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XVIII IEA World Congress of Epidemiology
VII Brazilian Congress of Epidemiology

Epidemiology in the Construction of Health for All:
Tools for a Changing World

September 20 - 24, 2008 - FIERGS - Porto Alegre - RS - Brazil

Sunday, 21 Sept. 2008 / 03:45 - 05:30

Environmental toxic substances: exposed individuals and exposed populations.

Chair: Miquel Porta (Barcelona, Spain)

With:

Antonio Carlos Monteiro Ponce de León (Brasil, RJ)

Duk-Hee Lee (Daegu, South Korea)

IEA

Hosted and supported by the International Epidemiological Association

ABRASCO

Associação Brasileira de Pós-graduação em Saúde Coletiva

Environmental toxic substances: exposed individuals and exposed populations.

XVIII IEA World Congress of Epidemiology
VII Brazilian Congress of Epidemiology

Epidemiology in the Construction of Health for All: Tools for a Changing World

September 20 - 24, 2008 - FIERGS - Porto Alegre - RS - Brazil

Miquel Porta, MD, MPH, PhD
Institut Municipal d'Investigació Mèdica,
Universitat Autònoma de Barcelona, and
University of North Carolina at Chapel Hill.
www.imim.es

Porto Alegre
Sunday, Sept. 21, 2008

www.imim.es/programesrecerca/epidemiologia/en_documentsgrecm.html

Home > Research programmes > Epidemiology and public health >

Clinical and Molecular Epidemiology of Cancer

Scientific documents

- B. Conferencia: "¿Deberíamos analizar los compuestos tóxicos persistentes que tenemos en la sangre?"
- Accumulation of genetic and epigenetic alterations: a key causal process between the environment and the occurrence of cancer
- Between molecules and the environment: keeping patients in the picture
- A. Encuentro de trabajo: "Concentraciones de compuestos tóxicos persistentes (CTPs) en la población general española: información disponible y posibles estudios para un diagnóstico de la situación"

IMIM hospitaldelmar

prbb Parc Recerca Biomèdica Barcelona

UAB Universitat Autònoma de Barcelona

Persistent toxic substances: exposed individuals and exposed populations

J Epidemiol Community Health 2004;**58**:534–535.

EDITORIAL

Occup Environ Med 2002;**59**:651–653

Pollution

Implementing the Stockholm Treaty on Persistent Organic Pollutants

M Porta, E Zumeta

Implementation of the Stockholm Treaty on Persistent Organic Pollutants is a unique opportunity to foster changes in environmental, occupational, and food policies

J Epidemiol Community Health 2002;**56**:806–807

Bovine spongiform encephalopathy, persistent organic pollutants, and the achievable utopias

Sick individuals and sick populations

Geoffrey Rose

Rose G (Department of Epidemiology, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK). Sick individuals and sick populations. *International Journal of Epidemiology* 1985;**14**:32–38.

Aetiology confronts two distinct issues: the determinants of individual cases, and the determinants of incidence rate. If exposure to a necessary agent is homogeneous within a population, then case/control and cohort methods will fail to detect it: they will only identify markers of susceptibility. The corresponding strategies in control are the 'high-risk' approach, which seeks to protect susceptible individuals, and the population approach, which seeks to control the causes of incidence. The two approaches are not usually in competition, but the prior concern should always be to discover and control the causes of incidence.

Based on a lecture to the Xth Scientific Meeting of the International Epidemiological Association, 27 August 1984, Vancouver, Canada.

PTS levels in farm-raised and in wild salmon

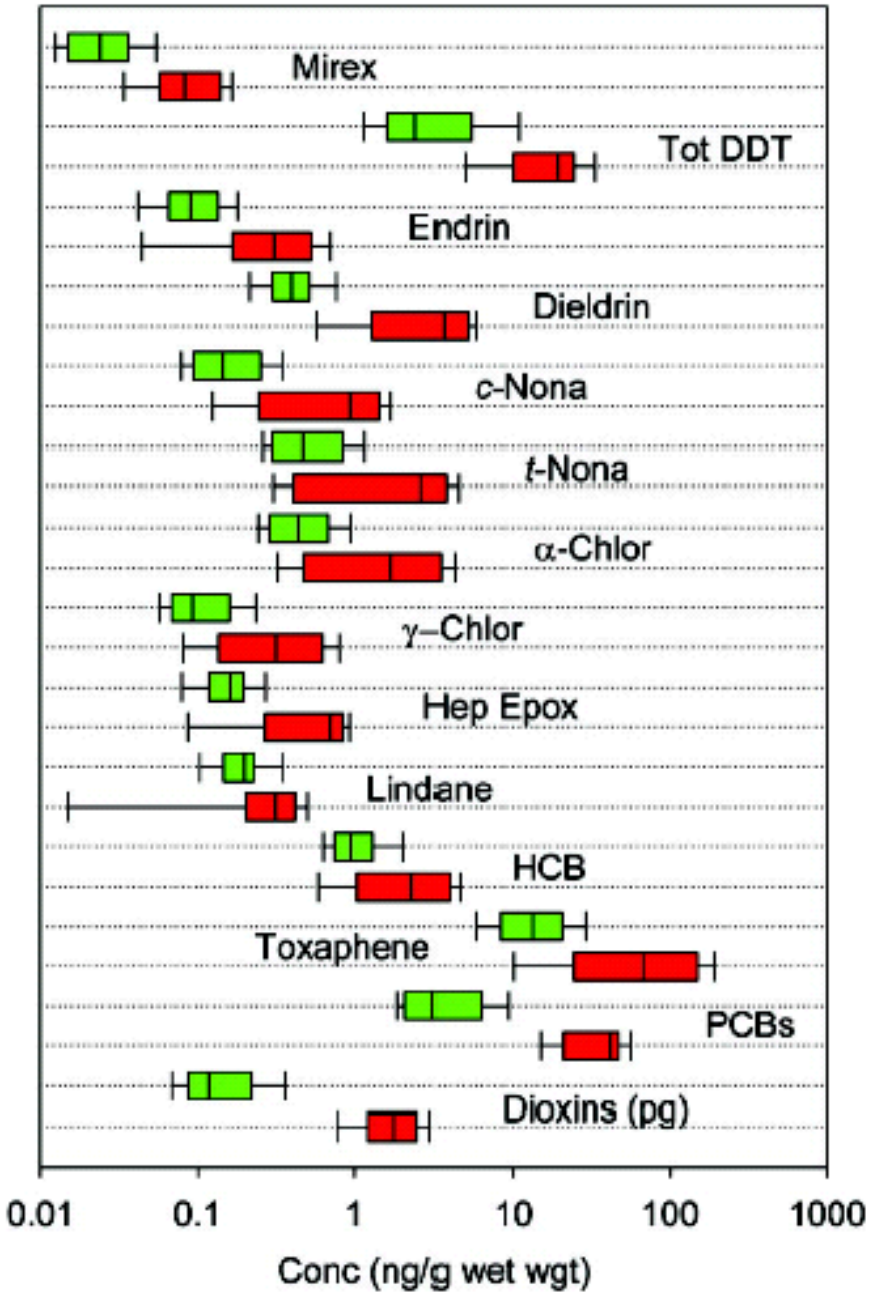


Fig. 1. Concentrations (in ng/g wet weight, except dioxins) of 14 contaminants found in farm-raised (red bars) and wild (green bars) salmon. The vertical lines represent the 10th, 50th, and 90th percentiles, and the boxes represent the 25th to 75th percentiles. Dioxins are in pg of World Health Organization toxic equivalents (WHO-TEQs) per g of wet weight and include polychlorinated dibenzo-*p*-dioxins and dibenzofurans and dioxin-like PCBs. Typically 75% of the total TEQ was due to the dioxin-like PCBs. Other abbreviations are as follows: Tot DDT, the *p,p′* and *o,p′* isomers of DDT, DDD, and DDE; Nona, nonachlor; Chlor, chlordane; Hep Epox, heptachlor epoxide.

9 JANUARY 2004 VOL 303 SCIENCE www.sciencemag.org

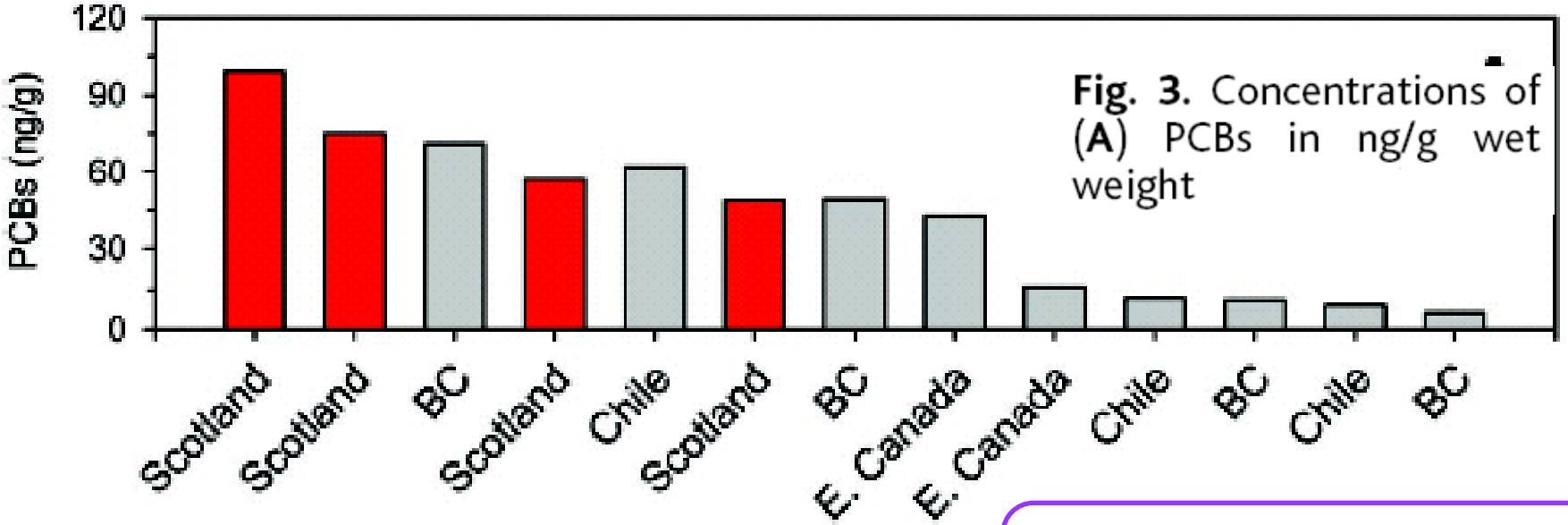


Fig. 3. Concentrations of (**A**) PCBs in ng/g wet weight

PTS levels in animal feed

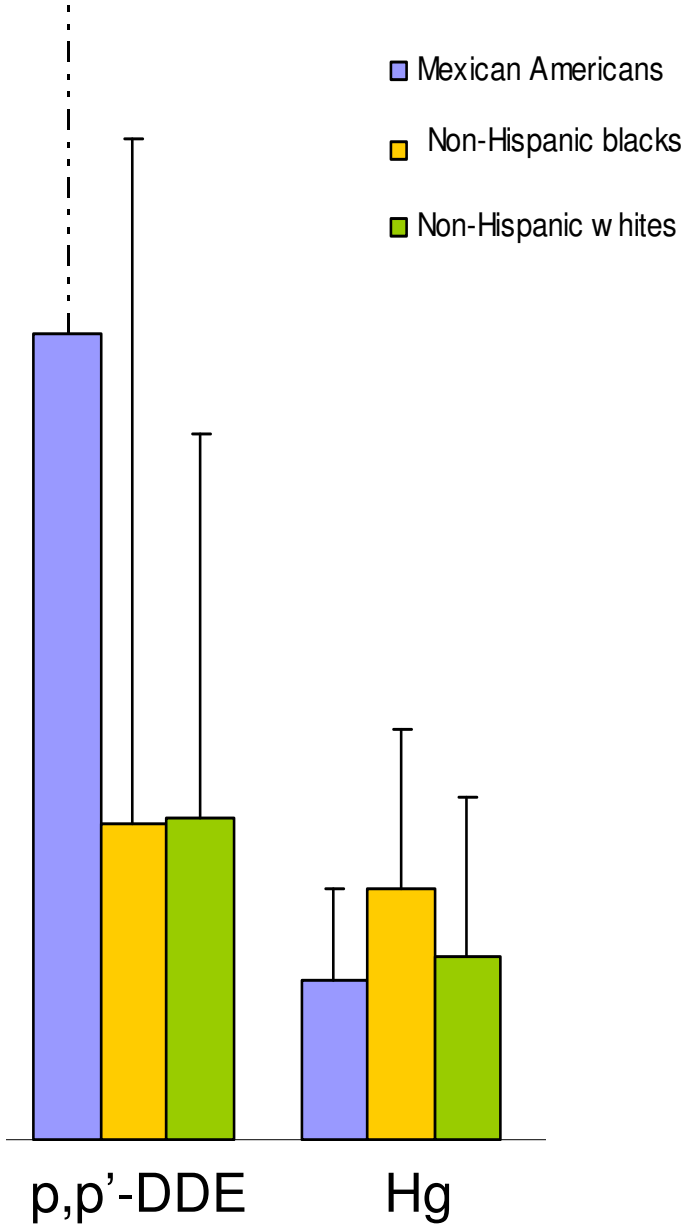
Concentrations of CBs in commercial fish feed purchased at facilities in various countries at various times of the year. Each bar represents the analysis of one sample of fish feed, and the country

Fish feed purchased in Europe is indicated by red, and fish feed purchased in North or South America is indicated by gray.

serum concentrations of p,p'-DDE and Hg (ppb) among Mexican Americans, Non-Hispanic Blacks and Non-Hispanic Whites U.S.A. 2001-2002. Median and 75th percentile.

3rd. NRHEEC 2001-2002

www.cdc.gov/exposurereport

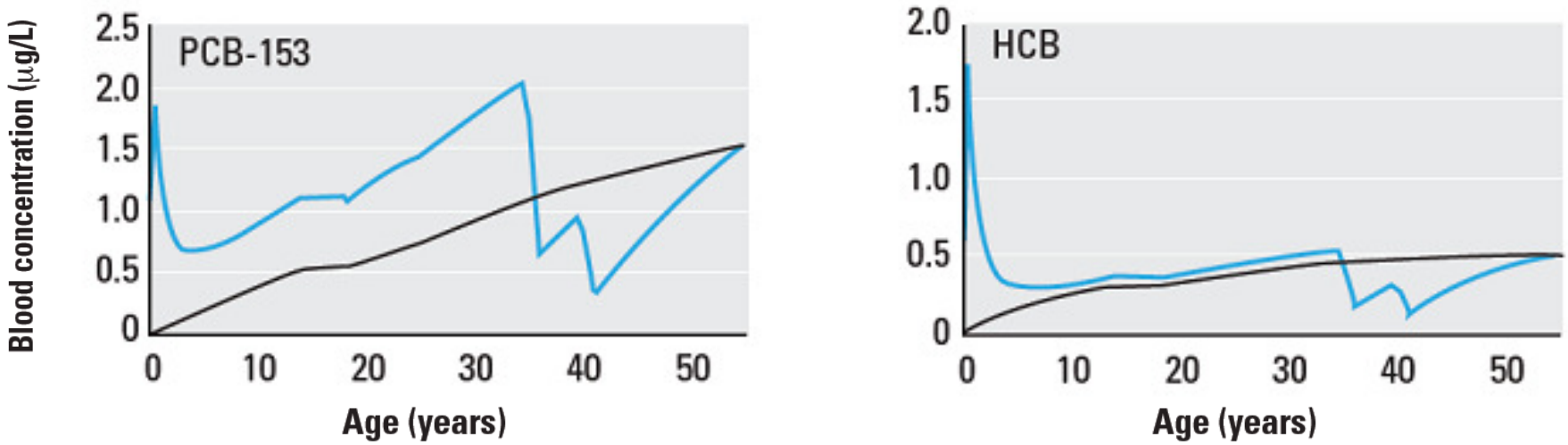


July 2008 • Environmental Health Perspectives

Physiologically Based Pharmacokinetic Modeling of Persistent Organic Pollutants for Lifetime Exposure Assessment: A New Tool in Breast Cancer Epidemiologic Studies

Marc-André Verner,[1] Michel Charbonneau,[2] Lizbeth López-Carrillo,[3] and Sami Haddad[1*]*

[1]Département des sciences biologiques, Université du Québec à Montréal, Montréal, Québec, Canada; [2]INRS-Institut Armand-Frappier, Université du Québec, Laval, Québec, Canada; [3]Instituto Nacional de Salud Publica, Cuernavaca, Mexico



Toxicokinetic profiles for normal body weight history for a woman who was exposed to 10 ng/kg/day of each of the chemicals and had no pregnancy (black line) or was breast-fed for 6 months in childhood, was exposed to 18.7 ng/kg/day PCB-153, 11.6 ng/kg/day HCB, and who had two pregnancies at 35 and 40 years of age followed by 12-month lactation periods (blue line).

Arsenic Exposure and Prevalence of Type 2 Diabetes in US Adults

Ana Navas-Acien, MD, PhD
Ellen K. Silbergeld, PhD
Roberto Pastor-Barriuso, PhD
Eliseo Guallar, MD, DrPH

JAMA, August 20, 2008

Design, Setting, and Participants Cross-sectional study in 788 adults aged 20 years or older who participated in the 2003-2004 National Health and Nutrition Examination Survey (NHANES) and had urine arsenic determinations.

Results

After adjustment for diabetes risk factors and markers of seafood intake, participants with type 2 diabetes had a 26% higher level of total arsenic (95% confidence interval [CI], 2.0%-56.0%) than participants without type 2 diabetes.

After similar adjustment, the odds ratios for type 2 diabetes comparing participants at the 80th vs the 20th percentiles were 3.58 for the level of total arsenic (95% CI, 1.18-10.83).

Could low-level background exposure to persistent organic pollutants contribute to the social burden of type 2 diabetes?

Duk-Hee Lee, David R Jacobs Jr, Miquel Porta

Persistent organic pollutants may contribute to cause diabetes

J Epidemiol Community Health 2006;**60**:1006–1008.

A Strong Dose-Response Relation Between Serum Concentrations of Persistent Organic Pollutants and Diabetes

Results from the National Health and Examination Survey 1999–2002

Diabetes Care 29:1638–1644, 2006

DUK-HEE LEE, MD, PHD[1]
DAVID R. JACOBS, JR., PHD[2,3]

OBJECTIVE — Low-level exposure to some persistent organic pollutants (POPs) has recently become a focus because of their possible link with the risk of diabetes.

RESULTS — Compared with subjects with serum concentrations below the limit of detection, after adjustment for age, sex, race and ethnicity, poverty income ratio, BMI, and waist circumference, diabetes prevalence was strongly positively associated with lipid-adjusted serum concentrations of all six POPs. When the participants were classified according to the sum of category numbers of the six POPs, adjusted odds ratios were 1.0, 14.0, 14.7, 38.3, and 37.7 (P for trend < 0.001). The association was consistent in stratified analyses and stronger in younger participants, Mexican Americans, and obese individuals.

Response to Porta DIABETES CARE, NOVEMBER 2006

Association Between Serum Concentrations of Persistent Organic Pollutants and Insulin Resistance Among Nondiabetic Adults

Results from the National Health and Nutrition Examination Survey 1999–2002

DUK-HEE LEE *Diabetes Care* 30:622–628, 2007

OC pesticides and nondioxin-like PCBs may be associated with type 2 diabetes risk by increasing insulin resistance,

POPs may interact with obesity to increase the risk of type 2 diabetes.

Response to Porta DIABETES CARE, NOVEMBER 2006

THE LANCET
Vol 368 August 12, 2006

Miquel Porta

Persistent organic pollutants and the burden of diabetes

Studies from the USA[1,2] have drawn attention to the possibility that persistent organic pollutants might contribute to cause diabetes.[3-6]

Because they contaminate virtually all people, even if they confer only a low individual risk of diabetes, these pollutants might have a substantial overall population effect.[10]

THE LANCET
Vol 368 August 12, 2006

Miquel Porta

Persistent organic pollutants and the burden of diabetes

When assessing the mechanisms linking diet, fat intake, obesity, and diabetes, persistent organic pollutants should also be considered. We need a better understanding of the burden of diabetes that these pollutants might contribute to cause.

Clinical and Experimental Allergy, **36**, 1236–1241 2006

Early exposure to dichlorodiphenyldichloroethylene, breastfeeding and asthma at age six

J. Sunyer*†, M. Torrent‡, R. Garcia-Esteban*, N. Ribas-Fitó*, D. Carrizo§, I. Romieu¶, J. M. Antó*† and J. O. Grimalt§

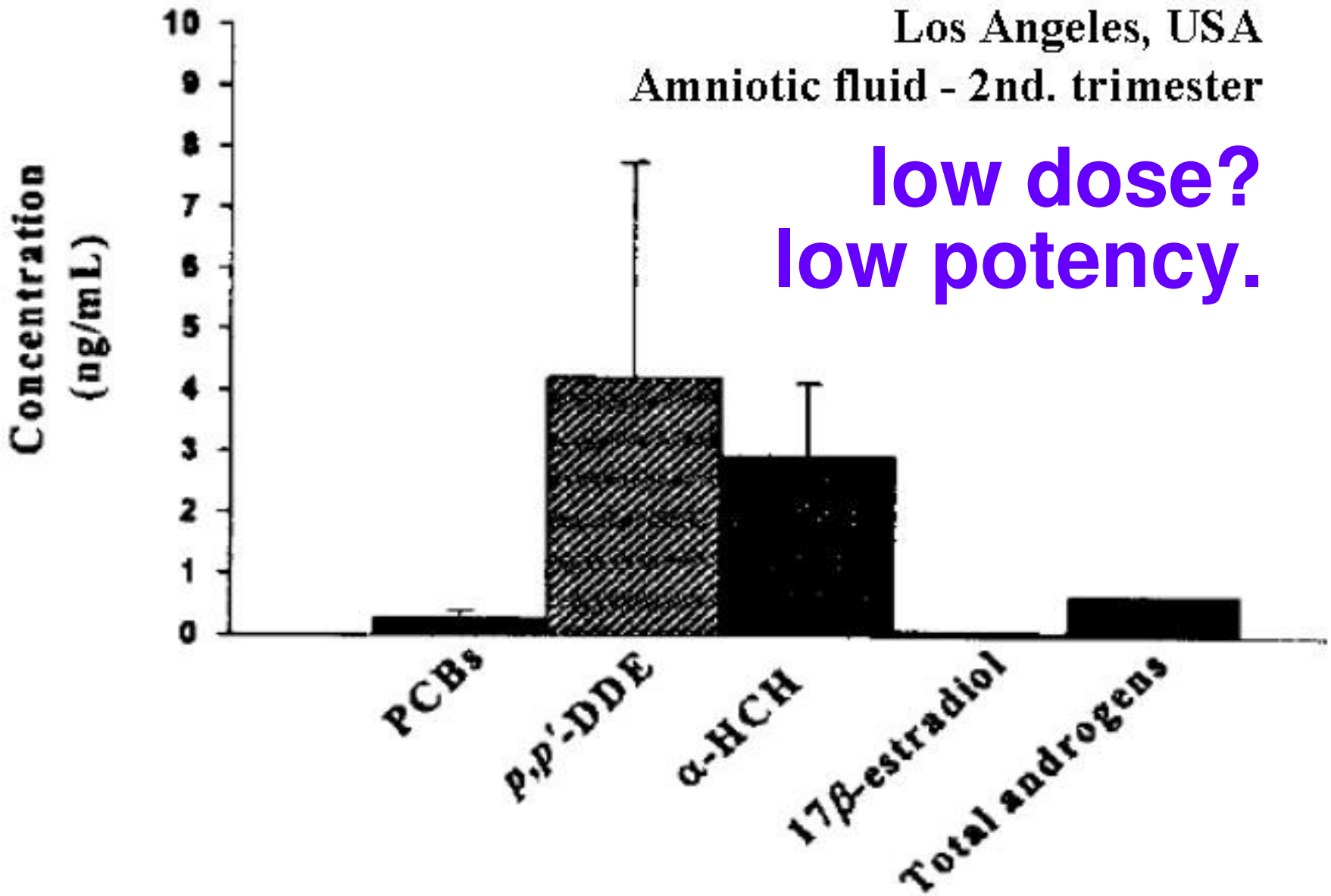
Results At birth and 4 years of age, all children had detectable levels of DDE (median 1 ng/mL and 0.8 ng/mL, respectively). From birth to age 4, the mean DDE level among children with artificial feeding decreased by 72%, while among breastfed children it increased by 53%. Diagnosed asthma and persistent wheezing were associated with DDE at birth [odds ratio (OR) for an increase in 1 ng/mL, OR = 1.18, 95% confidence interval (95% CI) = 1.01–1.39 and OR = 1.13, 95% CI = 0.98–1.30, respectively], but not with DDE at 4 years. Neither breastfeeding nor atopy modified these associations ($P > 0.3$). Breastfeeding protected against diagnosed asthma (OR = 0.33, 95% CI = 0.08–0.87) and wheezing (OR = 0.53, 95% CI = 0.34–0.82) in children with low and high DDE levels at birth.

Conclusion In a community without known dichlorodiphenyltrichloroethane environmental releases, this study strengthens the evidence for an effect of DDE on asthma by measuring the disease at age 6 and does not support the hypothesis that DDE modifies the protective effect of breastfeeding on asthma.

International

Our children inherit the toxic burden of our planet.

Foster W, et al. J Clin Endocrinol Metab 2000; 85: 2954-7.

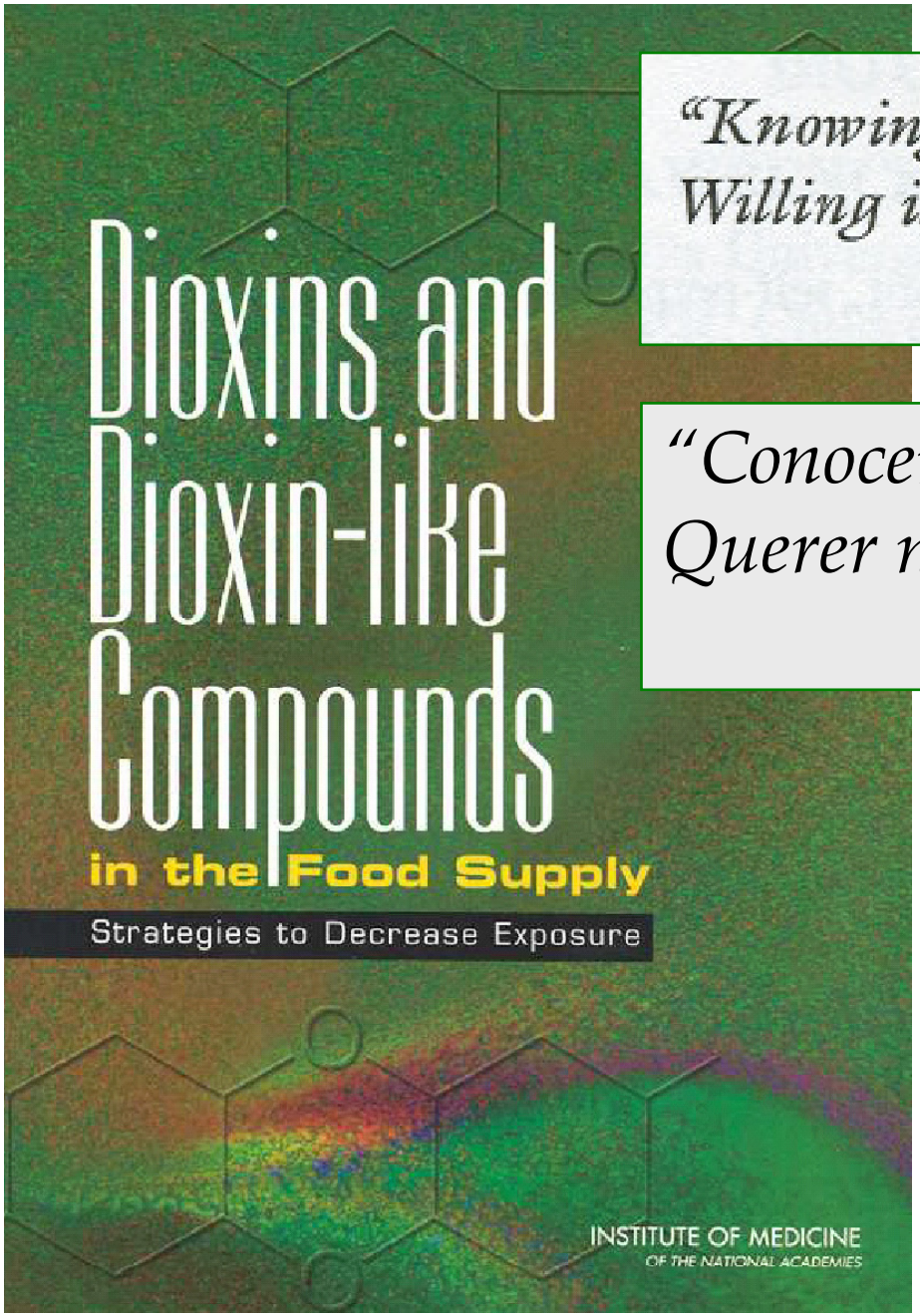


The contamination of the general healthy population by organochlorine compounds, other PTS, and other Environmental Chemical Agents is a fact of relevance for public health.

It also has important consequences for environmental, food, industrial and economic policies.

- Most countries lack population indicators on the effects that environmental agents have on human health.
- Several government levels have a role in the monitoring of biological levels of PTS among humans in order to assess the risks of adverse health effects.
- Surveillance of contamination of the general population by PTS is necessary to fulfil the governments' mission to protect the public health.

- ✓ **PTS are present at 'low doses' in many fatty foods.**
- ✓ **PTS are commonly detected in human beings...**
- ✓ **... at concentrations that at mid- and long-term, and in combination with other factors may contribute to cause effects clinically and –particularly– <u>socially</u> relevant.**



"Knowing is not enough; we must apply. Willing is not enough; we must do."

—Goethe

"Conocer no basta; debemos aplicar. Querer no basta; debemos hacer."

–Goethe

2003

THE NATIONAL ACADEMIES PRESS
Washington, D.C.
www.nap.edu

DEBATE

J Epidemiol Community Health 2002;**56**:813–817

Persistent toxic chemicals in the US food supply*

Guest Editor: M Porta; Assistant Editor: E Zumeta

K S Schafer, S E Kegley

DEBATE

J Epidemiol Community Health 2002;**56**:828–830

Food contamination with polychlorinated biphenyls and dioxins in Belgium. Effects on the body burden

N Van Larebeke, A Covaci, P Schepens, L Hens

G Bengtsson

L G Hansen

C M Benbrook

T Damstra, S W Page, J L Herrman, T Meredith

G M Solomon, A M Huddle

http://jech.bmj.com

PTS accumulate in the biological sense...

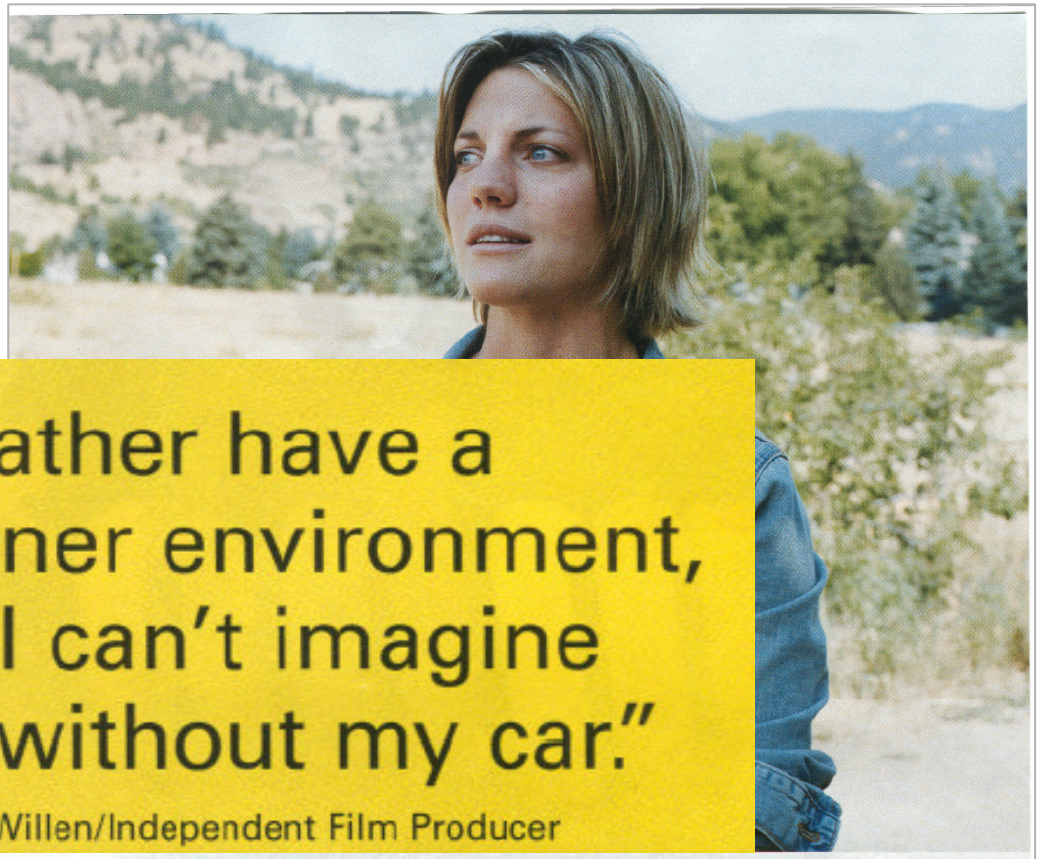
PTS travel great distances:
through the atmosphere as well as
through the international trade channels for
human food, animal feed, fat...

PTS also accumulate
in the cultural environment of our societies:
PTS are deeply rooted in our lifestyles.

Occupat Environ Med 2002.
J Epi Community Health 2002.
Int J Occupat Environ Health 2003.
J Epi Community Health 2004.

bp

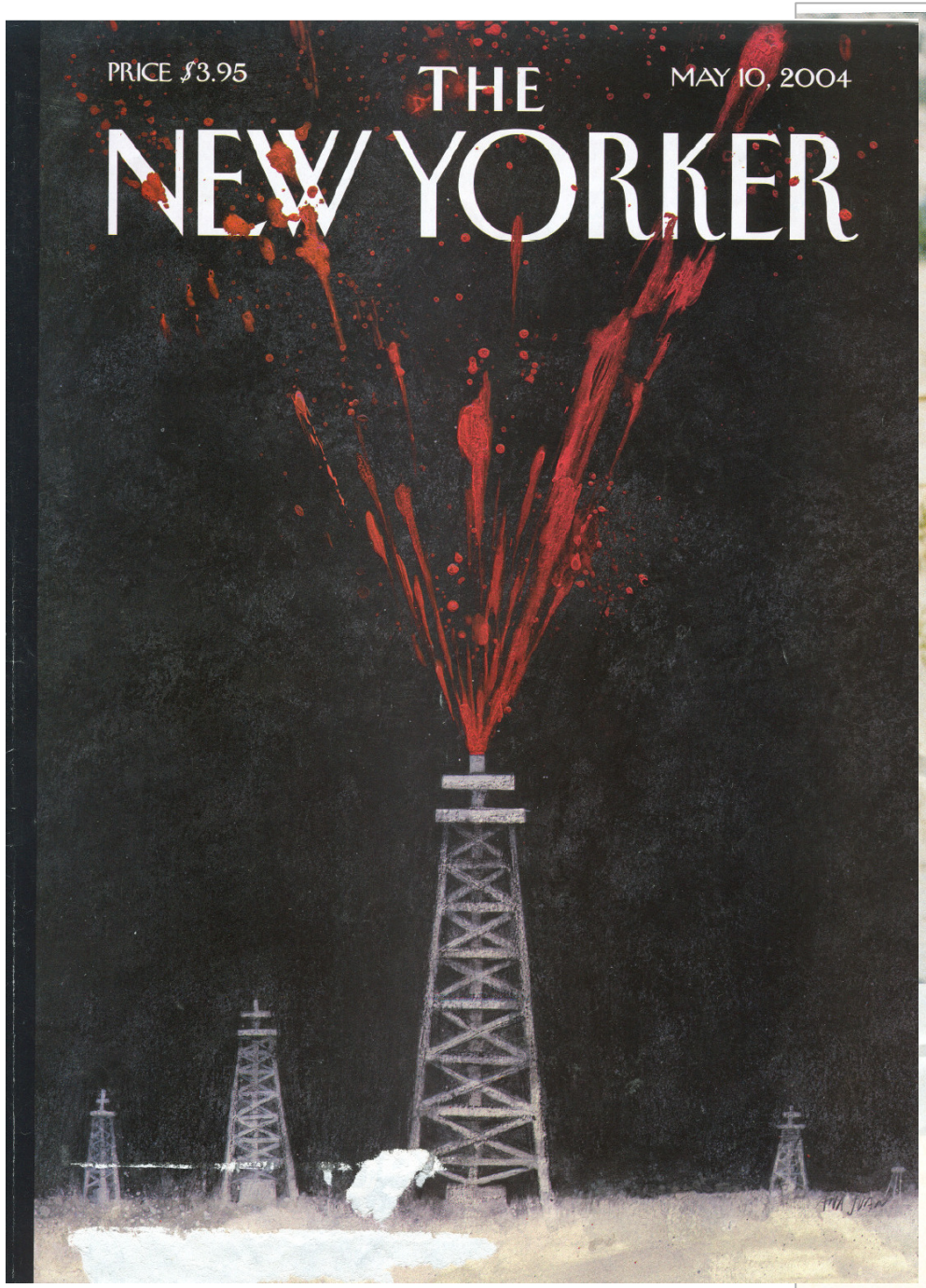
beyond petroleum™



"I'd rather have a cleaner environment, but I can't imagine me without my car."

▲ Steph Willen/Independent Film Producer

We shouldn't have to choose. We voluntarily introduced cleaner burning low-sulfur fuels, six years before E.P.A. mandates. These fuels help reduce ozone pollution and are now available in over 40 U.S. cities.



We shouldn't have to choose. We voluntarily introduced cleaner burning low-sulfur fuels, six years before E.P.A. mandates. These fuels help reduce ozone pollution and are now available in over 40 U.S. cities.

It's a start.

bp

beyond petroleum™

bp.com

El libro de los desórdenes. **Reservoir books / Mondadori, 2004. p 81**

CONSTRUCTIVE CONVERSATIONS ABOUT HEALTH

policy and values

Edited by Marshall Marinker

Chapter 13

Creativity

Miquel Porta

Contents

- Health policy and the constructive conversationalist
- The value of values
- Health and wellbeing
- Equity and justice
- Choice
- Democracy
- Stewardship
- Evidence
- Efficiency
- Synergy
- Sustainability
- Interdependence
- Creativity
- Ethical considerations in health systems
- Justice and the allocation of health care
- Health values and the politician
- The future

Contributors

- Marc Danzon
- Ilona Kickbusch
- Jennifer Prah Ruger
- Giovanni Moro
- Per Carlsson
- Peter Garpendy
- Constantino Sakellarides
- Derek Yach
- David Hunter
- Morton Warner
- Mihaly Kokeny
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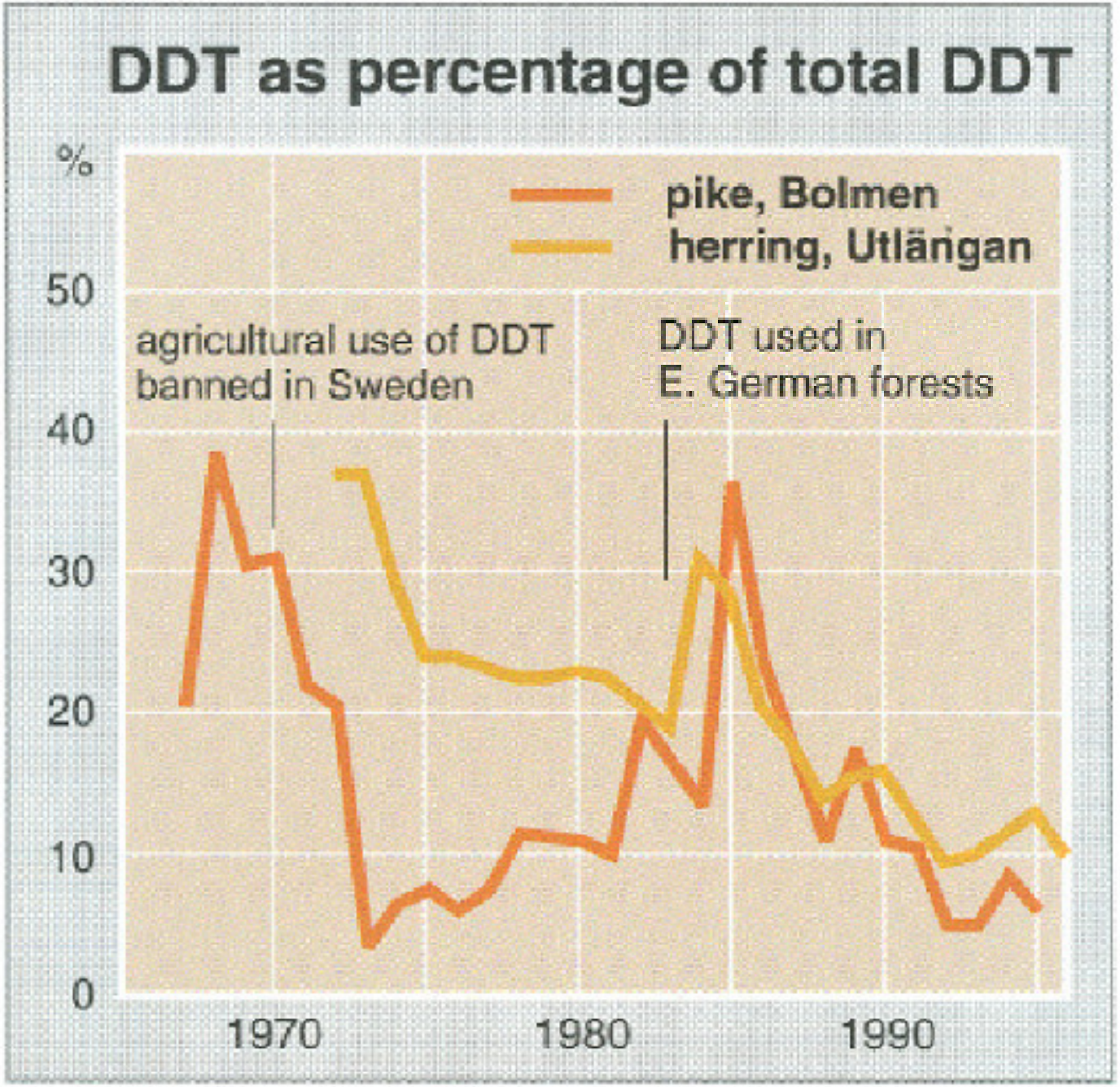
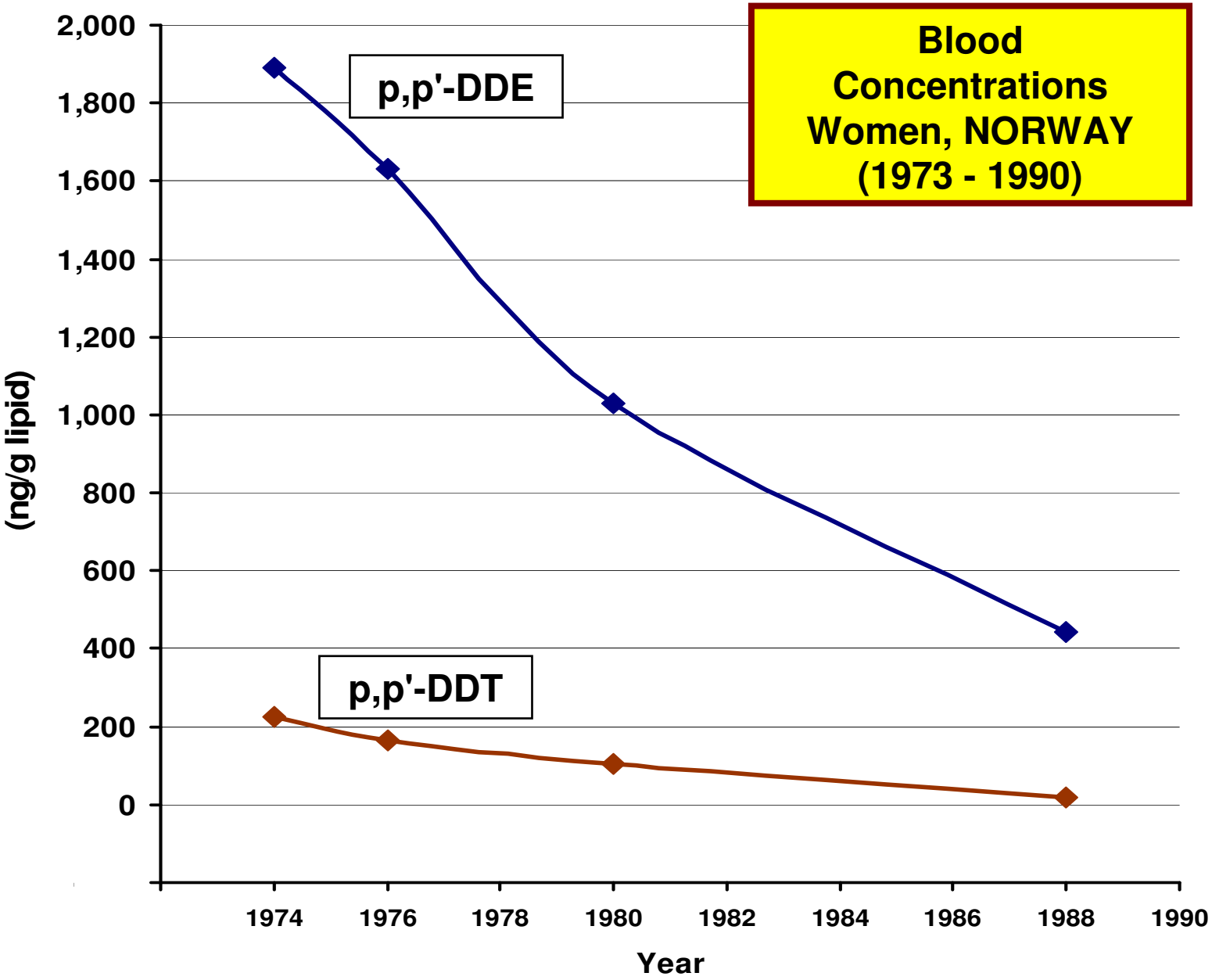
- Hans Stein
- Josep Figueras

Radcliffe Publishing

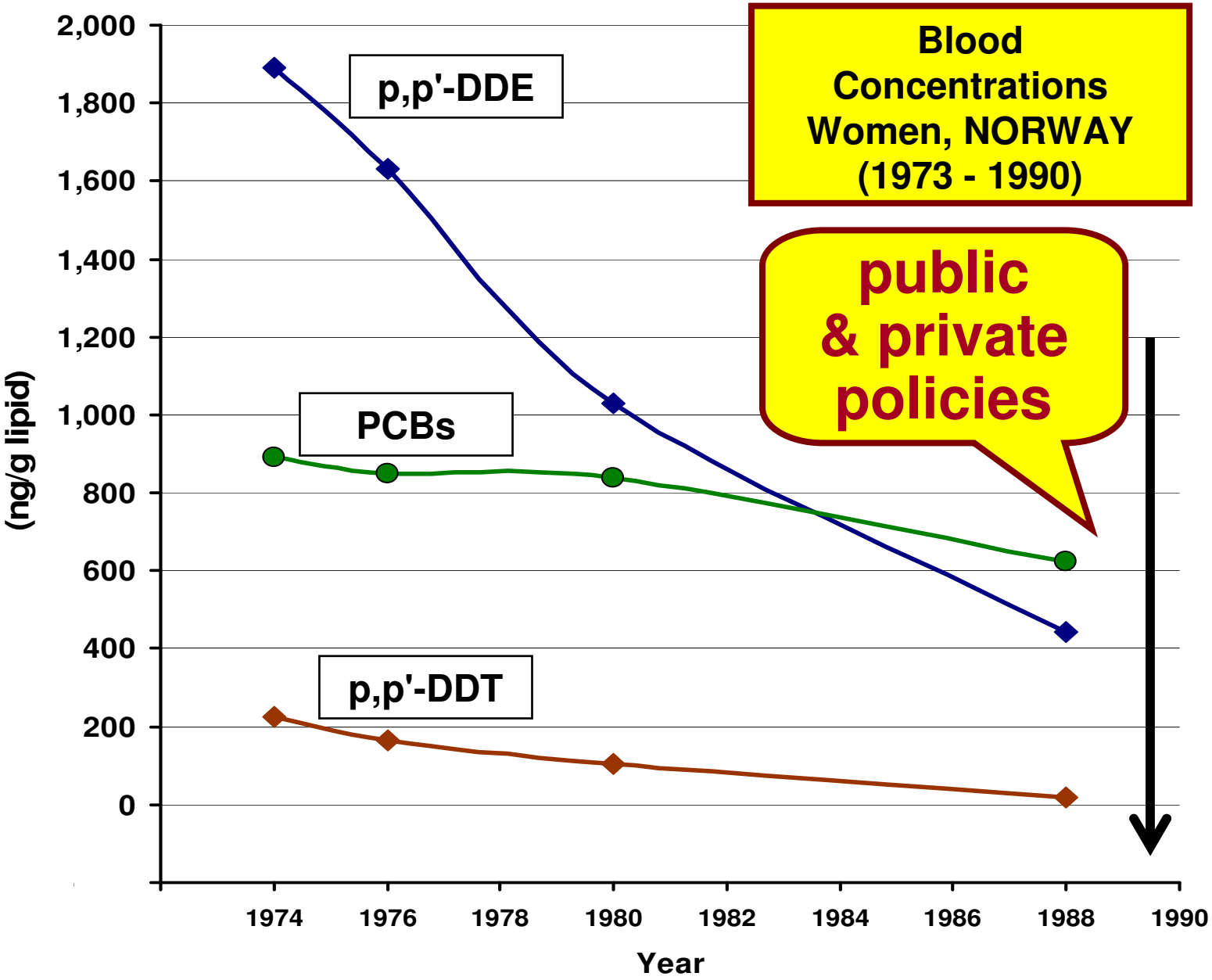


Swedish EPA:

www.environ.se



Ward EM et al. CEBP 2000



Ward EM et al. CEBP 2000

Paediatric and Perinatal Epidemiology, **19**, 31–35 2005

Gerd M. Lackmann

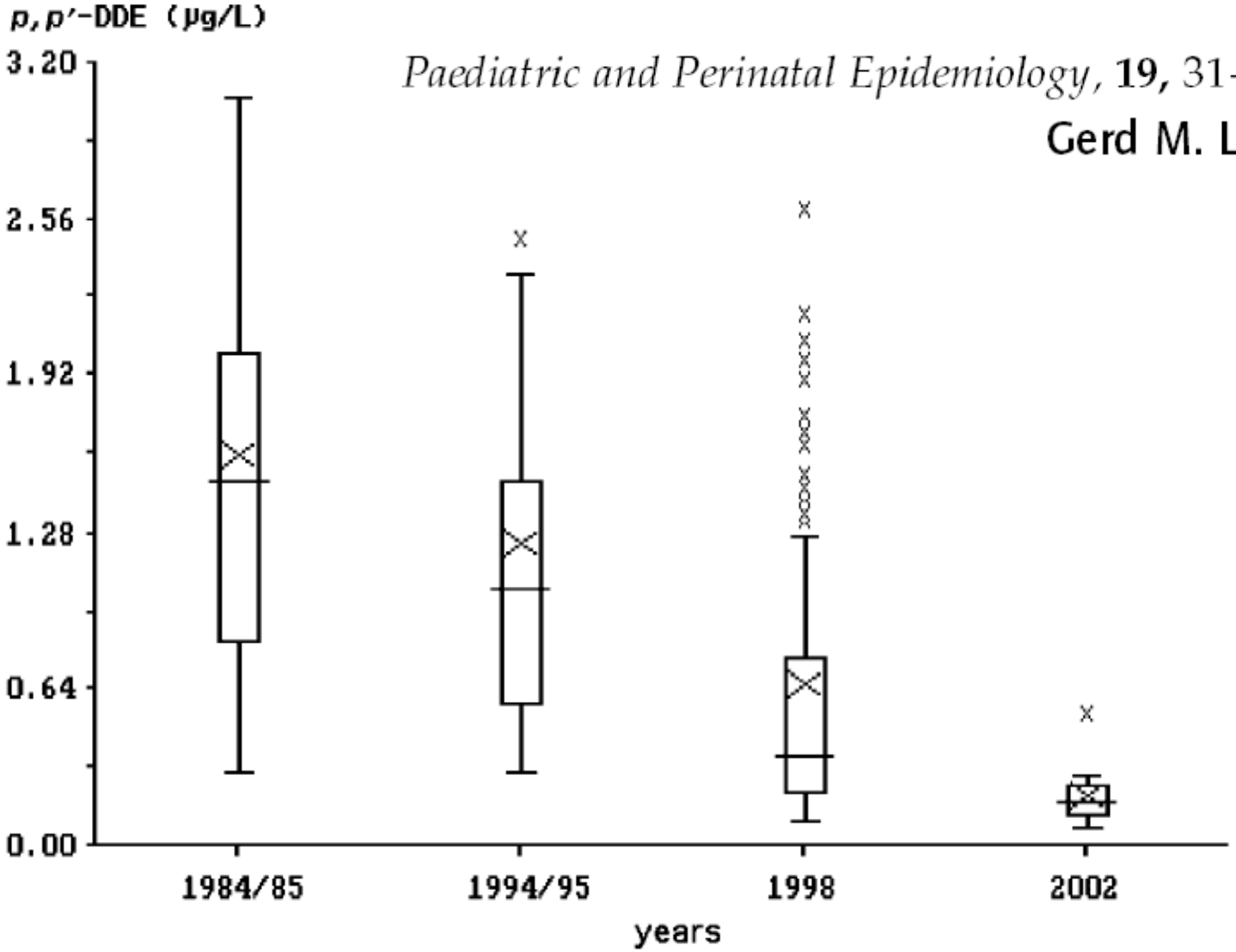


Figure 1. Box & Whisker-diagram of *p,p'*-DDE concentrations (µg/L) in full-term German neonates from the mid-1980s to 2002.

D.D.T.
Powerful Insecticide
Harmless to Humans
Applied by
TODD INSECT FOG APPLICATOR

Spraying it about — in 1946, whole districts of Athens were sprayed with DDT from low-flying aircraft in attempts to halt the spread of a cholera epidemic by flies.

NATURE 1995; 375: 538-9.

Paediatric and Perinatal Epidemiology, **19**, 31–35 2005

Gerd M. Lackmann

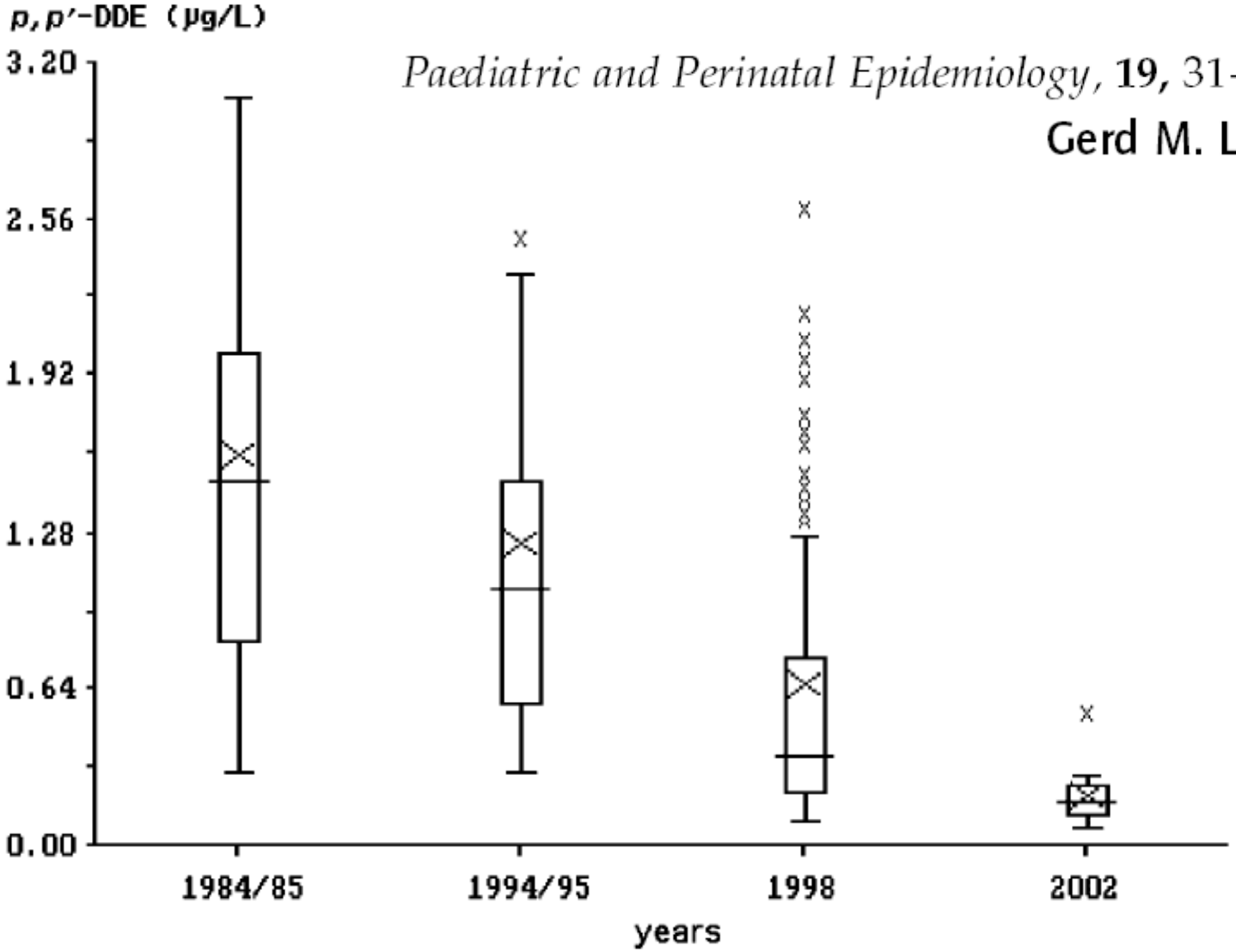
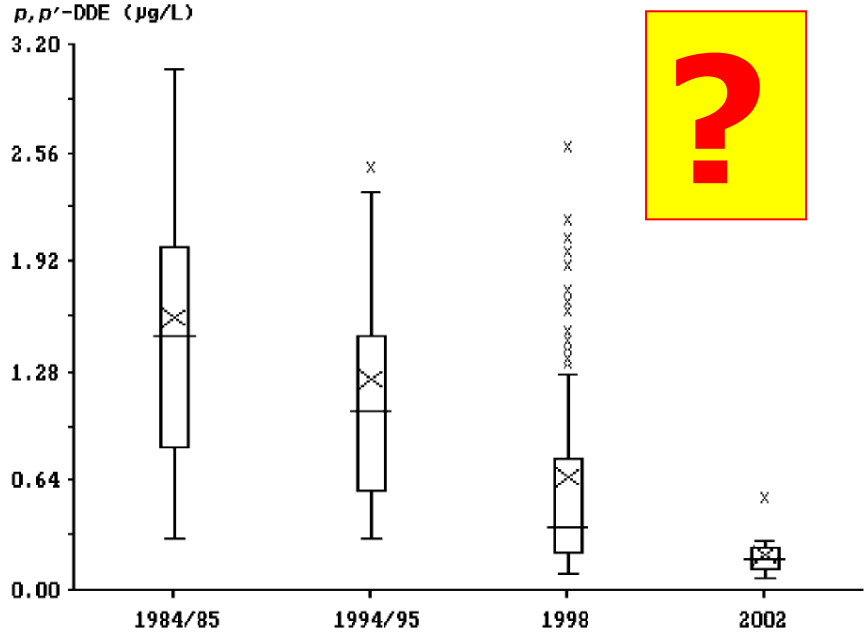
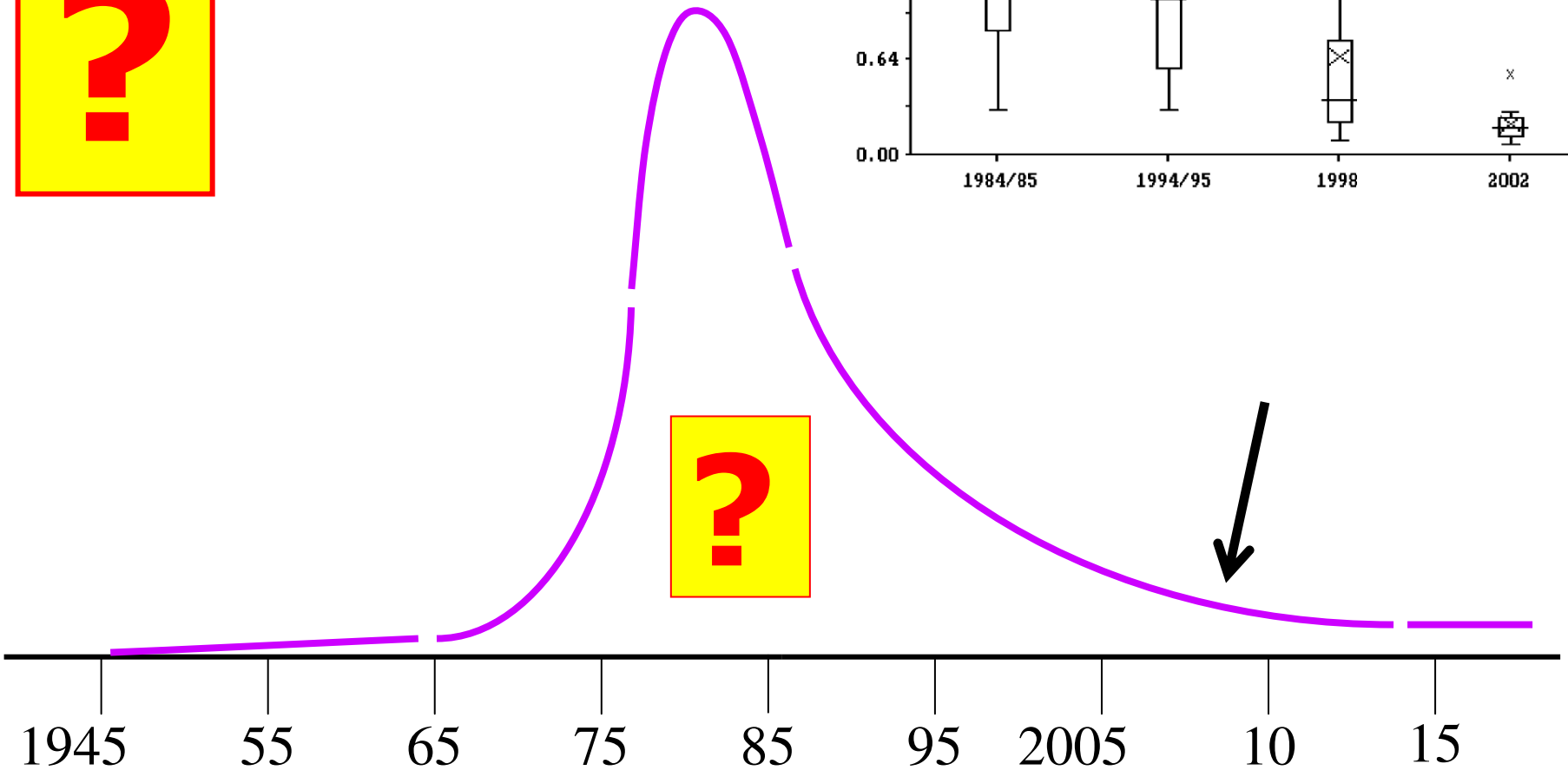


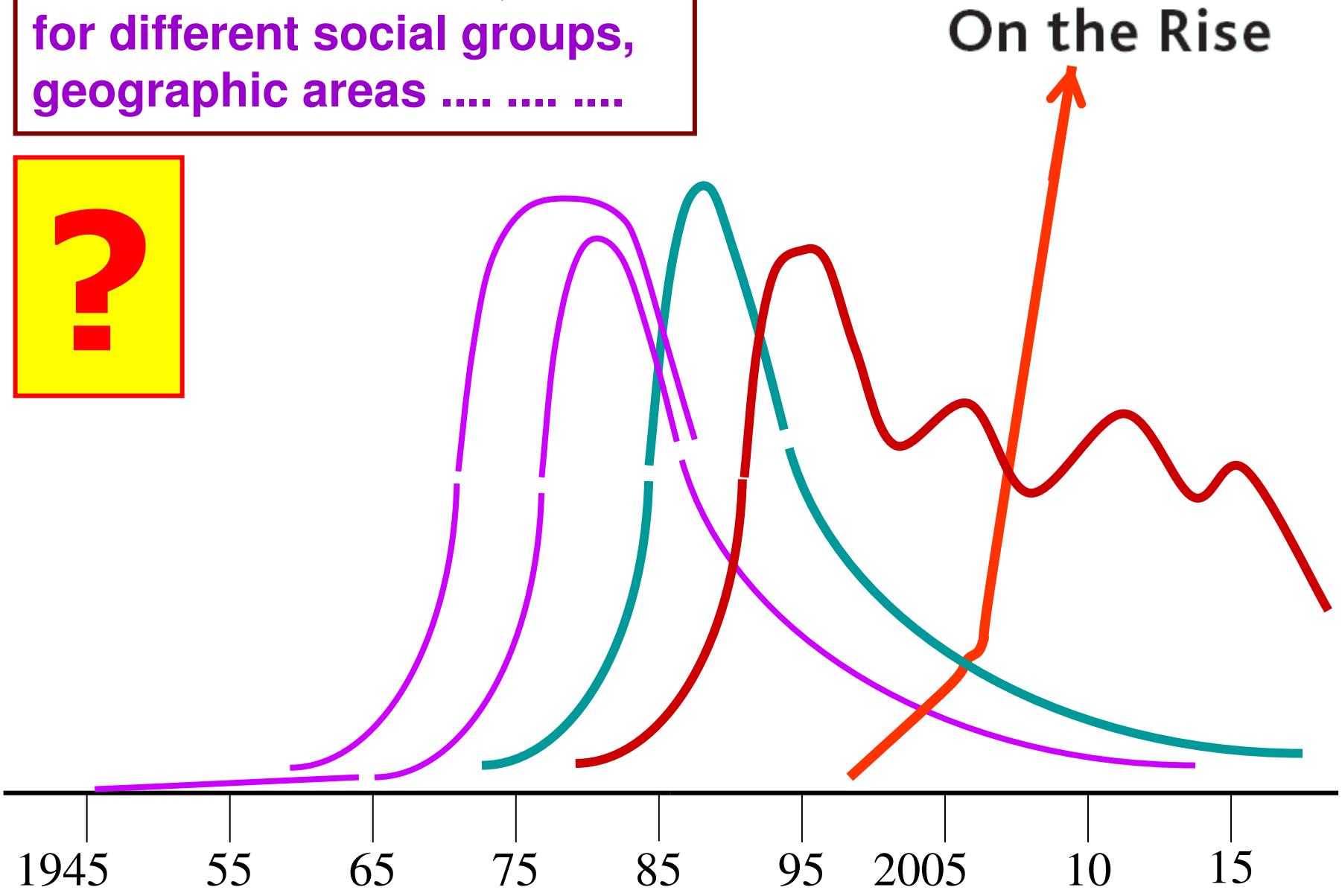
Figure 1. Box & Whisker-diagram of *p,p'*-DDE concentrations (µg/L) in full-term German neonates from the mid-1980s to 2002.

Curves for each PTS,
for different social groups,
geographic areas ....



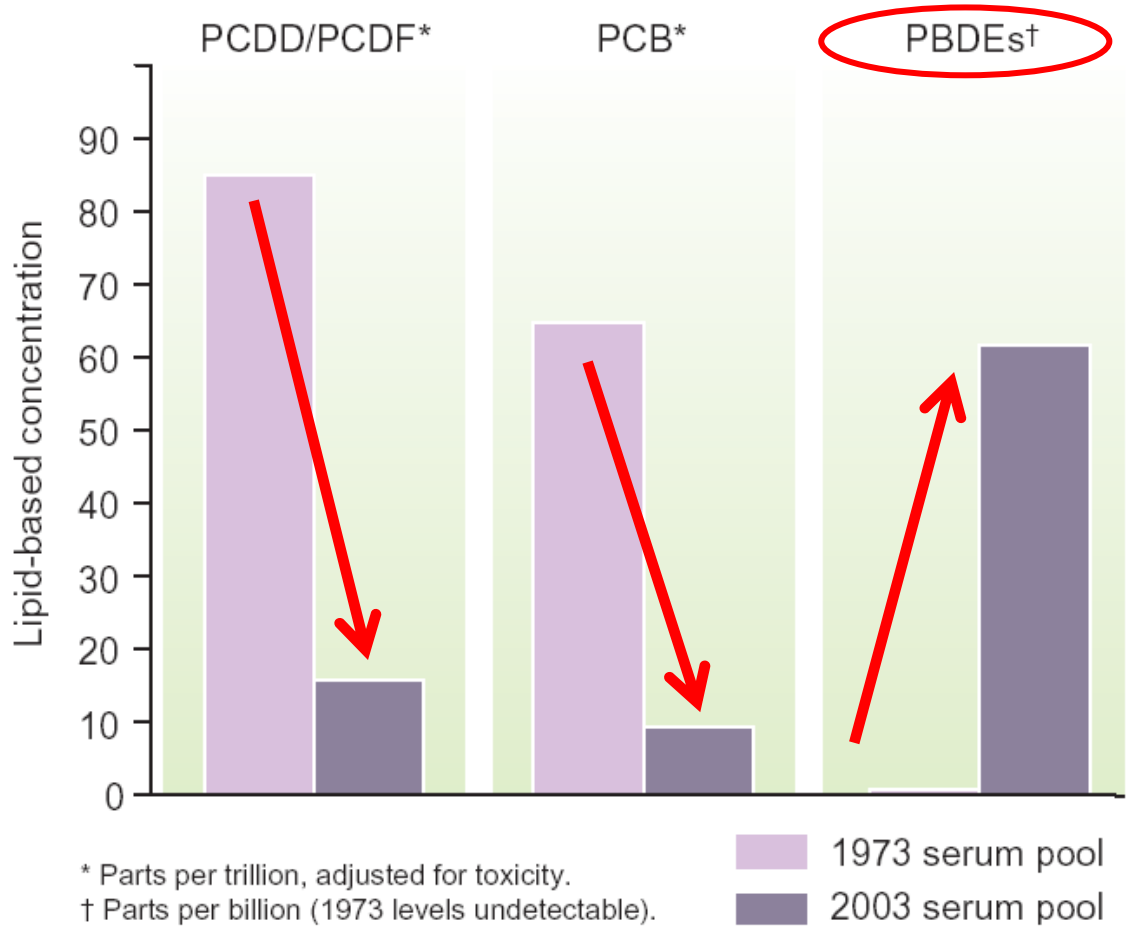


Curves for each PTS,
for different social groups,
geographic areas ....



TOXICOLOGY

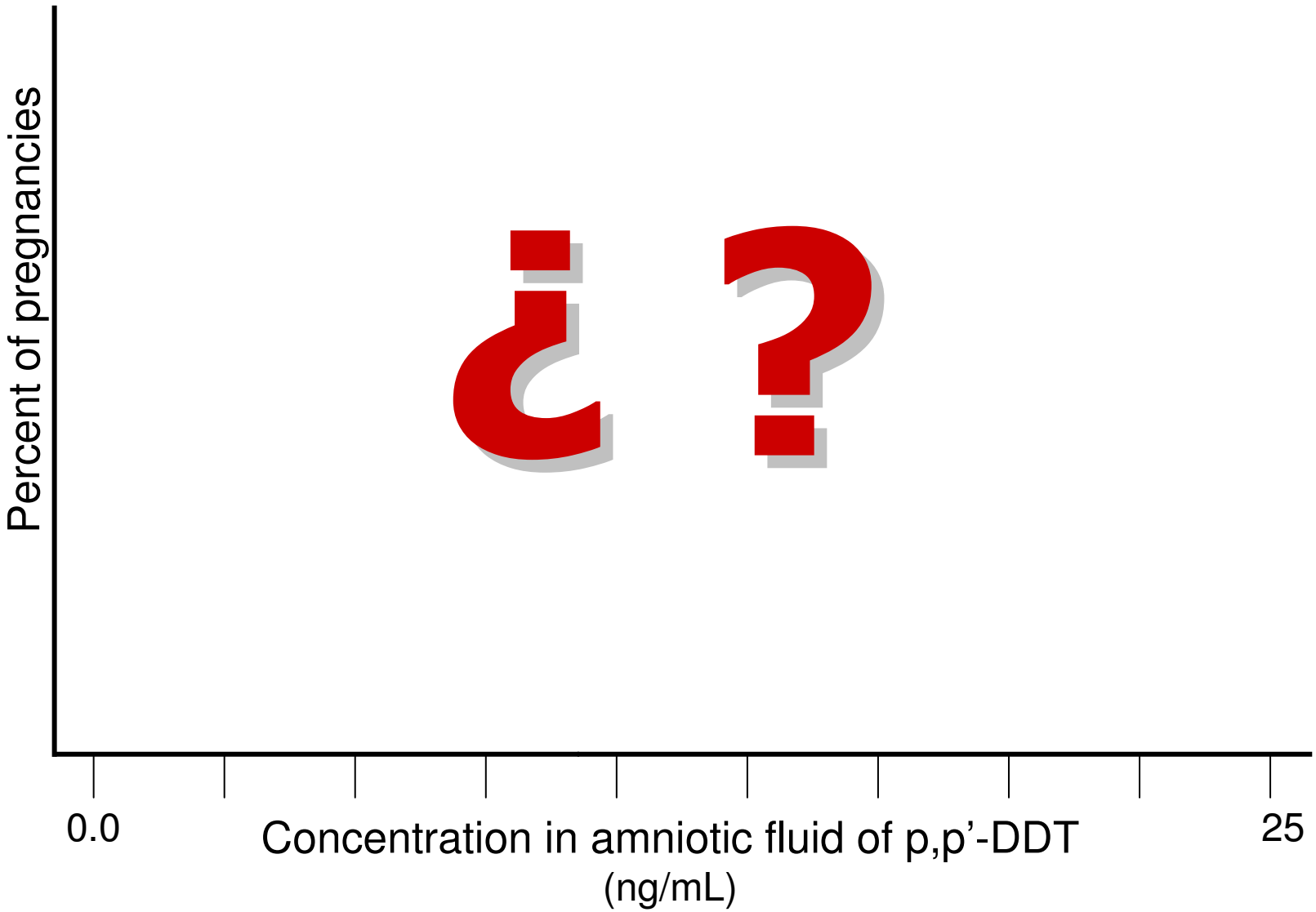
Exposure to Flame Retardants On the Rise



* Parts per trillion, adjusted for toxicity.
† Parts per billion (1973 levels undetectable).

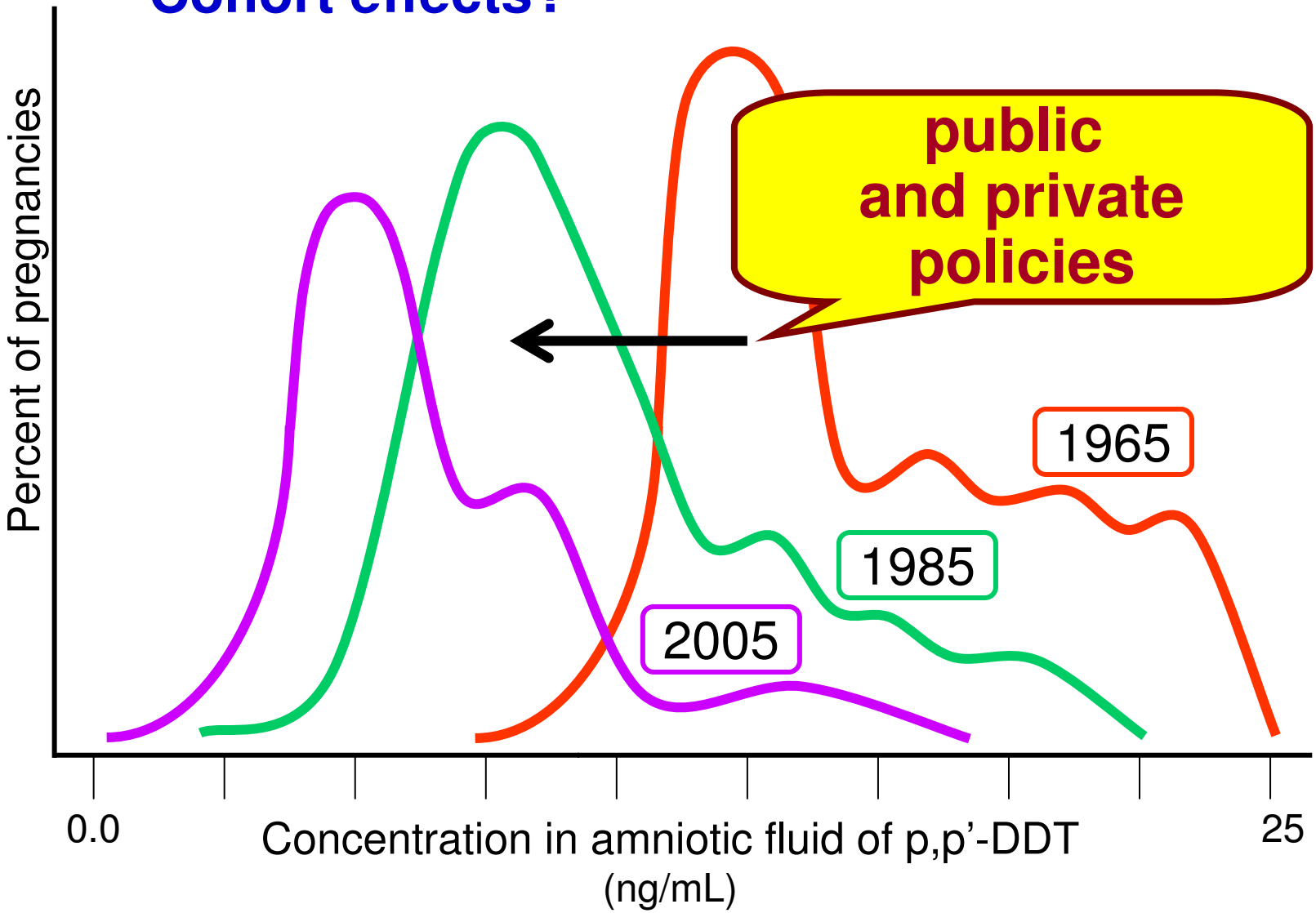
Burning issue Body burden of dioxins and furans and PCBs has declined since their use was banned; exposure to PBDEs has climbed steeply.

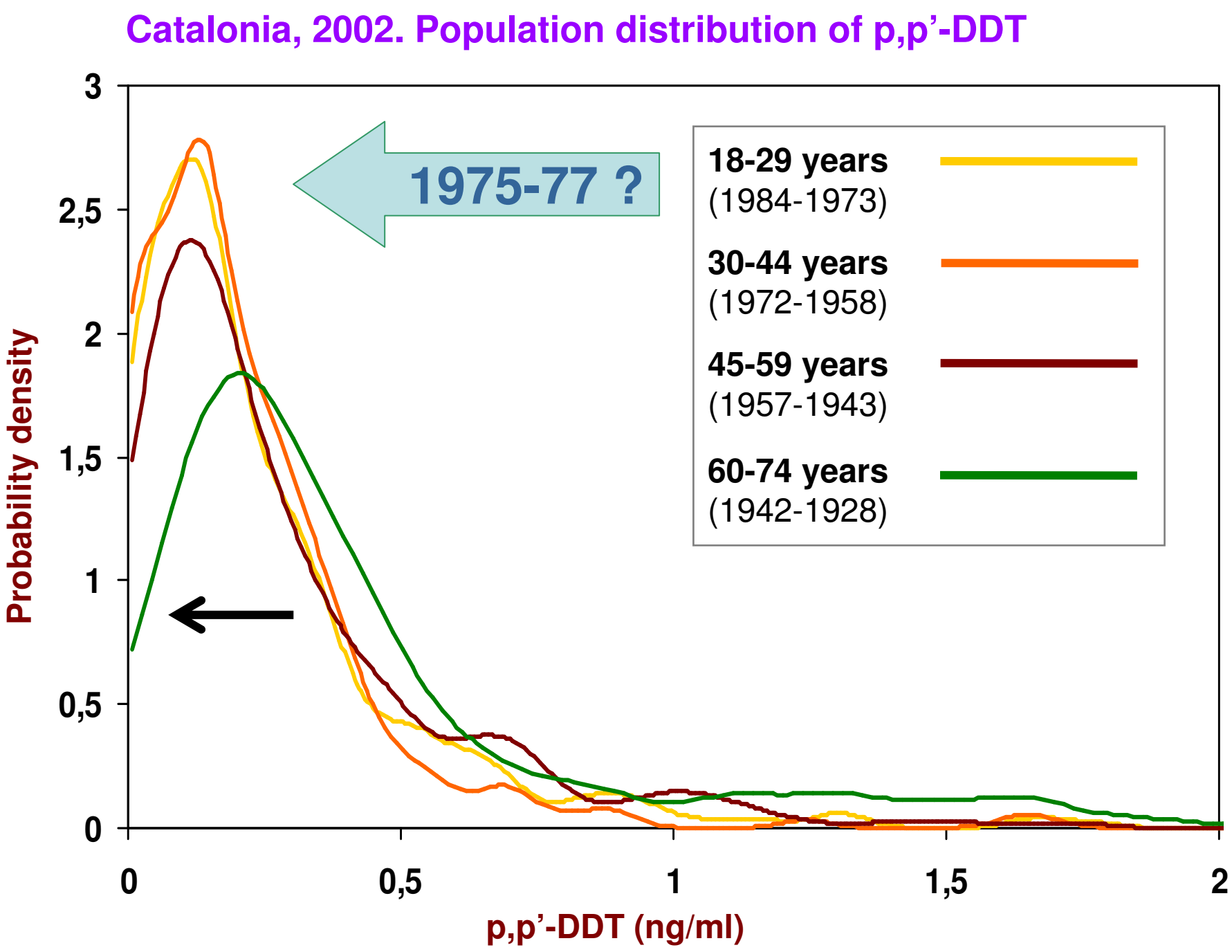
What is the population distribution of PTS?



What is the population distribution of PTS?

Cohort effects?




Catalonia, 2002. Population distribution of p,p'-DDT
1975-77 ?
18-29 years
(1984-1973)
30-44 years
(1972-1958)
45-59 years
(1957-1943)
60-74 years
(1942-1928)
Probability density
3
2,5
2
1,5
1
0,5
0
0
0,5
1
1,5
2
p,p'-DDT (ng/ml)

ROSE'S STRATEGY OF

PREVENTIVE MEDICINE

GEOFFREY ROSE

WITH COMMENTARY BY

KAY-TEE KHAW & MICHAEL MARMOT

La Estrategia de la MEDICINA PREVENTIVA

Geoffrey Rose

MASSON – SALVAT *Medicina*

Other papers of [on] Prof. G. Rose:

– Rose G. Strategy of prevention: lessons from cardiovascular disease. BMJ 1981.

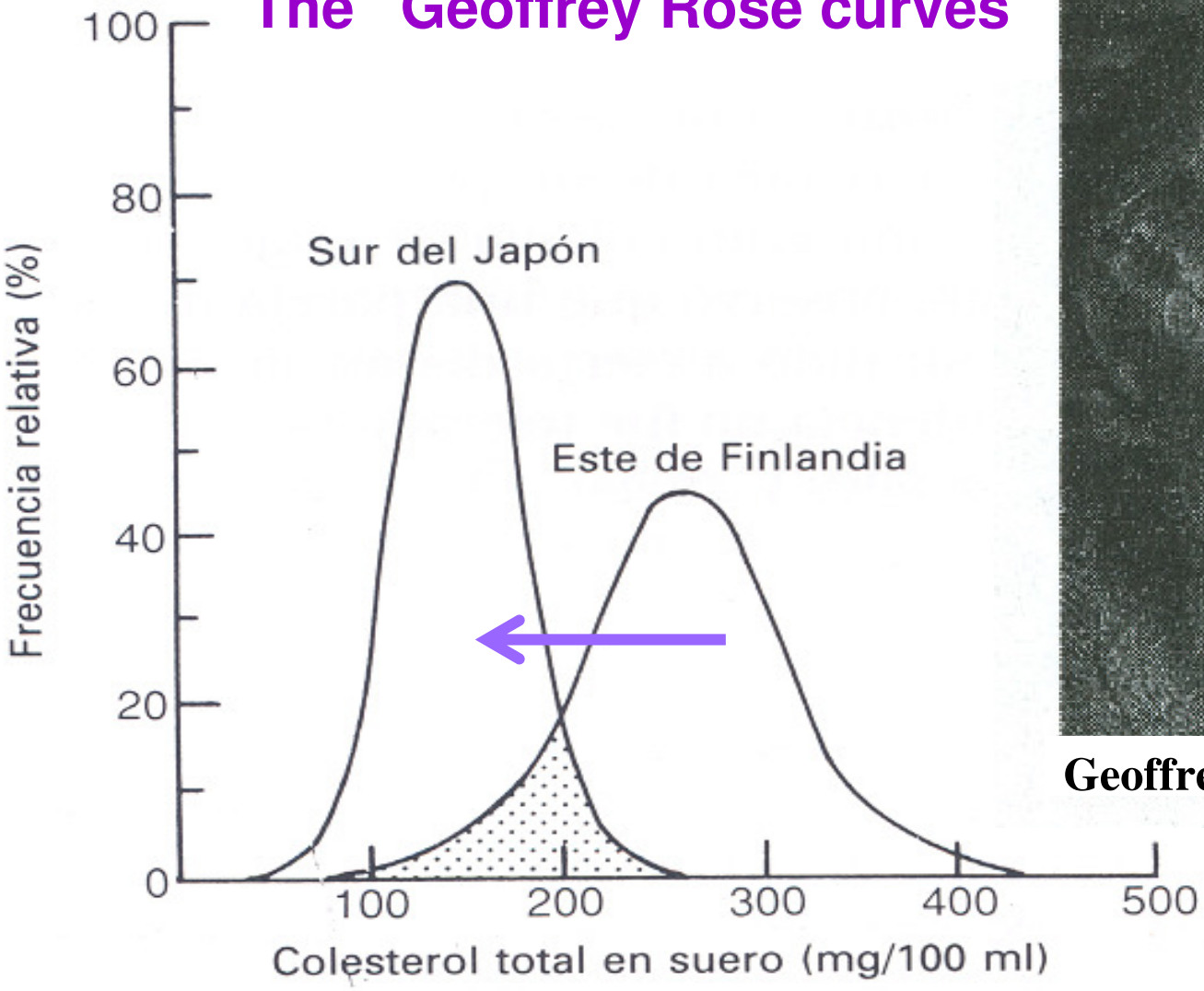
– Rose G. Prophylaxis with beta-blockers and the community. Br J Clin Pharmacol 1982.

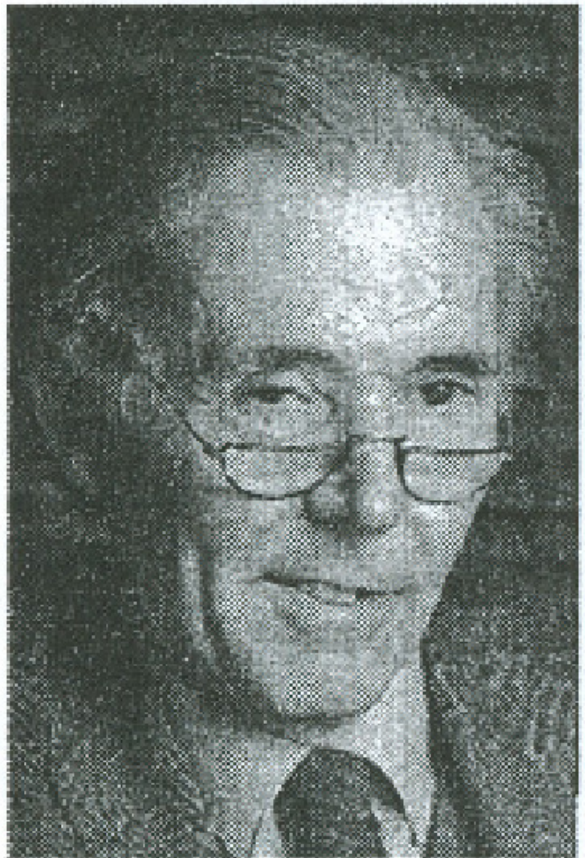
– Rose G, Day S. The population mean predicts the number of deviant individuals. BMJ 1990.

– [Hofman A, Vandenbroucke JP. Geoffrey Rose's big idea. BMJ 1992].

– [Porta M. PTS: Exposed individuals and exposed populations. JECH 2004].

The “Geoffrey Rose curves”





Geoffrey Rose (1926-1993)

Diferentes distribuciones de las cifras de colesterol en suero en el sur del Japón y el este de Finlandia.

J Epidemiol Community Health 2004;**58**:534–535.

Persistent toxic substances: exposed individuals and exposed populations

On the lintel of his classic *The strategy of preventive medicine*,[1] Geoffrey Rose (1926–1993) inscribed these words of Fyodor Dostoyevsky (1821–1881): "We are all responsible for all". The idea that as citizens and societies we have shared, common responsibilities in front of threats to health is central to epidemiology, public health, even to clinical medicine… and to virtually all other professions and scientific disciplines. Why should it not also be relevant to urbanism, pedagogy, biology, or chemistry? It is of course also central to literature and most other forms of artistic expression.

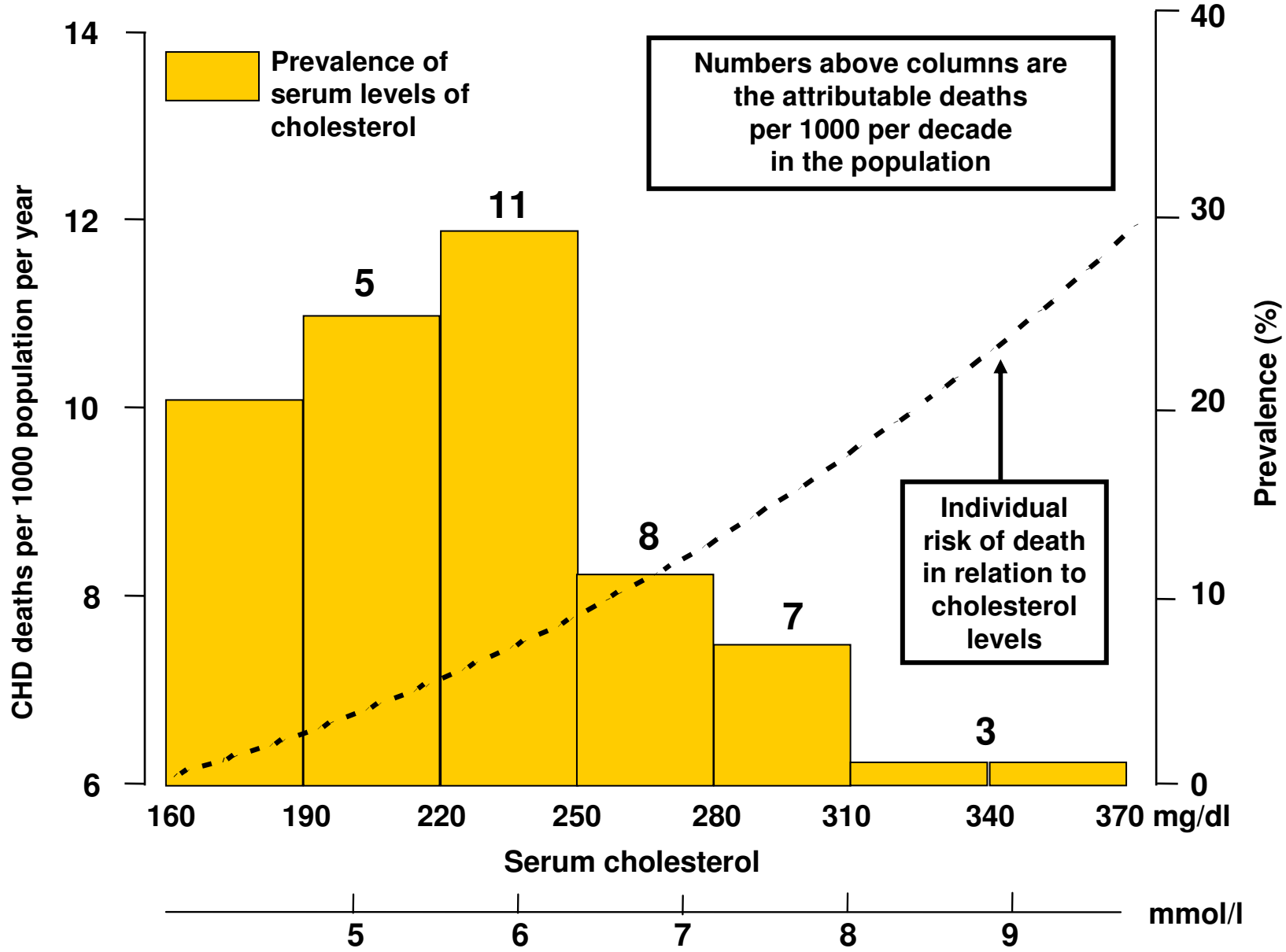
While these findings should not leave us indifferent, they are not particularly alarming. Mainly, because similar results would be obtained in most of us. But, would it not be more coherent to say that similar results would be obtained "in our populations",[1 22] should we have the appropriate surveillance systems in place? Do we not know that there's no effective individual escape from PTS? Then the path to follow is not to perform individual measurements of PTS, but population surveillance and control of PTS. Indeed, "Geoffrey Roses's big idea"[23] (changing the population distribution of a risk factor prevents more burden of disease than targeting people at high risk) is perfectly relevant to PTS—perhaps even more than to classic risk factors for chronic diseases.[4–8] The only way forward is to shift the population distribution of PTS.

J Epidemiol Community Health 2004;**58**:534–535.

Geoffrey Rose's big idea...
is even more relevant for environmental exposures as PTS because there is very little or nothing an individual may do...

individual escape from PTS? Then the path to follow is not to perform individual measurements of PTS, but population surveillance and control of PTS. Indeed, "Geoffrey Roses's big idea"[23] (changing the population distribution of a risk factor prevents more burden of disease than targeting people at high risk) is perfectly relevant to PTS—perhaps even more than to classic risk factors for chronic diseases.[4–8] The only way forward is to shift the population distribution of PTS.

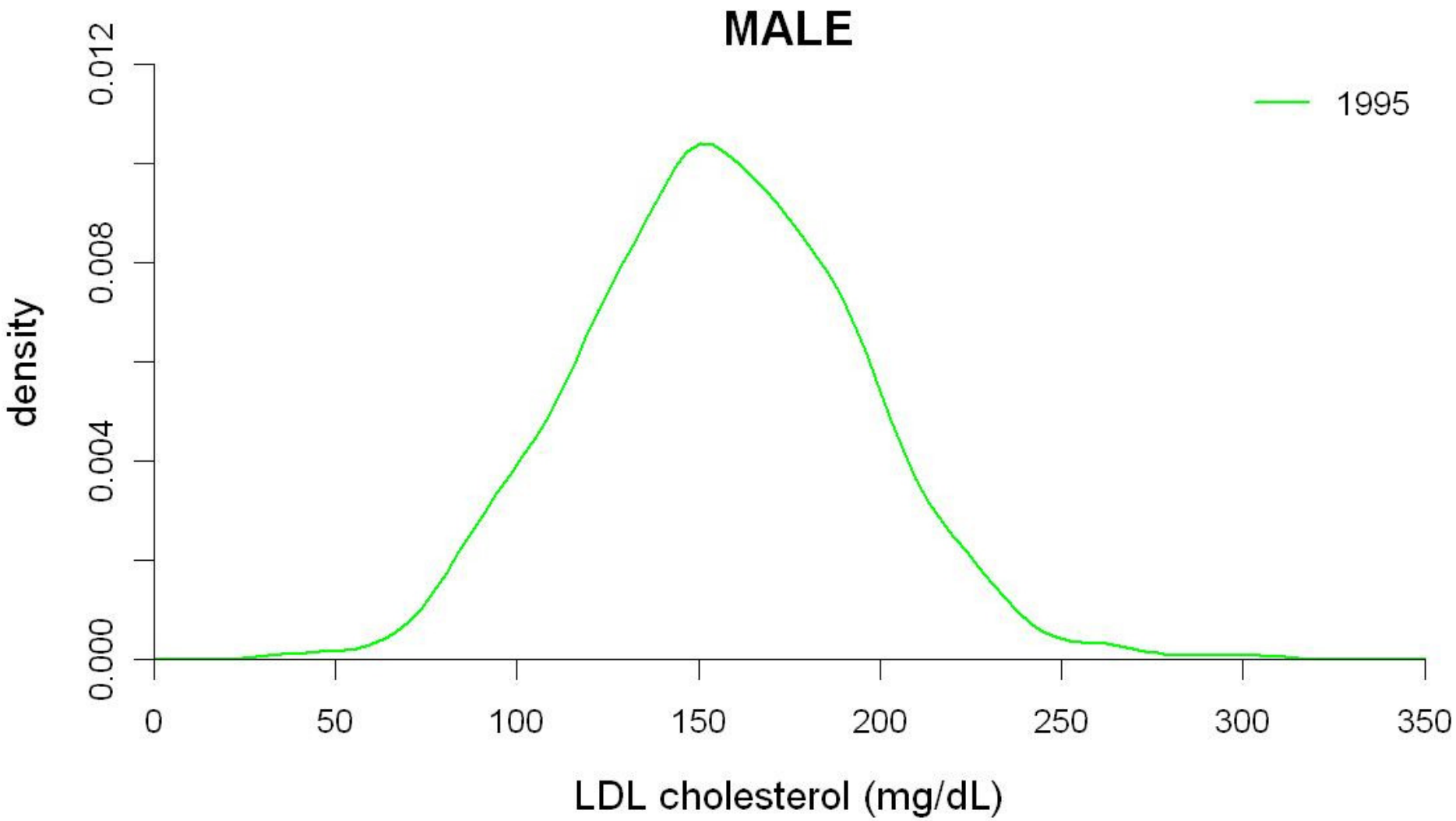
The dominance of deaths (coronary heart disease) in those with average levels of a risk factor



Source: WHO, Technical Report Series 678, 1982

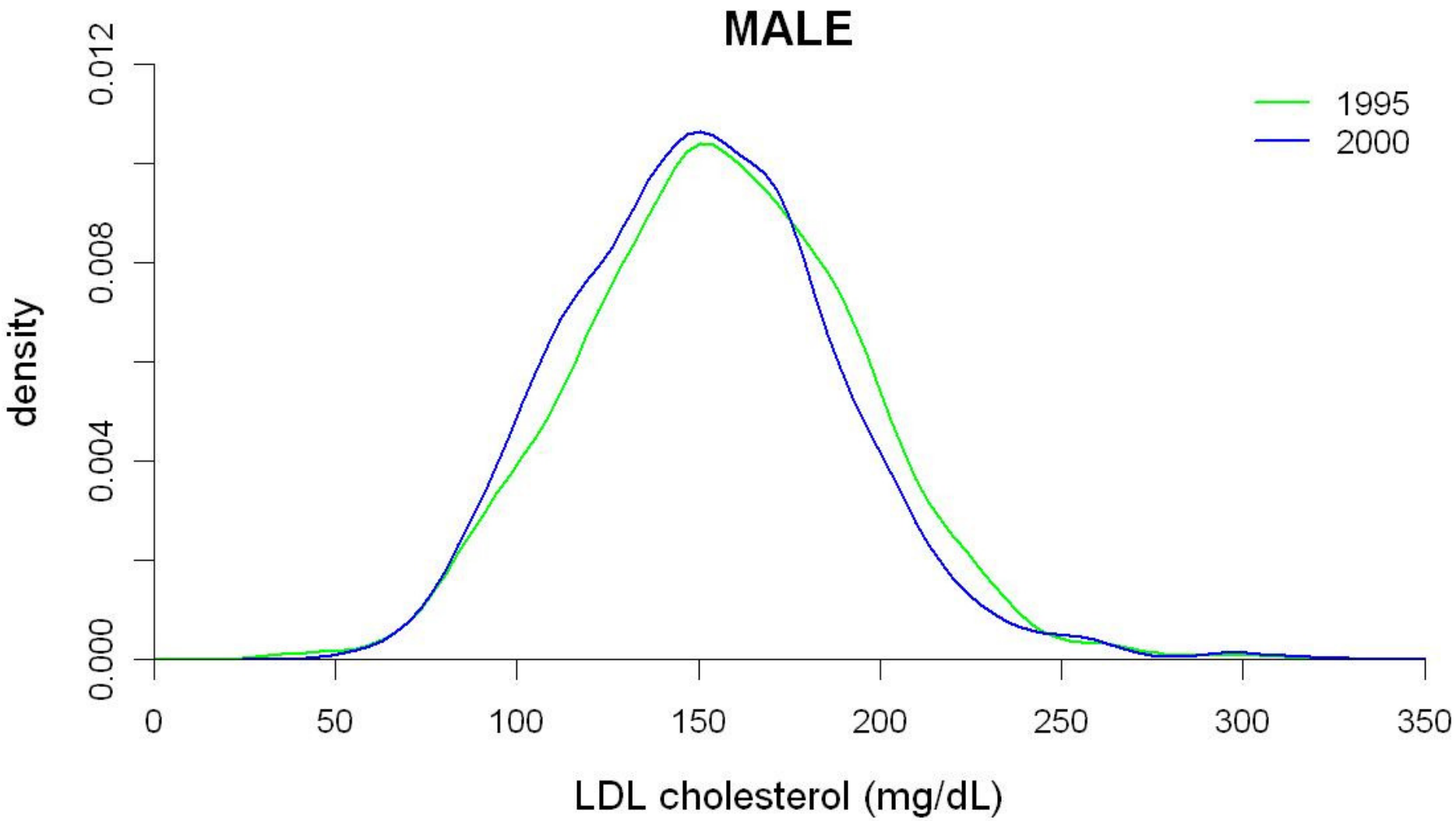
Changes in LDL cholesterol, 1995-2005

Population of Girona 35-74 years. Grau M & REGICOR. Eur J Cardiovasc Prev Rehab 2007



Changes in LDL cholesterol, 1995-2005

Population of Girona 35-74 years. Grau M & REGICOR. Eur J Cardiovasc Prev Rehab 2007



Changes in LDL cholesterol, 1995-2005

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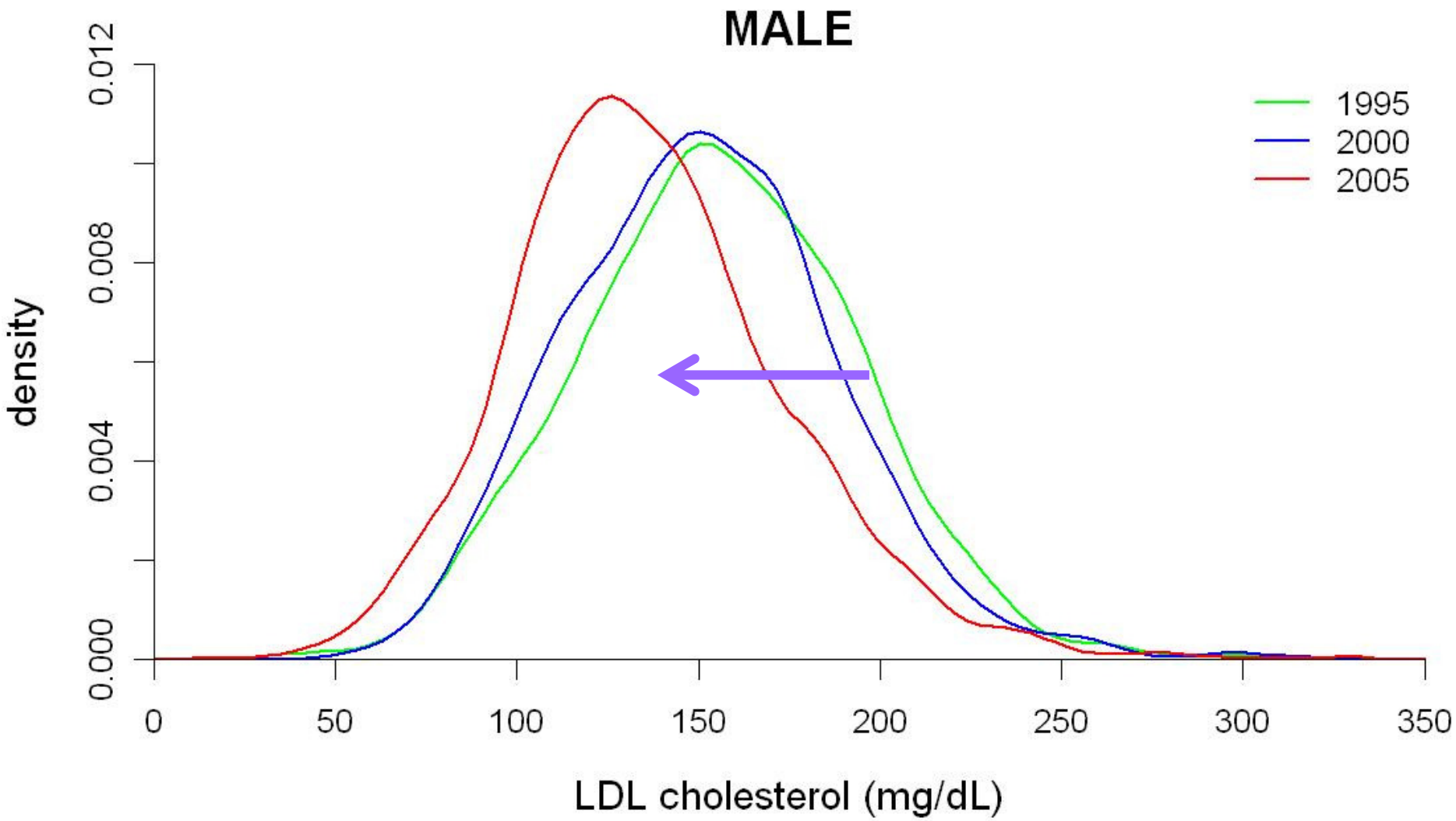

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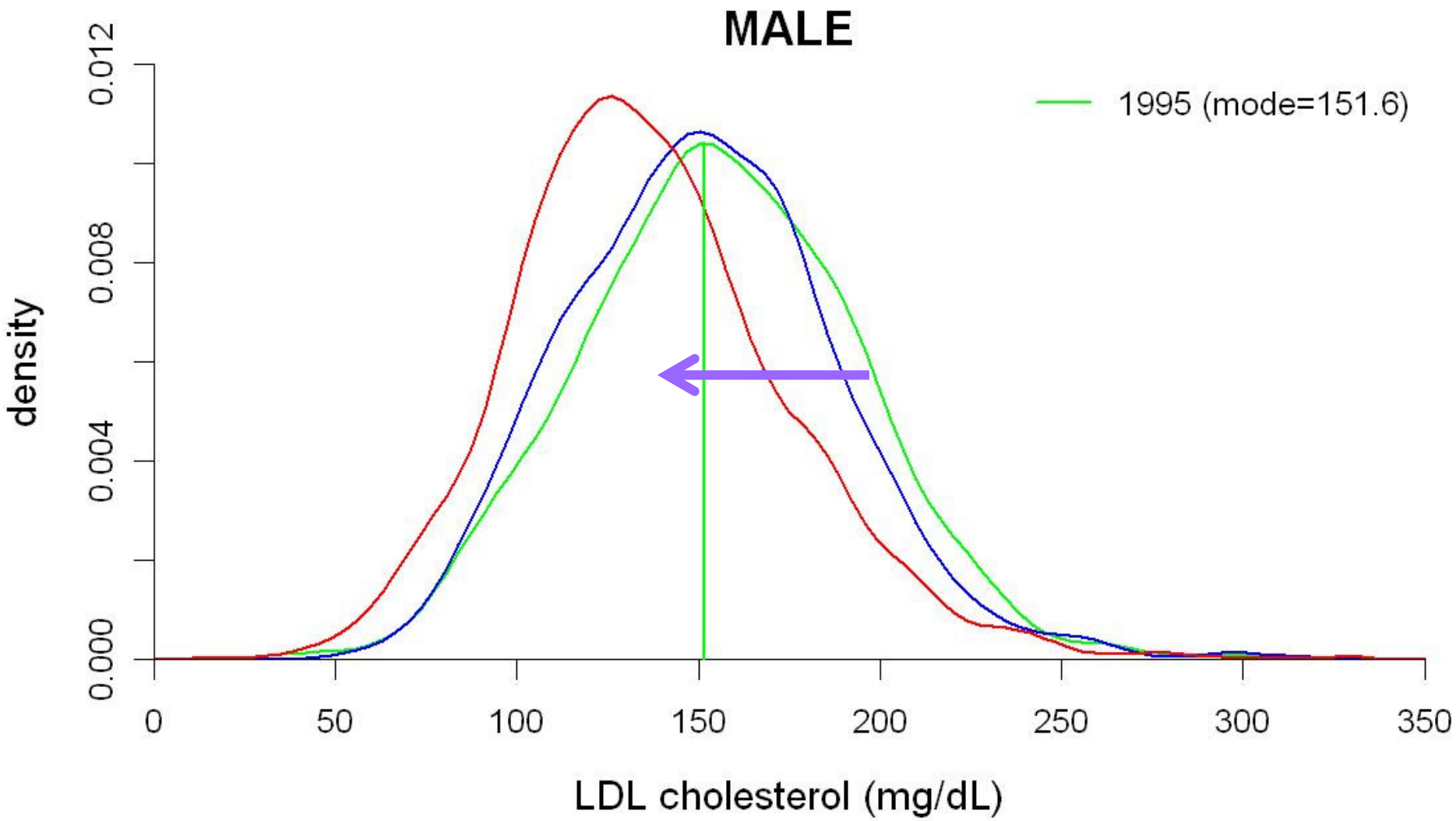
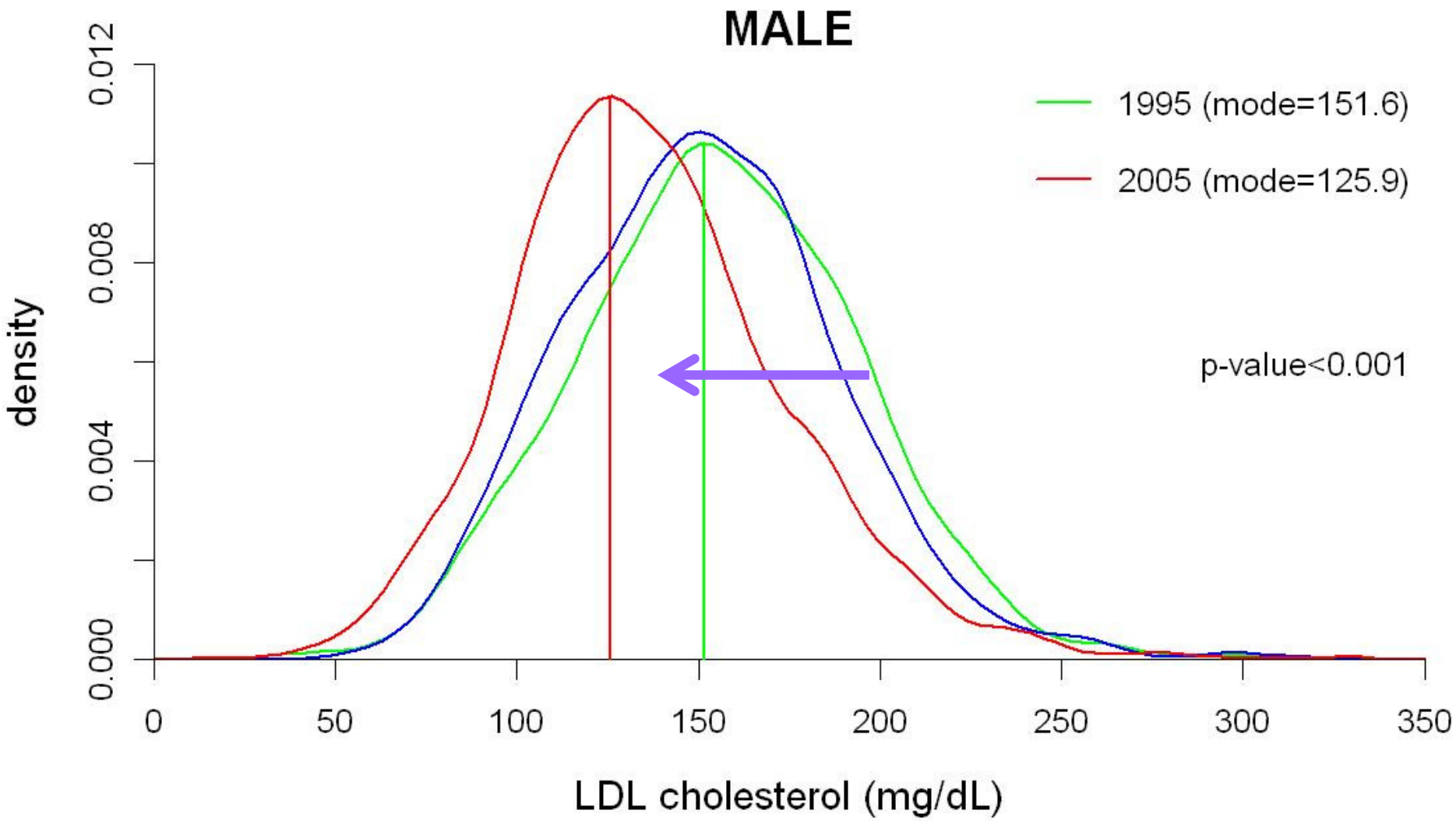
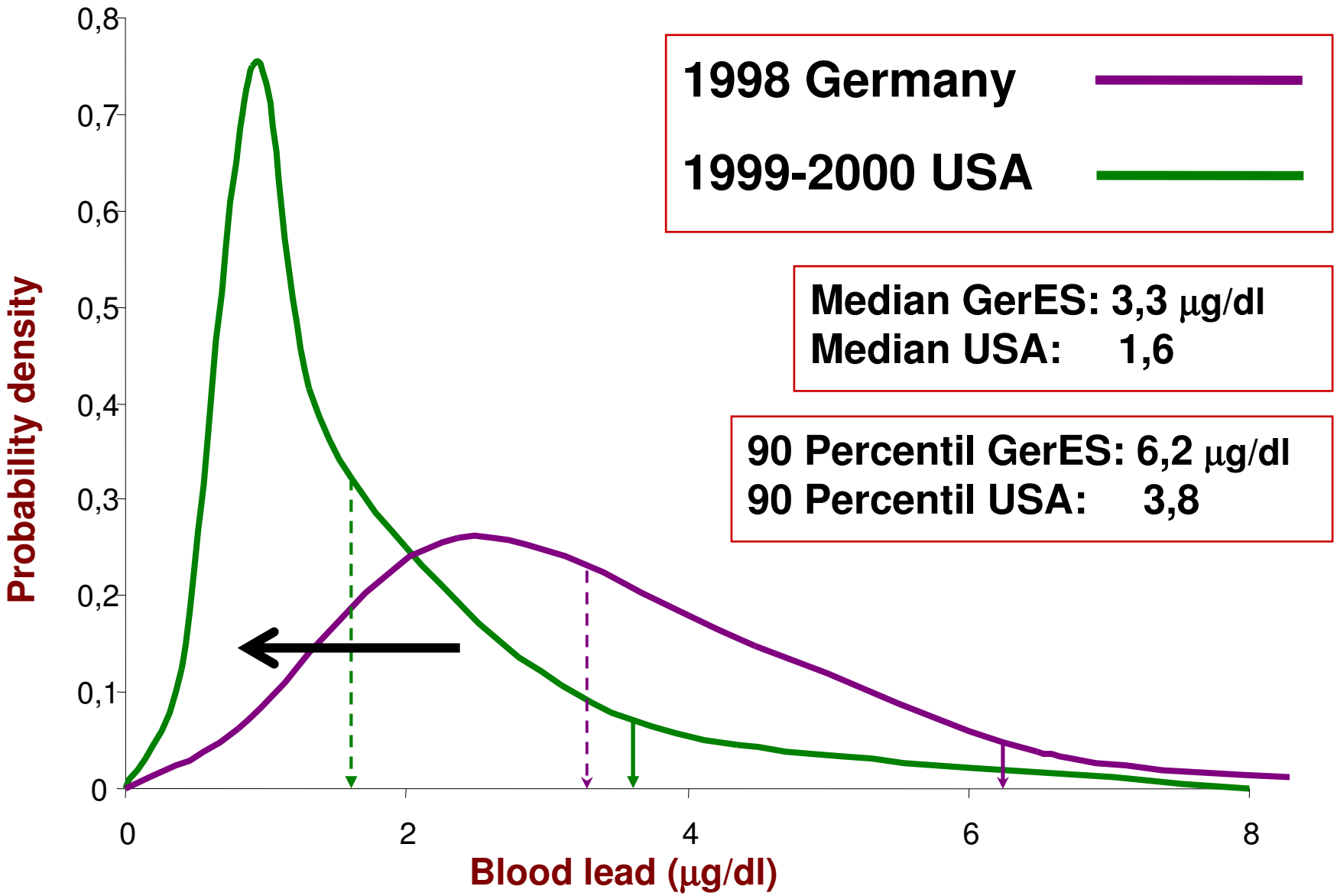


Changes in LDL cholesterol, 1995-2005

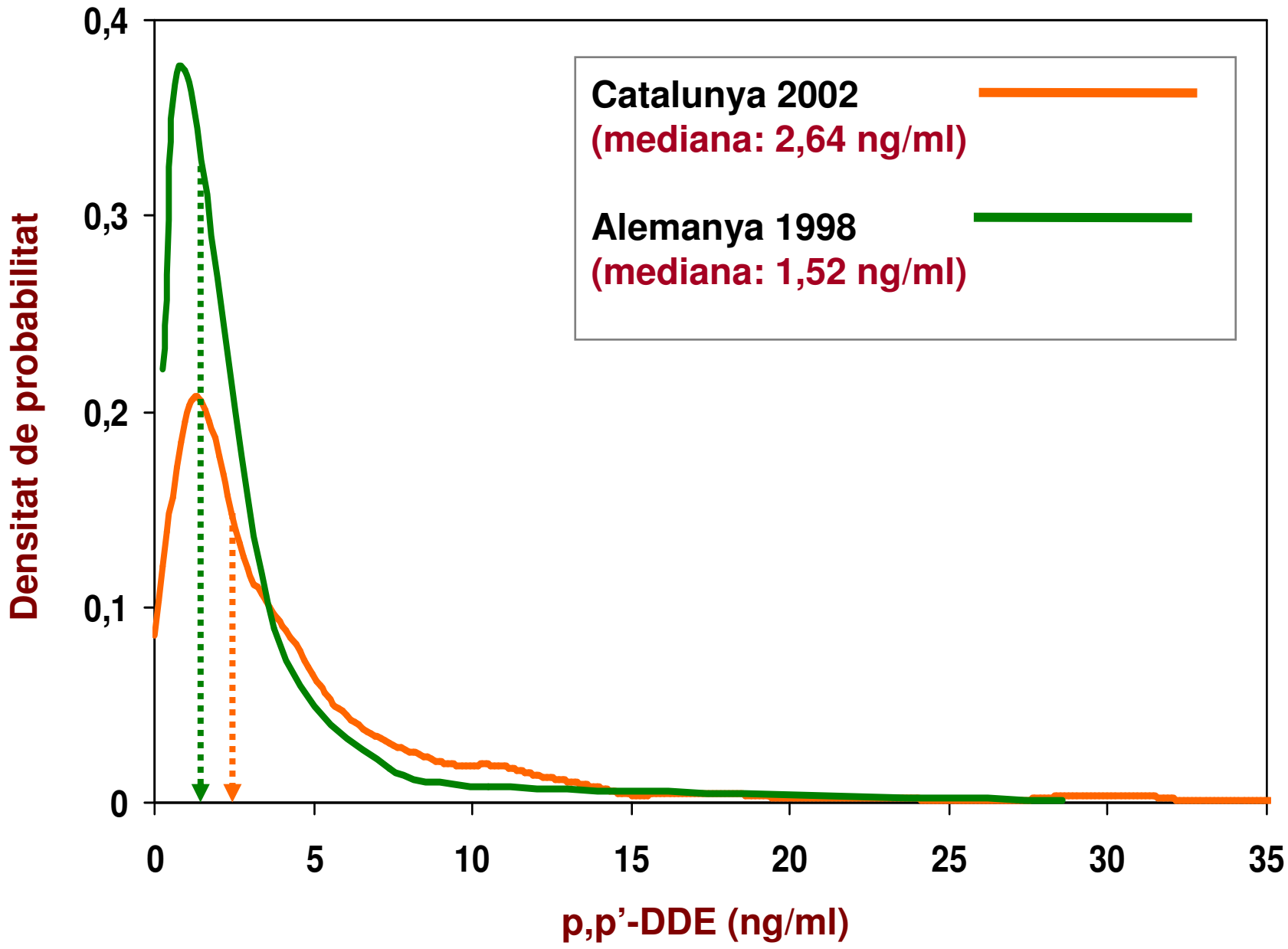
Population of Girona 35-74 years. Grau M & REGICOR. Eur J Cardiovasc Prev Rehab 2007



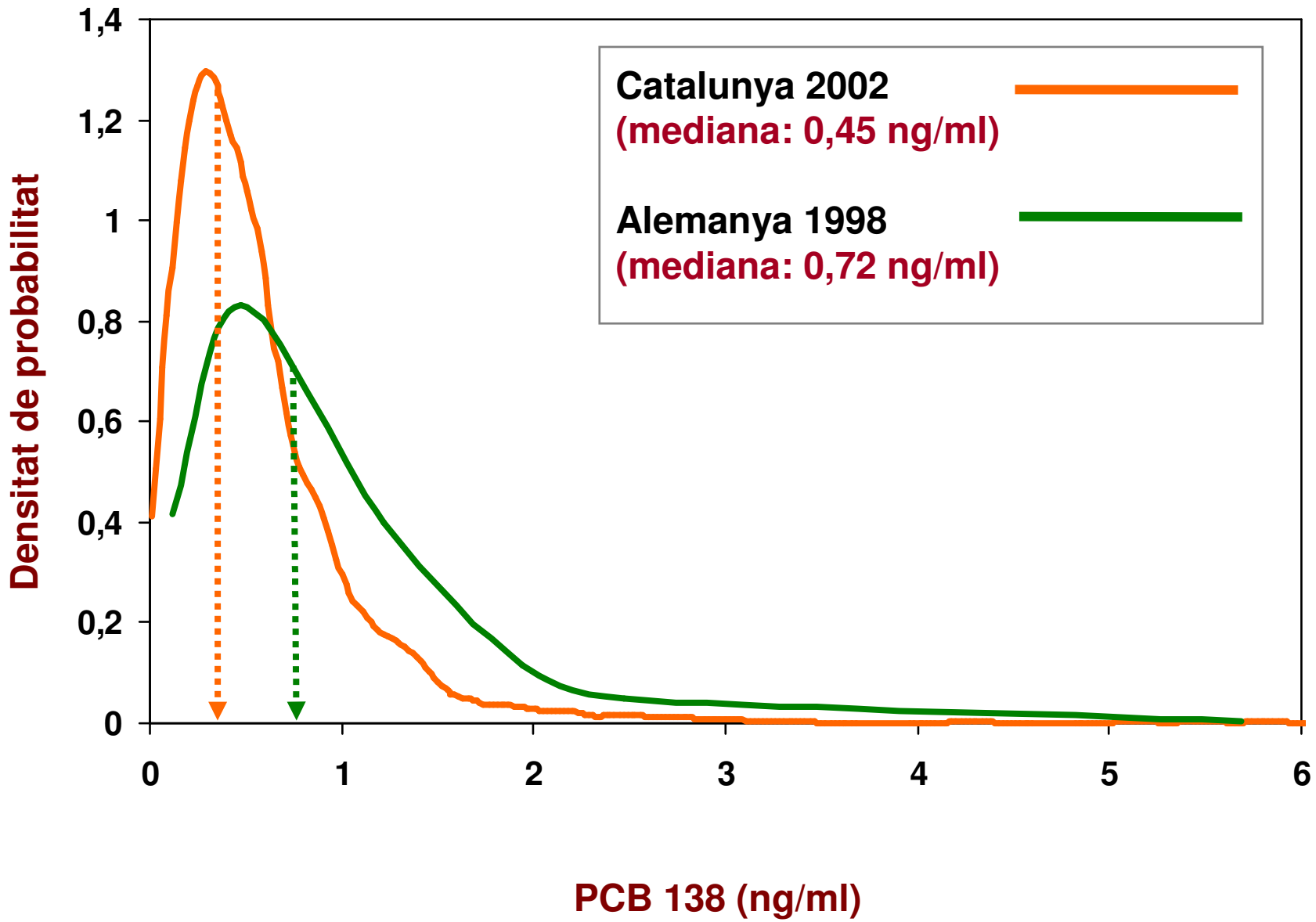
Blood LEAD, Germany and USA



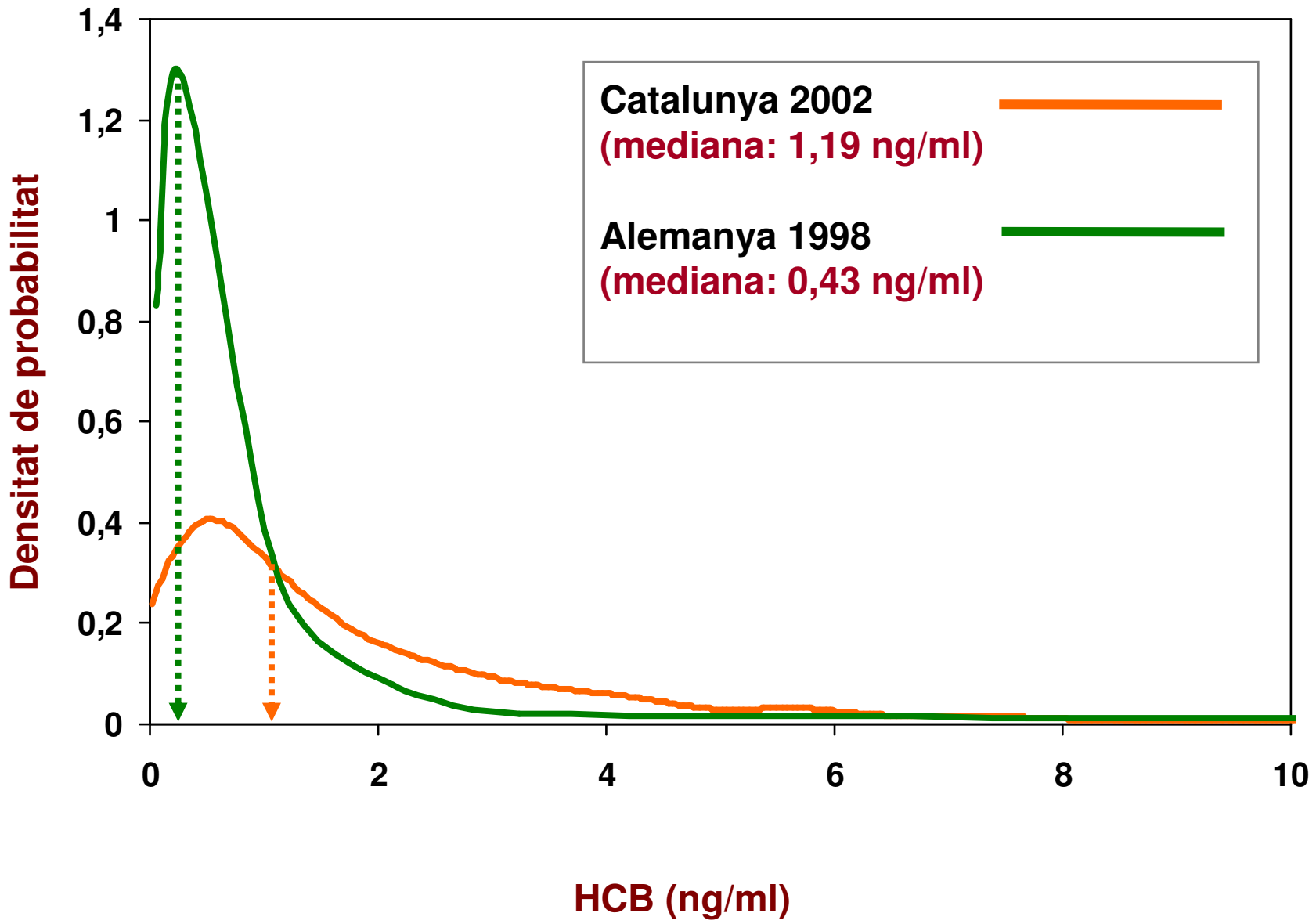
Distribució poblacional de p,p'-DDE



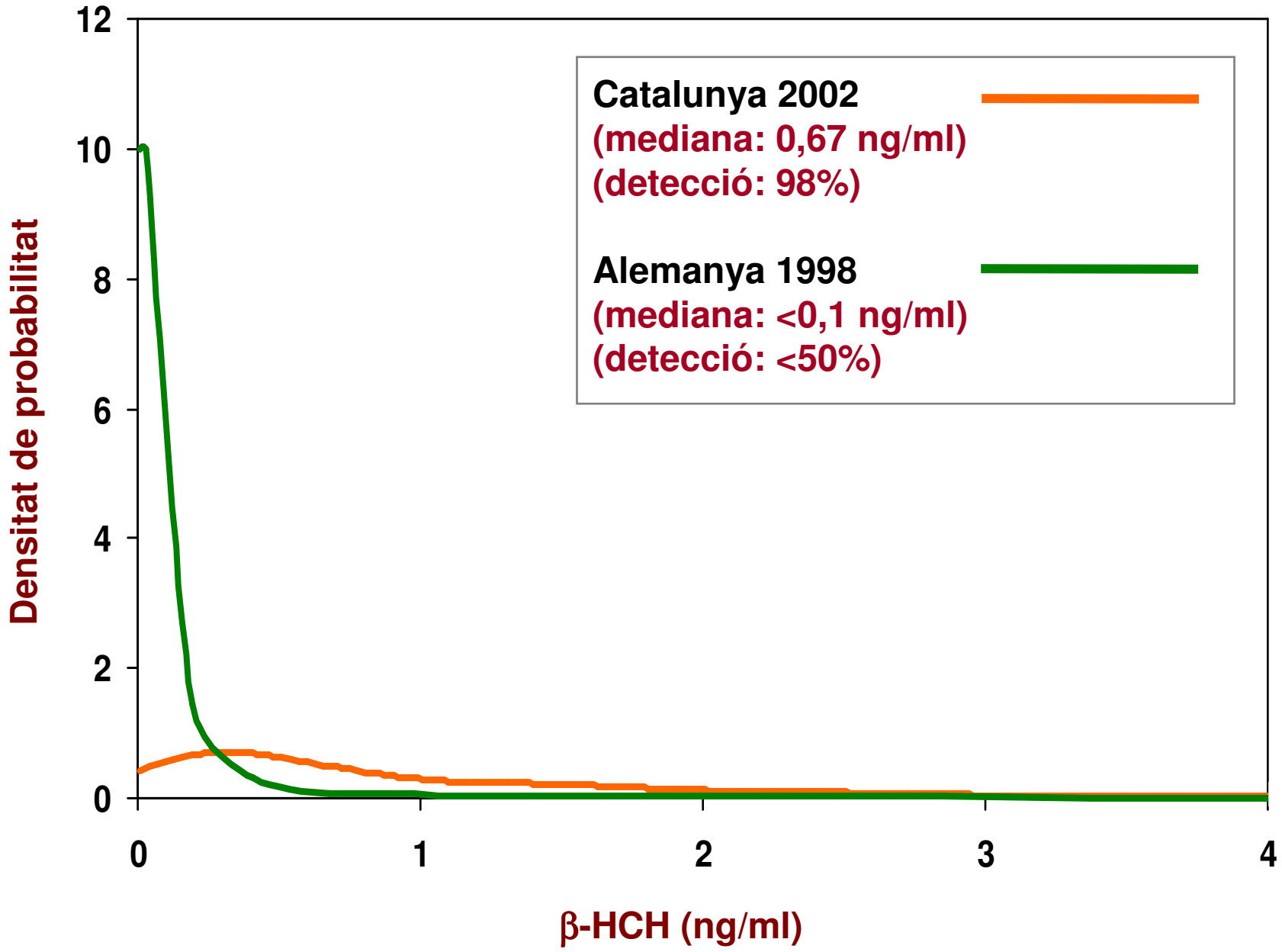
Distribució poblacional de PCB 138



Distribució poblacional de HCB



Distribució poblacional de β-HCH



»marcas

Zara, líder mundial
Inditex bate a GAP en ventas
Páginas 8 y 9

»deportes

El negocio del gol
La Eurocopa mueve 1.200 millones
Páginas 18 y 19

»mar

Una flota se hunde
La crisis de la pesca tiene causas más profundas que el alza del crudo

Negocios

EL PAÍS | DOMINGO 8 DE JUNIO DE 2008. NÚMERO 1179

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mo inglés REACH. Este reglamento persigue un objetivo fundamental de salud pública: detener el desarrollo descontrolado de patologías, en especial, el cáncer, posiblemente ligadas a la ingestión de productos químicos peligrosos.

En busca de la química limpia

El nuevo reglamento europeo obliga a las empresas a registrar las sustancias que utilicen en sus procesos

/ BLOOMBERG

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Los pasos necesarios para la implantación del reglamento Reach

Sectores	A	B	C	D	E
Equipamiento de automóviles					
Bosch (Alemania)	-	1	-	-	-
Delphi (EE UU)	-	1	-	-	-
Valeo (Grancia)	1	6	1	-	-
Plastic Omnium (Francia)	3	6	1	-	3
Constructores de automóviles				-	
General Motors (EE UU)	-	1	-	-	-
Hyundai Motor (Corea)	1	6	1	1	-
Renault (Francia)	1	1	1	-	-
Constructores aeronáuticos					

grandes grupos deberan, mas alla de la difusión interna de la información y de la implantación de instrumentos de gestión, entrar de lleno en el trabajo operativo exigido por el REACH.

Después de la constitución de los expedientes de prerregistro, será necesario compartirlos con los consorcios y con los foros de información (estos últimos se inaugurarán en Internet en enero de 2009), destinados a inventariar los diversos usos de las sustancias y a elaborar conjuntamente (en el caso de los consorcios) los estudios toxicológicos, a fin de lograr un consenso técnico y repartir el coste de los análisis. Después habrá que elaborar las fichas SCH y depositar los análisis en la AEPC.

El REACH ofrece a las empresas, especialmente a las que exportan a la Unión Europea y, que por esta razón, se ven afectadas

La UE busca evitar patologías ligadas a la ingestión de productos químicos

Quien incumpla las normas puede ver prohibida la venta de sus productos

»laboratorio de ideas

La inexistente burbuja del petróleo
Por PAUL KRUGMAN — Página 24

El mal ejemplo de los avestruces
Por JOSEP PIQUÉ — Página 25

Hacia un nuevo modelo energético
Por RAFAEL MIRANDA — Página 27

»análisis

El inestable marco regulatorio eléctrico Por RAFAEL MATEU DE ROS — Página 16

Y está lloviendo a cántaros Por ÁNGEL LABORDA — Página 30

Lecciones económicas que la historia no nos enseña
Por PAUL SAMUELSON — Página 33

breakingviews.com — Página 26

tal de salud pública: detener el desarrollo descontrolado de patologías, en especial, el cáncer, posiblemente ligadas a la ingestión de productos químicos peligrosos.

Sólo las empresas que hayan llevado a cabo este trámite podrán beneficiarse del plazo de 10 años, hasta 2018, para registrar definitivamente estas sustancias, entregando a la AEPC el resultado de unos análisis toxicológicos de los efectos de cada una de ellas sobre el medio ambiente y la salud humana, en el contexto de todos sus posibles usos. Para ello, será necesario que establezcan *fichas*, redactadas de forma homogénea, según el Sistema General Armonizado (SGH) definido por la AEPC. Si el análisis resulta positivo, esta última podrá entonces

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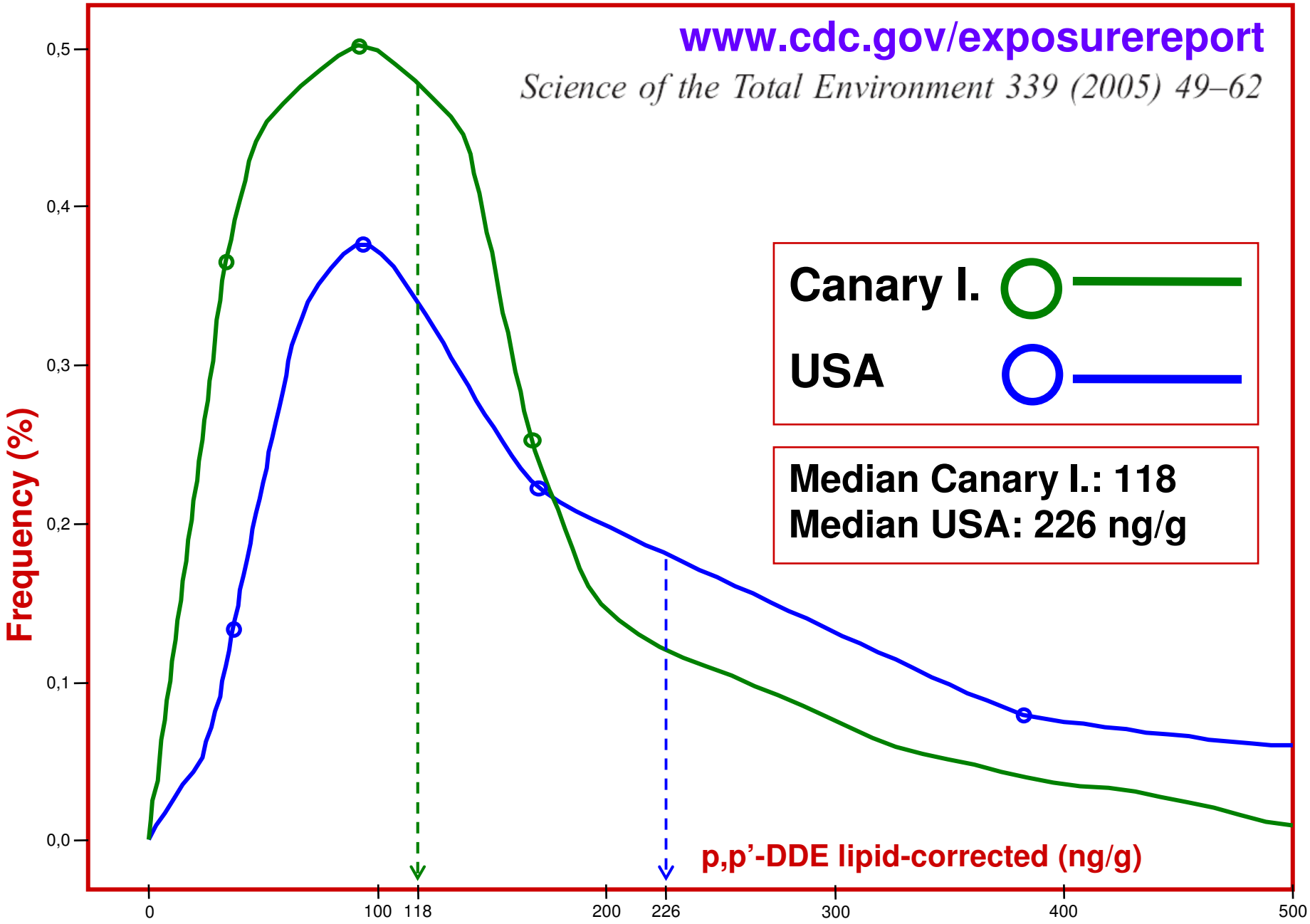
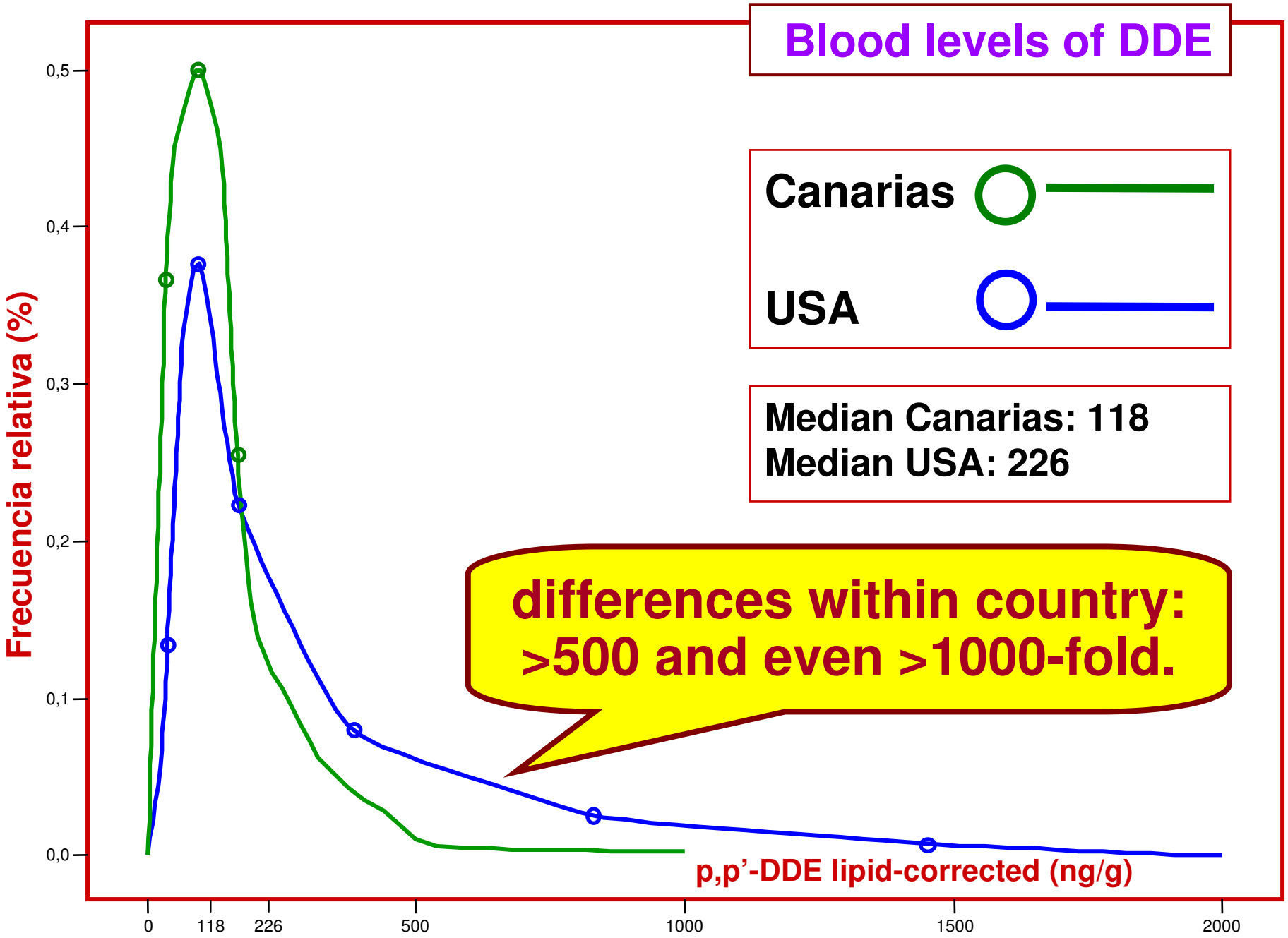

www.cdc.gov/exposurereport
Science of the Total Environment 339 (2005) 49–62
Canary I.
USA
Median Canary I.: 118
Median USA: 226 ng/g
Frequency (%)
0,5
0,4
0,3
0,2
0,1
0,0
0
100
118
200
226
300
400
500
p,p'-DDE lipid-corrected (ng/g)


Blood levels of DDE
Canarias
USA
Median Canarias: 118
Median USA: 226
differences within country:
>500 and even >1000-fold.
Frecuencia relativa (%)
0,5
0,4
0,3
0,2
0,1
0,0
0
118
226
500
1000
1500
2000
p,p'-DDE lipid-corrected (ng/g)

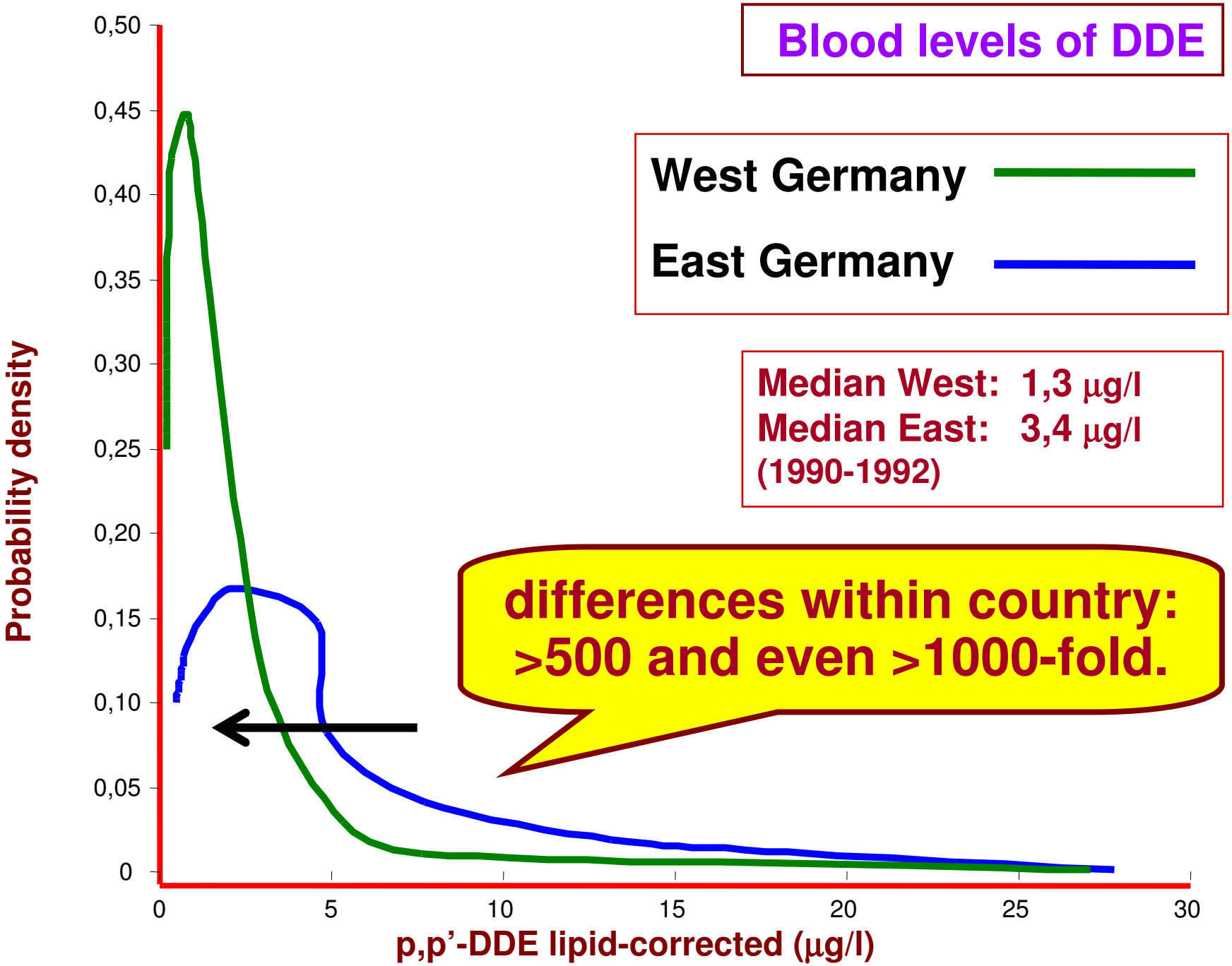

Blood levels of DDE
West Germany
East Germany
Median West: 1,3 µg/l
Median East: 3,4 µg/l
(1990-1992)
differences within country:
>500 and even >1000-fold.
Probability density
0,50
0,45
0,40
0,35
0,30
0,25
0,20
0,15
0,10
0,05
0
0
5
10
15
20
25
30
p,p'-DDE lipid-corrected (µg/l)

Table 154. Hexachlorobenzene (lipid adjusted)

www.cdc.gov/exposurereport

Geometric mean and selected percentiles of serum concentrations (nanograms/gram [ng/g] of lipid or parts-per-billion on a lipid weight basis) for the U.S. population aged 12 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. Interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
Total, age 12 and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	1702
Age group								
12-19 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	591
20 years and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	1111
Gender								
Males	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	807
Females	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	895
Race/ethnicity								
Mexican Americans	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	583
Non-Hispanic blacks	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	350
Non-Hispanic whites	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	636

< LOD means less than the limit of detection, which averaged 60.5 ng/g of lipid (SD 19.3, maximum value 118).

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 157. *p,p'*-DDT (lipid adjusted)

www.cdc.gov/exposurereport

Geometric mean and selected percentiles of serum concentrations (nanograms/gram [ng/g] of lipid or parts-per-billion on a lipid weight basis) for the U.S. population aged 12 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. Interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
Total, age 12 and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	27.0 (<LOD-34.0)	1679
Age group								
12-19 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	677
20 years and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	29.4 (22.2-37.3)	1002
Gender								
Males	*	< LOD	< LOD	< LOD	< LOD	< LOD	24.3 (<LOD-34.1)	799
Females	*	< LOD	< LOD	< LOD	< LOD	< LOD	29.1 (22.5-34.0)	880
Race/ethnicity								
Mexican Americans	*	< LOD	< LOD	< LOD	< LOD	59.7 (28.9-150)	150 (63.4-493)	635
Non-Hispanic blacks	*	< LOD	< LOD	< LOD	< LOD	< LOD	25.7 (<LOD-63.9)	356
Non-Hispanic whites	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	564

< LOD means less than the limit of detection, which averaged 10.6 ng/g of lipid (SD 3.4, maximum value 20.7).

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

www.cdc.gov/exposurereport

Serum concentrations of p,p'-DDE (lipid-corrected, in ng/g) in the US general population

	Geometric mean (95% conf. Interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
Total, age 12 and older	260 (234-289)	74.2 (66.1-84.2)	114 (99.8-129)	226 (191-267)	538 (485-609)	1120 (991-1290)	1780 (1520-2230)	1964
Age group								
12-19 years	118 (101-137)	45.9 (34.9-56.6)	69.8 (59.2-80.4)	108 (90.6-132)	185 (141-233)	343 (255-479)	528 (364-644)	686
20 years and older	297 (267-330)	86.0 (75.2-96.7)	130 (115-150)	269 (229-303)	626 (538-697)	1250 (1100-1420)	1990 (1570-2510)	1278
Gender								
Males	249 (221-281)	77.6 (68.6-88.2)	119 (101-133)	222 (182-266)	489 (383-570)	985 (756-1130)	1350 (1190-1610)	937
Females	270 (241-302)	68.9 (55.1-82.5)	112 (96.0-129)	228 (191-286)	604 (516-697)	1320 (1100-1600)	2150 (1650-2750)	1027
Race/ethnicity								
Mexican Americans	674 (572-795)	154 (133-214)	300 (252-370)	623 (505-750)	1350 (1090-1660)	3090 (2100-4610)	4940 (3280-7810)	657
Non-Hispanic blacks	295 (253-344)	62.2 (56.9-80.5)	113 (98.3-128)	203 (164-253)	452 (392-571)	1340 (974-1910)	2160 (1470-4010)	416
Non-Hispanic whites	217 (193-244)	73.0 (63.2-82.2)	107 (94.5-127)	197 (175-238)	459 (372-513)	852 (693-1010)	1220 (1040-1410)	732

Table 154. Hexachlorobenzene (lipid adjusted)

www.cdc.gov/exposurereport

Geometric mean and selected percentiles of serum concentrations (nanograms/gram [ng/g] of lipid or parts-per-billion on a lipid weight basis) for the U.S. population aged 12 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. Interval)	Selected percentiles (95% confidence interval)						Sample size
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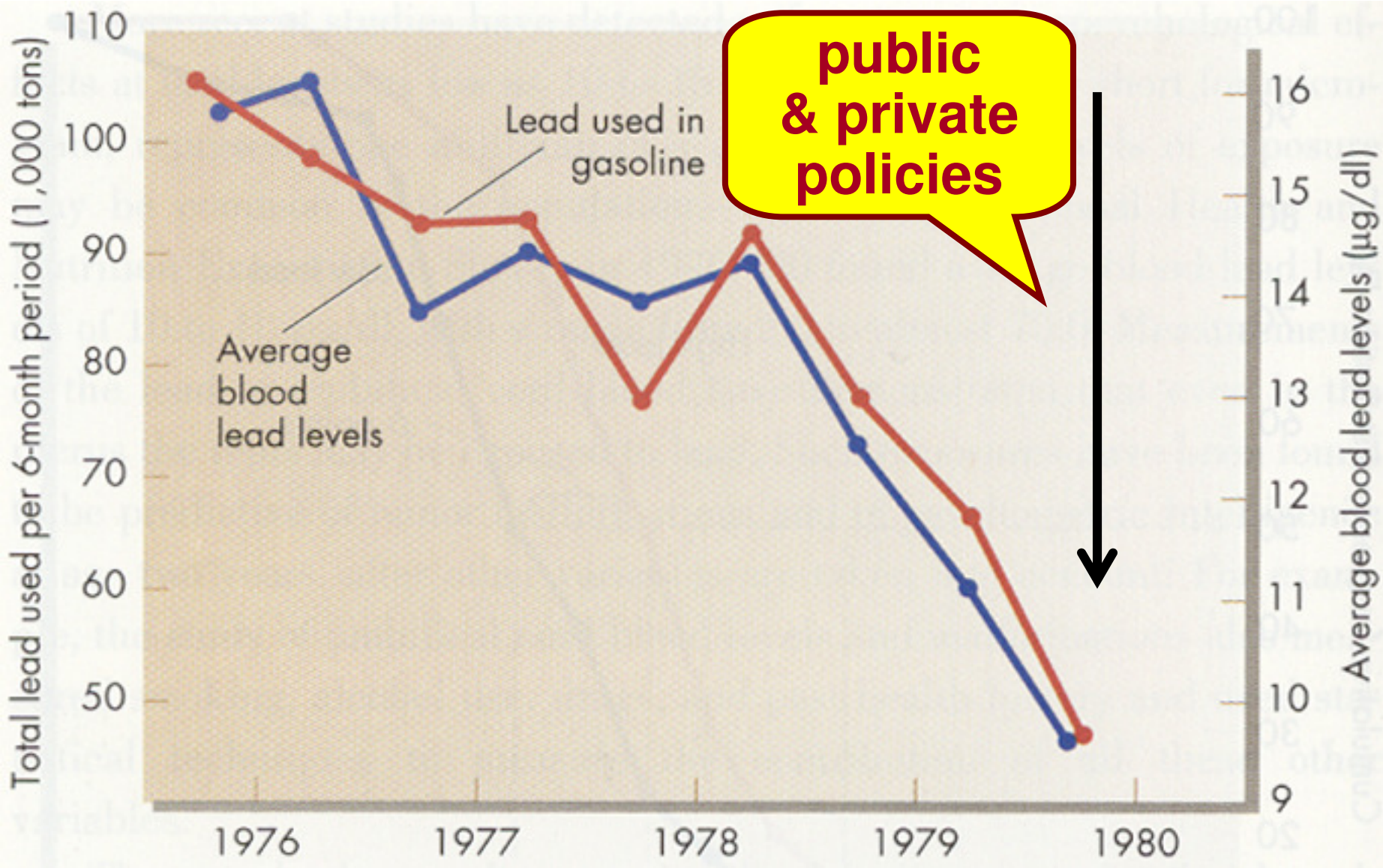
Age group								
12-19 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	591
20 years and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	1111
Gender								
Males	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	807
Females	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	895
Race/ethnicity								
Mexican Americans	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	583
Non-Hispanic blacks	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	350
Non-Hispanic whites	*	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	636

< LOD means less than the limit of detection, which averaged 60.5 ng/g of lipid (SD 19.3, maximum value 118).

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.



Stolley PD & Lasky T. ***Investigating disease patterns. The science of epidemiology.*** **New York: Scientific American Library, 1995.**

PRESS RELEASES Rapid

MEMO/03/219

Bruxelles, 6 November 2003

Presence of persistent chemicals in the human body results of Commissioner Wallstrom's blood test

The presence of persistent chemicals in the human body and their potential harmful effects is amongst the problems addressed by the European Commission's recent proposal for a new regulatory framework for chemicals (REACH - see IP/03/1477). To illustrate this problem, Margot Wallström, European Commissioner for Environment, submitted a sample of her blood for testing. The results of these tests, which give a record of the chemicals to which Mrs Wallström has been exposed and which have accumulated in her body, have been published by the European Commission today.

PRESS RELEASES Rapid

REACH

The presence of persistent and bio-accumulating substances in the blood test of Mrs Wallström, shows that nobody can escape contamination by chemicals. Despite intense research on some of the chemicals, there is a general lack of knowledge about the effects on human health and the environment of more than 99 % of the total volume of chemicals on the market. It is therefore essential to systematically examine all chemicals used in significant quantities in the EU.

nobody can escape contamination by chemicals.

Dostoievski:
“We are all responsible for all.”

Geoffrey Rose (1926 - 1993)

La estrategia de la medicina preventiva.

Oxford: Oxford University Press, 1992.

The values of public health

“We are all on the same boat.”

The values of the majority?

“We all go down on the same boat.”

Risk privatization?

As individuals there's little we can do to "defend ourselves" from certain environmental risks.

"We are all on the same boat."

Should we know what are the concentrations of PTS in the population?

J Epidemiol Community Health 2004;**58**:534–535.

Persistent toxic substances: exposed individuals and exposed populations

Sould we analyze our blood concentrations of PTS?

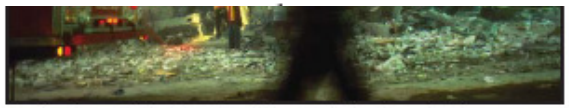
News Focus

Biomonitoring is charting the public's exposure to many chemicals,

After the World Trade Center towers collapsed on 11 September 2001, the world was gripped by the search for survivors. Researchers at the Centers for Disease Control and Prevention (CDC) raced to address an

to dangerous levels. Although the team couldn't rule out all possible health effects, James Pirkle, deputy director for science at CDC's Environmental Health Laboratory, says the fast tests were "a huge help," eliminating the need for a lot of further studies.

What made the rapid findings possible were tremendous advances in methods of sampling human tissue for chemicals, called biomonitoring. Over the past decade, analytical techniques have improved so much that researchers can detect ever smaller concentrations of chemicals in a single blood sample. The largest effort is CDC's National Report on Human Exposure to Environmental Chemicals, an ongoing $6.5 million survey that is now measuring about 145 chemicals in some 2500 people across the United States every 2 years. "It's critically important early



Clearing the smoke. Rapid sampling of rescuers alleviated some health concerns.

S. PARK PETRICICH/CCSSB

leverage. As a result of biomonitoring data, "we'll see sweeping changes in our system of public health safeguards," predicts Jane Houlihan, EWG's vice president of research.

But although biomonitoring can provide reams of statistics about the chemicals people are exposed to, it can't necessarily indicate whether such exposures are likely to make them sick. So while environmentalists herald biomonitoring as a valuable tool for precautionary action, chemical manufacturers worry that it will spark unjustified alarm and costly regulations that may not provide much real benefit to public health. "Industry sees a movement toward collecting a lot of bio-

public for chemical exposure was "a fundamental change in mindset," says Joseph Thornton, a molecular biologist at the University of Oregon, Eugene. The same point is hammered by environmental groups: Everyone is exposed to chemicals.

CDC's small testing program was massively expanded in the late 1990s to become the world's largest survey of chemical exposure among the general public. As part of the National Health and Nutrition Examination Survey (NHANES), CDC's biomonitoring results provide a guide to typical exposure to chemicals that pose a known or possible threat to health. Many are pesticides; others are ingredients in cosmetics, plastics, and other components of everyday life. Says Arnold Schecter of the University of Texas School of Public Health in Dallas: "CDC is

Health Laboratory, says the

fast tests were "a huge help," eliminating the need for a lot of further studies.

additional concern: the exposure of rescuers to potentially toxic smoke from the rubble. They took blood and urine samples from 370 firefighters, including those digging through the rubble at Ground Zero and those putting out nearby blazes. After examining the samples for dioxins, cyanide, and 100 other chemicals associated with burning buildings, they determined that the rescuers had not been exposed to dangerous levels. Although the team couldn't rule out all possible health effects, James Pirkle, deputy director for science at CDC's Environmental

What made the rapid findings possible were tremendous advances in methods of sampling human tissue for chemicals, called biomonitoring. Over the past decade, analytical techniques have improved so much that researchers can detect ever smaller concentrations of chemicals in a single blood sample. The largest effort is CDC's National Report on Human Exposure to Environmental Chemicals, an ongoing $6.5 million survey that is now measuring about 145 chemicals in some 2500 people across the United States every 2 years. "It's critically important early intelligence about compounds that are getting into people," says Philip Landrigan of Mount Sinai School of Medicine in New York City.

Biomonitoring is hot. With lab costs down, environmental groups are commissioning their own analyses of chemical exposures. Last year, the Environmental Working Group (EWG) in Washington, D.C., released a report entitled *Body Burden: The Pollution in People* that examined the levels of 210 chemicals in nine people. In April, the World Wildlife Federation tested for 101 compounds in 39 members of the European Parliament. The impetus is clear: Such studies can generate headlines and political leverage. As a result of biomonitoring data, "we'll see sweeping changes in our system of public health safeguards," predicts Jane Houlihan, EWG's vice president of research.

But although biomonitoring can provide reams of statistics about the chemicals people are exposed to, it can't necessarily indicate whether such exposures are likely to make them sick. So while environmentalists herald biomonitoring as a valuable tool for precautionary action, chemical manufacturers worry that it will spark unjustified alarm and costly regulations that may not provide much real benefit to public health. "Industry sees a movement toward collecting a lot of biomonitoring data prematurely, before we know what to do with it," says Nancy Doerrer, scientific program manager at ILSI Health and Environmental Sciences Institute, an industry-funded group in Washington, D.C. What's

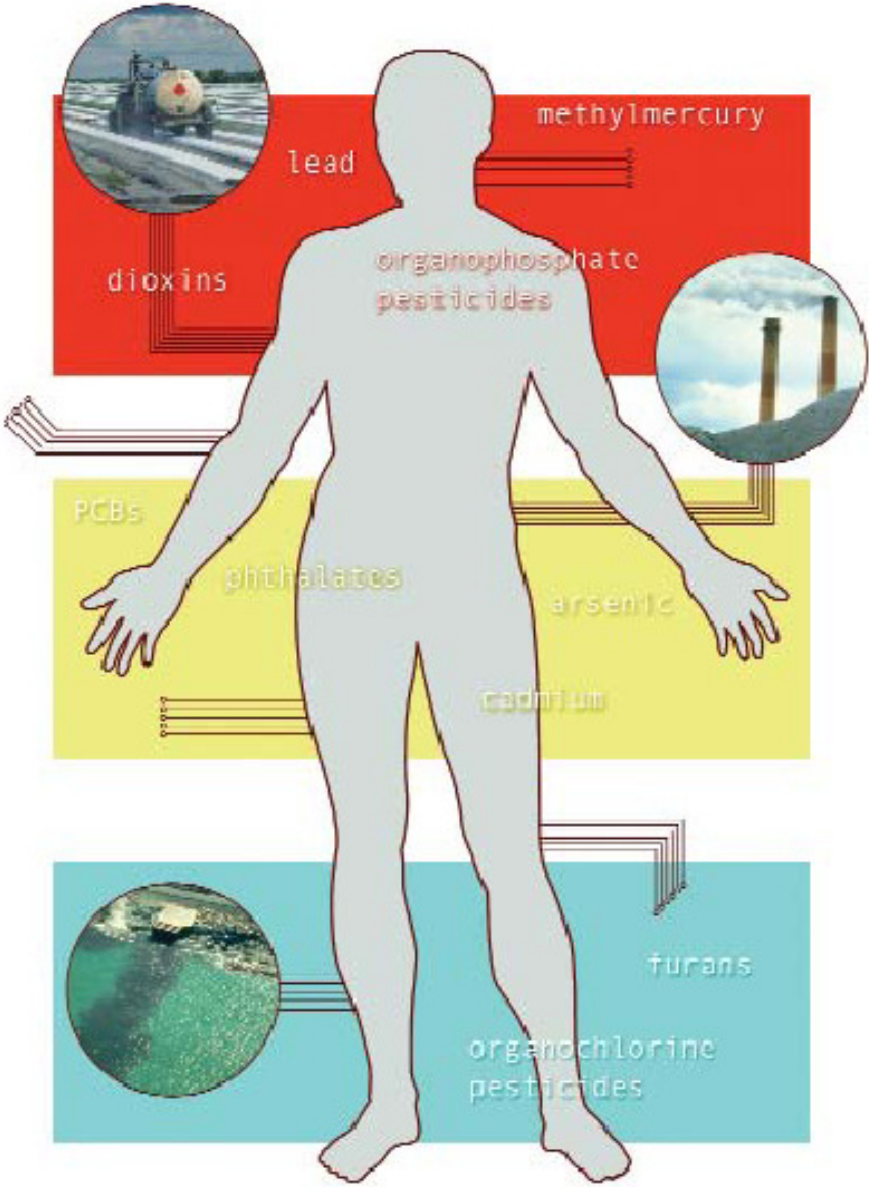
What's normal?

What does it mean?

Biomonitoring's strong suit is that it directly measures the amount of a chemical in bodily fluids or tissues. Those exposure data are much more relevant for risk assessments than are extrapolations from chemical concentrations in soil, air, or water. What you really want to know is not whether asbestos is in the walls but whether it's in your lungs, says Schecter: "If you didn't get it in your body, you don't need to worry about health effects."

What's normal?

What does it mean?



Worry? EWG found, on average, 91 chemicals in people. For many, health effects are unknown.

What's normal?

What does it mean?

For EPA, the problem is that the pace of biomonitoring has eclipsed that of the basic epidemiology and toxicology needed to reveal whether a chemical causes harm.

What's normal?

What does it mean?

NO to indifference, NO to fear.

NO to paternalism, NO to opacity.

YES to measures of collective protection.

YES to research, YES to innovation.

YES to society of knowledge: apply it.

YES to information, YES to awareness.

YES to active citizens.

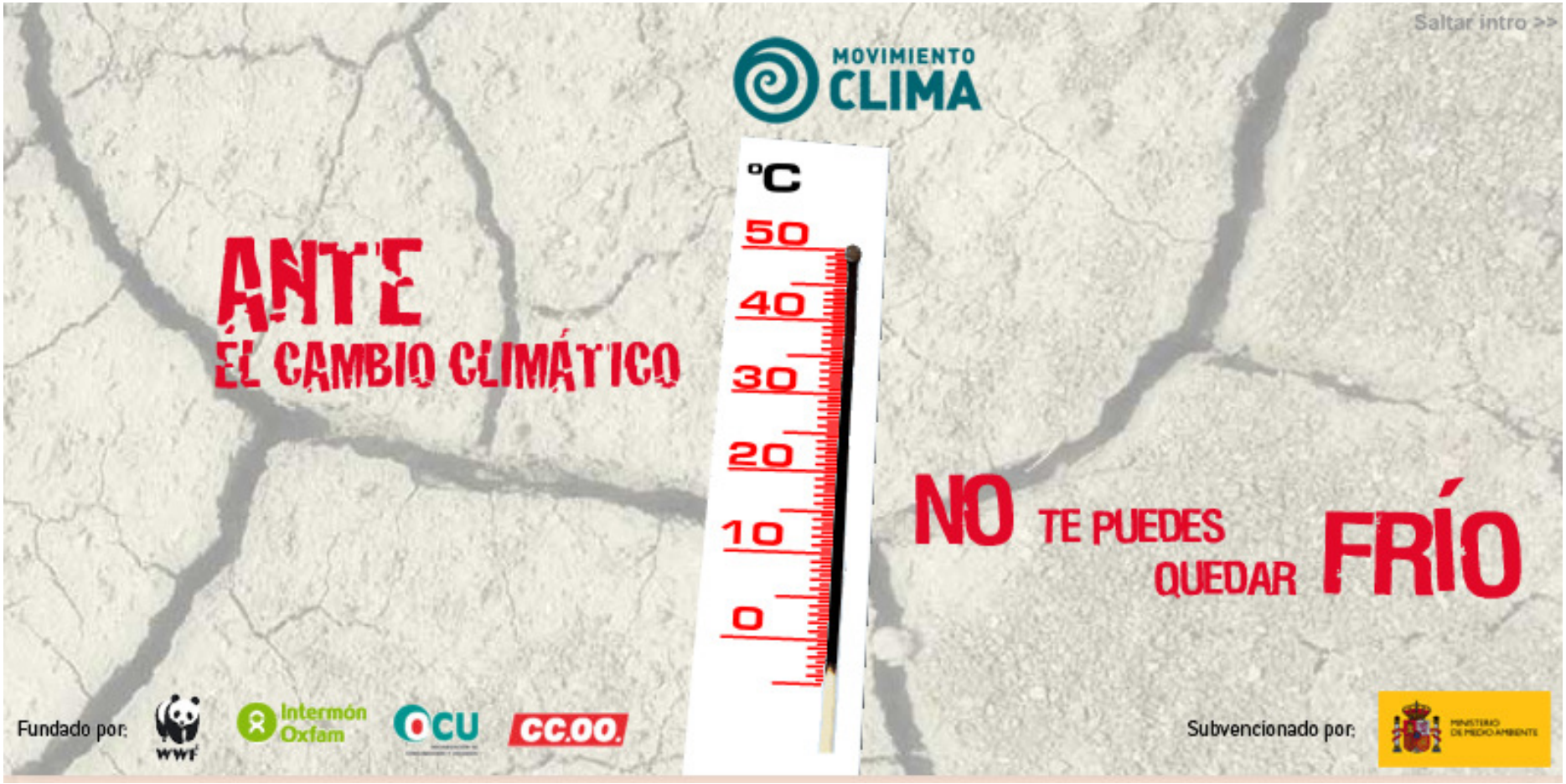
YES to law enforcement.

YES to ecologic agriculture... and more...

alliances

CIENTÍFICOS, ECOLOGISTAS, CONSUMIDORES Y SINDICATOS EXIGEN AL GOBIERNO QUE RATIFIQUE EL CONVENIO DE ESTOCOLMO

El Ejecutivo tiene paralizada la ratificación a pesar de que ya ha pasado el trámite parlamentario ante el Congreso y el Senado



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el movimiento_

los hechos_

¡actúa!_

+ acciones_

sala de prensa_

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enlaces_

Todos tenemos la oportunidad de aportar nuestro pequeño granito de arena para frenar el cambio climático. Cada pequeña acción cuenta, y necesitamos tu ayuda para poder conseguirlo, porque el cambio climático es un problema que nos afecta a todos. **Firma ahora tu compromiso particular con el clima** y empieza desde hoy a ahorrar energia y a reducir tus emisiones de CO2 de una manera sencilla y con muy poco esfuerzo.

¡Actuar está en tu mano!

IMPLÍCATE

IMPLÍCATE MÁS

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¡IMPLÍCATE!

así ahorras 87,2 kg CO2 al año

1 APAGA TOTALMENTE EL TELEVISOR, EL ORDENADOR Y EL EQUIPO DE MÚSICA CUANDO NO LOS USES.

así ahorras 6 kg CO2 al año

2 DESENCHUFA EL CARGADOR DEL MÓVIL DE LA RED CUANDO HAYA FINALIZADO LA CARGA.

así ahorras 359,8 kg CO2 al año

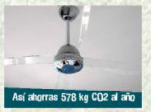
3 UTILIZA LA LAVADORA SÓLO CUANDO ESTÉ LLENA Y CON PROGRAMAS DE BAJA TEMPERATURA.

Así ahorras 531,1 kg CO2 al año

4 OPTA POR UNA DUCHA RÁPIDA EN VEZ DE UN BAÑO.

Así ahorras 179 kg CO2 al año

5 PON CUATRO BOMBILLAS DE BAJO CONSUMO EN CASA ¡E ILUMÍNATE CON EFICIENCIA!


Así ahorras 578 kg CO2 al año

6 EN VERANO BAJA TOLDOS Y PERSIANAS Y EVITA EL USO DEL AIRE ACONDICIONADO.

Así ahorras 304,5 kg CO2 al año

7 UTILIZA EL TRANSPORTE PÚBLICO PARA DESPLAZARTE A CLASE O AL TRABAJO. Y SI PUEDES A PIE O EN BICI ¡MEJOR!

MOVIMIENTO CLIMA

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SUBVENCIONADO POR: Ministerio de Medio Ambiente

¡ACTÚA!

así ahorras 286 kg CO2 al año

8 NO DEJES QUE EN INVIERNO EL CALOR SE ESCAPE POR LAS RENDIJAS DE TU CASA.

así ahorras 293,2 kg CO2 al año

9 ELIGE SIEMPRE ELECTRODOMÉSTICOS EFICIENTES (CLASE A).

Así ahorras 228,7 kg CO2 al año

10 BAJA 1º C LA TEMPERATURA DE LA CALEFACCIÓN EN INVIERNO.

IMPLÍCATE MÁS

Puedes ahorrar 1.096,7 kg CO2 al año.

1 SI TIENES QUE COMPRAR UN COCHE, DECÍDETE POR UN MODELO HÍBRIDO.

Puedes ahorrar 1.025,6 kg CO2 al año.

2 INSTALA PANELES SOLARES TÉRMICOS EN CASA.

Puedes ahorrar 1.008,8 kg CO2 al año.

3 APROVECHA LA PRÓXIMA REFORMA PARA MEJORAR EL AISLAMIENTO INTEGRAL DE TU CASA.

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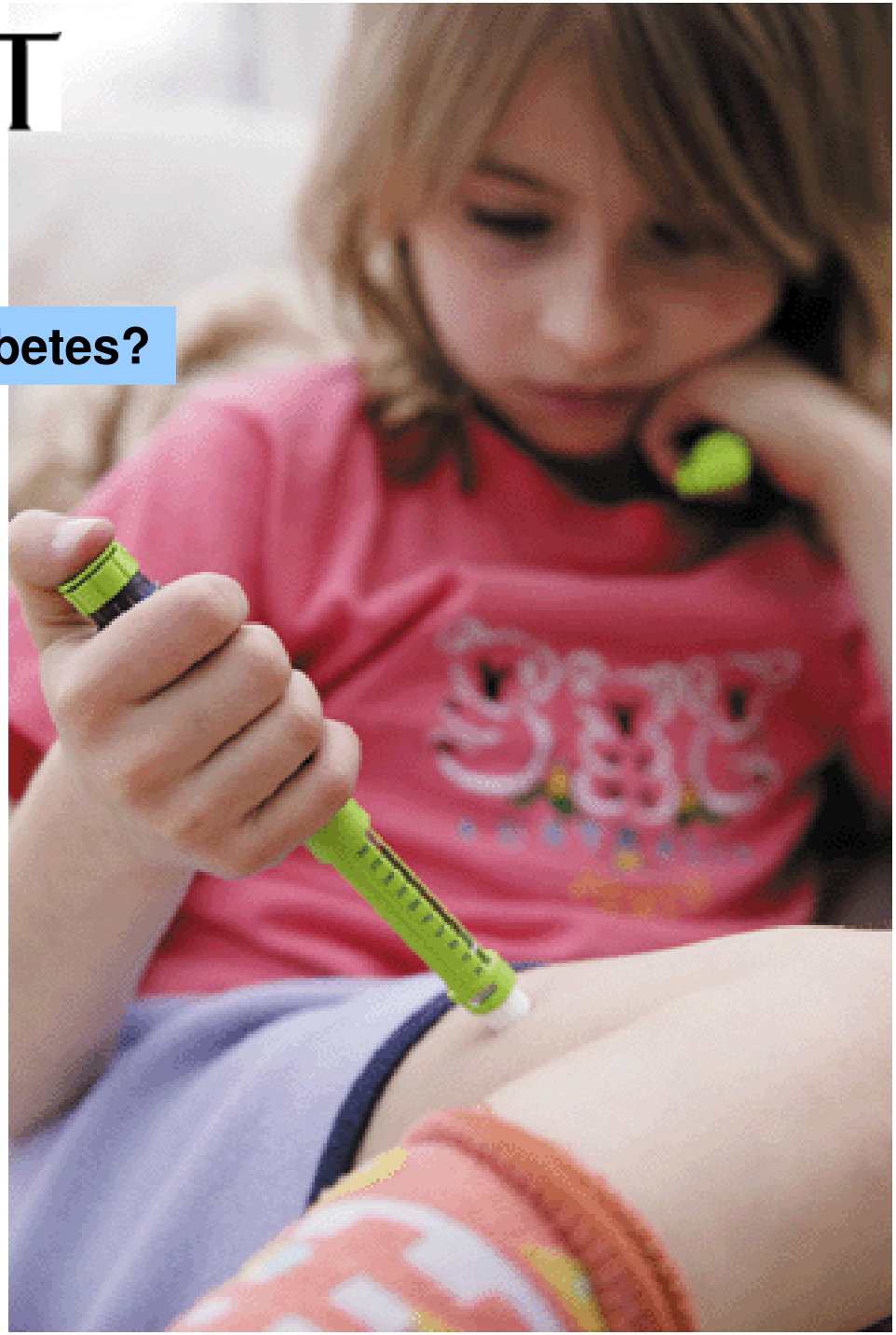
experience of social organizations ➔ pedagogy

Adverse effects of POPs in Great Lakes wildlife, such as the deformed bill of this young cormorant, have helped spur international action.

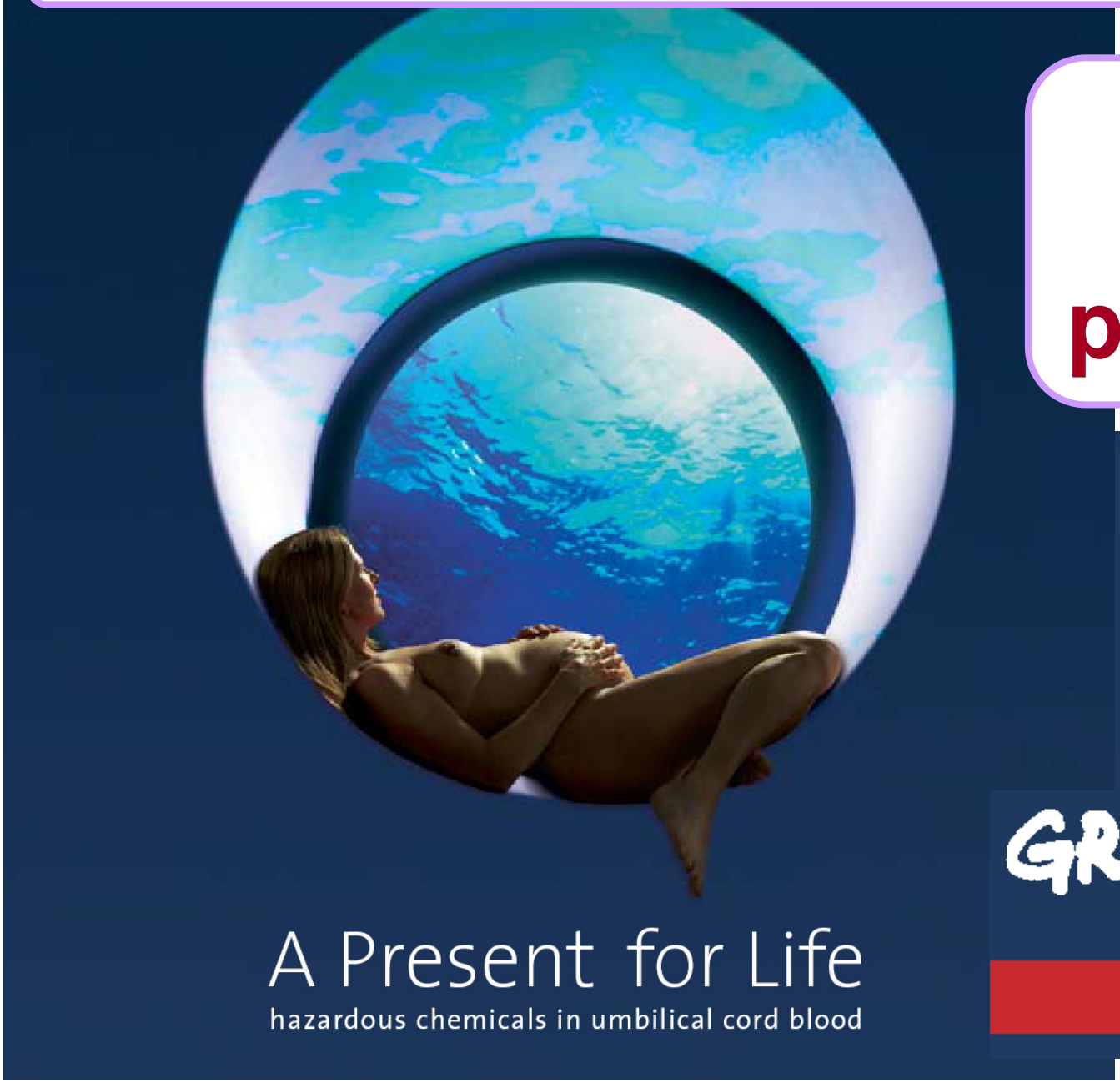
THE LANCET
Vol 364 November 6, 2004

What triggers childhood type 1 diabetes?

" birds...
vs.
human beings "



scientific orginaz. ← → social organizations



pedagogy

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Contribución invisible. El agua es uno de los elementos químicos más preciados de la naturaleza. Aunque la mayoría da por supuesta su pureza, ésta sólo se consigue gracias a productos químicos para el tratamiento del agua. Como los nuestros.

Éxito visible. Como partner en muchos sectores industriales desarrollamos y optimizamos soluciones como éstas para nuestros clientes. Los resultados de nuestra aportación son visibles y permiten mejorar procesos, aumentar la calidad y reducir costes. Así colaboramos con el éxito de nuestros clientes y a la mejora de la calidad de vida de todos nosotros. **www.basf.com/more**

EL TOTAL ES LO QUE CUENTA

MINISTERIO
DE MEDIO AMBIENTE

Abre el grifo solo el tiempo necesario
En vez de bañarte, dúchate
Usa la lavadora y el lavavajillas a plena carga
No tires el aceite al fregadero ni al inodoro
Reutiliza de un año a otro el agua de tu piscina
Lava el coche con bayeta y esponja
Evitemos las pérdidas por fugas
Riega tu jardín por aspersión y goteo
Pon tu gota de agua

Total: podemos ahorrar hasta 2.500 millones de litros al día si todos seguimos estos consejos. Ahorrar agua es tan necesario que por eso no hemos gastado ni una sola gota para hacer este anuncio.

Gota a gota se hace el río.

TOTAL: Cada día la degradación del medio ambiente nos afecta más

En todos está invertir este proceso.

MINISTERIO
DE MEDIO AMBIENTE

Total:

Más de 2.500 millones de litros de agua se desperdician cada día en consumo urbano en España.

- √ Provocando la desertización de la cuarta de nuestro territorio.
- √ Produciendo pérdida de cosechas y empobrecimiento del suelo.
- √ Agravando la sequía y la erosión.
- √ Impidiendo hacer frente al progresivo au de la demanda.
- √ Sobreexplotando y acabando con fuente manantiales y lagunas.

En todos está invertir este proceso.

El Total es lo que cuenta

EL PAÍS, martes 18 de mayo de 2004

with whom do we assess their cultural impact?

JORDI SUNYER Y NÚRIA RIBAS-FITÓ / Investigadores del IMIM de Barcelona

"La lactancia materna es beneficiosa a pesar del DDT que contiene"

DAVID SEGARRA, **Barcelona**

La leche humana no sólo contiene nutrientes para el bebé. También es una importante fuente de numerosos contaminantes, entre ellos DDT. Un equipo de investigadores médicos acaba de determinar que el DDT contenido en la leche afecta negativamente a la inteligencia infantil. Pero, aun así, los beneficios de la lactancia materna superan este inconveniente, según los doctores Jordi Sunyer y Núria Ribas-Fitó, del Instituto Municipal de Investigaciones Médicas de Barcelona.

Pregunta. ¿Tenemos mucho DDT en nuestro cuerpo?

Núria Ribas-Fitó. Los niveles de DDE [metabolito de descomposición del DDT] en el cuerpo humano en España son relativamente altos. Algunos estudios indican que tenemos el doble de contaminante que el promedio de países europeos, aproximadamente. Se trata de DDT que fue

Núria Ribas-Fitó y Jordi Sunyer.

La red Inma examina a 5.000 niños

da temprana en la guardería, que estimula enormemente a los niños. En este contexto, los contaminantes tienen peso menor.

P. ¿Es recomendable la lactancia?

J. S. Los niños que lactan incorporan más contaminantes, pero obtienen mejores puntuaciones en los tests. La conclusión principal de nuestro estudio es que la lactancia contrarresta los efectos negativos del DDE.

N. R-F. En un grupo de 480 niños menorquines hemos comprobado que los niños que han seguido lactancia materna no sólo tienen un mejor desarrollo, sino una mejor sociabilidad a los cuatro años de vida. Y esto está relacionado con la duración de la lactancia. Por esto queremos saber qué sucede en las lactancias de corta duración, de tan sólo uno o dos meses, un tiempo suficiente para que pasen los tóxicos, pero muy corto para beneficiarse de la vertiente

Abre los ojos, sin miedo

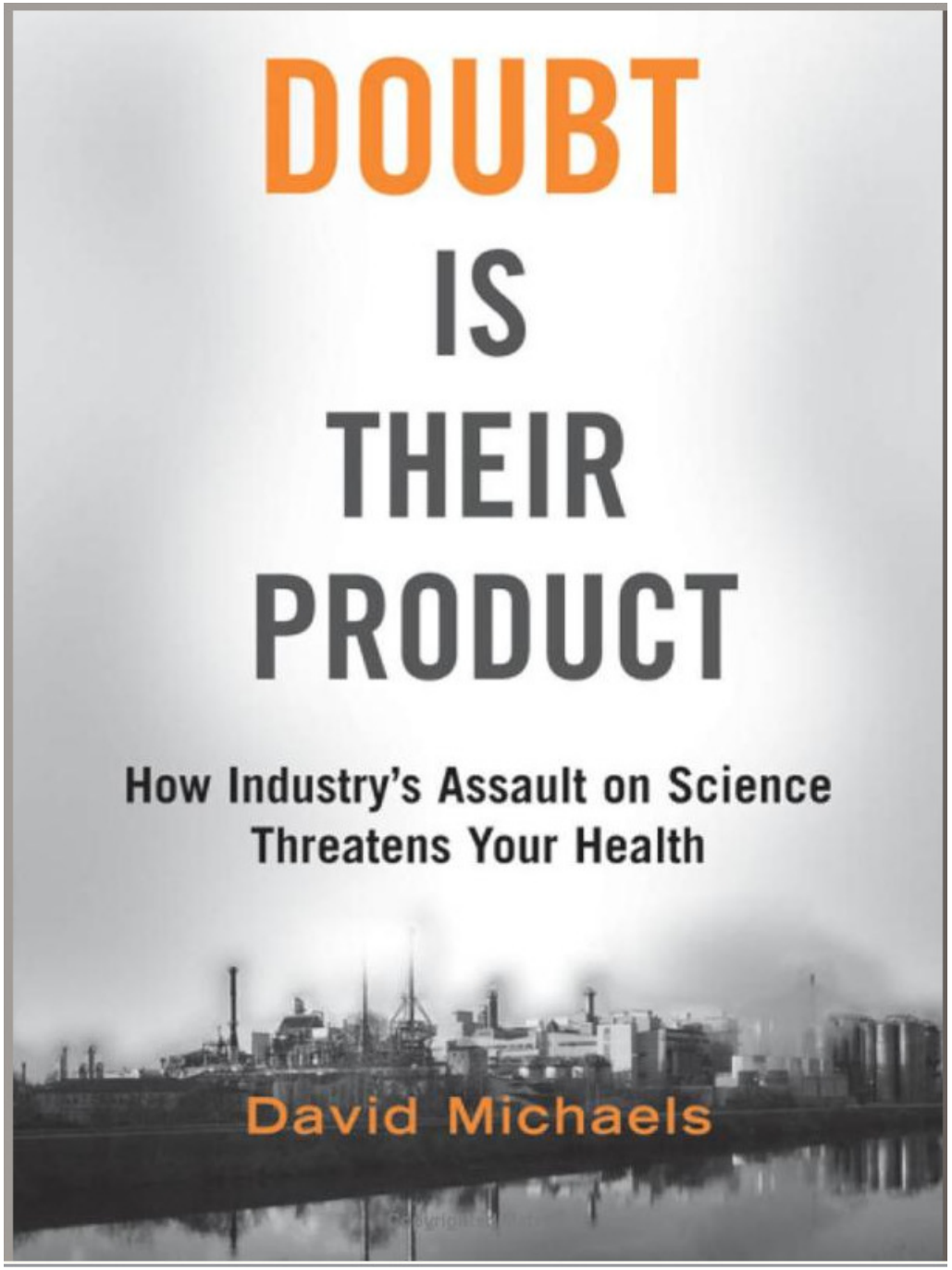
Por una pedagogía científica culturalmente sostenible

Miquel Porta Serra

Debemos hallar *formas de pedagogía científica más sostenibles culturalmente* no sólo por razones de eficiencia, si no, sobre todo, para no causar más «efectos adversos»: miedos, ansiedades innecesarias, estigmatización, discriminación, medicalización, dependencia, otras formas de iatrogenia, gasto socialmente estéril, etc.). Porque –a juicio de CiMA– debemos estar radicalmente en contra de provocar más miedo, angustia y alienación. Porque deseamos promover formas de vida «autónomas, solidarias y alegres». Y porque, como parte inseparable de todo ello, queremos

preservar nuestra identidad cultural. La que se basa, por ejemplo, en el placer de reunirse alegremente en torno a una buena mesa... *Lo que no puede ser es que las personas malvivamos en un estado cuasi-permanente de duda, sospecha, desafección, rechazo, repugnancia o asco* ante el medio ambiente en el que vivimos y *somos.*

Miquel Porta Serra es profesor de salud pública de la Universidad Autónoma de Barcelona. Presidente de Científicos por el Medio Ambiente (CiMA) www.cima.org.es.



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David Michaels **is a scientist and former government regulator. During the Clinton Administration, he served as Assistant Secretary of Energy for Environment, Safety and Health, responsible for protecting the health and safety of the workers, neighboring communities, and the environment surrounding the nation's nuclear weapons factories. He currently directs the Project on Scientific Knowledge and Public Policy at The George Washington University School of Public Health and Health Services. In 2006, he received the American Association for the Advancement of Science's Scientific Freedom and Responsibility Award for his work on behalf of nuclear weapons workers and for advocacy for scientific integrity**

EL PAÍS - Opinión - 12-12-2005

EL PAIS, 30 -10-2003

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