



HOKKAIDO UNIVERSITY

Title	環境と健康の視点でとらえるSDGs
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2018.10.17 市民講演会
SDGsを考える
～暮らし・教育・健康～

環境と健康の視点でとらえるSDGs

北海道大学 環境健康科学研究教育センター
湊屋 街子



はじめに・・・

私たちはだれもが健康な生活を送りたいと願っています
健康には、私たちの身のまわりの環境が大きく関係しています
今日は、SDGsの17目標のひとつ「**すべての人に健康と福祉を**」
を軸にお話しをしたいと思います



目標3「すべての人に健康と福祉を」、 「健康」は17の目標すべてに関わっている



目標3を環境と健康の視点でみると…

4

3 すべての人に
健康と福祉を

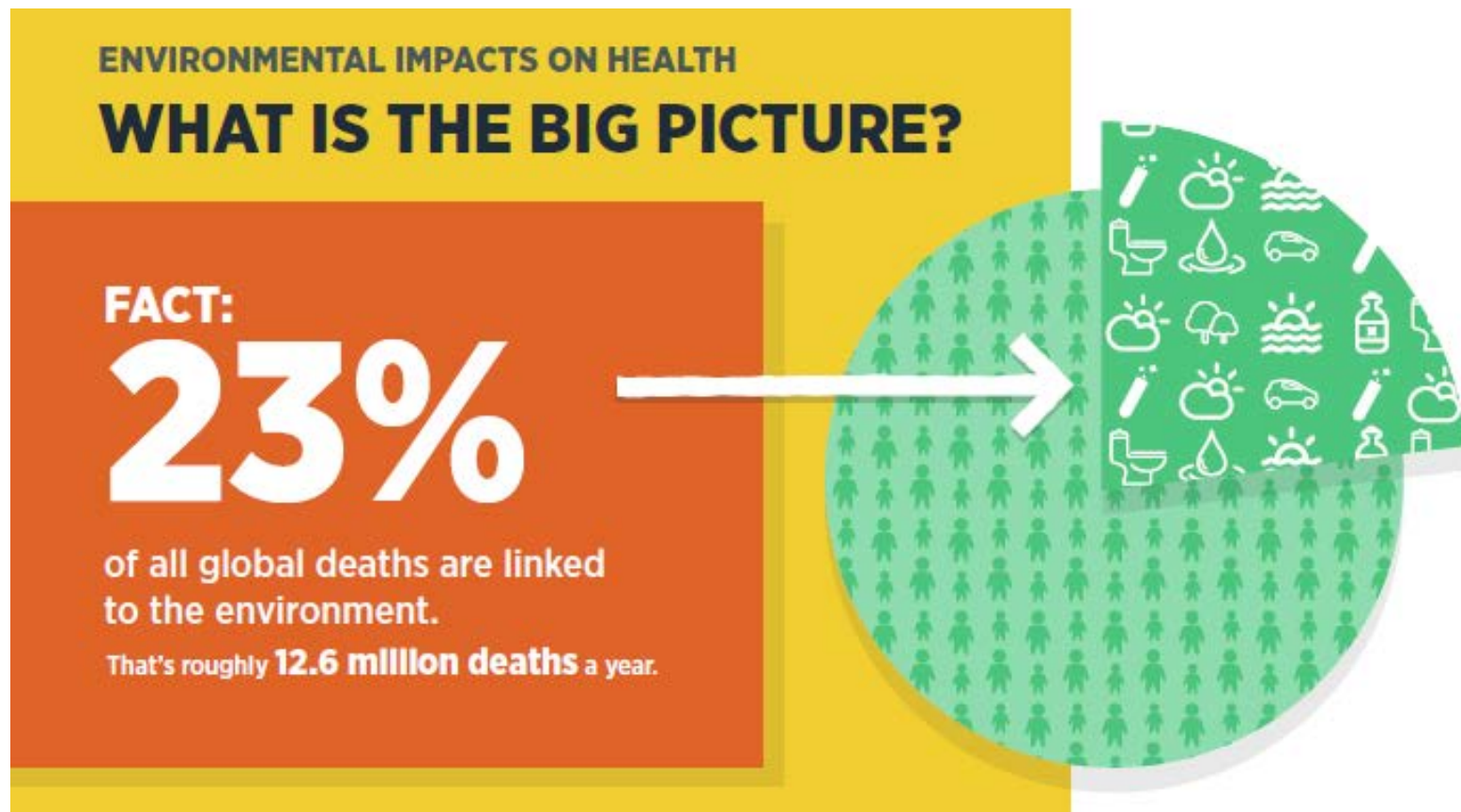


ターゲット3.9

2030年までに、**有害化学物質、ならびに大気、水質及び土壌の汚染による死亡及び疾病の件数を大幅に減少**させる



身の回りの環境はどのくらい私たちに影響する？



世界中の死の**23%**が、**環境と関連**しており、
その数はおよそ**12,600,000人**

特に環境化学物質に着目すると・・・





重金属



溶剤



塗料



農薬



薬剤

世界では、毎年**20万人**が
化学物質への曝露が
原因で死亡

私たちは日々の生活で化学物質の曝露を受けている

8

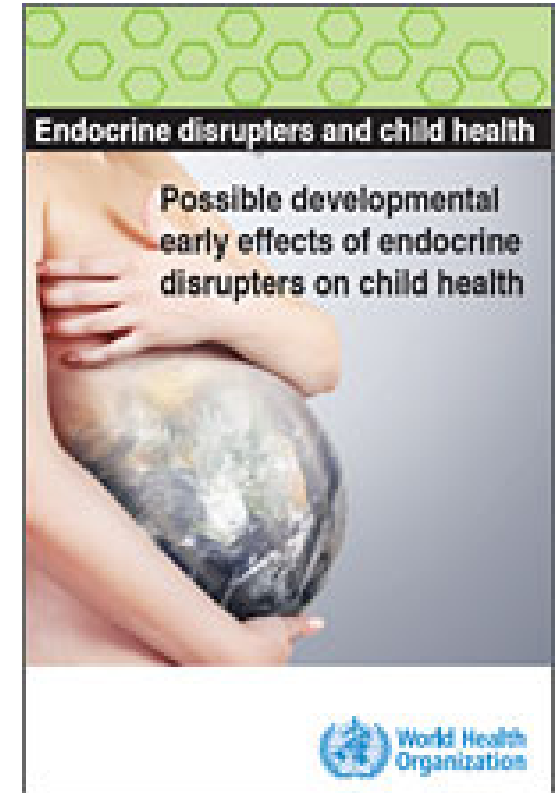
飲食

呼吸

皮膚



特に環境による影響を受けやすいのは…子どもたち

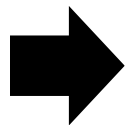


子どもは、守られるべき"脆弱な人々"

私たちの健康はおなかの中にあるときから・・・

10

胎児期の環境化学物質への曝露



発達の遅れ、問題行動
ぜんそく
感染症にかかりやすい
睾丸形成異常症候群

心疾患
動脈硬化

不妊

乳がん

肥満

思春期到来

早期閉経
子宮筋腫

精巣がん
アルツハイマー病
パーキンソン病

年齢(才)

2

12

25

40

60

70





環境



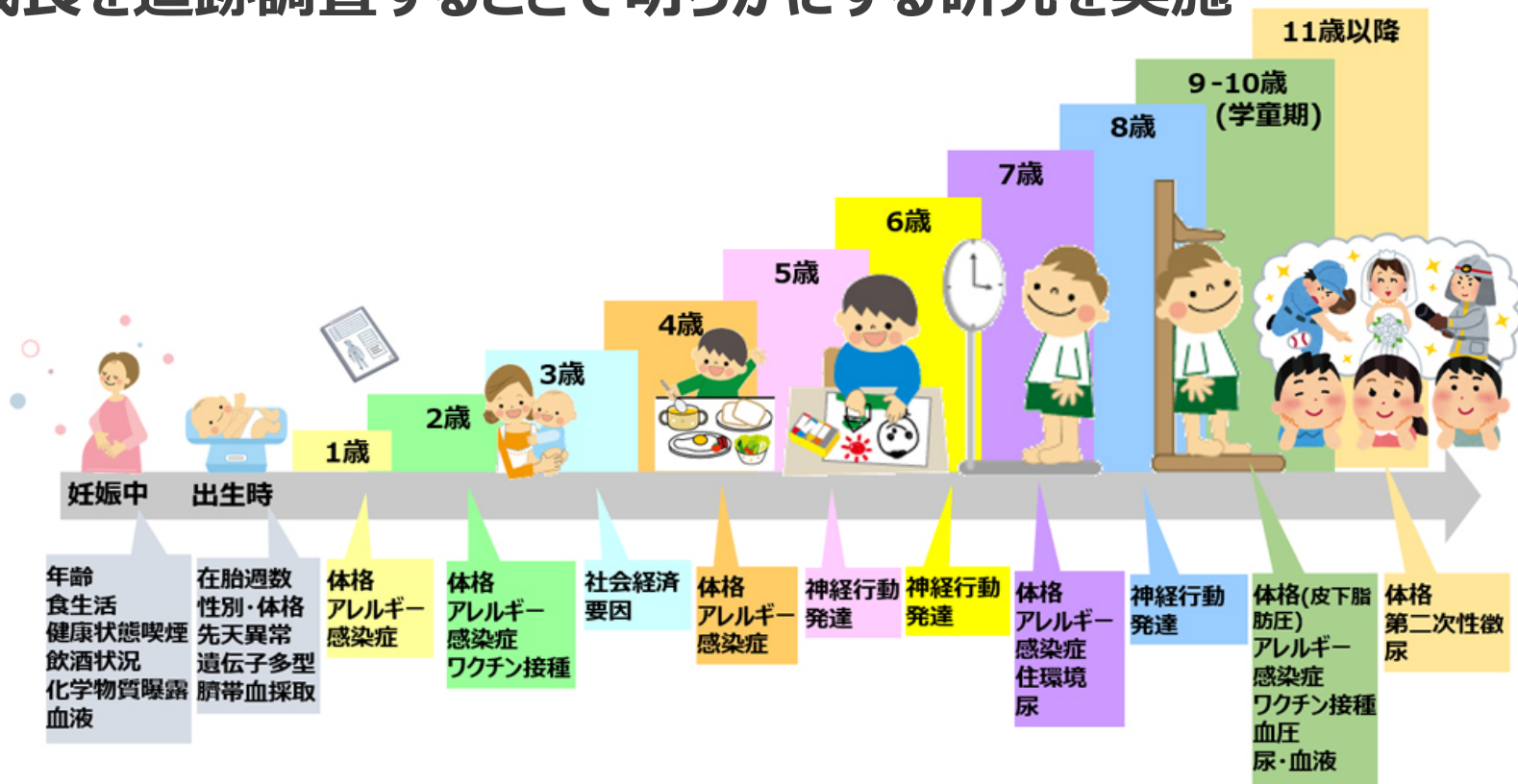
健康

私たち研究者ができることは？



子ども

北海道大学環境健康科学研究教育センターは、
環境化学物質による健康障害の予防に関するWHO研究協力センター
として、目標3のターゲットでもある、**タバコを含む有害な環境化学
物質による、様々な健康への影響**を、おなかの中にいるときから、
生後の成長を追跡調査することで明らかにする研究を実施



胎児期 → 出生 → 乳児期 → 幼児期 → 学童期 → 思春期 → 青年期



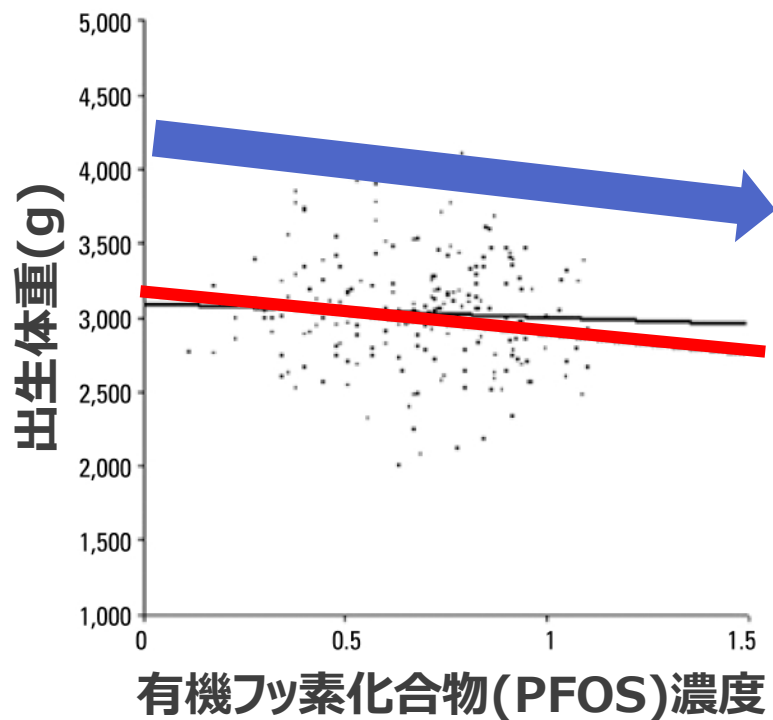
北海道大規模コホート	
リクルート	2002～2012年
登録人数 (母)	20,926名 (北海道37医療機関)

リスク要因（胎児期）	体格	甲状腺ホルモン	性/ステロイドホルモン	発達	アレルギー・感染症
喫煙、カフェイン	✓			✓	
社会経済要因	✓			✓	
ダイオキシン類	✓	✓	✓	✓	✓
有機フッ素化合物*	✓	✓	✓	✓	✓
有機塩素系農薬			✓		
メチル化水銀	✓				
フタル酸エステル	✓		✓		✓
ビスフェノールA			✓	✓	

*有機フッ素化合物は、撥水・撥油性などの特徴を持ち、撥水撥油剤、界面活性剤、消火剤、殺虫剤、および調理用器具のコーティング剤等の幅広い用途で使用する

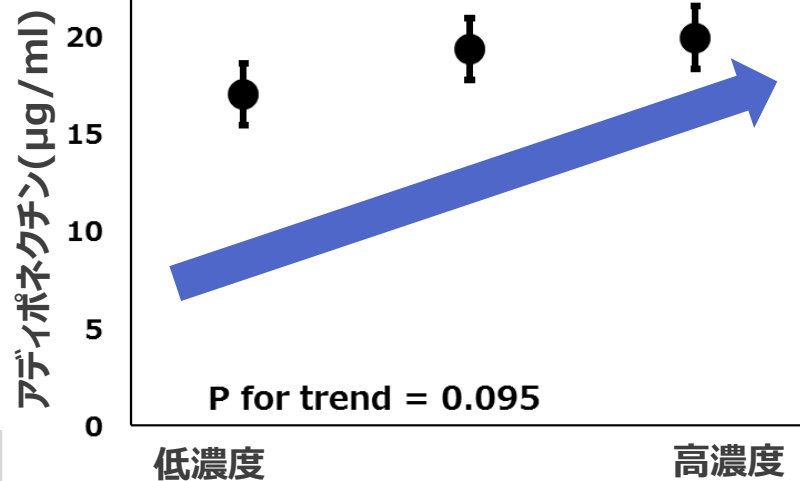
発育への影響

有機フッ素化合物(PFOS)濃度の増加によって、出生体重が減少



Washino et al. EHP 2009

有機フッ素化合物(PFOS)の増加によって、アディポネクチン濃度※は増加する



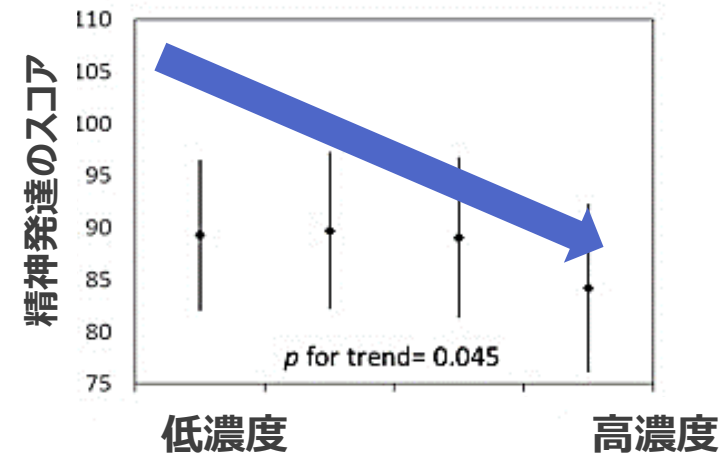
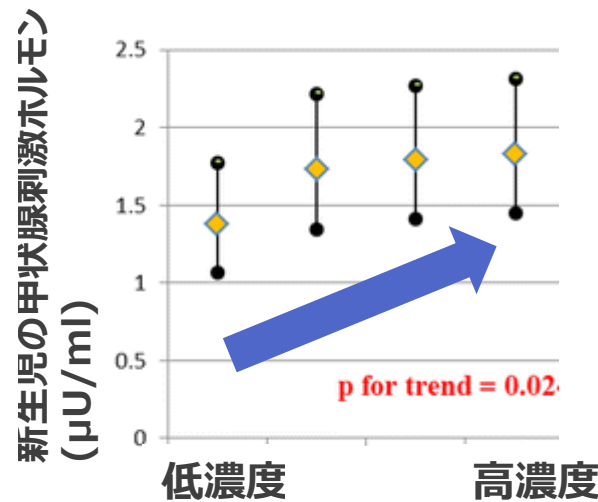
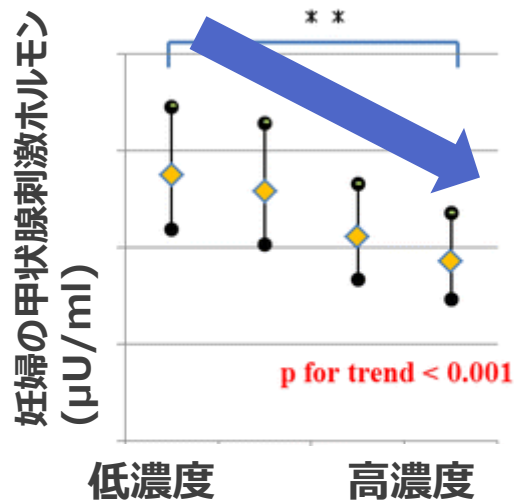
※脂肪細胞から分泌される物質で、血管の修復作用やインスリンの分泌を抑えるといった生理活性作用などがある

Minatoya et al. Environ Res 2017

発育・発達への影響

有機フッ素化合物(PFOS)濃度の増加によって、妊婦の甲状腺刺激ホルモン濃度は減少、新生児の甲状腺刺激ホルモン濃度が増加

有機フッ素化合物(PFOA)濃度の増加によって、女児の6か月の精神発達のスコアが低下

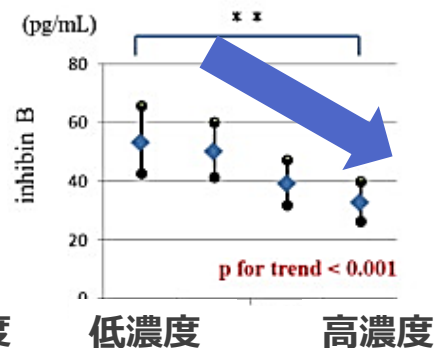
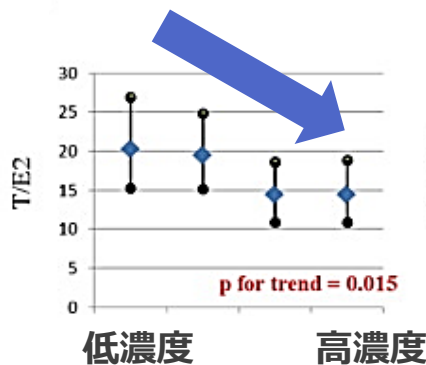
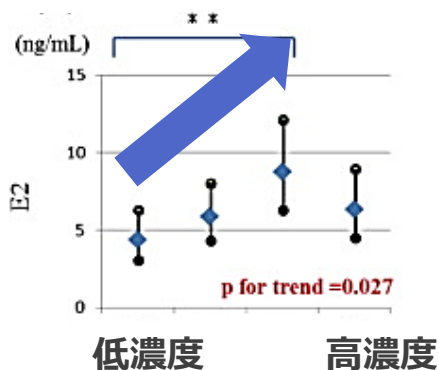


北海道スタディからわかったこと

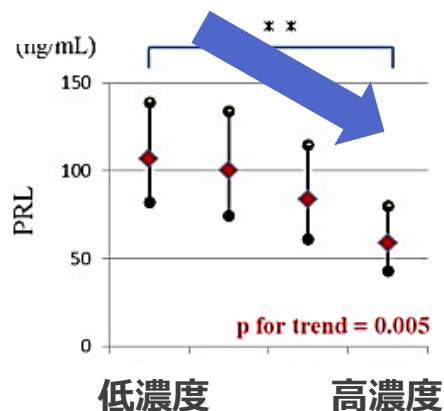
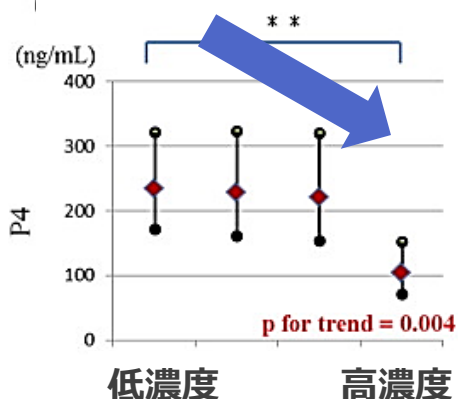
ホルモンバランスへの影響

有機フッ素化合物(PFOS)濃度の増加によって、
性ホルモン濃度が乱れる

男児

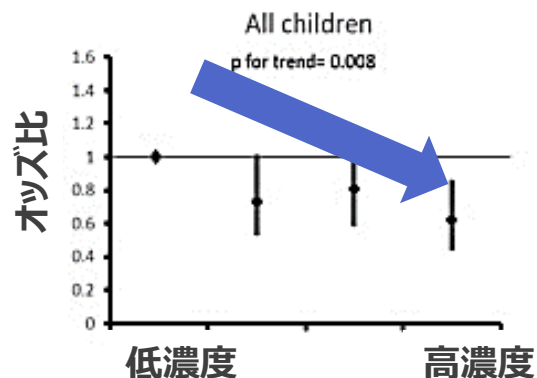


女児

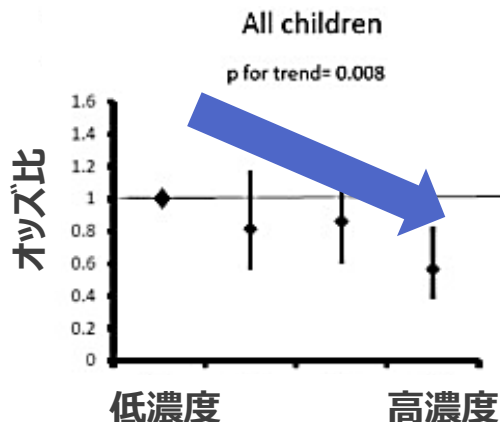


免疫機能への影響

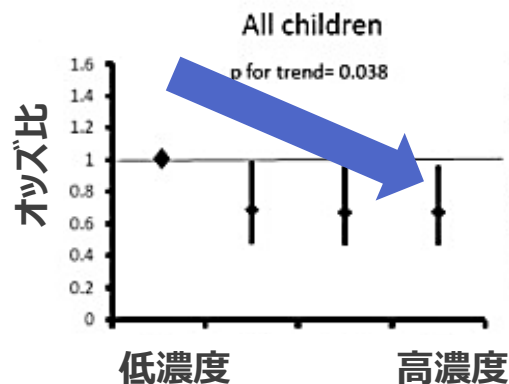
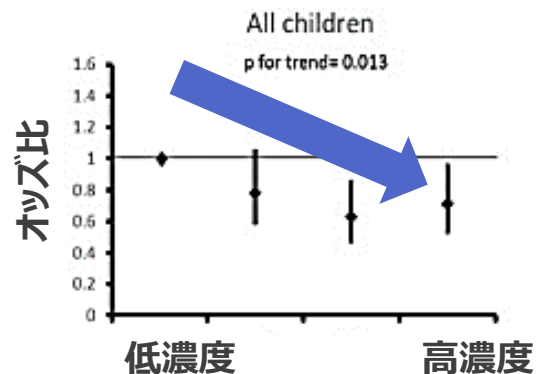
アレルギー



湿疹



有機フッ素化合物
(PFDoDA, PFTrDA)
濃度の増加によって、4歳
でのアレルギー、湿疹の
リスクが低下



① 化学物質と健康に関する一般市民向けリーフレットの作成

Dioxins and our health



What are dioxins ?

Dioxins are a group of highly toxic chemical compounds that are called persistent organic pollutants (POPs). They are found throughout the world in the environment.

Dioxins mainly build up in the fatty tissue of animals, and the higher an animal is in the food chain, the higher the concentration of dioxins.

Of the known dioxin-related compounds, about 30 have significant toxicity. TCDD is the most toxic.

How are dioxins produced ?

Most dioxins are unwanted by-products of manufacturing processes such as smelting, the chlorine bleaching of paper pulp, and the production of some herbicides and pesticides. One of the major causes of the release of dioxins into the environment is incomplete burning of solid waste and hospital waste by uncontrolled waste incinerators. Dioxins can also result from volcanic eruptions, forest fires and other natural processes. Technologies have been developed for controlled waste incineration with low dioxin emissions.

Where can we find dioxins ?

Long-term storage and improper disposal of PCB-based waste may cause the release of dioxins into the environment.

The highest levels of dioxins are found in soil, sediment and food—especially dairy products, meat, fish and shellfish. Very low levels are found in plants, water and air.

What should be done to reduce the production of dioxins ?

Proper incineration of contaminated material is currently the best method for preventing and controlling exposure to dioxins. It can also destroy PCB-based waste etc. The incineration process requires high temperatures above 850°C. Even higher temperatures of 1000°C or more are required to destroy large amounts of contaminated material.

The disposal of electrical equipment may also release PCBs and PCDF contaminants. To reduce human exposure, it is crucial to identify and safely dispose of material containing or likely to generate dioxins and dioxin-like substances such as electrical equipment.

What can we do to reduce the risk of exposure?

Experts have established a provisional tolerable margin of intake (PMI) of 70 picograms per kilogram of body weight per month. Over a lifetime, this is the amount of dioxins that can be ingested without causing negative health effects.

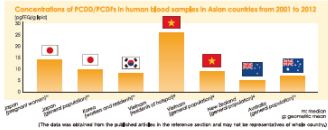
A balanced diet that includes plenty of fruits, vegetables and cereals can help prevent too much exposure to dioxins from a single source. This is probably most important for girls and young women because it can reduce the exposure of their unborn babies and breastfed infants when they become mothers later on in life.

Feed and feed contamination monitoring systems can be used to make sure these tolerance levels are not exceeded. It is the responsibility of food and feed producers to guarantee the safety of raw materials and processes used during production, and it is the role of national governments to monitor the safety of their food supplies and to take action to protect public health.

Dioxins in Asia

Concentrations in human blood

More than 90% of human exposure is through food—especially fish and shellfish, meat and dairy products. Concentrations in human blood samples in Asian countries and Pacific Islands are shown below. Residents living in hot spots where incidents occurred in the past continue to have higher levels of dioxins. The general population among the countries shown was found to have similar dioxin levels.



In the past

During the Vietnam War from 1961 to 1972, herbicides contaminated with TCDD—the most toxic congener of dioxin—were sprayed in Southern Vietnam. Military airplanes formerly used for spraying herbicides are referred to as TCDD contamination hot spots because of the extremely high levels of TCDD found in soil samples collected from them. Yusho and Yucheng are “old diseases” caused by the consumption of contaminated rice oil in western Japan in 1968 and in Taiwan from 1978 to 1979.

Current issues

According to the Global E-waste Monitor, 45.7% of the world’s e-waste (i.e., electrical and electronic equipment and its parts that have been discarded by the owner as waste) is generated in Asian countries. Uncontrolled combustion and thermal processing of e-waste can release complex mixtures of dioxin-related compounds. Informal e-waste recycling sites in developing Asian countries are severely contaminated by dioxin-related compounds. Residents living near such sites in Asia are thought to be exposed to dioxin-related compounds through the ingestion of seafood and contact with the skin, as well as by eating food produced nearby. Comprehensive assessment of dioxin-related compounds from e-waste at informal recycling sites in Asian countries must be carried out to effectively determine human and environmental exposure risks.

What is known about health effects ?

Dioxins are highly toxic and can cause reproductive and developmental problems, damage the immune system, interfere with hormones and cause cancer.

Short-term exposure to high levels of dioxins may result in skin lesions, such as chloracne and patchy darkening of the skin, and affect liver function. Long-term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system and reproductive functions.

Prevention for the next generation

Developing fetuses are the most sensitive to dioxin exposure. Newborns, with their rapidly developing organ systems, may also be more vulnerable to some effects. Therefore, both accidental high-dose exposure and relatively low-dose exposure have been linked to low birth weight, delays and defects in neurodevelopment, and endocrine disrupting properties. Although some fish may be contaminated, most are safe to eat. Pay attention to local fish advisories/guidance and improve methods used to clean and cook fish to remove some of the fat. It is also important to keep children away from waste dump sites, e-waste recycling sites and other contaminated areas.

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CONTACT

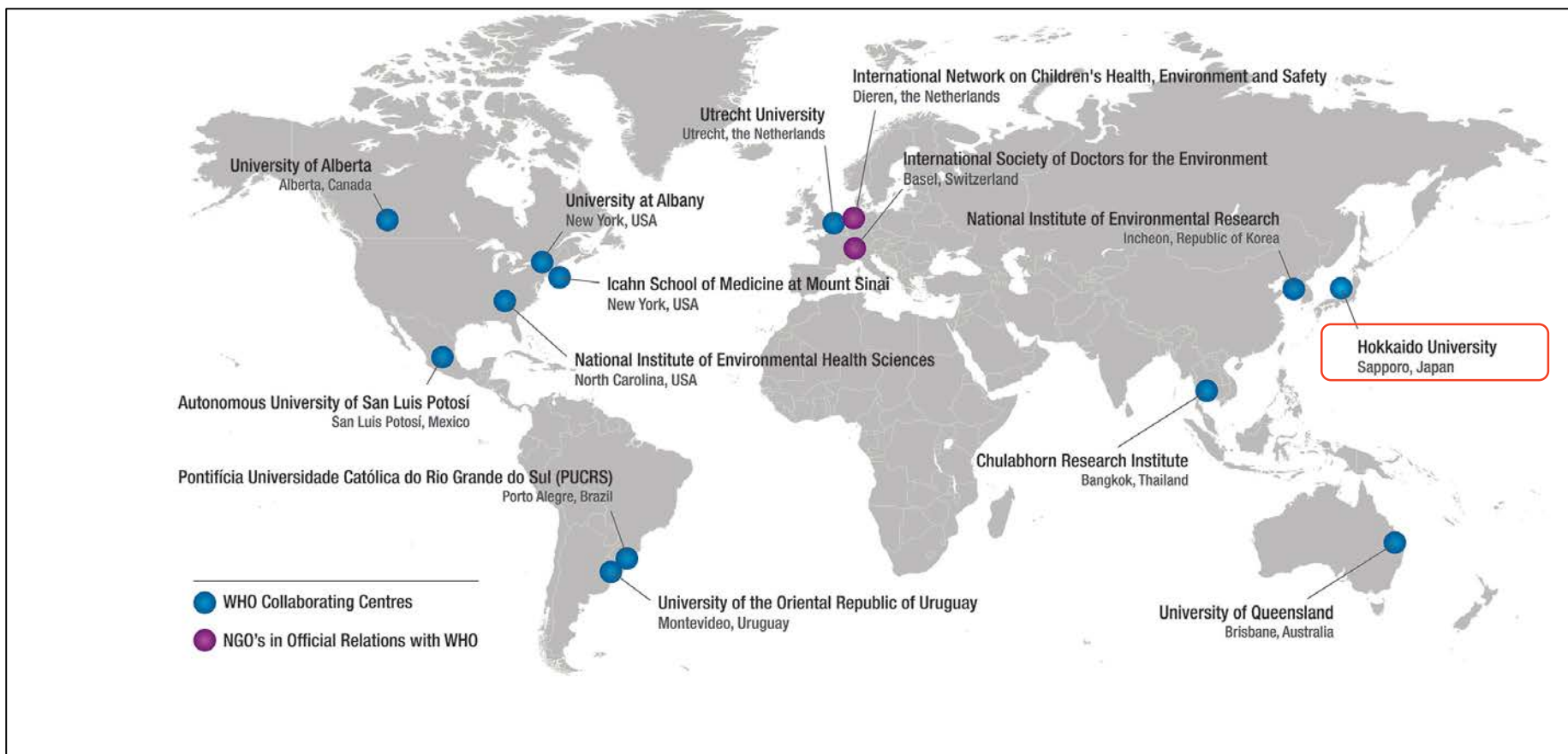
WHO Collaborating Centre for Environmental Health and Prevention of Chemical Hazards
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WHO Collaborating Centre for Environmental Health and Prevention of Chemical Hazards

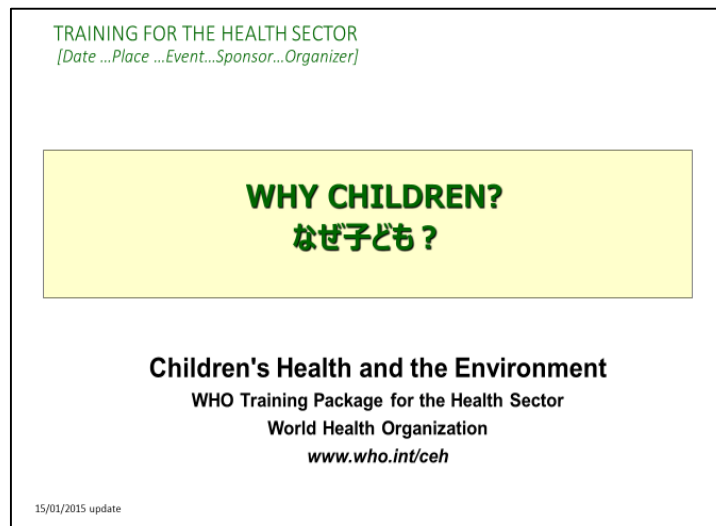
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② 環境と子どもの健康について研究をする世界の機関と協力



③ WHOのトレーニングモジュールの翻訳

- Why Children? /なぜ子ども?
- Children are not little adults/
子どもは小さな大人ではない
- Chemicals/子どもと化学物質





私たち研究者ができることは？



18

私たちは研究を通して、環境が子どもの健康に与える
影響を明らかにしていきます

ご清聴ありがとうございました



ご質問はこちらまで↓



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