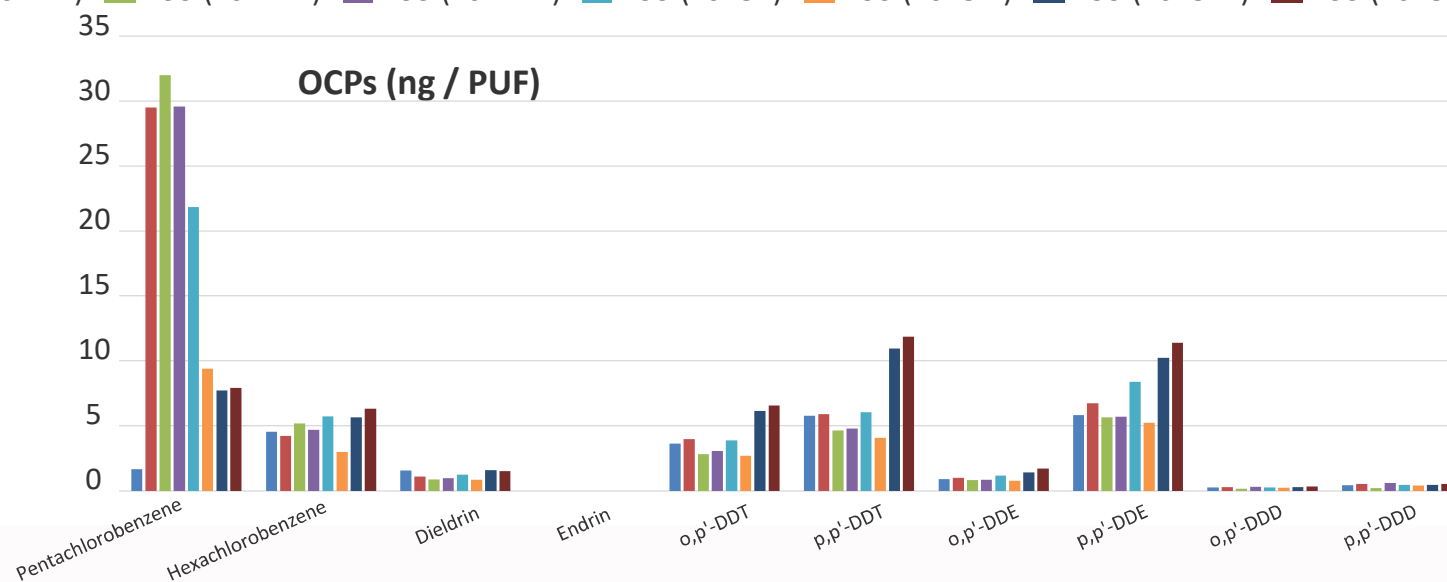
Annual-2017 Annual-2018



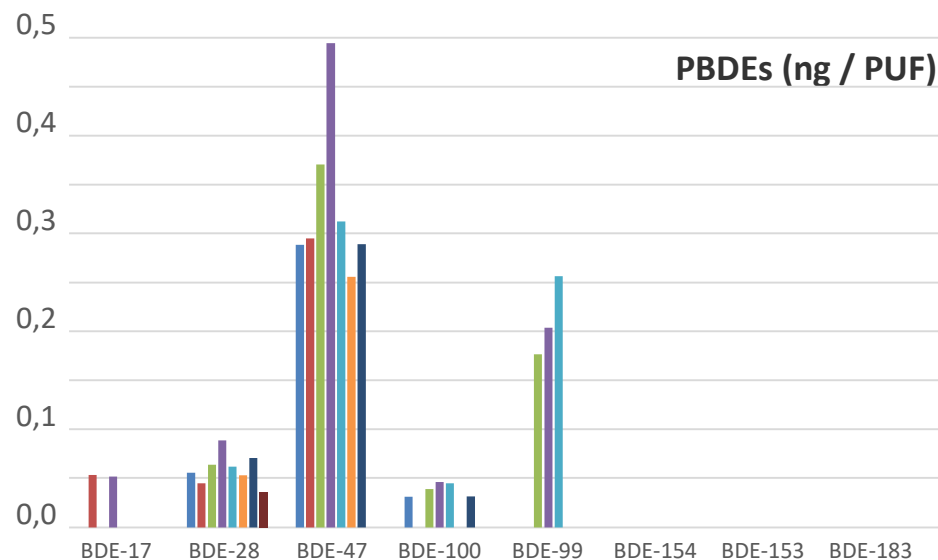




Annual-2017 Annual-2018



ECUADOR

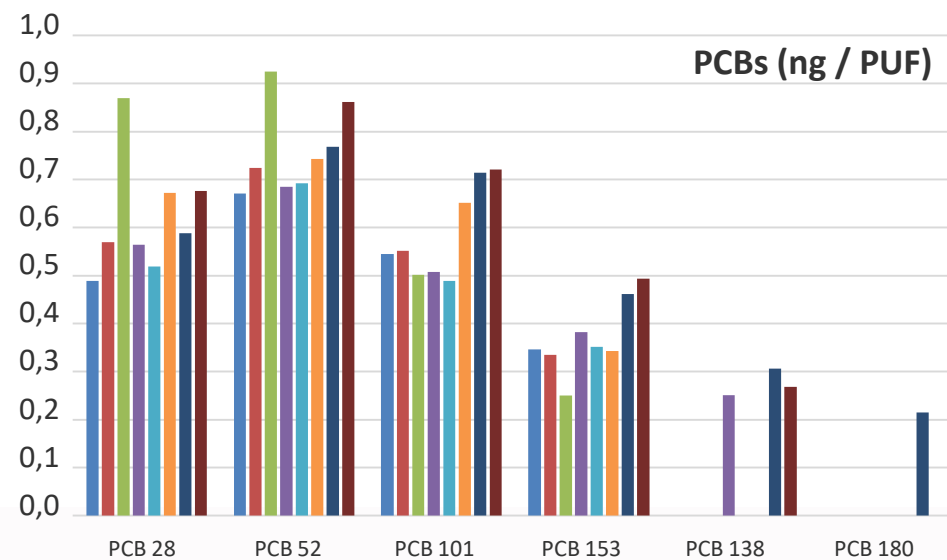


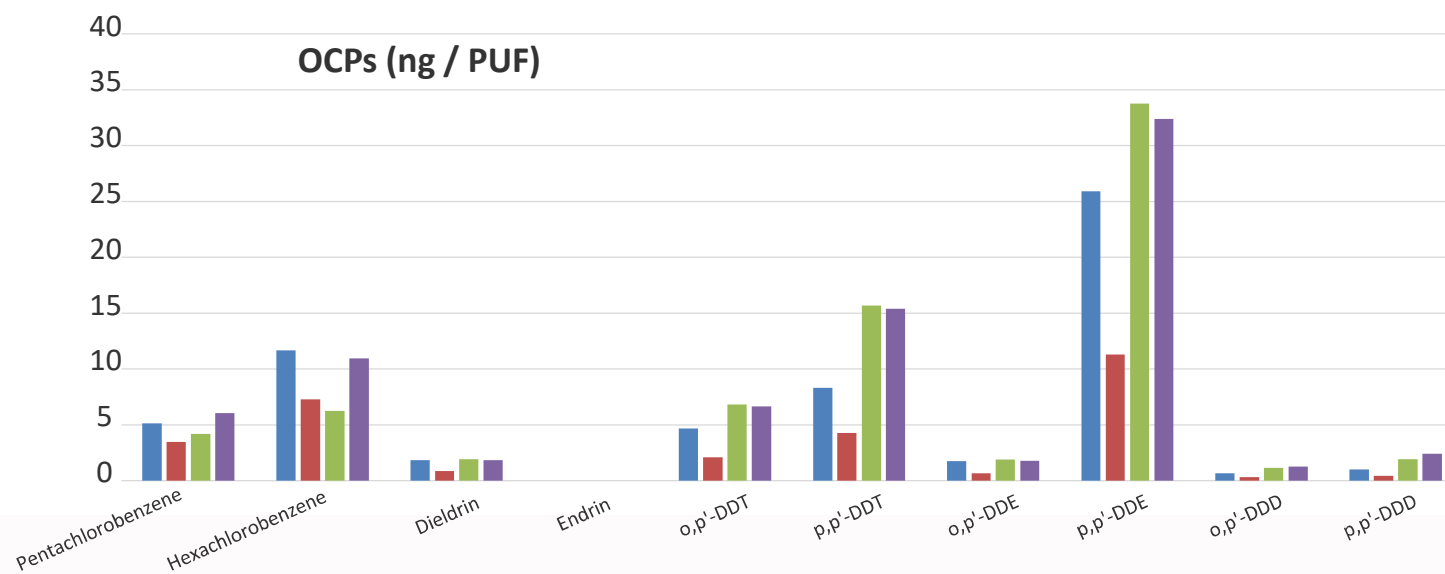
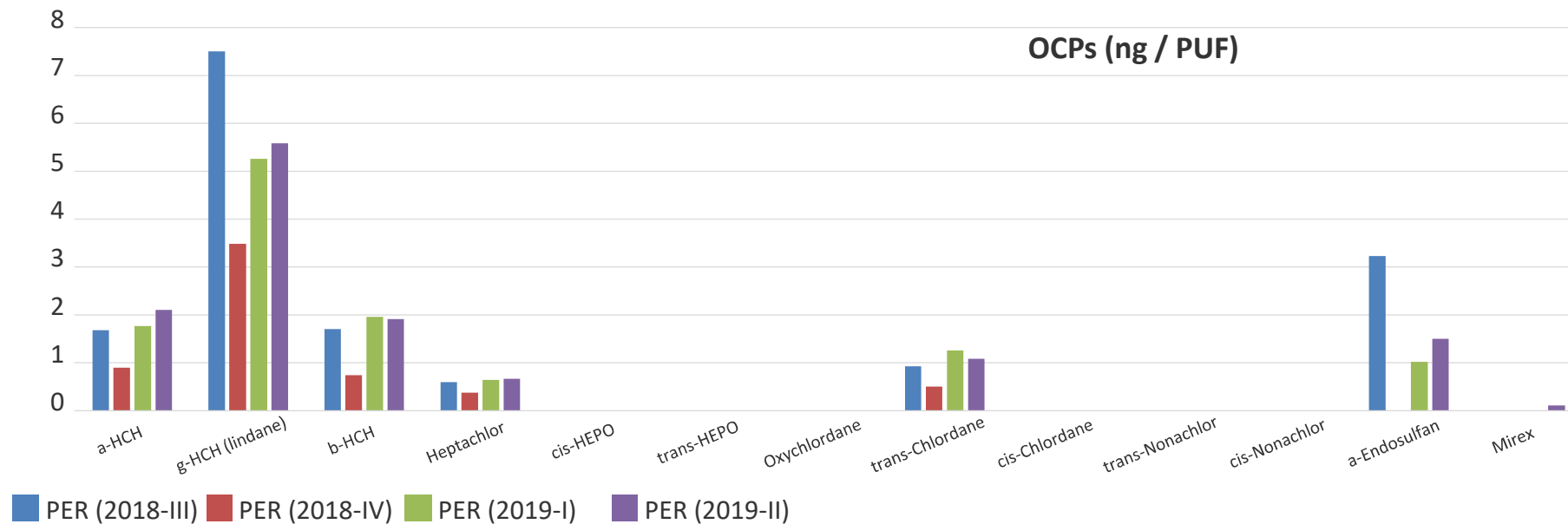
■ ECU (2017-I) ■ ECU (2017-II) ■ ECU (2017-III) ■ ECU (2017-IV) ■ ECU (2018-I) ■ ECU (2018-II) ■ ECU (2018-III) ■ ECU (2018-IV)

PCDD/Fs & dl-PCBs (pg / 4 PUF)

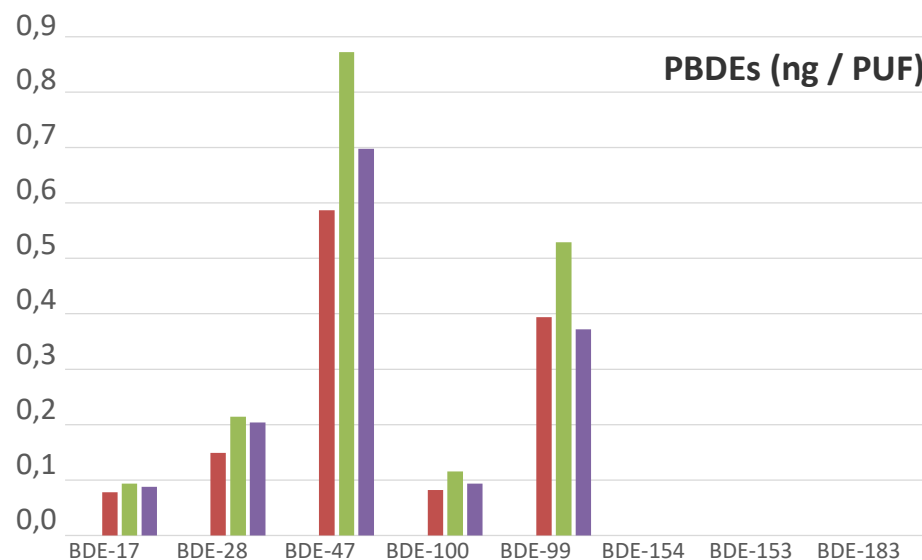
WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	5,3	6,4
WHO ₂₀₀₅ -TEQ _{PCB}	1,9	2,2
WHO ₂₀₀₅ -TEQ _{total}	7,2	8,6

Annual-2017 Annual-2018





PERU

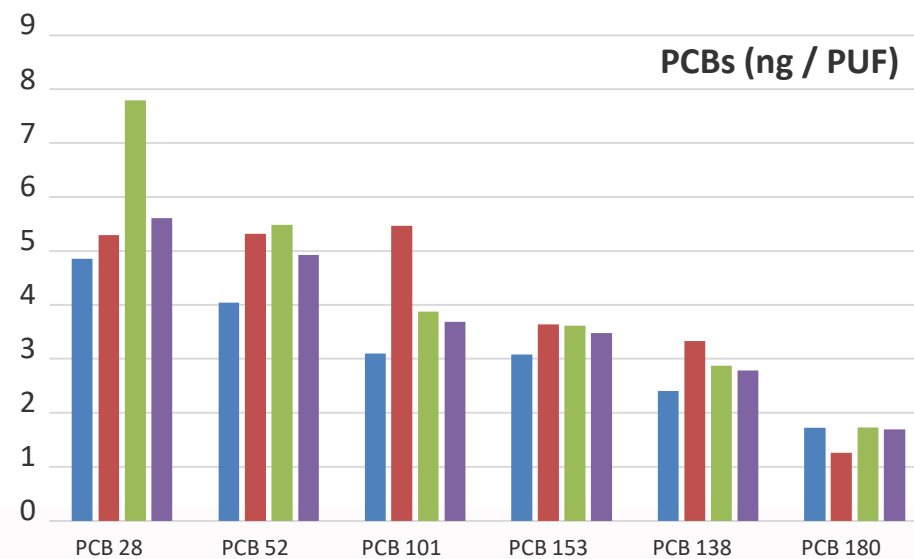


PER (2018-III) PER (2018-IV) PER (2019-I) PER (2019-II)

PCDD/Fs & dl-PCBs (pg / 4 PUF)

WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	77
WHO ₂₀₀₅ -TEQ _{PCB}	44
WHO ₂₀₀₅ -TEQ _{total}	121

Annual-2018/19





PBDEs (ng / PUF)

No quantifiable levels

BDE-17 BDE-28 BDE-47 BDE-100 BDE-99 BDE-154 BDE-153 BDE-183

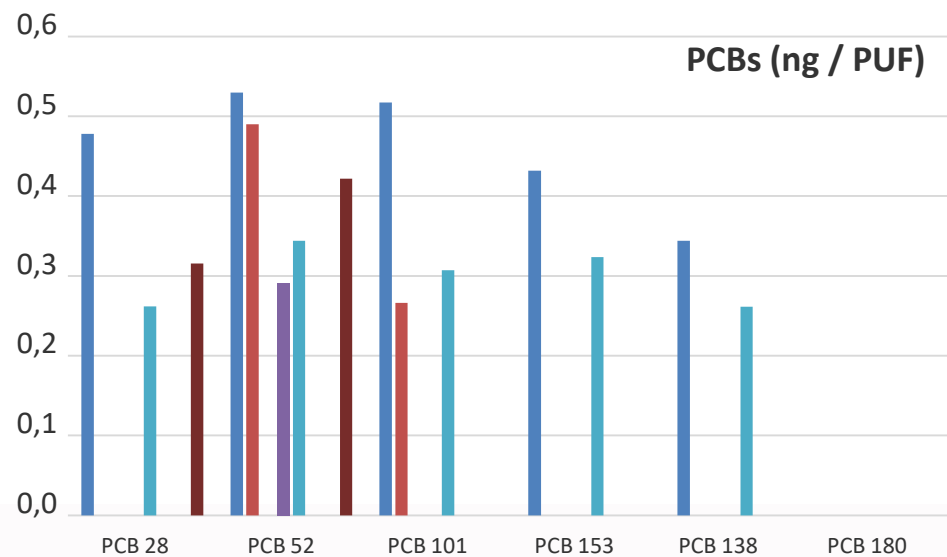
CHL (2017-I) CHL (2017-II) CHL (2017-III) CHL (2017-IV) CHL (2018-I) CHL (2018-II) CHL (2018-III) CHL (2018-IV)

PCDD/Fs & dl-PCBs (pg / 4 PUF)

WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	2,4	8,1
WHO ₂₀₀₅ -TEQ _{PCB}	1,3	1,2
WHO ₂₀₀₅ -TEQ _{total}	3,7	9,2

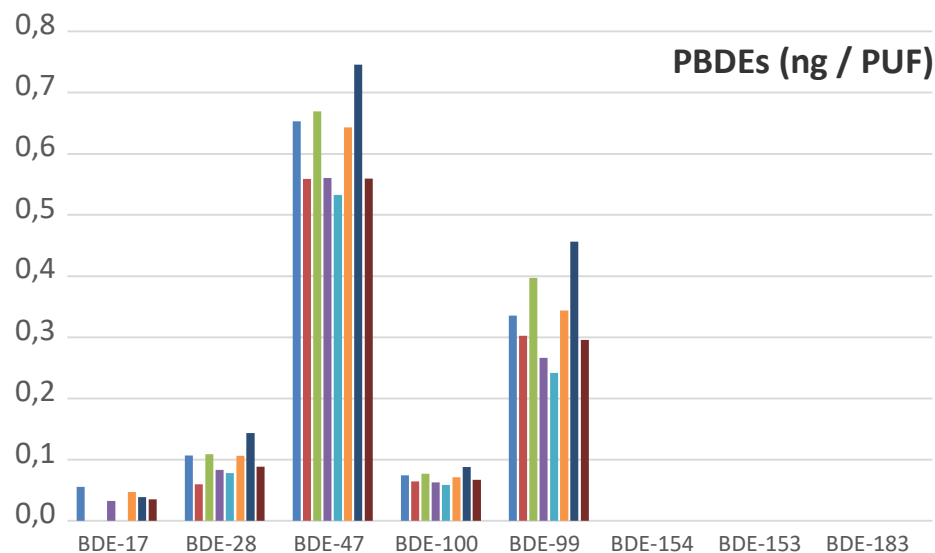
Annual-2017 Annual-2018

PCBs (ng / PUF)





BRAZIL

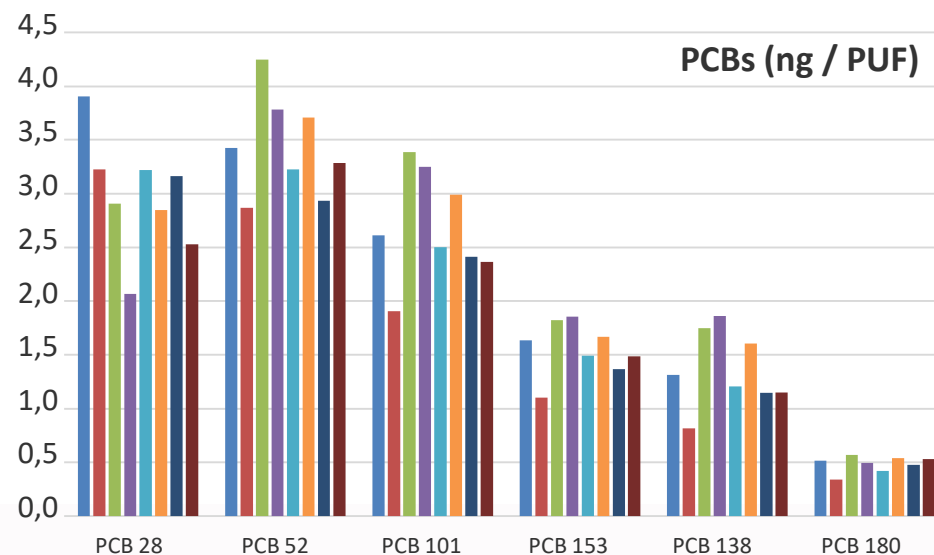


■ BRA (2017-I) ■ BRA (2017-II) ■ BRA (2017-III) ■ BRA (2017-IV) ■ BRA (2018-I) ■ BRA (2018-II) ■ BRA (2018-III) ■ BRA (2018-IV)

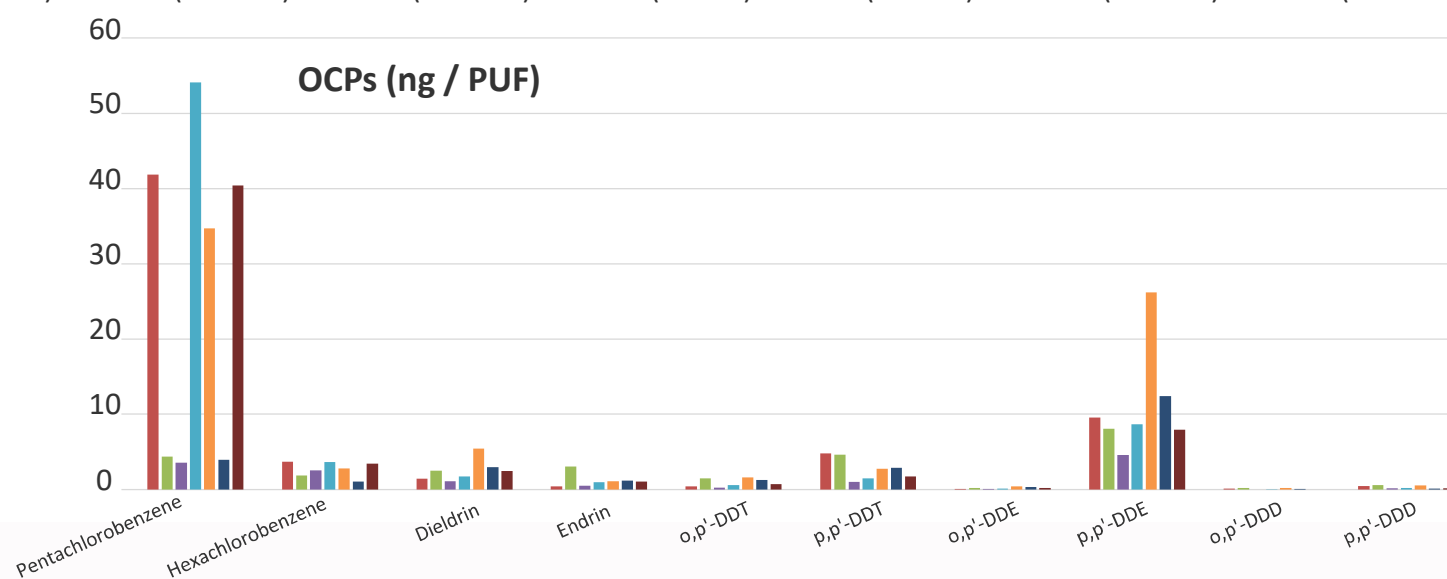
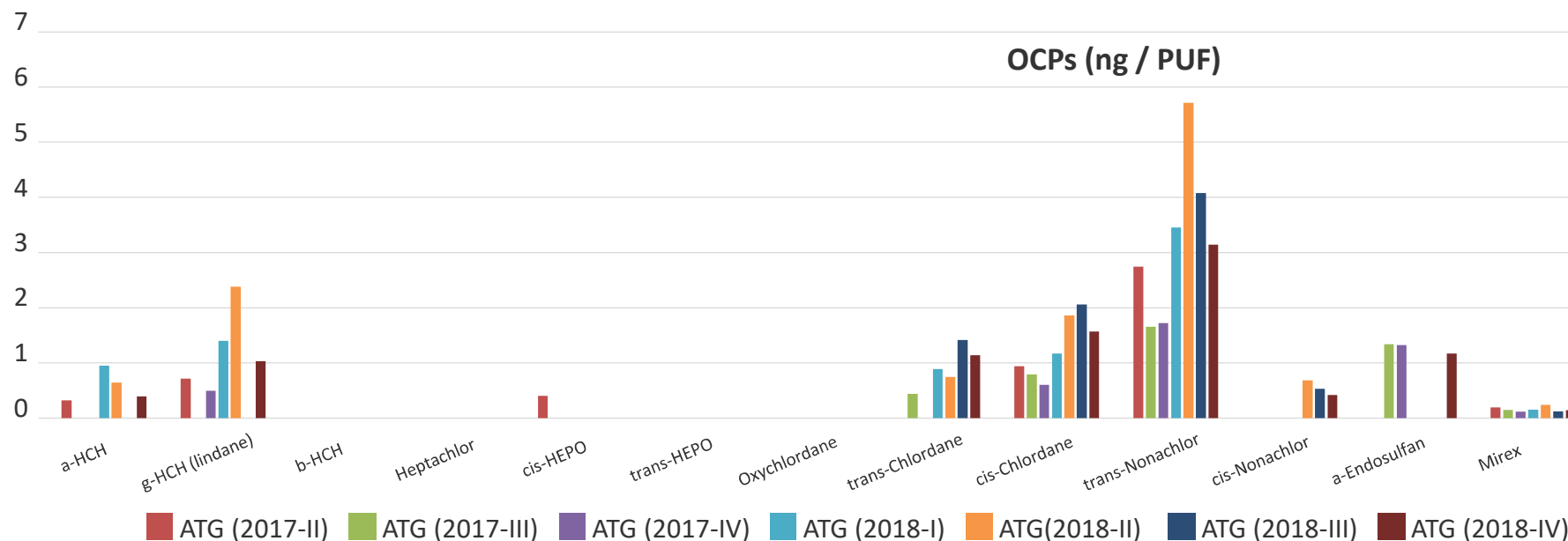
PCDD/Fs & dl-PCBs (pg / 4 PUF)

WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	27	34
WHO ₂₀₀₅ -TEQ _{PCB}	9	13
WHO ₂₀₀₅ -TEQ _{total}	36	47

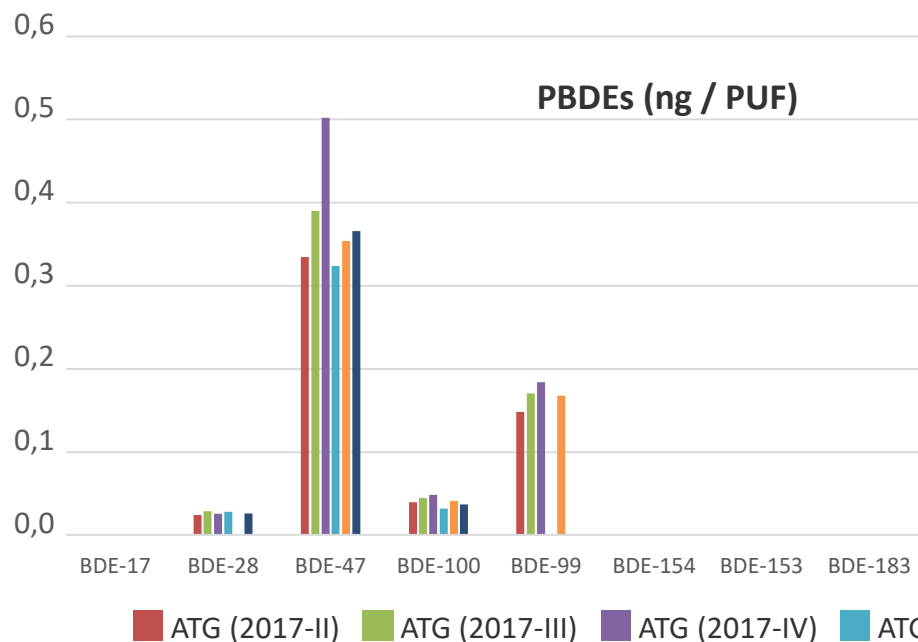
Annual-2017 Annual-2018



ANTIGUA & BARBUDA



ANTIGUA & BARBUDA



PCDD/Fs & dl-PCBs (pg / 3 PUF) (pg / 4 PUF)

WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	0,42	1,4
WHO ₂₀₀₅ -TEQ _{PCB}	0,77	1,0
WHO ₂₀₀₅ -TEQ _{total}	1,2	2,4

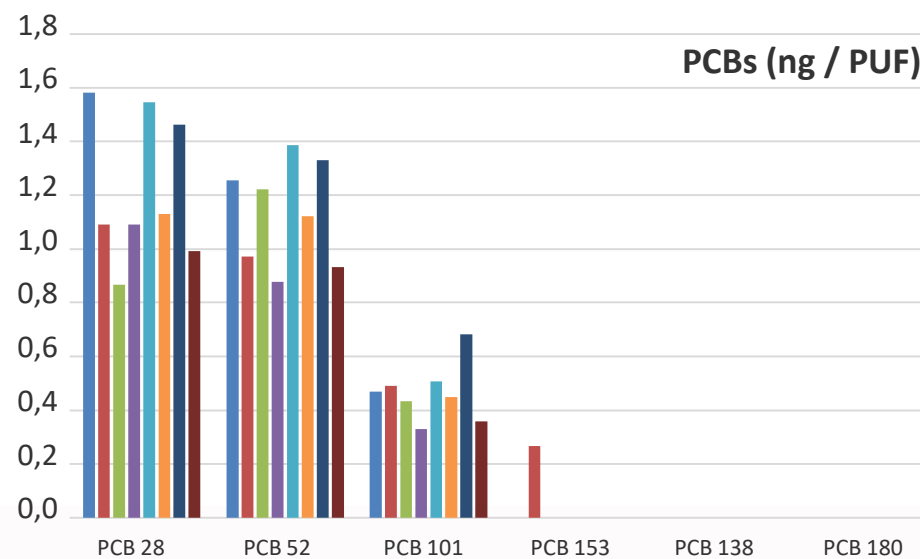
Annual-2017 Annual-2018

PCBs (ng / PUF)

No quantifiable levels

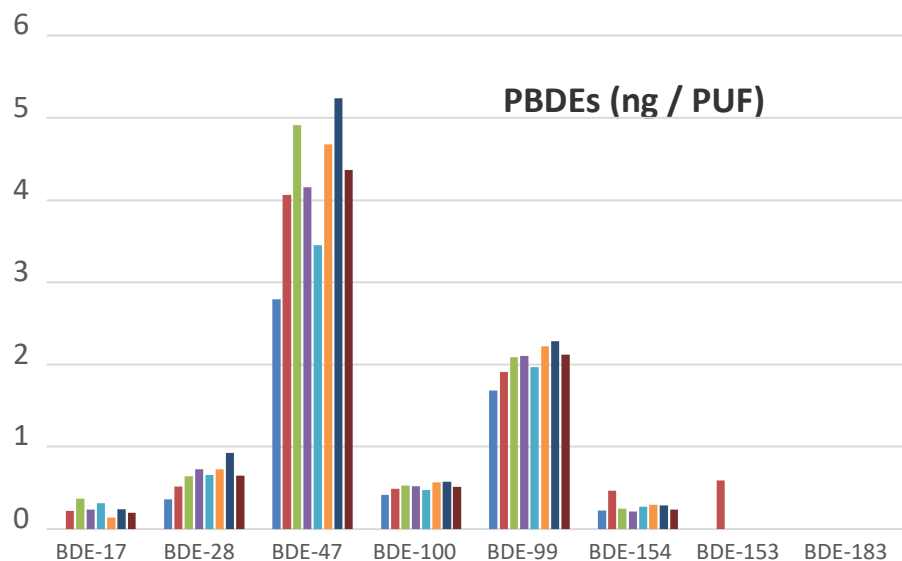
PCB 28 PCB 52 PCB 101 PCB 153 PCB 138 PCB 180



Annual-2017 Annual-2018



JAMAICA

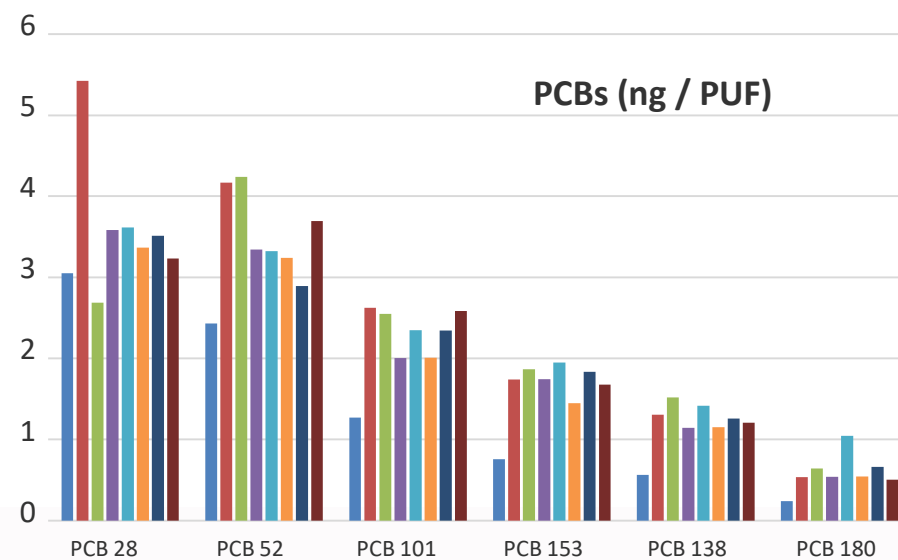


■ JAM(2017-I)
 ■ JAM (2017-II)
 ■ JAM (2017-III)
 ■ JAM (2017-IV)
 ■ JAM (2018-I)
 ■ JAM (2018-II)
 ■ JAM (2018-III)
 ■ JAM (2018-IV)

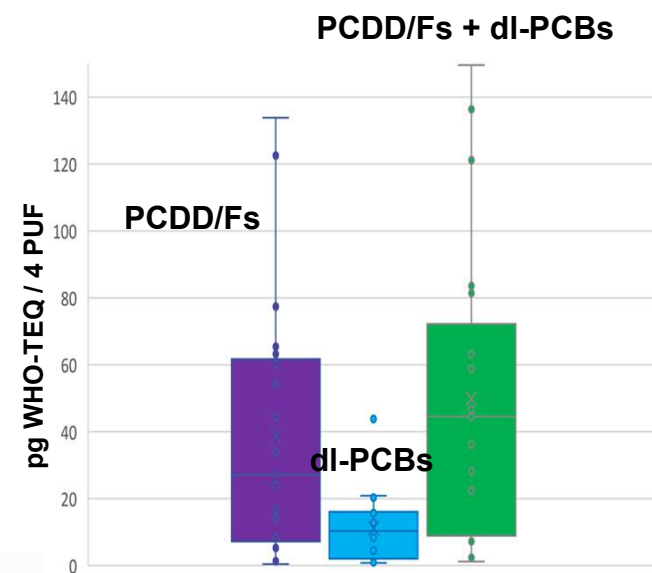
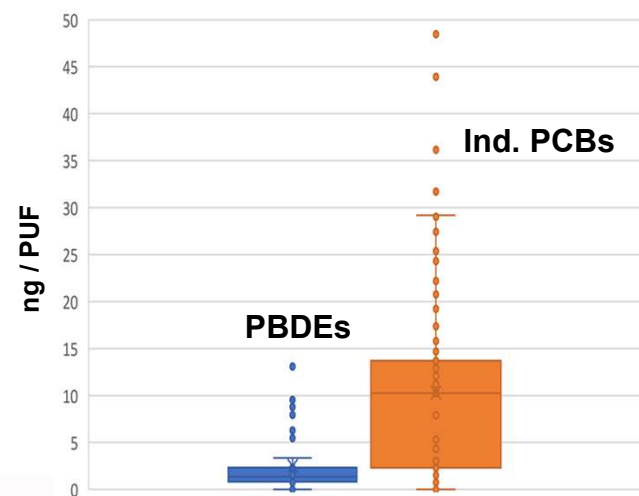
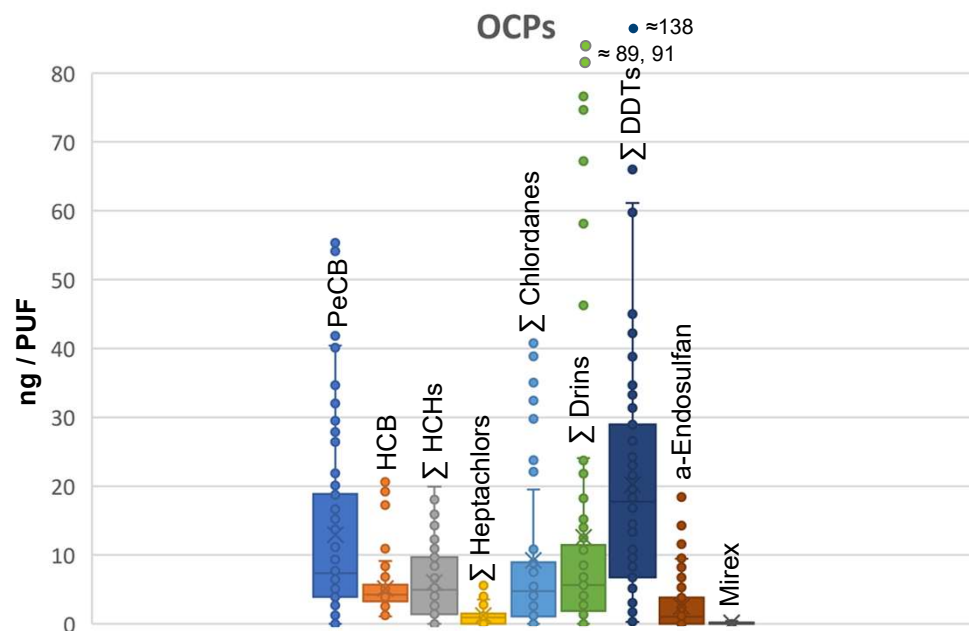
PCDD/Fs & dl-PCBs (pg / 4 PUF)

WHO ₂₀₀₅ -TEQ _{PCDD/PCDF}	122	134
WHO ₂₀₀₅ -TEQ _{PCB}	14	16
WHO ₂₀₀₅ -TEQ _{total}	136	150

Annual-2017 Annual-2018



COMPARATIVE RESULTS



CONCLUSIONS

- In general terms, there are differences between rural and urban areas and between countries, related to both the levels and the families of compounds.
- Levels are representative of the particular sampling location.
- For OCPs:
 - g-HCH (lindane): ECU COL BRA
 - Chlordanes: BRB JAM ATG (lower levels, rural area)
 - Dieldrin: **BRB** JAM
 - DDTs (p,p'-DDE): **MEX** COL PER
 - a-Endosulfan: **MEX** ARG URY BRA
- For PBDEs: MEX JAM
- For PCBs: **ARG** PER
- For PCDD/Fs: **JAM** PER URY BRB

On behalf of all the CSIC team:

Dedicated to the memory of Prof. Tara Dasgupta



On behalf of all the CSIC team:

Thanks for your attention

