PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Trends and correlates of the public's perception of the healthcare system in the European Union: a multi-level analysis of Eurobarometer survey data from 2009 to 2013
AUTHORS	AlSaud, AlJohara; Taddese, Henock; Filippidis, Filippos

VERSION 1 – REVIEW

REVIEWER	Kyriakos Souliotis University of Peloponnese, Greece
REVIEW RETURNED	08-Jul-2017

GENERAL COMMENTS	First of all thank you for giving me the opportunity to review this paper. The pertinent manuscript is well written, taps on an important issue, the citizens' perception of their healthcare system, and encompasses data from the 27 EU countries during the economic recession. Of particular value is that the authors are not only trying to evaluate the citizens' perception on the matter but also to acknowledge those factors (individual or systemic) that are associated with a more positive or negative view of the healthcare system. Single item measures were used instead of a standardized index or scale to assess the respondents' perceptions of their country's health care system and their levels of life satisfaction which can sometimes be problematic and should be mentioned in the limitations section. Moreover the authors should comment more on their results in the discussion section and link them with the existing bibliography on the topic. More specifically on the first and the third paragraph of the discussion section only one reference is used. Apart from these I do believe that this paper deserves to be published as adds on the existing knowledge on the adverse effects of the economic crisis.

REVIEWER	Robert Blendon and Joachim Hero Harvard T.H. Chan School of Public Health, U.S.A.
REVIEW RETURNED	10-Jul-2017

GENERAL COMMENTS	The aim of this study is to understand the consequences of the financial crisis on citizen perceptions of their own health care system in 27 EU countries. The article is written on an important topic with wide interest to researchers in the field of public perceptions and satisfaction with health systems; However, we recommend several major revisions before the article is suitable for publication in BMJ Open.

	Our largest concern with the manuscript in its current form is that it is not designed appropriately to answer the central research question: what have been the potential consequences of the financial crisis on public views? In order to do this, the financial crisis and country efforts to address them need to be defined, parameterized, and included in the authors' models. As far as we can tell, the comparison between perceptions in 2009 and 2013 across all 27 countries is the only evidence presented to this end, which is insufficient to say anything meaningful about the effect of the 2008 financial crisis. At a minimum, countries need to be categorized by how deeply affected they were by the global recession and their responses to it (say, on an austerity to heavy government intervention scale), preferably distinguishing between responses specifically aimed at health care vs. generalized response across social services. As a result of the above, the results of this paper do not address the objective. A significant decline in how people view the provision of health care in their country between 2009 and 2013 in Europe is not strong evidence all by itself that the financial crisis hurt public views. The identification of a handful of countries like Spain, Greece, Germany, and Denmark paints this impression, though a formal analysis should be conducted where the change in perceptions is compared with some quantifiable measure of the impact of the recession. While it should not be too difficult to identify some country specific metrics of recession impact/policy response, a simplified form of this analysis could categorize countries according to low/moderate/severe impact based upon economic measures and weak/moderate/strong government response. Additionally, we question the authors' inclusion of total expenditure on health and government expenditure as a % of GDP. Wouldn't this be controlling for the mechanism you hypothesized would cause souring perceptions of health systems of the period 2009-2013? It is hypothesized that austerity measures implemented by the countries would harm perceptions, but here you are adjusting for what is spent on health, therefore your observed effects would not be capturing any decline in perceptions between 2009-2013 that would be due to greater or fewer public investments in health care. To give the results more context, authors should consider including a discussion of how European views of health systems have changed over time as well as how views of health care compare to other services. If the authors have access to perceptions of other government services or sectors, this information would be useful in framing perceptions of health care in these countries. Do people feel more or less positively about these other services? Did perceptions of these other services also decline over the recession and by how much? The answers to these questions, combined with insights on the extent to which austerity measures were applied in those areas, might help clarify whether declines in perceptions are tied to retrenchment policies in healthcare. If perceptions declined by a similar degree across the board, it makes the specific connection between health care cuts and public perceptions murkier. The authors should explain why they believe that model-adjusted effects of time differ from unadjusted results and country specific results: there does not appear to be much of a decline in public perceptions overall in the unadjusted data, and many more countries appear to have better impressions than worse impressions of their health care system in 2013 compared to 2009.

	Could this be due to the strong influence of Spain and Greece? An analysis that accounts for variation in the impact of the recession by country would clarify these questions. These issues thus contribute to our views that the discussion and conclusions are not justified by the results in their current form. In addition to the points made about not having a well parameterized variable for which countries were hardest hit by the crisis, the authors should clarify what of thier findings lead them to conclude that forces “external to the health care system” are the most responsible for decline in positive perceptions. Finally, some mention of missingness should be made in the manuscript or supplemental material—how many observation were dropped due to missing responses and what analysis was specifically done to establish that this missingness was not a serious concern?

VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Reviewer Name: Kyriakos Souliotis
Institution and Country: University of Peloponnese, Greece
Please state any competing interests or state ‘None declared’: None Declared

Please leave your comments for the authors below

Comment: First of all thank you for giving me the opportunity to review this paper. The pertinent manuscript is well written, taps on an important issue, the citizens’ perception of their healthcare system, and encompasses data from the 27 EU countries during the economic recession. Of particular value is that the authors are not only trying to evaluate the citizens’ perception on the matter but also to acknowledge those factors (individual or systemic) that are associated with a more positive or negative view of the healthcare system.

Response: We thank the reviewer for the positive feedback.

Comment: Single item measures were used instead of a standardized index or scale to assess the respondents’ perceptions of their country’s health care system and their levels of life satisfaction which can sometimes be problematic and should be mentioned in the limitations section.

Response: We have added this point about single item measures in the limitations section.

Comment: Moreover the authors should comment more on their results in the discussion section and link them with the existing bibliography on the topic. More specifically on the first and the third paragraph of the discussion section only one reference is used.
Apart from these I do believe that this paper deserves to be published as adds on the existing knowledge on the adverse effects of the economic crisis.

Response: Following comments by both reviewers, we have expanded our Discussion section, including comments regarding socio-demographic variables, and have added additional references as appropriate.

Reviewer: 2
Reviewer Name: Robert Blendon and Joachim Hero
Institution and Country: Harvard T.H. Chan School of Public Health, U.S.A.
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

The aim of this study is to understand the consequences of the financial crisis on citizen perceptions of their own health care system in 27 EU countries. The article is written on an important topic with wide interest to researchers in the field of public perceptions and satisfaction with health systems; However, we recommend several major revisions before the article is suitable for publication in BMJ Open.

Please see clarifications

Comment: Our largest concern with the manuscript in its current form is that it is not designed appropriately to answer the central research question: what have been the potential consequences of the financial crisis on public views? In order to do this, the financial crisis and country efforts to address them need to be defined, parameterized, and included in the authors' models. As far as we can tell, the comparison between perceptions in 2009 and 2013 across all 27 countries is the only evidence presented to this end, which is insufficient to say anything meaningful about the effect of the 2008 financial crisis. At a minimum, countries need to be categorized by how deeply affected they were by the global recession and their responses to it (say, on an austerity to heavy government intervention scale), preferably distinguishing between responses specifically aimed at health care vs. generalized response across social services.

Response: Thank you very much for your feedback. We acknowledge that there has been some inconsistency in the way we have stated our study's aim. While the aim in the abstract refers to "potential consequences of the 2008 financial crisis", the aim in the main text states that our intention was to "assess trends in public perceptions of health systems in 27 European Union (EU) member states between 2009 and 2013, in order to discuss observed changes in the context of the financial crisis and associated policy measures".

Comment: The latter is more accurate and reflects our approach throughout the manuscript. We are consistently cautious in our interpretations and conclusions and do not assume a direct pathway of effect between the financial crisis and citizen's perceptions of the health care system. Hence, the premise of our paper lies in the interest of identifying the salient trends following this major economic crisis and discussing these within the context of the crisis; rather than postulating and testing the effects of the crisis on perceptions.

Response: We think that seeking to account for the effects for the financial crisis as it manifests through public sector retrenchment policies and thereby, changes in health care services, would not be supported by current understanding of the nature of public perceptions of health care systems. Current literature largely eschews a notion of full, direct or even major attribution of citizen's perception to their actual experiences of the health care system, and any changes thereof. To quote one of the key resources in this regard, Bleich et al (p. 275) state:

"Our study of the relationship between satisfaction with the health-care system and patient experience revealed that the latter is an important determinant of degree of satisfaction and that it explains about [a mere]10% of its variation. However, most of the variation is explained by factors that are unrelated to patient experience".

Comment: Still, we felt that assessing trends, in the years following the crisis, can shed critical insights into shifts in trends in these 'interesting times'; whilst keeping the explanations of determinant factors open ended, i.e. in keeping with current conceptual understanding of the public perceptions as a metrics.

Response: Following the reviewers' comments, we have modified the statement of aim included in the abstract to better reflect the nature and interest of the study.

Comment: As a result of the above, the results of this paper do not address the objective. A significant decline in how people view the provision of health care in their country between 2009 and 2013 in Europe is not strong evidence all by itself that the financial crisis hurt public views. The identification of a handful of countries like Spain, Greece, Germany, and Denmark paints this impression, though a formal analysis should be conducted where the change in perceptions is compared with some quantifiable measure of the impact of the recession. While it should not be too difficult to identify some country specific metrics of recession impact/policy response, a simplified form of this analysis could categorize countries according to low/moderate/severe impact based upon economic measures and weak/moderate/strong government response.

Response: Please see our response to the previous comment regarding the aim of the study.

Comment: Additionally, we question the authors' inclusion of total expenditure on health and government expenditure as a % of GDP. Wouldn't this be controlling for the mechanism you hypothesized would cause souring perceptions of health systems of the period 2009-2013? It is hypothesized that austerity measures implemented by the countries would harm perceptions, but here you are adjusting for what is spent on health, therefore your observed effects would not be capturing any decline in perceptions between 2009-2013 that would be due to greater or fewer public investments in health care.

Response: As above, correlation between austerity and perceptions is not the hypothesis being tested – potential factors are assessed in the model and the results interpreted with the context of the financial crisis. Total expenditure on health and % of government expenditure on health had been found to be associated with positive perceptions in previous research, so it is important to include them in the model. Having tested all the potential explanatory factors for association, the paper discusses the findings within the context of the financial crisis – rather than testing a hypothesis of direct effect of the financial crisis on health care services and relevant perceptions.

Having said this, GDP per capita, total expenditure on health as % of GDP, and government expenditure on health as % of total expenditure on health can roughly quantify both the magnitude of the financial crisis and the changes in the financing of healthcare. Therefore, one could assess the association of perceptions with the above factors through our model by looking at effect sizes of the respective variables. Having controlled for these means that the adjusted changes over time can be attributed to factors other than the ones included in the model (at individual and country levels) and this is how we have interpreted our results.

Comment: To give the results more context, authors should consider including a discussion of how European views of health systems have changed over time as well as how views of health care compare to other services. If the authors have access to perceptions of other government services or sectors, this information would be useful in framing perceptions of health care in these countries. Do people feel more or less positively about these other services? Did perceptions of these other services also decline over the recession and by how much? The answers to these questions, combined with insights on the extent to which austerity measures were applied in those areas, might help clarify whether declines in perceptions are tied to retrenchment policies in healthcare.

If perceptions declined by a similar degree across the board, it makes the specific connection between health care cuts and public perceptions murkier.

Response: We thank the reviewers for this suggestion. As clarified above, the objective is not to draw a direct connection between retrenchment policies and perceptions. However, we acknowledge that any time trends detected may reflect a general decline in satisfaction across multiple domains that may lead us to false conclusions; hence we value the reviewers' suggestion.

Comment: Eurobarometer did not include any questions for other services or sectors that were directly comparable with the one on healthcare. For example, there were questions regarding pensions and unemployment benefits, but national policies in these areas differed widely between countries throughout the economic crisis and a direct comparison across 27 countries would be very complicated.

Response: However, following this comment and in order to put trends in perceptions of health care in context, we conducted a similar analysis with an outcome that was less likely to have been heavily influenced by economic policies during the crisis. The question we analysed was regarding respondents' satisfaction on "Relations in (OUR COUNTRY) between people from different cultural or religious backgrounds or nationalities".

Comment: Satisfaction regarding the current situation in relations between people from different cultural or religious backgrounds or nationalities fluctuated during the study period, but unlike perceptions on healthcare, there was no clear trend. Respondents in 2013 were equally likely to be satisfied with the current situation in this domain as in 2009 (OR=1.01; 95% CI: 0.95-1.06).

Response: This finding highlights the fact that our findings most likely reflect an actual change in perceptions of healthcare and not a general trend of lower satisfaction across all domains. We have added this analysis in the Methods and Results sections.

Comment: The authors should explain why they believe that model-adjusted effects of time differ from unadjusted results and country specific results: there does not appear to be much of a decline in public perceptions overall in the unadjusted data, and many more countries appear to have better impressions than worse impressions of their health care system in 2013 compared to 2009. Could this be due to the strong influence of Spain and Greece? An analysis that accounts for variation in the impact of the recession by country would clarify these questions.

Response: We thank the reviewers for this interesting observation. We found a quite strong association between GDP per capita and perceptions, consistent with previous research. Almost all countries experienced an increase in their GDP between 2009 and 2013. Thus adjusting for GDP in the regression model may produce results that seem to differ from unadjusted results. To facilitate interpretation of our results, we have added two supplemental tables showing trends in GDP and expenditure on health over the years and have discussed this finding in the Discussion section.

Comment: These issues thus contribute to our views that the discussion and conclusions are not justified by the results in their current form. In addition to the points made about not having a well parameterized variable for which countries were hardest hit by the crisis, the authors should clarify what of thier findings lead them to conclude that forces "external to the health care system" are the most responsible for decline in positive perceptions.

Response: The ‘forces external to the health system’ argument was brought in to explain/support the findings that the strongest associations were found with people’s general living status and their overall satisfaction with life, as explained in the relevant paragraph in the Discussion section. OR for variables such as age, level in society, financial difficulties and life satisfaction indicate that these factors are strongly associated with perceptions, therefore we feel it is warranted to conclude that they are important determinants of perceptions of healthcare. We acknowledge that a comparison with potential associations with health care system factors may not be as clear, therefore we have edited the relevant statement to reflect this.

Comment: Finally, some mention of missingness should be made in the manuscript or supplemental material—how many observation were dropped due to missing responses and what analysis was specifically done to establish that this missingness was not a serious concern?

Response: Thank you, we have now included further discussions on missing data in ‘Strengths and limitations’.

VERSION 2 – REVIEW

REVIEWER	Kyriakos Souliotis University of Peloponnese, Greece
REVIEW RETURNED	25-Sep-2017

GENERAL COMMENTS	This is a revised version of a paper that aims at investigating the citizens’ perception of their healthcare system, in 27 EU countries during the time period 2009-2013. The authors have addressed all of my comments. Therefore I suggest the acceptance of the paper and I would like to thank you for the opportunity to review this manuscript.

REVIEWER	Robert Blendon and Joachim Hero Harvard T. H. Chan School of Public Health, USA
REVIEW RETURNED	15-Sep-2017

GENERAL COMMENTS	Per their clarification, the authors do not seek to formally test any relationship between the 2008 economic crisis or country responses with attitudes towards the health system, but only to consider trends in satisfaction within the context of the crisis (and recovery, as all the data occurs post-crisis). Therefore, the comments below reflect a reevaluation of the study under that pretext. Given this clarification, we feel it is important that any discussion avoid the suggestion that the trends that are described in this article provide evidence--directly or indirectly—that the economic crisis or government responses to the crisis was responsible for them. The authors seem to do so at a couple points and these should be tempered to reflect the fact that no tests were conducted on the effect of the crises or policy response: 1) in the abstract when they conclude that perceptions of health care "predominantly reflect their overall prospects within the broader socio-economic systems they live in", which have "in-turn been affected by the crisis and policy measures instituted". 2) In strengths and limitations authors state that the data “has enabled the study to test potential associations between perceptions and the financial crisis across a wide range of countries.”

	This is not consistent with the authors' statement that the study does not seek to test this relationship. This is not tempered by the following sentence in this section as the issue goes beyond the ability of the study to establish causality. In instances where the authors informally speculate on the relationship between countries that implemented austerity vs those that did not (2 para, discussion), it should be emphasized that no formal test of these responses was conducted or possible. Finally, in the conclusion, the statement that "public perception has particularly suffered in countries that are relatively poor or where…" is overly broad in its current format and cannot be independently assessed from the results. The available results show that living in a lower GDP nation is associated with worse perception of health care provision, but not that it has declined more between 2009 and 2013 than in wealthier countries. To do this, the authors should include interaction terms in their models between year and several of the country-level variables. Without further analysis, we feel this sentence should be removed. Methods and Results: Authors need to be more precise about their methods and treatment of the outcome. It is not clear whether the outcome is treated as a binary variable in the analysis (collapsing the top two categories and the bottom two categories). The description of the variable in the methods describes all categories and does not specify whether it was dichotomized. If all outcome categories were maintained for regression analysis, the methods need to be specific about what kind of model they used—basic logistic models only take binary outcomes, so was ordered logistic used? Authors should avoid referring to reductions in the odds in terms of likelihood as it conflates the concepts of odds and relative risk. This is particularly important in this case since expressing odd ratios as a risk ratio significantly exaggerates the effect size when the outcome is common (60+% have a positive perception here). Therefore, it is misleading to say that respondents were 15% less likely to have a positive perception of health care (assuming that you have done your analysis using a binary outcome, as appears to be the case) in 2013 compared to 2009 since you are not talking about differences in likelihood but differences in odds. To illustrate, a 15% reduction in the odds of having a positive perception of one's country's healthcare system starting from 65% "positive perception" roughly corresponds to a reduction in expected positive perception to 61%, or a 6% reduction in the likelihood of having a positive perception (Odds at 65% = .65/.35; Odds at 61% = .61/.39, giving us an OR of (.65/.35)/(.61/.35) = .84). This applies to the discussion of all the results. Authors should either be precise in how they describe these results— E.g. "Respondents in 2013 had a 15% lower odds of reporting a positive perception of health care provision"—or better yet, convert results into adjusted response rates over the years so that readers can more easily interpret the results. Misc comments: Intro 2nd para, 1st sentence: "any differences in trends" and in the last sentence "explain distinct trends in different countries" are vague. Each refers to trends in what specifically? Intro 3rd para: Is it in the context of the financial crises or the government response to the financial crisis, given that the crisis itself was in 2008. Though effects were felt long after, it would be useful for the authors to paint a clearer picture of this. Methods: We assume that the levels in the multi-level analysis was country, but please clarify

	Methods para 2: it states that population size weighting factors were used to ensure proportionality, but we believe these weights are redundant in a multi-level analysis where countries are the levels. Authors should consult with a statistician to make sure that the analysis is not affected by their inclusion. Methods & measures: The comparison trend that the authors included does not provide a satisfactory comparison (such a comparison might be the provision of education, or public administration) and in its current form strikes us as a straw man. Without a good comparison, it would be better to include as a limitation the inability to distinguish trends in views about health provision with trends in views about society more generally. Results: second para—results do not seem to indicate a significant decrease in positive perceptions "over the years", which could be interpreted as "year over year", but rather a significant decline between 2009 and 2013. In fact, results show that the decline occurred between 2009 and 2010, but no further declines occurred in the following years. Discussion: para 3: in the third to last sentence, it's unclear what the sentence refers to. That older and lower education individuals across Europe tend to be more satisfied regardless of location? Also, two of the citations seem to be about patient satisfaction, not health system satisfaction.

VERSION 2 – AUTHOR RESPONSE

Reviewer: 2
Reviewer Name: Robert Blendon and Joachim Hero
Institution and Country: Harvard T. H. Chan School of Public Health, USA
Please state any competing interests or state 'None declared': None Declared

Please leave your comments for the authors below

Comment: Per their clarification, the authors do not seek to formally test any relationship between the 2008 economic crisis or country responses with attitudes towards the health system, but only to consider trends in satisfaction within the context of the crisis (and recovery, as all the data occurs post-crisis). Therefore, the comments below reflect a reevaluation of the study under that pretext. Given this clarification, we feel it is important that any discussion avoid the suggestion that the trends that are described in this article provide evidence--directly or indirectly—that the economic crisis or government responses to the crisis was responsible for them.
The authors seem to do so at a couple points and these should be tempered to reflect the fact that no tests were conducted on the effect of the crises or policy response:
1) in the abstract when they conclude that perceptions of health care "predominantly reflect their overall prospects within the broader socio-economic systems they live in", which have "in-turn been affected by the crisis and policy measures instituted".
2) In strengths and limitations authors state that the data "has enabled the study to test potential associations between perceptions and the financial crisis across a wide range of countries." This is not consistent with the authors' statement that the study does not seek to test this relationship. This is not tempered by the following sentence in this section as the issue goes beyond the ability of the study to establish causality.

Response: We thank the reviewers for their thorough comments. Following their suggestions, we have edited the relevant text in order to avoid language that would imply any causal associations and highlighted that we have not conducted a test for the association between the crisis and policy responses on the one hand, and perceptions of the healthcare system on the other.

Comment: In instances where the authors informally speculate on the relationship between countries that implemented austerity vs those that did not (2 para, discussion), it should be emphasized that no formal test of these responses was conducted or possible.

Response: We have clarified that “we did not formally test whether national policies were associated with changes in perceptions”.

Comment: Finally, in the conclusion, the statement that “public perception has particularly suffered in countries that are relatively poor or where…” is overly broad in its current format and cannot be independently assessed from the results. The available results show that living in a lower GDP nation is associated with worse perception of health care provision, but not that it has declined more between 2009 and 2013 than in wealthier countries. To do this, the authors should include interaction terms in their models between year and several of the country-level variables. Without further analysis, we feel this sentence should be removed.

Response: We thank the reviewers for this comment. No interaction terms were included in our analysis; therefore, we have removed this sentence following the reviewers’ suggestion.

Methods and Results:
Authors need to be more precise about their methods and treatment of the outcome. It is not clear whether the outcome is treated as a binary variable in the analysis (collapsing the top two categories and the bottom two categories). The description of the variable in the methods describes all categories and does not specify whether it was dichotomized. If all outcome categories were maintained for regression analysis, the methods need to be specific about what kind of model they used—basic logistic models only take binary outcomes, so was ordered logistic used?

Response: We have edited the relevant text in the Methods section and explicitly mentioned that responses were dichotomized into ‘positive perceptions’ (‘Very good’ and ‘Rather good’) and ‘negative perceptions’ (‘Very bad’ and ‘Rather bad’).

Comment: Authors should avoid referring to reductions in the odds in terms of likelihood as it conflates the concepts of odds and relative risk. This is particularly important in this case since expressing odd ratios as a risk ratio significantly exaggerates the effect size when the outcome is common (60+% have a positive perception here). Therefore, it is misleading to say that respondents were 15% less likely to have a positive perception of health care (assuming that you have done your analysis using a binary outcome, as appears to be the case) in 2013 compared to 2009 since you are not talking about differences in likelihood but differences in odds. To illustrate, a 15% reduction in the odds of having a positive perception of one’s country’s healthcare system starting from 65% “positive perception” roughly corresponds to a reduction in expected positive perception to 61%, or a 6% reduction in the likelihood of having a positive perception (Odds at 65% = .65/.35; Odds at 61% = .61/.39, giving us an OR of (.65/.35)/(.61/.35) = .84). This applies to the discussion of all the results. Authors should either be precise in how they describe these results— E.g. “Respondents in 2013 had a 15% lower odds of reporting a positive perception of health care provision”—or better yet, convert results into adjusted response rates over the years so that readers can more easily interpret the results.

Response: We appreciate that terms such as “likelihood” and “less likely” may be interpreted as expressing risk ratios rather than odds ratios. Therefore, we have made edits throughout the text to clarify that we are always referring to odds/odds ratios.

Misc comments:
Intro 2nd para, 1st sentence: “any differences in trends” and in the last sentence “explain distinct trends in different countries” are vague. Each refers to trends in what specifically?

Response: We have edited these sentences to clarify their meaning.

Intro 3rd para: Is it in the context of the financial crises or the government response to the financial crisis, given that the crisis itself was in 2008. Though effects were felt long after, it would be useful for the authors to paint a clearer picture of this.

Response: We thank the reviewers for this comment. The period 2009 to 2013 includes the financial crisis in some EU member states, which experienced recession for a number of years, but also government responses (and not necessarily recession) in several other member states. Overall, the socioeconomic context of the study period in the EU was very much linked to the financial crisis and government responses to it. This is now reflected in the last paragraph of the introduction.

Methods: We assume that the levels in the multi-level analysis was country, but please clarify
Methods para 2: it states that population size weighting factors were used to ensure proportionality, but we believe these weights are redundant in a multi-level analysis where countries are the levels. Authors should consult with a statistician to make sure that the analysis is not affected by their inclusion.

Response: The higher level of analysis was indeed the country (member-state), which we have now explicitly explained in the Methods/Statistical Analysis section. Weights were used for descriptive analyses, but not for the multi-level analysis, as the reviewers correctly point out. We acknowledge that this was not clear in the text. Following this comment, we have clarified that “survey weights were used in descriptive analyses”.

Methods & measures: The comparison trend that the authors included does not provide a satisfactory comparison (such a comparison might be the provision of education, or public administration) and in its current form strikes us as a straw man. Without a good comparison, it would be better to include as a limitation the inability to distinguish trends in views about health provision with trends in views about society more generally.

Response: Following this comment, we have removed the comparison with relations between people from different backgrounds and all the relevant text. We have added this limitation in the “Strengths and limitations” section.

Results: second para—results do not seem to indicate a significant decrease in positive perceptions “over the years”, which could be interpreted as “year over year”, but rather a significant decline between 2009 and 2013. In fact, results show that the decline occurred between 2009 and 2010, but no further declines occurred in the following years.

Response: We have now edited the text, which now refers to a comparison between specific years.

Discussion: para 3: in the third to last sentence, it’s unclear what the sentence refers to. That older and lower education individuals across Europe tend to be more satisfied regardless of location? Also, two of the citations seem to be about patient satisfaction, not health system satisfaction.

Response: Our findings indicate that, after adjusting for other sociodemographic variables, individuals of older age and lower social status were more satisfied with the health system in the European Union as a whole. We have edited the sentence to convey this message more clearly and we have clarified that previous findings refer to both overall perception of the healthcare system and patient satisfaction.

Reviewer: 1

Reviewer Name: Kyriakos Souliotis
Institution and Country: University of Peloponnese, Greece
Please state any competing interests or state 'None declared': None declared

Please leave your comments for the authors below

Comment: This is a revised version of a paper that aims at investigating the citizens' perception of their healthcare system, in 27 EU countries during the time period 2009-2013. The authors have addressed all of my comments.
Therefore I suggest the acceptance of the paper and I would like to thank you for the opportunity to review this manuscript.

Response: We thank the reviewer for the positive comments.