Author’s response to reviews

Title: Understanding Resilience of Female Adolescents towards Teenage Pregnancy: A Crosssectional Survey in Dar es Salaam, Tanzania

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Author’s response to reviews:

The comments of the first two reviewers were addressed in a revision submitted in October 2016. They are not highlighted in track changes anymore.

Reviewer #1: This article provides an important lens from which to explore the issue of teenage pregnancy and reproductive resilience. Contrary to the typical problematic/negative vantage point that is applied, the authors make a strong case for research and programming priorities using a strength-based approach (including highlighting the potential of pregnancy as a protective factor).

The language is in line with that of positive youth development/developmental assets for adolescents, which are both growing areas with promise for ASRH and the authors could make more connections there while discussing capacities and capital.

Other strong points include the article's balance of simple language with strong data, which makes it easy to follow but technically robust. The authors' involvement of youth involvement in data collection and their recognition of the benefit of qualitative data and mixed-methods approaches in this kind of work also enrich the paper.

We thank the reviewer for his/her encouraging words.
To further strengthen the paper, I recommend the following minor edits, if possible:

1. Clarify/provide more detail as to why 50% was chosen as the cutoff for the competence score

We agree with this point and added additional information. For the purpose of this analysis the score of ≤50 % was determined as ‘low competence in mobilizing resources to avoid or deal with pregnancy’ and the score of 51–100 % as ‘high competence in mobilizing resources to avoid/deal with pregnancy’. A 50 % cut-off point was used in order to learn about the broad spectrum of competencies among respondents.

2. Provide detail on the development of the score e.g. was reliability testing done etc.

We thank the reviewer for this suggestion. Each competence-question answered with “yes” (i.e. having actively mobilized resources, continued education) contributed ‘1’, questions answered with “no” (i.e. having not actively mobilized resources, did not continue with education) contributed “0” to the score. Among the pregnant girls and/or young mothers each respondent could score the minimum of 0 (all questions answered with “no”) and the maximum of 10 (100 %). Reliability testing was not performed.

3. Line 394 "young mother" should read young mothers

We revised the respective words.

Finally, for future research, the authors may want to consider realist evaluation as an interesting way to get at the question of "who benefits from which interventions and who falls through the cracks" (lines 412-413).
Thanks a lot for this recommendation.

Reviewer #2: Interesting idea to link the reproductive resilience framework to the issues of adolescent girls "teen pregnancy" issues. Using Bourdieu's conceptual framework on "Capitol" -- social, economic, cultural, and symbolic capital" is also novel and a welcome approach to the topic. Original idea to link reproductive resilience framework to issues of adolescent girls/ "teenage pregnancy". The article would benefit from English language and grammar editing. No need to keep using the term "teenage pregnancy". Once it is stated that the article is about pregnancy among 15-19 year old females (teenagers), there is no need to refer to this as "teenage pregnancy". "Teenage pregnancy" is a loaded term that lacks definition.

Interesting idea to use Bourdieu's conceptual framework around "Capital" -- social, economic, cultural, and symbolic capital", and apply that to this topic. It is a welcome approach, and provides a more nuanced understanding of the strategies that girls could/might employ, and allows for a more positive approach to the issue.

We are grateful for these positive words.

Many of the references are old (more than a decade old). The references around resiliency are strong, but those related to adolescent health and development, and SRH specifically are quite outdated. The authors need to update the references, including The Journal of Adolescent Health and more recent editions of Lancet. The authors do not appear to be familiar with DHS or other such data sources around sources of data on TFR, contraceptive access and knowledge, etc. There is a large literature on this.

Building on this very important comment we replaced old references with more recent ones including publications in The Lancet and the Journal of Adolescent Health.

More and better analyses and presentation of the descriptive data of the population is needed (Table 2) by cross-tabs. The younger girls (15-16) are also the ones that are likely "never pregnant" and also not in a relationship (single). This needs to be easier for the reader to interpret.33.9% of pregnant girls/and or young mothers are married (so which came first the
pregnancy and then he marriage, or other way around)? Need to know that. Can this be described?

We thank the reviewer for raising this point and thus described the descriptive data in more detail. The younger girls are more likely to be never pregnant and not in a relationships. Most of the girls who were married were pregnant before marriage. Teenagers with less education were more likely to start childbearing than better-educated girls.

Data analysis and treatment: Authors should disaggregate data by three distinct categories of girls: 1) never pregnant girls, 2) pregnant girls, 3) young mothers. Do not lump the pregnant girls with young mothers. There are quite different populations in terms of needs, motivation, resources, and status in society.

We fully agree with this recommendation and also suggest that future research should consider these three different groups. In our case, however, the number of pregnant girls was relatively small and would not have allowed for meaningful analysis.

Competency scale -- the notion of the competency scale and the domains is fine. The actual questions related to that (provided on page 25 in the paper) are ok but likely inadequate. The art and science of question-asking among this population is critical for robust data and interpretation; not sure who well versed the authors are in that aspect of methodology.

The following information was added: The questions were carefully discussed within the research team comprising of Tanzanian, Ghanaian and Swiss social scientists and statisticians as well as Tanzanian adolescent data collectors. Hereby particular attention was paid to the local context including suitability of terms and local concepts of teenage pregnancy. In addition, questions were pre-tested and discussed with Tanzanian adolescents and revised thoroughly.

Sampling -- need to have better understanding of the sampling frame. We want to have a sense of the total universe of girls age 15-19 in the selected clusters. The paper indicates that all HH with adolescents age 15-19 were visited, and based on willingness to participate in study, they were included. So, how many HH had 15-19 years old females, how many were asked to be in the study? how many said no?, and when did the research team stop going to HH? Need more clarity
on how representative the 750 girls are. Are they 10%? 50% of all girls age 15-19 in the selected clusters? Was it easier or more difficult to get married girls in your sample? How were they recruited as they were likely not in their natal home?

Stronger and more clarity around sampling, the questions asked, disaggregation by category of girls would greatly enhance the quality of this paper.

Building on these helpful observations, we added more information regarding sampling. Within each cluster all households with adolescents aged 15-19 years were visited and all were, based on their willingness to participate, included in the study. Thus the research team stopped going to households only after all clusters were covered completely. In each cluster on average 63 adolescents were sampled. It was not difficult to cover married girls through this approach as most of them either stayed with their family or the family of their partners. At the end of fieldwork, only six girls refused participation, mainly because their caretakers did not give their consent.

Editing for English grammar would be helpful.

We completely revised the manuscript.

Distinguishing between 3 categories of girls would be useful: 1) "never pregnant girls, 2) pregnant girl, 3) young mothers. They are unique populations.

We fully agree with this recommendation and also suggest that future research should consider these three different groups. In our case, however, the number of pregnant girls was relatively small and would not have allowed for meaningful analysis.

Need to understand the sampling frame a bit better. How representative are the 750 girls in this study?

The selection of 750 girls builds on sound sample size calculations. To attain the required sample size for the study, taking into account the adolescent population and teenage pregnancy rate in
Dar es Salaam, 12 clusters four in each of the three municipalities in Dar es Salaam were randomly selected.

Agree that more in-depth qualitative research around the capital conceptual framework would be warranted.

We fully agree with the reviewer

The comments below have been carefully addressed in the current round of revision and are highlighted in track changes

Reviewer #3: The aim of the study is to identify factors that could contribute to strengthening the reproductive resilience of girls in Dar es Salaam, Tanzania.

In the introduction, when describing the "group of researchers" who conceptualized resilience from a social science perspective…” it may be beneficial to clarify who these researchers are or where they are from. It would give the reader a bit of context and familiarity.

Thanks for these comments, we added a sentence about the background of the researchers

The explanation of the conceptual framework and Bordieus work adds a lot of value to comprehending the study.

I feel the discussion is strong and appreciate the included limitations of the study. The discussion speaks to the need for qualitative studies, yet on page 6, (right before the conceptual framework) it is noted that the study did include a qualitative component. I found this a bit confusing because it seems as if the study was mixed methods, yet the report was only focusing on the quantitative component. Inclusion of some of the qualitative findings would be interesting.
We agree with the reviewer that qualitative insights are highly valuable. As mentioned in the manuscript, we, however, decided to report the detailed qualitative findings elsewhere in order to have enough space for a detailed presentation of the qualitative findings.

The reader could better understand the significance of this study if authors touched briefly on how to capitalize on the competencies of pregnant adolescents and young mothers. For example, empowering young women further by having more options and opportunities for things such as childcare, job training etc. In the study, competence is self-reported, but perhaps quantifying follow up visits to doctor appointments, use of contraceptives post-partum, etc, can be used as other values of competence. There is a difference of young women being aware of what resources are available, with them actually taking advantage and leveraging their competency.

In the light of this valuable comment, we re-wrote the last sentence in the conclusion section.

Reviewer #4: This is really good topic. The issue of resilience in SRH needs to given the attention it deserves and definitely programs must start to incorporate it in their work around adolescent SRH.

I feel this study could have been stronger if it had employed the qualitative method as well. The study seemed to have focused on proving its hypothesis. I am not quite confident that you examined how (as you stated in the conclusion) the various capitals which you have discussed were put to use to generate competence- the study had a lot of limitations (at least this is stated in the manuscript)

We agree with the reviewer that qualitative insights are highly valuable. As mentioned in the manuscript, we, however, decided to report the detailed qualitative findings elsewhere in order to have enough space to go more into depth and detail.

The data presented here illustrate how crucial it is to understand how and by whom capacities are built in order to identify entry points for future interventions. As described in the limitation section, this study does not provide insights into whether or how these capacities are then translated into action.
Is there a reason why the study only included girls from the urban cities?

The study focuses on Dar es Salaam in order to highlight the realities of urban adolescents which differ from the ones of their rural peers. However, data was also collected in the rural sites (Mtwara), which will be presented in a separate manuscript.

The language used in the manuscript needs to be simplified.

The complete manuscript was very carefully proof edited again. Doing so, the language was also simplified.

Reviewer #5: REPH-D-16-00080R2

Full Title: Understanding Resilience of Female Adolescents towards Teenage Pregnancy: A Cross-sectional Survey in Dar es Salaam, Tanzania

Thank you for the opportunity to review this manuscript, which focus on reproductive resilience - a very understudied and interesting topic. This quantitative study investigated different domains of resilience and its association with "competence" to avoid or deal with teenage pregnancy among adolescent females aged 15-19 in Tanzania. The key strengths of the MS include its theoretical grounding, representative sample and wide range of different aspects of resilience explored. In particular, I found the focus on positive aspects of adolescent sexuality and young peoples' resilience very encouraging.

While interesting, the MS requires a lot of clarification especially around the conceptualization and description of the measures in the Methods (simply not clear). The organization of Results vs. Discussion is also not in line with a "standard" way of writing a quantitative public health paper (although I am not sure about the Journals' preferences).

Below I have outlined key major points as well as minor points that should be addressed before the article can be considered acceptable for publication.
We are highly grateful for such detailed and constructive comments and tried to address all of them to our best knowledge.

MAJOR POINTS:

Study setting: A specification of the context is needed early in the introduction; whether these SRH threats are in the context of LMICs and in sub-Saharan Africa specially. Young women in many other settings (high-income) do actually not have a high risk of dying in childbirth. Please also clarify in which settings a rapid urbanization is taken place. It might be a good idea to focus on Tanzania or Eastern Africa from the start.

We fully agree with this observation and re-wrote the introduction chapter.

Conceptual framework: In the second paragraph of the introduction, you make the case that adolescent SRH including pregnancy should not (only) be viewed from a negative perspective, especially in settings with a "non-Western" conceptualization of adolescence. This does not really line up with the conceptual framework viewing teenage pregnancy as a threat. Is it also possible that 15-19 year old girls in the study could consider teenage pregnancy something positive? This might be the case if girls are married, which is not really discussed in the introduction. A further elaboration on how teenage pregnancy is viewed, beyond the public health assumption that this is a threat, would strengthen the paper. There is a lot of interesting work on this topic from the US, for example Kathy Edin's work on how young women in urban poor areas choose early motherhood as a way of making a life in lack of other opportunities.

We thank the reviewer for this important point. Since this work does focus on Tanzania we did not refer to Kathy Edin’s insightful work.

The results presented here focus on unwanted and unplanned teenage pregnancy. In the limitation section we highlight that the construction of teenage pregnancy is difficult. While the reproductive resilience framework presented here offers new insights, it also has some shortcomings. The framework is grounded in the applied realm and therefore runs the risk of reducing resilience to normative and dominant concepts at the expense of the emic perspectives of actors. There is clearly a need to complement experts’ views of the key categories (threat, capitals, capacities and competencies) with qualitative research into local meanings corresponding with these scientific constructs.
Sample and sampling: What was the required sample size for the study (same as the actual sample N=750), and what was the population size from which the sample was drawn? Were sample weights considered given that this is survey data; if not, why?

We added more detailed information. The total female adolescent population based on the 2002 census was 160'266. A minimum of 750 were calculated for this study. Sample weights were not considered.

Also, clarify whether all households with adolescents 15-19 were visited, or whether it was all adolescents with adolescent females. If more than one adolescent female aged 15-19 was present in the household, were all or one included (if one, how were they selected)?

We further clarified this point and re-wrote the sentence. All adolescent girls within a household were interviewed.

Measures: The Methods is missing a section on Measures. As currently written is not clear how the different concepts/domains of competence and resilience were measured, and which were the outcome and independent variables respectively. It is specified that "a cumulative competence scale was developed to assess reproductive resilience". This sounds like competence is measuring resilience, but according to the conceptual framework, competence is an outcome of resilience, and resilience is measured through different forms of capital. This is somewhat confusing and a clearer definition of the measures is needed. It almost sounds like the outcome (competence) consists of scores based on the independent variables (different capitals)…? Please clarify. Table 1 is really the only presentation of how these variables were measured, and the information is rather scarce. What were the response options for "what kind of sources" and "whom do you turn to"? Fixed or open-ended? 2.1 and 2.2 also seem very similar; what if someone listed a friend under question 2.2 as an information source? In Table 3, it seems like there is one composite measure of the different capitals - is this ANY source of the ones listed below the main type of capital?

We added more detailed information in the data analysis section, explaining that we computed bivariate relationship between competence score and capital variables; competence score and ability variables; competence score and demographic variables. Variables for consideration in logistic models to identify determinants of resilience were identified by suggestive bivariate relationships. All logistic regression models were controlled for age, since we knew that proportionally more never pregnant girls were in the younger age than the pregnant/young
mothers. The outcome variable of the study is the ability to avoid pregnancy or cope well with it, which is expressed in the competence scores.

The response options for the questions were fixed categories that could be ticked.

I also wonder whether respondents were able to understand the question assessing "competence" as listed in Table 1 - or whether there several questions for each type of capital (and with what response options (e.g. "a lot", "a little", "not at all" or merely yes/no). The wording seems a little academic to use in a survey; did respondents really understand what was referred to by, for example, "cultural support"?

We fully agree with this observation. The usage and translation of terms was of great importance during the design of the questionnaire. They were carefully discussed in the interdisciplinary team and then also together with adolescents during a pre-test of the questionnaire. In addition, peer-to-peer data collectors were trained intensively during a two-days-workshop. Hereby terms were again carefully discussed with all participants. Terms were explained during data collection to the adolescents by the peer-data collectors in order to avoid misunderstanding. Hence we are confident that the wording was clear to the study participants.

Given that competence was measured on a 10-point scale, information about how was the scale developed is warranted. It would be helpful to know whether you conducted an exploratory factor analysis to see if and how the items hang together, and the alpha coefficient should be given.

The scale was developed building on the literature and the framework. The cumulative competence scale was developed to assess reproductive resilience. It was computed based on 10 competence indicators that refer to the re- and pro-active mobilization of resources. Depending on pregnancy status (never pregnant vs. pregnant adolescents and young mothers), a set of questions related to competence were asked (Table 1). The questions were carefully discussed within the research team, comprising Tanzanian, Ghanaian, and Swiss social scientists, and statisticians as well as Tanzanian adolescent data collectors. Particular attention was given to the local context, including suitability of terms and local concepts of teenage pregnancy. The questions were pre-tested and discussed with Tanzanian adolescents and revised thoroughly. We did not conduct an exploratory factors analysis.
Furthermore, the scale was used to classified high competence as $\geq 50\%$; does this imply scores 5 or higher, or does it refer to the percentile distribution of the scores in the sample (i.e., cut at the median score)? It is important to distinguish (and provide a rationale for) whether these scores are relative to the group distribution, or to the scale. Did you also explore other cut-off points, and if so what were the results? Please describe whether the distribution was skewed or roughly normal as this would impact the analytic methods.

This refers to the percentile distribution of the scores in the sample.

The score development is described in the sub-chaper “Data Analysis”: Each competence question answered with ‘yes’ (i.e. having actively mobilized resources, continued education, etc.) contributed ‘1’; questions answered with ‘no’ (i.e. not having actively mobilized resources, did not continue with education, etc.) contributed ‘0’ to the score. Each respondent among the pregnant girls and young mothers could score a minimum of 0 (all questions answered with ‘no’) and a maximum of 10 (100%) (all questions answered with ‘yes’). For the purpose of this analysis, a score of $\leq 50\%$ was indicative of ‘low competence in mobilizing resources to avoid or deal with pregnancy’, while a score of 51-100% was considered as ‘high competence in mobilizing resources to avoid or deal with pregnancy’. A 50% cut-off point was used in order to learn about the broad spectrum of competencies among respondents. No reliability testing was performed for score development.

Analyses: Model selection seems to have been based solely on bivariate significance. What was the rationale for this decision? In general, scholars do not recommend to rely only on significance but to think broader including factors that have been found important in the past (for example, always include age even if not significant) or which are hypothesized to be important. For example, you could very well have included the variable "economic capital" (line 385) - just because it was not significant in the bivariate model is not a reason to exclude it. Since you do not show the bivariate results, the reader has no way of knowing how these variables were related.

In our analysis we decided in favor of computing bivariate relationships between the competence score and (1) capital variables; (2) ability variables and (3) demographic variables. Variables for consideration in logistic models to identify determinants of resilience were identified by suggestive bivariate relationships ($p \leq .20$). This procedure was discussed and approved by a statistician who is also co-authors of this paper. Hence we are confident that the model selection is sound.
A complementary paper, which has been published in Reproductive Health by the same authors in 2015 on reproductive resilience in Ghana used exactly the same approach.

Results vs. Discussion: Be careful about what you include in the Results, and what should go in the Discussion. This is not a typical article structure for a quantitative public health paper. Usually the Results section presents what you found, and the Discussion adds comparisons with other studies and contrast findings to societal contexts, etc. The current structure makes it somewhat difficult to follow the results from THIS study as the results are mixed with discussion previous studies. I am not sure whether this format is ok with the Journal, but since most readers likely will be used to a more "traditional" structure I would recommend separating the Results from the Discussion. This is, however, up to the Journal.

We would prefer keeping it as presented, this, however, depends on the recommendation of the editors. Currently in the findings section we report the results, while in the discussion section the findings are contextualized and linked to other studies. However, in some rare cases we referred to some key literature already also in the findings section to provide background information.

Also think about how findings are presented, and what is being compared. For example, "talking to peers significantly contributed to the competence of girls who had not been pregnant [OR=1.71, 95% CI=1.18 to 2.48, p=0.004]". Compared to what? Not talking to peers? As noted earlier, a section that defines the independent variables (resilience domains) and its measures is needed in the Methods.

We agree with this important comment and added a section regarding dependent and independent variables (lines 277-288).

Finally, be careful about making conclusions about developmental processes given that your data is cross-sectional (e.g., lines 447-449). You are merely comparing two different groups (never and ever-pregnant), and other factors than resilience might account for the differences in their "competence scores".

We added a sentence in the limitations section pointing out to the role of other factors.
MINOR POINTS:

* Define the age range of "young people", "youth" and "adolescents" used in the two first sentences. I see that you have included a definition in the Methods, but it would be better to just use "adolescents" in the introduction since this is the terminology you use following the Methods.

Would also suggest using "adolescent women" instead of "young women" to be consistent.

Building on this recommendation, young women was replaced by “adolescent women” in the whole manuscript.

* Line 55: "not enough is know about how the country's youth experience and cope with sexuality and teenage pregnancy". This sentence does not read well, please rephrase.

We rephrased the sentence.

* Line 66-67, consider removing "threat" as this put the aim in a negative connotation, whereas the focus is supposed to be positive. I would just say, "for dealing with teenage pregnancy and childbirth".

We rephrased the sentence accordingly.

Perhaps also add "avoiding" or "preventing" before dealing.

We rephrased the sentence accordingly.

* Consider defining "high competence" in the Abstract.

We provided a definition.
* Cultural capital ORs - what is the reference in the Abstract? High vs. low?
Yes, the reference is high versus low. We rephrased the sentence accordingly.

* Line 82, consider adding "to prevent or deal with."
We rephrased the sentence accordingly.

* Line 109: "young" people?
We rephrased the sentence accordingly.

* Lines 133-136: I would just say what the study focused on out of these SRH topics, and delete what it did not focus on (implicit since you list all topics)
The sentence was rephrased accordingly.

* Consider moving paragraph on the different study sites and the design on lines 137-147 to the Design section in the Methods, and just state briefly what the aim of the current study is in the introduction.

We are afraid that doing so might impact on the clarity of the introduction section. Hence we would prefer keeping this section as it is.

* It seems like the terms "capacities" and "competence" are used synonymously, which is a little confusing given that they are not (see lines 175-180).

The terms are not meant to be used synonymously as they have different meanings. This is also illustrated in Figure 1. Line 174-180 provide a definition of capacities. Line 181-185 introduce the concept of competencies.
* Lines 180-185: this seems like a definition of how the outcome was measured, which belongs in the Methods (under an added Measures section).

We discussed moving this section to the methods chapter. But we believe that doing so would make it difficult to fully understand the hypothesis presented after this definition.

* Lines 170-171: This sentence is not clear. What definitions simplify Bordieu's work? Isn't this Bordieu's work? I would delete this last sentence.

Yes, it is Bourdieu’s work, we are, however, aware that it is a summary of his thinking and would therefore like to point out that our short summary of the key ideas of practice theory might simplify Bourdieu’s thinking. To make the sentence clearer we rephrased it.

* For ethical clearance, if adolescents were under 18 they technically cannot provide consent, but only assent to participate (check terminology).

We rephrased the sentence accordingly.

* Since this is survey data, you are only able to assess what the adolescents reported - not their actual experiences. Therefore, try to use "reported" as much as possible. For example, on line 290 16% reported that they were pregnant or already mothers. It would also be good to know the actual percent breakdown between these two different groups - how many reported being pregnant, and how many were mothers?

We included the term “reported” where appropriate.

* Line 483: Please clarify that it is among adolescent females. Avoid using words such as "many" without quantifying what is meant by this.

We added female adolescents but kept “many” as the numbers where thoroughly presented in the findings section already.

* Line 489: Strengthening resilience factors?

We added “resilience” factors.
* Table 1: why list the measures of capacities if these were not used in the analysis?

We preferred to keep the measures of capacities in the table to allow for transparency. Doing so helps the reader to better understand the context of this study and its study design.

* Table 2: some cells have very small numbers, please consider collapsing into categories (e.g., 15-17 years, 18-19 years).

The small numbers only apply for the “pregnant girls/young mothers” column. Collapsing into categories would not be suitable for the group “never pregnant girls”. Hence the table was not changed as recommended.

* I would recommend splitting up the first long paragraph of the discussion into several paragraphs, one for each key finding. As currently written it is a little difficult to follow.

The paragraph was split into subsections as recommended.

* Given that this is a quantitative paper, readers might not be familiar with some terminology such as "emic". Try to avoid jargon and make sure to define and clarify terms.

We removed the term emic.

* It is true that qualitative research is very important to complement and further clarify your findings. However, given that the parent project included qualitative research, how could these findings be used to situate what you found in the current study?

The qualitative data explain in more detail how especially symbolic capital is of importance for female adolescents. However, these results will be reported elsewhere.

* Overall, pay attention to use of active and passive tense throughout the manuscript. There also remain grammatical errors that need to be corrected.

The manuscript was carefully language edited again by an English native speaker.