# SYSTEMATIC REVIEW PROTOCOL: Food Safety and Zoonotic Hazards in the fish value chain in Egypt[[1]](#footnote-1)

Authors:

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SA and JL modified the protocol developed for Egypt, DG supervised this. JL and SA are the guarantors of the review.

Amendments: future amendments to the protocol will be tracked through numerical ordering, and published with any subsequent publication.

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The funders had no input in the development or refining of the protocol.

Registration: the protocol has not been registered

INTRODUCTION

Rationale: The CGIAR Research Program on Livestock and Fish (<http://livestockfish.cgiar.org>) was initiated in 2012 with an aim to undertake downstream transformation of selected high-potential livestock and fish value chains. These value chains were identified by a systematic approach based on their potential to contribute to pro-poor development. Nine value chains were identified for initial focus including dairy in Egypt, pork in Uganda, fish in Egypt and small ruminants in West Africa. A sister program, the CGIAR Research Program on Agriculture for Nutrition and Health (<http://a4nh.cgiar.org>) undertook to address food safety and zoonoses in these value chains. We undertook SLR in five of these value chains to generate evidence on priority zoonotic and food borne hazards and to explore if SLR was suitable for generating evidence to help prioritisation and planning research for value chain development.

Objectives: To gather information available in the published scientific literature related to safety of fish products and piscine zoonoses in Egypt

Research questions:

1. What is the prevalence and levels of the selected hazards in the people, tilapia, tilapia products and water in Egypt?

**PICOS:** what is the prevalence of (biological *hazard*) infection in (tilapia) in Egypt? What are the levels of (hazard) in (tilapia) in Egypt?

1. What are the results of experiments conducted on tilapia in regards to the selected hazards?

**PICOS:** what is the effect of (*hazard*) exposure in (tilapia) in regards to public health risk?

1. What are the risk factors for each of the selected hazards in each of the selected populations in the target area?

**PICOS:** what are the risk factors for (hazard) infection in (tilapia) in Egypt?

1. What impacts does each of the selected hazards in the target population have in the target area (including (i) overall disease burden (DALYs: Disability-adjusted life year[[2]](#footnote-2)), (ii) economic burden (at individual or population levels), (iii) health, (iv) social, (v) environment)?

**PICOS:** what type of impacts does (hazard) in (tilapia) has in Egypt?

1. What are the available control strategies for each of the selected hazards and what is their effectiveness in the selected populations in the target areas?

**PICOS:** what are the available control strategies for (hazard) in (tilapia) in Egypt and their effectiveness?

Population: Tilapia value chain; Setting: Egypt

Hazards:

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| **Food borne non-zoonotic** | **Food-borne zoonoses** |
| Total PCB residues | *Salmonella* sp. |
| Pentachlorophenol (PCPs) | *Listeria monocytogenes*  |
| Heavy metals: mercury, cadmium, lead, arsenic | *Vibrio* spp. *Vibrio parahaemolyticus* |
| Pesticides | *Staphylococcus aureus* |

METHODS

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| Eligibility criteria | **Inclusion criteria**Reporting “prevalence”: Presence or levels of hazard in tilapia, tilapia products, people, water? (for hazards selected for review) ORReporting “Impact”: Economic cost, DALYs, social or other burdens, environmental impact ORReporting on aspects of control : Risk factors, knowledge, control methods ORReviews when they capture original field research **Exclusion criteria**Written in language other than English ORFrom outside of Egypt ORReviews if they do not contain original field research |
| Information sources | Online databases: PubMed, CabDirect, Web of Science, African Journals OnLine (AJOL) |
| Search | **PubMed**

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| (("tilapia"[MeSH Terms] OR "tilapia"[All Fields]) OR "oreochromis niloticus"[Text Word] OR oreochromis[All Fields] OR sarotherodon[All Fields]) AND ("egypt"[MeSH Terms] OR "egypt"[All Fields]) |
| ("tilapia"[MeSH Terms] OR "tilapia"[All Fields]) AND ("egypt"[MeSH Terms] OR "egypt"[All Fields]) |
| (salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio) OR (heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs) OR metalloid\*) AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND egypt |
| ((salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio) OR (heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs) OR metalloid\*) AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND egypt[Title/Abstract] |
| (salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio) OR (heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs) OR metalloid\*) AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND egypt[Title/Abstract] AND (fish AND (pond\* OR farm OR farms OR cultur\* OR hatcher\* OR production OR products OR rearing)) |

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| ("tilapia"OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND gl:(egypt) |
| tilapia AND gl:(egypt) |
| (salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR "heavy metal" OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*)) AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND gl:(egypt) |
| (title:(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR "heavy metal" OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*)) OR ab:(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR "heavy metal" OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR pcbs OR dioxin-like pcbs OR dl-pcbs) OR metalloid\*)) AND (title:(tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) OR ab:(tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon)) AND gl:(egypt) |
| (title:(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR "heavy metal" OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*)) OR ab:(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR "heavy metal" OR cadmium OR lead OR arsenic OR mercury OR copper OR ("polychlorinated biphenyls" OR pcbs OR dioxin-like pcbs OR dl-pcbs) OR metalloid\*)) AND (title:(tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) OR ab:(tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon)) AND (fish AND (pond\* OR farm\* OR cultur\* OR hatcher\* OR rear\* OR product\*)) AND gl:(egypt) |

**Web of Science**

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| TS=(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*) AND TS=((tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon)) AND CU=(egypt) |
| TS=(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*) AND TS=(tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND TS=(egypt\*) |
| TS=(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*) AND TS=((tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon)) AND TS=fish AND TS=(pond\* OR farm\* OR cultur\* OR hatcher\*) AND CU=(egypt) |
| TS=(salmonell\* OR listeri\* OR "listeria monocytogenes" OR staphylococ\* OR vibrio OR heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR pcbs OR metalloid\*) AND TS=((tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon)) AND TS=fish AND TS=(pond\* OR farm\* OR cultur\* OR hatcher\*) AND TS=(egypt\*) |

**AJOL**

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| (salmonell\* OR listeri\* OR "listeria monocytogenes" OR "escherichia coli" OR staphylococ\* OR vibrio OR heavy metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR metalloid\*) AND egypt |
| (salmonell\* OR listeri\* OR "escherichia coli" OR staphylococ\* OR vibrio OR metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs OR metalloid\*) AND egypt AND tilapia |
| (salmonell\* OR listeri\* OR "coli" OR staphylococ\* OR vibrio OR metal\* OR cadmium OR lead OR arsenic OR mercury OR copper OR "polychlorinated biphenyls" OR dioxin-like pcbs) AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND egypt |
| (salmonell\* OR listeri\* OR staphylococ\* OR vibrio) AND egypt AND (tilapia OR "oreochromis niloticus" OR oreochromis OR sarotherodon) AND egypt |

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| Study records | Download citations to Mendeley Reference Manager and to an excel file. |
| Selection process | SCREENING (TITLE/ABSTRACT) * Download of titles and abstracts and removal of duplicates
* Double blind screening of title/abstract (inclusion/exclusion criteria)
* Selection of articles considered relevant by AT LEAST one reviewer

ELIGIBILITY AND QUALITY ASSESSMENT (FULL PAPERS)* Download of full papers available online, or through library.
* Full paper review (inclusion/exclusion criteria); 10% of papers double reviewed
* Full paper / abstract (data extraction)
 |
| **Data collection**  | Standardized data extraction file. Data extracted from at least 2 reviewers for 10% of papers |
| **Data items** | See data extraction template |
| Assessment of bias of single studies (quality criteria) | Quality of the papers to be judged according to quality criteria (see below). Articles judged as poor quality will be excluded from data synthesis. |
| Good quality | Medium quality | Poor quality |
| Unbiased selection of subjects | Biased selection of subjects is acknowledged and accounted for | Not acknowledged biased selection of subjects |
| Data analysis is appropriate | Limitations in data analysis are acknowledged and accounted for | Data analysis is not appropriate |
| Methods used are scientifically sound | Methods used are scientifically sound, although may not be the most appropriate methods | Wrong or inappropriate methods are used  |
| Accurate description of methods | Some details on methods are lacking, but methods are understandable, and results remain valid | Methods are not clear or incomplete |
| Reported results are complete and seem accurate |  | Reported results are incomplete and/or inaccurate |
| Data synthesis | **Research question 1 and 2** (prevalence and risk factors). Data to be analyzed by hazard. When enough quality data is available, meta-analysis techniques will be used to obtain summary measures. If only limited data is available, data will be summarized descriptively. **Research questions 3 and 4** (control and impact). Data will be analyzed by hazard. If sufficient quantitative data of good quality is available, simple quantitative analysis will be performed to summarize literature findings. Qualitative information will be combined, compared and contrasted to identify control options and impacts for each of the hazards. |

1. Note from editors: This protocol was not subject to peer-review [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)