SUPPLEMENTARY MATERIAL

for the manuscript entitled

**'Drowning among fishing communities on the Tanzanian shore of Lake Victoria:
A mixed-methods study to examine incidence, risk factors and socioeconomic impact'**

Supplementary methods

Identification of drowning deaths

We aimed to identify all drowning deaths occurring within the targeted communities in the preceding two years. We used an extensive networking approach in each community to collect data on drowning deaths, first at the local authority level, and second at the community level, as described below. These are close-knit communities, and we therefore considered it feasible to identify most or all deaths. Methods for identification of drowning deaths were developed and evaluated in an earlier pilot study.[1]

Local authority level: We held meetings with Beach Management Unit (BMU) leaders, heads of fishery departments and other community leaders (including village or street chairpersons) to introduce and discuss the study, and to request lists and records of fishermen and other community members who had died from drowning within the preceding 24 months. BMU leaders are central authority figures among fishermen, and village or street chairpersons among the wider communities. Both are influential and highly-respected positions in the communities, acting on behalf of the Tanzanian government in micro-level fishing (BMU leaders) or community (village or street chairpersons) management and administration. They are resident and fully integrated in the communities, having direct daily contact and interaction with fishermen and other community members. We therefore considered that BMU and village or street leaders were likely to be important focal points for collection of data on drowning deaths. Community leaders were involved at each of the eight communities included in the study. These typically included one street/village chairperson, and one or two BMU leaders per site. At each participating community, research staff were provided a list of persons who drowned by these local authorities.

Community level: In our earlier pilot study, we approached police stations and health facilities to request data on drowning deaths. However, these sources typically did not hold the required data, reportedly because persons who drowned were often not taken to health facilities (or mortuaries), and deaths were not always reported through official streams. Given the relatively small size and typically close-knit nature of the targeted fishing communities, we therefore considered that the majority of drowning deaths could be most effectively identified through direct reporting by the fishermen and other community members themselves. To enable such reporting, we first conducted large community meetings, during which we introduced and discussed the study. These meetings were advertised throughout the community and facilitated by community leaders, thus encouraging attendance. We then conducted structured face-to-face interviews using anonymised questionnaires pre-programmed into data collection tablets with fishermen and other community members recruited from the community meetings. In these questionnaires we asked if participants knew of any person who had drowned in the community in the past two years (among other drowning-related questions not reported on in this paper). Adults aged ≥18 years who resided in the relevant community at the time of data collection and were able and willing to provide informed consent were eligible for inclusion. A total of 601 questionnaire-based interviews were conducted, distributed across the eight communities. We subsequently used 'snowball' sampling, whereby existing study participants encouraged reporting of drowning incidents by other community members. Research staff typically spent two weeks in each community, meeting with fishermen and other community members and educating them about the study, assisted by BMU and community leaders. This facilitated reporting by any person who knew of a drowning victim and/or incident.

Selection and recruitment of participants for risk factor questionnaires

To obtain a detailed account of each drowning death, we identified a family member, friend, colleague or other community member who knew the victim and the circumstances of the incident. In some cases, this was the person who reported the drowning death initially. Where the person who initially reported the death did not know the victim and/or the detailed circumstances of the incident, we obtained referrals to persons who would be able to provide the required information from community/BMU leaders or other community members. We then approached the potential interviewee to ask if they would be willing to participate in the study. Some participants of the risk factor questionnaire provided data on more than one drowning victim.

Selection and recruitment of participants for semi-structured interviews

To evaluate perceived socio-economic impacts of the drowning deaths, we sought to identify community members who truly knew and understood the effects of the deaths on the victim's family and (where applicable) business. Interview participants were therefore selected using a prioritisation system. Study staff first sought to recruit close family members of the persons who drowned, such as spouses or parents. However, often these family members were either not living in the community or were too distraught about the event to participate in the interview. In such cases staff attempted to approach members of the victims' wider families or, in the absence of those, close friends or colleagues. In some cases, the interviewee was also a respondent of the quantitative risk factor questionnaire described above. In other cases, we again obtained referrals to suitable participants from community/BMU leaders or other community members and then approached the potential interviewee to ask if they would be willing to participate in the study. Interviews were not conducted in cases where no family members, close friends or close colleagues were available. Some participants of the semi-structured interviews provided data on more than one drowning victim.

Supplementary Box 1: Guide for semi-structured interviews

a)   Please start by telling me a bit about yourself.
Probe to find out:
- *How old they are*
- *What is their profession and/or role within the community*
- *Whether they live in the community or are just there for work*
- *What their family situation is, including whether they are married, have children etc*
- *How long they have lived or worked in the community*
b)   Please now tell me a little bit about the person who drowned.
Probe to find out:
- *In what capacity (and how well) the participant knew the victim*
- *If applicable, how long the participant had known the victim*
- *The age and gender of the victim*
- *Whether the victim lived in the community or was just there for work*
- *What the victim's profession or role in the community was*
- *What family the victim had, and where they are now*
- *What role the victim had within their household*
- *Whether the victim was the primary breadwinner for their household/family.*
If the deceased was a fisherman, also probe to find out:
- *How long the victim was a fisherman for*
- *How much time did the victim spend fishing*
c)   Please can you briefly describe the circumstances surrounding the drowning incident.
Explain that you would now like to talk about the effect of the incident on the victim's family.
d)   How has the death of the victim affected his/her family?
Pro*be to find out how many dependents the victim has left behind (unless the victim is a child).*
Also probe to find out if the death has resulted in:
- *A loss of income for the family*
- *Reduced opportunities for family members (for example, loss of business opportunities, loss of a child's opportunity to go to school/college etc)*
- *Loss of social status within the community*
- *Payment of debts of the victim*
- *Any other detrimental social or economic effects*
e)   Did the family have to make any changes after the victim died?
Prompt with examples as needed, including:
- *Changing the structure/roles of household/family members*
- *Moving to another community or other accommodation*
- *Sending other family members out to work*
- *Finding other sources of income*
f)   What role did the community play in assisting the family after the incident?
Explain that you would now like to talk about the effect of the incident on the victim's colleagues.
Note: questions g) to i) should only be answered for cases where the victim was working.
g)   Please tell me a bit more about the victim's profession.
Probe to find out:

- *If they were employed by another person or company, or if they were self-employed*	
- *Whether they owned a business*	
- *How many colleagues they had, and how they fitted into the staffing structure of their work (for example, whether they were a manager of other staff)*	
- *Where they worked from*	
- *What overhead costs might have been incurred (for example, office hire, electricity, water etc)*	
h) How did the death of the victim affect their business?	
i) What has happened to their business/work since the victim died?	
For h) and i), probe to find out:	
- *Whether the work is still ongoing*	
- *Whether the workplace is still functioning*	
- *Whether the business has suffered loss of earnings*	
- *Whether someone else has replaced the deceased*	
- *Whether there have been any changes to the work resulting from the death*	
j) How has the death of the victim affected you personally? (Ask both family members and colleagues)	
For colleague, probe to find out whether the participant:	
- *Has suffered a loss of earnings*	
- *Lost their job/business*	
- *Had to pay off debts that were not theirs*	
- *Had to assist the family of the victim in any way*	
- *Has suffered any other ill effect resulting from the death*	
k) Are there any other ways that you think the death of the victim has affected their family, colleagues or community?	

Reference:

(1) Whitworth, H. et al. An observational study to inform potential drowning intervention strategies among fishing communities in the lake zone of Tanzania (DRIFT). [Project]. London School of Hygiene & Tropical Medicine, London, United Kingdom.

Supplementary Results

Supplementary Table 1: Demographic characteristics of persons deceased due to drowning. Data shown are n (%).

Variable[a]	Adults (n = 77)	Children (n = 9)	Total (n = 86)
Gender			
Male	75 (97)	3 (33)	78 (91)
Female	2 (3)	6 (67)	8 (9)
Age (in years) at death			
≤10[b]	0 (0)	9 (100)	9 (11)
11-17	1 (1)	0 (0)	1 (1)
18-40	60 (78)	0 (0)	60 (70)
≥41	14 (18)	0 (0)	14 (16)
Unknown	2 (3)	0 (0)	2 (2)
Religion			
Catholic or other Christian	50 (65)	8 (88)	58 (67)
Muslim	15 (19)	0 (0)	15 (17)
No religion / Unknown	12 (16)	1 (11)	13 (15)
Primary occupation			
Fishing	70 (91)	-	-
Other fishing industry	2 (3)	-	-
Other employment	5 (6)	-	-
Marital status			
Married	44 (57)	-	-
Divorced	2 (3)	-	-
Single / Unknown	31 (40)	-	-
Number of non-spouse dependents			
0 dependents	33 (43)	-	-
1-3 dependents	29 (38)	-	-
≥4 dependents	15 (19)	-	-

[a] *All persons who drowned were of black African race.*
[b] *Four children were <5 years old, whilst five were 5-10 years old.*

Supplementary Box 2: Description of drowning deaths among fishermen, adult community members and child community members.

Drowning deaths[a] (n = 86)
Fishermen (n = 70)
67 fishermen were in a boat prior to the drowning incident (65 fishing, 1 travelling, and 1 on patrol).

57 fishermen fell into the water because the boat sank/capsized due to:
        Bad weather (n = 46);
        Holes in or damage to the boat (n = 6);
        Collision with rocks (n = 3) or another boat (n = 1);
        Unknown (n = 1).
    6 fishermen fell or were accidentally knocked out of the boat due to:
        Collision with another boat (n = 2);
        Hippopotamus attack (n = 1);
        Attempting to pull up the anchor (n = 1);
        Alcohol intoxication (n = 1);
        Epileptic fit (n = 1).
    3 fishermen were pushed/forced into the water by another person during a robbery or other attack.
    1 fisherman purposefully entered the water as he heard hippopotamus noises and attempted to swim away.

2 fishermen were on the lake shore prior to drowning. In both cases, the victim purposefully entered the water, 1 due to alcohol intoxication, and 1 attempting to escape arrest.
In 1 unwitnessed case, it is not known where the fisherman was prior to drowning, or the reason for drowning. His body was found in the lake when he was already dead. His body was taken to a health facility and the cause of death was confirmed to be drowning.
Other adults (n = 7)

4 victims were in a boat prior to the drowning incident (3 travelling, and 1 working on a boat).
    3 victims fell into the water because the boat sank/capsized in bad weather;
    1 victim entered the water on purpose to clean a boat.

2 victims were at the lake shore prior to drowning. One entered the water on purpose due to alcohol intoxication. The other (unwitnessed) had also been drinking alcohol and went to the lakeshore to buy fish. It is not known why he entered the water but his deceased body was found in the lake the next morning. His body was taken to a health facility and the cause of death confirmed as drowning.
In 1 unwitnessed case, it is not known where the victim was prior to drowning, or the reason for drowning. His body was found in the lake and taken to a health facility where the cause of death was confirmed as drowning.
Children (n = 9)
1 child was on a boat prior to the drowning incident (travelling). She fell into the water when the boat collided with rocks and sank.
6 children were on the lakeshore prior to drowning, all of whom entered the water on purpose for recreation.
In 2 unwitnessed cases, it is not known when or why the children went in the lake. One was found floating in the water by a fisherman, but was still alive. Whilst attempts were made to save the child, these were unsuccessful and he died. The other child was found already dead in the water at the lakeshore. Her body was taken to a health facility and the cause of death was confirmed as drowning.

[a] *Incidents were witnessed unless stated otherwise.*