Author's response to reviews

Title: The risk of pathogenic intestinal parasite infections in Kisii Municipality, Kenya

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Cover letter to BMC on revised Version 2 manuscript

The risk of pathogenic intestinal parasite infections in Kisii Municipality, Kenya

Authors¿ responses to Ynes Ortega¿s review report.

1. The food handlers selected, were asymptomatic adult male and female from the sampled markets and butcheries through random sampling as they attended Kisii Provincial Hospital for routine examination of stool parasitological profile according to the Kenyan Ministry of Health Regulations (Public Health act Chapter 242). The food handlers were associated with the sampled markets since they alternate between the five markets in Kisii Municipality because the municipal markets occur on alternate days and the two markets chosen in this study are the major ones.

2. The food handlers selected were adult males and females handling foods in the Kisii Municipality Markets.

3. The four vegetable varieties were chosen because they are the major ones eaten by residents of Kisii Municipality as salads. The plant parts that are eaten as vegetables were chosen for sampling i.e. leaves of Solanum nigrum, Brassica oleracea var. acephala, Brassica oleracea capitata and Gynandropsis gynandra. However, this study did not examine parasitological profile of hand washes of vegetables and meat vendors as they rarely wash their hands in the marketplace.

4. The sampled meat and vegetable food stuffs were washed in distilled water and the suspension was strained through a sieve to remove undesirable materials. The filtrate was concentrated by centrifuging. The floatation fluid was examined for intestinal parasites using a light microscope.

5. The meat samples were washed in distilled and the suspension strained through a sieve to remove undesirable materials. The filtrate was concentrated by centrifuging. The floatation fluid was examined for intestinal parasites using a light microscope. The kind of meats sampled included beef, mutton and goat.
Slaughter houses were not examined for prevalence of intestinal parasites. Ascaris lumbricoides was identified at species level

6. The authors suggested that contamination of vegetables could have occurred at the farm since they are commonly watered at the farms using water that may have been contaminated or contaminated by soil during harvesting.

7. We have indicated in our introduction that Kisii Municipal markets are characterized with lack of bathrooms and washing facilities, poor sanitary conditions of latrines with lack of water supply, and presence of piles of garbage that provide a fertile environment for transmission of intestinal parasites to food handlers

8. The conclusion that foodstuffs were contaminated at the farms has been removed since foods were not examined for occurrence of intestinal parasites at the farm.

9. An inquiry on the watering of vegetables and distribution suggested that the water used for watering at the farms may be contaminated and since such vegetables are sold unwashed by distributors and retailers, this may be a major source of contamination.

10. The authors determined samples positive samples and further established the density of intestinal parasites as this may increase the risk of transmission of intestinal parasites to man. This information has been included in our version 2 of the revised manuscript.

Authors’ responses to Jean Kennedy’s review report.

- Abstract
- Methods
  - Random sampling was used in the selection of all the study samples hence systematic sampling in the early manuscript was erroneous.
  - Stool smears were taken from asymptomatic food handlers as they attended Kisii Provincial Hospital for routine examination of stool parasitological profile according to the Kenyan Ministry of Health Regulations (Public Health act Chapter 242). Therefore such food handlers were not patients. The hospital was elevated to provincial status on December 2007.
- Results
  - Parasites in the foodstuffs.
    - The first sentence has been modified to: Types of samples examined for occurrence of intestinal parasites includes a total of 84 vegetable, 440 meat and 168 stool samples.
    - The second sentence has been modified to start with: Fifty five.
    - Second last sentence has been modified to: Of the parasites detected, the most common parasites infesting the foodstuffs and infecting the food handlers were Ascaris lumbricoides and Entamoeba histolytica.
Last sentence was modified to: Parasites were significantly less likely to be present on meat that was refrigerated during display than meat that was displayed at ambient temperature.

Conclusion

The authors modified the first statement to: There is a high risk of infection with intestinal parasites in the sampled Municipal markets. Note that these are the major markets selling foodstuffs.

We changed the second sentence to: About half of the food handlers surveyed (41.1%) at the Municipal Hospital had one or more parasitic infections. Furthermore, meat (65.5%) and vegetables (75.9%) sold at the Municipal market were found to be contaminated with parasites hence the inhabitants requires a need for education on food safety, good distribution practices and improvement on sanitary conditions.

Background

The first statement was modified to: Intestinal parasites cause significant morbidity and mortality throughout the world, particularly in undeveloped countries and in persons with comorbidities.

An interesting statement was given about the prevalence of the major intestinal parasites found in various samples examined in Kisii Municipality hence the statement was modified to: Globally, it is estimated that 1.2 billion, 795 million 740 million, 50 million and 2.8 million people are infected with Ascaris lumbricoides, Trichuris trichiura hook worms (Ancylostoma duodenale and Necator americanus), Entamoeba histolytica [2] and Giardia lamblia [3] respectively.

The third statement was modified to: In humans, major sources of intestinal parasitic infections include poor personal hygiene [4], environmental conditions like contamination of soil and water sources with human faeces [5], poor sewage disposal such as use of night soil as fertilizer can be a major source of intestinal parasitic infections [6].

The reference including money was modified to: [8]

Study population

Study design has been explained to be: A correlational descriptive study design was used to determine the association between various risk factors and the occurrence of intestinal parasites.

The sampling plan: has been explicitly explained by the authors to be random for various samples examined.

Sample size of each food stuffs was calculated based on: a n estimated prevalence of prevalence of 10%, d=0.05 at a confidence level of 95%.

Why people were sampled at the municipal Hospital: The food handlers selected, were asymptomatic and attended Kisii Provincial Hospital for routine examination of stool parasitological profile according to the Kenyan Ministry of Health Regulations (Public Health act Chapter 242).
Stratified sampling for vegetables was erroneous: We have replaced it with random sampling plan.

Description of laboratory methods: The authors have briefly described the laboratory procedures for various samples used during the study.

Overall risk of intestinal parasites: We deleted this section as recommended by the reviewer as it looks repetition of results.

Parasites in foodstuffs: We included results from meat samples in this section as they are food stuffs.

P value in the last sentence of the first paragraph: Has been changed to p=0.000 replacing p<0.05 which was erroneous.

First sentence of second paragraph was changed to: Fifteen (68.2%) butcheries had the same person handling the meat and the cash (no cashier) while seven (31.8%) had a food handler and a cashier.

First and second paragraph on page 10 of version1 of our manuscript: we re-analyzed samples from the same butchers and for houseflies but the results were the same. However in our revised manuscript we have only used descriptive statistics in this section which we deemed necessary.

Discussion

The first sentence was modified to: The study showed high intestinal parasitic infestation of both meat and vegetable foodstuffs was 65.5 % and 75.9 %, respectively. Additionally, the burden of infection with intestinal parasites among the food handlers was almost half (41%).

64.5% was erroneous: This was replaced by 65.5%

The first sentence of discussions was changed to: These findings indicate a public health priority and strongly support the need for education on food safety, Good Manufacturing Practice (GMP), Hazard Analysis Critical Control Pint (HACCP), improvement of sanitation conditions in and around the market by waste collection, management and handling of foodstuffs so as to reduce the prevalence of infections in both food handlers and food stuffs sold at the market.

The tables were modified to accommodated the parasite densities hence we included our p values in our results and discussions.

Thank you