Author's response to reviews

Title: The rise in stunting in relation to avian influenza and food consumption patterns in Lower Egypt in comparison to Upper Egypt: results from 2005 and 2008 Demographic and Health Surveys

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Version: 5 Date: 1 March 2015

Author's response to reviews: see over
Dear Editors and Colleagues at BMC Public Health,

Hope this letter finds you all well.

Thank you for your review of the manuscript entitled, *The Rise in Stunting in Relation to Avian Influenza: a Comparison of the 2005 and 2008 Egypt Demographic and Health Surveys,* for consideration for publication in the BMC Public Health Journal.

We enclosed our revisions to the manuscript (i.e., text and title), and included updated tables and figures, and a detailed point-by-point response to both reviewers. We used red colored font in the manuscript text to denote changes and in the point-by-point response.

Please let us know if you have further questions, as we are happy to respond to any inquiries and feedback.

Thank you for considering this manuscript for acceptance to BMC Public Health Journal.

We greatly appreciate your time and look forward to your response.

Sincerely,

Justine A. Kavle
Reviewer's report (Reviewer #1)
Title: The rise in stunting in relation to avian influenza: a comparison of the 2005 and 2008 Egypt Demographic and Health Surveys
Version: 2 Date: 24 December 2014
Reviewer: Caroline Hird

Major comments
1. This study uses the results of the Egyptian Demographic and Health Surveys to explore possible associations between determinants of stunting (based on the WHO framework of childhood stunting) and stunting in Egypt, in the context of an avian influenza outbreak and associated culling of poultry. The findings are very different for the two areas of Egypt: in Upper Egypt stunting significantly decreased whilst in Lower Egypt stunting significantly increased (as stated in lines 262 and 263). Different factors were associated with an increased risk of stunting in Upper Egypt than Lower Egypt, in both univariate and multivariate analysis.

RESPONSE to #1: None, as the reviewer was summarizing the results of the study.

Major Compulsory Revisions
2. Lines 373-375 states that the events which contributed to a rise in stunting in Lower Egypt between 2005-2008 were likely to be different from the events in Upper Egypt that protected children from stunting over the same time period. However, the discussion of these different events is difficult to follow. Introduction of results not previously presented (i.e. in line 441-441) does not
help, nor does inclusion of quoted narrative from other studies (lines 411-417 and 418-412). From the discussion it would appear that the mass reduction of chickens and eggs associated with the avian influenza outbreak was in Lower not Upper Egypt. This needs to be more explicit if this was indeed the case.

RESPONSE to #2:

The addition of qualitative information relaying personal experiences of families, collected by our team, supports the demonstrated decline in reduced dietary diversity, shown in the quantitative survey data. We added language to clarify the findings presented and feel it strongly supports our case, and should not be deleted from the discussion. The language “decline in reduced dietary diversity” in line 422 and the language “and were not fed chicken or meat” in line 426 was added to clarify existing qualitative information. In addition, the phrase “evidence of growing food insecurity in the face of economic crises” was added in lines 434-435. These changes are found on pages 20-21, as indicated by parentheses (...) in Lines 422-441, as shown below.

This (decline in reduced dietary diversity) is supported by families’ personal experiences of economic loss and changes in dietary habits, in response to fear of illness during the AI outbreak, especially for children. [32] Adults were often consuming “store-bought” frozen meat or previously frozen chicken, although with less frequency than prior to the AI outbreak. (Yet), children were fed different, less nutritive foods than elders (and were not fed chicken or meat).

As relayed by one father from Lower Egypt, “The family started replacing birds with meat and fish ....our budget was affected and instead of having [animal] protein every day we started having it only once or twice a week. During avian influenza we were eating [frozen] birds they were buying and the children’s diet was affected like the whole family. Every day each family member used to have a piece of chicken accompanying the food, this was replaced by fish and meat and we cannot bear the price of these foods to be included in the diet so we served [meat] only once or twice a week and sometimes...replaced chicken with eggs .” [32]

Families relayed that meat and fish are very expensive – (evidence of growing food insecurity in the face of economic crises). One father lamented “we started
replacing these foods with rice, cooked vegetables and beans for a year and a half...the food for children was totally different from the elders. The children’s diet included yogurt, milk, and [sugary] biscuits... elder members had rice and vegetables.” Replacement of animal-source foods, with beans, lentils, and chickpeas, and an overreliance on cereals and tubers have been documented previously. [31, 32, 35, 36] Families expressed fears of animal source foods (i.e. chicken, eggs) as a source of indigestion and illness for young children, and often withheld these foods, as a response to fear of AI in Lower Egypt. [32]

3. Figure 1 has been slightly corrupted so that text is not correctly within textboxes.

RESPONSE TO #3: We made this correction to Figure 1 – so that the text fits correctly within the text boxes.

Minor Essential Revisions

4. Line 66 Lannotti needs capital L

RESPONSE to #4 The author’s last name begins with an “i” not an “L” – so therefore no change has been made – as the author’s last name is – Iannotti, with a capital “I”, as shown in Line 84, page 5.

5. Line 105-111 The description of how Egypt is divided into smaller units for the purposes of the survey is difficult to follow if unfamiliar with the terminology used. Three distinct areas identified in the EDHS are described: shiakhas, villages and medinas (major towns). How these relate back to kisms and marquezes is not essential to understand and suggest removing reference to these and so lines 105-107 reads: Egypt is divided into 27 administrative units, known as governorates. Each governorate is divided into shiakhas (urban areas), villages (rural areas) and medinas (major towns).

RESPONSE to #5: We removed the language referring to kisms and marquezes from lines 109-111 on page 6, and we added the language: “Each governorate is divided into shiakhas (urban areas), villages (rural areas) and medinas (major
“towns)” to the existing language of Egypt is divided into 27 administrative units, known as governorates in lines 125-126, on page 7.

6. Line 112 not really sure how this sentence fits with earlier definitions/description of shiakhas, villages and medinas. Suggest removing comma and text, if this revision reflects the true meaning, so reads shiakhas and villages were the primary sample units.

RESPONSE to #6: We made the change from “For 2005 and 2008 data collection, shiakhas defined, as towns and villages were the primary sample units” to “Shiakhas and villages were defined as primary sample units.” in Line 131 on page 7.

7. Line 200-204 in Table 1 only three variables are listed as maternal level nutrition-related factors (education, age and BMI); consumption of food groups does not appear and the other factors are listed as child level factors. This discrepancy needs to be corrected.

RESPONSE to #7: We provided edits to Table 1 – to include consumption of food groups for both mother and child, we also edited the language in table 1 – so the word “maternal” is removed from “education” and “age”, as these rows are categorized under “maternal level nutrition-related factors”, and the language is redundant.

8. Line 287 check p-value (p=0.44). In Table 2 the p-value is given as 0.044.

RESPONSE to #8: This discrepancy has been corrected in Line 300, page 15. The correct p-value is 0.044.
9. Line 287 add was to sentence so reads: In 2008, the stunting was lowest in the poorest wealth quintile

RESPONSE to #9: This change was made and the word “was” was added so the sentence “In 2008, the stunting was lowest in the poorest wealth quintile” in Line 300, on page 15.

10. Line 517 change evidenced to suggested – the limitations of the study as described by the authors in lines 503-505 mean that it is difficult to conclude that there is evidence for reduced dietary diversity.

RESPONSE to #10: Although the limitations of the study described blunt the associations of diet in our statistical modeling, our data do show evidence of reduced dietary diversity through decreased consumption of food groups, declining variety of foods fed to young children and the lack of poultry raised and owned by households which was associated with stunting. We do not think adding the language “it is difficult to conclude there is evidence for reduced dietary diversity” is warranted and therefore, have not included it.

Discretionary Revisions – these revisions have been incorporated into the manuscript as described below:

11. Line 34 suggest adding referred to as to this sentence so reads known as the “first 1000 days” and referred to as “the window of opportunity to prevent nutrition”.

RESPONSE to #11: In line 52, page 3, we have added the wording in parentheses (...) to existing wording: ‘known as the first 100 days and (referred to as) the window of opportunity to prevent malnutrition.’ The word malnutrition rather than nutrition, as suggested by the reviewer, was retained. During this period of time of rapid growth and development, the probability of a reversal in stunted growth is low. Therefore “the first 1000 days” is the opportunity to prevent chronic malnutrition or stunting in the first 2 years of life, which mitigates further insults into adulthood.
12. Line 57 change animal source foods to chickens so reads
Therefore, by removing chickens, as sources of household income and food for the family diet,

**RESPONSE to #12: We changed the wording ‘animal source foods’ to ‘chickens’ in Line 71, page 4.**

13. Line 57 suggest removing d from decreased so reads decrease

**RESPONSE to #13: In Line 77, page 4, we have removed the d from decreased in the sentence.**

14. Line 60-62 (Raising animals...income and expenditure) suggest moving this up to line 48, so this sentence occurs before sentence starting Since 2005.

**RESPONSE to #14: We moved the lines “Raising animals, such as poultry and livestock, has been shown to have a positive impact on nutritional status, as well as significantly contribute to household income and expenditure to lines 66-68, on page 4 – so it occurs before the sentence beginning with “Since 2005.”**

15. Line 407 apostrophe before personal is superfluous

**RESPONSE to #15: The apostrophe in line 421, page 20 was moved closer to the word “families” and retained to indicate “families’ personal experiences.”**
Reviewer's report (Reviewer 2)

Title: The rise in stunting in relation to avian influenza: a comparison of the 2005 and 2008 Egypt Demographic and Health Surveys
Version: 2 Date: 29 January 2015
Reviewer: Anjali Pai

Reviewer's report:
Summary
This is a secondary analysis of the effects of the avian influenza outbreak in Egypt, leading to lack of availability of poultry and changes in nutritional intake, on stunting in childhood. It compares cross-sectional data from the Egyptian Demographic and Health surveys in 2005 and 2008 between Lower and Upper Egypt. According to the authors’ analysis, it can be concluded that the avian influenza outbreak in Lower Egypt led to reduced nutritional food intake in children, which was one of the factors that contributed to stunting. Poor nutrition in childhood and stunting are important public health issues as they can affect the health of children into adulthood, which can in turn lead to reduced productivity for individuals, their families and societies. The authors recognize the public health problems associated with stunting and the significance of this in Egypt. They have completed a comprehensive literature review which provides a good context to the study, and have mostly appropriately acknowledged their sources of reference. The objective of the paper is clear. Statistical tests used - chi square and t-tests for unadjusted analysis, and logistic regression for multivariable analysis - are appropriate and fairly well described but require clarification (see comments below). Permission to use data was obtained. Suggestions for improvement/clarification on the results and discussion sections are included in comments below. Overall, this paper has been written well with a reasonably good structure and formatting (except for comments mentioned below); however several essential and compulsory revisions are required. The manuscript may be re-considered for publishing after revisions have been made.
Discretionary Revisions:

We addressed the discretionary revisions from Reviewer 2 in the following ways:

1. The abstract provides a reasonably accurate summary of the paper. Consistency in displaying results in the abstract in terms of mentioning confidence intervals and p-values is advisable for clarity.

   RESPONSE to #1: We added the adjusted odds ratios, confidence intervals, p-values for clarity and consistency in presenting our statistical modeling results in the results of the abstract, lines 30-37 page 2.

2. The term ‘avian influenza’ and its abbreviation (AI) are both used throughout the paper. Suggest using only one for consistency.

   RESPONSE to #2: The avian influenza abbreviation is first cited in lines 70-71, page 4 and thereafter, the abbreviation is used throughout the body of the manuscript. The only exception where avian influenza is not abbreviated is when a quote is cited by families affected by the avian influenza Line 429, page 20.

3. ‘Figure 1’ is repeated twice in paragraph for ‘Conceptual framework’ (lines 84-91).

   RESPONSE to #3: The repeated wording of Figure 1 was removed from page 5. Currently, Figure 1 is cited only once in this paragraph.

4. The full form of PSU is repeated twice before using the abbreviation (lines 112 – 115).

   RESPONSE to #4: The full form of PSU, defined as primary sampling unit, was used once in line 123, on page 6. The abbreviation (PSU) was used subsequently in the paper.
5. It is advisable to use full form for Length for age Z score (line168).

RESPONSE to #5: The full form of Length for Age Z score was used to replace LAZ in Line 186, page 9.

6. The list of abbreviations than the authors have included will be more useful if in the initial part of the document (if acceptable as per journal rules).

RESPONSE to #6: Thank you for your comment on the list of abbreviations. We will leave the decision up to the journal (BMC Public Health) as to the placement of the list of abbreviations, whether in the initial part of the document or in the latter part of the document, as acceptable per journal rules. We would prefer to have it in the initial part, as the reviewer suggests.

7. Water and sanitation variables are mentioned in the text but not shown in the tables.

RESPONSE to #7: Water and sanitation variables were not found to have a consistent relationship with child stunting in bivariate and multivariate regression analyses in 2005 and 2008, with largely non-significant findings, with the exception of 2005 data from Upper Egypt. This is the reason why they were not included in the main manuscript tables. We included the results in an additional file, as supplementary online tables. We indicated in lines 228-229, page 11, the following: “An additional file with tables shows these results in more detail [see Additional file 1].” Information on the additional file is shown in page 40.
Minor Essential Revisions: these minor essential revisions have been addressed, point by point, as shown below.

1. Consistent spacing between paragraphs and different sections of the paper, indentation of the first line of new paragraphs, and reconsideration of certain sub-headings (italics/bold, etc.) is advisable to differentiate between sections (e.g. lines 187-189).

RESPONSE to #1: We used the spacing recommended by the journal, and also double checked the indentation of the first line of new paragraphs. We added any indentations that were missing. In the Methods section of the paper, on pages 6-12, subheadings in italics font are already demarcated and include the following: Sample size, Assessment of nutritional status, Study instruments, Description of variables, Outcome variable, Independent variables and Statistical data analyses. Additional subheadings are provided in the results section. We also added Strengths and Limitations subheading to the discussion section in Line 512, page 24, per the other reviewer’s comments. These subheadings are sufficient and clearly marked, and additional subheadings are not necessary.

2. Two of the author affiliations have been marked as ‘2’ and ‘4’ has been missed.

RESPONSE to #2: The changes to the author’s affiliations have been made on page 1 (Cover Page). The 2nd affiliation is with PATH, the 3rd affiliation with El-Zanaty and Associates and the 4th affiliation is with George Washington University, Milken Institute School of Public Health, Department of Prevention and Community Health, Washington DC, USA

3. The word ‘surveys’ is missing in line 71: “....Lower Egypt between the 2005 and 2008 Egypt Demographic and Health [6]....”

RESPONSE to #3: We added the word ‘surveys’ to Line 89, page 5.
4. Clarification is required for the full form of EDHS and whether the ‘E’ of EDHS stands for Egypt or Egyptian? It is advisable to remain consistent and state abbreviation of a term when it is first used in the paper (and only use abbreviated form there on)

RESPONSE to #4: The full form of EDHS is Egypt Demographic and Health Surveys. The definition of EDHS has been first described on Page 5, Line 89, in the Methods section. We changed the definition of EDHS from Egyptian Demographic and Health Surveys to Egypt Demographic and Health Surveys. Thereafter, the abbreviation of the term is used. We used the EDHS abbreviation in Line 101, page 5 and Line 114, page 6.

5. Figure 1 needs to be re-formatted so that the outlines of boxes do not overlap with the words.

RESPONSE to #5: The formatting issues with Figure 1 were fixed. The boxes do not overlap with the words.

6. The definition of ‘shiakas’ is repeated three times (lines 106, 112, 118). Using a different phrase to ‘defined as’ may clarify this.

RESPONSE to #6: We added the sentence “Each governorate is divided into shiakhas (urban areas), villages (rural areas) and medinas (major towns)” in Lines 125-126 on page 7 to provide definition and clarity to the word shiakhas.

7. Tables 2 and 3 require re-formatting. Suggest consistent line spacing/ column width/landscape layout and avoidance of splitting tables over two pages which can be a deterrent to the reader. In addition, re-ordering variables by child, maternal and household factors is advised to improve continuity for the reader.

RESPONSE to #7: We reordered the variables in Tables 2 and 3 by child, maternal and household factors. We also reordered the variables for Table 1. Per guidelines by BMC Public Health journal, the tables were submitted in portrait
layout and not landscape layout. In addition, tables within 2 pages (A4 format), are considered acceptable for submission of the manuscript.

8. The term ‘unadjusted analysis’ should replace ‘bivariate analysis’, and ‘multivariable’ should replace ‘multivariate’.

RESPONSE to #8: This change from ‘unadjusted analyses’ to ‘bivariate analyses’ has been made in Line 283, page 14 and Line 318 page 15. The word ‘multivariate’ was replaced with “multivariable” throughout the manuscript, where appropriate, and indicated in red font in lines 257, 260, 353 and 527.

9. The statistical software package should be ‘Stata’ and not ‘STATA’ as it is not an abbreviation.

RESPONSE to #9: The change has been made from STATA to Stata, as reflected in Lines 266-267, page 13.

10. Line 276 needs to be amended: Stunting in greater proportion of males than females in 2005 is not significant (p=0.510).

RESPONSE to #10: We edited the language, to read “In Lower Egypt, a significantly greater proportion of males were stunted (34.4%) than females in 2008 (p=0.002) than 2005 (17.1%) (p=0.510).” The addition of p-values from different survey years was meant to clarify the content of this sentence in Lines 288-290 on page 14.
11. There is no mentioned of analyses between mother’s BMI and stunting (tables 2&3) in the paper.

RESPONSE to #11: We presented the results on maternal BMI and stunting in Lines 303-305, page 15 and included the following” In Lower and Upper Egypt, in 2005, stunted children were more likely to have a mother that was thin, normal or overweight than obese (p<0.001). Yet, in 2008, stunting by maternal BMI was evenly distributed across thin and normal, overweight and obese mothers. “

12. The statement “Declining dietary diversity....figure 3” should include mention of the years 2005 and 2008 to give the term ‘respectively’ meaning, and clarity to the sentence.

RESPONSE to #12: The wording of “in 2005 and 2008” was added to “Declining dietary diversity was noted in all breastfed children 6-23 months in Egypt, and notable in Lower Egypt (64.1% versus 54.9 %, in 2005 and 2008, respectively; P < 0.001) and Upper Egypt 56.3% versus 47.5%, in 2005 and 2008 respectively; P < 0.001 (Figure 3)” in Lines 328-331 on page 16.

13. Grammatical corrections:
a. Lines 382-383, ‘was reported’ should be deleted

RESPONSE to #13a: We deleted the language ‘was reported’ from the sentence “Following the report of the first human case of highly pathogenic avian influenza (H5N1) virus was reported in March 2006 [28], the Egyptian government conducted mass removal of chickens and eggs and vaccinations of poultry through 2009 in response to the avian influenza outbreak in Lower Egypt [29].” The sentence now reads “Following the report of the first human case of highly pathogenic AI (H5N1) virus in March 2006[29], the Egyptian government conducted mass removal of chickens and eggs and vaccinations of poultry through 2009 in response to the AI outbreak in Lower Egypt [30].” in Lines 397-399, on page 19.
b. Lines 395-396 should be revised to “.....with large and significant decreases found in Lower Egypt and Upper Egypt.” We have changed the following

RESPONSE to #13b: The Lines 395-396 “Dietary diversity decreased across all regions of Egypt between 2005 and 2008 EDHS, with a large and significant decreases were found in Lower Egypt and Upper Egypt” were revised to “Dietary diversity decreased across all regions of Egypt between 2005 and 2008 EDHS, (with large and significant decreases found in Lower Egypt and Upper Egypt.)” The change in wording is in parentheses (...) and also found in Lines 409-410 on page 19-20.

14. The paper would benefit from a subtitle of ‘Strengths and limitations’ under the discussion section.

RESPONSE to #14: This subtitle has been added to the Discussion section in Line 512, page 24.

Major Compulsory Revisions:

1. Although the main aim of the paper (lines 80 to 83) is well defined, the title of the paper is not as focused as it does not specify the population of interest i.e. children aged between 6 and 59 months, or nutritional variables. Also the ‘rise’ in stunting was in Lower Egypt only, but the study is a comparison between Lower and Upper Egypt.

For e.g. ‘Stunting in relation to avian influenza and nutrition in children under five years: a comparison of the 2005 and 2008 Egypt Demographic and Health Surveys’ addresses these points and is suggested as an alternative.
RESPONSE to #1 We changed the title to “The rise in stunting in relation to avian influenza and food consumption patterns in Lower Egypt in comparison to Upper Egypt: results from 2005 and 2008 Demographic and Health Surveys.” This title captures the food consumption and reduced dietary diversity of both children and mothers. The rise in stunting in Lower Egypt in comparison to Upper Egypt is also captured in this revised title, since the results presented vary greatly, by region, and the avian influenza outbreak occurred in Lower Egypt. Given stunting is often described in children and collected routinely as an indicator of child nutritional status by Demographic and Health Surveys, we do not think it is necessary to specify the ages of the children in the title of the manuscript.

2. The maternal level factors mentioned under methods (lines 199-204) do not tally with the variables in table 1. Only 6 maternal variables are mentioned although the author states ‘seven’.

RESPONSE to #2: We changed the number of maternal variables to 6 by adding the revision “Six variables were included for maternal level factors” in Line 216, page 11. We also added the consumption of food groups to Table 1 to ensure consistency between text and table.

3. In table 1, ‘birth interval’ and ‘size at birth’ are mentioned as child level factors rather than ‘maternal level’ as stated in lines 202-203. ‘Consumption of food groups’ is not included in table 1 as a variable, but has been stated in line 204.

RESPONSE to #3: We made the corrections and included birth interval and size at birth factors as maternal level factors. We also included the consumption of food groups in table 1.

4. The authors mention using Pearson’s chi square and t-tests (line 239) for unadjusted analysis. However it is unclear which results are represented by
these tests in Tables 2 and 3.

RESPONSE to #4: Chi-square is commonly used to test differences in frequencies in categorical data and t-tests are for comparisons of means of continuous variables. We have added the following text as denoted in parentheses in the following sentence: Bivariate analyses were performed using Pearson’s chi-square, (to test differences in frequencies of categorical variables) and t-tests, for differences in (means of continuous variables) in lines 255-256, page 12.

5. In the penultimate paragraph of the methods section, the authors mention that bivariate (unadjusted) and multivariate (multivariable) model analysis is presented for 2008 only in Lower Egypt. However tables 2 and 4 represent analysis for both 2005 and 2008 in Lower Egypt.

RESPONSE to #5: We removed the sentence “No variables were found to be significant in bi-variate and multivariate models for Lower Egypt in 2005, therefore analyses is presented for 2008 only” from lines 248-250. This sentence was after the following sentence: “Descriptive and bi-variate associations of dietary variables and stunting analyses are discussed in these analyses” in Lines 258-259, on page 13.

6. It would have been useful if the term ‘variance inflation factor’ was explained in detail for better understanding (last paragraph of methods section).

RESPONSE to #6: We added /modified wording to the existing explanation in the manuscript to lines 263-266, page 13. This is indicated in parentheses here: “All variables in the final logistic regression model were tested for multicollinearity using the variance inflation factor test. Variance inflation factor values (greater than) five were considered to be a collinear and were removed from the final model. (Maternal educational level) and household wealth were specifically checked for multicollinearity (i.e. given wealth often increases with education), and not found to be collinear.” We feel the explanation is sufficient in explaining why and how multicollinearity was checked.
7. In the results section, the authors state “Mothers with birth intervals less than 24 months since a previous birth were significantly associated with increased stunting in Lower Egypt for 2008 (p=0.035) and 2005 (p =0.087)” . However from table 2 it is clear that for 2005 this is only true if comparing birth intervals less than 24 months to >48 months (all others are similar ~ 17%).

**RESPONSE to #7: In Line 326, page 16, we added the wording in parentheses (compared to 48+ months) to clarify the comparison of less than 24 months to 48+ months in Lower Egypt, 2005 in the following sentence: ‘Mothers with birth intervals less than 24 months since a previous birth were significantly associated with increased stunting in Lower Egypt for 2008 (P = .035) and 2005 (P = 0.087, (compared to 48+ months only) and for Upper Egypt in 2005 (P = 0.046) (Table 2).’**

8. The authors fail to mention the other strength of using EDHS data which is it had a representative sample, including oversampling in remote areas.

**RESPONSE to #8: In Lines 513-515, page 24, we provided additional information on the strength of the EDHS, as denoted in the parentheses (...) portions of the sentence— “It is based on data from (nationally representative) demographic and (health) surveys that used internationally validated questionnaires, with high response rates (>98%), (and oversampling in remote areas.)” These edits incorporate the language suggested by the reviewer.**
9. The authors also do not mention the disadvantages of data collection through questionnaires (memory bias, incomplete data). Also, there is no mention of missing data and how this was adjusted in the analysis.

`RESPONSE to #9: In Lines 520-521, page 25 we added information on memory bias “Participants must also rely on memory to recall information collected by questionnaires, which may contribute to possible memory bias.” Regarding missing data, we provided information on how many children were measured and that complete data were available for 97.2% of the sample. Data excluded were due to outliers or no data for child age in the DHS dataset. The data was restricted to available data - which only excluded 2.8% of the sample - and did not change the outcome of our results presented in this manuscript. The following explanation in the Methods section of the manuscript in Lines 163-169, pages 8-9, discusses these points: ‘The nutritional status of children was determined by measuring the height/length and weight of all children less than six years of age living in households selected in the EDHS sample, where 99% of children were measured. Six (2005) and ten percent (2008) of the data were considered implausible due to outliers or no data for child age in months was available. Thus, the data were restricted to 12,131 and 9,103 children, 6-59 months of age, in 2005 and 2008, respectively, with credible anthropometric data and to children that were breastfed, which included the majority of the sample (97.2%).’ Analyses was then restricted to last-born children with credible anthropometric data.

10. The authors have found a difference in the prevalence of stunting in two populations across two time periods. They claim that the rise in stunting in Lower Egypt is attributable to the avian influenza outbreak despite clearly stating in lines 263-264 that stunting coincided with the outbreak. Also only household ownership of poultry rather than avian influenza on an independent level has been measured. Changes in diet (apart from reduced consumption of poultry), reduced diversity of diet, and feeding practices could have happened despite the avian influenza outbreak. These in turn could be due to reasons such as lack of dietary education and health promotion (such as consumption of other animal products), increased availability and affordability of non-nutritious food in Lower Egypt can all be attributed to a rise in stunting (supported by evidence). In
addition the impact of maternal and child health project in Upper Egypt may have contributed to better feeding practices and reduced stunting there. All this has been acknowledged in the paper (lines 444-468). The conclusion therefore that stunting in children under five years in Lower Egypt can be attributed to the avian influenza outbreak has been overstated.

RESPONSE to #10: In this manuscript, we discussed several possible reasons for the rise in stunting, not only the avian influenza outbreak. In the abstract our conclusions on page 2 state: “Decreased dietary diversity, reduced poultry consumption, substitution of nutritious foods with sugary foods paralleled a reduction in household raising of birds, following the AI outbreak in Lower Egypt and not Upper Egypt. Increased feeding of sugary foods due to fear of illness or greater penetration of these sugary foods may be related to stunting.” We concede that growing availability of these foods, greater food insecurity, and affordability, all play a role in stunting, and therefore have not singled one reason, but rather discuss that the rise in stunting coincided with all of these events. This is also discussed in detail in the Discussion section.

11. It would be useful if the authors could mention the relevance of their findings applicable to other populations, and the usefulness of their research in the discussion/conclusion sections.

RESPONSE to #11: We added the following language to address applicability and usefulness in parentheses (...) in the conclusion section in lines 548-551, page 26: “Intake of sugary foods (and junk foods should be monitored in other countries as well, given the growing frequency in use and demand for these foods) [57, 58]. Mothers need advice on infant and young child feeding to improve children’s dietary intake and reduce intake of sugary foods. Mothers in Egypt (and elsewhere) should be counselled, to feed the nutritious foods they are consuming to children and on birth spacing for two years for optimal growth and development and to prevent stunting.
Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests