



MARYLAND  
Department of Health

# State Water Fluoridation Plan

Prevention and Health Promotion Administration

Office of Oral Health

[health.maryland.gov/oral-health](http://health.maryland.gov/oral-health)

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**Vision:** To achieve optimal fluoridation levels in all Community Water Systems.

**Mission:** To promote oral health through the benefits of water fluoridation.

## **BENEFITS/COST EFFECTIVENESS**

Since the inception of community water fluoridation in the United States in 1945, it has been demonstrated to be a safe and cost-effective way to prevent tooth decay. Community water fluoridation has been recognized by the Centers for Disease Control and Prevention (CDC) as one of the top 10 public health achievements of the 20th century.

Water fluoridation protects teeth in two ways:

Systemically: when delivered through the water supply

Topically: through direct contact with teeth throughout life

Two published studies conducted by CDC reaffirm the benefits of community water fluoridation. Together, the studies continue to show that widespread community water fluoridation prevents cavities and saves money, both for families and the health care system. In fact, the economic analysis found that for larger communities of more than 20,000 people where it costs about .50 cents per person to fluoridate the water, every \$1 invested in this preventive measure yields approximately \$38 savings in dental treatment costs.

"An Economic Evaluation of Community Water Fluoridation"<sup>1</sup> presents the results of an economic analysis of water fluoridation under modern conditions of widespread availability of fluorides. Researchers from CDC and Terry College of Business, University of Georgia, found that under typical conditions, the annual per-person cost savings in fluoridated communities ranged from \$16 in very small communities (<5,000) to nearly \$19 for larger communities (>20,000). The analysis takes into account the costs of installing and maintaining necessary equipment and operating water plants, the expected effectiveness of fluoridation, estimates of expected cavities in non-fluoridated communities, treatment of cavities, and time lost visiting the dentist for treatment.

A related analysis found that children living in non-fluoridated communities, in states that are highly fluoridated, receive partial benefits of fluoridation from eating foods and drinking beverages processed in fluoridated communities. This second study, "Quantifying the Diffused Benefit from Water Fluoridation"<sup>2</sup> reports that 12-year-old children living in states where more than half of the communities have fluoridated water have 26 percent fewer decayed tooth surfaces per year than 12-year-old children living in states where less than one-quarter of the communities are fluoridated. "Widespread community water fluoridation prevents cavities even in neighboring communities that are not fluoridated," according to Dr. Susan Griffin, the study's main author. "For instance, a 12-year-old child who has lived in a non-fluoridated community in a highly fluoridated state would typically have one fewer cavity than a child in a low-fluoridated state."

## References

1. Griffin SO, Jones K, Tomar SL. An economic evaluation of community water fluoridation. *J Publ Health Dent* 2001;61(2):78–86.
2. Griffin SO, Gooch BF, Lockwood SA, Tomar SL. Quantifying the diffused benefit from water fluoridation in the United States. *Community Dent Oral Epidemiol* 2001;29:120–129.

## DRINKING WATER IN MARYLAND—STATUS

DRINKING WATER STATISTICS <sup>1</sup>				
	2016 <sup>1</sup>	2013 <sup>1</sup>	2010 <sup>1</sup>	2007 <sup>1</sup>
<b>Population of Maryland</b>	6,016,447	5,928,814	5,773,552	5,618,334
<b>Individuals Served by Community Water Systems</b>	5,107,864	5,057,350	4,989,406	4,844,668
<b>Percent of Population Served by Community Water Systems</b>	84.8%	85.3%	86.4%	86.2%
<b>Percent of Population Served by Individual Wells</b>	15.2%	14.7%	13.6%	13.8%
<b>Number of Public Water Systems</b>	3,295	3,396	3,432	3,533
<b>Number of Community Water Systems</b>	464	474	473	486
<b>Number of Non-Community Non-Transient Water Systems (NCNTWS)</b>	532	544	550	559
<b>Number of Transient Non-Community Water Systems (TNCWS)</b>	2,299	2,378	2,409	2,488
<b>Number of Systems using Surface Water</b>	65	60	59	69
<b>Number of Systems using only Ground Water</b>	3,230	3,336	3,373	3,464

<sup>1</sup> excerpted from "Capacity Development for Maryland Public Drinking Water Systems" (Maryland Department of the Environment, October 2017)

## FLUORIDATED WATER IN MARYLAND—STATUS

FLUORIDATED WATER STATISTICS	
	<b>2016</b>
<b>Population of Maryland</b>	<b>6,016,447<sup>1</sup></b>
<b>Individuals Served by Community Water Systems</b>	<b>5,107,864<sup>1</sup></b>
<b>Population Served by Community Water Systems Receiving Fluoridated Water</b>	<b>4,839,044<sup>2</sup></b>
<b>Number of Community Water Systems</b>	<b>464<sup>1</sup></b>
<b>Number of Community Water Systems Providing Fluoridated Water</b>	<b>69<sup>2</sup></b>
<b>Percentage of Population Served by Community Water Systems Receiving Fluoridated Water</b>	<b>94.7%<sup>2</sup></b>
<b>Population Served by Community Water Systems Receiving Non-fluoridated Water</b>	<b>268,820<sup>2</sup></b>
<b>Number of Community Water Systems Providing Non-fluoridated Water</b>	<b>395<sup>2</sup></b>
<b>Percentage of Population Served by Community Water Systems Receiving Non-fluoridated Water</b>	<b>5.3%<sup>2</sup></b>

<sup>1</sup> excerpted from "Capacity Development for Maryland Public Drinking Water Systems" (Maryland Department of the Environment, October 2017)

<sup>2</sup> excerpted from "State Drinking Water Information System – release 3.33" (Maryland Department of the Environment, October 2017)

## **PROGRESS/TRENDS/CHALLENGES**

The current status of water fluoridation in the State of Maryland regarding progress and trends is fairly static. Maryland currently has 94.7 percent of the population served by community water systems receiving fluoridated water. The challenge for any future fluoridation efforts is to ensure that the current high level of community water fluoridation is not jeopardized. While the Office of Oral Health (OOH) will be an important resource and source of support for communities that want to initiate fluoridation, these efforts will have to begin at the community level and demonstrate adequate local support. OOH will tailor its support to the needs and conditions surrounding each fluoridation effort. There are currently no community requests for OOH water fluoridation support and assistance underway.

## **LAWS AND REGULATIONS**

Maryland's constitution outlines two approaches to initiate or cease water fluoridation:

- Ballot Initiative
- Proposed Legislation

Ballot initiatives are grass roots efforts, requiring the submission of a designated minimum number of verified voter signatures in order to have a measure placed on the ballot for approval/rejection by the voters. Legislation may also be proposed by delegates to the General Assembly and placed on the ballot for approval/rejection by the voters.

Alternately, a decision to initiate or cease fluoridation can also be made by the local entity wherever jurisdiction over the water supply falls (city council, county commission, water board, or board of health). In locations where the issue is volatile, councils typically do not want to make a unilateral decision without a clear indication of public sentiment. In these situations, a referendum is typically held.

The Code of Maryland Annotated Regulations (COMAR) contains existing legislation affecting systems that currently fluoridate under Title 26 (Department of Environment), Subtitle 04 (Regulation of Water Supply, Sewage Disposal, and Solid Waste). These regulations mirror the requirements of The Code of Federal Regulations, Title 40 (Protection of Environment), Chapter I (Environmental Protection Agency), Part 141 (National Primary Drinking Water Regulations).

## **1) PROGRAM MANAGEMENT**

### **Strategic partners**

1. Maryland Department of the Environment (MDE) Water Supply Program
2. Maryland Rural Water Association (MRWA)

Historically and currently, the MDE has retained regulatory authority over all drinking water related issues, including water fluoridation. MDE receives all testing data from water systems, from monthly operating reports (MOR) to compliance sample results. The data is monitored by MDE from a risk-based (as opposed to health-based) perspective. MDE's goal is not to promote oral health via optimal fluoridation levels but rather to review and monitor water quality data submitted by water systems for violations of State and Federal regulations and guidelines. MDE conducts site visits at water systems to monitor system performance at an operational level. MDE previously conducted training for water operators but has transferred those responsibilities to the Maryland Rural Water Association (MRWA).

MRWA provides free technical services, training, and assistance to small drinking water systems in rural areas throughout the State of Maryland. Their staff specialists (Circuit Riders) make routine visits to these systems and respond to water system emergencies.

The OOH located at the Maryland Department of Health (MDH) represents the health-based perspective on water fluoridation. OOH (through CDC funding) has hired the first Water Fluoridation Coordinator in the State of Maryland. The Water Fluoridation Coordinator coordinates the currently available information and resources to improve fluoridation-related data access, data reporting, data assessment, training, and education, as well as Engineering and Administrative Recommendations for Water Fluoridation (EARWF) compliance. An existing Memorandum of Understanding (MOU) between MDE and MDH provides an official agreement and outline for cooperation between the two agencies regarding fluoridation improvement efforts.

## **2) DATA ACCESS**

### **Strategic objective**

1. Establish ongoing and sustainable access to fluoridation data controlled by MDE

### **Strategic partner**

1. MDE—Safe Drinking Water Act (SDWA) Implementation Division

Historically and currently, water fluoridation has fallen under the umbrella of MDE. MDE receives all testing data from water systems, from MORs to compliance sample results. The data is monitored by MDE from a risk-based (as opposed to health-based) perspective. MDE's goal is not to promote oral health via optimal fluoridation levels but rather to review and monitor water quality data submitted by water systems for violations of State and Federal regulations and guidelines.

MDH has not historically had access to the data reported to MDE by the water systems. A key component of this water fluoridation plan is the establishment of a working relationship between MDE and MDH to allow for the free exchange of fluoridation data as reported to MDE by the water systems.

Establishment of open access to available fluoridation data in 2009 has allowed MDH to assess the status of water fluoridation in Maryland. It is critical for the following activities:

- Regularly reporting of fluoride levels via CDC's Water Fluoridation Reporting System (WFRS)
- Assessment of fluoridation status of water systems
- Prioritizing water systems in need of assistance with fluoridation should there be a community request for OOH support

### **3) REPORTING**

#### **Strategic objectives**

1. Establish regular schedule of fluoridation data review/reporting to WFRS with MDE
2. Obtain internet access at MDE to allow more efficient reporting of data through WFRS

#### **Strategic partners**

1. MDE Water Supply Program
  - SDWA Implementation Division
  - Engineering & Technical Assistance Division
2. CDC

Historically and currently, water fluoridation has fallen under the umbrella of MDE. MDE retains regulatory authority over all drinking water related issues and maintains water system data, including system status (active, suspended, consecutive). MDE receives all testing data from water systems, from MORs to compliance sample results. The data is monitored by MDE from a risk-based (as opposed to health-based) perspective. MDE's goal is not to promote oral health via optimal fluoridation levels but rather to review and monitor water quality data submitted by water systems for violations of State and Federal regulations and guidelines. MDE conducts site visits at water systems to monitor system performance at an operational level.

A data-sharing relationship has been established between MDE and MDH, and regular reporting of the data to CDC via WFRS is ongoing. The time intensive nature of this process has been alleviated by securing computer access at MDE for the Water Fluoridation Coordinator. This allows for the uploading of data directly from the hard copy files while at MDE headquarters.

### **4) DATA ASSESSMENT**

### **Strategic objective**

1. Utilize access to fluoridation data to prioritize those systems not meeting requirements and guidelines

### **Strategic partner**

2. CDC

Access to the fluoridation data from the water systems provides the essential element for evaluating the performance of water systems regarding supplemental fluoridation. Water systems are evaluated for completeness and consistency of data, as well as adherence to optimal level guidelines and reporting requirements. Assessment of these parameters allows for prioritizing water systems for the purpose of determining where to focus improvement efforts and resources.

## **5) MONITORING**

### **Strategic objective**

1. Establish ongoing and sustainable split sampling on a monthly basis

### **Strategic partner**

2. MDE—SDWA Implementation Division

Historically and currently, water fluoridation has fallen under the umbrella of MDE. MDE receives all testing data from water systems, from MORs to compliance sample results. The data is monitored by MDE from a risk-based (as opposed to health-based) perspective. MDE's goal is not to promote oral health via optimal fluoridation levels but rather to review and monitor water quality data submitted by water systems for violations of State and Federal regulations and guidelines.

Currently no split sampling is conducted by water systems. The majority of water systems conduct daily sampling, but due to budgetary restrictions and absent any regulatory requirement, have no plans to institute split sampling for fluoride or any other water quality parameters.

OOH will attempt, through its partnership with MDE, to have split sampling instituted by water systems. As relationships with the water systems are developed, OOH will define the barriers (apart from the lack of a regulatory requirement) to split sampling and work to address them and implement sustainable split sampling on a monthly basis.

## **6) TRAINING AND EDUCATION**

### **Strategic objectives**

1. Establish partnership with the MRWA with an emphasis on training and education efforts
2. Focus efforts/resources on priority systems

### **Strategic partner**

#### 1. MRWA

In order to affect meaningful changes in water systems and their operations, a relationship between OOH and the individual water systems and their operators must be cultivated. A key partner in developing these relationships is MRWA. MRWA provides free technical services, training and assistance to small drinking water systems in rural areas throughout the State of Maryland. Their staff specialists make routine visits to these systems and respond to water system emergencies.

The relationships MRWA has established with smaller water systems provides a unique gateway for education and training initiatives geared towards enhancing and improving fluoridation efforts. Working with MRWA allows OOH to capitalize on these existing relationships and will result in a tacit endorsement of ongoing efforts to improve fluoridation efforts.

The site visits conducted by MRWA have highlighted the water operator's desire for a full-day fluoridation training course developed for water operators. Many operators reported wanting additional training or needing refresher training. In early 2013, OOH began working with MRWA to develop a full-day fluoridation training course for water operators. In December 2013, the course was approved by MDE, and water operators who complete the course receive continuing education credits. Classes are presented semi-annually at a variety of locations across the state. Having fluoridation training readily available to water operators will make water systems better equipped to provide optimally fluoridated water.

## **7) ENGINEERING AND ADMINISTRATIVE RECOMMENDATIONS FOR WATER FLUORIDATION (EARWF)**

### **Strategic objectives**

1. Incorporate CDC's EARWF
2. Track progress toward implementing EARWF into water system operations

### **Strategic partners**

1. MDE Water Supply Program
  - SDWA Implementation Division

### 3. 2. MRWA CDC

Incorporating CDC's EARWF requires a multifaceted approach enlisting several strategic partners. In order to make water systems institute new procedures, modify existing practices, or eliminate outdated or ineffective methods, the cooperation and endorsement of trusted, long-time resources/partners such as MDE and MWRA is essential.

Historically and currently, water fluoridation has fallen under the umbrella of MDE. MDE receives all testing data from water systems, from MORs to compliance sample results. Numerous EARWF recommendations are already addressed by MDE. Maintaining the relationship based on the sharing of fluoridation data allows for determining what EARWF items are not currently addressed.

MRWA provides free technical services, training and assistance to small drinking water systems in rural areas throughout the State of Maryland. Their staff specialists make routine visits to these systems and respond to water system emergencies. MDH has established a partnership with MRWA to conduct site inspections & provide technical assistance. During the site visits, water systems are asked to complete a site inspection sheet designed by MDH to obtain and document CDC EARWF and information needed by MDH.

These partnerships should allow for inspection activities targeting water systems prioritized through the data review process. The inspections are geared towards resolving problems noted during data review (fluoride levels outside the optimal range, missing or incomplete data, etc.) and identifying sustainable solutions (additional training, updated equipment, additional and/or more efficient sampling, etc.). Inspection activities also provide an opportunity for an inventory fluoridation equipment and documentation of needed replacement equipment.

## 8) FLUORIDATION INITIATION OR CONTINUATION

### Strategic objectives

1. Identify communities that could potentially fluoridate and a process to reach out to those communities
2. Process for dealing with communities that threaten to stop fluoridating and who will be involved (task force)

### Strategic partners

1. MDE Water Supply Program
  - SDWA Implementation Division
2. MRWA
3. CDC

Currently 94.7 percent of those people served by community water systems in the State of

Maryland receive fluoridated water. Based on this widespread availability of fluoridated water (well in excess of the Healthy People 2020 Objective of 75 percent of population on public water supplies receiving fluoridated water), any efforts to support water fluoridation must be approached with caution. With the majority of Maryland residents already drinking fluoridated water through their public water systems, any efforts initiated by OOH to institute a new local water fluoridation project or statewide policy could be counter-productive and endanger current progress. Such efforts not only provide an opportunity for anti-fluoride activists to defeat new fluoridation initiatives, but more importantly also can potentially create public support for suspending fluoridation in communities that currently fluoridate. Given that two community water systems in the State of Maryland provide 70 percent of the fluoridated water, it is critical that OOH approach any new local or statewide fluoridation initiative or policy with studied discretion. While opportunities to support fluoridation will not be ignored if requested by a local community or jurisdiction, they must be approached utilizing a cost/benefit analysis perspective.

Communities that threaten to stop fluoridating will require a coordinated response utilizing the resources of MDH OOH, MDE, MRWA and CDC. In addition to the efforts of these strategic partners, a critical element will be to use these partnerships to identify local supporters of fluoridation. History has shown that the involvement of government agencies in efforts to continue fluoridation is most effective when utilized as a resource by local supporters, as opposed to functioning as the primary advocates. Local agencies and individuals enjoy a higher level of trust in the community and are better equipped to function as the primary advocates with the strategic partners contributing as needed.