

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Prevalence and time trends in overweight and obesity among urban women: An analysis of demographic and health surveys data from 24 African countries, 1991-2014
AUTHORS	Amugsi, Dickson; DIMBUENE, ZACHARIE; Mberu, Blessing; Muthuri, Stella; Ezeh, Alex

VERSION 1 – REVIEW

REVIEWER	Elizabeth Rhodes Emory University, U.S.
REVIEW RETURNED	17-May-2017

GENERAL COMMENTS	<ul style="list-style-type: none">- In the abstract, I suggest the authors include how overweight and obesity were defined.- The introduction discusses the distribution of overweight and obesity across levels of SES. However, the analysis does not examine overweight and obesity by indicators of SES. Do they have any ideas regarding the role of SES as a determinant of overweight and obesity in the countries they included in the paper?- The introduction could be improved by strengthening the rationale for focusing on women living in urban areas (versus both urban and rural areas).- The authors present several adverse health consequences associated with obesity (e.g., increased risk of cancer, cardiovascular disease, and type 2 diabetes). Given that the paper focuses on overweight and obesity among women, a discussion of the consequences of overweight and obesity among women of reproductive age and maternal overweight and obesity would be useful.- The authors mention urbanization as a factor driving increases in the prevalence of overweight and obesity. Do they believe that urbanization is always related to overweight or obesity? What do they think about planned urbanization (e.g., planned infrastructure to promote physical activity, reduce sedentary time, and improve the availability and accessibility of healthy foods)?- While I marked "yes" to 'Is the standard of written English acceptable for publication?', I would suggest the authors make minor revisions throughout the paper to improve the writing.- In some countries (e.g., Cameroon, Madagascar, and Nigeria), the changes in overweight and obesity were not statistically significant. Do the authors have any ideas about the factors underlying the lack of significant changes, or the research needed to understand the trends of overweight and obesity in these countries?- The authors conclude that strategies to address overweight and obesity are needed.
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	<p>The paper would be strengthened if the authors discussed the current context (e.g., resources available, existing policies, persisting problem of underweight in African countries) and how strategies to address overweight and obesity fit in to this context.</p> <ul style="list-style-type: none"> - The authors mention that the “lack of uniformity in the definition of urban and rural settings may also affect the generalizability of the findings across countries” (line 351 – 353), but they may be referring to comparability of the prevalence estimates across countries. - In the discussion and conclusions sections, there are several statements that may go beyond the evidence presented (e.g., results suggest that “urban women who are overweight have a greater probability of progressing to obesity”, “We have supported the finding that urbanization is associated with increased prevalence of overweight and obesity among women”). - The authors note that a “limitation is the cross-sectional nature of the data, which makes it impossible to ascertain the changes in BMI over time” (line 350 – 351). I would suggest that the authors be precise in their statement. They did evaluate changes in the prevalence of overweight and obesity. Are they referring to the inability to evaluate the incidence of overweight and obesity?
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REVIEWER	DR. FATAI ADESINA MARUF NNAMDI AZIKIWE UNIVERSITY, NIGERIA.
REVIEW RETURNED	23-May-2017

GENERAL COMMENTS	<p>This study examined the prevalence and trends of overweight and obesity among non-pregnant urban women in Africa. This study is considered timely and informative, especially when most of the information available on African populations on these subjects is country-specific and used one data point as opposed to transnational nature and use of multiple data point in the current study.</p> <p>The manuscript is well-written and arranged in an orderly manner. The background to the study is adequately established and the methodology described in full detail. Results are presented comprehensibly. However, much as adequate effort is made to discuss the findings from the study, they are not in any way compared to those from studies on urban populations from technologically advanced countries from the US, the UK, and Australia etc. It will be desirable to discuss these technologically contrasting populations comparatively. In addition, it will be important to know how these findings compare with those on African rural populations, and possible causes and implications of any differential findings.</p>
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REVIEWER	Evrin Oral LSUHSC, School of Public Health, Biostatistics Program-USA
REVIEW RETURNED	12-Jul-2017

GENERAL COMMENTS	<p>Page 4: What do you mean by “Use of nationally representative data sets, thereby providing more robust estimates of the prevalence and trends of overweight and obesity”? I do not know how you tie “robustness” to “nationally representative data sets”, it does not make sense.</p> <p>Line 198: What do you mean by that “point estimates are not affected by the complex survey design”? In fact, what do you mean by “Since point estimates are not affected by the complex survey design, the DHS weight for each survey was used to get a reliable estimate”? This statement is not true, both standard errors and point estimates would be biased.</p> <p>Line 202: At the beginning of the paper the authors say they only considered the urban women (lines 188-190); however, in the analyses section, they say the analyses were conducted on the full sample (urban+rural)?</p> <p>Line 210-212: What does “overestimation of the statistical power” mean? This is a bizarre phrase.</p> <p>Comments: Page 4: This statement is not accurate: “Height and weight used in the calculation of BMI, was objectively measured, reducing possible misclassification”. Objectively measuring BMI (instead of asking the respondents) would not directly reduce misclassification. Objectively measuring BMI can reduce socially desirability bias. If a woman knows her height and weight accurately and tells it accurately then objectively measuring the BMI would give the same result with asking them their weight/height/BMI. If a woman does not tell her weight accurately (for example is she claims she is 110 pounds when she is 120 pounds) that does not mean her BMI would automatically would be misclassification. Of course, there might be cases where what they report is very different than their actual values, but again it does not mean it will happen all the time. This sentence needs to be revised, the authors might add “possibly reducing” or re-write the sentence.</p> <p>General Comments: I feel like a lot of statistical analyses details are left out and imprecise language seems to be masking some of the data handling process. I am (in general) not in favor of treating data sets as if they are longitudinal when in fact it is not known if the samples collected within time are from the same or different people (or a mix of both situations). The authors treat time as an independent variable.</p> <p>The authors made no comments in the paper on nonresponse/attrition, which is a big issue in surveys like this. Nonreponse also needs to be taken into account since it also affects the estimates.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Elizabeth Rhodes

Institution and Country: Emory University, U.S.

Competing Interests: None declared

Comment: In the abstract, I suggest the authors include how overweight and obesity were defined.

Response: This sentence has been added to the abstract: The participants were classified as overweight (25.0-29.9 kg/m²) and obese (≥ 30.0 kg/m²).

Comment: The introduction discusses the distribution of overweight and obesity across levels of SES. However, the analysis does not examine overweight and obesity by indicators of SES. Do they have any ideas regarding the role of SES as a determinant of overweight and obesity in the countries they included in the paper?

Response: Multi-country analysis using the data that included almost all the countries used in the present analysis show that the effect of SES varies from country to country-- higher growth rate of overweight prevalence among the lowest wealth and education groups in some lower-income countries and the reverse in other countries. The general view is that the differential growth in prevalence of overweight and obesity rates could reflect differences in SES-specific response to conditions at the time.

Comment: The introduction could be improved by strengthening the rationale for focusing on women living in urban areas (versus both urban and rural areas).

Response: This paragraph has been included in the manuscript to address this concern: In Ghana for example, systematic review and meta-analysis revealed that overweight/obesity among urban women was 11 percentage points higher than rural women, while obesity was two times higher in urban relative to rural women (Ofori-Asenso et al 2016). Similar trends were obtained using data from 42 countries in Asia, the Middle East, Africa (East, West, Central and Southern), and Latin America, with a combined overweight/obesity prevalence of 37.2% among urban women compared to 19% of rural women (Popkin et al 2012). The study however noted regional differences, with rural women in Latin America, the Middle East, and North Africa having much higher increases in the prevalence of overweight/obesity compared to their urban counterparts. Conversely, in different multi-country analysis, overweight was increasing more quickly in urban areas than in rural areas of lower-income countries such as Bangladesh and Uganda, but increasing more quickly in rural areas compared to urban areas of upper-middle-income countries, such as Jordan and Peru (Neuman et al 2013).

Comment: The authors present several adverse health consequences associated with obesity (e.g., increased risk of cancer, cardiovascular disease, and type 2 diabetes). Given that the paper focuses on overweight and obesity among women, a discussion of the consequences of overweight and obesity among women of reproductive age and maternal overweight and obesity would be useful.

Response: This paragraph has been added to the manuscript to address this concern: The consequences of overweight and obesity on women of reproductive age are more serious, especially during pregnancy. Studies have shown that maternal obesity can result in negative outcomes in both mothers and fetuses, including gestational diabetes, preeclampsia, an increased miscarriage rate (Leddy et al 2008, Lash and Armstrong 2009), and stillbirth and congenital anomalies.

Obesity in pregnancy can also affect health later in life for both mother and child, including increased risk of heart disease, hypertension, and diabetes (Leddy et al 2008). Children also have a risk of future obesity. Overweight and obesity are associated with decreased contraceptive efficacy and ovulatory disorders in women of reproductive age (Lash and Armstrong 2009), and increasing maternal BMI exerts a progressive adverse effect on vaginal delivery rates for both primigravid and multigravid women (Lynch et al 2008). Obese mothers were more likely than other mothers to terminate breastfeeding when the infant showed satiation cues (Arianas 2017). Obese mothers with higher BMI were also reported using more restrictive feeding practices, limiting the quantity and quality of foods provided to their toddlers, and were observed to use more pressure in getting their children to eat during mealtimes (Haycraft EL, Blissett 2008 Rising R, Lifshitz 2005). Together, these findings show the varied effects of overweight and obesity on women of reproductive age and their children.

Comment: The authors mention urbanization as a factor driving increases in the prevalence of overweight and obesity. Do they believe that urbanization is always related to overweight or obesity? What do they think about planned urbanization (e.g., planned infrastructure to promote physical activity, reduce sedentary time, and improve the availability and accessibility of healthy foods)?

Response: This is a valid point raised by the reviewer. However, we did not factor in planned urbanization as there were not data to that effect, and we do not have evidence showing that well planned urbanization would result in healthier lifestyles and weight status in this setting. Some well-planned countries such as the US (and other developed economies) still battle the surge in obesity (currently 12th most obese country in the world: <http://www.worldatlas.com/articles/29-most-obese-countries-in-the-world.html>). Urbanization is not the only driver of obesity but one of the key drivers.

Comment: While I marked "yes" to 'Is the standard of written English acceptable for publication?' I would suggest the authors make minor revisions throughout the paper to improve the writing.

Response: This has been done

Comment: In some countries (e.g., Cameroon, Madagascar, and Nigeria), the changes in overweight and obesity were not statistically significant. Do the authors have any ideas about the factors underlying the lack of significant changes, or the research needed to understand the trends of overweight and obesity in these countries?

Response: We do not have empirical evidence as to why these trends were not statistically significant, but have tried to give a plausible explanation for this trend based on trends for countries with 4 or more data points compared to those with 3 data points. The following is captured in the manuscript: "For countries with three data points, only 4 of the 11 countries had a significant increase for overweight and 3 for obesity. This suggests that length of time (number of survey points) plays a role in understanding the changes in overweight and obesity over time".

Comment: The authors conclude that strategies to address overweight and obesity are needed. The paper would be strengthened if the authors discussed the current context (e.g., resources available, existing policies, persisting problem of underweight in African countries) and how strategies to address overweight and obesity fit in to this context.

Response: This paragraph has been added to address this concern: Intervention strategies, described in the literature as 'effective and essential' (44) in addressing overweight and obesity in a developing country context include, policy interventions and inter-sectoral partnerships; addressing food system drivers of caloric over-consumption; and improving eating and physical activity environments in key community settings (44). It is believed that effective implementation of these strategies has the potential to curtail the incidence of overweight and obesity.

It is important to recognize that large inequalities remain a major issue in many African countries, which may have a bearing on areas that ought to be prioritized and targeted for interventions. For example, in many African countries, it is common to see problems of undernutrition alongside increasing rates of overweight and obesity. This “dual burden” of undernutrition and obesity exists not only at country- or community-level, but all the way down to households(17, 45). Undernutrition persists as a significant problem(46) in many African countries, and interventions have been put in place to address it (16, 47, 48). However, the issue of overweight and obesity has not received adequate attention as yet in Africa (17, 48). More attention of policy makers and public health practitioners on ways to address the overweight and obesity epidemic, taking into account undernutrition is warranted”.

Comment: The authors mention that the “lack of uniformity in the definition or urban and rural settings may also affect the generalizability of the findings across countries” (line 351 – 353), but they may be referring to comparability of the prevalence estimates across countries.

Response: This has been corrected. Generalizability replaced with comparability as suggested by the reviewer.

Comment: In the discussion and conclusions sections, there are several statements that may go beyond the evidence presented (e.g., results suggest that “urban women who are overweight have a greater probability of progressing to obesity”, “We have supported the finding that urbanization is associated with increased prevalence of overweight and obesity among women”).

Response: This has been revised

Comment: The authors note that a “limitation is the cross-sectional nature of the data, which makes it impossible to ascertain the changes in BMI over time” (line 350 – 351). I would suggest that the authors be precise in their statement. They did evaluate changes in the prevalence of overweight and obesity. Are they referring to the inability to evaluate the incidence of overweight and obesity?

Response: This sentence has been revised to read “Because the surveys used in this analysis were conducted at different times across the countries, we were unable to estimate the change in BMI across all countries for the entire survey period”.

Reviewer: 2

Reviewer Name: DR. FATAI ADESINA MARUF

Institution and Country: NNAMDI AZIKIWE UNIVERSITY, NIGERIA.

Competing Interests: None declared

Comments: This study examined the prevalence and trends of overweight and obesity among non-pregnant urban women in Africa. This study is considered timely and informative, especially when most of the information available on African populations on these subjects is country-specific and used one data point as opposed to transnational nature and use of multiple data point in the current study.

Response: We appreciated this comment from the reviewer.

Comment: The manuscript is well-written and arranged in an orderly manner. The background to the study is adequately established and the methodology described in full detail. Results are presented comprehensibly.

However, much as adequate effort is made to discuss the findings from the study, they are not in any way compared to those from studies on urban populations from technologically advanced countries from the US, the UK, and Australia etc. It will be desirable to discuss these technologically contrasting populations comparatively. In addition, it will be important to know how these findings compare with those on African rural populations, and possible causes and implications of any differential findings.

Response: The entire manuscript has been revised taking into account the reviewer's comments. We however, tried to avoid laying a lot of emphasis on comparing urban and rural in the discussion section. Since we did not conduct comparative analysis, doing so will be outside the scope of our findings.

Reviewer: 3

Reviewer Name: Evrim Oral

Institution and Country: LSUHSC, School of Public Health, Biostatistics Program-USA

Competing Interests: None declared

Comment: Page 4: What do you mean by "Use of nationally representative data sets, thereby providing more robust estimates of the prevalence and trends of overweight and obesity"? I do not know how you tie "robustness" to "nationally representative data sets", it does not make sense.

Response: The sentence has been revised and now reads: Use of nationally representative data sets, thereby enhancing the generalizability of the findings

Comment: Line 198: What do you mean by that "point estimates are not affected by the complex survey design"? In fact, what do you mean by "Since point estimates are not affected by the complex survey design, the DHS weight for each survey was used to get a reliable estimate"? This statement is not true, both standard errors and point estimates would be biased.

Response: Thank you for this comment. Weighting the in DHS data depends on the type of analysis one intends to do. For example, for point estimates where you don't need significance testing or confidence intervals (CIs), you simply use iweights in STATA. However, where you need significance testing or CIs, you have to take the sample design into account when calculating the standard errors. And this can be done using svyset command in STATA (<http://blog.dhsprogram.com/sampling-weighting-at-dhs/>).

Comment: Line 202: At the beginning of the paper the authors say they only considered the urban women (lines 188-190); however, in the analyses section, they say the analyses were conducted on the full sample (urban+rural)?

Response: The analysis was conducted on the sub-sample. This sentence explained how the analysis was done: "To avoid flawed variances and biased confidence intervals owing to the complex survey design, the analyses were conducted on the sub-sample with the full sample (urban+rural) maintained in the dataset. In STATA, this is achieved with the "subpop" in svy procedures.

Comment: Line 210-212: What does "overestimation of the statistical power" mean? This is a bizarre phrase.

Response: The sentence has been revised and now reads: “While in steps 1 and 2 the time point data sets were treated independently, we pooled the data sets for trend analyses. To account for sampling weight, the weight in the pooled data was divided by the number of surveys available for the respective countries”.

Comments: Page 4: This statement is not accurate: “Height and weight used in the calculation of BMI, was objectively measured, reducing possible misclassification”. Objectively measuring BMI (instead of asking the respondents) would not directly reduce misclassification. Objectively measuring BMI can reduce socially desirability bias. If a woman knows her height and weight accurately and tells it accurately then objectively measuring the BMI would give the same result with asking them their weight/height/BMI. If a woman does not tell her weight accurately (for example is she claims she is 110 pounds when she is 120 pounds) that does not mean her BMI would automatically be misclassification. Of course, there might be cases where what they report is very different than their actual values, but again it does not mean it will happen all the time. This sentence needs to be revised, the authors might add “possibly reducing” or re-write the sentence.

Response: We have revised the sentence to reflect the reviewer’s suggestion: Height and weight used in the calculation of BMI, were objectively measured, possibly reducing misclassification

General Comments 1: I feel like a lot of statistical analyses details are left out and imprecise language seems to be masking some of the data handling process.

I am (in general) not in favor of treating data sets as if they are longitudinal when in fact it is not known if the samples collected within time are from the same or different people (or a mix of both situations). The authors treat time as an independent variable.

Response: Thank you for this comment. We have revised the results to ensure that we are precise as much as possible in our presentation.

General comment 2: The authors made no comments in the paper on nonresponse/attrition, which is a big issue in surveys like this. Nonresponse also needs to be taken into account since it also affects the estimates.

Response: One of the key advantages of the DHS data is high response rates (<https://academic.oup.com/ije/article/41/6/1602/747345/Demographic-and-health-surveys-a-profile>). Therefore non-response is not an issue associated with the DHS surveys.

VERSION 2 – REVIEW

REVIEWER	Elizabeth Rhodes Doctoral candidate Emory University USA
REVIEW RETURNED	18-Aug-2017

GENERAL COMMENTS	<ul style="list-style-type: none">- Amugsi et al. address an important research question and the results on the prevalence and trends of overweight and obesity among urban women in SSA have important implications for policy and practice.- In the results and conclusion sections of the abstract, suggest specifying the population – e.g., the prevalence of overweight and obesity among women increased in all 24 countries.- In the discussion section, the note that the results “suggest that urban women who are overweight have a greater probability of progressing to obesity” seems to go beyond the evidence presented.- Suggest softening the language around urbanization as a cause for increasing overweight and obesity since the magnitude of the effect of urbanization on overweight and obesity is unclear- The focus on strategies and interventions needed to address overweight and obesity is useful. Do the authors have suggestions for further research that is needed to expand our understanding of the issue of overweight and obesity among women in SSA, or even other populations in SSA?
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REVIEWER	Evrin Oral LSUHSC, School of Public Health, Biostatistics Program
REVIEW RETURNED	20-Aug-2017

GENERAL COMMENTS	The reviewer also provided a marked copy with additional comments. Please contact the publisher for full details.
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 1

Reviewer Name: Elizabeth Rhodes

Institution and Country: Doctoral candidate, Emory University, USA

Competing Interests: None declared

Comments: Amugsi et al. address an important research question and the results on the prevalence and trends of overweight and obesity among urban women in SSA have important implications for policy and practice.

Response: Thank you for this positive comment

Comment: In the results and conclusion sections of the abstract, suggest specifying the population – e.g., the prevalence of overweight and obesity among women increased in all 24 countries.

Response: The target population has now been included as suggested by the reviewer.

Comments: In the discussion section, the note that the results “suggest that urban women who are overweight have a greater probability of progressing to obesity” seems to go beyond the evidence presented.

Response: The sentence has been rephrased as follows: "This is not unexpected as women who are overweight (also known as pre-obesity) are naturally likely to become obese if efforts are not made by such women to control their weight. Thus, addressing overweight may, to a larger extent curtail incidence of obesity"

Comment: Suggest softening the language around urbanization as a cause for increasing overweight and obesity since the magnitude of the effect of urbanization on overweight and obesity is unclear

Response: We have gone through the entire manuscript to ensure that issues around the over-interpretation of results are addressed.

Comment: The focus on strategies and interventions needed to address overweight and obesity is useful. Do the authors have suggestions for further research that is needed to expand our understanding of the issue of overweight and obesity among women in SSA, or even other populations in SSA?

Response: We have added these sentences to the manuscript to address this concern "For future research, we suggest the conduct of longitudinal studies to systematically elucidate cumulative changes in individual's BMI over time. Longitudinal studies will also be able to ascertain the extent to which overweight can lead to mild-to-moderate obesity"

Reviewer: 3

Reviewer Name: Evrim Oral

Institution and Country: LSUHSC, School of Public Health, Biostatistics Program

Competing Interests: None declared

Comment: My suggested edits are highlighted with green. My questions that need to be addressed are highlighted in blue. I put all my comments and suggestions on authors' revised manuscript. Please follow the highlighted sections.

Response: The reviewers suggested edits have been incorporated into the manuscript, and the questions raised have been extracted and addressed as shown below:

Comment: Either give a reference or delete this part, I am not even sure what you mean by "point estimates are not affected by complex survey design", do you mean point estimates are unbiased in a multistage survey design?,

Response: The sentence "and since point estimates are not affected by the complex survey design" has now been removed from the manuscript as suggested by the reviewer.

Comment: What do you mean by "on the sub-sample with the full sample" Did you do analyses on urban women then on urban+full? Or did you do the analyses only on urban+full? If yes, why? How did using full sample (urban+rural) instead of just urban helped with bias? Explain and give a reference. Another point: what do you mean by "flawed variance"? Do you mean the variance is biased? Even your title says "urban" women. If you used both urban and rural women then change your title. Or if you did everything only on the urban sample, then just delete this sentence, it is just confusing.

Response: This sentence has been removed from the manuscript as suggested by the reviewer to avoid confusing the reader "To avoid flawed variances and biased confidence intervals owing to the complex survey design, the analyses were conducted on the sub-sample with the full sample (urban+rural) maintained in the dataset"