PATH
Appropriate Technology

Safe Water Project Dissemination Meeting

New Delhi, India

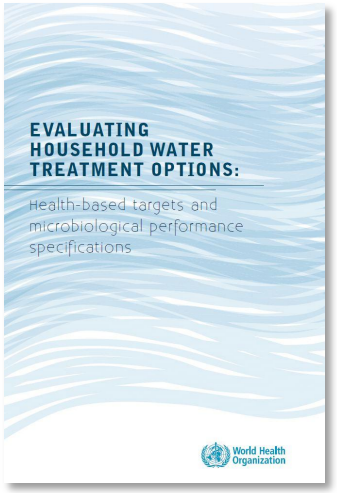
Pat Lennon

January 19, 2012

PATH
A catalyst for global health

Appropriate technology

- Efficacy guidelines.
- New HWTS products.
- Community water treatment.



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Efficacy guidelines – More than the United States Environmental Protection Agency

- World Health Organization (WHO) new guidelines
- Water Quality Association (WQA) – India

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WHO publication released August 2011

Evaluating Household Water Treatment Options: Health-based targets and microbial performance specifications.

Guidance on:

- Tiered performance targets.
- Establishing performance targets.

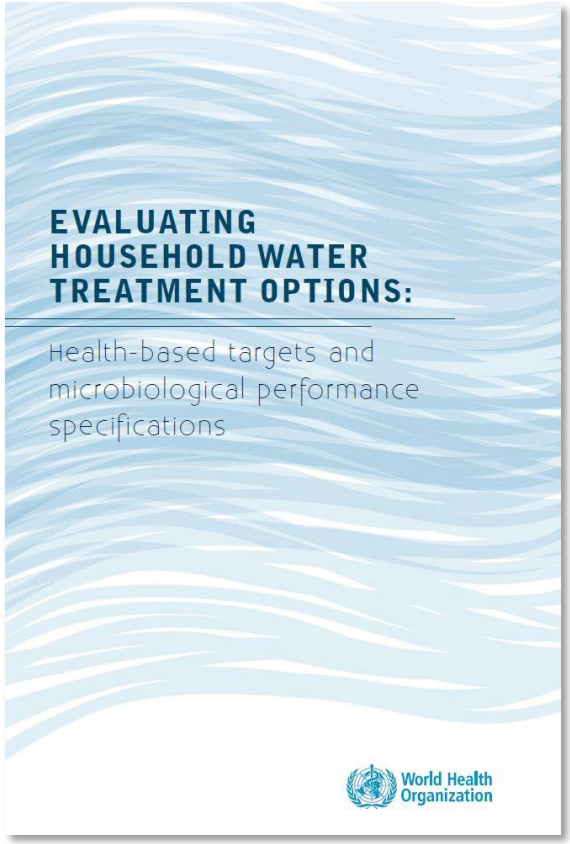

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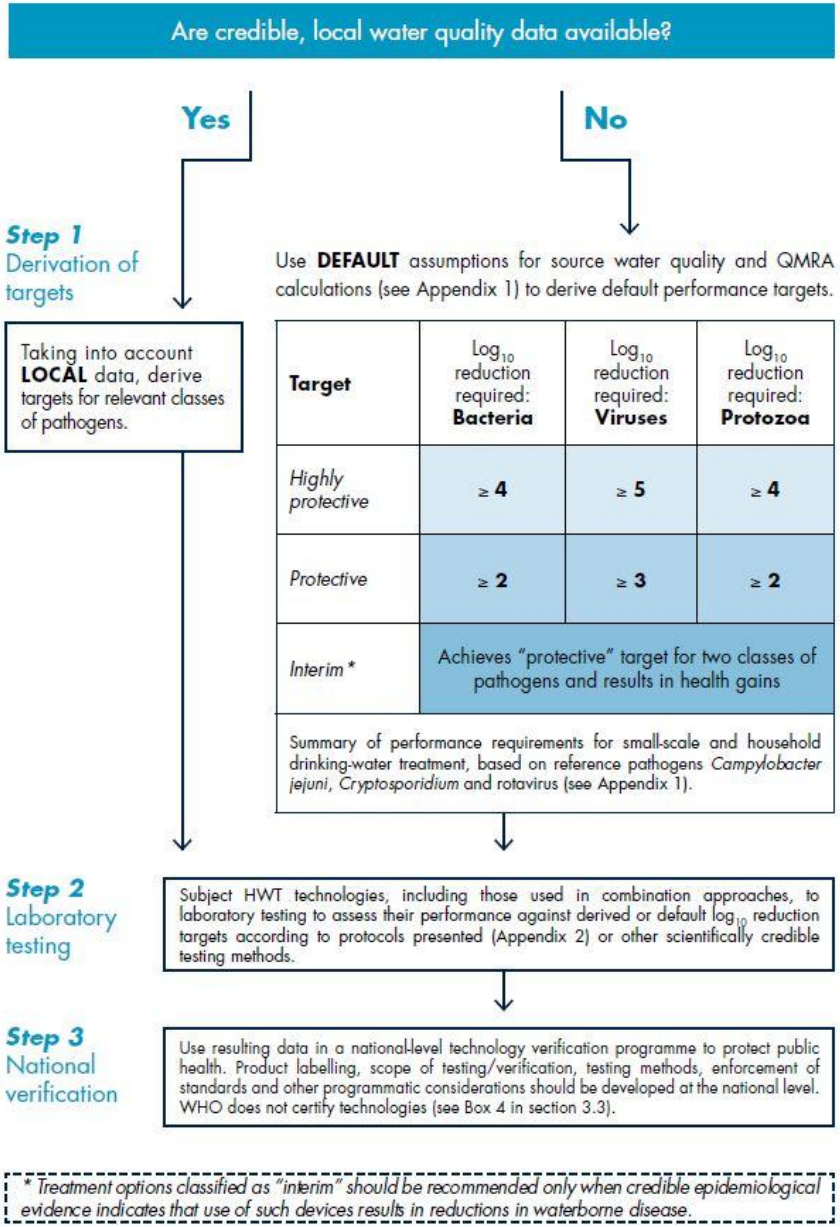
Figure 1. Flowchart for establishing health-based HWT performance targets



WHO. *Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications.* Geneva: WHO; 2011.

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WATER QUALITY ASSOCIATION – INDIA

Dr. Chandrasekhar

WATER QUALITY ASSOCIATION

WQA is a not-for-profit International trade association based at Lisle, Illinois State (USA) representing the household, commercial, industrial and small system drinking water treatment industry (www.wqa.org)

Mission – To promote the health benefits of improving drinking water with the use of POE and POU water treatment technologies throughout the world.

WQA International Membership

- **2500 member companies in 80 Countries**
- **Leading industry companies are members of WQA world-wide**

Membership Benefits:

- **Networking & Industry Forums**
- **Access to US markets and US companies**
- **Credibility through** Media Outreach, Targeted PR Campaigns, Consumer Awareness, Use of WQA Logo in Your Marketing, Code of Ethics
- **Education & Professional Certification**
- **Technical support through technical services & research reports**
- **Communication through industry updates, alerts, statistics & marketing data**
- **Product certification program (Gold seal certification program)**

WQA India Task Force

1st WQA India Task Force meeting (July 23, 2008)

- Defined the structure (Chair & vice chairs)
- Set meeting frequency (2 times per year)
- WQA members:15
- Certified water specialist : Nil
- Companies having Gold seal certified products: 3
- Promote WQA Code of Ethics
- Reviewed WQA Membership, Gold Seal And Professional Certification Logo policies

Developed Sub-committees

- Product Testing Standards
- Education / Professional Certification
- Public Relation/Communication

8th WQA India Task Force Meeting (January 24, 2012)

- 70 International WQA Members in India
- Certified water specialist (CWS-I) – 19
- Companies using Gold seal certified products – 12
- Started Professional Certification Program (CWS-I) in 2010 and Launched CWS-II (RO & UF) in 2011
- Held seven training seminars/CWS-I exams in India and one CWS-II exam
- Monitoring Member and Gold Seal Logo Use and increasing consumer awareness of WQA
- WQA India Task Force rules and regulations
- Participating in trade shows viz. EA water, India water expo and Aquatech shows
- Special India Task Force section in WQA home page
- Strong WQA India Task Force leadership structure and policies formulated

WQA India Task Force Standard sub-committee

Developing Standards for Microbiological Water Treatment Systems (MWTS)

Objective – Develop consumer relevant standards for drinking water treatment devices

Context

Developing & Emerging urban areas (primarily)

- In general access to improved water sources through pipes/ taps
- complexity of the water supply system
- lack of 24X7 water supply
- leaky pipes
- illegal tapping
- contaminated intermediate storage tank etc

This leads to situations of frequent microbial contamination of water supplies. Physico-chemical composition, such urban water supplies are better as compared to water of unknown origin (EPA). Used EPA guide standard protocol with relevant modifications to begin with……..

Agreed principles on developing standards by Sub-committee team:

1. MWTS must be capable of addressing all 3 recognized classes of water-borne pathogens
   - Bacteria, viruses and cysts
2. Risk-based approach must be employed for determining the levels of log-reduction to be accomplished by the MWTS for each class of contaminant
3. Across the rated life of the MWTS there must be evidence of consistent achievement of the minimum target log reductions across all the pathogens as demonstrated through multiple challenges with the representative organisms of each class across the rated life
4. Once the rated life is exhausted, the consumer must be appropriately alerted for actions such as technical service or replacement of consumables to prevent consumption of untreated water
5. The output water from the MWTS should not contain any material derived from the system at levels that could be considered harmful to the consumers

Recommendations and Way Forward

- The crucial issue is not the log reductions but to ensure whether
  - MWTS is able to comply with principles on developing standards
  - Technically can we able to verify that the proposed 'Protocol' (regardless of specific log reductions) can be carried out repeatedly across multiple labs?
- WQA has taken a lead and has lined up testing in BioVir Laboratory in USA
- We will approach 3-4 labs i) UL Lab, India ii) BRC, Mumbai iii) AWRTCL, Bangalore iv) IADFAC, Bangalore and will select two labs based on technical capabilities and pricing of testing.
- Extensive testing of different technologies UV (Physical Disinfection) , RO & UF (both exclusion), Halogen and Silver (both chemical disinfectants) based products with the proposed protocol to be carried out across different laboratories
- Incorporating comments from NSF and EFL on draft protocol by Dr. Regu and Dr. Nimish and discussions are in progress for funds generation for testing.
- Survey (literature) of non-microbiological water quality and safety issues across India
- Agree on developing standards for specific non-microbiological contaminants

New HWTS product development

Why?

How?

New products

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Why new products?

Goals:

- Increase *uptake.*
- Support *correct and consistent* use.

Products need to support these goals.

How: Design iterations

12/2009

Renderings tested with final extended-user testing visit

- Going too far from existing devices causes confusion.
- A gravity-fed, vertical, two-container device will be our first design.

1/2010

Appearance renderings size and flow rate models

- More volume is better.
- Higher flow rates are better.
- Price is the most important factor.
- Height becomes an issue at ~600 mm.
- Participants like seeing the water level.

1/2010

Semifunctional prototypes

- Filter must only insert one way.
- Participants mistakenly matched like-colored parts during assembly.

How: Design iterations

2/2010
Appearance prototypes

- Conflicting desires for both traditional and modern design.

2/2010
Functional prototypes

- There were too many ways to assemble the prototypes.
- Cues for correct assembly were too weak (lots of “near fits”).

8/2010
Beta prototype

- Continued learning incorporated into design guidelines and platform designs.

Choice

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Action

- Send email to: **newwaterfilters@path.org**
  - Get updates on product availability
  - Become a field validation partner

Community solutions

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Smart Electrochlorination: Iterative design

Core technology leveraged from outdoor and military product development

0.5- 4 L in 1-2 minutes

20-L Prototype

Prototypes tested in field conditions with entrepreneurs and at-scale NGOs.

20 L in 2 minutes

200-L Prototypes

Prototypes tested in 10 countries with entrepreneurs, NGOs, MFIs, and schools

200 L in 6-8 minutes

Commercial device and large-batch prototype

Commercial, low-rate production of SE200

Large-batch prototypes tested with NGOs and health centers

10,000 L in 35-40 minutes

Salt + Water + Electrodes + 12V DC = Chlorine-based oxidant disinfectant

Way forward

- Exploring appropriate delivery models and partnerships.