Today's focus: Intersection of Lead and Water!

How have we talked about water before?

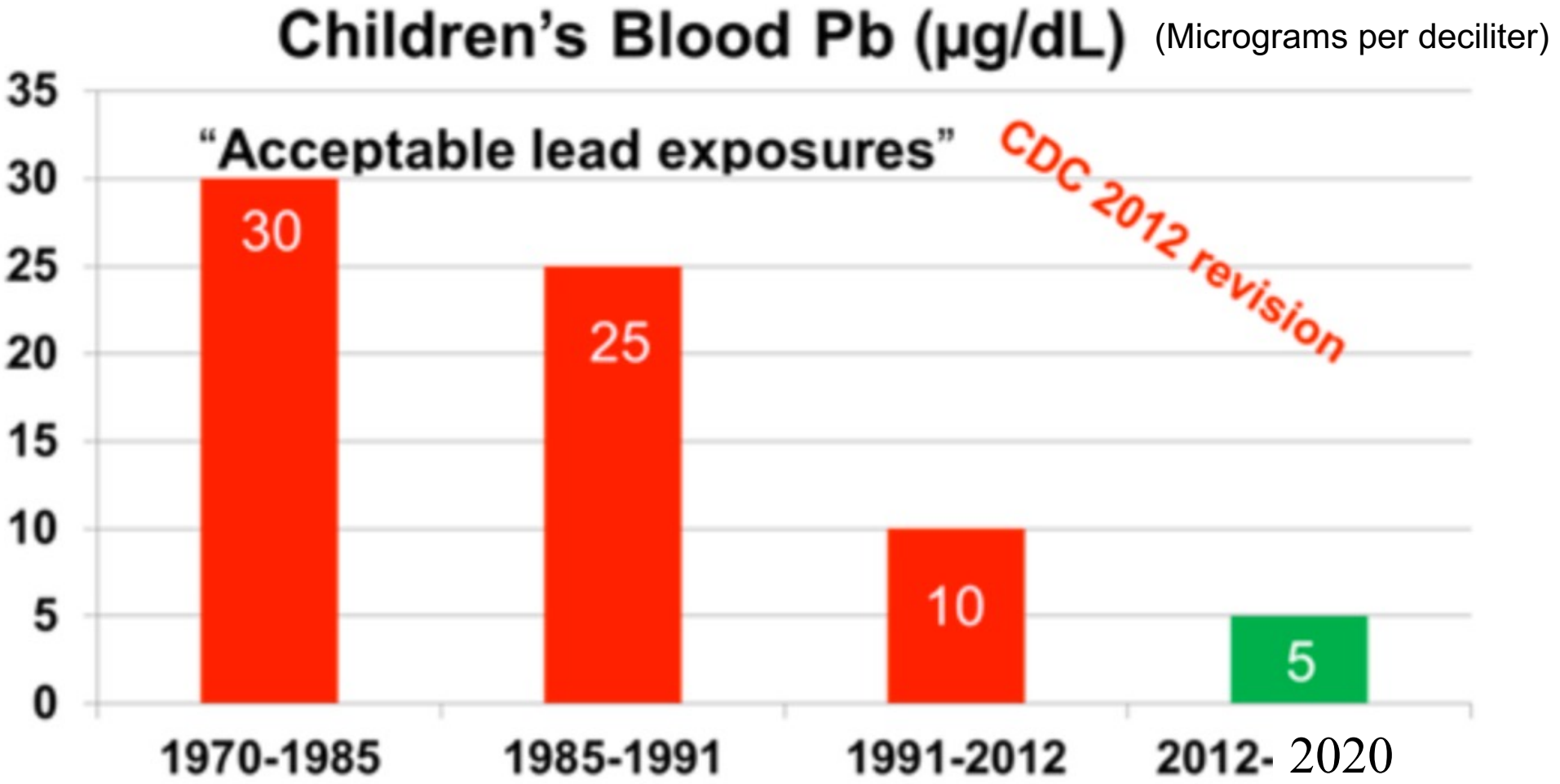
Things to think about….

- Children-Why small bodies are affected more than adults?
- Social Justice-Burden of lead exposure is not evenly distributed.
- How successful have we been in managing lead exposure?

http://lead.tulane.edu/lead_poisoning.html

How have our lead standards changed?

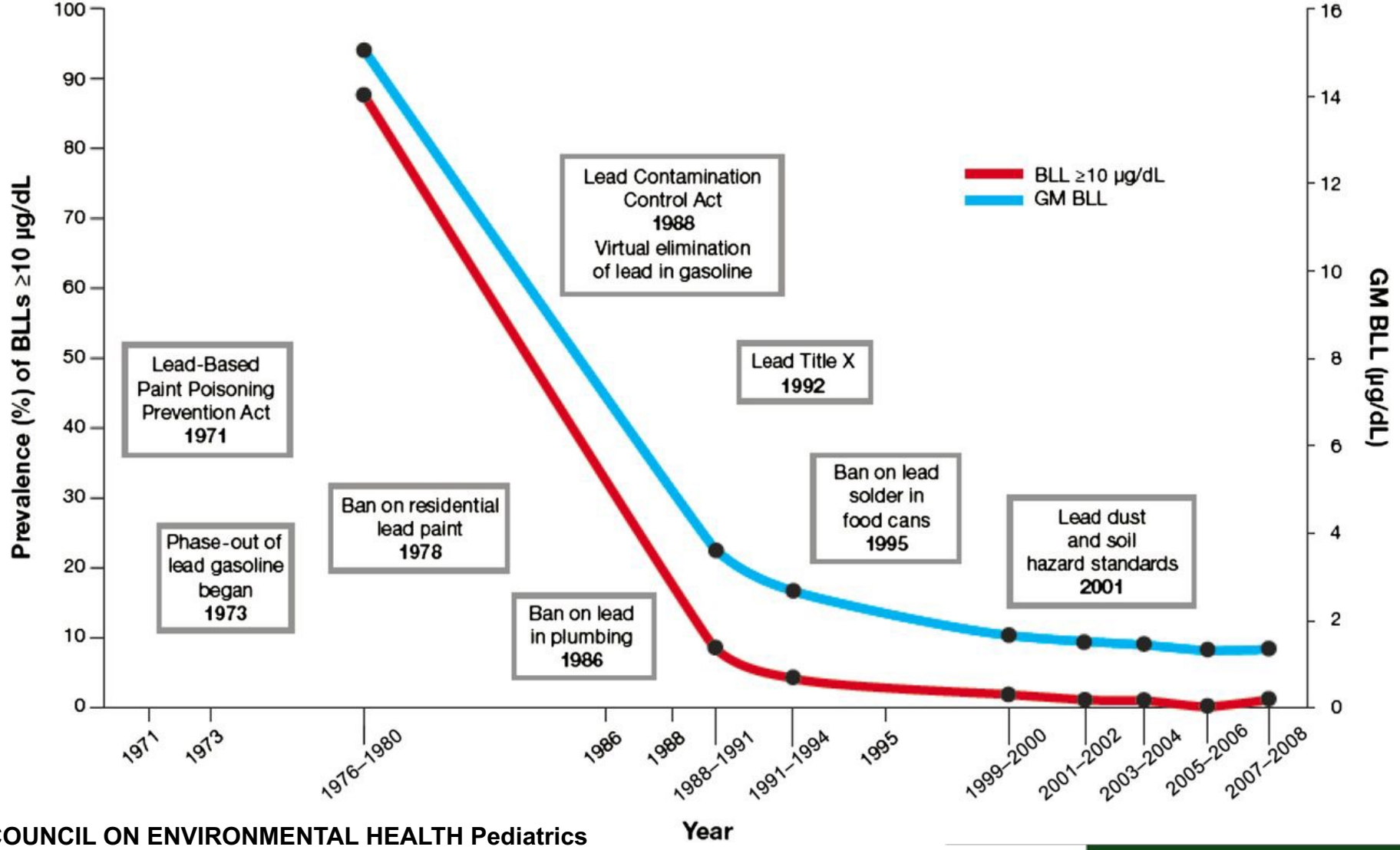
Do you think we ever increase "allowable exposures"?



→ **2021** CDC lowered it again from 5 to 3.5 µg/dL.

Timeline of lead poisoning prevention policies and blood lead levels in children aged 1–5 years, by year—NHANES (National Health and Nutrition Examination Survey is a program of studies designed to assess the health and nutritional status- National Center for Health Statistics) **United States, 1971–2008.**

Blue=GM=Geometric mean (ignore)



COUNCIL ON ENVIRONMENTAL HEALTH Pediatrics
doi:10.1542/peds.2016-1493

http://pediatrics.aappublications.org/content/early/2016/06/16/peds.2016-1493

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A recent article….

This paper focused on **legacy lead exposures**.

"We estimate that over 170 million Americans alive today were exposed to high-lead levels in early childhood, several million of whom were exposed to five-plus times the current reference level."

"More than 90% of those born between 1950 and 1980 experienced BLLs in excess of 5 µg/dL, the threshold considered "safe" for children. The legacy of early life lead exposure will stay in the United States for decades to come."

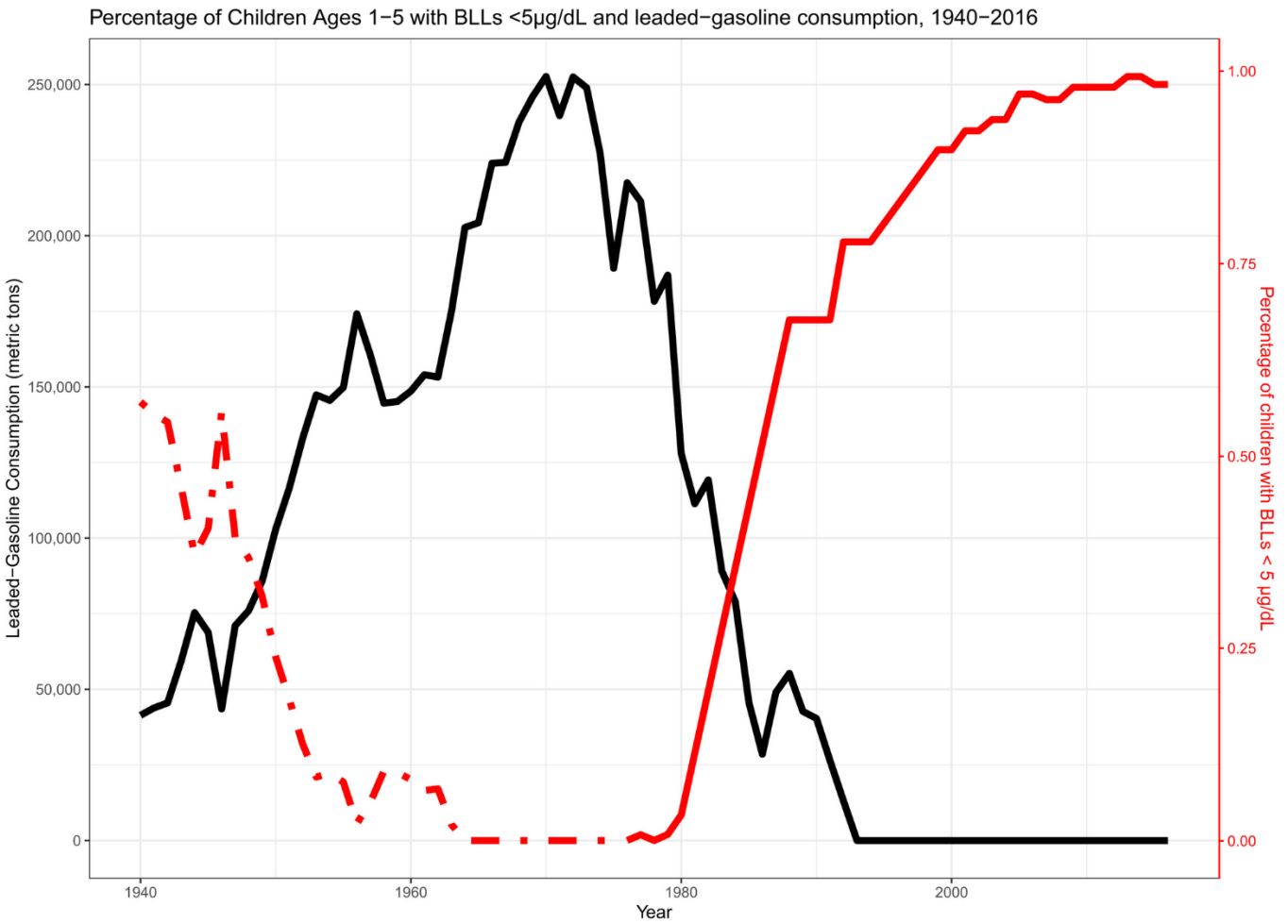
RESEARCH ARTICLE | SOCIAL SCIENCES |

Half of US population exposed to adverse lead levels in early childhood

Michael J. McFarland, Matt E. Hauer, and Aaron Reuben Authors Info & Affiliations

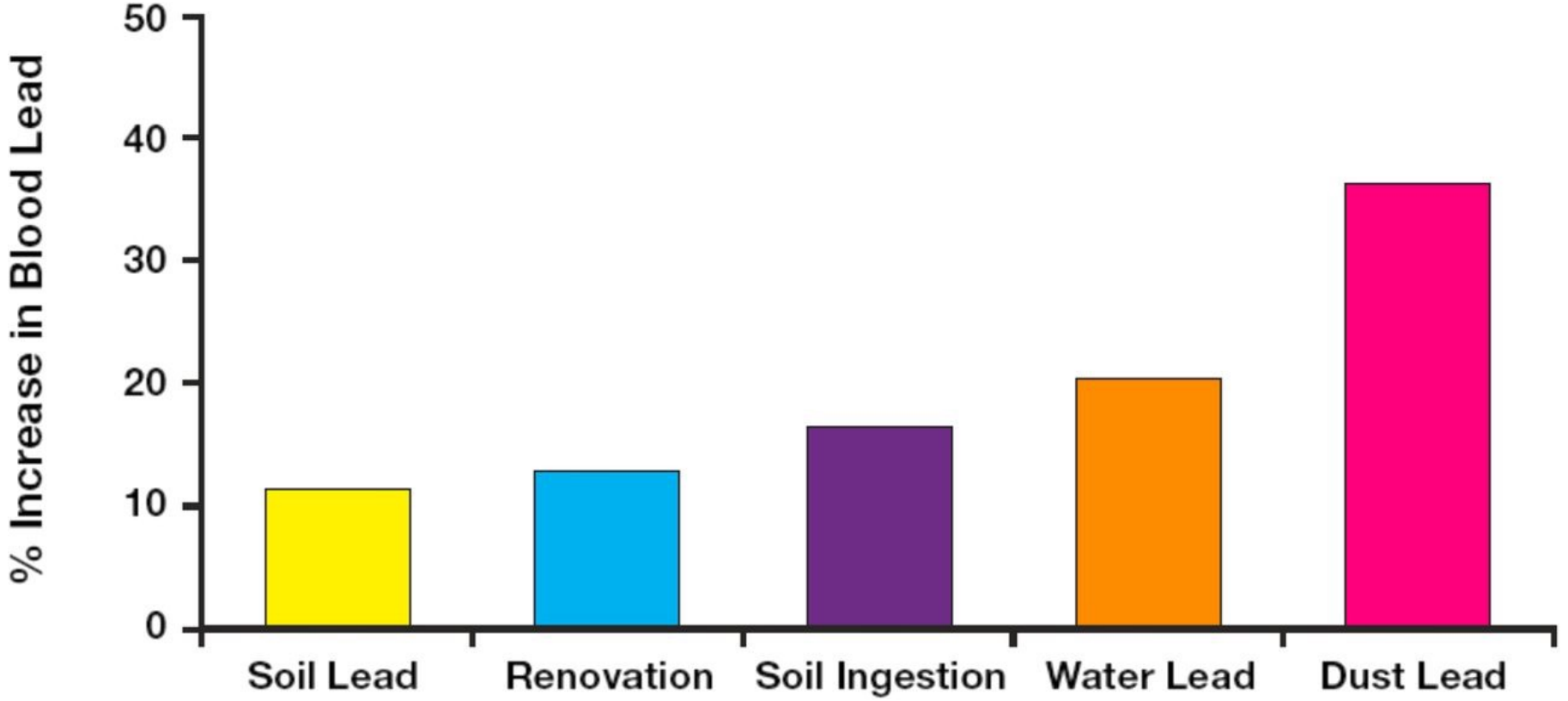
Edited by Douglas Massey, Office of Population Research, Princeton University, Princeton, NJ; received October 10, 2021; accepted December 27, 2021

March 7, 2022 | 119 (11) e2118631119 | https://doi.org/10.1073/pnas.2118631119



Leaded gasoline consumption and the percentage of children with BLLs under 5 µg/dL, 1940 to 2016. Leaded gasoline consumption comes from the Bureau of Mines Minerals Yearbook. The percentage of children aged 1 to 5 with BLLs come from 1976 to 2016 of the NHANES waves 2 to 4 (solid red line), while the dotted line is imputed from regressing childhood BLLs on leaded gasoline consumption.

Sources of high blood lead levels in kids more recently?



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Can also be found in some toys.

Behavioral and Emotional Problems of Lead Exposure

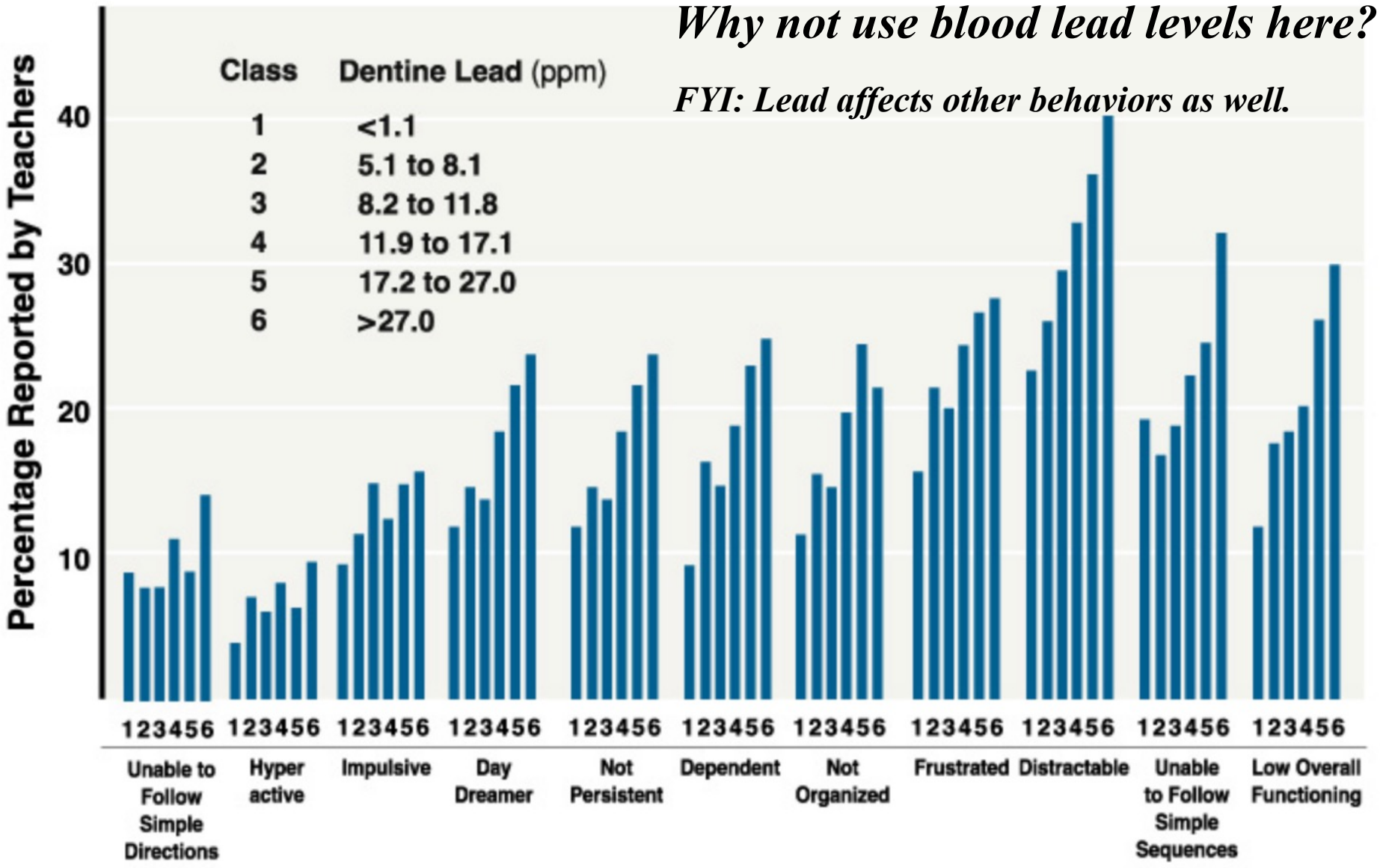


Figure 2: Children with higher concentrations of tooth lead were found to function less successfully at school. Adapted from Needleman et al., 1979, NEJM (2).

http://ehatlas.ische.ca/lead/human-impact/health-concerns

Department of Environmental Quality

Main Characters Flint Lead Podcast

EPA United States Environmental Protection Agency

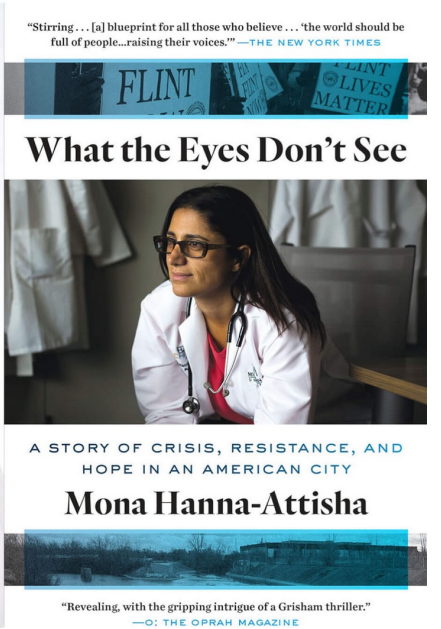


Table 1 Violations

Violations

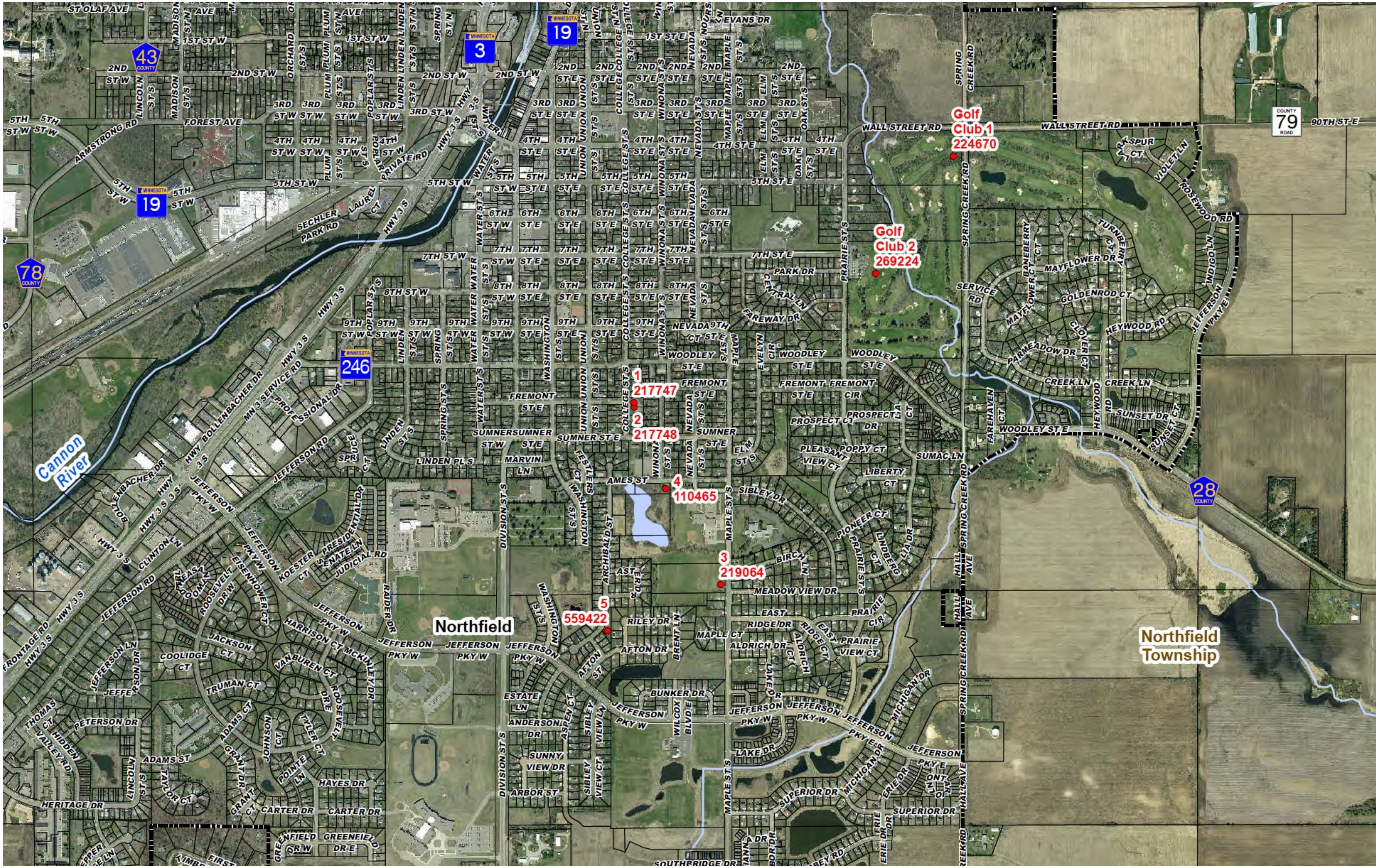
Violation Category Code	Violation Type Description	Rule Name	Contaminant Name	Compliance Status Description	Compliance Period Begin Date	Compliance Period End Date
MR	Monitoring and Reporting (DBP)	Stage 1 Disinfectants and Disinfection Byproducts Rule	Chlorine	Returned to Compliance	01-Jul-14	30-Sep-14
MR	Monitoring, Routine Minor (TCR)	Total Coliform Rule	Coliform (TCR)	Known	01-Mar-01	31-Mar-01
MR	Monitoring, Routine Minor (TCR)	Total Coliform Rule	Coliform (TCR)	Known	01-Oct-92	31-Oct-92

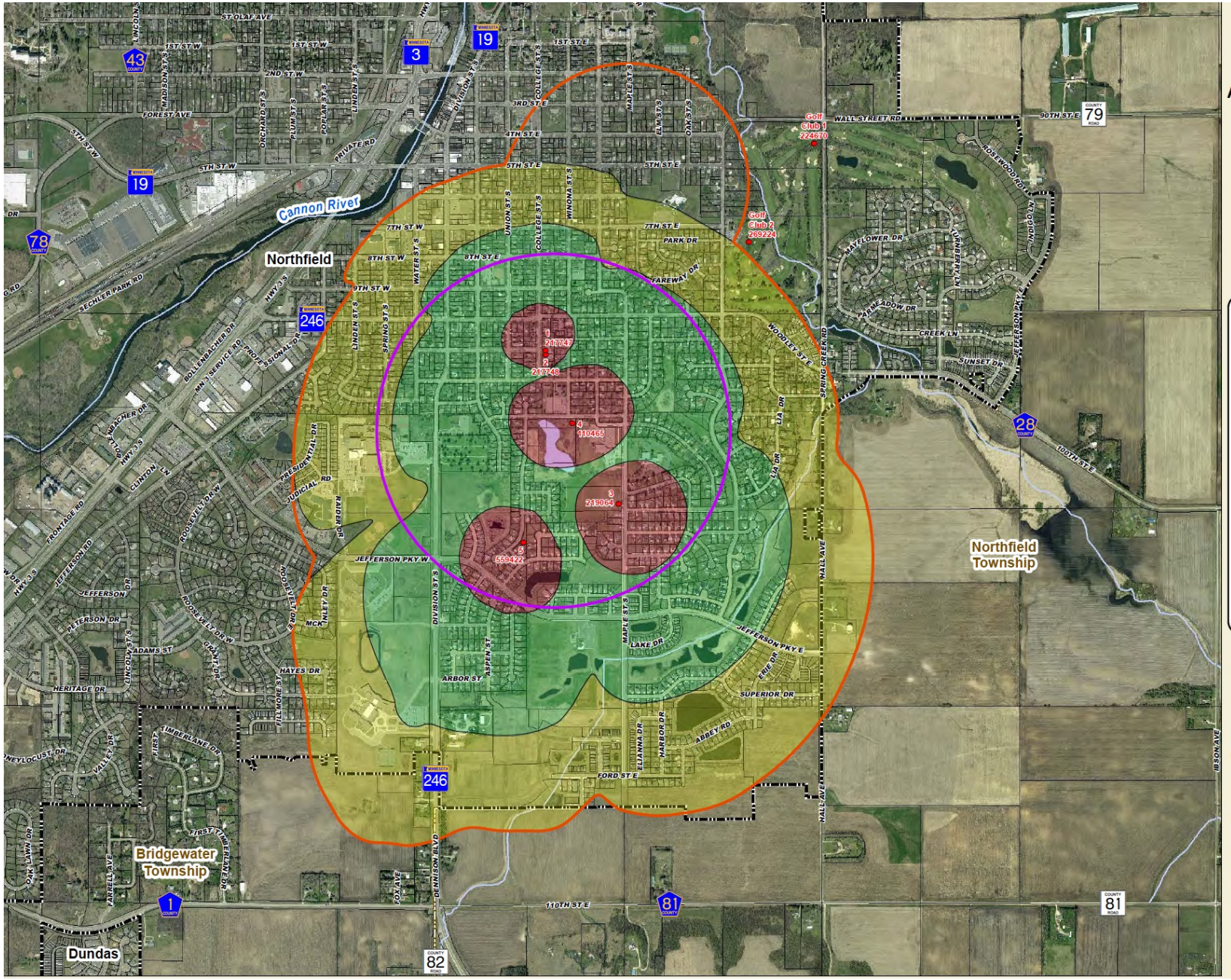
If you look at the last of the three tables you will see what they add to the water from the 5 active wells (2-6) after they pump it out of the ground. Flouride, Chlorine and Polyphosphate are added. What do these things do???

Table 3. What they add to the water.

Treatment Plants

Facility Name	Facility Id	Treatment Process	Treatment Objective
Well #6 Entry Point	18	Fluoridation	Other
Well #2 Entry Point	5	Fluoridation	Other
Well #3 Entry Point	6	Fluoridation	Other
Well #4 Entry Point	7	Fluoridation	Other
Well #5 Entry Point	8	Fluoridation	Other
Well #6 Entry Point	18	Gaseous Chlorination, Post	Disinfection
Well #2 Entry Point	5	Gaseous Chlorination, Post	Disinfection
Well #3 Entry Point	6	Gaseous Chlorination, Post	Disinfection
Well #4 Entry Point	7	Gaseous Chlorination, Post	Disinfection
Well #5 Entry Point	8	Gaseous Chlorination, Post	Disinfection
Well #6 Entry Point	18	Inhibitor, Polyphosphate	Other
Well #2 Entry Point	5	Inhibitor, Polyphosphate	Other
Well #3 Entry Point	6	Inhibitor, Polyphosphate	Other
Well #4 Entry Point	7	Inhibitor, Polyphosphate	Other
Well #5 Entry Point	8	Inhibitor, Polyphosphate	Other


Golf Club 1
224670
Golf Club 2
269224
1
217747
2
217748
3
219064
4
110465
5
559422
Northfield
Northfield Township
Cannon River



City Of Northfield

AMENDED WELLHEAD PROTECTION

Wells 2-5 WHPAs for Jordan Sandstone (Partial Pumping from Well 2)

Figure 5

February, 2012

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