



Photo credit: Eddy Mbuyi/OXFAM

Reducing open waste burning

# Risks of open burning to health and environment

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## OPEN BURNING AT OLUSOSUN DUMPSITE IN LAGOS, NIGERIA.



Source: <https://www.von.gov.ng/lagos-begins-capping-of-controversial-dumpsite/>



**“Open burning is the **combustion of unwanted combustible materials** (e.g. paper, plastics, waste oils etc.) in nature or open dumps where smoke and emissions are released directly into the air without passing through a stack.”**

(2006 IPCC Guidelines for National Greenhouse Gas Inventories)



“At least **33 percent** of waste is mismanaged globally through open dumping or burning”.  
In low-income countries the number is **93 percent!**

(<https://www.worldbank.org/en/news/feature/2018/12/21/year-in-review-2018-in-14-charts>)

An estimated **970 million** tons of waste per year are burned openly in backyards and dumpsites

(Wiedinmeyr et al, 2014)



- ❑ Is the **biggest landfill** on earth
- ❑ **Big volume** of air get contaminated
- ❑ **High speed** of transportation of contaminants
- ❑ **Big area** of influence
- ❑ **High quantity** of touched people
- ❑ Contaminant **gets diluted ...**
- ❑ But, people get **chronically affected**



- ❑ **Poor waste** management system
- ❑ **Low financing** for waste management
- ❑ **Low efficiency** of collection services
- ❑ Uncapped, unregulated landfills and dumps
- ❑ **Increases** in waste collection fees
- ❑ Evading payment of waste collection fees
- ❑ **Heating** at home...



**Open burning of waste** releases a variety of **toxic pollutants** into the air and also produces **soil pollution,** **water pollution** and **food contamination.**

These toxic pollutants are known to have severe **health & environmental impacts.**



Open waste burning activities is a leading source of unintended Persistent Organic Pollutants (uPOPs) and other priority pollutants.

uPOPs are formed during burning:

- **Polychlorinated dibenzo dioxins (PCDD)**
- **Polychlorinated dibenzo furans (PCDF)**
- **Polychlorinated biphenyls (PCB)**
- **Hexachlorobenzene (HCB)**
- **Pentachlorobenzene (PeCB)**





Other pollutants **contained** in waste or **formed** when burning waste (examples only):

- **Polyaromatic hydrocarbons (carcinogens)**
- **Mercury (toxic)**
- **Carbon black (climate pollutant)**
- **Arsenic (toxic)**
- **FINE DUST !**
- **Sulphur oxides**
- **Hydrochloric acid**

# What is the difference?



- **Free will to drink !**
- **But when breathing it, you cannot Escape!**

# Toxic effects

– how does it affect us?





The health effects from uPOPs are:



- Cancer
- Respiratory diseases
- Disturbance of the immune system
- Reproductive effects
- Poor cognitive development  
(nervous system)
- Chromosomal mutations
- Hypersensitivity
- Skin irritation
- Eye damage
- Liver damage
- Irregular heart beat
- Headaches
- ...!!!



## Speaking technical

### WHO:

- Tolerable Daily Intake (TDI) for dioxin-like equivalencies (TEQs): 1 to 4 pg TEQ/kg body weight (bw)
- Provisional Tolerable Monthly Intake (PTMI): 70 pg TEQs/kg bw per month.
  - The only difference between these two values is that a daily variation above TDI on a monthly basis does not represent a health concern.

### US EPA:

- Oral reference dose (RfD) of 0.7 pg TCDD/kg bw per day

### ATSDR (Agency for Toxic Substances and Disease Registry, USA):

- “Minimum risk level” (MRL) for acute exposure of 20 and for semichronic exposure 1 pg TCDD/kg bw per day”



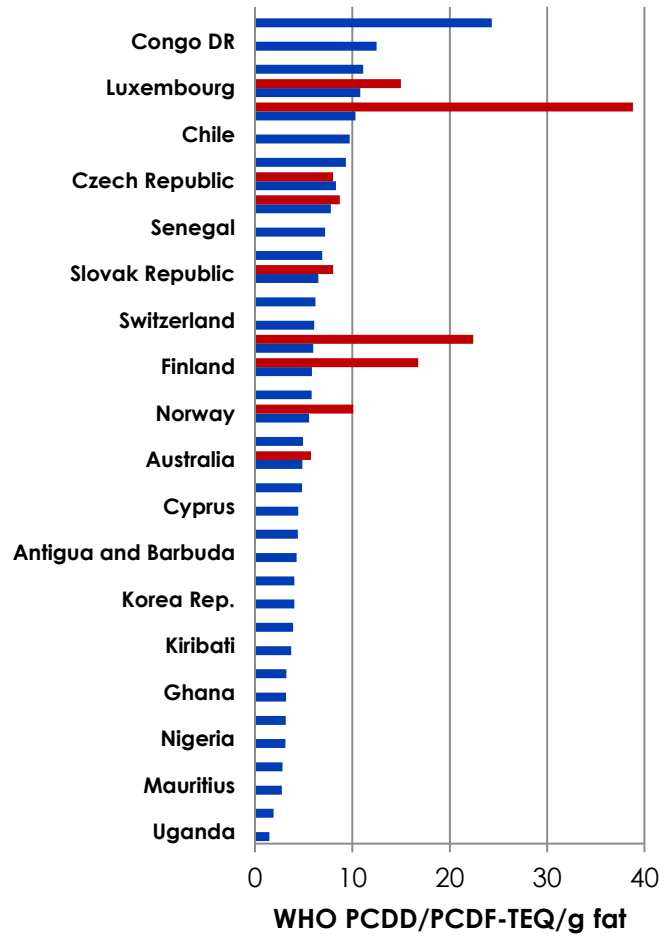
## What does this mean?

It means that if a child of **10 kg** weight gets more than about **10 pg** dioxins/furans in the feed per day, it **may be at risk**.

**10 pg** or picogram is **10/1000 000 000 000 g** – less than you can ever imagine!

# CONCENTRATION OF DIOXINS AND FURANS IN HUMAN MILK PG TEQ/G FAT

■ 1987-2002 ■ 2005-2010





For lead, we estimate national emissions and releases in

100's of tonnes/year

For mercury we estimate national emissions and releases in

100's of kg/year

For dioxins and furans (uPOPs) we estimate **national emissions and releases in 100's of grammes (g)/year** – and we worry about that.

**That is how toxic uPOPs are!**



## Sources and exposure

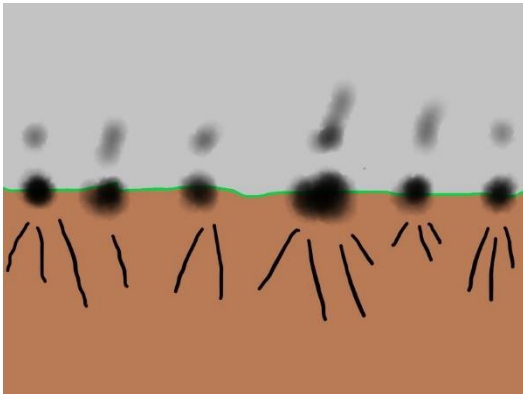
- Where does it come from and how do we get it into us?



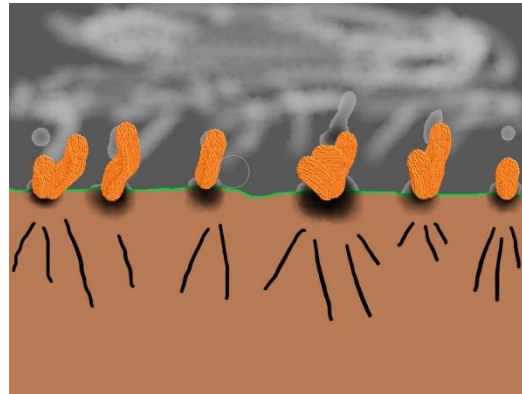


The way we treat the waste makes all the difference!

**Waste dumping**



**Waste burning**



**Sanitary landfill**



# How do we get it into us?



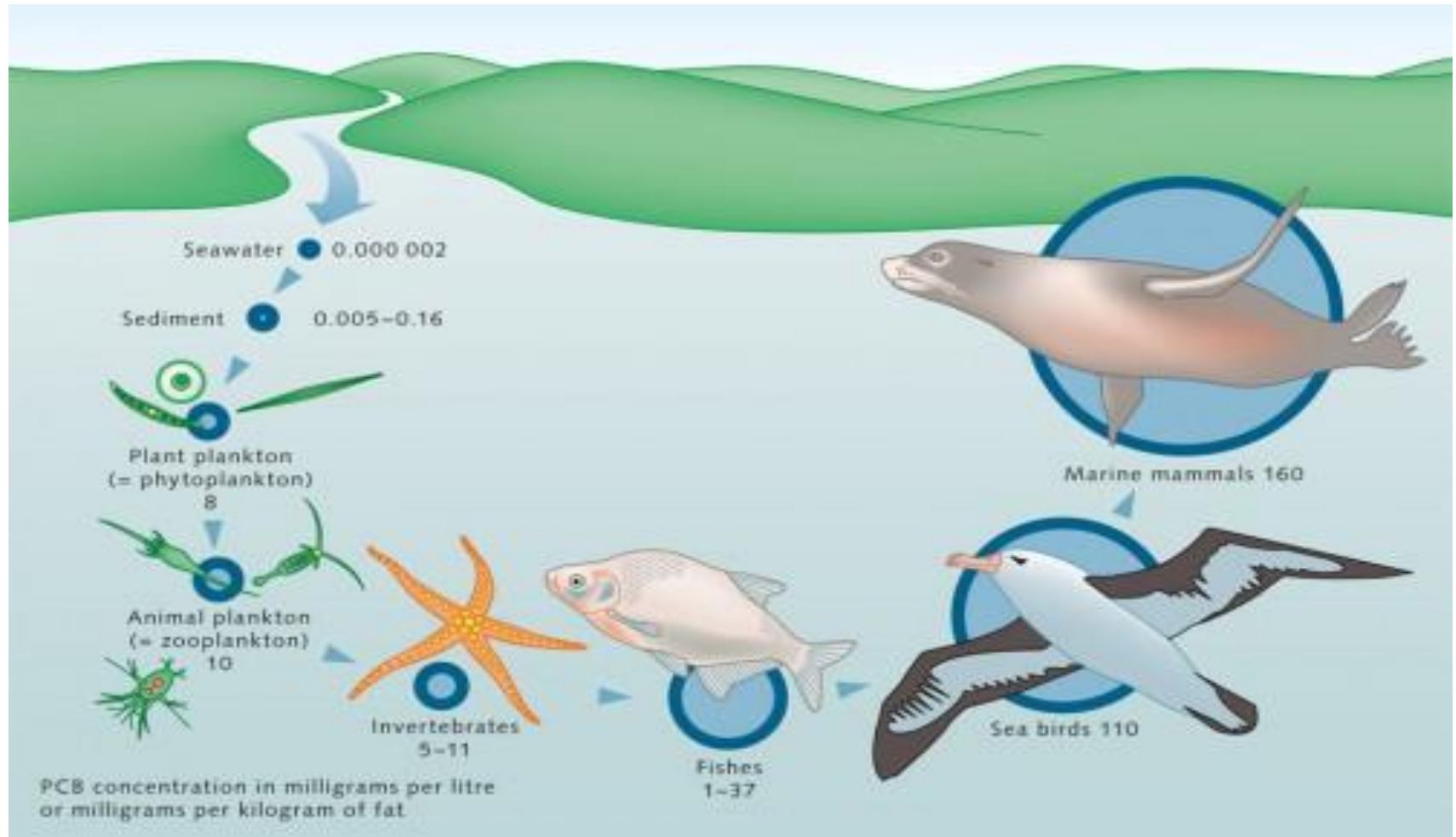
Pollutants settle on crops, lakes & rivers where animals live or graze

uPOPs bioaccumulate in the environment and ends up in our diet

In Canada, 90 percent of the intake of dioxins and furans is from the diet, may be less  
in Africa due to direct inhalation

We also inhale uPOPs from air (chemicals and dust particles) and through skin  
(direct contact with chemicals)

# BIO-ACCUMULATION



Copyright: [https://worldoceanreview.com/en/files/2010/10/k4\\_pcb-anreicherung-marine-nkette\\_e\\_en.jpg](https://worldoceanreview.com/en/files/2010/10/k4_pcb-anreicherung-marine-nkette_e_en.jpg)

# CONCLUSIONS



In Africa, about 70 percent of the uPOPs emitted come from open waste burning

uPOPs are potent toxins that accumulate in our surroundings, in our food and in us

Open waste burning also contribute with toxic mercury, greenhouse gasses and other pollutants



**STOP OPEN BURNING!**



**THANK YOU  
FOR YOUR  
ATTENTION**

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**REDUCE, REUSE, RECYCLE!**

[https://www.youtube.com/  
watch?v=uSM2riAEX4U](https://www.youtube.com/watch?v=uSM2riAEX4U)