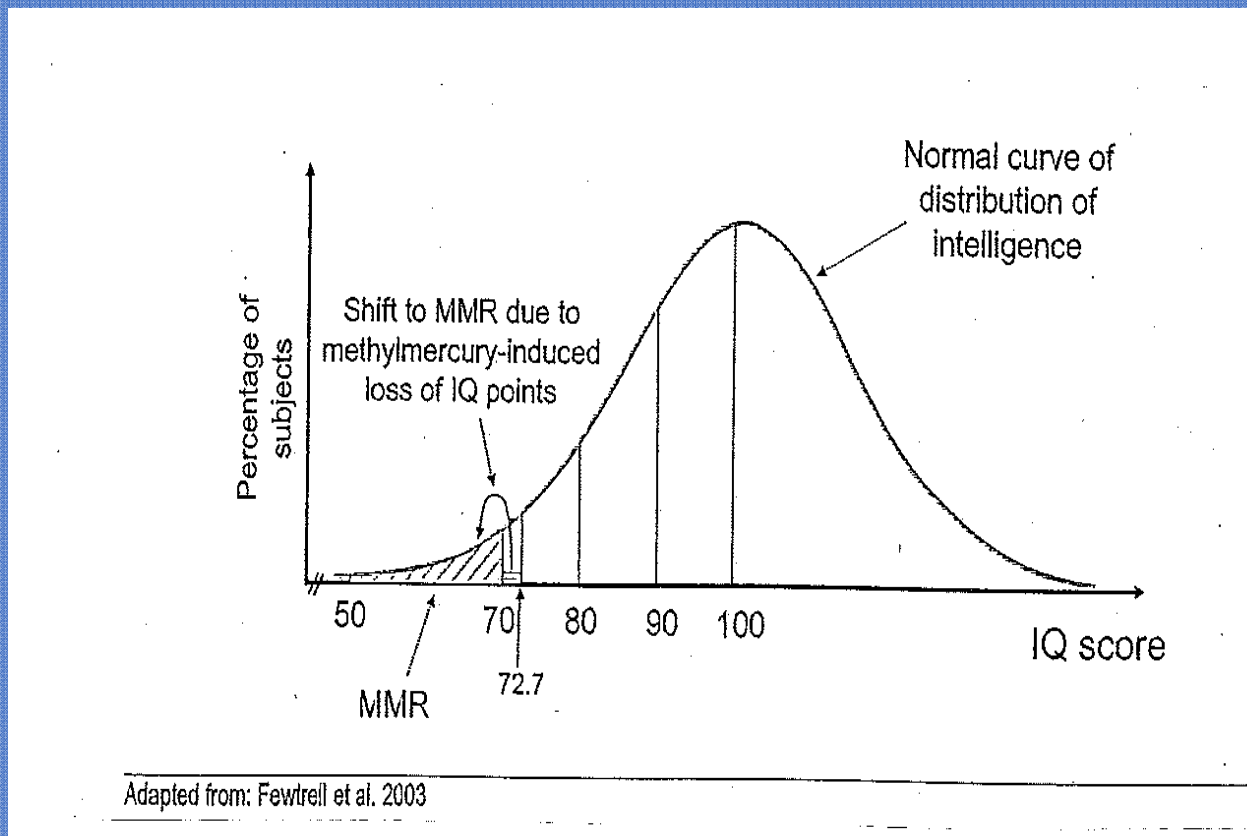


Burden of Disease Associated with MeHg-Related IQ Loss

IQ loss not a disease, so estimate how frequently IQ loss will result in a case of intellectual disability (ID) (IQ < 70), i.e., the number of people with IQ above 70 who would enter ID range as a result of MeHg-induced IQ loss



Mortality Rates for Ischemic Heart Disease by Baseline Systolic/Diastolic Blood Pressure (Prospective Studies Collaboration, *Lancet* 2002;360:1903-13)

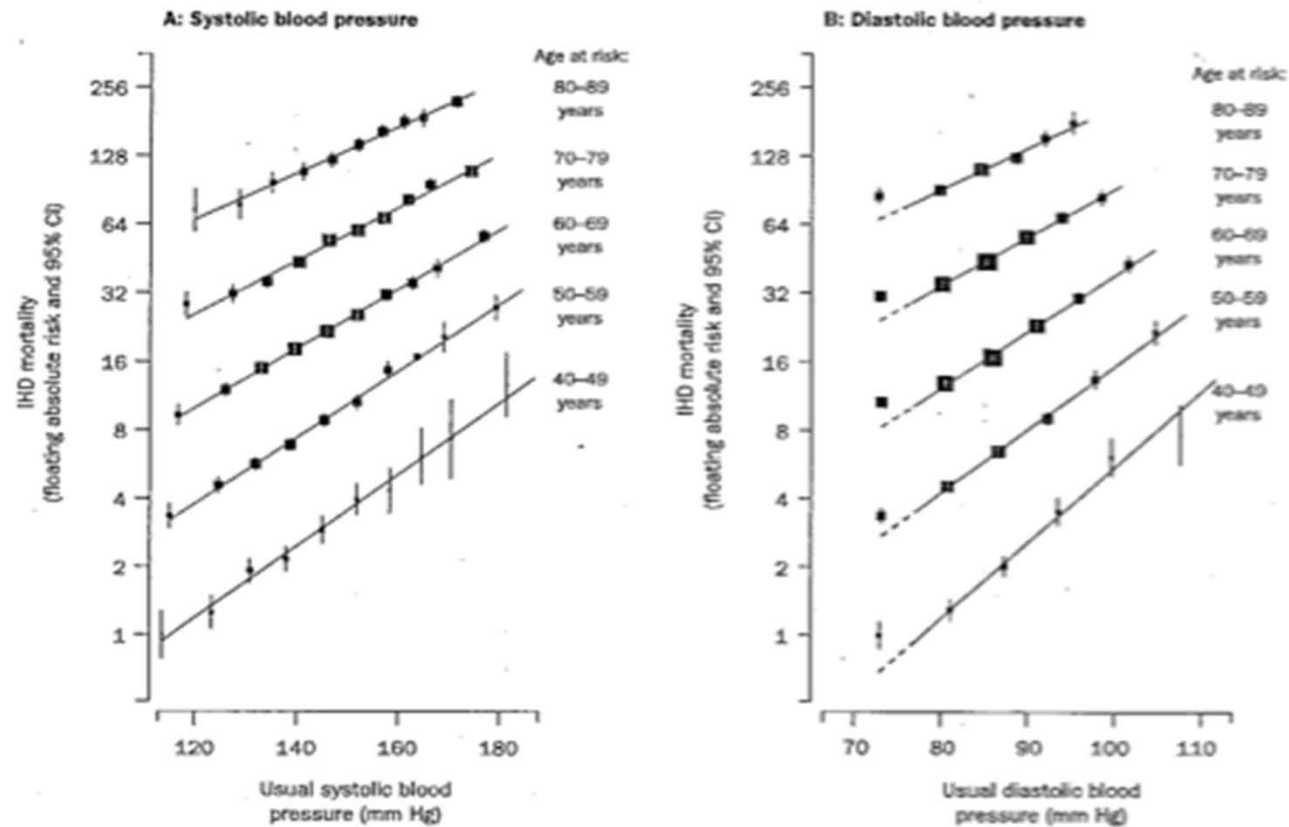
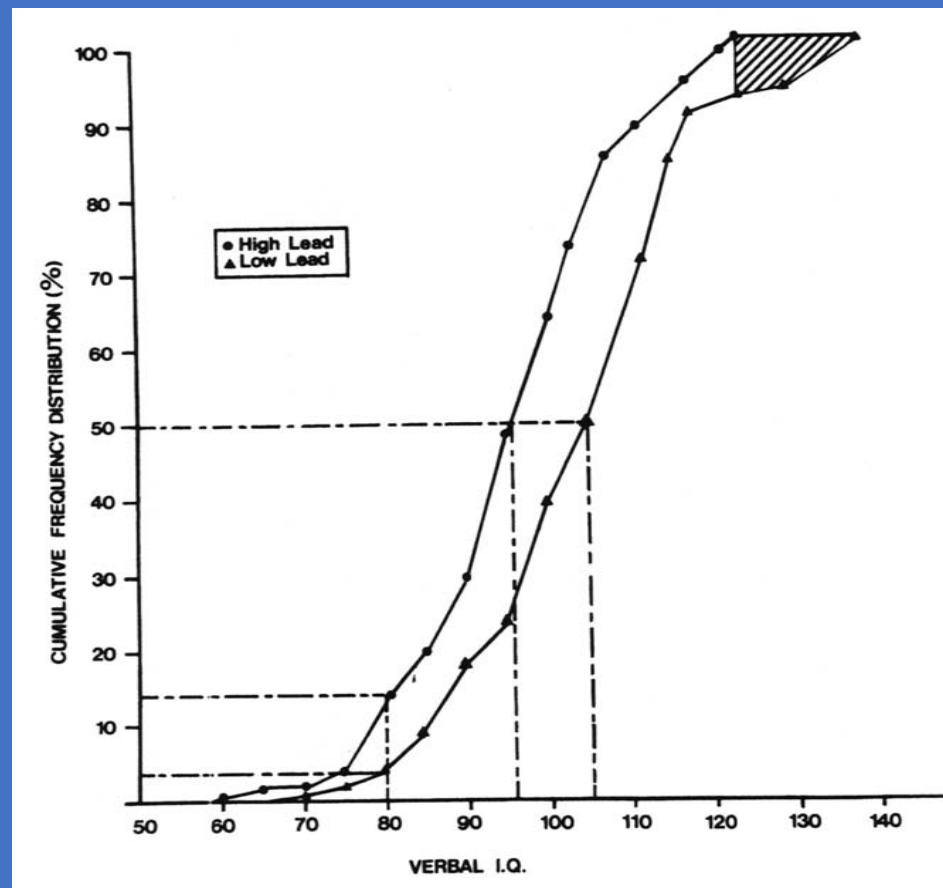


Figure 4: Ischaemic heart disease (IHD) mortality rate in each decade of age versus usual blood pressure at the start of that decade. Conventions as in figure 2.

Example of importance of considering *both* effect size and prevalence in considering population impact: Risk of Down Syndrome by maternal age

Maternal age (years)	DS cases/1000 births	Total Births (as % of all ages)	% of Total DS cases
<30	0.7	78	51
30-34	1.3	16	20
35-39	3.7	5	16
40-44	13.1	0.95	11
>44	34.6	0.05	2
All ages	1.5	100	100

Cumulative Frequency Distributions of Children's Verbal IQ Scores, by Dentine Lead Concentration



Needleman et al. *New England Journal of Medicine* 1982;306;367

Table 1. Estimated numbers of FSIQ points lost from lead exposure for children in different intervals of the blood lead distribution.

Range of the BLL distribution (µg/dL)	Midpoint BLL (µg/dL)	FSIQ loss ^a	No. of children	No. of FSIQ points lost
0 to 50th percentile (0–1.43)	0.72	0.37	12,750,000	4,717,500
50th to 75th percentile (1.43–2.10)	1.77	0.90	6,375,000	5,737,500
75th to 90th percentile (2.10–2.98)	2.54	1.30	3,825,000	4,972,500
90th to 95th percentile (2.98–3.80)	3.39	1.73	1,275,000	2,205,750
95th to 98th percentile (3.80–7.50)	5.65	2.88	765,000	2,203,200
> 98th percentile (> 7.50)	15	6.10	510,000	3,111,000

Abbreviation: BLL, blood lead level.

^aThe FSIQ losses associated with blood lead intervals < 98th percentile were calculated by multiplying the midpoint BLL in an interval by –0.51 IQ points/µg/dL, the slope estimated for BLL < 10 µg/dL in the pooled analysis (Lanphear et al. 2005). The midpoint BLL of children with a BLL > 98th percentile was assumed to be 15, and the FSIQ loss was assumed to be 6.10 points (5.1 points lost up to a BLL of 10 µg/dL and an additional 1 point, which is one-half of the FSIQ loss estimated in the pooled analyses to be associated with an increase in BLL from 10 to 20 µg/dL).

Total number IQ points lost in population: 22,947,853

Total IQ Losses Associated with Medical Events/Conditions, US Children 0-5 Years (Bellinger, *Environ Health Perspect* 2012; 120:501-7)

Event/Condition	Total Number of IQ points Lost
Brain tumors	37,288
Duchenne muscular dystrophy	68,850
Congenital heart disease	105,805
Chemotherapy (ALL)	135,788
Type 1 diabetes	185,640
Methylmercury	1,385,785
Pediatric bipolar disorder	2,203,200
Traumatic brain injury	4,856,086
Nonorganic failure to thrive	5,355,000
Autism spectrum disorders	7,018,563
Iron deficiency	9,409,510
ADHD	16,799,400
Organophosphate pesticides	18,978,019
Lead	22,947,853
Preterm birth	34,031,025

Estimated Loss of IQ in US Children at Different Intervals of Blood Lead ($\mu\text{g}/\text{dL}$)

