Water, sanitation, hygiene, and nutrition: successes, challenges, and implications for integration

Article *in* International Journal of Public Health · July 2014

Impact Factor: 2.7 · DOI: 10.1007/s00038-014-0580-8

3 authors:

Jordan Teague
George Washington University
3 PUBLICATIONS **3** CITATIONS
SEE PROFILE

E. Anna Johnston
Center for Disaster and Humanitarian Assis…
2 PUBLICATIONS **3** CITATIONS
SEE PROFILE

Jay P. Graham
George Washington University
44 PUBLICATIONS **807** CITATIONS
SEE PROFILE

Int J Public Health
DOI 10.1007/s00038-014-0580-8

ORIGINAL ARTICLE

Water, sanitation, hygiene, and nutrition: successes, challenges, and implications for integration

Jordan Teague · E. Anna Johnston · Jay P. Graham

Received: 23 April 2014 / Revised: 12 June 2014 / Accepted: 16 June 2014

Abstract
Objectives This study explores the integration of water, sanitation, and hygiene (WASH) and nutrition programming for improved child health outcomes and aims to identify barriers to and necessary steps for successful integration.
Methods Sixteen semi-structured in-depth interviews were conducted with key stakeholders from both the WASH and nutrition sectors, exploring barriers to integration and potential steps to more effectively integrate programs.
Results Key barriers included insufficient and siloed funding, staff capacity and interest, knowledge of the two sectors, coordination, and limited evidence on the impact of integrated programs. To achieve more effective integration, respondents highlighted the need for more holistic strategies that consider both sectors, improved coordination, donor support and funding, a stronger evidence base for integration, and leadership at all levels.
Conclusions Organizations desiring to integrate programs can use these results to prepare for challenges and to know what conditions are necessary for successfully integrated programs. Donors should encourage integration and fund operational research to improve the efficiency of integration efforts. Knowledge among sectors should be shared and incentives should be designed to facilitate better coordination, especially where both sectors are working toward common goals.

Keywords WASH · Nutrition · Integration · Program

Introduction

The importance of nutrition and water, sanitation, and hygiene (WASH) interventions for child health and development has been well documented in the literature. Undernutrition in all its forms was projected to be responsible for 45 percent of all child deaths in 2011 (Black et al. 2013), while lack of WASH is estimated to be responsible for 20 percent of total deaths and disability-adjusted life years (DALYs) in children (Prüss-Üstün et al. 2008). It has been increasingly recognized that there is a cyclical relationship between nutritional status and WASH. Although there is limited evidence on the impacts of WASH on nutrition, research has suggested that WASH could be responsible for nearly half of undernutrition worldwide (Prüss-Üstün and Corvalán 2006).

Much more evidence exists on the ability of WASH interventions to reduce diarrheal disease—estimated reductions are between 30 and 60 % (Prüss-Üstün et al. 2008; Pickering and Davis 2012; Norman et al. 2010; Cairncross and Curtis 2003). Diarrhea affects nutrition, and through a reduction in diarrheal disease, improved WASH conditions may avert more than 860,000 child deaths each year from malnutrition (Prüss-Üstün et al. 2008). More recently, research has highlighted that a child's nutritional status may be affected by environmental enteropathy (Lin

Electronic supplementary material The online version of this article (doi:10.1007/s00038-014-0580-8) contains supplementary material, which is available to authorized users.

J. Teague (✉) · E. A. Johnston · J. P. Graham
George Washington University Milken Institute School of Public Health, 950 New Hampshire Ave NW, Suite 400, Washington DC 20052, USA
e-mail: jlteague14@gmail.com

J. Teague
WASH Advocates, 1506 21st Street NW, Suite 200, Washington DC 20036, USA

Published online: 11 July 2014

et al. 2013; Prendergast and Kelly 2012). Dangour et al. (2013) recently performed a systematic review of 14 rigorous studies on WASH interventions and their effects on child nutrition. Their review concluded there is a benefit of WASH interventions on child growth (see also Cuesta 2007). Conversely, undernutrition is a risk factor for enteric infections (Walker et al. 2013) and reduces the body's ability to fight this and other infectious diseases, such as HIV/AIDS. In the case of HIV, macronutrient and micronutrient deficiencies contribute to disease transmission and increase morbidity and mortality in people living with HIV through immunologic decline (Weiser et al. 2011).

Based on the growing evidence that these interventions are critical to child development, it is recognized that WASH and nutrition programs are both necessary to achieve improved health outcomes. The most effective interventions are likely to be those that combine both improved nutrition and infection control and prevention efforts (Dewey and Mayers 2011). A limited number of studies have shown that WASH activities can be integrated into nutrition programming for improved outcomes (Dorion et al. 2012; Bhutta et al. 2008), and Walker et al. (2013) recommended prioritizing nutrition interventions in WASH programming to reduce morbidity and mortality from diarrhea and other enteric infections.

Although a number of studies have suggested that WASH and nutrition activities can and should be integrated, there is limited evidence on how WASH and nutrition activities are integrated in the field, what barriers integrated programs face, and what stakeholders believe to be necessary for successful integration. The aim of this study was to explore the integration of WASH and nutrition programming to identify barriers and necessary steps for successful integration of WASH and nutrition programs.

Methods

We conducted in-depth, semi-structured interviews with stakeholders in both the WASH and nutrition sectors. The interviews explored actions taken to integrate WASH and nutrition programming, barriers and challenges to integration, and ideal conditions for the integration of those programs. The interview guide can be found in Online Resource 1. The study was approved by the George Washington University Internal Review Board (IRB#091337).

Interviewees were purposively recruited based on their positions in organizations that had been identified as having both WASH and nutrition programming. Key individuals in these organizations were contacted with an invitation to participate, or to recommend other individuals who may be more appropriate. Nineteen invitations were sent to individuals at ten organizations, from which 16 individuals were interviewed (84 % response rate). Three of those 19 recommended at least one other person, who all agreed to participate. One person declined to participate, and we received no response from two others. Table 1 shows the demographic information of respondents.

Table 1 Background information on study participants based in six countries, by area of expertise, location of work, and position in organization in 2013

	N (%)
Area of expertise	
Nutrition	7 (44)
Water, sanitation, and hygiene (WASH)	7 (44)
Behavior change	1 (6)
Integrated rural development	1 (6)
Location	
Headquarters	14 (88)
Field	2 (12)
Position	
Technical advisor	13 (82)
Chief program officer	1 (6)
Executive leadership	1 (6)
Program officer	1 (6)

United States, United Kingdom, Bangladesh, Ethiopia, Kenya, Somalia

One author (JT) conducted all interviews between October and December 2013. All available participants were interviewed face-to-face ($n = 6$), but due to location or availability, ten participants were interviewed by phone or Skype. All interviews were audio-recorded using Audionote-Notepad and Voice Recorder Version 3.3.1 (Luminant Software). Each interview was transcribed and all were analyzed using NVivo 10 (QSR International, Melbourne, Victoria, Australia). The same author coded the interview transcripts via the grounded theory method, allowing relevant themes to emerge from the interviews.

Results

The interviews revealed emerging themes in barriers to effective integration of WASH and nutrition programs, and highlighted the needs of each sector to achieve more effective integration. In total, 14 factors were found to negatively influence integration, while 11 variables were identified as critical actions, strategies, and changes needed for more effectively integrated programs (see Tables 2, 3).

Table 2 Barriers to integration in programs in 47 countries identified by study participants in 16 in-depth interviews in 2013

Barriers	*N* (%)
Staff	14 (87)
Funding	13 (81)
Knowledge	13 (81)
Evidence	10 (63)
Time	9 (56)
Behaviors	9 (56)
Coordination	8 (50)
Indicators	8 (50)
Multi-faceted sectors	6 (38)
Resources	5 (32)
Community health workers	5 (32)
Strategies	4 (25)
Sustainability	4 (25)
Beneficiaries' knowledge	3 (19)

Afghanistan, Bangladesh, Benin, Bihar, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Dominican Republic, Ethiopia, Ghana, Guatemala, Haiti, India, Indonesia, Iraq, Kenya, Laos, Lebanon, Liberia, Madagascar, Malawi, Mali, Mexico, Mozambique, Myanmar, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Syria, Uganda, Vietnam, Yemen, Zimbabwe

Table 3 Identified needs for integration in programs in 47 countries by study participants in 16 in-depth interviews in 2013

Needs	*N* (%)
Strategy	13 (81)
Coordination	11 (69)
Funding	9 (56)
Evidence	8 (50)
Leadership	8 (50)
Training	7 (44)
Advocacy	5 (32)
Staff time	5 (32)
Reporting	4 (25)
Evaluation criteria	4 (25)
Sustainability	2 (13)

Afghanistan, Bangladesh, Benin, Bihar, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Dominican Republic, Ethiopia, Ghana, Guatemala, Haiti, India, Indonesia, Iraq, Kenya, Laos, Lebanon, Liberia, Madagascar, Malawi, Mali, Mexico, Mozambique, Myanmar, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Syria, Uganda, Vietnam, Yemen, Zimbabwe

The full codebook is available in Online Resource 2. This section discusses those most frequently identified by participants as barriers and needs.

Barriers

A majority of respondents listed insufficient or siloed funding, funding intended for a singular purpose, such as WASH or nutrition, but not both; staff capacity and interest; knowledge of each sector; coordination between sectors; and evidence of impact of integrated programs as significant challenges in integrating programs. Figure 1 shows a breakdown of the most common barriers listed by participants.

Staff

Fourteen participants (87.5 %) mentioned low capacity and interest of program staff as influencing the prevention of effectively integrated programs. Several factors fed into this including responsibilities that were derived from evaluation criteria and reporting requirements by supervisors and donors. Further, participants felt that staff members were overloaded and hesitant to become involved in unfamiliar sectors.

If staff were not required through specific monitoring and evaluation indicators to deliver on certain activities, integration was unlikely to occur. This was highlighted in respondent interviews:

> "It's not in anyone's evaluation criteria to, you know, do more work than is required."

> "If collaboration does not help them reach their indicators, they don't really have an incentive to do it."

Program staff were considered already overloaded with responsibilities in their own jobs, making it difficult to find willingness of supervisors and staff, and time to integrate with projects outside of their own sectors:

> "They have plenty to do with their own jobs and so that's a challenge, is to get them excited about the potential and also that their boss in management is willing to have them spend more time on integrated something outside their sector."

Additionally, respondents noted staff were generally unfamiliar with the sectors outside of the one in which they have worked. Staff may not be comfortable in expanding their portfolios or may not even think to include activities other than ones already incorporated in their programs.

> "Sometimes, you know, people are just doing what they know how to do best. And so they just focus on their work and not stepping back and looking at the bigger picture."

> "Sometimes people don't integrate just because they don't know really well the other sector."

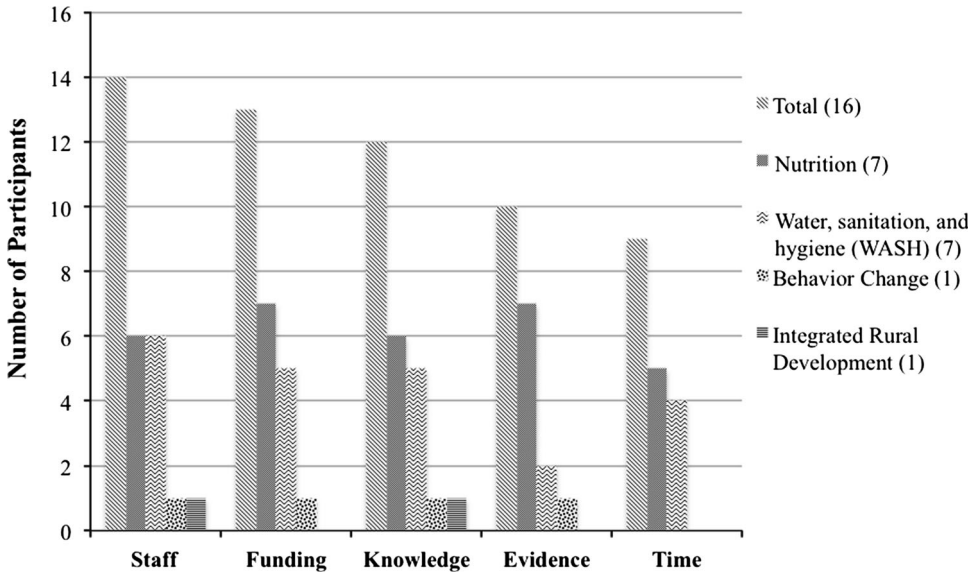

Fig. 1 Most commonly identified barriers to integration by study participants' area of expertise

Funding

Thirteen respondents (81 %) identified funding as a barrier to integrating program activities. In many cases, funding streams for WASH and nutrition programs come separately from a donor with different goals and restrictions, or from different donors altogether. With siloed funding streams, respondents reported that it is difficult to integrate programs for many reasons, including the restrictions on exactly what it can be used for.

> "You get specific types of funding, and then when you get that funding there are restrictions on what you are and are not allowed to use it for."

Historically, funding for WASH programs has focused on infrastructure or behavior change programs for sanitation and hygiene, while nutrition funding mainly directs programs to use it for nutritious foods and supplements and nutrition-related behaviors. These types of restrictions do not allow nutrition programs to incorporate WASH infrastructure or improved WASH behaviors, other than hygiene behaviors, and vice versa.

> "There was no pressure from the donor side for people to integrate."

> "I think at this point we're not looking at it because we don't have funding. No one's paying us to look at that, and no one's asking us to look at that."

Without such pressure or directives, participants indicated unwillingness in each sector to incorporate other programming into their funding.

> "Nutrition people don't want to use their nutrition dollars for WASH."

In addition, siloed funding streams create difficulties in forming strategies for integration.

> "And so it takes a new way of thinking about programming to decide that you're going to combine these funding streams together."

Additionally, while organizations may have received pilot funding for such integrated projects, it has often not enough to really show an impact or take the program to scale.

> "But when the funding comes, it's often times a pilot funding, less than a million. And there's little that you can do with that, so there's a capital investment to begin with and you can't take it to an extent that you could."

Knowledge

Thirteen participants (81 %) identified not knowing how to go about integrating programs as a key challenge, in addition to a lack of training and knowledge sharing among sectors.

> "We're still learning in the WASH sector."

> "It's very, it's amazing to find out how little those who work in WASH might know about nutrition and how little people in nutrition know about WASH."

As each sector is still learning the most strategic interventions of its own, it was said to be quite difficult to prioritize integrated interventions, and decide with limited time and resources which activities have the most impact.

> "I think we don't know the highest value times or what's, how to prioritize…I don't know that we know

the value of the different behaviors and the different interventions."

"I think, perhaps, a little bit of agreeing on what may or may not be considered more important."

Evidence

Ten respondents (62.5 %) identified lack of evidence of the impact of integrated programs and insufficient examples of successfully integrated programs as barriers to implementing such programs. There has been little published evidence on integrated programs that have been successful and can serve as examples for future integrated projects.

"So, you know, there's a lot of push to integrate, but in terms of real evaluation, like, rigorous evaluations conducted on projects that do this type of integration, there just isn't a lot."

"It's trying to figure out how it works on the ground that is tough, and, people have to feel like it's worth it to put forth the effort."

While many in the WASH and nutrition sectors realized the importance of the convergence of these programs, very few studies have been conducted on the actual health impacts of combined programs.

"We don't have any evidence at the moment, in my opinion, that clearly tells this is the impact you could get from sanitation, this is the impact you could get from nutrition, and if you combine them, this is the impact level."

"There isn't a ton of research on these integrated projects. It's, to demonstrate that it's, not only effective, but more effective than, like, kind of the sum of its parts."

Time

Nine participants (56 %) noted lack of time as a key factor in limiting the amount and success of integrated programs. Participants could not comment on the success of integrated programs due to their short funding cycles, and the long time it takes to change behaviors and see nutritional impacts.

"Our development projects usually aren't that long and we know it takes a little bit longer to make any change to behaviors."

"But in the time frame of WASH programs, do you really get to see that impact on stunting? And the answer is probably not."

Additionally, programs with separate funding cycles also had varied timelines, increasing the difficulties of integrating.

"So one program may be funded for six months, another one for two years, etc., and they would get a different timing, and so it's kind of hard for us to make sure that we have the same, like the activities going in a logical way."

Program staff generally did not have time to perform any additional responsibilities.

"And then you have issues with, for example, health staff who have a million things to do and don't have time to appropriately consult or don't even, like, WASH isn't even on their radar."

"People are spending work hours on these collaborations, so they have to feel like it's a win–win situation. They have to feel like this time is being spent to help further their goals, or else they're not going to be able to justify doing it, because they typically are spending all their time trying to reach their own program's objectives."

Needs

The major needs identified by study participants for integrated programs were a comprehensive strategy, coordination, funding and donor support, evidence, and leadership. Figure 2 shows a breakdown of the most commonly identified needs.

Strategy

Thirteen participants (81 %) pointed to a comprehensive strategy for integrating programs as necessary for their performance and success. A defined method of integrating WASH and nutrition programs will be conducive to more programs being integrated and to those programs achieving their intended impact.

"I'm all for it, we just need to figure out how to do it."

"Step by step, this is what it means, this is what it will look like, and this is how it can be implemented on the ground."

The ability to prioritize certain WASH and nutrition interventions in integrated programs, and being able to utilize that information to create effective programs emerged as an important need for integration.

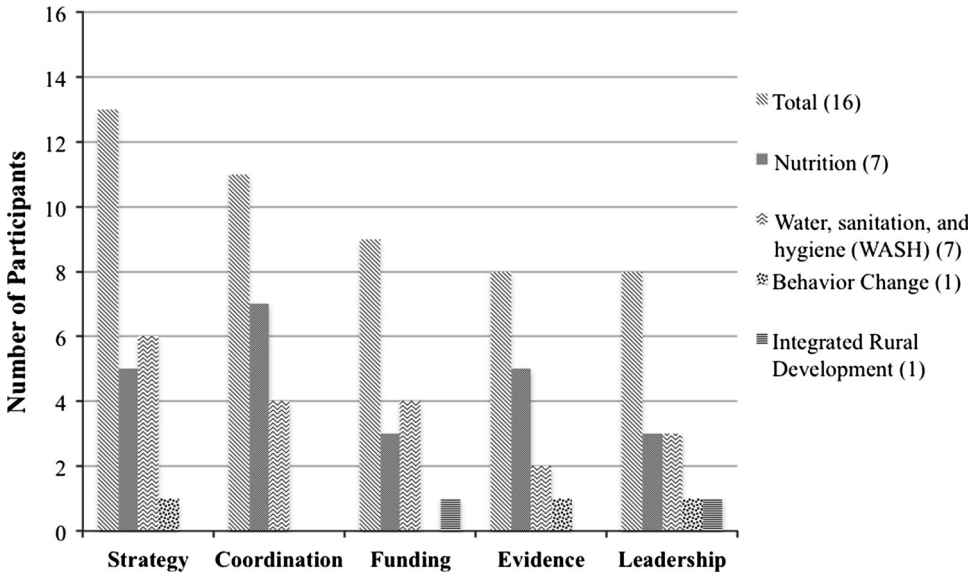

Fig. 2 Most commonly identified needs for integration, by study participants' area of expertise

> "We need to sit down to see what are the key, the minimal package that we need to use if we are going to implement a program."

A broad consensus among respondents was that integrated WASH and nutrition programs will take a new, strategic way of designing, implementing, and evaluating programs.

> "It will take a new way of thinking about how to handle integrated programs so that they're truly integrated and not driven by the most powerful interest in the room."

Coordination

As part of an integrated strategy, eleven participants (69 %) indicated that key stakeholders in the WASH and nutrition sectors must collaborate more.

> "I think that we need to work with the donors, the donors need to work with each other and with the governments to lay out a plan that really does get down to providing that package that people need at all levels."

> "We would not see the different sectors as standing on their own…you need to bring in people from other sectors so that they can see things from different angles. I think, basically, just reaching across different offices to figure out what's even possible."

It will be important to foster an environment that is conducive to collaboration between programs and sectors, rather than competition.

> "I think one of the big shifts is moving away from the projects feeling like they're in competition with each other…but I think when you create an environment where they don't feel that way, it's a little bit easier."

> "I think we need to want to work together."

One of the first steps will be to have more meetings and discussions between the WASH and nutrition sectors.

> "More discussions between different donors about how to do this work."

> "More coordination meetings at the country level between WASH people and health people and nutrition people."

Funding

Nine respondents (56 %) noted that resolving issues with funding will create an enabling environment for integrating WASH and nutrition programs. Participants indicated that donor support and encouragement is a key factor.

> "Donor directives, donors allowing more integrated programming and providing funding for more integrated programming, that will be a very strong driver."

> "Donors need to push it a little more…if we had a donor that said, you know, 'I want, I'm going to give you money for nutrition and WASH,' you know, we're sitting at the same table together."

Part of donor encouragement would be to increase the amount of funding there is for integrated programs.

> "Mainly what we need is, for some things there may be a need for new solutions, but mainly it's mostly scaling up what's already there. And to scale up, it's maybe reducing the cost but it's also investing much more."

Additionally, the way that funds are appropriated and given to programs will need to be integrated.

> "Having an integrated funding stream makes it just easier, right, it facilitates that."

> "To make us implement them together, as opposed to, say, you know, give us money for nutrition and then two years later, give us money for WASH in a different geographic area. So, allowing us to do it together, I think will really force us to work together."

Evidence

Half of all participants (8 in total) indicated that more evidence on the impact of integrated programs and more examples of successfully integrated programs is necessary to garner more support for integration and to serve as a guide for the design of newly integrated programs.

> "You can have a model of how it would work and people would be using it instead of, you know, not doing that or trying to figure out how to do it yourself."

> "There could be a number of different things from that level that make it difficult to have an integrated program and it would be good if that were more clearly understood so that it would be easier for them to happen at the level of the [country office]."

In order for donors to support integrated programs, there needs to be evidence of the impact.

> "But I think that for a donor to put their money down and say, 'Yeah, we want to put money into this,' they would need to have more data."

However, programs need to be given the resources and the freedom to generate that evidence:

> "That donors indicate within program [request for abstracts] specific, if you want to call it operations research, or to allow that learning that needs to happen within the integration of WASH and nutrition."

Leadership

Eight respondents (50 %) noted that successfully integrated programs need a champion to lead the effort and that approval from leadership of programs, organizations, and countries will be a key factor in integrating WASH and nutrition programs.

> "You have to have leadership that understands the importance and is willing to, you know, have their staff spend more time than anticipated on the coordination that's required."

> "You have to have someone strong leading the integration, because that's not natural."

> "You know, there has to be some encouragement from the outside or some, push from leadership levels for people to change the way that they're, that they do business."

Discussion

While the impact of WASH on nutrition, and vice versa, is recognized, there remain a multitude of difficulties in implementing integrated programs for improved health outcomes. Commonly reported barriers that have prevented integrated programs include low capacity and interest on the part of staff, insufficient funding, siloed funding streams, lack of knowledge of integrated program methodology, lack of examples of successful integrated programs, insufficient evidence on impact of such programs, short program timelines, and the already limited time of staff.

The integration of public health programs has been relatively widely researched and much of the literature supports the findings of this analysis (Axelsson and Axelsson 2006; Lush et al. 2001; Ramakrishnan et al. 2012). Ramakrishnan et al. (2012) found that a barrier to integrating nutrition programs for improved maternal and child health outcomes was overworked, undercompensated, and under supported staff. This is in line with responses from participants of this study. Program staff in both WASH and nutrition projects do not always have extra time to incorporate activities from other sectors, nor are they incentivized to do so by their reporting requirements. Unless WASH or nutrition indicators are included in project objectives, there is little incentive to work toward an integrated goal.

The findings of Lush et al. (2001) highlighted the issue of siloed funding. The authors noted that limited funding streams and lack of pressure or encouragement from donors has prevented integrated programs—this is similar to what respondents in our study reported. Their study noted that the directives of donors, whether one or several, resulted in isolated programming and there was a lack of additional funding to expand and integrate current programs.

Additionally, Lush et al. found that other barriers to integrating maternal and child health and family planning with HIV/AIDS and sexually transmitted disease (STD) programs included diverse demands placed on program staff, lack of cooperation, lack of definition of integration in practice for these programs, and the specialization of staff resulting in lack of knowledge of other sectors, all in alignment with our findings.

The most common needs for integration identified in this study were a comprehensive strategy, coordination, funding, evidence, and leadership. While a few of these are unique to this study, previous research on integrated programs in public health had similar results. In integrating nutrition programs for improved maternal and child health outcomes, for example, Ramakrishnan et al. (2012) identified the need to set clear targets in integrated programs. The authors noted that clear targets and integrated activities facilitate the adoption of a comprehensive strategy for all stakeholders to work toward and facilitate effective monitoring and evaluation. In addition, the authors found that supportive supervisors were necessary to the success of integrated programs, much like the need for leadership identified by participants in this study.

Many of these actions are dependent upon the others. To create an integrated methodology or a comprehensive strategy or for an 'integration champion' to promote integrated programs, or even for organizations to coordinate their actions, there must be evidence to support the expected impact of these programs, and examples of how this integration can work programmatically. Donors want to see this evidence before they fund integrated projects, but to get such evidence, donors must fund integrated programs and operational research.

Strengths and limitations

This study relied on self-reported data from semi-structured in-depth interviews. As such, the results are vulnerable to recall bias if certain projects discussed occurred in the past, rather than the present. In addition, the final sample included fewer field-level respondents than headquarters staff, but all respondents were involved in design or implementation of WASH or nutrition programs at their organizations.

This study had several strengths. While studies have assessed the relationship of WASH and nutrition on health outcomes, and on specific programs that integrate these activities, this is the first study to the authors' knowledge on actual implementation practices that include multiple organizations undertaking WASH and nutrition activities. Further, this study is the first to report on the barriers to and needs for successfully integrated programs. The results of this study can be used to better understand the challenges in integration, and what is needed to overcome these barriers and implement more effective programs where they are appropriate. Additionally, respondents for this study provided perspectives from a diverse set of backgrounds and experiences. The projects discussed take place in varied regional settings and utilize varying forms of integration (Table 4).

Implications

In public health and international development, program integration is not a new or emerging concept. It does not, however, have a strong history of success and there are gains to be had. Implementers and donors desiring to integrate their WASH and nutrition programs can use the results of this study for program planning to prepare for challenges they may encounter, and to know what conditions are necessary for successfully integrated programs. Knowing that lack of capacity and willingness of staff, funding, donor support, knowledge, evidence, and time have been common barriers to integration can better help donors and implementers better prepare to integrate programs. Realizing that there are common needs for integration, such as a comprehensive strategy, coordination, funding, evidence, and leadership, can facilitate a culture conducive to more integrated and impactful programs. To integrate WASH and nutrition and to do so more effectively, donors should support integration and fund operational research to generate the understanding of the additive or multiplicative effects that can be gained from integrated programs. Improved knowledge sharing among

Table 4 Methods of integration used by organizations, for programs in 47 countries based on 16 in-depth interviews in 2013

Methods of integration	*N* (%)
Messaging	16 (100)
Behavior change programs	11 (69)
Target same beneficiaries	11 (69)
Integrated strategy	8 (50)
Cross-training	7 (44)
Advocacy	4 (25)
Materials (guidelines, toolkits, and assessments)	3 (19)
Integrated teams	3 (19)
Integrated meetings	2 (13)
Joint monitoring	1 (6)

Afghanistan, Bangladesh, Benin, Bihar, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Dominican Republic, Ethiopia, Ghana, Guatemala, Haiti, India, Indonesia, Iraq, Kenya, Laos, Lebanon, Liberia, Madagascar, Malawi, Mali, Mexico, Mozambique, Myanmar, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, Sudan, Syria, Uganda, Vietnam, Yemen, Zimbabwe

Table 5 Key quotes from participants in in-depth interviews in 2013

"If different approaches have been used before or people might have been trained on different approaches, it might be difficult to have people change those kind of, perhaps, habits, or approaches that they might feel more comfortable with."
"Knowing exactly what to do is still a challenge."
"There's no document that has proven evidence what can work properly."
"We've yet to finalize our offering to our platforms, to clearly say here's how we think you can go about it and here's why we think, um, you should do it that way and hence the health impact that might come about."
"I'm wondering to what extent we have examples, sufficient examples on the ground to be able to paint the picture of what this really should or could look like."
"The idea would be to have a standardized methodology."
"I'm yet to see a clear example of a project where WASH and nutrition have been integrated and there's been some, um, benefit that was provided to the end user."
"It's too early to tell, you know, for WASH and nutrition integration."
"Assisting or providing more technical assistance or a clearer picture on what the 'how' can look like, and what the costs that are involved, uh, and what the steps may be involved."
"We need approval from the funders to move in a certain direction."
"It takes a champion, you know, not only on a technical level but also the mission director has to be interested and willing."

sector professionals is needed, and incentives should be designed for the two sectors to more effectively work together toward common goals (Table 5).

References

Axelsson R, Axelsson S (2006) Integration and collaboration in public health—a conceptual framework. Int J Health Plan Manag 21:75–88

Bhutta Z, Ahmed T, Black R, Cousens S et al (2008) What works? Interventions for maternal and child undernutrition and survival. Lancet 371:417–440

Black R, Victora C, Walker S, Bhutta Z et al (2013) Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet 382(9890):427–451

Cairncross S, Curtis V (2003) Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. Lancet Infect Dis 3(5):275–281

Cuesta J (2007) Child malnutrition and the provision of water and sanitation in the Philippines. J Asia Pac Econ 12(2):125–157

Dangour A, Watson L, Cumming O, Boisson S et al (2013) Interventions to improve water quality and supply, sanitation and hygiene practices, and their effects on the nutrition status of children. Cochrane Database Syst Rev (Online) 8:CD009382

Dewey K, Mayers D (2011) Early child growth: how do nutrition and infection interact? Matern Child Nutr 7(3):129–142

Dorion C, Hunter P, Van den Bergh R, Roure C et al (2012) Does village water supply affect children's length of stay in a therapeutic feeding program in Niger? Lessons from a Médecins Sans Frontières program. PLoS One 7(12):e50982

Lin A, Arnold B, Afreen S, Goto R et al (2013) Household environmental conditions are associated with enteropathy and impaired growth in rural Bangladesh. Am J Trop Med Hyg 89(1):130–137

Lush L, Walt G, Cleland J, Mayhew S (2001) The role of MCH and family planning services in HIV/STD control: is integration the answer? Afr J Reprod Health 5(3):29–46

Norman G, Pedley S, Takkouche B (2010) Effects of sewerage on diarrhoea and enteric infections: a systematic review and meta-analysis. Lancet Infect Dis 10(8):536–544

Pickering A, Davis J (2012) Freshwater availability and water fetching distance affect child health in sub-Saharan Africa. Environ Sci Technol 46(4):2391–2397

Prendergast A, Kelly P (2012) Review: enteropathies in the developing world: neglected effects on global health. Am J Trop Med 86(5):756–763

Prüss-Üstün A, Corvalán C (2006) Preventing disease through healthy environments: toward an estimate of the environmental burden of disease. World Health Organization. http://www.who.int/quantifying_ehimpacts/publications/preventingdisease.pdf. Accessed 2 Apr 2014

Prüss-Üstün A, Bos R, Gore F, Bartram J (2008) Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. World Health Organization. http://whqlibdoc.who.int/publications/2008/9789241596435_eng.pdf. Accessed 2 Apr 2014

Ramakrishnan U, Lowe A, Vir S, Kumar S, Mohanraj R et al (2012) Public health interventions, barriers, and opportunities for improving maternal nutrition in India. Food Nutr Bull 33(2 suppl):S71–S92

Walker C, Rudan I, Liu L, Nair H et al (2013) Global burden of childhood pneumonia and diarrhea. Lancet 381:1405–1416

Weiser S, Young S, Cohen C, Kushel M et al (2011) Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDs. Am J Clin Nutr 2011(94 suppl):1729S–1739S