

# **NTP Board of Scientific Counselors Working Group: Text Related to an IQ Statistic**

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Working Group Chair

NTP Board of Scientific Counselors Meeting  
May 16, 2023

- May 4, 2023, the NTP Board of Scientific Counselors (BSC) approved the Working Group report in full, with exception of text for 8.P (page 323) related to an IQ statistic
- BSC asked the Working Group to verify or correct the text

**8.P:** Discussion section: “Although the estimated decreases in IQ may seem small, research on other neurotoxicants has shown that subtle shifts in IQ at the population level can have a profound impact on the number of people who fall within the high and low ranges of the population’s IQ distribution.”

**comment:** Does this imply that fluoride causes a shift in intelligence at all levels of exposure (e.g., including at 0.7 mg/L)? If that is not the intent, this passage could be misleading.

**Response: Disagree (no change)**

- We do not consider this statement to be misleading. Using [redacted] example, total fluoride exposure among individuals living in optimally fluoridated areas (0.7mg/L in drinking water) may be higher than 0.7mg/L, dependent on personal behaviors and habits. We discuss the potential for this type of variation in the manuscript.

### **BSC WG Assessment:**

The BSC WG considers the NTP authors’ response to the reviewer’s comment inadequate.

The BSC WG agrees that subtle shifts in mean IQ at the population level could have a large impact. The BSC WG notes that fluoride exposure among individuals in optimally fluoridated areas could be higher or lower than 0.7 mg/L depending on personal behaviors and habits. The BSC WG has concern about the next sentence in the Discussion section of the draft M-A Manuscript: “For example, a 5-point decrease in a population’s IQ, would nearly double the number of people classified as intellectually disabled (reference 55).” Table 2 of the M-A Manuscript lists the Overall Mean Effect on IQ in 55 studies as -0.46 (-0.55, -0.37). Given that the mean effect size is ~ a half a point in mean IQ, that the studies included in the meta-analysis have very indirect measures of exposure (mean effects), and that the heterogeneity in this meta-analysis is very high, the BSC WG recommends that the authors present an example more consistent with their data.

Text  
under  
review by  
BSC  
Working  
Group

- Table 2 of the Draft Meta-Analysis Manuscript (page II-36) presents the Standardized Mean Difference (SMD)
  - Assuming a standard deviation of 15 points for IQ, a SMD of -0.46 would equate to a decrease of 7 points in IQ
    - $-0.46 \times 15 = -6.9$  (~7 IQ points)
  - Example in the Discussion section of the Draft Meta-Analysis Manuscript that presents a 5-point decrease in a population's IQ is correct
- BSC Working Group has completed its review and determined that the text in the Working Group's assessment related to the IQ statistic is in error
- BSC Working Group has revised its assessment for 8.P

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# Questions?