Water and Sanitation in California

Laura Feinstein
Senior Researcher, Pacific Institute

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Background: Pacific Institute

- **Organization**: Independent non-profit research institute.

- **Mission**: Create and advance solutions to the world’s most pressing water challenges.

- **Strategy**: produce research that advances a sustainable environment, healthy economy, and social equity with science-based solutions.
Recent Publications

Measuring Progress Toward Universal Access to Water and Sanitation in California

How should the state define, measure, and track water and sanitation service?
Recent Publications

Plumbing the Depths: Californians Without Toilets and Running Water

How many Californians lack access to water and sanitation because they are unhoused, or have incomplete plumbing in the home?
Access to Sanitation and Hygiene for Individuals Experiencing Homelessness in Alameda County

How can a county improve access to toilets and handwashing for persons experiencing homelessness?
Overview

Part 1: Background
Part 2: Defining Water and Sanitation Service in California
Part 3: Who Lacks Access to Water and Sanitation in California
Part 4: Policy Recommendations
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What are drinking water, sanitation and hygiene?

**Drinking water** is water for indoor domestic use: “consumption, cooking, and sanitary purposes” (California Water Code §106.3)

**Sanitation** is a toilet and the infrastructure and management for safe disposal of human waste and wastewater

- Does not include the water for operating a toilet and wastewater system

**Hygiene** refers to a facility for handwashing, accompanied by soap
Causes of Death, United States, 2010

Deaths per 100,000 people
Source: University of North Carolina Population Center and Center for Disease Control
Causes of Death, United States, 1900 versus 2010

1900

- Cancer, 64.0
- Heart disease, 137.4
- Senility, 50.2
- Accidents, 72.3
- Nephropathies, 88.6
- Cerebrovascular disease, 106.9
- Diphtheria, 40.3
- Gastrointestinal infections, 142.7
- Tuberculosis, 194.4
- Pneumonia or influenza, 202.2

Other, 620.1

Gastrointestinal disease: from third-leading cause of death to near-zero

2010

- Cancer, 185.9
- Heart disease, 192.9
- Cerebrovascular disease, 41.8

Other, 201.3

Suicide, 12.2
Diabetes, 22.3
Noninfectious airways diseases, 44.6
Senility, 27.0
Accidents, 38.2
Nephropathies, 15.3
Pneumonia or influenza, 15.2

Deaths per 100,000 people
Source: University of North Carolina Population Center and Center for Disease Control
“Targeting human waste sources of bacteria is the most cost-effective strategy to improve public health and increase recreational opportunities following rain events.”
Measuring Water Service at a System Level

System Quality ≠ Service Experienced by Individuals

Household with complete plumbing

Premise plumbing quality problems: lead and copper, pathogens, secondary contaminants

Household with incomplete plumbing

Public drinking fountains and restrooms

Persons experiencing homelessness
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Approach: Service Ladders

Drinking Water

Sanitation

Hygiene

Approach: Service Ladders

By 2015, 154 countries had achieved over 75% coverage with basic sanitation services.
Service Ladders Are Adaptable

- Schools
- Health care facilities
- Specific regions

**WASH in Schools**

<table>
<thead>
<tr>
<th>SERVICE LEVEL</th>
<th>DRINKING WATER</th>
<th>SANITATION</th>
<th>HYGIENE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced</td>
<td>To be defined at national level</td>
<td>To be defined at national level</td>
<td>To be defined at national level</td>
</tr>
<tr>
<td>Basic (SDG)</td>
<td>Drinking water from an improved source is available at the school</td>
<td>Improved facilities, which are single-sex and usable at the school</td>
<td>Handwashing facilities that have water and soap are available</td>
</tr>
<tr>
<td>Limited</td>
<td>There is an improved source (piped, protected well/ spring, rainwater, packaged/delivered water), but water is not available at time of survey</td>
<td>There are improved facilities (flush/ pour flush toilets, pit latrine with slab, composting toilet), but not single-sex or not usable at time of survey</td>
<td>Handwashing facilities with water, but no soap</td>
</tr>
<tr>
<td>No service</td>
<td>No water source or unimproved source (unprotected well/ spring, surface water)</td>
<td>No toilets or latrines, or unimproved facilities (pit latrines without a slab or platform, hanging latrines, bucket latrines)</td>
<td>No handwashing facilities at the school or handwashing facilities with no water</td>
</tr>
</tbody>
</table>

Source: WHO and UNICEF, 2017
Our Results: California Service Ladders

In *Measuring Progress* (2018)

Service Ladders customized for prevailing statutes and regulations, aligned with public datasets

- Safe Water
- Affordable Water and Sanitation
- Accessible Water
- Safe Sanitation
- Accessible Sanitation
California Service Ladders

In *Measuring Progress* (2018) Service Ladders customized for prevailing statutes and regulations, aligned with public datasets

- Safe Water
- Affordable Water and Sanitation
- Accessible Water
- Safe Sanitation
- Accessible Sanitation
Accessible Drinking Water

**Goal:** Accessible water should be available in the home, in sufficient volumes to meet domestic needs, at hot and cold temperatures, twenty-four hours a day.

**Considerations:**
- Location
- Time to collect water
- Sufficient volume
- Temperature
- Available hours
# Service Ladder: Accessible Drinking Water

**Goal:** Water should be available in sufficient volumes to meet domestic needs, at hot and cold temperatures, in a location near home, at the times needed.

<table>
<thead>
<tr>
<th>Service Level</th>
<th>Household-Level Service Indicator</th>
<th>Household-Level Performance Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfactory</td>
<td>Sufficient hot and cold indoor piped water reliably available 24 hours a day.</td>
<td>At least 43 GPCD hot and cold indoor piped potable water available 24 hours a day.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Sufficient hot and cold water from an improved source available on premises (indoors or outside) and reliably available 24 hours a day; bottled or delivered water acceptable in some circumstances.</td>
<td>At least 43 GPCD hot and cold piped potable water available on the premises 24 hours a day.</td>
</tr>
<tr>
<td>Marginal</td>
<td>Sufficient water from an improved source, including bottled water or tanks of water delivered by truck, provided collection time is not more than 30 minutes round-trip (including waiting time), and reliably available at least 12 hours a day.</td>
<td>Improved, potable water source providing at least 14 GPCD within 30 minutes round-trip of place of residence (including waiting time), available at least 12 hours a day.</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>Water that does not meet at least the Marginal standards for access.</td>
<td>Any one of the characteristics of Marginal access to water is not met.</td>
</tr>
</tbody>
</table>
Service Ladder: Accessible Drinking Water

**Context:** Relevant for group shelters, encampments without in-unit running water. 43 Gallons Per Capita Day (GPCD) derived from Residential End Use of Studies (DeOreo 2016, 2011) See *Measuring Progress* for full methodology

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
<th>Minimum GPCD</th>
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**Accessible Sanitation**

**Goal:** Toilets should be private, located in the home, safe to visit, and available when needed.

**Considerations:**
- Private to use
- Physical safety
- Maintenance
- Number of people sharing a toilet
- Location
- Open hours
### Service Ladder: Accessible Sanitation

**Goal:** Toilets should be private, located in the home, safe to visit, and available when needed.

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<td>Satisfactory</td>
<td>Private, secure, well-maintained, in-home facility, not shared with other households, available 24 hours a day</td>
<td>Household has 24-hour access to a functioning toilet not shared with other households</td>
</tr>
<tr>
<td>Moderate</td>
<td>Private, secure, well-maintained, on-site facility, possibly shared with other households, available 24 hours a day</td>
<td>Household has 24-hour access to a functioning toilet either in the structure (not necessarily in their unit for multi-unit buildings) or on the property, with at least one toilet per 10 male residents plus one toilet per 8 female residents</td>
</tr>
<tr>
<td>Marginal</td>
<td>Private, secure, well-maintained facility, possibly shared with other households, no more than 50 meters from home, available 24 hours a day</td>
<td>Household has 24-hour access to a functioning toilet shared with no more than 20 people, within 50 meters of their usual place of residence</td>
</tr>
<tr>
<td>Unacceptable</td>
<td>Facility is more than 50 meters from home, not available 24 hours a day, or use of the facility compromises personal safety or privacy</td>
<td>Any one of the characteristics of Marginal access to sanitation is not met.</td>
</tr>
</tbody>
</table>
Service Ladder: Accessible Sanitation

**Context:** toilet on the premises but not necessarily in the unit, such as a toilet shared among several units in a Single Room Occupancy. Maximum number of persons sharing toilet based on California Plumbing Code for residential dormitories (California Building Standards Commission 2016).

<table>
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<th>Access Code</th>
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**Context:** Shared living situations such as encampments, boat marinas, RV parks without in-unit toilets.

Corresponds to Emergency Sanitation Standards specified by the United Nations High Commissioner on Refugees (2018).
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Lack of Access to Drinking Water and Sanitation

Californians Without Access to Toilets or Hot and Cold Water, 2015

From *Plumbing the Depths* (2019)
Barriers in Accessing Public Toilets

Public restrooms are often:

- Shared among too many people
- Too far from place of residence
- Closed at night
- Dangerous to visit
- Poorly maintained and cleaned
- Without doors, locks, soap, or toilet paper

See *Measuring Progress* and *Plumbing the Depths* for documentation

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Lack of Public Toilets is a Problem for All

Public restrooms are a vital public service
Those who lack shelter are particularly dependent on public facilities
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Policy Recommendations

• Recognize sanitation as a co-equal component of the Human Right to Water.

• Recognize and address barriers to water and sanitation failures at the household and individual level.

• Use Service Ladders to define and track safe, affordable, accessible water and sanitation for those with permanent shelter and those experiencing homelessness.

• Identify minimum standards for access to drinking water and sanitation for those without shelter.
Policy Recommendations

• Use water quality objectives and stormwater permits as an avenue to direct resources toward sanitation and hygiene.

• Support mobile hygiene units and public restrooms.

• Staff public restrooms with members of the community they serve.

Mobile Hygiene Unit by Lava Mae
Additional Information

Visit Report Web Page:
http://pacinst.org/publication/measuring-progress/

- Report With Full Service Ladders
- Data Sources for Informing Performance Indicators

Also see: A Survey of Efforts to Achieve Universal Access to Water and Sanitation in California

Coming Soon: Californians with Incomplete Plumbing
Questions?

Acknowledgements

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_Community Interviews:_ Theodora Simon

_Endless Support:_ Staff of Pacific Institute

_Contact:_ Laura Feinstein, _lfeinstein@pacinst.org_
## Gallons Per Capita Day

### Table A. Volume of Water for Indoor Use

<table>
<thead>
<tr>
<th>Use(s)</th>
<th>Adjusted Water Use in California Cities, 2018</th>
<th>Observed Water Use in California Cities, 2006-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Essential Indoor Use</td>
<td>43</td>
<td>47</td>
</tr>
<tr>
<td>Leaks</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Total Indoor Use</td>
<td>52</td>
<td>58</td>
</tr>
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</table>