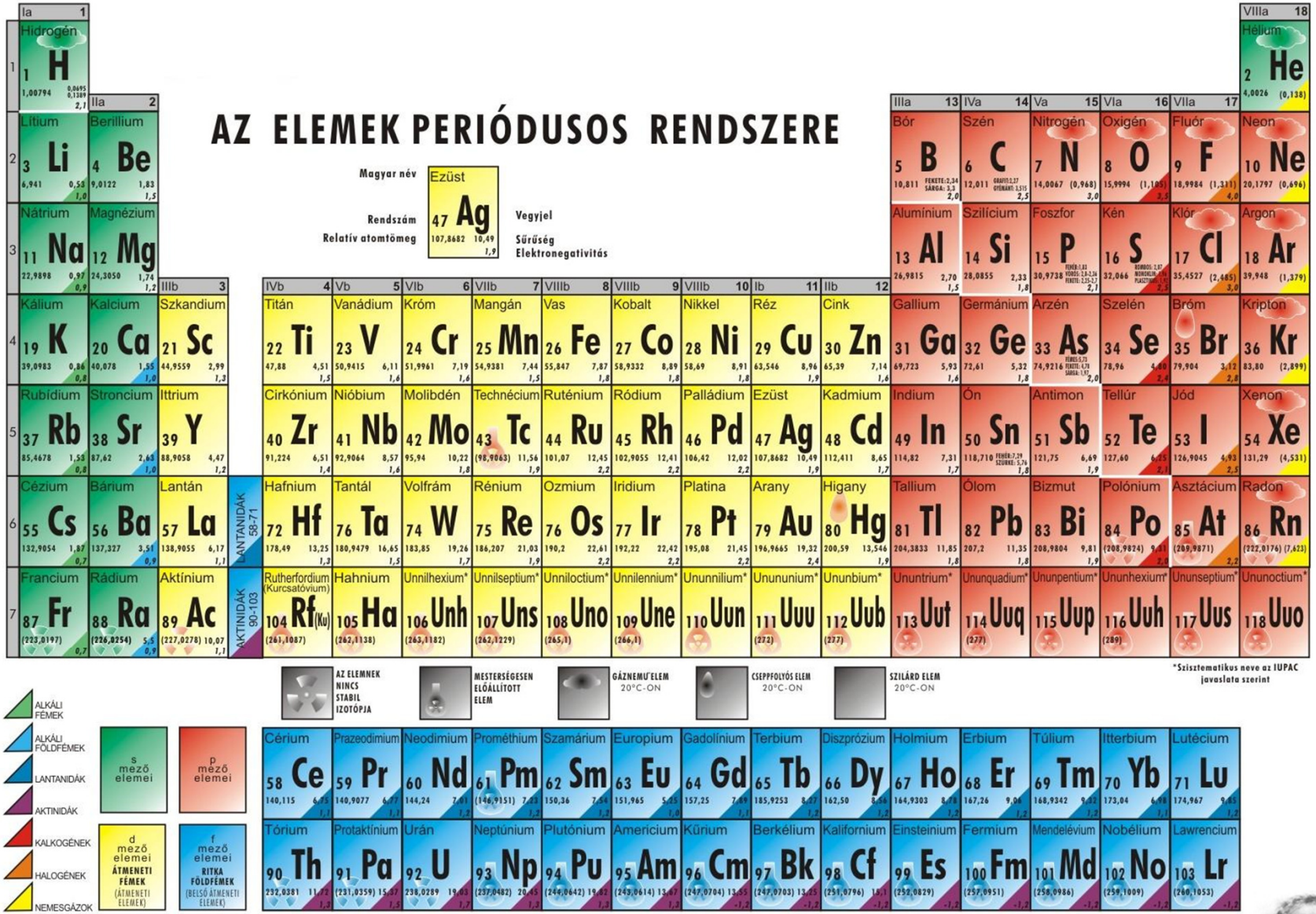
Ólom – a mérgező elem I.

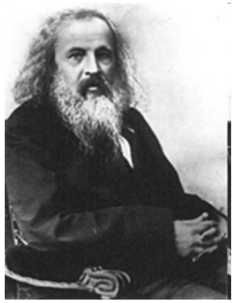
Müller Ágnes – szakoktató,
kari külügyi és nemzetközi program koordinátor
az előadás anyaga a KSOHIA projekt alapján készült

FÉMEK

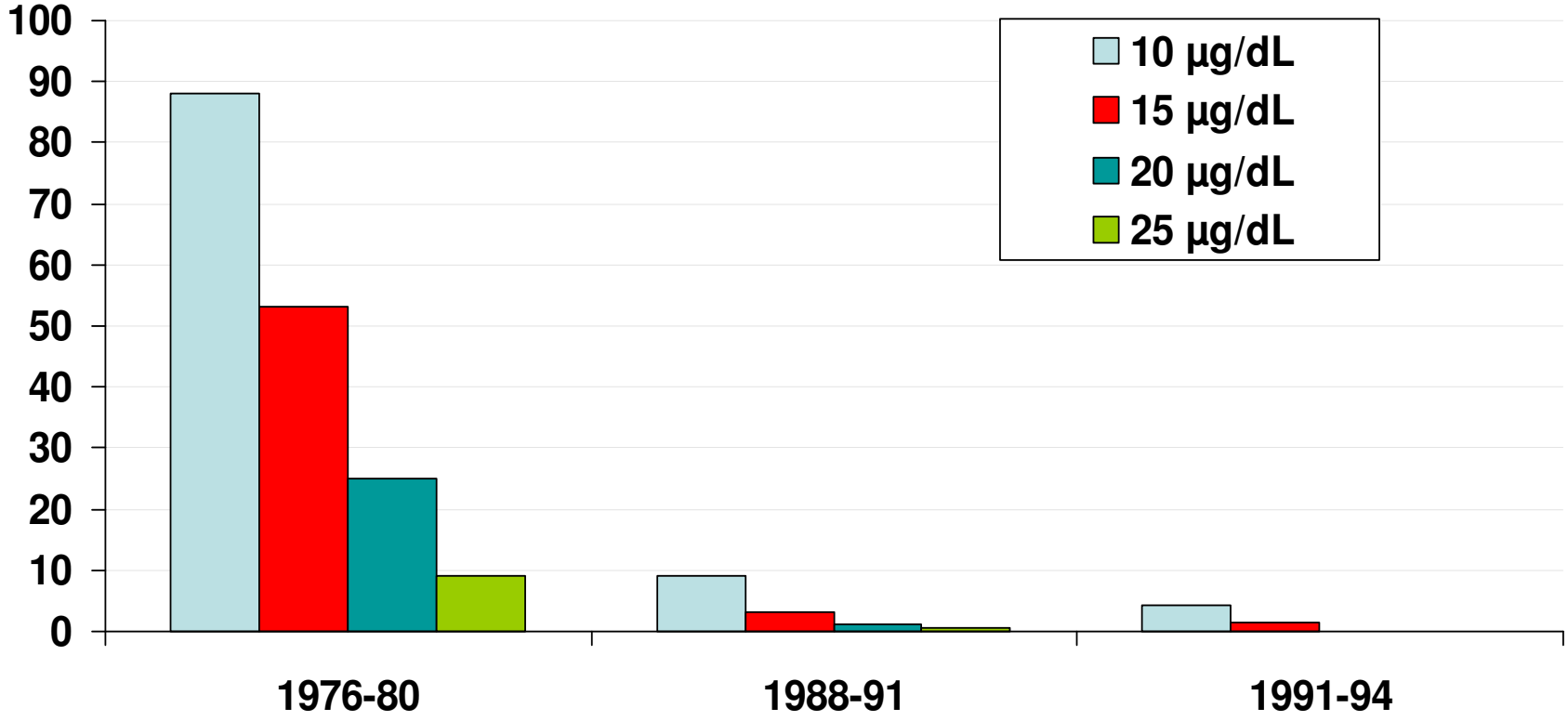
Bármely kategóriája az elektromosan pozitív elemeknek, melyeknek többnyire fényes felületük van, általában jó elektromos- és hővezetők, felolvaszthatók és összeolvaszthatók, vékony lemezekre hengerelhetők vagy drótokba sodorhatók. A tipikus fémek sókat képeznek nemfémekből, oxidokat oxigénből és egymással ötvöződnek.



http://vbk.freeblog.hu/files/elemek.JPG



A különböző vér-ólomszinteket meghaladó óvodáskorú gyermekek aránya



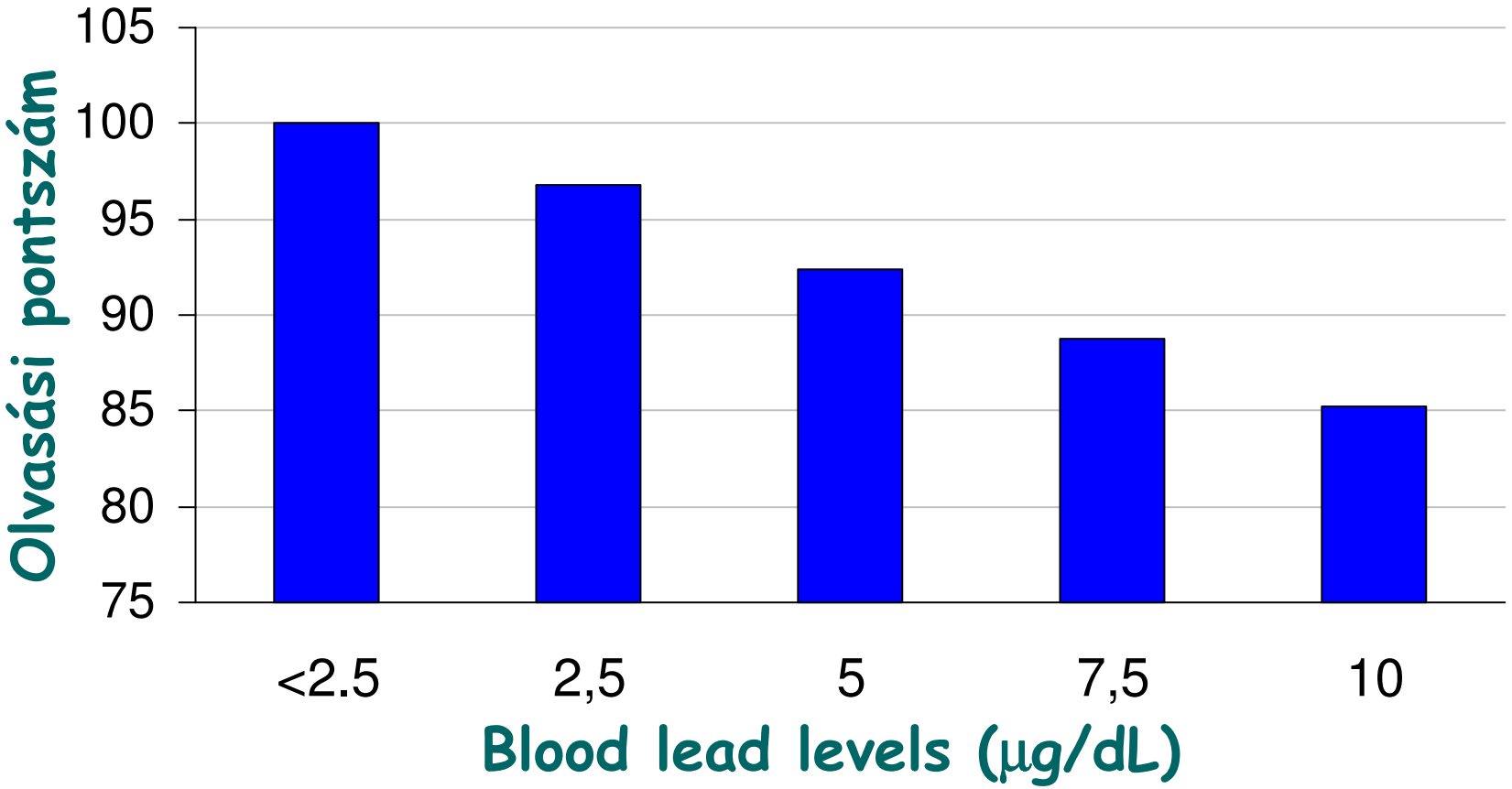
Pirkle JL, et al. Environ Health Perspect 1998;106:745-50.

"The Secret History of Lead":http://www.thenation.com/doc/20000320/kitman

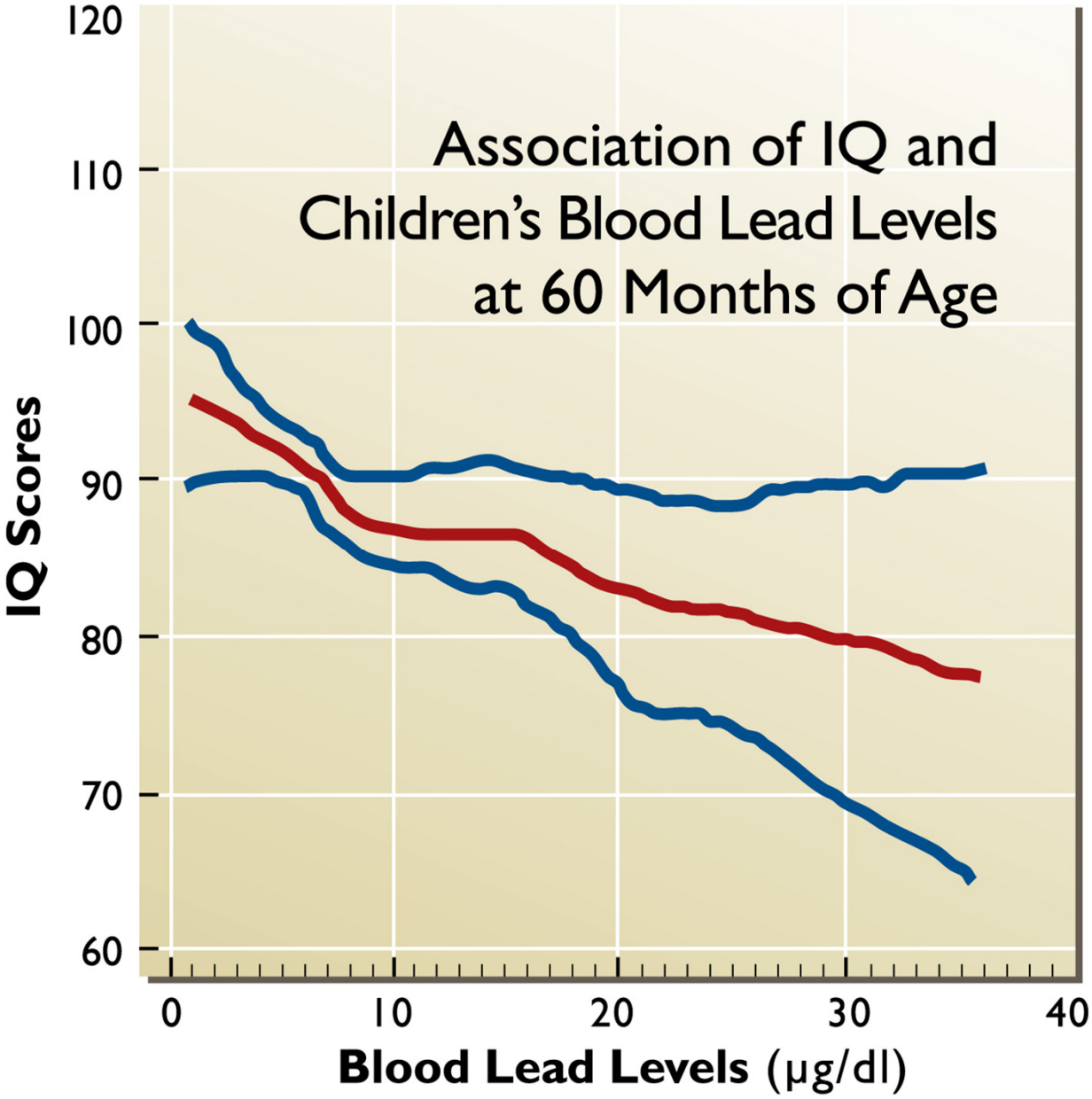
Ólommérgezés – Továbbra is fő közegészségügyi probléma

- Az ólommérgezés USA egyes részein járványos
- Fő környezeti törvényszéki probléma
- Bizonyíték a káros hatásra 10 µg/dL alatt
- Szervezeti méreg, mely emberben számos káros állapottal és betegséggel hozható kapcsolatba

Ólommal kapcsolatos olvasási hibák amerikai gyermekeknél

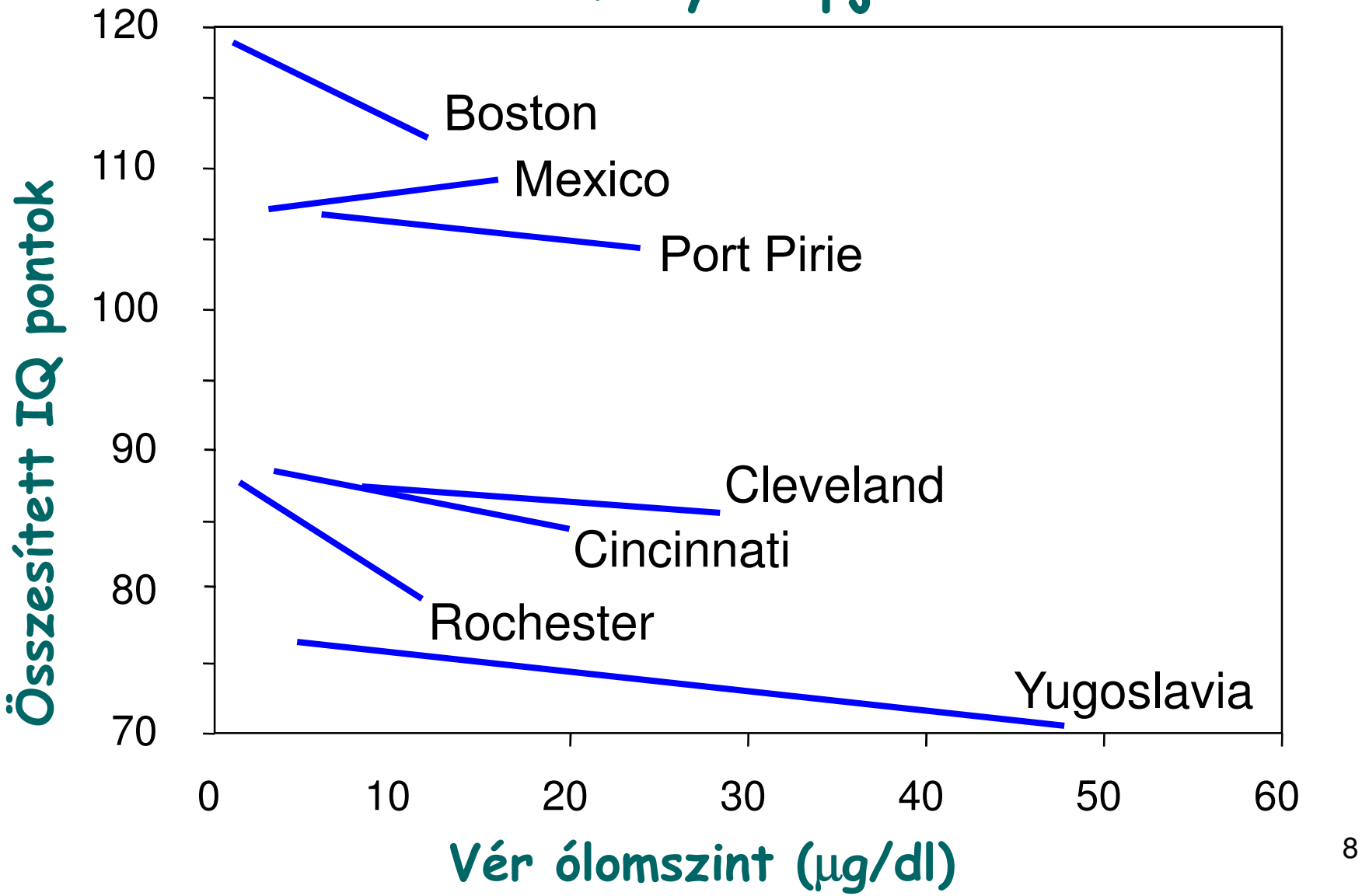


Lanphear BP, et al. Public Health Reports 2000;115:521-529.

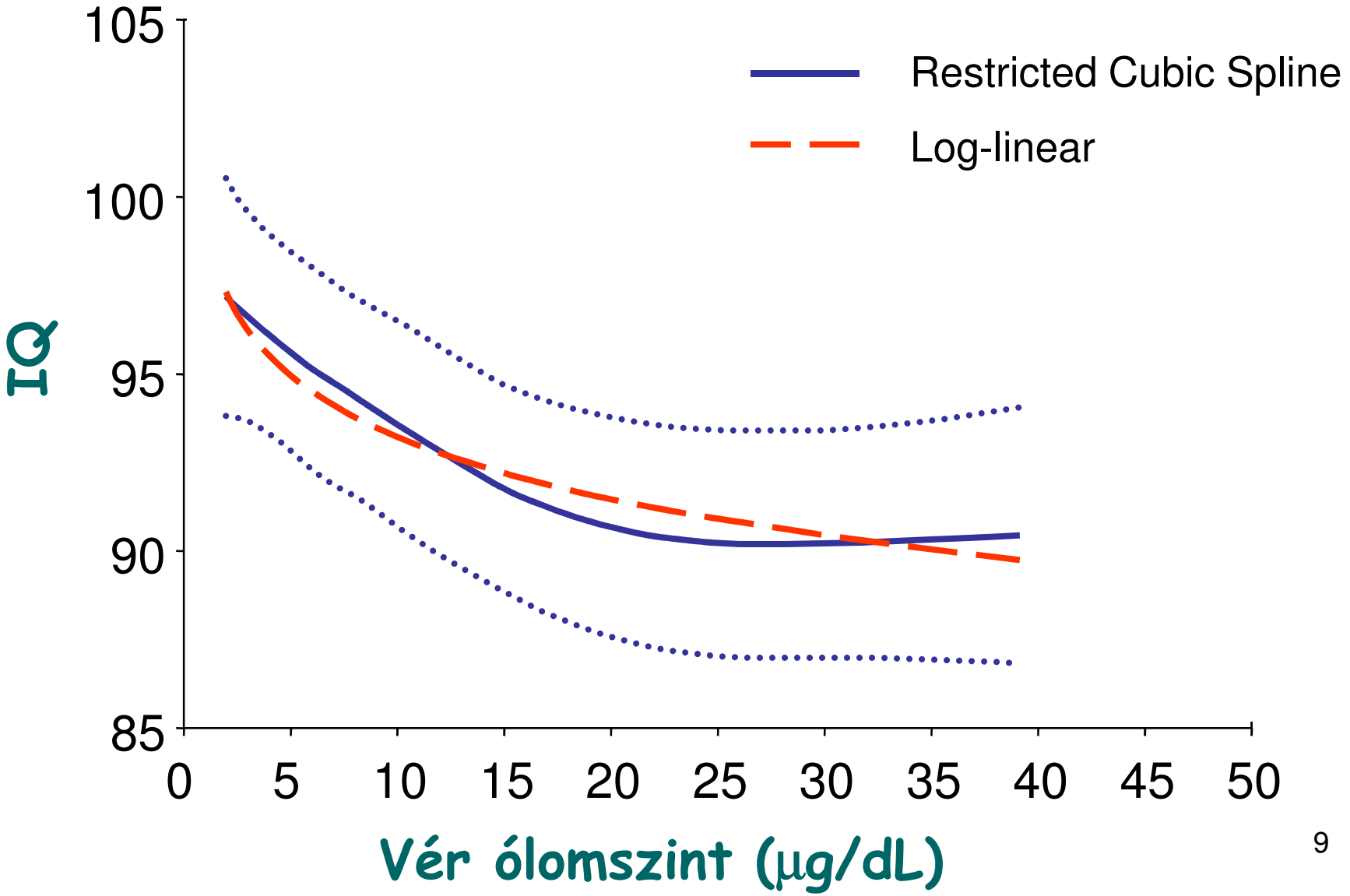


Canfield R, et al. NEJM 2003;348:1517-1526.

Az ólom és az IQ pontok kapcsolata gyermekek körében 7 prospektív ólom-expozíciós kohort tanulmány alapján



A vér-ólomkoncentrációk és a gyermekek intellektuális funkciói közötti kapcsolat

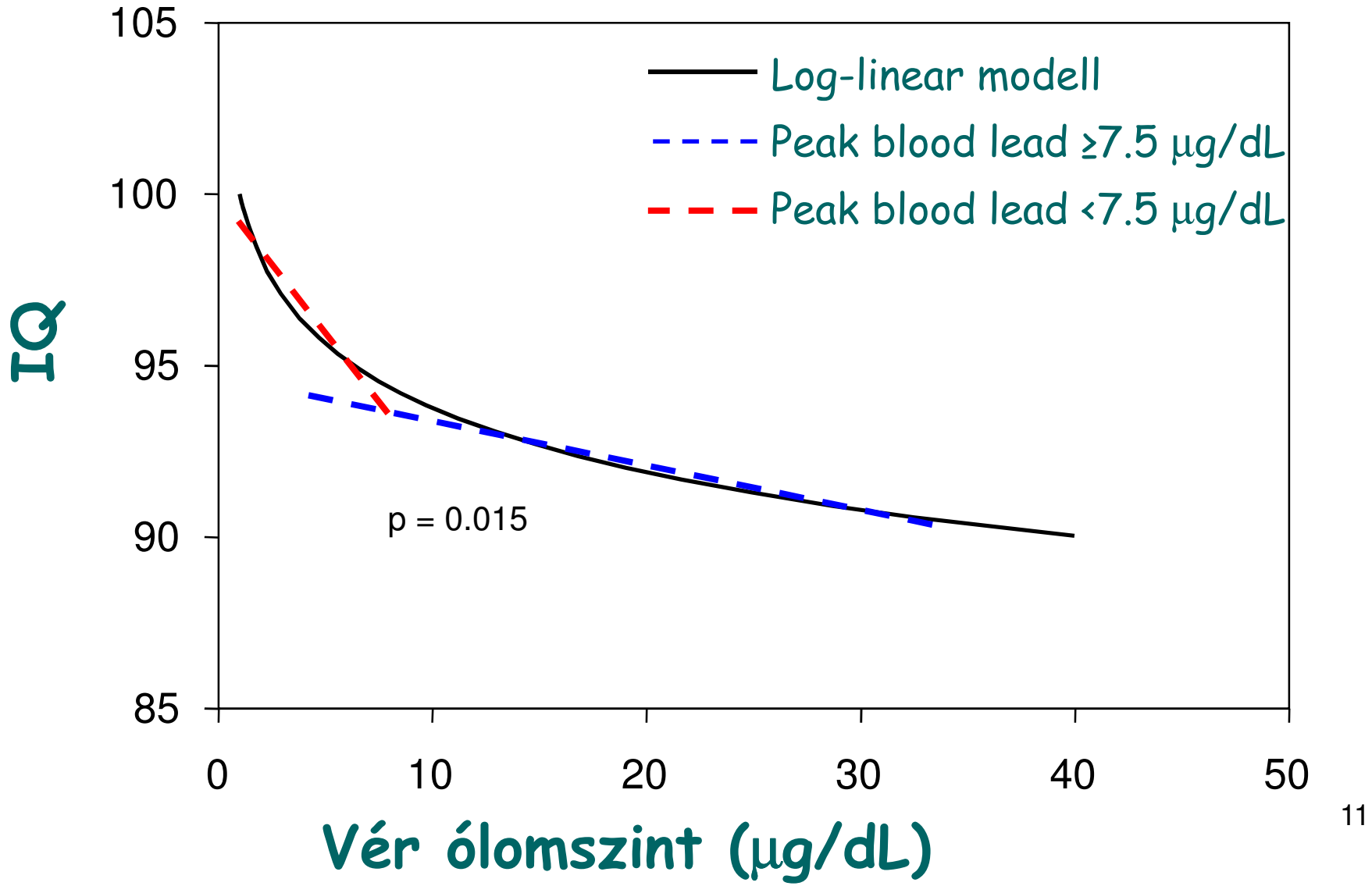


Az ólommal kapcsolatos IQ veszteségek becslése adott vér-ólom koncentrációnál, (5-95 % percentilisnél)

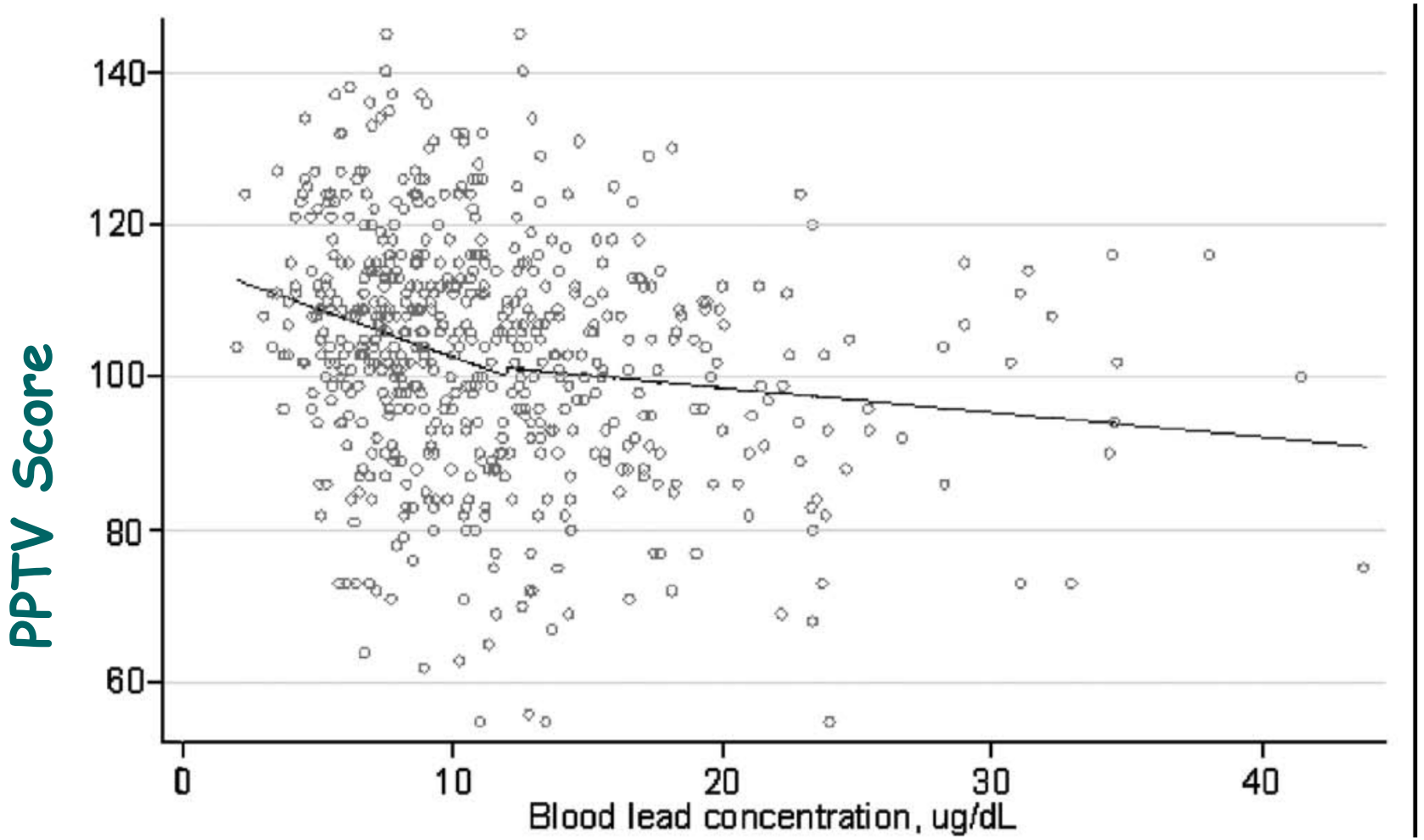
Vér-ólomszint tartomány	Becsült IQ veszteség (95% CI)
2.4 - 30 µg/dL	6.9 (4.2, 9.4)
2.4 - 10 µg/dL	3.9 (2.4, 5.3)
10 - 20 µg/dL	1.9 (1.2, 2.6)
20 - 30 µg/dL	1.1 (0.7, 1.5)

Lanphear BP, et al. EHP 2005;113:894-899.

A vér-ólom koncentrációk és a gyermekek intellektuális funkcióinak kapcsolata 7.5 µg/dL vér-ólomszint felett és alatt



A vér-ólom koncentrációk és a gyermekek intellektuális funkcióinak kapcsolata



Kordas K, et al. Environmental Research 2006;100:371-386.

A test ólommal való terhelése ősemberben, tipikus amerikai emberben és egy szemmel látható ólommérgezés

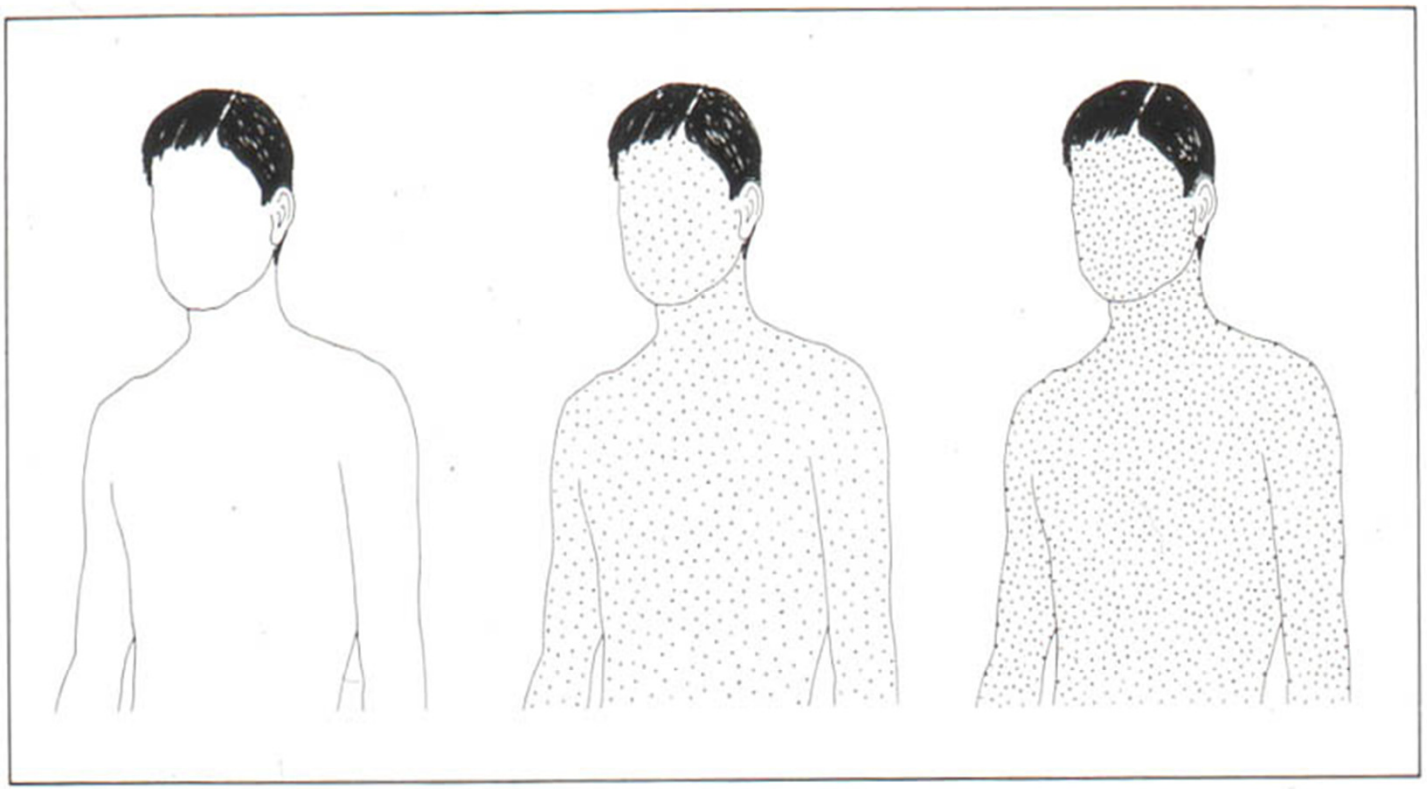
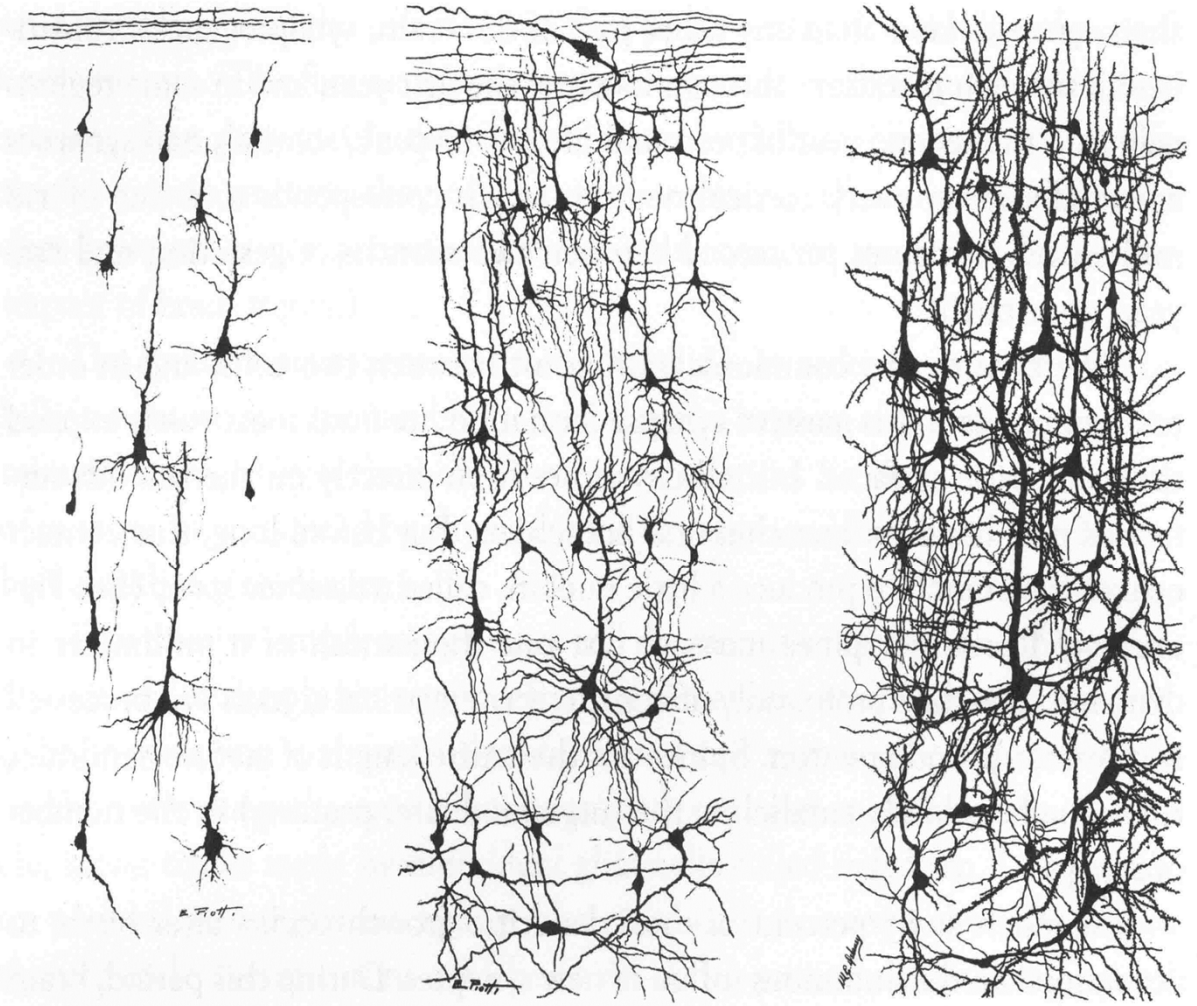
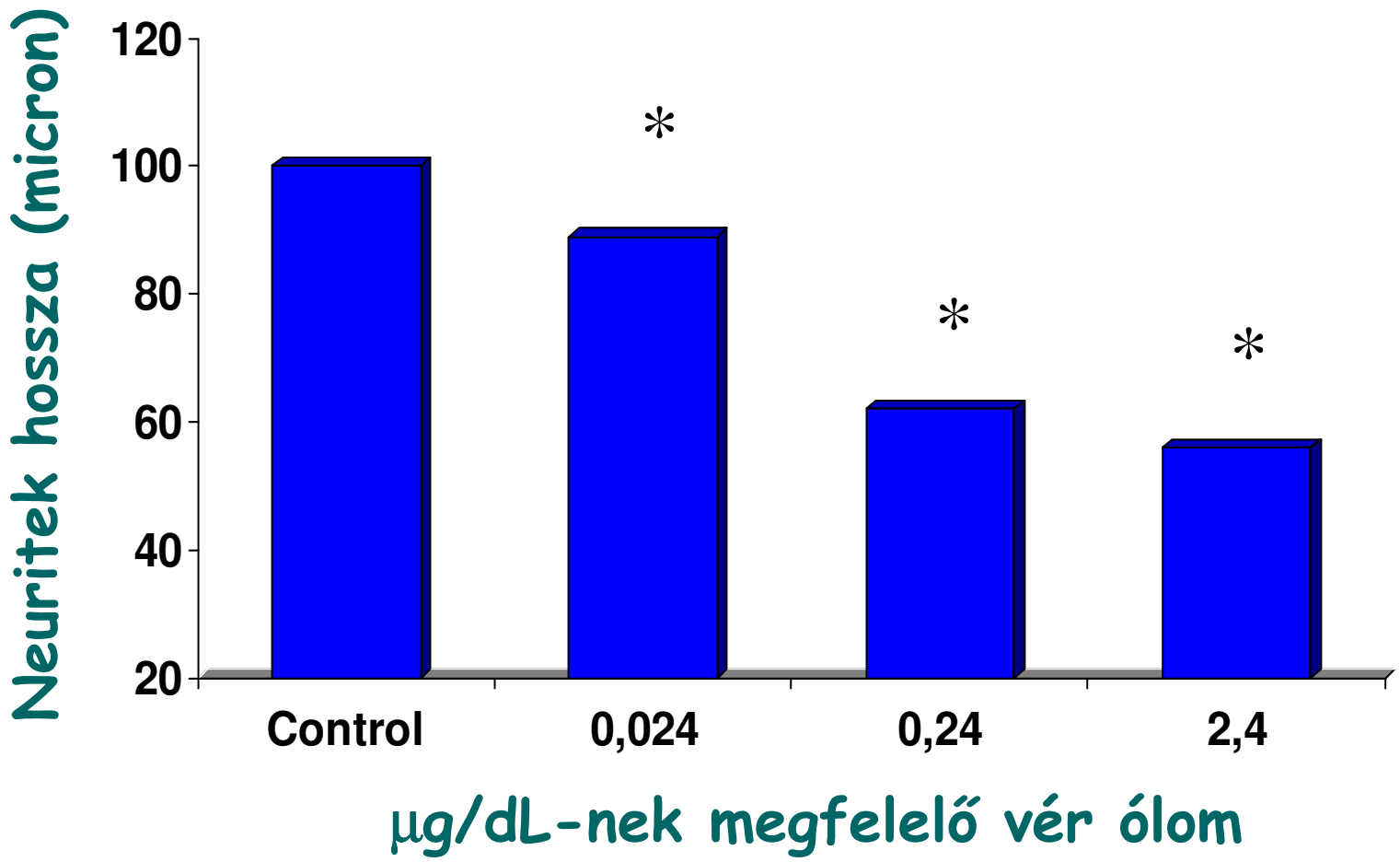


FIGURE 1-1 Body burdens of lead in ancient people uncontaminated by industrial lead (left); typical Americans (middle); people with overt clinical lead poisoning (right). Each dot represents 40μg of lead. Source: Patterson et al., 1991; adapted from NRC, 1980.

Idegi fejlődés kora gyermekkorban

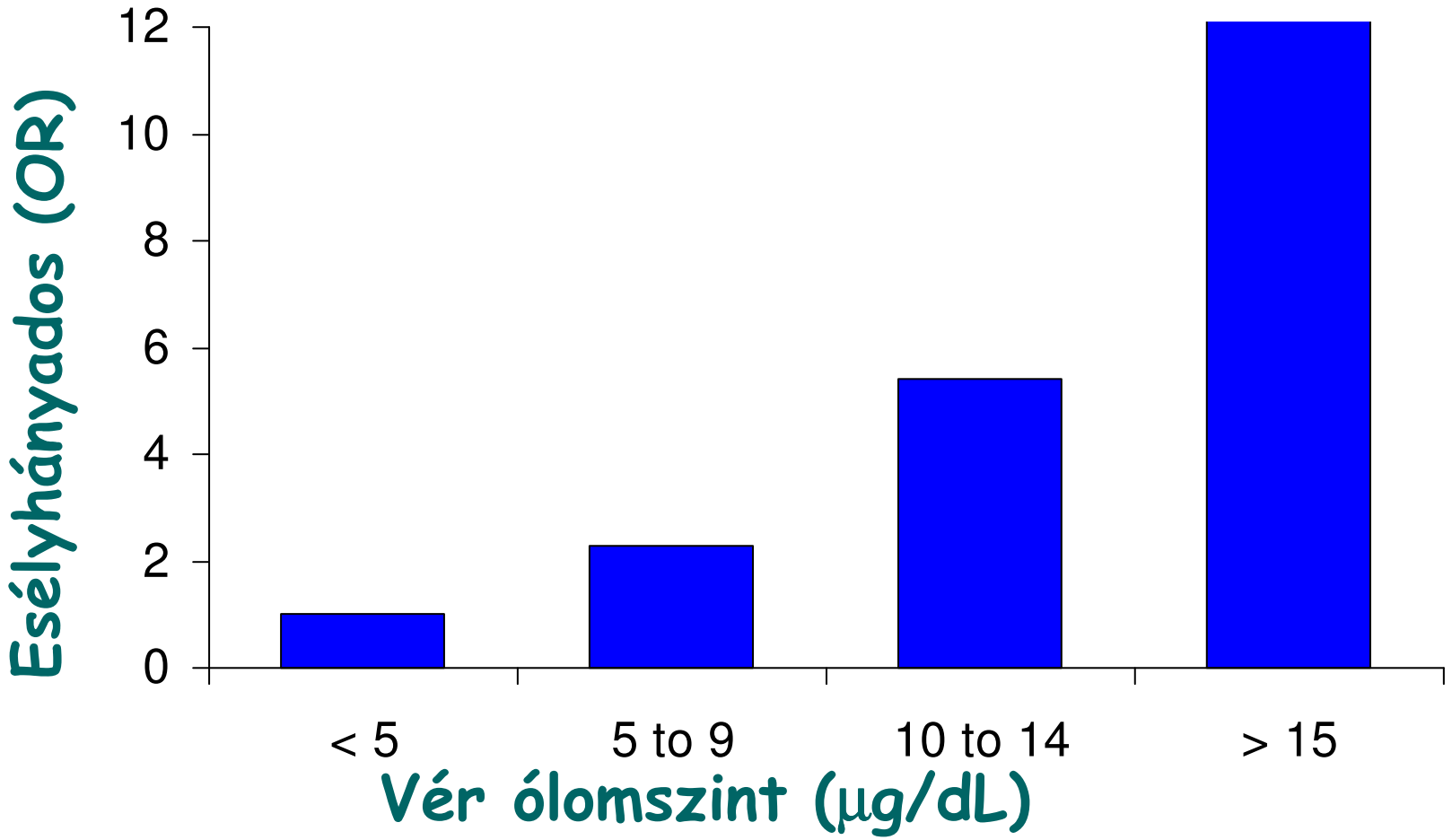


Az ólómexpozíció hatásai a dopaminerg neuronok nyúlványainak hosszára



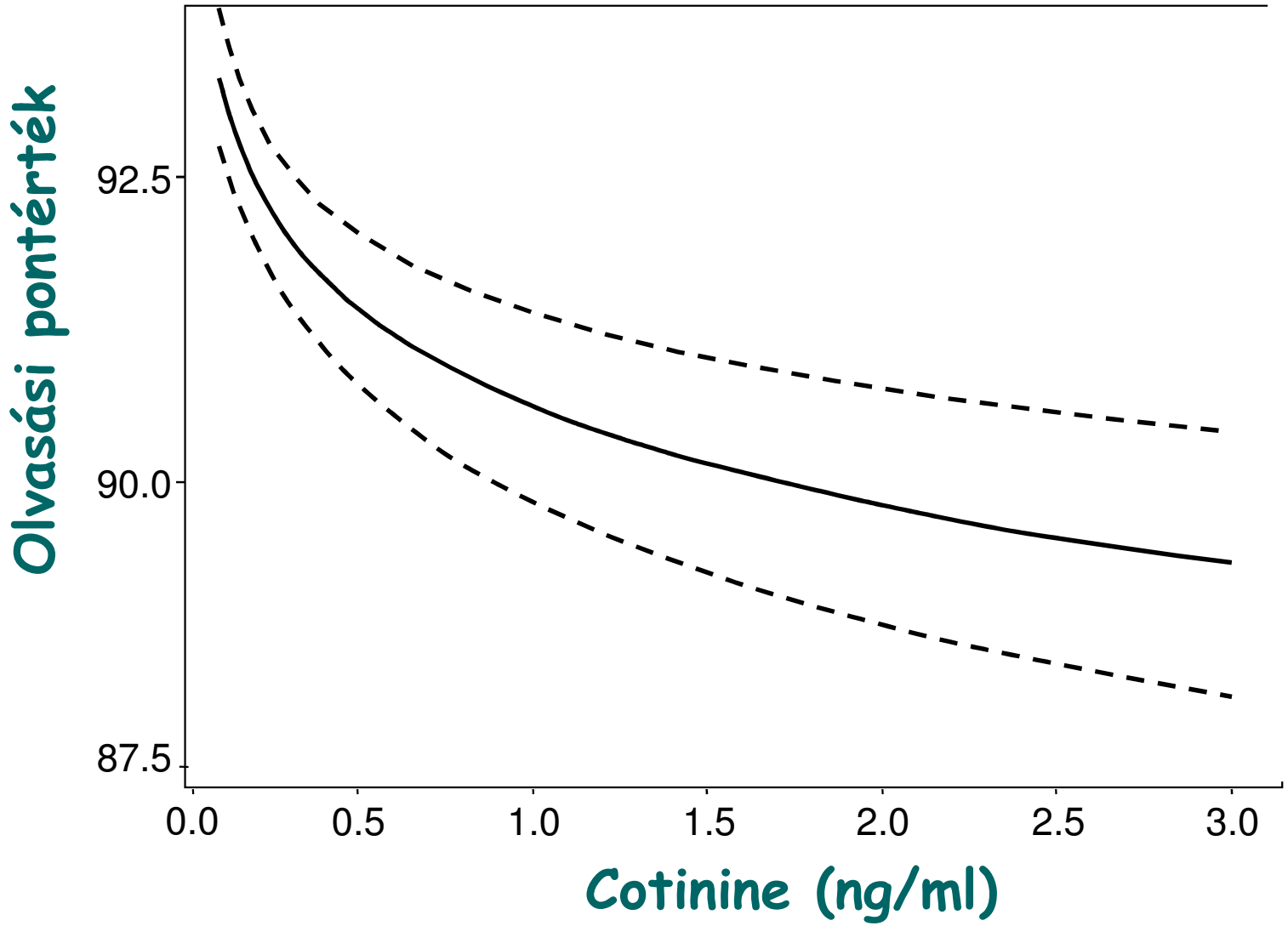
Schneider JS, et al. Neurotox & Teratol 2003:25:555-559.

A spontán vetélés kockázata az anyai vér-ólomszintek alapján



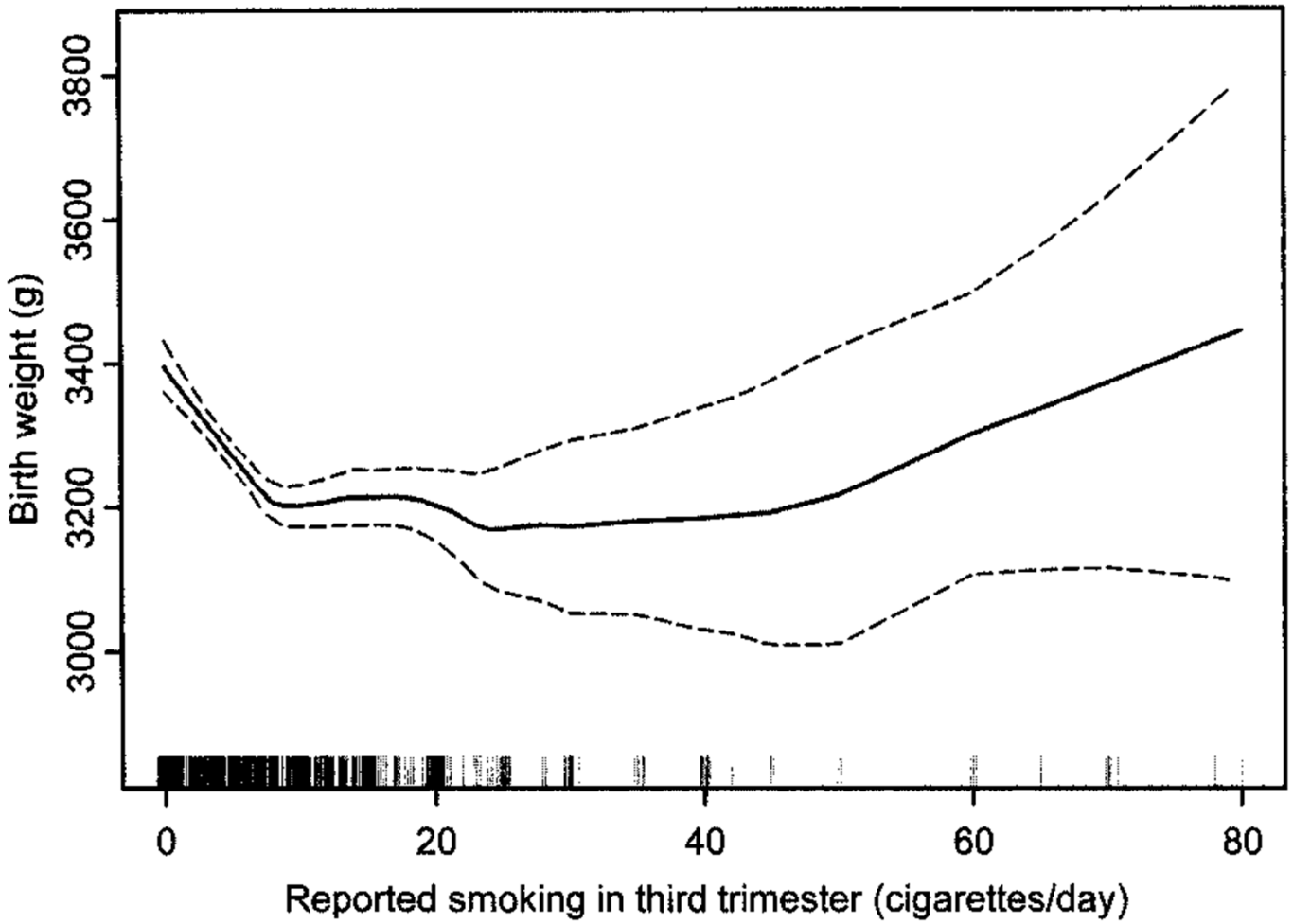
Borja-Aburto VH, et al. Am J Epidemiol 1999:150:590-597.

Olvasási pontértékek a szérum cotinine szint alapján USA gyermekekben NHANES III, 1998-1994



Yolton K, et al. Environ Health Perspect 2005;113:98-103.

A várandósság alatti dohányzás és a születési súly kapcsolata



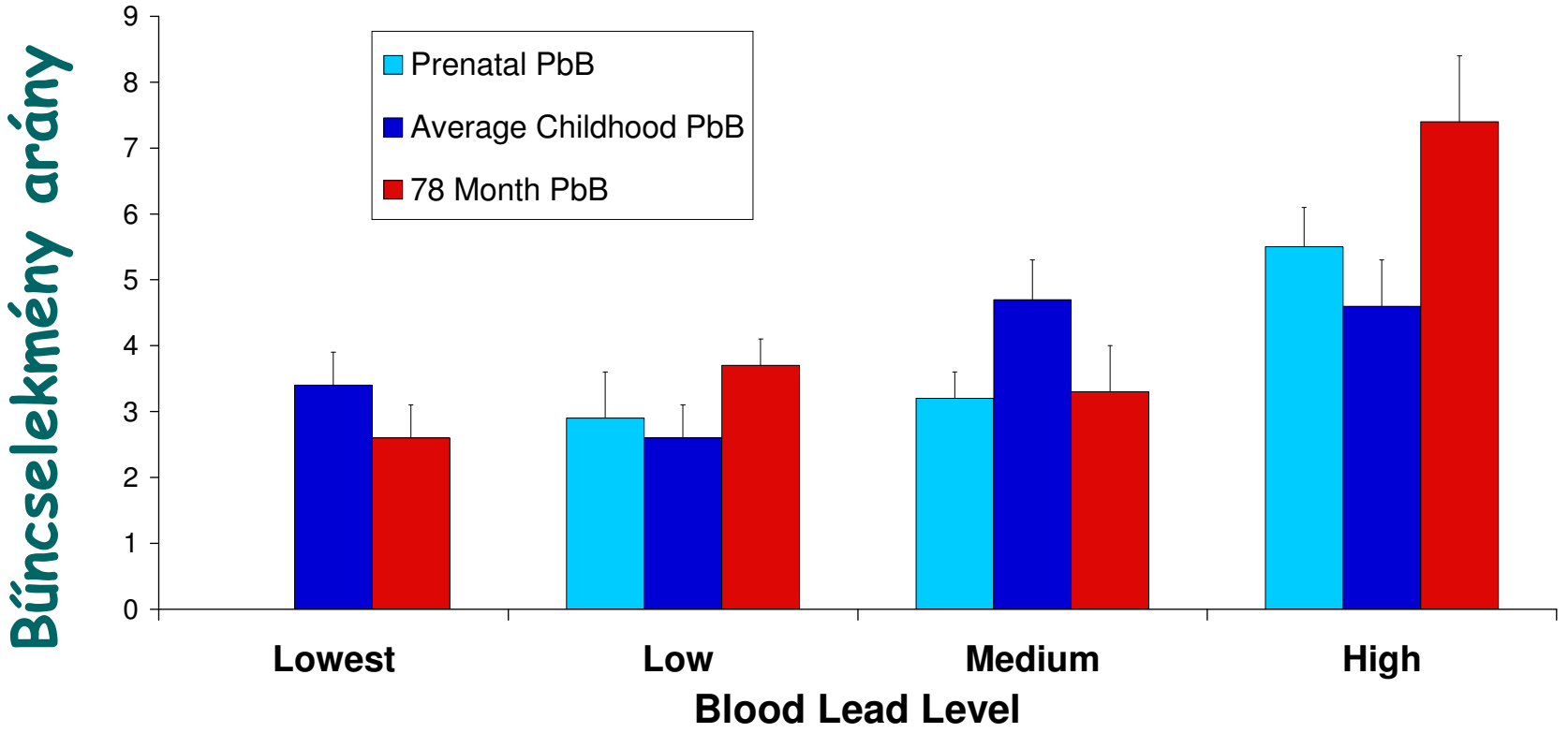
England LJ, et al . Am J Epidemiol 2001;154:694-701.

tekkaus.com

doctorsecrets.com

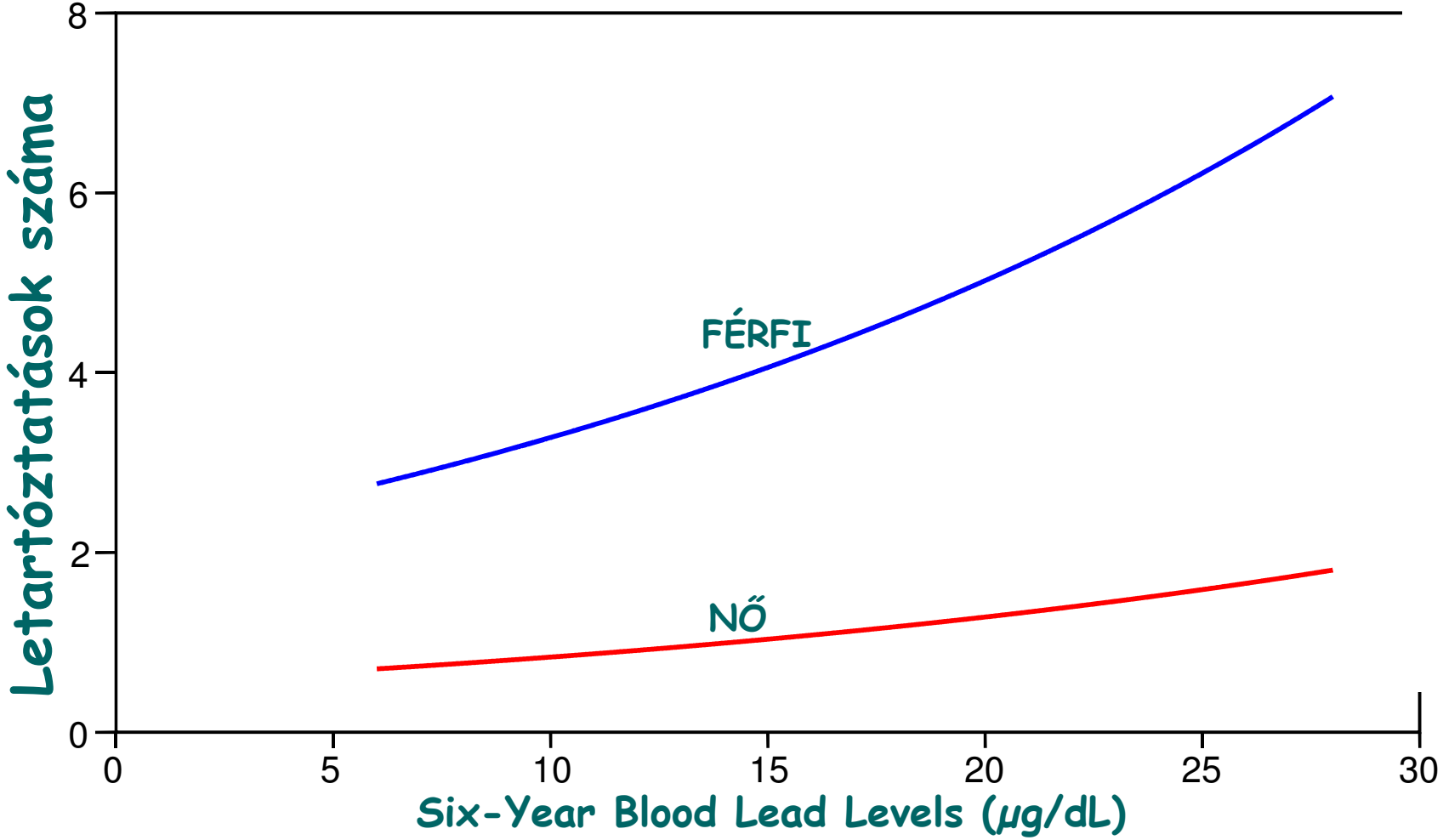
tipsforfirsttimemoms.blogspot.com

A vér-ólomszintek és a bűncselekmények kapcsolata felnőttkorban



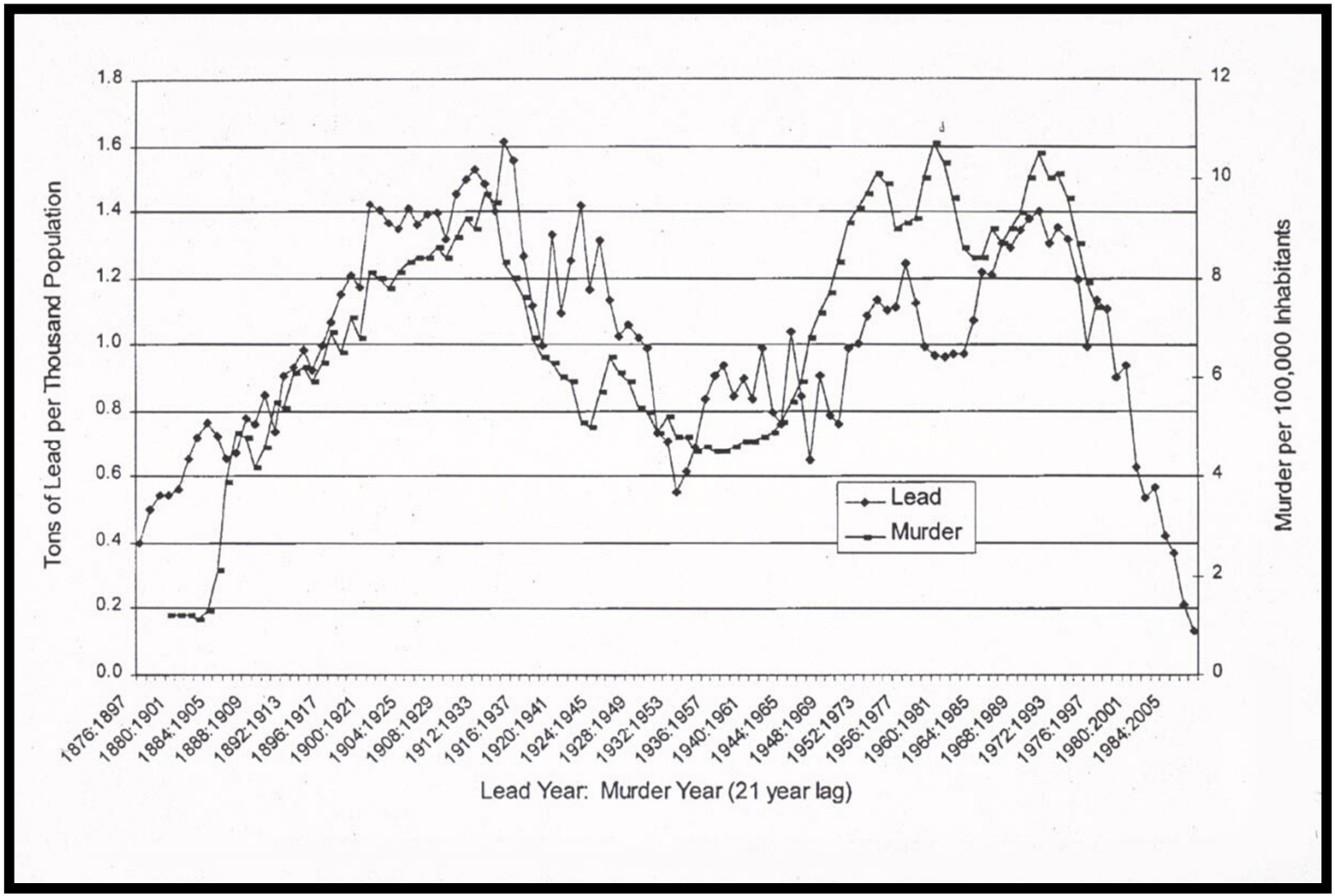
Dietrich KN, et al. Neurotox & Teratol 2001;23:511-518.

Letartóztatások száma és a gyermekkori ólomexpozíció: A Cincinnati ólom-tanulmány

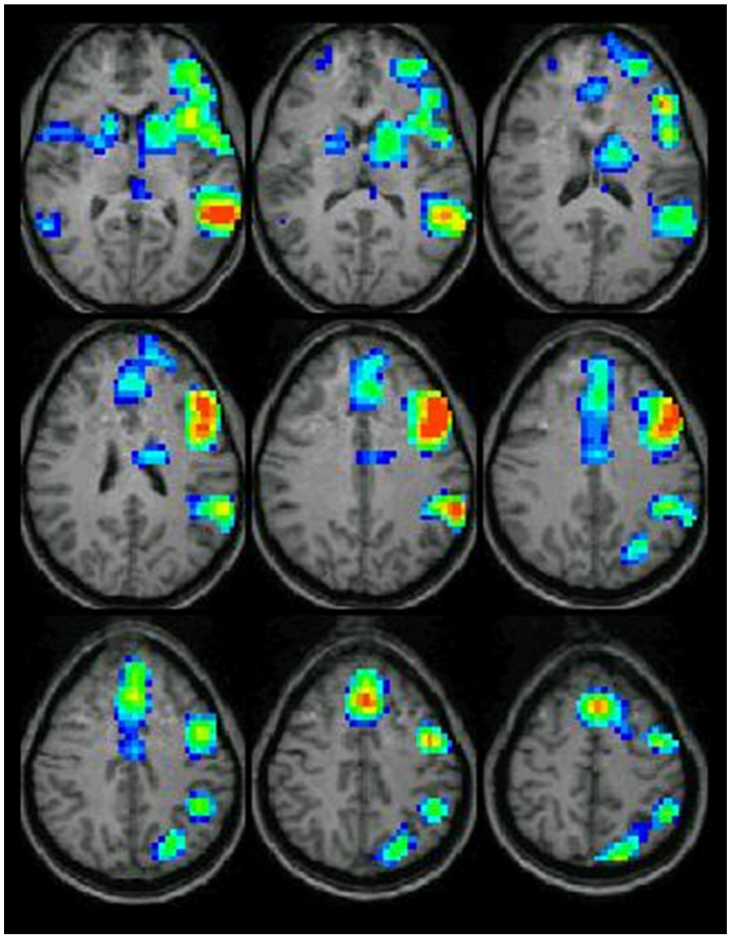


* Accounting for birthweight, age, prenatal tobacco exposure, maternal age at delivery, maternal IQ, maternal arrest history, HOME Score.

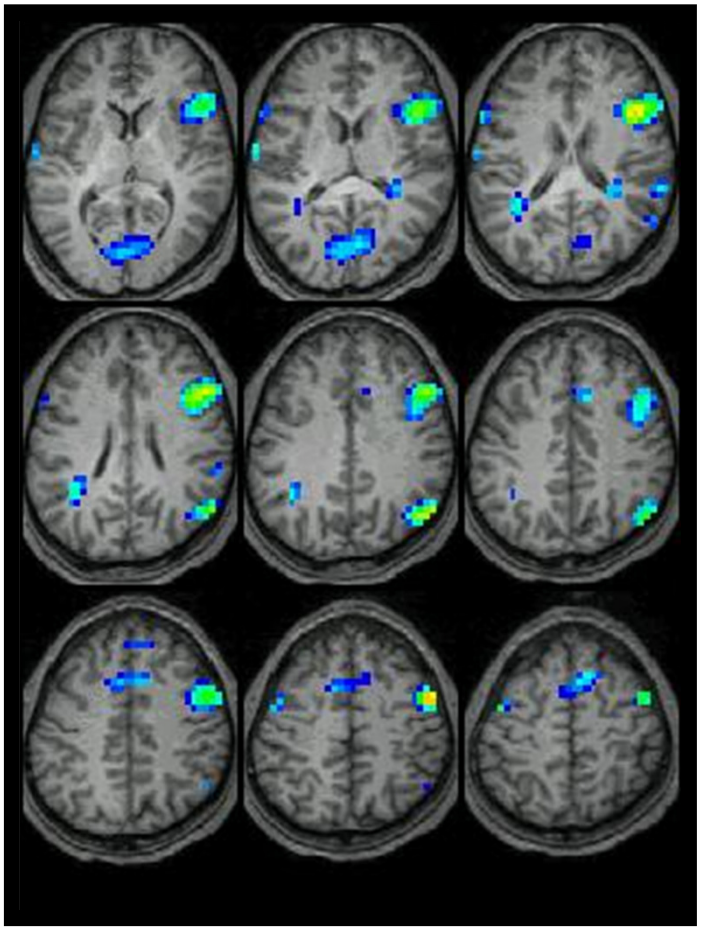
Az ólomexpozíció és a gyilkossági arány kapcsolata az USA-ban (/100,000)



„Igealkotási” feladat az ólom-expozíció tükrében



Alacsony átlag vér-ólom szint (7.6 μg/dL)



Magas átlag vér-ólom szint (26 μg/dL)

Yuan W, et al. Pediatrics (in press).

Mérgezőnek tekinthető az ólom 10 µg/dL-es vérszint alatt?

"A munkacsoport arra a következtetésre jutott, hogy amíg a rendelkezésre álló bizonyítékok nem engedik meg a végleges okozati magyarázatot a magas vér-ólomszint és a kedvezőtlen egészségügyi mutatók között <10 µg/dL értéknél, az elérhető bizonyítékok súlya támogatja - és nem veti el - azt, hogy ezen összefüggések magyarázata - legalább részben - okozati.

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Miért nem változik a vér-ólom határértéke ebben az időszakban?

- Nincsenek tényleges „klinikai" beavatkozások alacsony vér-ólom szintnél gyermekeknél (< 10 µg/dL-nél)

- A gyermekeket nem lehet osztályozni 10 µg/dL < vagy > vér-ólomszintenként a laboratóriumi tesztek velejáró pontatlansága miatt

- Nincs bizonyíték a küszöbértékre; így, a biztonságos határérték csökkentése önkényes lenne és bizonytalan előnyökkel szolgálna

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Science

NEWS FOCUS

TOXICOLOGY

Overhaul of CDC Panel Revives Lead Safety Debate

Just as an advisory committee began looking at evidence for setting a stricter lead-exposure standard, it got reorganized.

How far should society go in p
children from exposure to low
lead? The question, hotly debated
past, is suddenly back on the front
ter public health advocates and a
Democrats in Congress accused
Administration of trying to load a
tial advisory panel with friends o
industry. They suspect that the A
tion wants to head off an effort to
definition of lead poisoning. A g
spokesperson acknowledges tha
that advises the Centers for
Disease Control and Preven-
tion (CDC) in Atlanta is get-
ting new members. But he de-
nies that the Administration
has any policy in mind and
says that the new panelists are
well qualified.

The changes to CDC's Ad-
visory Committee on Child-
hood Lead Poisoning Preven-
tion are the latest of several
that have raised concerns
about scientific advice (see
Editorial, p. 703). This change
comes at a critical time for the C
mittee: It is examining studies s
that lead is harmful below the allo
el of 10 micrograms per deciliter
blood. If the panel decides that
amount of lead is harmful, it cou
mend lowering exposure. This wo
prompt tighter cleanup regulatio
would be expensive for the lead
and owners of housing with le
paint to implement.

The CDC changes also come a
time in litigation over lead's toxi
Rhode Island, following the mode
that sued the tobacco industry, is s
paint producers to recover the cost
lead-poisoned children and remov
bling paint from old buildings. Son
lion U.S. housing units still had l
paint in the late 1990s, according t
survey. Lowering the level deeme
would increase the number of child
and probably boost damage claims.

In the 1960s, doctors diagn
poisoning if the blood level was
μg/dl, exposure that can cause s

5 μg/dl. CDC seemed agreeable: The *St. Louis Post-Dispatch* last summer quoted Richard Jackson, head of the CDC division that deals with childhood lead toxicity, as predicting that the committee would recommend lowering the lead standard and CDC "would go along."

But Jackson isn't commenting now. And the Administration's critics see the latest committee changes as a reversal. The CDC's advisory panel overhaul was documented by an environmental group, the Natural Re-

732

EDITORIAL

An Epidemic of Politics

Americans have come to accept the role of politics in the appointment of certain kinds of public officials. Few of us are surprised, though some may be disappointed, when a federal judgeship is awarded because the candidate passes a litmus test of loyalty to some principle important to the president's party. Scientific appointments, however, should rest on more objective criteria of training, ability, and performance—at least, that's what this community has always believed. Thus we can view with relative calm the interrogation of a future secretary of Health and Human Services (HHS) about his views on abortion. But it seems out of place when appointees to scientific advisory committees are subjected to tests of political loyalty. And study section membership, which involves peer review of scientific proposals, surely ought to be free of such barriers to entry.

During the past fall, *Science* published several news stories related to this practice. One involved the wholesale replacement of members of the advisory committee to the Centers for Disease Control and Prevention's (CDC's) National Center for Environmental Health, without consultation with the center's director. Another involved CDC's Advisory Committee on Lead Poisoning and Prevention. Still another covered the National Human Research Protections Advisory Committee and the Advisory Committee on Genetic Testing. Perhaps most telling was the revamping of the membership of the study section that evaluates grants for the study of workplace injuries for the National Institute of Occupational Safety and Health. Advisory committees might have been vulnerable to occasional stacking of this kind in the past, though it is a bad idea. But study sections?

> Scientific appointments should rest on more objective criteria.

The present epidemic, in which advisory committees are shut down and reassembled with new members, and candidates are subjected to loyalty tests, seems old hat to some observers. "After all, that's fairly standard practice," we have been told by officials in HHS. Well, it isn't—or at least it wasn't. What's unusual about the current epidemic is not that the Bush administration examines candidates for compatibility with its "values." It's how deep the practice cuts; in particular, the way it now invades areas once immune to this kind of manipulation.

In this space in the 25 October 2002 issue, *Science* published an editorial by David Michaels and a group of colleagues. Several were distinguished former public servants who had been involved with some of the committees in question, and they brought a useful personal-experience perspective to the matter. Their piece was a story in itself, but what followed was even more interesting. It loosed a volley of letters to us in which scientists told of similar experiences. Here are two examples:

A nominee for the National Institutes of Health Muscular Dystrophy Research Coordinating Committee is vetted by a staffer from the Office of White House Liaison, Health and Human Services. After being asked about her views on various Bush administration policies, none of them related to the work of the committee, she is asked whether she supports the president's embryonic stem cell policy.

A distinguished professor of psychiatry and psychology receives a call from the White House about his nomination to serve on the National Council on Drug Abuse. His interviewer declares that he must vet him to "determine whether he held any views that might be embarrassing to the president." A series of questions follows, into which the interviewer interpolates a running score, viz.: "You're two for three; the president opposes needle exchange on moral grounds regardless of the outcome." He then asks whether the candidate had voted for Bush, and on being informed that he had not, asked: "Why didn't you support the president?"

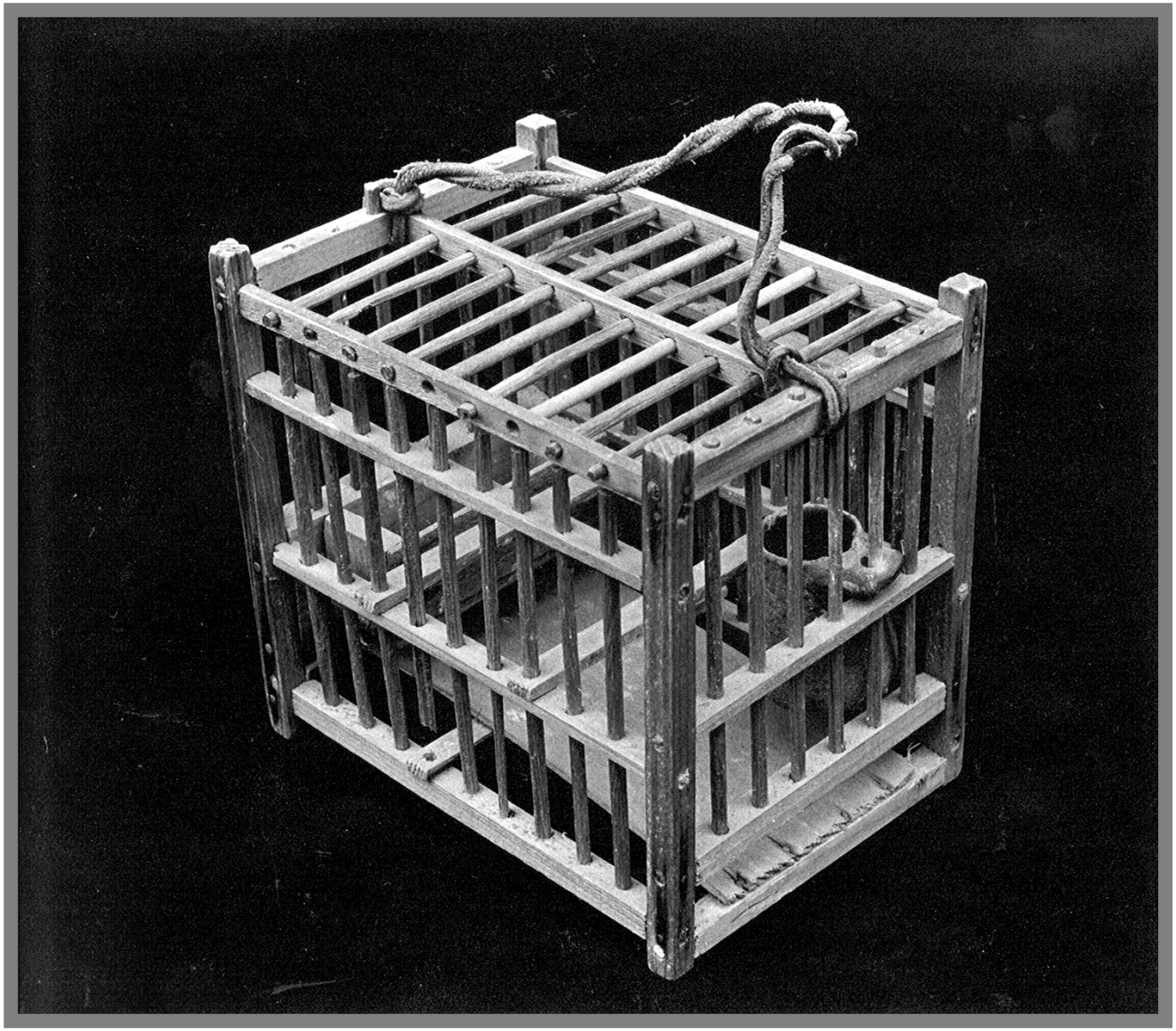
This stuff would be prime material for a Robin Williams comedy shtick, but it really isn't funny. The purpose of advisory committees is to provide balanced, thoughtful advice to the policy process; it is better not to put the policy up front. As for study sections, deciding which research projects to support has always been a matter for objective peer review. Political preferences are for the pork barrel, and the Congress is already doing too much of that. Indeed, the applicable statute for all this—the Federal Advisory Committee Act—specifically requires that committees be balanced and "not inappropriately influenced by the appointing authority." It would be a good idea for HHS Secretary Tommy Thompson and the White House Personnel Office to read the law, and then follow it.

Donald Kennedy

www.sciencemag.org SCIENCE VOL 299 31 JANUARY 2003 625

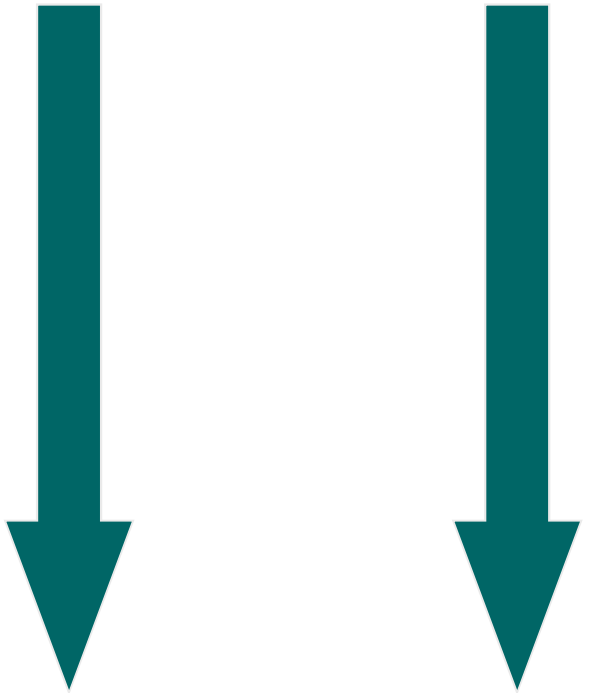
Rhode Island

„A megelőzés alkatrésze”



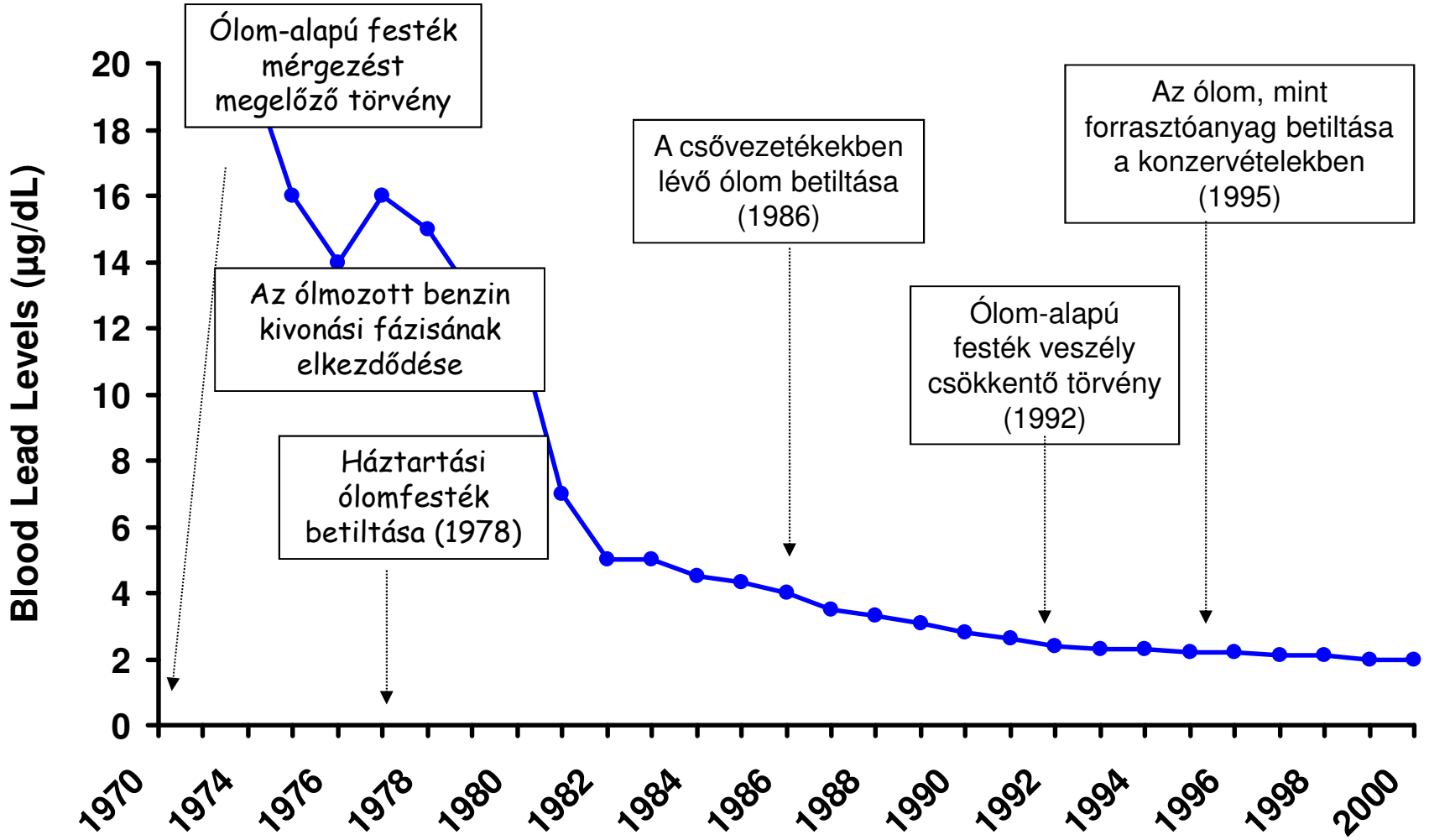
A megelőzés formái

- Oktatás / Nevelés
- Törvények alkalmazása
- Műszaki tudományok



> Költség > Hatékonyság

A gyermekek vér-ólom szintjének hanyatlása a szabályozások eredményeként



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Köszönöm a figyelmet!