2016 Annual Meeting of the International Network on Household Water Treatment and Safe Storage

10 October 2016
Chapel Hill, North Carolina, USA

Coordinated by the World Health Organization and the United Nations Children’s Fund with communications and facilitation support from The Water Institute at the University of North Carolina
Acknowledgements

The annual meeting of the International Network on Household Water Treatment and Safe Storage (the Network) was made possible in large part due to the contributions of Network participants in planning, presenting, and offering insightful comments and questions in response to the meeting presentations and discussions. Meeting presenters included Batsi Majuru of World Health Organization (WHO), Fiorella Polo of the United Nations Children’s Fund (UNICEF), Laura MacDonald of Centre for Affordable Water and Sanitation Technology (CAWST), Caroline Meub of Pure Water for the World, and Edema Ojomo of the Water Institute at the University of North Carolina at Chapel Hill (UNC).

The Water Institute at UNC kindly offered facilities and logistical support for the. A special thanks to Marissa Streyle and Heather Pace of The Water Institute for planning support.

The meeting was organized jointly by WHO, UNICEF, and The Water Institute at UNC and facilitated by Batsi Majuru of WHO, Fiorella Polo of UNICEF, and Michael Forson of UNICEF. Edema Ojomo of the Water Institute at UNC provided communications and other organizational support to the event proceedings.
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<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention (USA)</td>
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<td>HWT</td>
<td>Household Water Treatment</td>
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<td>HWTS</td>
<td>Household Water Treatment and Safe Storage</td>
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<td>MDGs</td>
<td>Millennium Development Goals</td>
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<td>the Network</td>
<td>International Network on Household Water Treatment and Safe Storage</td>
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<td>NGO</td>
<td>Nongovernmental Organization</td>
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<td>the Scheme</td>
<td>WHO International Scheme to Evaluate Household Water Treatment Technologies</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>UNC</td>
<td>University of North Carolina at Chapel Hill</td>
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<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
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<td>WaSH</td>
<td>Water, Sanitation and Hygiene</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WSP</td>
<td>Water Safety Plan</td>
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Introduction

The goal of the International Network on Household Water Treatment and Safe Storage (the Network) is “to contribute to a significant reduction in water-borne and water-related vector-borne diseases, especially among vulnerable populations, by promoting household water treatment and safe storage as a key component of community-targeted environmental health programs” (WHO and UNICEF 2011).1

The World Health Organization (WHO) established the Network in 2003 and was joined by United Nations Children’s Fund (UNICEF) in 2011 as a co-hosting agency. The Network comprises over 140 organizations, including intergovernmental bodies, national governments, nongovernmental organizations (NGOs), private sector companies, and academic institutions.

Currently, the four main areas of the Network activity are policy and advocacy, research and learning, implementation and scale-up, and monitoring and evaluation. Network Secretariat communications crosscut and support each of these four focus areas. Network activities are guided by expertise and strategic input from the Network Advisory Group and Public-Private Partnership Group.

The Network is currently at the end of the second phase for its strategy to contribute to a significant reduction in water-borne and water-related vector-borne diseases. Phase II of the Network strategy was from 2011 to 2016, and had the following objectives:

- strengthen the evidence base of the public health relevance of household water treatment and safe storage significantly;
- achieve tangible results in the scaling-up of household water treatment and safe storage (HWTS) in countries in all regions of the world;
- develop and put in place national policies and institutional frameworks to ensure the integration of different environmental health interventions with drinking-water treatment and safe storage at the household level from a broad public health perspective; and
- evaluate and disseminate best practice in HWTS programmes for advocacy purposes.

This report details the proceedings of the 2016 Network annual meeting held on 10 October, 2016 during the Water and Health Conference hosted by The Water Institute at the University of North Carolina at Chapel Hill (UNC). The annual meeting agenda is included in Appendix A. The list of meeting attendees is included in Appendix B.

Meeting action items and key issues

The main action items and key issues discussed at the meetings are summarized below.

- **Greater emphasis should be given to what happens at the national level**
  
  Participants noted that the Network provides an important platform for information sharing. However, more focus should be given to how such information sharing could be achieved at the national level, and how this information could be used to support policy development and implementation.

- **More efforts needed to strengthen national policies on HWTS**
  
  Since 2003, the Network has convened a number of regional workshops aimed at developing / strengthening national policies on HWTS. Participants noted that while these workshops were useful in raising awareness of HWTS, more work is now needed to address specific issues related to the implementation of HWTS, including monitoring and evaluation of HWTS use, and the enabling environment for HWTS, such as reduced taxes / waivers for imported HWTS products.

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• **Better documentation of integrated HWTS and public health programmes**

While the Network has supported the development of various resources on integration of HWTS into wider public health efforts, there is relatively little documentation of how such integration has worked in practice. Participants suggested that examples could be drawn from the United States President’s Emergency Plan for AIDS Relief (PEPFAR) basic care packages that have integrated HWTS to prevent opportunistic infections. Such case studies could be shared on the online database HWTS Knowledge Base, developed by Centre for Affordable Water and Sanitation Technology (CAWST).

• **More field data on products that have been evaluated under the Scheme**

Participants noted that while the Scheme was useful for providing information on product efficacy, this information needs to be completed with field data based on actual use, to support product selection. There was a lot of interest in an online database developed by the Centre for Affordable Water & Sanitation Technologies (CAWST), which contains information on a range of topics related to HWTS, including: technology and product efficacy; monitoring and evaluation; existing projects on HWTS; and implementation approaches. Participants recommended that the products on this platform be linked to those evaluated under the Scheme.

• **Phase III of the Network Strategy and the future of the Network**

As the Network moves into Phase III, strategies and action plans are needed to ensure that the Network continues to remain relevant, continues to provide useful information to its members and to the general population at large, and continues to carry out activities that ensure safe water for all. During this period of the Sustainable Development Goals (SDGs), the Network needs to find its place and find ways to contribute to the agenda of water safety for all. This meeting gathered information from Network members on how the Network can move forward and areas where the Network can provide the most value.

### Meeting overview and objectives

The Network meeting was attended by approximately 30 participants. Themes covered during the meeting included update of the Phase II strategy of the Network, the role of household water treatment and safe storage (HWTS) in the larger water safety context and in contributing to the broader SDG drinking-water targets, and the place of the Network in the changing drinking-water sector.

The objective of the meeting was to update Network members on the activities that occurred between the 2015 annual meeting (held October 26th, 2015) and the 2016 annual meeting. Additionally, the meeting aimed to gather input from Network members on the next phase of the Network strategy, particularly in light of the start of the SDGs. Specifically, the meeting objectives were:

• Update participants on select activities that took place during 2015/2016
• Update participants on progress towards the objectives of the Phase II strategy
• Discuss Phase III activities for the Network strategy
• Seek input on key Network priorities as we consider the SDGs
Meeting sessions and discussions

Session 1: Where we are

This session provided updates on events and news from the last annual Network meeting to the 2016 annual Network meeting, updates on what is happening in HWTS implementation, and information on ways HWTS could fit in the broader water safety agenda.

Update on 2015/2016 activities

Edema Ojomo of The Water Institute at UNC gave a presentation on Network activities that took place between the 2015 annual meeting and the 2016 annual meeting. Some highlights of the presentation included:

- the inter-regional HWTS workshop that took place in Addis Ababa in 2016 and was attended by 50 participants from Ethiopia, Kenya, and Ghana. The goal of the workshop was to review the status and progress in implementing national policies and strategies on HWTS. Key points highlighted were: national working groups on HWTS are useful for catalysing action; resource mobilization for implementation of strategies is weak; tangible approaches for Public-Private Partnerships (PPPs) are needed.²

- results of Round I of the WHO International Scheme to Evaluate Household Water Treatment Technologies (the Scheme) are available. Ten household water treatment (HWT) technologies, including solar, chemical, filtration and ultraviolet (UV) were evaluated, and a rapid market assessment of HWT products was conducted. The Round I summary report details that there are both high performing and poor performing products and that more needs to be done to strengthen national regulation and evaluation of HWT alongside effective implementation.³

- a webinar in 2015 on strengthening HWTS in emergencies. The webinar included government officials, United Nations (UN) staff, and NGO and private sector entities involved in the post-earthquake response in Nepal. Key discussion points highlighted the importance of adequate and reinforced training for response workers, alongside user training and follow up.⁴

- an HWTS side event at the Water, Engineering and Development Centre (WEDC) conference. The session was attended by over 50 participants, and highlighted the importance of regulation and evaluation of HWT alongside effective implementation; and

- the HWTS Massive Online Open Course (MOOC). The MOOC has over 4,500 total learners from 167 countries, and continues to gather interest. The course now has French and Spanish subtitles⁵.

Update on HWTS implementation activities by Network members.

Carolyn Meub of Pure Water for the World (PWW) provided an update on the implementation activities PWW was carrying out and lessons learned over the years on improving implementation effectiveness. Her talk was focused on the Caribbean and Central America. PWW is an implementer that has been

² The workshop summary report can be found here: http://www.who.int/water_sanitation_health/water-quality/household/hwts-regional-workshop-ethiopia-2016.pdf?ua=1
³ The Round I report can be found here: http://www.who.int/household_water/scheme/household-water-treatment-report-round-1/en/
⁴ The webinar recording can be found here: https://www.youtube.com/watch?v=3g31DEQwrXI
⁵ Information on the course can be found at: www.coursera.org/course/hwts
present in Honduras since 2008 and the organization trains other implementers. According to the presentation, one important thing to be aware of is that things are always involving in the field and in implementation. Initially, the focus used to be on filters and education at PWW, then there was a change in focus to behavior change, and the focus is now on monitoring. It is important to realize that monitoring works as a feedback loop and not a straight line in which implementation occurs, then training activities and then the activities end. Rather, results from monitoring feed implementation continuously. It is also necessary for monitoring to be done independently. The importance of working with governments was highlighted in the presentation as well as this engagement process with governments being a slow but important process.

Laura MacDonald of the Centre for Affordable Water and Sanitation Technology (CAWST) provided information on the knowledge base that CAWST has put together for those involved in and interested in HWTS. The knowledge base aims to serve as a place for people to obtain more information on what is going on around the world in relation to HWTS activities. The content is currently organized into implementation, monitoring, products and technologies,6 and country focus. The database is currently not exhaustive but work is being done to add more information to it. There is information on product progression as well, that is, information is available on the extent to which a product has been tested and studied. The project map has information on the different projects that are being carried out in different countries around the world. The plan is to increase stakeholder engagement to add content to the database.

Joseph Ampadu-Boakye from Safe Water Network (SWN) discussed SWN’s focus on applying an enterprise approach to safe water in communities. Over the next year, SWN is looking into bringing business principles into the way HWTS is introduced into communities and it is going to provide avenues for public private partnerships.

Michael Gately from Medentech talked about what was happening with the chlorine disinfectant tablets Aquatabs®. 2016 is the first year since Aquatabs launched that they reached treating 11 billion liters in a year. The product is a known commercial product and as a result has been used in many communities. What has happened has grown out of what has been done at the Network. One lesson Medentech has learned is that the less people have to do, the more successful things will be because it is a challenge to get people to do things.

The place of HWTS in the broader water safety agenda

Fiorella Polo of UNICEF gave a presentation on how HWTS could fit in the broader water safety agenda and on the avenues the Network is considering as we move into Phase III and try to position the Network to be relevant in this SDG period. Countries have realized the importance of partnerships in achieving safe water for all and this is a potential area for the Network to be a strategic partner. Discussions took place on the new service ladder developed for this SDG period: no service, unimproved, basic water (Millennium Development Goals (MDG) period definition of access to improved water sources), and safely managed water. This ladder shows the difference between the previous definition of access to improved water sources and the current definition of safely managed water. The proposed indicator of “safely managed drinking water services” comprises the following criteria: an improved drinking water facility; which is; available when needed; located on premises; and compliant with faecal and priority chemical standards. As such, current estimates of access to improved drinking-water sources may change under the SDGs, once these criteria are taken into account. For example, an unnamed country that met the MDG target for drinking-water and has coverage estimates of 98 % coverage has estimates that reduce to 58 % under the SDG target, once the criteria for safely managed have been taken into account. The WHO/UNICEF Joint Monitoring Programme on Water

6 Technology is an established method and the particular item developed is a product. For example, ceramic filtration is technology and the tulip table top is a product.
Supply and Sanitation (JMP) is gearing up to include measures of water quality in household surveys. Network participants were asked to think about the opportunities the Network has in contributing to the SDGs and how the Network can link to the broader water safety agenda (e.g., considering water safety beyond the household).

Alisson Tummon of Procter & Gamble (P&G) shared a brief update on the Children’s Safe Drinking Water Program, under which the flocculant-disinfectant P&G Purifier of Water is distributed. P&G is focused on learning where and how the water treatment packed could be useful to communities, and is working with World Vision, particularly on school programs, to ensure safe drinking water. The importance of integration of HWTS into other sectors was highlighted in her talk.

Session 2: Repositioning the Network in the SDG Agenda

This session was broken into two main sections. The first was a presentation on the achievements of the Network during Phase II of the Network and possible future directions for Phase III and the second section was a panel discussion on the role of the Network in the SDG era.

Section I: Update on Phase II activities

Batsi Majuru of WHO gave a presentation on the achievements of the Network during Phase II and highlighted areas the Network fully achieved the Phase II objectives and partially achieved the objectives. Phase II was reviewed through a Network survey that was conducted in 2015, discussions with the Advisory Group (AG) and Public-Private Partnerships Group (PPG) in 2015, phone discussions with AG and other participating organizations, and reflections of the Secretariat. One of the objectives during Phase II was to strengthen the evidence base on health impacts of HWTS, and between 2011 and 2015, there were several rigorous studies that highlighted the impact HWTS has on health. One of such studies is the WHO update on burden of disease associated with inadequate water, sanitation, and hygiene (WaSH) which noted that HWTS could contribute to 45% reduction in diarrhoeal diseases. The Network also aimed to facilitate national policy development and did this through several regional and inter-regional workshops during the 2011-2016 period. As a result of these workshops, new policies were developed or HWTS was integrated into existing policies such as maternal and child health policies and nutrition policies. The Network did not achieve as much progress as it desired in regard to the Phase II objective of evaluating best practices in HWTS programmes. Although the toolkit for monitoring HWTS programmes was developed in 2012, the extent to which the toolkit has been incorporated into programmes is limited and no evidence-based frameworks for assessing behavior change as a key determinant of correct and consistent use have been applied at scale. Additionally, sustainable markets for HWTS remain a challenge as a result of a number of factors including high import regulations on HWTS products and HWTS being viewed as an emergency tool and not an everyday product. With regard to integrating HWTS into public health efforts, progress was made at the global level (e.g., development of the WHO taskforce on integration of HWTS and health) but little practical action has been carried out on integrating HWTS with key public health efforts. She closed by saying that as the Network moves forward, it is important that members of the Network are more active and more involved in Network activities, citing CAWST’s development of the knowledge base as an example of involvement by a Network member to fill a gap highlighted by the Network in prior years.

Section II: Panel discussion and feedback from the Network on ways forward

There were three members on the panel: Rob Quick of the Centers for Disease Control and Prevention (CDC), Carolyn Meub of Pure Water for the World, and Benjamin Murkomen of the Ministry of Health, Kenya. Each panel member was asked a different question about repositioning the Network in the coming years.

Rob Quick: Question - Do you agree that the network should engage more in emergencies and in communities that have emergencies? Why? How?
Response: When it comes to emergencies, HWTS is more complex and there is little time for evaluations or monitoring during use in that time because the focus is on providing safe water to people most in need. It is, therefore, difficult to collect data in emergencies. It is necessary that disasters are classified into natural disasters, complex emergencies that require extended relief efforts, and disease outbreaks and characteristics such as political instability, availability of human and financial resources, and availability of water are considered. The Network can work to identify how to protect health and collect data in the context of challenging situations; therefore there can be knowledge prior to an emergency about effective technologies that are also acceptable to consumers. Additionally, there should be options so that if one product or technology is not effective or acceptable in a situation, product change can occur quickly. The Network can advocate more strongly for safe storage as these are often forgotten during emergencies. Organizations that are members of the Network can focus on doing fast targeted implementation during emergencies to answer some of these questions.

Carolyn Meub agreed that the Network has a role to play in promoting HWTS during emergencies.

Carolyn Meub: Question - How can we as a network reach out to the broader community – water safety and national level? Should we reach out? Why?
Response: It is important that Network members focus primarily on water safety and not solely on their specific business or technology; if issues like sustainability are at the forefront of organizations’ approach, efforts are made to engage with the right partners ensuring implementation is not a standalone practice. It is important to consider human resources in the community when the organization leaves and how to build the capacity in these areas. Additionally, engagement with other non-WaSH sectors, such as schools, is important. The takeaway point was that engagement of the broader community is important and to do this it is necessary to plan jointly, advocate jointly, and to reach out to different actors at different levels.

Benjamin Murkomen: Question – What are the challenges and opportunities for the Network to reach out to the broader water community?
Response: The Network has been important at the national level. In Kenya, power and resources have been devolved from central government to the 47 county governments; these county governments are now responsible for implementing HWTS, with the goal of addressing water safety at the service level. However, there are challenges that exist, both at the policy and service delivery level. Policy challenges include: weak compliance regulations, a gap in obtaining monitoring data from the household level, and ensuring that the technologies on the market have been regulated. At the service delivery level, there is a need for capacity building of staff and better coordination from the global to national to local levels. The Network could provide tools to coordinate partners at different levels and tools to help regulate, monitor and implement HWTS products.

Participants’ views on achievements and future directions for the Network

After the discussion with the panel, the audience was asked if they agreed with the responses and the way forward provided by the panelists. Dr. Dilshad Jaff of UNC agreed that it is complex to work in
emergencies and that as Rob Quick noted it is important to use materials that are readily available and understood in communities. When asked who was not present in the room but the Network could reach out to, Rob Quick noted that engaging more with healthcare facilities and with the health sector is important because these organization and this sector is central to emergency settings.

The audience was also asked to write on post-it notes—yellow post-its for valuable things the Network is currently doing and orange for things the Network can do in the future or do better—about areas the Network can engage in. Compiled information showed that meeting participants believed the Network was doing a good job of sharing lessons and information that was developed by Network members and external organizations and that the Scheme developed by the Network was a useful tool. The information also showed that the Network can do better in advocating for safe storage, integrating with other WaSH and non-WaSH activities, and evaluation of monitoring efforts, specifically determining if monitoring is happening and if it is happening, what the results show.

Wrap up

Michael Forson of UNICEF wrapped up the meeting stating that there is a changing environment in the WaSH sector which has an impact on the Network and on HWTS. He noted that during the MDG period, HWTS was not measured and with the SDGs, there is an implied role for HWTS because of the introduction of “safe” water in the targets. In moving forward, it is important that activities from the Network are not solely the responsibility of WHO and UNICEF but every member of the Network should be more active and play a more critical role. There is a need for more involvement from the members in running the Network. Also, the Network will need to engage with the broader water safety community and the broader community as a whole. One thing that was noted was that there is little focus on safe storage and yet this is a very important aspect of safe water and so the Network will need to improve advocacy efforts for safe storage and shed more light on safe storage so that it is not forgotten.
Appendix A. Network Meeting Agenda
International Network on Household Water Treatment and Safe Storage
Annual Meeting

University of North Carolina at Chapel Hill, USA
Monday 10 October 2016
8:30 am-12:00 pm

Meeting objectives
- Update on Network activities 2015-2016
- Review progress on Network Phase II (2011-2016) strategy
- Seek input on post-2016 strategy (discuss the role of the Network in the SDGs and water safety framework)

08:15-08:30 Sign in

8:30-8:40 Opening remarks, meeting overview and introductions Michael Forson, UNICEF

Session 1: Where we are Batsi Majuru, WHO
08:40-08:55 Update on events and news from 2015/2016 Edema Ojomo, UNC
10 min for presentation and Q&A

08:55-09:20 What's new in the implementation of HWTS? Soapbox
5-8 min updates followed by discussion

09:20-10:00 HWTS in the broader water safety agenda
- Water safety in the SDGs Fiorella Polo, UNICEF
- Building a bridge to universal WASH Allison Tummon, P&G
10 min presentation followed by discussion

Coffee break, 10:00-10:30

Session 2: Repositioning the Network in the SDG agenda Fiorella Polo, UNICEF
10:30-10:35 Session introduction session Batsi Majuru, WHO
10:30-11:00 Session introduction, overview of Phase II, directions for Phase III Batsi Majuru, WHO
15 min presentation followed by discussion

11:00-11:30 Panel discussion: looking ahead: Network in the SDG era
Panellists: Rob Quick, CDC, Carolyn Meub, Pure Water for the World, Benjamin Murkomen, Ministry of Health, Kenya

11:30-11:55 Open discussion with rapid fire inputs from audience

11:55-12:00 Wrap up Michael Forson, UNICEF
## Appendix B. List of Network Meeting Participants

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<tr>
<th>Name</th>
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<tr>
<td>Jessica Tribbe</td>
<td>UNICEF</td>
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<td>Oliver Subasinghe</td>
<td>USAID</td>
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<td>Jesse Schubert</td>
<td>PATH</td>
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<td>Derek Chitwood</td>
<td>Partners in Hope</td>
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<td>Frederick Goddard</td>
<td>Emory University</td>
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<td>Liz Morgan</td>
<td>East Tennessee State University</td>
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<td>Amanda Lardizabal</td>
<td>University of Illinois Urbana-Champaign</td>
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<td>Regula Meierhofer</td>
<td>EAWAG</td>
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<td>Tim Oriard</td>
<td>Cascade Designs, Inc.</td>
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<td>Carolyn Meub</td>
<td>Pure Water for the World</td>
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<td>Lydia Abebe</td>
<td>The Water Institute at UNC</td>
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<td>Hamisi M. Malebo</td>
<td>National Institute for Medical Research, Tanzania</td>
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<td>Frank Husson</td>
<td>Solar Solutions</td>
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<td>Benjamin Murkomen</td>
<td>Ministry of Health, Kenya</td>
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<td>David Gittins</td>
<td>Imerys</td>
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<td>Woody M. Collins</td>
<td>Congo Helping Hands</td>
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<td>Katie Friedman</td>
<td>UNC Chapel Hill/TU Delft</td>
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<td>Jules Hountondji</td>
<td>PSI Benin</td>
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<td>Alisson Tummon</td>
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<td>Edema Ojomo</td>
<td>The Water Institute at UNC</td>
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<td>Kristen Downs</td>
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<td>Joseph Ampadu-Boakye</td>
<td>Safe Water Network</td>
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<td>Michael Gately</td>
<td>Medentech</td>
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<td>Laura MacDonald</td>
<td>CAWST</td>
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<td>Dilshad Jaff</td>
<td>UNC Chapel Hill</td>
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<td>Nikki Beetsch</td>
<td>NSF International</td>
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Draft

This short paper reflects on the extent to which strategic objectives were implemented with corresponding achievements during Phase II (2011-16) of the International Network on Household Water Treatment and Safe Storage (the Network) and suggests a way forward in the next phase of work. Both the reflections and suggested way forward reflect input gathered in 2015 and 2016 from the Secretariat (WHO, UNICEF and University of North Carolina-Chapel Hill; UNC), the Network Advisory and Public Private Partnership Groups, and influential Network members at large. The reflections and suggestions were also influenced by the changing programming WASH environment and the move from Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs).

Background: Summary of Phase II Strategic Objectives

The Phase II strategy came into effect in 2011 after a consultative strategic meeting held in Geneva as well as a broad, open review with all Network members. While Phase I was largely focused on advocacy, Phase II, laid out an ambitious plan to strengthen the evidence, policies, scale-up and to document best practices. Phase II expanded the Secretariat beyond WHO to include UNICEF as a co-host and UNC to lead communications.

The specific Network’s strategic objectives in Phase II were as follows:

1. Evidence base of the public health relevance of household water treatment and safe storage (HWTS) significantly strengthened;
2. Tangible results in the scaling-up of household water treatment and safe storage achieved in countries in all regions of the world;
3. National policies and institutional frameworks developed and in place to ensure the integration of different environmental health interventions with drinking-water treatment and safe storage at the household level from a broad public health perspective; and,
4. Best practice in HWTS programmes evaluated and disseminated for advocacy purposes.

Part I. Progress on achieving strategic objectives

Overall, strategic objectives 1 and 3 were fully achieved while objectives 2 and 4 were only partially achieved. A more detailed summary follows.

Objective 1: Evidence base of the public health relevance of household water treatment and safe storage significantly strengthened -Fully Achieved

Prior to 2011, there was relatively little evidence on the use and health impacts of HWTS. During the five year period, a number of new, more rigorous research studies were conducted in the

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field, including three systematic reviews, two of which were published by Cochrane. The most recent Cochrane review by Clasen et al. (2015) highlights that: chlorine disinfection may reduce diarrhoea by about one quarter, flocculation-disinfection and solar disinfection by about one third. Filtration demonstrates the highest diarrhoeal disease reduction, of about half. In addition, in 2014 WHO updated the burden of diarrhoeal disease estimates and found that the strongest evidence, compared to other WASH interventions, came from HWTS and that HWTS can reduce diarrhoeal disease as much as 45%.

**Objective 2: Tangible results in the scaling-up of household water treatment and safe storage achieved in countries in all regions of the world -Partially Achieved**

To inform and strengthen efforts in scaling-up household water treatment and safe storage as part of an integrated approach with health, in 2013 WHO facilitated a taskforce of health experts from various background with links to HWTS (vector control, neglected tropical diseases, HIV/AIDS, malaria and child/maternal health)\(^9\). Key taskforce recommendations included linking HWT to global health targets including those on HIV testing, ending preventable child deaths from pneumonia and diarrhoea, and with global efforts to control vectors, especially in water storage containers. The taskforce also recommended the selection of HWT technologies that meet WHO performance criteria and are most likely to be used correctly and consistently and to monitor and track implementation alongside other health interventions. Furthermore, HWTS is included as part of global and programmatic strategies in a number of health areas including the WHO/UNICEF Global Action Plan on Pneumonia and Diarrhoea\(^10\), programmatic guidance for integrating WASH with HIV and nutrition\(^11\), and in Ebola early recovery indicators and documents. In addition, a joint session on HWTS and cholera held at the World Water Week in Marseille in 2012 highlighted the important role of HWTS in preventing and controlling outbreaks\(^12\). However, while progress was achieved at the global strategy level, practical action on integrating HWTS with key health efforts is still lacking. In addition, more nuanced planning is needed regarding how to most effectively scale-up HWTS which requires a targeted and time-bound approach (e.g. use during a cholera outbreak) as opposed to other public health interventions which are meant to be long-term and cover a wide population.

**Objective 3: National policies and institutional frameworks developed and in place to ensure the integration of different environmental health interventions with drinking-water treatment and safe storage at the household level from a broad public health perspective -Fully Achieved**

Significant effort was dedicated to strengthening national policies, primarily through regional workshops involving government, NGOs, the private sector, international organizations and academia where country action plans were developed. Five such workshops which, in total,

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involved 20 countries, were held in Uganda (2011), Mozambique (2012), Ghana (2013), Laos (2013), and Ethiopia (2016). Follow-up activities from these workshops ranged from seed-funding for implementing integrated HWTS and health efforts to technical support on policy development. New national strategies in Ghana, Tanzania and Malawi were notable outcomes of these workshops. However, there have been limitations to the sustainable change that this policy work has engendered. In some countries such as Ethiopia and Kenya, HWTS was captured in other policies such as Health and WASH, however strategic plans were developed for implementation from these policies. It was suggested that sub-regional HWTS networks be created to foster inter-country sharing that was found to be valuable within the workshop, but limited resources and leadership prevented this from happening. In addition, while an initial global review of HWTS policies was done in 2012, an update of this review would be useful to concretely assess the status of countries at the end of 2016. The initial review found that while HWTS was commonly included (72% of 46 countries responding) in national health and water policies, less than half had targets (43%) and the majority (76%) noted that limited monitoring of use and impact was a major challenge towards effective policy implementation. Among the few countries that responded to the question as to whether there are regulations in place for HWT technologies, less than half of them reported regulating such technologies based on their microbial or chemical performance. As such, in 2014 WHO established the International Scheme to Evaluate Household Water Treatment Technologies (the Scheme), to independently and consistently evaluate the performance of HWT technologies, and in so doing, guide their selection. A major focus of the capacity building under the Scheme is supporting the establishment of regulatory frameworks for HWT technologies in countries, and ensuring that performance is considered as a primary criterion for national certification / authorization of HWT technologies.

Objective 4: Best practice in HWTS programmes evaluated and disseminated for advocacy purposes - Partially Achieved

In order to harmonize and strengthen monitoring of HWTS use and the determinants of use, in 2012 WHO and UNICEF developed a Toolkit on Monitoring HWTS with input from over 40 Network Members. While the Toolkit was well received by government and implementers, it is unclear the extent to which programmes incorporated the monitoring recommendations into their work, in order to better understand best practices and engage in continual programme improvements. In addition, it has been noted that behaviour change is a key determinant of

consistent and correct use, and while a number of frameworks have been proposed to develop evidence-based behaviour change approaches, there is still limited ability within communities to use and implement these frameworks. Another critical consideration is sustainable markets for HWTS products, that would enable affordable and desirable products to be accessible to low income populations. Participating organizations of the Network such as Antenna Technologies, are working to develop and pilot sustainable business models not only for HWTS products, but also kiosks. Documentation and sharing of such approaches will be useful to support scale up.

Part II. Way Forward

It is evident that in the next phase of activities, the Network will need to be responsive to the Sustainable Development Goals (SDGs) as well as a growing recognition of the importance of implementing a package of safe water solutions that are grounded in safe management practices and services. If there are 2 billion or more people without safe drinking-water\(^9\) and governments cannot provide safe, reliable water from the tap, what role will HWTS play to meet this need?

Three main areas of focus in the next phase have emerged from reflections by the Secretariat and key Network Members. These are further described below.

Key areas of focus

Addressing HWTS within a package of water safety solutions

Under SDG 6, governments along with partners are working to place at the core of their efforts, safe management of water. This requires leadership from governments and the collaborative work of several ministries\(^20\). Water safety plans provide the basis for safely managing water and have expanded greatly to over 90 countries. Such efforts also require greater engagement with suppliers and regulators who are responsible for providing and ensuring water is safe to drink.

One specific aspect of this work is safe storage, which is of particular concern not only for diarrhoeal disease but also the spread of vector borne diseases such as dengue and Zika. Along the water chain, the household level is a major control point where safe water from the community source can be re-contaminated. HWTS is the important mitigating measure within the WSPs at the household level where the user is responsible and able to ensure that the water before consumption is safe. Households, suppliers and regulators ought to be sensitized to effective options, correct use, and monitoring activities as part of wider water quality monitoring efforts.

HWTS as a component of public health programmes

Integrating HWTS into public health programmes requires specific support for implementation efforts. This could happen by working in a few pilot countries that are rolling out large programmes for malaria, HIV, nutrition, WASH or improved pre-natal care. It also should be linked to operational research to document the impacts as well as the processes for most effectively linking HWTS with public health interventions. In addition, work to strengthen regulation, ensure that only products which meet health performance standards are available and that such products are classified as health products which will serve to increase access to and awareness of effective HWTS products among the health sector.

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Use of HWTS in emergencies

With the number of individuals affected by emergencies the highest it has been in the last century, there is a concrete need to provide safe water and sanitation solutions. One of the most immediate solutions is household water treatment and safe storage. Updated short technical guidance that reflects the latest developments and knowledge is needed to help best select, target, implement and monitor HWTS in emergencies.

Best practices and examples of targeted scale-up

- **Uptake** is the other critical piece; how are markets and consumer engagement affecting this, what about more public health based behaviour change interventions?
- **Scale-up and impact on health**: is this being achieved?

Modalities of work

A more targeted focus and recognition of the importance of partnerships in achieving all the SDGs requires the Network structure and processes to evolve. This entails: better positing of HWTS within wider efforts on water safety and public health, as outlined above; establishing stronger linkages with organizations working at local levels to achieve more targeted implementation of efforts; and giving space for participating organizations within the Network to contribute to, or fill in gaps where the Secretariat may not be able to do so.