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### Child drowning prevention in the Philippines: the beginning of a conversation

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## Child drowning prevention in the Philippines: the beginning of a conversation

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This study describes a process to explore factors which contribute to child-drowning deaths and allows the development of appropriate strategies to prevent similar deaths in a selected site in the Northern Philippines. Data collection techniques used in obtaining baseline data include: review of drowning mortality records; key informant interviews; focus group discussions; and community walk-throughs. Risk factors identified which could or did contribute to drowning events were: proximity to bodies of water; inadequate child supervision; lack of information/awareness of prevention strategies; and lack of drowning prevention programme(s). Measures on how to prevent drowning deaths were explored and initial interventions were implemented through a committee convened by the community. These interventions include: community education sessions; capability building measures; redesigning of community wells; development of playpens; and use of barriers. Community engagement is a crucial element in the development and implementation of any health programme. This study demonstrates that by engaging and working with the community action occurs, however, there is a need to conduct further evaluation activities to determine if the actions by the community continued beyond the project and have resulted in a decrease in drowning. One of the strengths of the process described is that it is culturally appropriate and site-specific and allows the community to find the solutions itself. Exploration and delivery of further projects in larger areas is required to reduce drowning in the Philippines. An imperative is the evaluation which will provide valuable information on whether barriers are a sustainable and acceptable means of prevention to the community in the long term.

**Keywords:** drowning prevention; community engagement; drowning prevention strategies; Haddon's matrix; intervention

### Introduction

Drowning prevention is a worldwide challenge with an estimated 388,000 people dying annually, of which 45% are under the age of 20 years (Peden, Ozanne-Smith, Branche, & Rivara, 2008). In 2004, approximately 175,000 children and youth under the age of 20 years died as a result of drowning around the world (Peden et al., 2008). These figures underestimate the burden of drowning as they do not include drowning deaths from disasters and transport; this is especially relevant for the Philippines as it is an archipelago and is visited by at least 20 typhoons a year.

This issue is even more pressing for those living in low- and middle-income countries (LMIC) in the tropics. The overwhelming majority (98.1%) of these deaths, occurred in the LMIC, and the LMIC of the World Health Organization (WHO) Western Pacific Region have the highest rate of drowning deaths (13.9 per 100,000 population) followed by the African Region (7.2 per 100,000), Eastern Mediterranean Region (6.8 per 100,000) and

South-East Asia Region (6.2 per 100,000) (Peden et al., 2008). Drowning is preventable, however, there is limited evidence about what works, particularly in a resource-poor environment.

Drowning is a leading cause of injury-related deaths in the Philippines (Lim-Quizon & Linnan, 2008). The Philippine National Injury Survey, conducted in 2003, was the first of its kind for the Philippines. It was a descriptive study undertaken to explore the patterns of fatal and non-fatal injury by type of injury, by gender and age groups. The fatal injury rate in childhood (0–17 years) was 58.9/100,000 children, the leading cause was drowning. For children after infancy (1–17 years), drowning (9.8/100,000) followed by road traffic accidents (RTA) (9.1/100,000) and mortality from violence (3.3/100,000) were the three leading causes of death followed by animal bites, burns and falls (2.5/100,000), respectively (Lim-Quizon & Linnan, 2008).

A retrospective review and analysis of published data on child drowning injury in the Philippines for the period

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1963–2003, found at least 3000 Filipinos (of all ages) die annually from drowning. Of these deaths 35.6% were children under 14 years, with children aged 1–4 years having the highest rate (6.4/100,000). Overall, drowning death rates during this period remained largely unchanged (3.86 in 1963 to 3.48 in 2003); however the drowning death rates have increased as a proportion of all deaths (0.54% to 0.71%), belying its under-recognition as a public health priority (Antonio & Consunji, 2011).

While it is clear that drowning deaths are a challenge in the Philippines, there is little information about the problem, such as: who is at risk, where the drowning occurred, what the victim was doing at the time, who was responsible for the child at the time, what prevention activities are being undertaken and their effectiveness.

Knowledge of the risk factors is a critical prerequisite for the effective prevention of drowning (Peden et al., 2008). The 'Haddon matrix' is a framework for analysing injury events and developing prevention strategies; it has two dimensions, factors and phases. The factor dimension explores the societal interaction around the injury and is divided into four categories: human, agent, physical environment and socio-economic environment. There are three phases: the pre-event, event and post-event phases (Haddon, 1980). For drowning, the first phase (i.e. pre-event) and the human and physical and socio-economic environments are important for helping understand where prevention activities should be targeted (Franklin & Scarr, 2014).

Drowning prevention strategies often require a multi-faceted approach, based on a particular pattern of drowning observed in a given location (Pearn, Nixon, Franklin, & Wallis, 2008). Passive strategies – such as improving safety design – that require no action or else a single action on the part of the individual, are generally regarded as more effective than active strategies, such as adopting safer behaviours, requiring repeated actions. However, for many types of drowning there are a limited number of passive strategies – or even none at all (Peden et al., 2008).

The Philippines has a population of approximately 92.34 million people as of 1 May 2010 (National Statistics Office [NSO], 2012) and is made up of 7107 islands where interaction with water is a regular occurrence. Aside from waters surrounding the whole archipelago, there are inland bodies of water (rivers, lakes, creeks among others). In addition, agriculture is a major source of livelihood, as is fishing (including in open waters, ponds, lakes). Following the Philippine National Injury Survey that was conducted in 2003, through Administrative Order No. 2006-0016 also known as the 'National Policy and Strategic Framework on Child Injury Prevention' (June 2006), the Department of Health (DOH, 2006) of the Philippines began to build a national programme on violence and injury prevention. This policy centred on planning

interventions and strategies on violence and injury prevention for children. One of the priority areas is drowning. In 2010, the Philippine government with support from the WHO started exploring methods to prevent drowning. This project was undertaken in 2011 and was instigated as an activity exploring drowning prevention in the Philippines.

### **Aim**

This study describes a process to explore factors which contribute to child-drowning deaths and allows the development of appropriate strategies to prevent similar deaths.

### **Methods and materials**

#### **Location**

This project was undertaken in the village (a barangay) of Lucao, Dagupan City in Northern Philippines. Lucao is located in the south-western part of Dagupan City. Its total land area is 195.30 km<sup>2</sup>. In 2010, its total population was 8442 and its population density is 47.3 people/km<sup>2</sup> (Lucao Barangay Profile, 2011). Lucao is composed of seven zones (puroks). Lucao was chosen based on: (1) area with drowning mortality, (2) receptiveness of local community leaders on health programme initiatives and (3) recommendation of the city health officer of Dagupan City.

#### **Deaths**

Official records from 2008 to 2011 on the deaths due to fatal drowning are reported in the city health office (CHO) of Dagupan. When a member of the family dies, this is reported to the city health officer who signs the death certificate. Data on the reported drowning deaths which occurred from 1 January 2008 to 31 September 2011 were obtained and reviewed.

#### **Project process**

The project was undertaken from August to December 2011, with the following steps (Figure 1):

- (1) Call for and selection of proposal
 

The DOH of the Philippines called for the submission of proposal for this project with funding coming from the WHO. Proposals were reviewed and a proposal was selected and approved by the DOH.
- (2) Endorsement from authorities and collection of drowning information
 

A letter from the DOH was sent to the city mayor of Dagupan city seeking permission and support for the project. The city mayor then

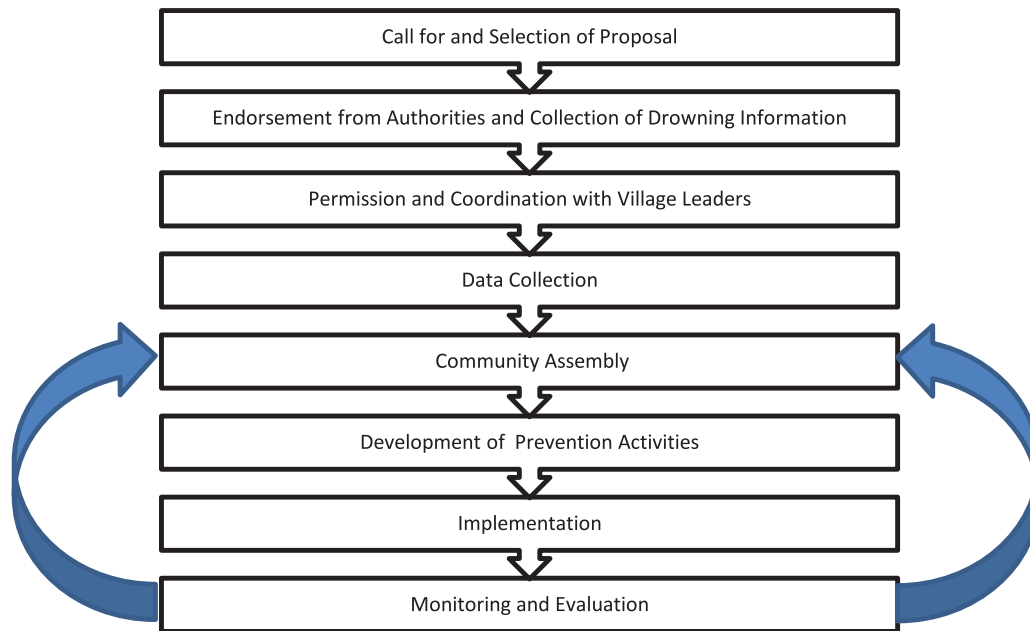


Figure 1. Flow diagram describing the project process.

endorsed the project and took it to the city health officer of Dagupan City for approval and support. With the city health officer's approval, drowning mortality data were retrieved and the site for the project was selected. The main author (J.P. Guevarra) was then endorsed to the local chief executive of the village where the project was to be implemented.

- (3) Permission and coordination with village leaders  
Permission from the local chief executive of the village (Barangay chairperson) was obtained after a thorough explanation and discussion about the purpose of the project.  
After permission was obtained, the village chief assigned a council member to be in close coordination with the main author for his needs. With the close coordination and cooperation of the village officials, data collection commenced.
- (4) Data collection  
Consent forms were signed by key informants and focus group participants before the actual data collection. All targeted key informants and focus group participants consented to the data collection activity. The council member assigned by the village chief selected four female village residents to accompany the author in conducting community walk-throughs. Out of the seven zones (puroks), it was decided that community walk-throughs be undertaken in four zones because these are the areas surrounded with bodies of water and where fatal drowning occurred in the village.

Mixed methods of data collection techniques were used in obtaining baseline data. These methods included: review of drowning mortality records, key informant interviews (KII), focus group discussions (FGD) (see Table 1) and community walk-throughs.

- (5) Community assembly  
A community assembly was called by the village chairperson for the purpose of presenting the results of data collection. This was also the venue for the open forum and validation of results of the assessment done in the village.
- (6) Development of prevention activities  
Using the results of the assessment, discussion with village leaders and representatives was undertaken to develop prevention strategies which can be implemented within the duration of the project. Initial set of strategies were determined and a village drowning prevention committee was formed that oversaw the implementation of activities.
- (7) Implementation  
The prevention strategies developed were implemented in the village of Lucao.
- (8) Monitoring and evaluation  
This phase is useful in determining if the prevention activities were continued by the members of the community and if the activities contributed to the prevention of drowning. However, this phase of the project has not been undertaken at the time of publication of this paper and it is the

Table 1. Results of the assessment in the project site in the Northern Philippines.

Data points	Methods used	
	Key informant interview	Focus group discussion (FGD)
Place of occurrence	<ul style="list-style-type: none"> <li>• 'Fish pond'</li> <li>• 'River'</li> </ul>	<ul style="list-style-type: none"> <li>• 'Fish pond'</li> <li>• 'In river'</li> </ul>
Causes of drowning	<ul style="list-style-type: none"> <li>• 'Neglect of parents'</li> <li>• 'Proximity of the victim's house to the fish pond'</li> </ul>	<ul style="list-style-type: none"> <li>• 'Neglect of parents'</li> <li>• 'Hard-headedness (not following instructions)'</li> <li>• 'Bathing in the creek'</li> </ul>
Health care and referral system	<ul style="list-style-type: none"> <li>• 'CPR was not given'</li> <li>• 'Brought to the hospital'</li> </ul>	<ul style="list-style-type: none"> <li>• 'No first aid given'</li> <li>• 'Brought straight to the hospital'</li> <li>• 'For near-drowning incident, they just "massaged" the victim'</li> </ul>
Surveillance and reporting system	<ul style="list-style-type: none"> <li>• 'Incidents of drowning/near drowning are reported to the barangay but these were not recorded'</li> <li>• 'Victims were brought to the hospital'</li> <li>• 'When incidents are reported to the barangay, officials go to the victim's house to extend whatever assistance they can give to the victim's family'</li> </ul>	<ul style="list-style-type: none"> <li>• 'One participant was with the victim who brought him to the hospital, he was also the one who reported the drowning incident to the barangay'</li> <li>• 'Drowning or near-drowning incidents are not reported to the barangay'</li> </ul>
Measures in place for drowning prevention	<ul style="list-style-type: none"> <li>• 'No policies/measures for drowning prevention'</li> <li>• 'There are safety nets in some fish ponds'</li> </ul>	<ul style="list-style-type: none"> <li>• 'No ordinance'</li> <li>• 'No safety measures in place'</li> </ul>
Activities needed to prevent drowning	<ul style="list-style-type: none"> <li>• 'Awareness/health education campaigns'</li> <li>• 'Reminders should be put in place'</li> </ul>	<ul style="list-style-type: none"> <li>• 'Information dissemination campaigns'</li> <li>• 'Training on swimming and first aid'</li> </ul>
Features/activities needed for the drowning prevention programme	<ul style="list-style-type: none"> <li>• 'Various forms of information dissemination'</li> <li>• 'Reminders/signage'</li> <li>• 'Information dissemination and training'</li> <li>• 'An ordinance prohibiting those who have drank alcoholic beverages to go to the river'</li> </ul>	<ul style="list-style-type: none"> <li>• 'The creation of a committee'</li> <li>• 'Passage of an ordinance on drowning prevention'</li> <li>• 'Presence of lifeguards/patrols'</li> </ul>
Perceived roles in drowning prevention programme	<ul style="list-style-type: none"> <li>• 'Providing leadership in the implementation of policies'</li> <li>• 'Health education/dissemination'</li> <li>• 'Monitoring the implementation of the programme'</li> </ul>	<ul style="list-style-type: none"> <li>• 'Cooperation to the drowning prevention programme'</li> <li>• 'Records keeping'</li> </ul>
Perceived barriers to drowning prevention programme	<ul style="list-style-type: none"> <li>• 'Budget'</li> <li>• 'Availability of the residents'</li> <li>• 'Lack of training on basic life support'</li> </ul>	<ul style="list-style-type: none"> <li>• 'Lack of budget'</li> <li>• 'Cooperation and lack of skills'</li> </ul>

intention of the researchers to visit the community and find out if the activities were continued and if drowning was prevented using the strategies.

### Analysis

Assessment in the site was done in the third quarter of 2011. The results of the assessment were analysed and presented to the community leaders and residents through a community assembly. In this activity possible prevention strategies were discussed.

### Results

City data on drowning mortality which occurred from 2008 to 2011 were obtained and reviewed. Information which was included in these records were age and sex. Drowning mortality for Dagupan city from 2008 to 2011 were 12, 11, 4 and 8, respectively; a crude drowning rate of 7.1/100,000 people. In all four years, there were more males who drowned compared to females. The youngest drowning victim was 8 months old while the oldest was 72 years old (Dagupan City Drowning Mortality Report, 2008–2011).

Three drowning mortalities from Lucao were reported from 2008 to 2011, the crude rate of 8.9/100,000 people. Two of these happened in 2009 while another in 2011. Two were children below 5 years old and the other one was an adult.

The results of the KII and FGD are presented in [Table 1](#). These qualitative techniques identified common places of occurrence of drowning in the area; causes of drowning; existing health care and referral system; surveillance and reporting system; measures in place for drowning prevention; activities needed to prevent drowning; activities/features needed for the drowning prevention programme; perceived roles in drowning prevention programme; and perceived barriers to drowning prevention measures.

The results of the assessment were presented to the members of the study site through a community assembly. Risk factors identified which could or did contribute to the drowning events were proximity to bodies of water, inadequate child supervision, lack of information dissemination/awareness campaigns and lack of programme on drowning prevention. Data were validated by those who attended the assembly, measures on how to prevent drowning incidents were explored and initial interventions were carried out through a committee convened by the community.

Personal factors identified were related to inadequate child supervision (such as 'neglect of parents', 'hard-headedness', i.e. not following instructions and 'letting children bathe unsupervised in bodies of water') and lack of knowledge and skills on appropriate resuscitation of

drowning victims (just 'massaged the victim', 'no first aid given', 'brought straight to the hospital'). Community education sessions and cardiopulmonary resuscitation training were implemented for these identified community concerns. Training for swimming among community leaders, community volunteers and interested parents was also planned but was not implemented due to time limitations. However, this is likely to be explored in future activities in the village.

Agent factors identified were proximity of houses to bodies of water, presence of ponds (through KII and FGD). Through community walk-throughs, it was identified that the village had five open dug wells which posed danger to young children living nearby and playing near these wells. Thus, community wells were reconstructed and covered.

For the physical environment, important structures to prevent drowning were either not found or were inadequate. As cited by the respondents both in KII and FGD, there were 'no safety measures in place', 'no measures for drowning prevention', 'there were no safety nets in some fish ponds'. Also through community walk-throughs, houses without barriers or backyard fences near bodies of water were identified with assistance from members of the village council. Several houses in different parts of the community were found to be either without house barriers or backyard fences. When probed further, it was revealed that there were many children in these identified houses. These results prompted the implementation of prevention activities such as the use of barriers (playpen, house/door barrier and porch barriers). Little information was known about the rescues which had been performed.

For social environment factors, policy/ies that will prevent drowning are required. This came from KII and FGD participants when asked about measures, activities or programme for drowning prevention ('no policies for drowning prevention', 'no ordinance', 'passage of an ordinance on drowning prevention'). Before the end of the project, village leaders were discussing about ordinances on prohibiting drinking of alcoholic beverages near bodies of water and requiring fish-pond owners to put safety nets in place in the areas covered by their business. At the time of writing this article, there is no information if these policies were implemented.

The development of drowning prevention activities was undertaken with the aid of the Haddon's matrix exploring personal factors, those related to the agent, the physical and social environments, before, during and after the event (Haddon, 1980).

### Discussion

Drowning is a significant issue which has received little attention in the Philippines; this public health problem requires attention if the Millennium Development Goal

(MDG) goal 4 'Reduce Child Mortality' (WHO, 2010) is to be met and prevention measures implemented. Addressing drowning cannot be undertaken by one person and will require cooperation from a range of sectors, as well as engagement with the community. Without cooperation it will be impossible to implement many of the interventions.

### ***Participatory approach and community engagement***

This project used a community-based participatory research approach (Minkler, Garcia, Rubin, & Wallerstein, 2012) ensuring community engagement from commencement of the project. This engagement occurred via village leaders and community residents' participation in community walk-throughs, data collection (including identification of drowning deaths, their location and high risk locations in and around the community), discussions particularly around the presentation of results, development of programmes and implementation of interventions.

Community engagement is central to many health improvement programmes and involves a range of strategies (Attree et al., 2011). Community engagement refers to the process of involving communities in decisions which affect them. This includes the planning, development and management of services, activities which aim to improve health or reduce health inequalities (Popay, 2006), citizens' panels and juries, neighbourhood committees and forums, community champions and collaborative methodology (used in initiatives such as the Healthy Communities Collaborative) (National Institute for Health and Clinical Excellence [NICE], 2008).

To ensure appropriate engagement the village drowning prevention committee was formed by the village leadership and composed of representatives from the village council (village chairman, councilors) and community groups such as village nurses, midwife, village volunteer health workers, and day care worker. Once the results of the research had been reported to the committee, with the guidance of the main investigator, they formed three subcommittees, to ensure the implementation of programme, these committees were responsible for:

- (1) Infrastructure subcommittee: Identification of the areas where drowning-prevention interventions will be implemented; canvassing and purchasing of the needed materials, supplies and equipment for the project; coordinating with the community residents regarding the implementation of activities.
- (2) Health subcommittee: Conducting health education on drowning prevention; accomplishing drowning report form; implementing drowning prevention activities.
- (3) Monitoring, evaluation and documentation subcommittee: Monitoring drowning prevention activities in the area; documenting implementation of drowning prevention activities; preparing accomplishment report.

The village drowning prevention committee chairperson (a village councilor) reported directly to the village chairman. While this study describes the need for and the activities of the village drowning prevention committee, the work of the committee and subcommittees continues and further work is required to explore the continuing functionality of the committees and evaluate their outcomes.

To ensure community engagement, four approaches were undertaken: it explored and presented to the community drowning deaths which had occurred in their area; community walk-throughs were conducted with members of the community identifying high risk areas (i.e. where people had drowned, where people had to be rescued or were likely to come into contact with water); third, community members participated in interviews and focus groups exploring drowning and its prevention and finally this information was presented back to the community which then participated in identifying and implementing appropriate prevention strategies.

The community walk-throughs were effective in identifying drowning events where people were rescued and survived, unfortunately, very little information is known about the circumstances that surround these events. Identifying high-risk areas allows for appropriate prevention strategies to be developed, however by only using drowning deaths as an indicator of high-risk areas many high-risk areas would be missed; by engaging the community and exploring where rescues had been attempted and where open water bodies are located allows for a comprehensive picture of drowning risks to be established.

### ***Use of qualitative approaches***

Key informant interviews and focus groups discussions were also utilised as data gathering techniques. By using these techniques, in-depth information was gathered from the respondents, which was helpful in crafting the prevention strategies used in the selected site. In Bangladesh (Rahman et al., 2010), a prevention package was formulated and piloted in four rural communities for three months. Focus group discussions and in-depth interviews were organised with stakeholders to elicit community acceptability, feasibility and sustainability of the proposed interventions (Rahman et al., 2010). This study demonstrated the usefulness of using KII and FGD in data collection and crafting of interventions.

### **Drowning prevention strategies**

Drowning is a problem which especially affects children worldwide (Peden et al., 2008), however little is known as to what strategies work in the LMIC. In this project, drowning prevention strategies explored and implemented included community education sessions, reconstruction of open dug wells, development of playpens and use of barriers for the house or the porch.

#### *Community education sessions*

Education sessions for health workers were undertaken. The attendees were then to conduct the same session in the community. The education sessions were attended by the midwife, nurses, barangay health workers (BHWs) and other community volunteers who assist the council in the implementation of council programmes in the village. Information in the first education session included discussion of risk factors identified to be present in the study site (houses near the ponds or river and houses built on top of bodies of water, houses without barriers, open dug wells), measures to prevent drowning in homes (covering or emptying water containers, close supervision of children, and barriers) and community prevention activities (use of barriers in areas where there are water hazards). They were oriented on what to inspect in the houses and on what they can teach especially to the mothers on drowning prevention measures during their house to house visits in the community.

The second education session was on the use of drowning report form developed in 2009 by the Department of Health to record information about drowning. This form is designed to gather information about the event including time, place of occurrence, type or body of water, description of the event, main activity at the time of the incident, safety measures present in the area at the time of the incident, demographic characteristics of the victim, child supervision and rescue efforts undertaken. It is planned that with the use of this form, authorities will have better information on drowning incidents and thus be able to develop appropriate future interventions. The community committed to ongoing community education sessions on drowning prevention in the form of mothers' classes and house to house visits especially where water hazards are present. The status of this community education work needs to be evaluated.

In addition, first aid and basic life support training was provided in coordination with the Philippine Red Cross – Dagupan City Chapter to community officials, health workers, elected youth leaders (SK Youth Council) and some community residents. The village council identified the participants to be trained in first aid and basic life support. These trainees came from different areas in village. It is hoped that those who attended the training will be

able to assist the community health workers in responding to future events which may occur in the community. In addition, first aid kit, supplies and materials were also made available. Capability building activities such as this training has its own positive and negative consequences. Those who finished the training are those who have the desire to contribute to community health and safety and have the willingness to respond. However, those who have been trained may not be present at the site at the time of the incident to respond as they also have other responsibilities to their family, work and the community. As such, it would be beneficial for the community to expand its base of trained personnel, this would require the community to include in their plan a continuing training programme to ensure as many people in the community are trained and available in case of need.

#### *Reconstruction of wells*

Open dug wells were identified as a priority area by the community. Another major activity of the community was the reconstruction and development of covers for open dug wells. Those open dug wells that were at ground level (Figure 2) were reconstructed (i.e. the wall height was raised and a cover provided) to make them safer (Figure 3). As of the time of writing this article, five wells had been reconstructed. Covering of wells is an example of environmental measure to prevent drowning (Peden et al., 2008).

#### *Playpen*

A portable four-sided enclosure in which a baby or young child can be safely placed without constant supervision. Families living near bodies of water with children less than 1 year of age were identified and became the



Figure 2. Open dug well (community well).





Figure 3. Reconstructed and covered community well.

beneficiaries of the playpens (Figure 4) which were developed in the community. According to the mothers, there were times when they leave their young children in their homes so that they can do their household chores and or engage in work. They were worried that their children may fall into bodies of water surrounding their houses. They believe that the use of playpens, where they can leave their children temporarily, will be safer for their children. At the time of writing this article, 10 playpens had been implemented.

#### *House, door and porch barriers*

Families with many children whose houses are located near or on bodies of water in the community were identified. House barriers (made of bamboo, placed in the door, windows and walls of the house) were constructed to ensure children, especially those left at home, would not fall into the water (Figure 5). Due to the limited resources available,

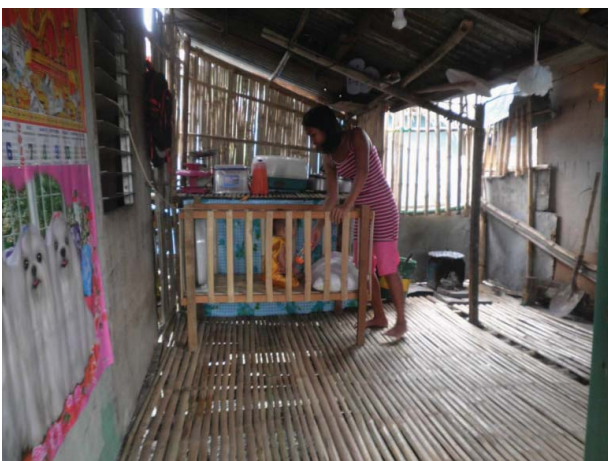


Figure 4. Playpen.



Figure 5. House/door barrier.

the drowning prevention committee identified priority families to receive this initiative, families of children who had died from drowning and families with children who experienced near-drowning event, and families that needed the barriers, such as those with many children or children who were at risk (living near water hazards) were provided with barriers. These families were supported in constructing house barriers and backyard fences (porch barriers) so that the children are not able to access bodies of water. At the time of writing this article, 40 house barriers and backyard fences had been built. Further work is required to explore the communities' acceptance of the barriers, costs and ongoing use.

A pilot study in rural Bangladesh (2004–2006) exploring child supervision practices for drowning prevention using a door barrier and a playpen found that of the 2694 observations: children were directly supervised or protected by a preventive tool in 96% of visits; households with a supervision tool had a significantly lower proportion of



Figure 6. Porch barrier.

observations with the child unsupervised and unprotected than households without a tool; families that received a playpen had 6.89 times the odds of using it at the time of the visit than families that received a door barrier. The researchers concluded that interventions such as the playpen, when introduced to households through community-based programmes, are accepted by parents (Callaghan et al., 2010).

Playpens and barriers have been associated with entrapment and other injuries, particularly when there are no standards in place. A risk assessment should be carried out for unintended injury that might occur from the way that these items are used in this culture, i.e. particularly where children might be 'left at home'. This highlights the need for an evaluation as an integral part of this study.

Utilising Haddon's matrix helps to identify risk factors before an event occurs and allows for appropriate interventions to be developed. It covers the personal factors, physical and social environments which are important in determining appropriate interventions for a specific site (Haddon, 1980). In this project, it was demonstrated that after identifying the risk factors in the environment that may have contributed to drowning deaths, strategies such as community education sessions, training, the reconstruction of wells, use of playpen and the use of barriers (house and porch) were identified as strategies which could prevent similar incidents from occurring. One of the major interventions was the use of barriers; however, we do not know what the acceptability of the barrier is to the community since it is not usually used as a drowning prevention strategy in the Philippines. The community continues to think that teaching how to swim is needed in order to avoid drowning incidents (personal communication). There is a need to conduct further investigation as to the acceptability of barriers as a drowning prevention strategy and expand the range of drowning prevention strategies available.

According to WHO (2012), drowning prevention strategies should be comprehensive and include: engineering methods which help to remove the hazard, legislation to enforce prevention and assure decreased exposure, education for individuals and communities to build awareness of risk and to aid in response if a drowning occurs and prioritisation of research and public health initiatives to further define the burden of drowning worldwide and explore prevention interventions. Some other strategies for which there is currently insufficient evidence and for which further research is needed are: learning to swim programmes for school children and adults; supervision of children in and outside the home and establishing parent groups or other child care mechanisms in rural communities, especially around harvesting; educating children on not entering fast-flowing streams and not swimming alone (WHO, 2012).

Drowning can be prevented within the context of culture and the environment of the LMIC as has been demonstrated in Bangladesh (Rahman et al., 2012). The interventions included helping parents learn about the high risk of drowning to their child, increasing the supervision of children, use of playpens for infants, use of adult supervision via community crèches for toddlers during their mother's peak busy periods, teaching children to swim and teaching children to safely rescue other children (Linnan, Scarr, & Giersing, 2013; Rahman et al., 2012).

### Limitations

From this project, several issues and limitations need to be understood as described in the following.

Use of qualitative techniques such as key informant interviews and focus group discussions have several limitations especially in terms of selection of representative sample and generalisability of results (Schulze, 2003). All effort was made to ensure that the key informants and focus group participants had knowledge about the local area and how a drowning prevention strategy might be implemented. While the researchers believed that the participants were the people most likely to have knowledge about drowning events and thus representative, it is possible but unlikely that the researchers might have missed key respondents. The researchers do not know if the results would generalise and, as such, recommend caution when applying these results to other populations. These techniques, however, were also complemented by other methods such as community walk-through and review of records which identified similar issues as in the key informant interviews.

The project followed the public health model from defining the problem, identification of risks, development and implementation of interventions (WHO, 2007). One very important step in the model which needs to be undertaken is evaluation of interventions implemented in the site. We are also unsure of the changes in attitudes and behaviour and as such the use of other models/approaches like Transtheoretical Model (Prochaska & DiClemente, 2005) and the Precede-Proceed Model (Green & Kreuter, 2005) would be a welcome initiative.

Though initial interventions were carried out in the site, evaluation as to the effectiveness of these as drowning prevention strategies has to date (at the time of submitting this article) not been undertaken. The use of barriers, playpens and reconstruction of wells are not common strategies for drowning prevention in the Philippines and further work is required to determine how acceptable to community members these are as strategies to prevent drowning. At the time of writing this article there have been no drowning deaths since the introduction of the programme, however as the numbers were small it

may be many years before we can claim that the programme has been a success.

Although there are limitations, it is also worth noting that a range of novel interventions for the Philippines were used. The interventions were carried out with the technical assistance from the Philippines' Department of Health and the World Health Organization. The authors would like to see these interventions replicated in other areas in the country where there are drowning cases. Further work will be required to ensure the transferability to other locations, this include information on individual and community social acceptance and durability of interventions.

## Conclusion

This article reports on the process used in developing and implementing drowning prevention strategies in Lucao, Dagupan City, Pangasinan, Philippines. One of the strengths of the process described is that it is culturally appropriate and site-specific and allows the community itself to find the solutions. The process used in the village of Lucao is simple and can be used or replicated in other parts of the Philippines where drowning is a public health concern.

This project also demonstrated the importance of community engagement in the development and implementation of drowning prevention activities. The development of a community drowning prevention committee was important in driving action in the community, as they provide the structure which plans, implement and monitor drowning prevention activities. The use of innovative drowning prevention strategies such as barriers, reconstruction and covering of open dug wells and playpens appear to be effective, however, further work is required to understand their impact. An imperative is the evaluation which will provide valuable information on whether barriers are a sustainable and acceptable means of prevention to the community in the long term.

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## References

Antonio, C.A.T., & Consunji, R.J. (2011). The epidemiology of child drowning injury in the Philippines. *Acta Medica Philippina*, 45(3), 38–43.

- Attree, P., French, B., Milton, B., Povall, S., Whitehead, M., & Popay J. (2011). The experience of community engagement for individuals: A rapid review of evidence. *Health and Social Care in the Community*, 19(3), 250–260.
- Callaghan, J.A., Hyder, A.A., Khan, R., Blum, L.S., Arifeen, A., & Baquil, A.H. (2010). Child supervision practices for drowning prevention in rural Bangladesh: A pilot study of supervision tools. *Journal of Epidemiology and Community Health*, 64, 645–647. doi:10.1136/jech.2008.080903. Retrieved from <http://jech.bmj.com/content/64/7/645.abstract>
- Department of Health (DOH). (2006). *Administrative order no. 2006-0016, the 'National Policy and Strategic Framework on Child Injury Prevention'*. Manila: Department of Health, Philippines.
- Franklin R.C., & Scarr, J. (2014). A framework for prevention. In J.J.L.M. Bierens (Ed.), *Handbook on drowning: Prevention, rescue, treatment* (2nd ed.). Berlin Heidelberg: Springer-Verlag. ISBN 364204252X
- Green, L.W., & Kreuter, M.W. (2005). *Health program planning: An educational and ecological approach* (4th ed.). San Francisco, CA: Mcgraw-Hill.
- Haddon, W. (1980). Advances in the epidemiology of injuries as a basis for public policy. *Public Health Reports*, 95(5), 411–421.
- Lim-Quizon, M.C., & Linnan, M. (2008). Philippine National Injury Survey (PNIS) 2004: Final report 2008. Manila: Department of Health, Philippines.
- Linnan, M., Scarr, J., & Giersing, M. (2013). Toward a world where children do not drown. *JAMA Pediatrics*, 167(2), 110–111. doi:10.1001/jamapediatrics.2013.948.
- Minkler, M., Garcia, A.P., Rubin, V., & Wallerstein, N. (2012). Community-based participatory research: A strategy for building healthy communities and promoting health through policy change. *PolicyLink*. Retrieved from <http://www.policylink.org/atf/cf/%7B97C6D565-BB43-406D-A6D5-ECA3BBF35AF0%7D/CBPR.pdf>.
- National Institute for Health and Clinical Excellence. (2008). *Community engagement. NICE Public Health Guidance 9*. London: National Institute for Health and Clinical Excellence. Retrieved from <http://guidance.nice.org.uk/ph9>.
- National Statistics Office. (2012). *The 2010 census of population and housing reveals the Philippine population at 92.34 million*. Retrieved October 6, 2013, from <http://census.gov.ph/content/2010-census-population-and-housing-reveals-philippine-population-9234-million>.
- Pearn, J.H., Nixon, J.W., Franklin, R.C., & Wallis, B. (2008). Safety legislation, public health policy and drowning prevention. *International Journal of Injury Control and Safety Promotion*, 15(2), 122–123.
- Peden, M., Ozanne-Smith, J., Branche, C., & Rivara, F. (Eds.). (2008). *World report on child injury prevention*. Geneva: World Health Organization and UNICEF.
- Popay, J. (2006). *Community engagement for health improvement: Questions of definition, outcomes and evaluation*. Retrieved August 11, 2013, from <http://www.nice.org.uk/niceMedia/pdf/smt/070306item13.pdf>.
- Prochaska, J.O., & DiClemente, C.C. (2005). The transtheoretical approach. In J.C. Norcross, & M.R. Goldfried (Eds.), *Handbook of psychotherapy integration* (pp. 147–171). New York, NY: Oxford University Press.
- Rahman, A., Miah, A.H., Mashreky, S.R., Shafinaz, S., Linnan, M., & Rahman, F. (2010). Initial community response to a childhood drowning prevention programme in a rural setting

- in Bangladesh. *Injury Prevention*, 16, 21–25. doi:10.1136/ip.2008.021311.
- Rahman, F., Bose, S., Linnan, M., Rahman, A., Mashreky, S., Haaland, B., & Finkelstein, E. (2012). Cost effectiveness of an injury and drowning prevention program in Bangladesh. *Pediatrics*, 130(6), e1621–e1628. doi:10.1542/peds.2012-0757.
- Schulze, S. (2003). Views on the combination of quantitative and qualitative research approaches. *Progressio*, 25(2), 8–20.
- World Health Organization. (2007). *Preventing injuries and violence: A guide for ministries of health*. Geneva: World Health Organization. Retrieved July 25, 2013, from [http://whqlibdoc.who.int/publications/2007/9789241595254\\_eng.pdf](http://whqlibdoc.who.int/publications/2007/9789241595254_eng.pdf).
- World Health Organization. (2010). *Accelerating progress towards the health-related millennium development goals*. Geneva: World Health Organization. Retrieved July 21, 2013, from [http://www.who.int/topics/millennium\\_development\\_goals/MDG-NHPS\\_brochure\\_2010.pdf](http://www.who.int/topics/millennium_development_goals/MDG-NHPS_brochure_2010.pdf).
- World Health Organization. (2012). *Drowning fact sheet no 347 October 2012*. Geneva: World Health Organization. Retrieved August 11, 2013, from <http://www.who.int/mediacentre/factsheets/fs347/en/>.