

Dioxins and Furans

Stockholm Convention Effectiveness Evaluation

2023 Highlights

Background Information

Polychlorinated dibenzo-p-dioxins (PCDD) are produced unintentionally due to incomplete combustion, as well as during the manufacture of pesticides and other chlorinated substances. They are emitted mostly from the burning of hospital waste, municipal waste, and hazardous waste, and also from automobile emissions, peat, coal, and wood. There are 75 different dioxins, of which seven are considered to be of concern. Dioxins have been associated with a number of adverse effects in humans, including immune and enzyme disorders and chloracne, and they are classified as possible human carcinogens.

Polychlorinated dibenzofurans (PCDF) are produced unintentionally from many of the same processes that produce dioxins, and also during the production of PCB. They have been detected in emissions from waste incinerators and automobiles. Furans are structurally similar to dioxins and share many of their toxic effects. There are 135 different types, and their toxicity varies. Furans persist in the environment for long periods, and are classified as possible human carcinogens.

As of 31 January 2022, the following chemicals are listed in Annex C to the Stockholm Convention:

- ✓ Polychlorinated dibenzo-p-dioxins (PCDD);
- ✓ Polychlorinated dibenzofurans (PCDF);
- ✓ Polychlorinated biphenyls (PCB);
- ✓ Hexachlorobenzene (HCB);
- ✓ Pentachlorobenzene (PeCB)
- ✓ Polychlorinated naphthalenes (PCN);
- ✓ Hexachlorobutadiene (HCBD).

Article 5 of the Stockholm Convention provides measures to reduce or eliminate releases from unintentional production of chemicals listed in Annex C to the Convention.

Measures to Reduce and/or Eliminate Releases

The Convention has acted as a trigger for initial action planning to minimize and ultimately eliminate releases of unintentional POPs worldwide. A majority of Parties (71%) have developed their national action plans further to the entry into force of the Convention. However, only 29% have reviewed and updated their national action plans for more newly listed Annex C POPs. Currently fewer than one third of the Parties are requiring BAT/BEP to control their releases of unintentional POPs from priority sources. Nearly half of the Parties that reported have evaluated the efficacy of the laws and policies relating to the management of releases.

A large proportion of Parties (89%) have provided information on their action plans under Article 5 assessing measures to reduce or eliminate releases from unintentional production. Nearly half of the Parties that reported evaluated the efficacy of the laws and policies relating to the management of releases. However, the number of Parties that have required best available techniques for priority source categories is much lower (29%).

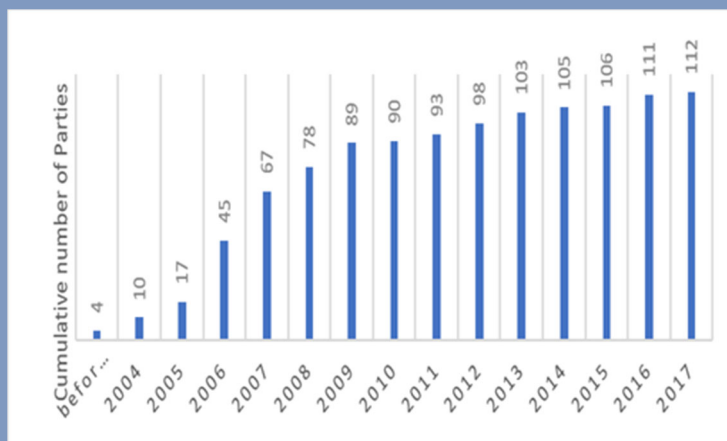


Figure 1. Number of Parties with action plans contributing to Article 5 (when date of action plan is available). (Source: EE-2 report UNEP/POPS/COP.11/INF/36)



Changes in Concentrations Measured in the Environment and in Human Populations

Releases of unintentional POPs have been successfully reduced in some regions by regulations that predated the Convention and have been maintained since.

Available data on POPs in non-core-media such as snow, ice, sediment, soil and biota for some parts of the world such as the Great Lakes, the Arctic, the Baltic, and Japan indicate significant decreases of PCDD/PCDF over the past three decades.

PCDD/PCDF continue to be measured in air and continue to show declining trends.

The levels of PCDD/PCDF in human milk have fallen steadily from their earlier high levels over the last 20 years, indicating the effectiveness of measures implemented to reduce environmental releases. Concentrations of PCDD/PCDF in human milk are found at relatively similar levels worldwide, in both industrialized and less industrialized regions.

Changes Since the First Effectiveness Evaluation

There has been a small increase in the number of Parties that have action plans under Article 5, adopted measures that require best available techniques for priority source categories, and evaluated the efficacy of the laws and policies relating to the management of releases. The toolkit for identification and quantification of releases of dioxins, furans and other unintentional POPs is reviewed continuously and updated as needed and serves as a practical guide for Parties.

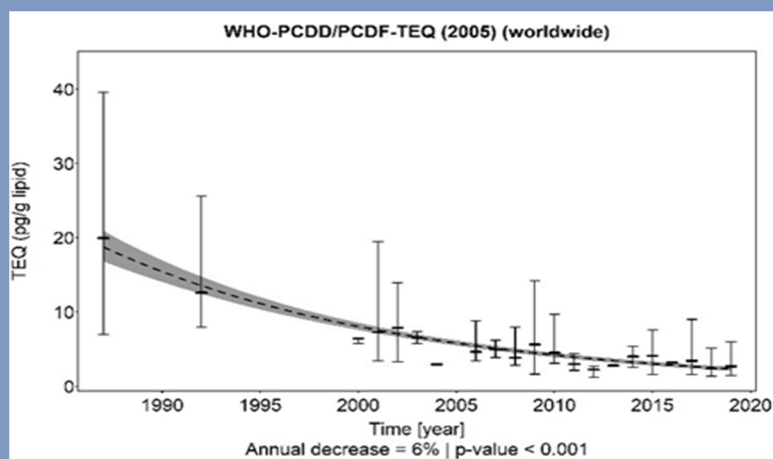


Figure 2. Global Theil-Sen exponential trends of WHO-PCDD/PCDF-TEQ concentrations (pg/g lipid) in human milk. (Source: Malisch et al. 2021 as cited in the GMP-3 report in UNEP/POPS/COP.11/INF/38)

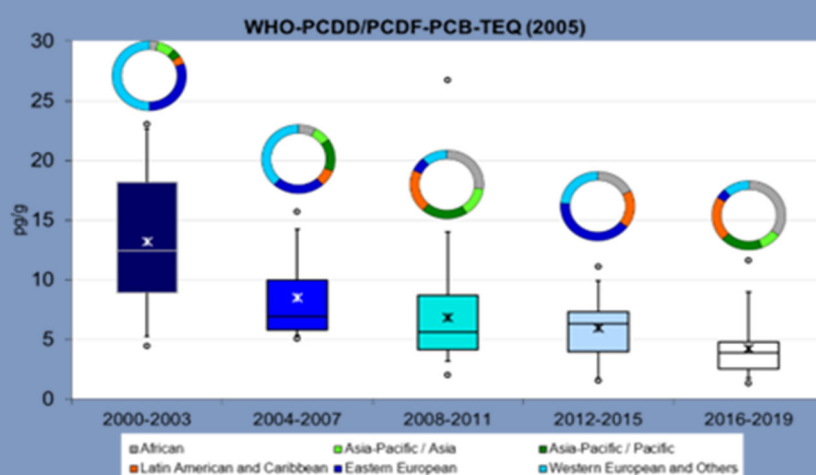


Figure 3. Median and range of WHO-PCDD/PCDF-TEQ concentrations (pg/g lipid) in human milk (5 rounds in 2000–2019). (Box plot: Minimum and maximum as circles; Whiskers: 5th and 95th percentile; Lower (25–50%) and upper (50–75%) quartiles separated by the line for the median as box and mean as asterisk. Source: Malisch et al. in press. Cited in GMP-3 report in UNEP/POPS/COP.11/INF/38)

Recommendations of the Effectiveness Evaluation Committee

- ✓ Parties should be **urged to develop and maintain their action plans** up to date to minimize and ultimately eliminate releases of unintentionally produced POPs, which should be implemented as part of the national implementation plans, and to strengthen requirements for the use of BAT/BEP for the priority sources identified as required in Article 5.
- ✓ The Secretariat should be **requested to continue to support Parties on the updating and implementation of action plans under Article 5**, in particular for those Parties that have never submitted one.
- ✓ Parties should be **urged to update their inventories regularly**, as required in Article 5, using the Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs and other available guidance, and, as required by Article 15, to provide this information as part of their national reports to confirm the success of the measures they have taken to implement Article 5.
- ✓ Regional centres and others in a position to do so should be invited to **continue to provide, and prioritize, capacity-building** on unintentionally produced POPs.

Guidance documents have been developed to assist Parties in developing inventories and minimizing releases of POPs from unintentional production pursuant to Article 5 of the Convention, and are available at <http://toolkit.pops.int> and <http://chm.pops.int/?tabid=187>.

The recommendations of the BAT/BEP experts can be found in documents UNEP/POPS/COP.11/8 and UNEP/POPS/COP.11/INF/16.

For more information on the second effectiveness evaluation of the Stockholm Convention, please refer to documents UNEP/POPS/COP.11/19/Add.1 and UNEP/POPS/COP.11/INF/36.



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STOCKHOLM CONVENTION

