





Results and Conclusions from the 3rd Interlaboratory Assessment and Status of the 4th Interlaboratory Assessment

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Content

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 - Dioxin-like POPs and PFOS
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Three rounds of POPs interlaboratory assessments




Bi-ennial Global Interlaboratory Assessment on Persistent Organic Pollutants – First Round 2010/2011




Coordinated by:
Chemicals Branch
United Nations Environment Programme/DTIE

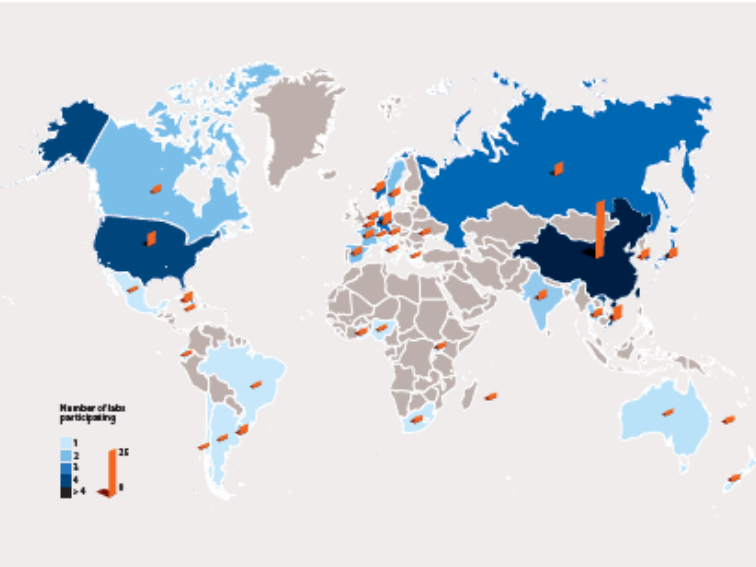
March 2012



INTER-ORGANIZATIONAL PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS
A cooperative agreement among FAO, ILO, UNEP, UNDO, UNCTAD, WHO, World Bank and OECD





Bi-ennial Global Interlaboratory Assessment on Persistent Organic Pollutants
Second Round 2012/2013




Number of labs participating

1	2	3	4	>4
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June 2014



Bi-ennial Global Interlaboratory Assessment on Persistent Organic Pollutants – Third Round 2016/2017



Coordinated by:
Chemicals and Health Branch
United Nations Environment Programme

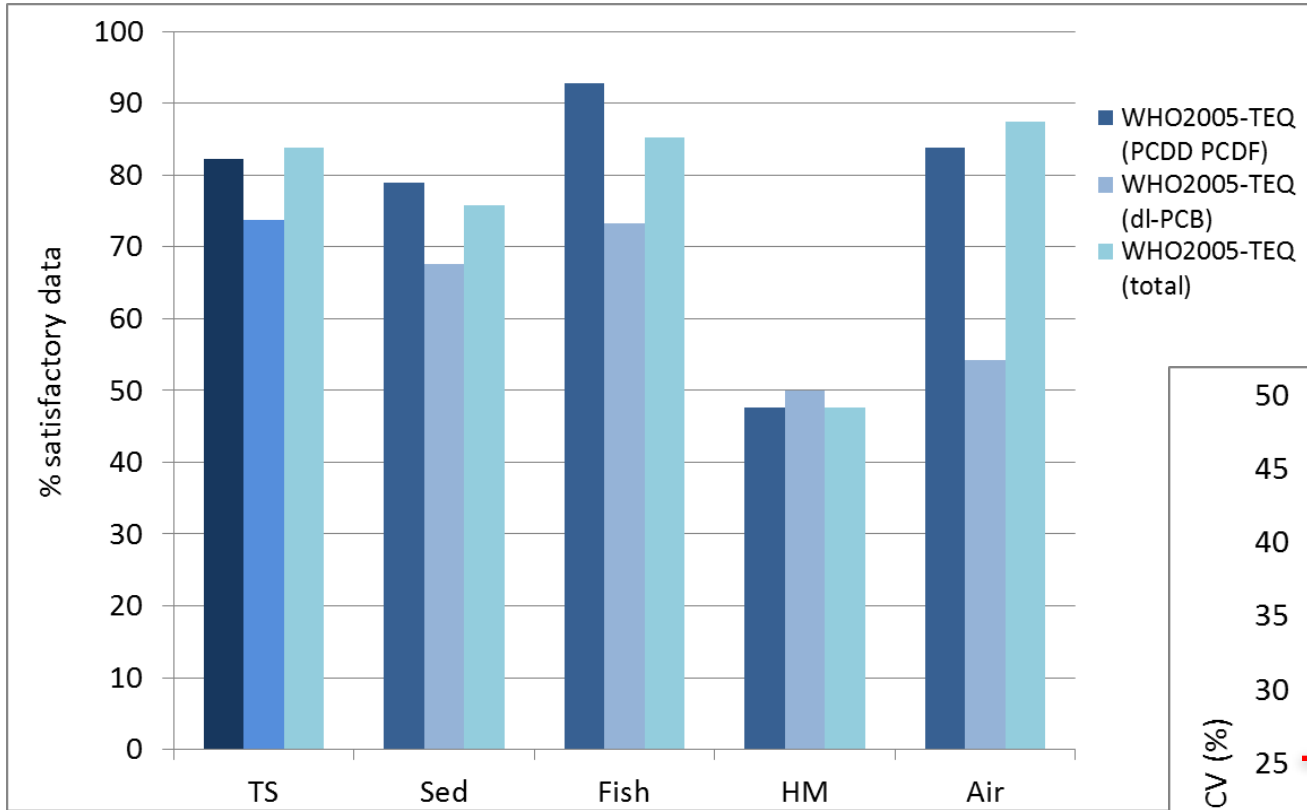
June 2017

3rd round of interlaboratory assessments

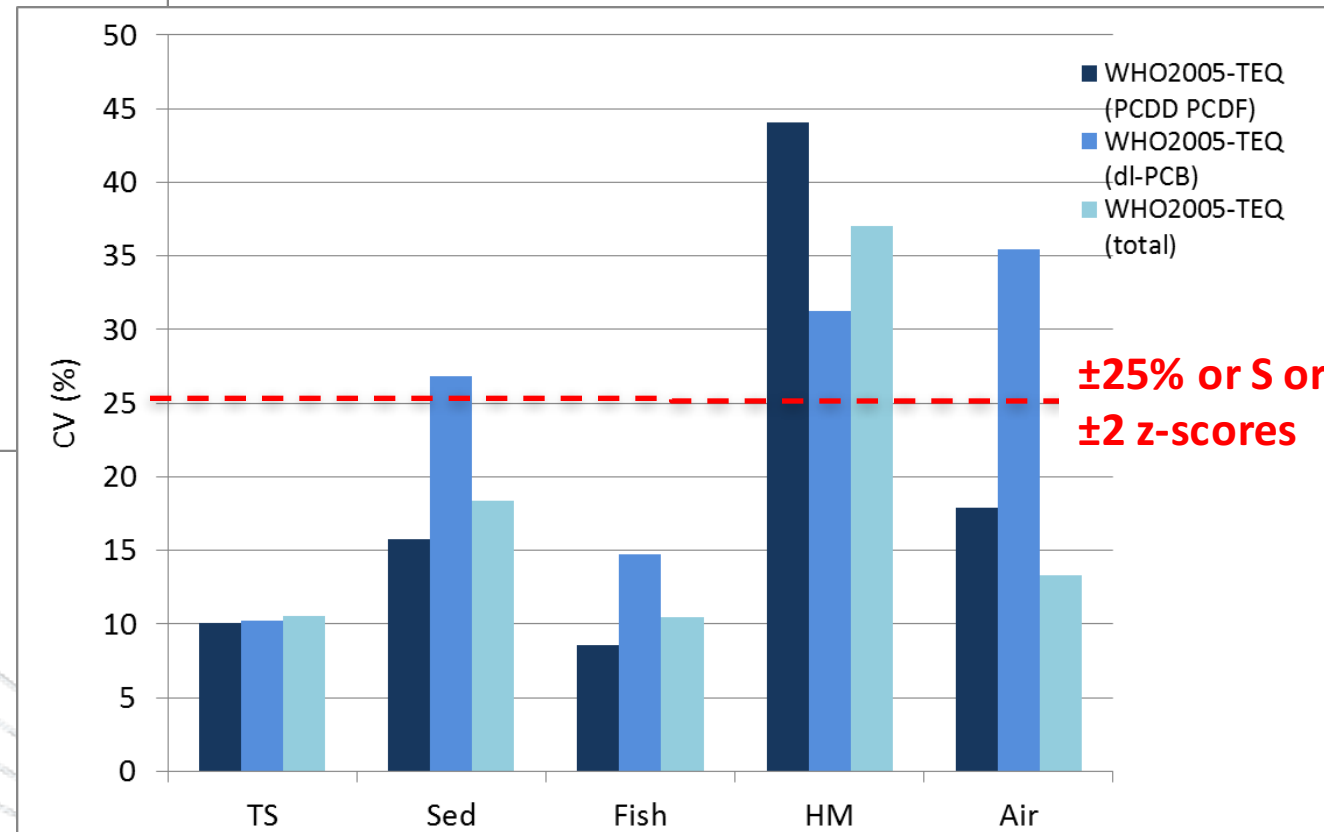


Region	# Labs registered	# Labs samples received	# Labs not reporting results	# Labs results submitted	% Labs with results
Africa	19	18	5	14	74%
Asia	67	61	14	53	78%
CEE	23	22	7	16	70%
GRULAC	39	34	14	25	64%
WEOG	27	27	2	25	93%
Grand Total	175	162	42	133	75%

Summary performance for dl-POPs (TEQ, LB)



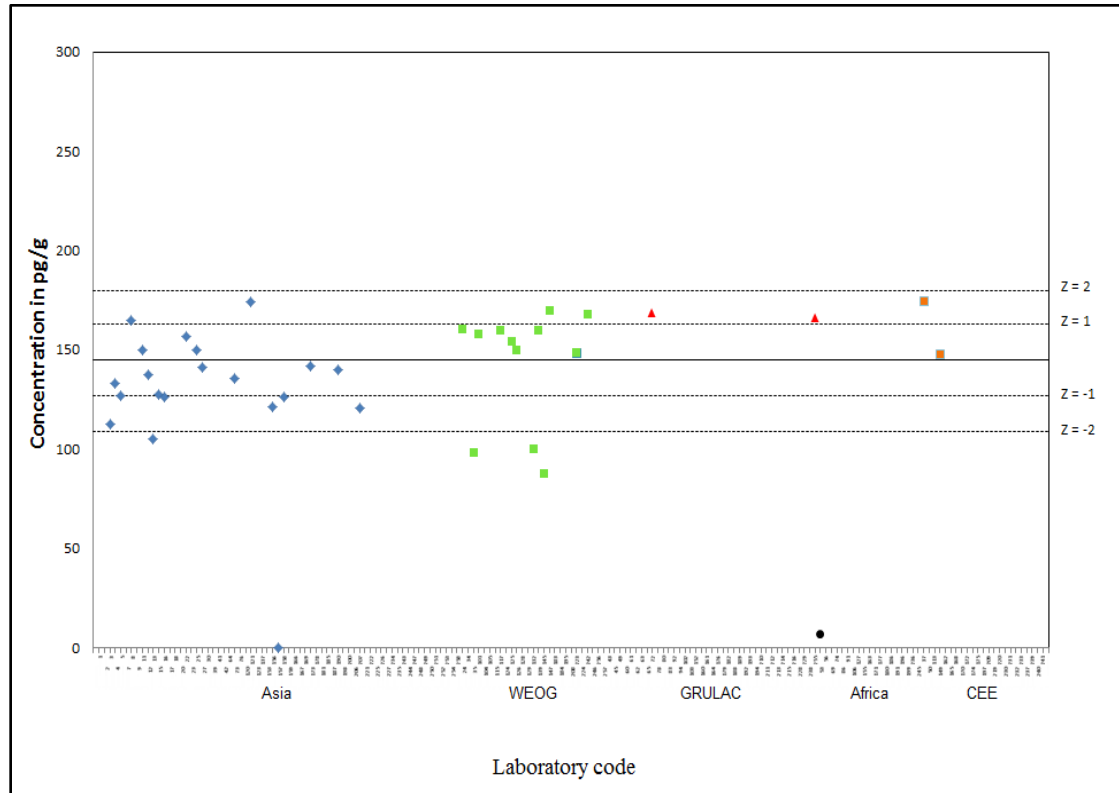
Maximum of 59 labs



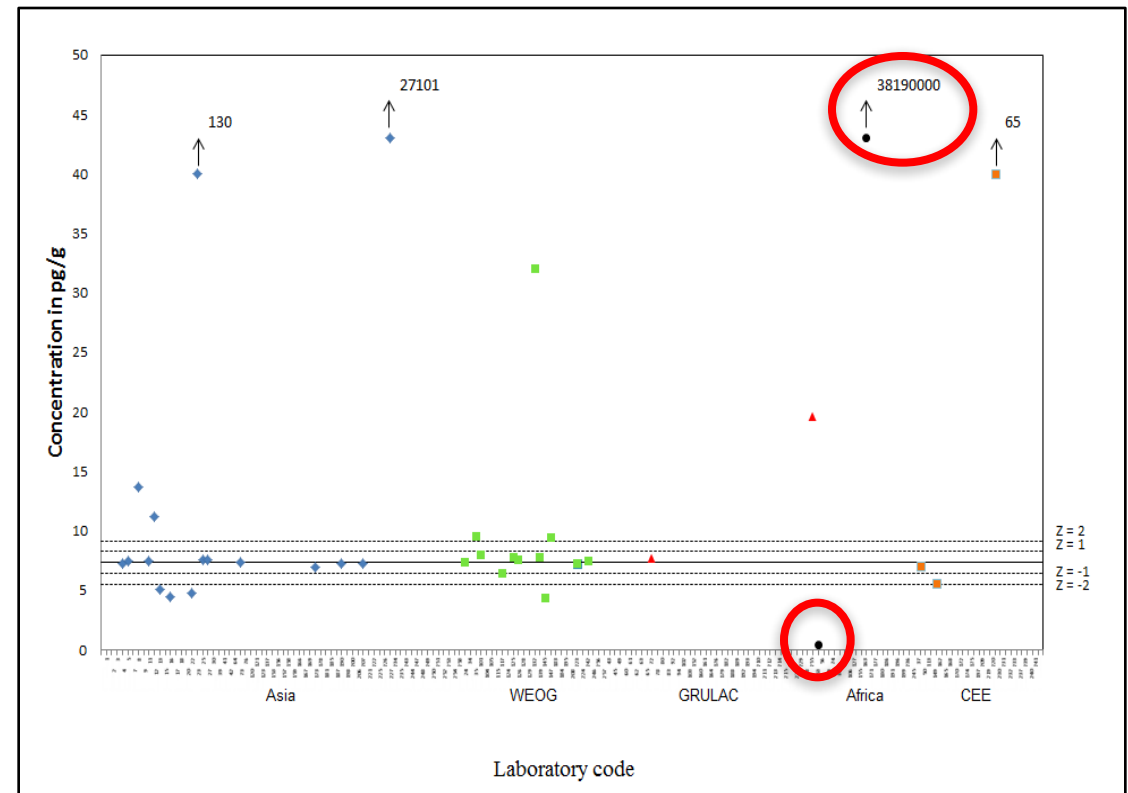
Except for the human milk sample, the performance of laboratories for PCDD/PCDF was better than for dl-PCB

Results of dl-POPs in air extract

TEQ_{PCDD/PCDF} (38 labs)



TEQ_{PCB} (38 labs)



Laboratory code on the x-axis, concentration in pg/g on the y-axis.

The assigned value given by straight line, $z = \pm 1$ (12.5%) and $z = \pm 2$ (25%) are given by the dotted lines.

Blue \blacklozenge symbols represent Asia, green \blacksquare WEOG, red \blacktriangle GRULAC, black \bullet Africa, orange \blacksquare CEE.

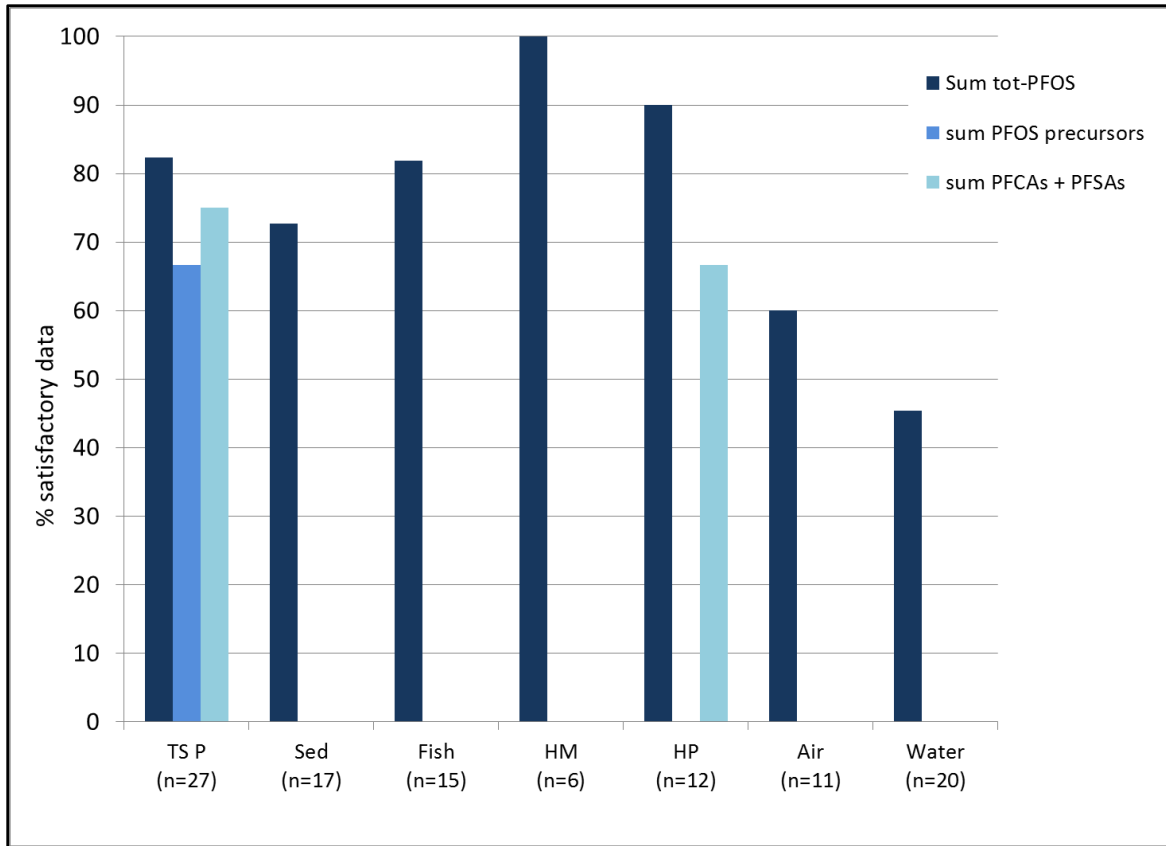
dl-POPs instrumentation and results



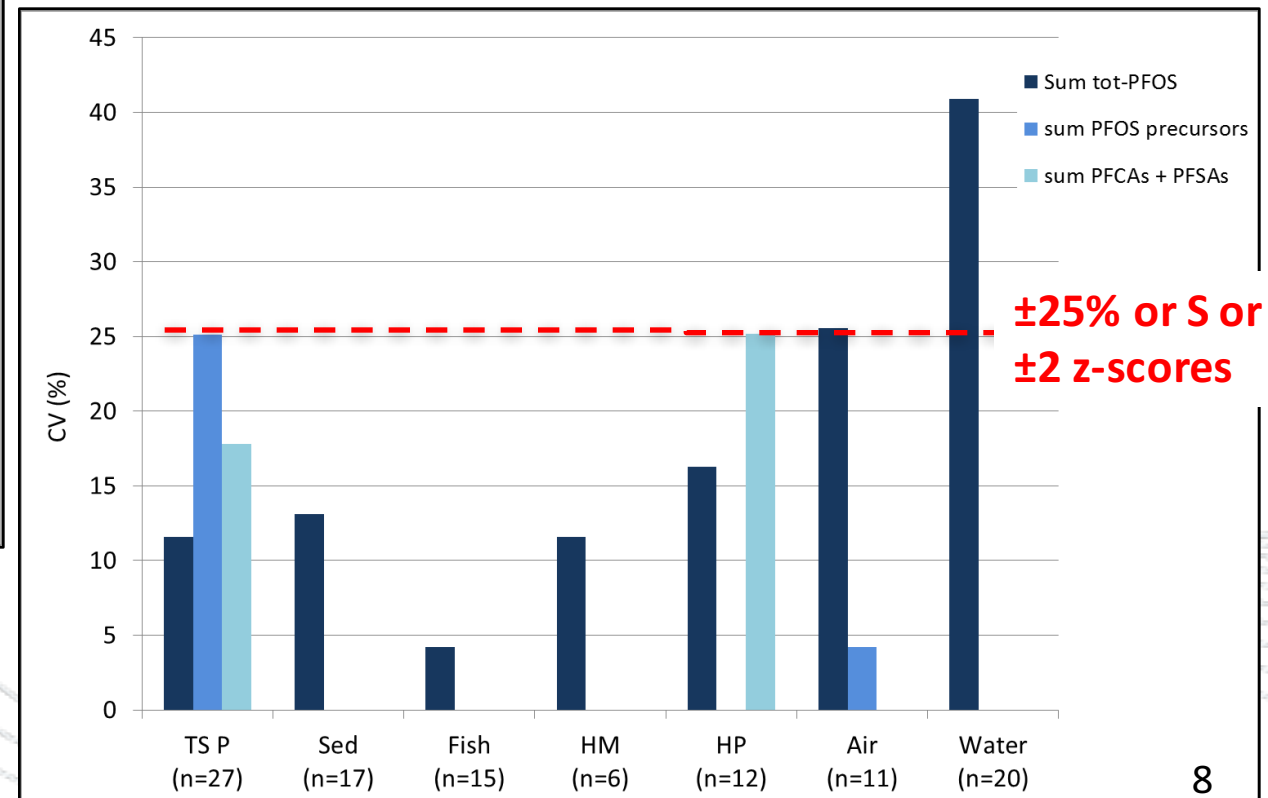
Instrument	# S-dl-POPs	# Q-dl-POPs	# U-dl-POPs	Subtotal	% S of all S
HRMS	3,406	451	612	4,469	84%
LRMS	322	58	285	665	8%
ECD	12	3	90	105	0.3%
NR	300	24	142	466	7%
GrandTotal	4,040	536	1,129	5,705	100%

- The majority of the labs used **HRGC/HRMS** (magnetic sector-field instruments) for dl-POPs;
- This combination seems to generate the best results;
- **ECD detection is not capable to analyze dl-POPs; not appropriate for dl-PCB; (two labs from Africa and one from CEE)**
- Most laboratories used 60 m long GC columns; some used 30 m long columns;
- Two columns of different polarity hardly used (← EPA methods);
- No laboratory used GCxGC for separation.

Summary performance for PFAS



Whereas 60% of the z-scores for PFOS were satisfactory for the air extract;
 No z-scores could be assigned for the precursors (FOSA, Me-/Et-FOSA/FOSE)



Maximum of 29 labs

Lab performance on all POPs (Top 24; total n=133)



Region	Lab#	S All	Q All	U All	C All	I All	B All	%S	n Rep All
Asia	L027	346	21	13	1	0	211	91%	381
WEOG	L117	290	11	19	8	5	259	87%	333
Asia	L190	241	29	42	3	13	264	73%	328
WEOG	L126	229	24	36	0	2	301	79%	291
Asia	L004	225	17	28	3	6	313	81%	279
WEOG	L124	225	12	11	5	0	339	89%	253
Asia	L011	215	11	41	0	0	325	81%	267
GRULAC	L072	210	19	43	2	5	313	75%	279
WEOG	L024	203	29	10	3	3	344	82%	248
WEOG	L034	203	18	18	2	0	351	84%	241
Asia	L030	194	19	14	5	6	354	82%	238
WEOG	L132	189	55	52	5	4	287	62%	305
WEOG	L101	185	7	11	2	1	386	90%	206
WEOG	L145	178	41	26	1	2	344	72%	248
Asia	L207	160	5	3	0	0	424	95%	168
Asia	L173	153	44	40	0	2	353	64%	239
Asia	L025	151	0	4	0	0	437	97%	155
Asia	L137	146	13	59	2	7	365	64%	227
WEOG	L105	141	19	64	10	21	337	55%	255
Asia	L013	140	40	74	3	28	307	49%	285
Asia	L005	138	20	36	2	8	388	68%	204
Asia	L153	133	22	38	0	0	399	69%	193
CEE	L037	129	13	2	0	1	447	89%	145
WEOG	L125	124	3	0	0	0	465	98%	127

- 126 Labs had at least one "S" z-score
- 7 labs did not achieve any "S" result

Total z-scores = 592

Best performance and widest spectrum of POPs/matrix analysis is located in Asia (China, Japan) and in WEOG (Europe, AUS, CAN, USA)

Performance of POPs laboratories in Africa and expert labs

14 labs from Africa

5 expert labs:

- CZE: Recetox, Masaryk University
- DEU: CVUA
- ESP: CSIC Barcelona
- NED: E&H VU Amsterdam
- SWE: MTM, Örebro University

Region	Lab#	S All	Q All	U All	C All	I All	%S	n Rep All
Asia	L027	346	21	13	1	0	91%	381
Expert1		229	24	36	0	2	79%	291
Expert2		225	12	11	5	0	89%	253
Expert3		185	7	11	2	1	90%	206
Expert4		141	19	64	10	21	55%	255
Expert5		129	13	2	0	1	89%	145
Africa	L053	56	30	105	0	0	29%	191
Africa	L127	51	4	24	3	1	61%	83
Africa	L069	22	3	54	0	7	26%	86
Africa	L163	12	5	148	0	0	7%	165
Africa	L086	9	2	36	0	0	19%	47
Africa	L155	7	2	27	0	5	17%	41
Africa	L091	6	0	74	3	35	5%	118
Africa	L171	5	5	30	0	9	10%	49
Africa	L186	4	0	10	0	1	27%	15
Africa	L191	4	0	21	0	0	16%	25
Africa	L074	2	0	41	3	51	2%	97
Africa	L196	2	2	36	0	22	3%	62
Africa	L106	0	0	12	0	10	0%	22

Distribution of capacity in African labs

- 8 labs that analyzed OCPs
- 9 labs that analyzed indicator PCB
- 4 labs analyzed dl-POPs (EGY, KEN, NGA, ZAF)
 - 2 analyzed PCDD/PCDF
 - 2 analyzed dl-PCB with ECD !
- 2 labs that analyzed PFAS; both located in South Africa
- 2 Labs that analyzed PBDE; both located in South Africa
- Overall conclusions:
 - Chemical analytical capacity and performance for POPs analysis still quite low (although some promising)
 - Capacity and performance for new POPs or more sophisticated POPs very low.

Invitation to participation in 4th round

- 4th round of the "Bi-ennial global interlaboratory assessment of POPs laboratories" to be undertaken in 2018 within the UNEP/GE FGMP2 projects;
- Coordination:
 - E&H VU Amsterdam and MTM Research Centre, Örebro University
- Invitation:
 - All labs that participated in rounds 1-3 (some additional)
 - No costs for laboratories from developing (and UNEP/GEF GMP2) countries
- Schedule:
 - Invitations and registration through MTM Örebro University by e-mail or web-based from March 2018 until end April 2018;
 - Preparation of test materials, confirmation of addresses, in June/July 2018;
 - Shipment of test samples – September 2018;
 - Reporting of results (MsExcel) by 15 January 2019.

Registration at present

- Number of labs registered: 128 (status: 21 July 2018)
 - Africa 18 MAR 4,
 - Asia 38 CHN 20, VNM 4, JPN 2
 - CEE 5 RUS 2
 - GRULAC 36 BRA 10, COL 3
 - WEOG 31 DEU 4, SWE 4, CDN 3
- 34 new laboratories registered:
 - National workshop in Brazil, "atmosphere" conference in Guangzhou, CWG PFAS of EURL/NRLs

Test solutions	Sediment	Fish	Human milk	Human plasma	Air (TOL)	Air (MeOH)	Water	Total
394	90	90 (122)	80 (114)	19	71	19	30	858

- Value of the samples: **USD 403,000**

Historic participation from Africa known

Participating laboratories and laboratories that submitted results


Round 1	Round 2	Round 3	Round 4		Results Round 1	Results Round 2	Results Round 3	Round 4
17	12	18	18	# Total labs				
				# submitted results	10	5	14	18 Reg
				# registered and no results	7	7	4	

- **No lab registered from GMP2 countries: DR Congo, Ethiopia, Togo (do not have POPs lab) and ZAMBIA**
- **Be prepared to receive the test samples in September 2018!**

Historic participation



Short name Lab	ISO-3	Contact person	Submitted results Round 1	Submitted results Round 2	Submitted results Round 3	Submitted results Round 4
LACIB	CMR	Ngassoum Martin Benoit	na	na	0	Reg
Laboratoire d'Essais Physico-Chimiques et Microbiologiques de l'Occ/KIN	COD	Jean Romain Kintaba; Antho Kabama; Jérôme Bamba	0		na	
QCAP Egypt	EGY	Emad Attallah	1	na	1	Reg
Environmental Public Health	ETH	Mesaye Getachew Woldegabriel	na	na	0	
GAEC	GHA	Crentsil Kofi Bempah	1	1	1	Reg
Pesticide Residue Lab.	GHA	Paul Osei-Fosu	1	na	na	
Ministry of Health	GHA	Eric Karikari Boateng	0	na	na	
CSIR Water Research Institute	GHA	Kwadwo Ansong Asante	na	na	1	Reg
Ghana EPA	GHA	Jerry Asumbere	na	na	na	Reg
Ministry of Public Health and Sanitation	KEN	Leonard W. Kariuki	0	na	na	
Kephis Analytical Chemistry Laboratory	KEN		1	0	na	
UoN	KEN	Shem O. Wandiga	1	0	1	Reg
Laboratoire de Contrôle des Pesticides	MDG	Hervé Francis Rakotondravony	na	na	0	
ETQCL CVL	MLI	Boubacar Madio dit Aladiogo Maïga	1	0	1	Reg
Government Analyst Division	MUS	Vishal Goury / Mr. N. Subratty	0	1	na	
MSIRI	MUS	Gunshiam Umrit	na	na	na	Reg

 Countries not included in GEF/GMP2 project

Historic participation

Short name Lab	ISO-3	Contact person	Submitted results Round 1	Submitted results Round 2	Submitted results Round 3	Submitted results Round 4
ONEE	MAR	Nassima Lambarki El Alloui	na	na	1	Reg
Nat'l Lab Monitoring	MAR	Ouahidi Moulay Lahcen	na	na	na	Reg
Pesticides et hydrocarbures	MAR	Jayed Maria	na	na	na	Reg
Department of Toxicology	MAR	Hecham Elhamri	na	na	na	Reg
Analytical & Environmental Chemistry Laboratory	NGA	Kehinde Olayinka, Babajide Alo	na	1	1	
GRC Nigeria	NGA	Adebola A. Adeyi	na	na	1	Reg
POP Reference Laboratory, Centre for Environmental Management and Control	NGA	C. N. Madu	na	na	0	
Centre Régional de Recherches en Ecotoxicologie et Sécurité Environnementale (Fondation CERES-Locustox)	SEN	Marie Ndao	1	0	1	Reg
POPT	ZAF	Rialet Pieters	1	na	na	
National Metrology Institute of South Africa	ZAF	Laura Quinn	na	0	1	
Environmental Chemistry Laboratory, Department of Environmental, Water & Earth Sciences	ZAF	OJ Okonkwo	na	1	1	
Environmental and Analytical Chemistry Research Group	ZAF	Adegbenro Peter Daso	na	na	1	
DWS RQIS	ZAF	Esna Portwig	na	na	1	Reg
Toxicology Laboratory	SDN	G. Elzorgani	0	0	na	
GCLA Tanzania	TZA	Benny Mallya	na	na	0	Reg
CITET	TUN	Baili Benjemaa Chedia	0	na	na	Reg
Chemiphar (U) Ltd.	UGA	Kepher Kuchana Kateu	1	na	na	
GAL Uganda	UGA	Jane Beebwa	1	1	1	Reg
Analytical Services Laboratory	ZMB	Chipo Syabbamba	0	0	na	



Countries not included in GEF/GMP2 project

Thank you very much
for your attention