## Aging and under-maintained water infrastructure, its impact on water quality, and equity

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http://wnpr.org/post/vermonts-crumbling-underground-water-infrastructure-demands-expensive-repairs; http://www.cbsnews.com/news/americas-aging-water-infrastructure-raisessafety-concerns/; http://www.foxbusiness.com/features/2016/01/28/america-s-water-infrastructure-is-in-need-major-overhaul.html; photo of lead pipe provided by Prof. Shawn McElmurry

#### Federal Contribution to Total Infrastructure Spending



Source: CBO 2015.

Distribution of census tracts in the conterminous United States that experienced both shrinkage and decline from 1970 to 2010 (n=1,849 tracts)





# EPA published a report on the impacts of water age on water quality 15 years ago.

#### **Chemical Issues**

Disinfection byproduct formation Disinfectant decay Corrosion control effectiveness Taste and odor

#### **Biological Issues**

Disinfection byproduct degradation Nitrification Microbial regrowth/recovery Taste and odor

#### Physical Issues

Temperature increases Sediment deposition Color

**Bold** denotes water quality problem with direct potential public health impact

#### Design guidelines for water age: 72 hours maximum



Energine Pathogens

### Shrinking Cities Declining Cities

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High Water

Poverty Declining well-being Health disparities HYPOTHESIS dec

Residents in shrinking and declining U.S. cities are vulnerable to poorer drinking water quality and greater public health risks.