

The Benefits of Drinking Water Regulations

Regulatory Impact Analysis

Background:

The Safe Drinking Water Act (SDWA) Amendments of 1996 explicitly include cost-benefit analysis as part of the regulatory process, a change from earlier requirements. While regulatory costs have been estimated in past rulemaking proceedings, benefits have been less well- described. The benefits of regulatory action are reflected in improvements in human welfare. Equivalently, they represent the avoided damages or losses in welfare that humans would have experienced in the absence of regulatory action. A broad categorization of the possible benefits of drinking water regulations would include:

- human health improvements
- enhanced aesthetic qualities
- avoided costs of averting behavior
- avoided materials damages
- avoided costs of market production
- nonuse benefits
- information benefits

Human Health Improvements:

Foremost among the damages avoided by public water treatment are the human health problems associated with contaminants in drinking water. The illnesses caused by these contaminants can either be characterized according to general health effects and diseases, or they can be described by more specific health outcomes. The diseases can be broadly divided into diseases from microbial contamination (e.g., gastrointestinal illness) and those from chemical contamination (e.g., cancer). The primary distinction that is typically made in health outcomes is between mortality and morbidity outcomes. Mortality occurs when an adverse health effect leads to premature death, whereas morbidity is associated with reductions in physical or mental well-being that result from disease.

Enhanced Aesthetic Qualities:

The aesthetic qualities of drinking water can generally be categorized according to taste, odor, and appearance, although the three are clearly interrelated. Although consumers often use the aesthetic qualities of drinking water as indicators of potential health risks, they also derive direct utility from these qualities. This is evidenced by the fact that individuals often purchase home treatment units, such as water softeners and activated carbon units, whose primary purpose is to improve the aesthetic (and functional) qualities of tap water. Regulatory measures that improve these aesthetic qualities will provide benefits to the public, regardless of whether they are intended to improve the safety of the drinking water.

Avoided Costs of Averting Behavior:

Both households and public suppliers of water take actions to prevent contamination at the tap. With regulations that improve the quality of water at the source or at the point of use, many of the costs of those activities, broadly referred to as averting behaviors, can be avoided. Accounting for these behaviors on the part of households is an essential component of measuring the value of drinking water safety for three primary reasons. First, these behaviors involve costs to households, which translate to losses in human welfare. Second, they control the degree to which individuals are ultimately exposed to harmful agents in drinking water, and as such, they influence the magnitude of losses from various adverse health outcomes. Third, the degree to which households engage in these activities reveals important information

regarding their willingness-to-pay to increase the safety of their drinking water. For public water suppliers, who routinely treat water before it is distributed, some of the treatments costs can be avoided, in principle, if the quality of source waters is enhanced. Thus, source water protection regulations in particular can confer benefits on rate payers to the extent that cost savings are passed on to them.

Avoided Materials Damages:

Drinking water regulations can also affect physical structures, particularly through the corrosion of water pipes. Measures to reduce the corrosivity of water have a number of potential benefits, such as a possible decline in pipe breakage, damage to meters and water facilities, water loss, water damage from leaks, etc.

Avoided Costs of Market Production:

Drinking water sources can also provide services as inputs to market production systems. To the extent that drinking water regulations improve the quality of source water used in production, benefits will accrue in the form of lower production and processing costs. Examples include restaurants, food processors, and other manufacturing establishments who treat water themselves to improve its quality. The costs of this treatment are likely to be passed on to households in the form of higher prices.

Nonuse Benefits:

Individuals can derive utility from cleaner drinking water supplies even if they do not consume and have no plans to consume the water themselves. The source of these nonuse benefits may be derived from altruistic motives (i.e., one derives utility from the knowledge that others benefit) or from more intrinsic motives (i.e., one derives utility directly from the knowledge that a natural resource is being protected.).

Information Benefits:

To the extent that regulations provide households with direct knowledge about the quality of drinking water, they may substitute for individual information-gathering activities and allow households to avoid these costs. Publicly provided information can also allow individuals to make better informed decisions. Misinformation and misperceptions about drinking water quality may cause households to bear costs that they would otherwise avoid. In addition, ensuring the public of safer drinking water supplies may also benefit consumers by increasing their sense of security and peace-of-mind.

Activities:

A literature review of the various categories of benefits associated with improvements in water quality was undertaken and is now available.

Schedule:

Which categories of benefits are most relevant for rulemakings underway and priorities of these categories for evaluation will be determined during Fiscal Year 1998.

Questions for stakeholders:

1. Have all relevant benefits categories been included?
2. Which categories do you feel are most relevant for evaluation in a regulatory context?
3. Which categories do you feel need additional analysis?