

Figure 2

World lead smelter and lead alkyl production since 1750 AD. Data from Murozumi et al².

LEAD IN HISTORY

Used 6000 years ago in Asia Minor

**Used by Romans to sweeten ciders and wine
may have contributed to Fall of Roman Empire**

**Hippocrates (c.370 BC) described first case of lead
colic in a metal extractor**

**Nicandor (c. 200 BC) noted association of lead
with palor, constipation, colic and paralysis**

**1978 (AD) - Lead Standard adopted by U.S.
Occupational Safety and Health Administration**

FOOD, DRINKING WATER

Canning - low pH, solder and glaze

Urban agriculture

Soft water and lead pipes

Pottery glaze

OTHER SOURCES

Toys and figures

Folk remedies: azarcon, greta, pa-lu-a

Gasoline sniffing

**Burning old car oil, colored newsprint,
batteries, lead-painted wood**

**BECAUSE INITIAL PRESENTATION CAN BE
UNCLEAR THINK OF LEAD TOXICITY IN:**

- Complaints in lead exposed worker**
- Any child with new behavioral, neuropsychiatric,
or eating problem**
- Child or adult with undiagnosed neurological disorder**

EFFECTS OF LEAD

Neurological

Reproductive

Renal

GI

Metabolic

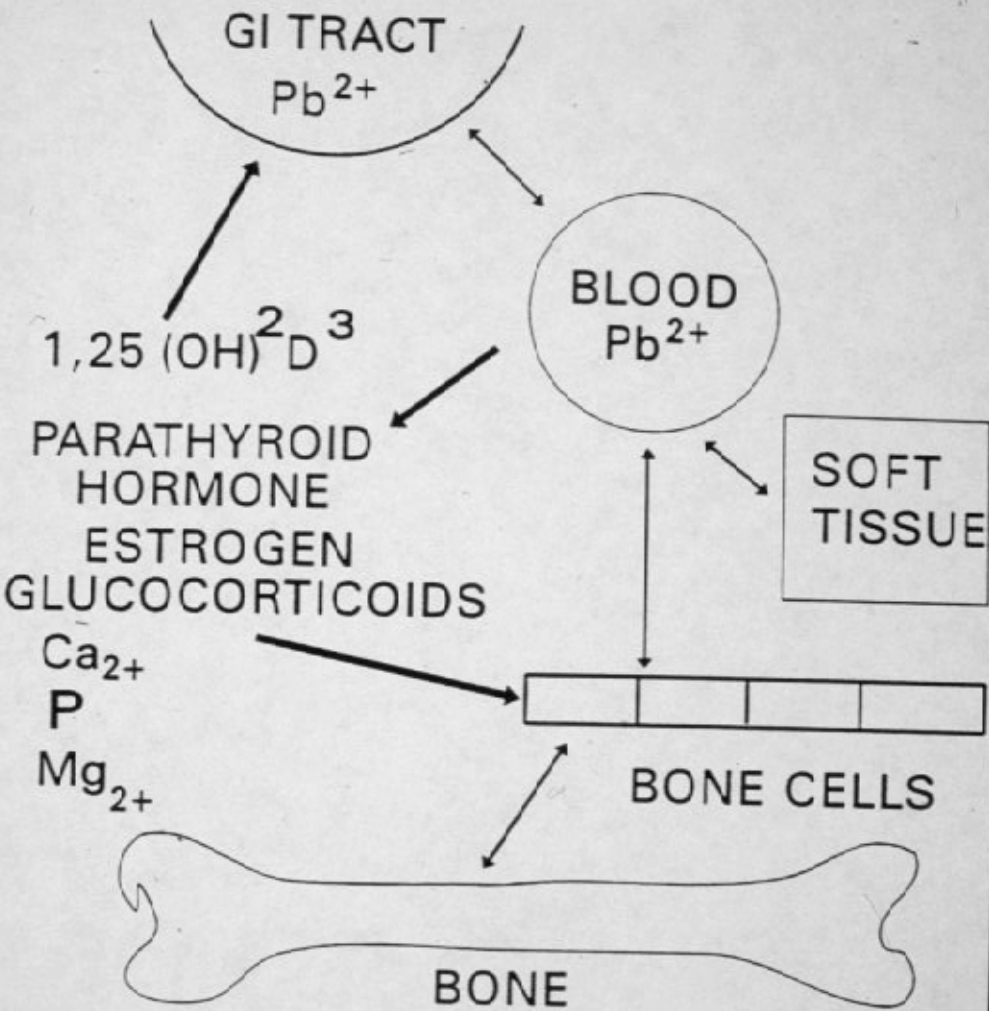
Endocrine

Musculoskeletal

Hematologic

ADULT LEAD POISONING

- 1. Confirm Pb level, ZPP**
- 2. End exposure**
- 3. Chelate for severe symptoms**
- 4. Follow up Pb, workplace, other exp.**



EFFECTS continued...

Reproductive

Females

- Miscarriage, still birth
- Inability to conceive

Males

- Inability to conceive
in wives of workers

Sperm abnormalities:

counts, abnormal forms

Dose response relationship

SOURCES: LEAD - EXPOSED TRADES

Battery Manufacture - Lead Smelters

Foundries - "Deleaders"

Radiator Repair - Firing Ranges

Others with "Low level Exposure"

Non-Occupational Sources

Figure 1

Two Pool Kinetic Model of Lead Burden in Adults

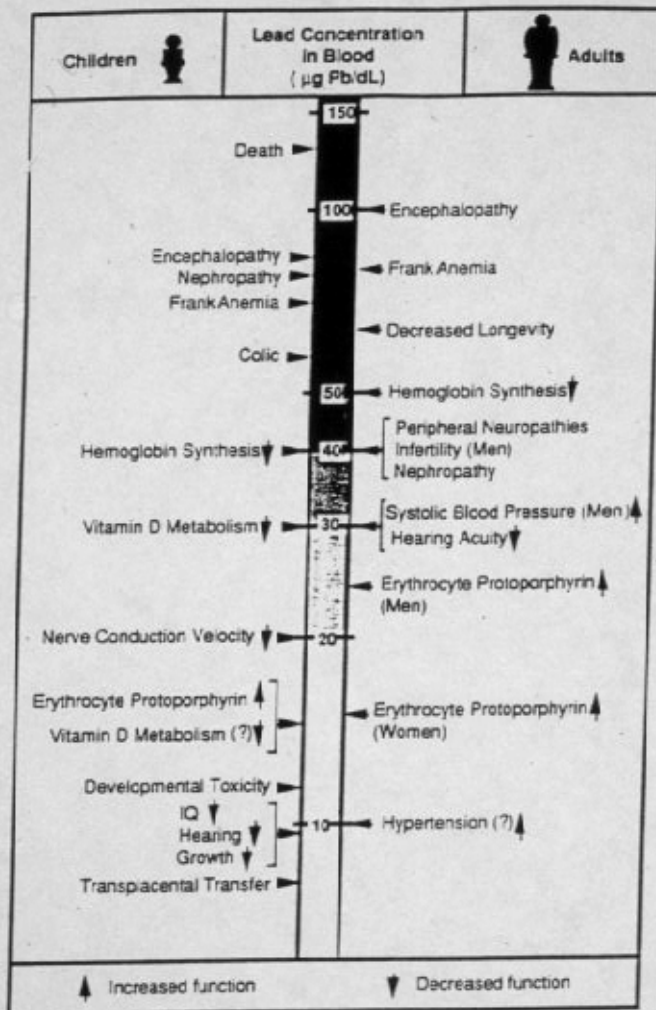


Figure 1. Two pool kinetic model of lead burden in adults. It is assumed that all of the lead in the body is associated in one of the two pools. The blood pool includes circulating blood and tissues equilibrating with blood. The bone pool is comprised of pools with several degrees of release time and not all of the lead in bone is equally exchanged with blood.

(Adapted from: M.B. Rabinowitz. 1991. Kinetics of bone lead. Environmental Health Perspectives 91:33-37.

LESS-DEVELOPED COUNTRIES

DEVELOPED COUNTRIES

1990
2025

AGE GROUP
OVER 65

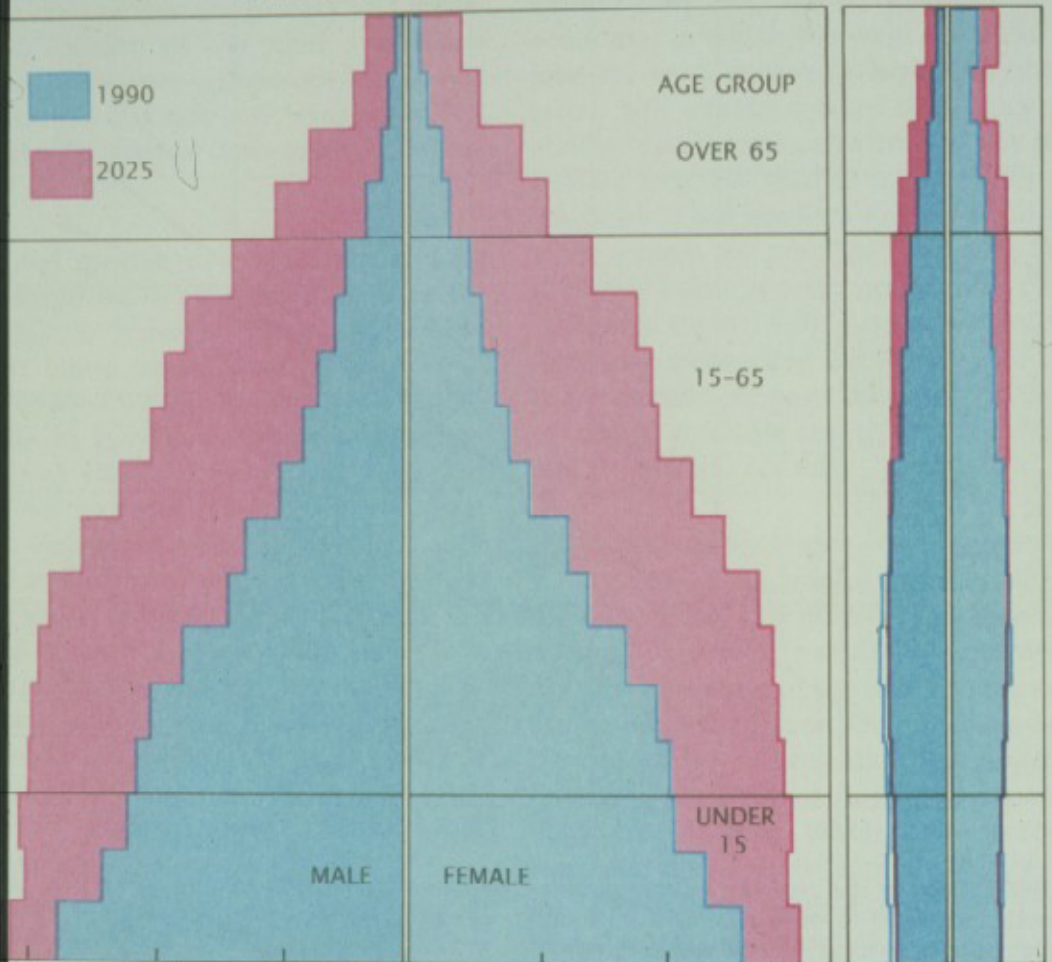
15-65

UNDER 15

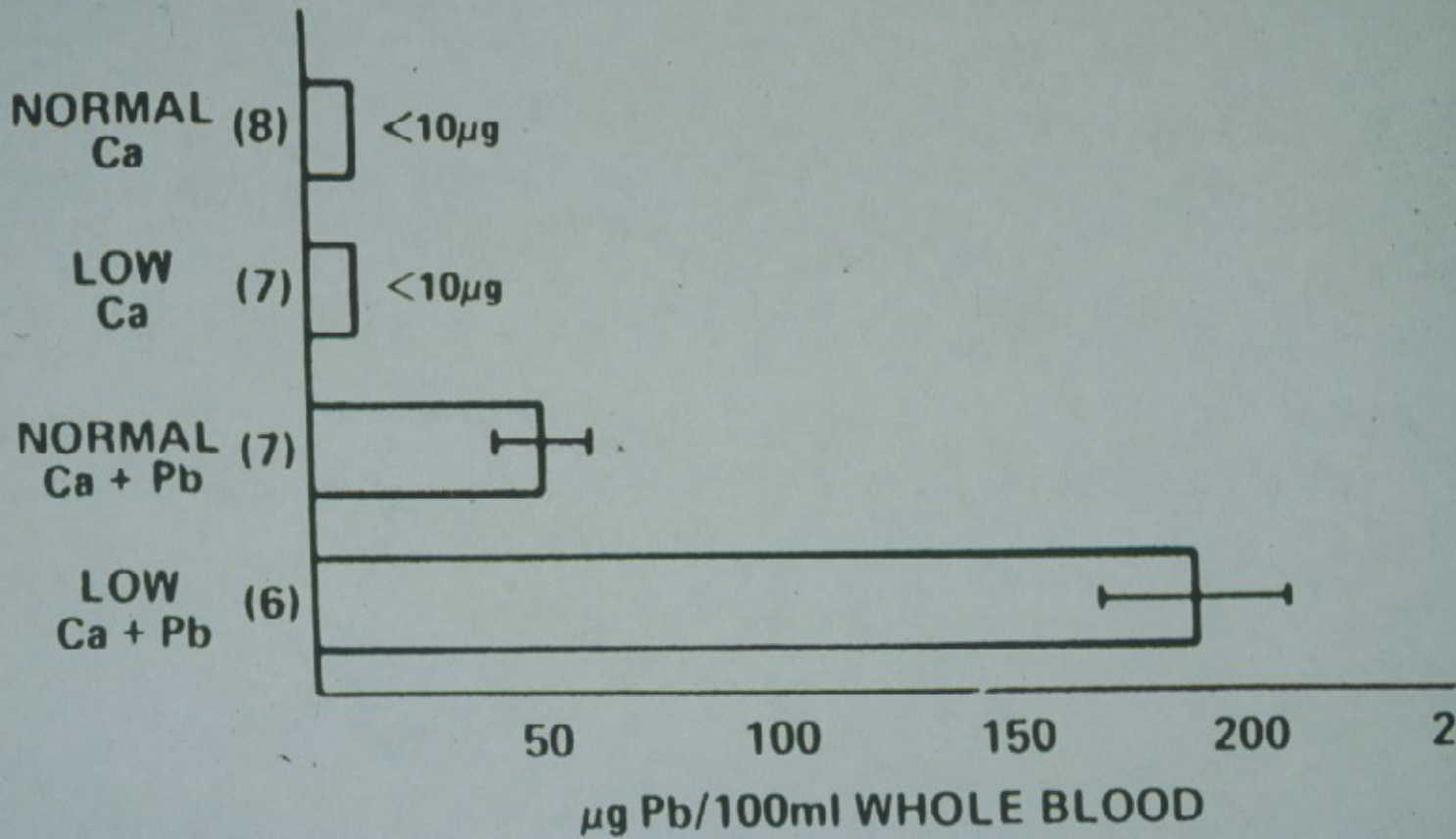
MALE

FEMALE

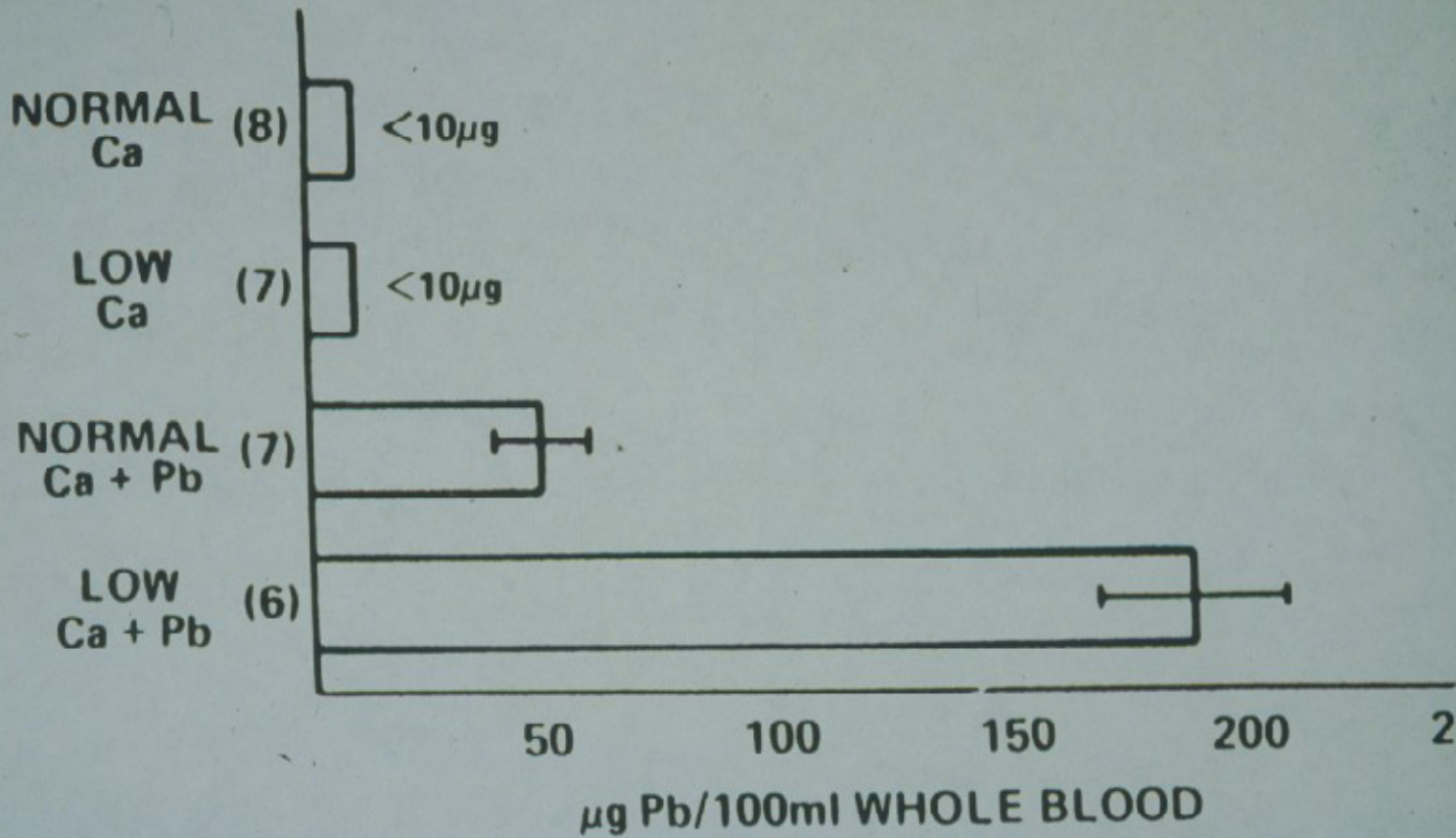
300 200 100 0 100 200 300 50 0 50
MILLIONS MILLIONS



DIET



DIET



Lead Paint

- **Primary source of high-dose exposure**
- **Old paint - 50% Pb**
 - 27 million homes
 - now 600 ppm (.06%) limit
- **New marine, industrial paint**
- **Pica, normal mouthing**
- **Bystander in deleading, renovations**

LEAD POISON PREVENTION PROGRAMS

Blood lead screening

Lead abatement activities

Training

Licencing

Protocol for removal

Hazardous waste disposal

Public information and education

NUTRIENT-LEAD INTERACTIONS

<u>Nutrient Deficiency</u>	<u>Effect Reported in Animal Models</u>
Calcium	Increasing bone turnover of lead with distribution to soft tissues, increased GI absorption of lead (Meredith et al., 1977)
Iron	Enhances G.I. absorption of lead, possibly increased cellular transport of lead (Mahaffey-Six and Goyer, 1972)
Phosphorus	Increased GI absorption of lead (Quarterman and Morrison, 1975)
Vitamin D	Lead inhibits formation of active metabolite of vitamin D (Mahaffey et al., 1982)
Increases in dietary fat absorption	Increases G.I. lead absorption (Barltrop and Khoo, 1975)
Zinc	Increasing zinc levels reduce ALAD inhibition by lead (Mahaffey, 1982)

Priority Groups For Childhood Screening

- Old homes
- Inner city, near highway
- Prior plumbism, family history
- Poor children
- 1 - 3 years of age
- Pica, behavioral

GRADUAL DECREASE IN INCIDENCE OF INFLUENZA
AS POPULATION ANTIBODY RISES

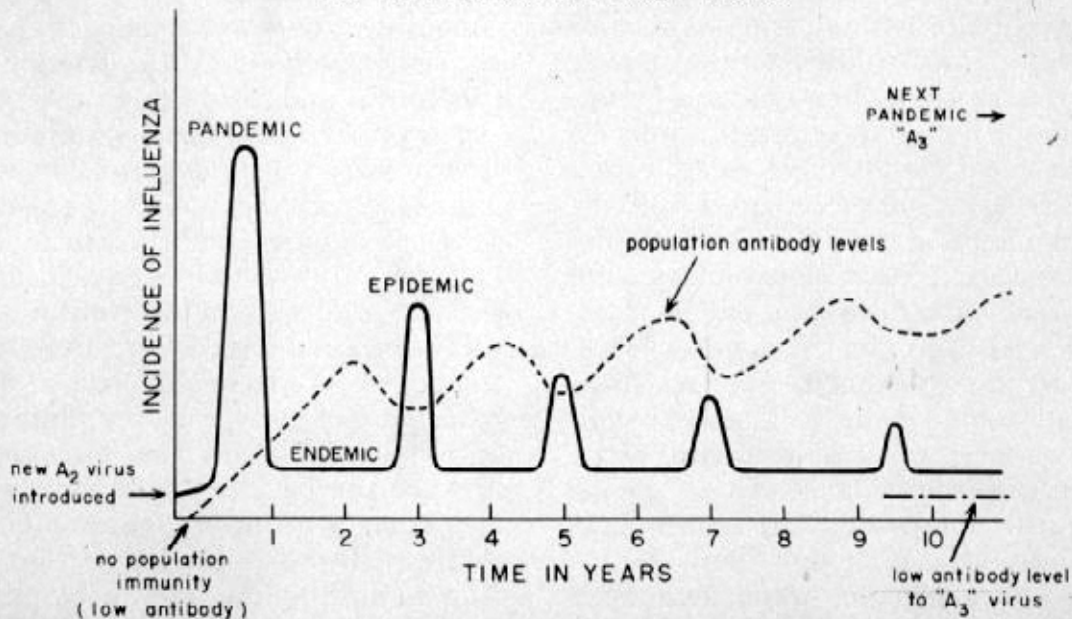


Figure 2. Schematic representation of the correlation of influenza incidence and mean population antibody levels after introduction of a new influenza virus variant. (From Kilbourne, E. D.: Sandoz Panorama, 6:7, 1968.)