

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Have the public's expectations for antibiotics for acute uncomplicated respiratory tract infections changed since the H1N1 influenza pandemic? A qualitative interview and quantitative questionnaire study
<b>AUTHORS</b>	Cliona A.M. McNulty, Puja Joshi, Chris C. Butler, Lou Atkinson, Tom Nichols, Angela Hogan and David P. French

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Maureen Baker Health Protection Lead Royal College of General Practitioners United Kingdom
<b>REVIEW RETURNED</b>	16/12/2011

<b>THE STUDY</b>	I found the message about requests for consultations and for antibiotics confusing and felt the text was contradictory on that point.
<b>RESULTS &amp; CONCLUSIONS</b>	As in section above, I felt the main message from this paper was confusing.
<b>GENERAL COMMENTS</b>	There is confusion in the manuscript between Q-research data and RCGP surveillance data. The text refers to Q-research and the figures to RCGP data

<b>REVIEWER</b>	Benedikt Huttner, MD postdoctoral research associate Division of epidemiology University of Utah Salt Lake City, united States  Competing interests: Participated in the "CHAMP - Changing behaviour of healthcare professionals and the general public towards a more prudent use of anti-microbial agents" project with Christopher C Butler
<b>REVIEW RETURNED</b>	25/12/2011

<b>THE STUDY</b>	General: I would suggest substituting "swine flu" with "H1N1" throughout the article. General, introduction: Some information about the clinical impact of H1N1 in England (e.g. mortality etc.) might be useful. Possible reference: Mytton OT, Rutter PD, Mak M, Stanton EA, Sachedina N, Donaldson LJ. Epidemiol Infect. 2011 Nov 1:1-9. [Epub ahead of print] Mortality due to pandemic (H1N1) 2009 influenza in England: a comparison of the first and second waves.) Page 2, line 7-14: "The H1N1 (2009) Pandemic has 'medicalised' acute respiratory illness presenting with flu-like symptoms including
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	<p>cough, cold, sore throat and fever. The general public now have a greater expectation that they should seek a consultation ...” I assume this was the hypothesis? This should be made clearer by framing the statement accordingly.</p> <p>Page 6, line 17: “England, as well as other European countries,5 has implemented public health campaigns,....” It might be useful to cite a newer reference regarding public campaigns here “Huttner B, Goossens H, Verheij T, Harbarth S; CHAMP consortium. Lancet Infect Dis. 2010 Jan;10(1):17-31.”</p>
<p><b>RESULTS &amp; CONCLUSIONS</b></p>	<p>Page 6, lines 28-33: It is mentioned that there was no campaign in 2009. What about 2010?</p> <p>Page 7, line 52: A short statement why there was no 2010 survey would be interesting.</p> <p>Page 8: A short indication about the location of the areas where the pharmacies were located and whether these were urban or rural regions might be appreciated by the reader not familiar with the detailed geography of England.</p> <p>Page 8, line 14: Since there seem to be data about oseltamivir dispensing, are there any data on antibiotic use available from the pharmacy company? The evolution of antibiotic dispensing would be very interesting information, but I am aware that this was not the focus of the study and would probably be associated with a significant amount of work.</p> <p>Page 9, line 5: Was each pharmacy only visited once?</p> <p>Page 9, line 30: How much time passed between the “pro forma” and the telephone interview?</p> <p>Page 11, line 26: “whether the public campaign message “Antibiotics don’t help when you have coughs or colds” should still be used following the recent swine flu outbreak.” What was the answer to this?</p> <p>Page 12, line 40: “using Stata 11.2.” (Stata Corporation, College Station, TX, USA) should be added.</p> <p>Page 12, line 56: “declined to participate when contacted, did not answer the telephone at the time when an interview had been arranged, or the telephone number supplied was out of order.” Separate numbers for the different reasons would be useful.</p> <p>Page 13, lines 50-53: “In 2011 there were 164 respondents with children aged 0-3 years and 316 with children aged 4-15 years (Table 1).” Since in the remainder of the manuscript (e.g. page 17, line3) children 0-4 years are grouped it would probably make more sense to use the same grouping here.</p> <p>Page 14, table 1: The 95% confidence intervals should be stated (applies also to the rest of the manuscript).</p> <p>Page 14, table 1: Is there any information if those who said they expected an antibiotic for flu were more likely to think that Tamiflu is an antibiotic? I assume not, since the Tamiflu questions were asked separately to a different sample of the population?</p> <p>Page 15, line 34: “In 2011 8.9% of respondents reported that they or someone in their household had had suspected or confirmed swine flu (4.3% themselves, 4.7% someone else)” How well does this correlate with surveillance data about clinically symptomatic infections? (possible reference Miller E, Hoschler K, Hardelid P, Stanford E, Andrews N, Zambon M.Lancet. 2010 Mar 27;375(9720):1100-8. Epub 2010 Jan 21.)</p> <p>Page 16, line 40: “they did for their most recent RTI and would not have done before the swine flu outbreak) was washing their hands more often (16%).” This could also be shortly mentioned in the discussion section (possible reference: Fleischman DS, Webster GD, Judah G, de Barra M, Aunger R, Curtis VA. BMJ Open. 2011</p>

	<p>Nov 24;1(2):e000127. Print 2011.)</p> <p>Page 18, line 59: “The small subgroup of respondents who had experienced H1N1 influenza themselves (4.3%) were more likely to consult their surgery with their most recent RTI (35% vs. 19%).” This could also be due to the fact that people who have a tendency to consult more often were more likely to have been diagnosed with H1N1. I thus think it is difficult to claim that H1N1 necessarily changed behavior in that aspect.</p> <p>Page 22, line 25-27: “... a targeted public health campaign might be needed to correct the view that taking Tamiflu© is protective against future influenza.” The same (i.e. not being protective against future influenza, at least not in the long run) could also be said about the yearly vaccine. I am not sure how much can be inferred from the inability of a large proportion of the surveyed public to identify Tamiflu© correctly as an antiviral agent. I think it a rather positive finding that not more of the surveyed people assumed Tamiflu© to be an antibiotic.</p> <p>Page 22, line 34: “This year’s European Antibiotic Awareness Day public campaign messages do not need to be changed as a result of the H1N1 influenza” Maybe specify the year and also add “in England” (The results may not be applicable to other European countries).</p> <p>Pages 31 and 52, figures 2a-c: Please add number of respondent in each group and explain meaning of red dot and bars (I assume actual percentage of respondents and 95% CI?). The same applies to figures 2b and 2c. It might also be preferable to switch the order of figures 2b and 2c (2a and 2c could maybe be combined in the same figure since they both relate to the same variable “personal experience of recent RTI”).</p> <p>Page 40, lie 34-60: I did not see the answers to questions 5a and 5b in the Ipsos MORI (Capibus) Questionnaire mentioned in the results section. The same applies to some other questions.</p> <p>Page 51, figure 1: Similar graphs for 2008 and 2009 showing the timing of the survey in relation to influenza like illness consultations would be useful (the curves for 2008 and 2009 could maybe even be added to the same graph).</p>
<p><b>GENERAL COMMENTS</b></p>	<p>General comments: This interesting, well-written study tries to assess the impact of the 2009 H1N1 influenza pandemic on the English public’s expectations with regard to antibiotics for uncomplicated respiratory tract infections using qualitative and quantitative information. The methodology is well described and is appropriate to address the study questions. The authors appropriately outline the limitations of the study and most of the conclusions are supported by the study results. While I do not have any major comments, I have some minor comments, listed above.</p> <p>General: I would suggest substituting “swine flu” with “H1N1” throughout the article.</p> <p>General, introduction: Some information about the clinical impact of H1N1 in England (e.g. mortality etc.) might be useful. Possible reference: Mytton OT, Rutter PD, Mak M, Stanton EA, Sachedina N, Donaldson LJ. Epidemiol Infect. 2011 Nov 1:1-9. [Epub ahead of print] Mortality due to pandemic (H1N1) 2009 influenza in England: a comparison of the first and second waves.)</p> <p>Page 2, line 7-14: “The H1N1 (2009) Pandemic has ‘medicalised’ acute respiratory illness presenting with flu-like symptoms including cough, cold, sore throat and fever. The general public now have a greater expectation that they should seek a consultation ...” I assume this was the hypothesis? This should be made clearer by framing the statement accordingly.</p> <p>Page 6, line 17: “England, as well as other European countries,5</p>

	has implemented public health campaigns,....” It might be useful to cite a newer reference regarding public campaigns here “Huttner B, Goossens H, Verheij T, Harbarth S; CHAMP consortium. Lancet Infect Dis. 2010 Jan;10(1):17-31.”
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### VERSION 1 – AUTHOR RESPONSE

Reviewer: Maureen Baker

1. I found the message about requests for consultations and for antibiotics confusing and felt the text was contradictory on that point.

Thank you we have changed the sentence to make it clearer.

2. There is confusion in the manuscript between Q-research data and RCGP surveillance data. The text refers to Q-research and the figures to RCGP data.

Thank you we have changed this sentence in the methods referring to the figure.

Reviewer: Benedikt Huttner, MD

1. General comments: This interesting, well-written study tries to assess the impact of the 2009 H1N1 influenza pandemic on the English public’s expectations with regard to antibiotics for uncomplicated respiratory tract infections using qualitative and quantitative information. The methodology is well described and is appropriate to address the study questions. The authors appropriately outline the limitations of the study and most of the conclusions are supported by the study results. While I do not have any major comments, I have some minor comments, listed below.

Thank you for your positive review, we have addressed your comments below.

2. Page 6, lines 28-33: It is mentioned that there was no campaign in 2009. What about 2010?  
Page 7, line 52: A short statement why there was no 2010 survey would be interesting.

There was no campaign in autumn of 2009 or spring of 2010 before this survey. In autumn 2010 there was a low budget awareness campaign mainly aimed at hospitals, this has been explained in the methods.

3. Page 8: A short indication about the location of the areas where the pharmacies were located and whether these were urban or rural regions might be appreciated by the reader not familiar with the detailed geography of England.

Thank you this has been added.

4. Page 8, line 14: Since there seem to be data about oseltamivir dispensing, are there any data on antibiotic use available from the pharmacy company? The evolution of antibiotic dispensing would be very interesting information, but I am aware that this was not the focus of the study and would probably be associated with a significant amount of work.

No we did not obtain antibiotic use data from the pharmaceutical company, so I am afraid we cannot provide this data.

5. Page 9, line 5: Was each pharmacy only visited once?

No each pharmacy was visited several times, we have added this to the methods. "As the interviews were conducted during the recruitment period the pharmacies were visited several times, in rotation, until data saturation was reached. In total the pharmacies were visited 26 times for 3-6 hours at a time."

6. Page 9, line 30: How much time passed between the "pro forma" and the telephone interview?

We aimed to interview participants within 2 weeks of the pharmacy visit; the 17 participants were interviewed between 3 and 8 days of the pharmacy visit (median 6 days). We have added this to the methods and results.

7. Page 11, line 26: "whether the public campaign message "Antibiotics don't help when you have coughs or colds" should still be used following the recent swine flu outbreak." What was the answer to this?

We have added this to the results. Most participants agreed the campaign should continue a minority disagreed with he campaign.

8. Page 12, line 40: "using Stata 11.2." (Stata Corporation, College Station, TX, USA) should be added.

Thank you this has been added.

9. Page 12, line 56: "declined to participate when contacted, did not answer the telephone at the time when an interview had been arranged, or the telephone number supplied was out of order." Separate numbers for the different reasons would be useful.

Three participants had given wrong numbers, two declined to participate when contacted, ten never answered the phone (private number or number showing), nine did not answer the telephone at the time when an interview had been arranged, and 9 could not commit to a time for an interview despite several phone calls. We have added this to the methods

10. Page 13, lines 50-53: "In 2011 there were 164 respondents with children aged 0-3 years and 316 with children aged 4-15 years (Table 1)." Since in the remainder of the manuscript (e.g. page 17, line3) children 0-4 years are grouped it would probably make more sense to use the same grouping here.

The figures for respondents with children aged 0-3 years and respondents with children aged 4-15 years come from routine preliminary questions that were not of our design. When it came to the questions we designed ourselves, we selected respondents with children aged 0-4 years. We agree it would make more sense to report the number of respondents with children aged 0-4. This line has been changed to "In 2011 there were 209 respondents with children aged 0-4 years " and we are no longer suggesting this result is reported in table 1.

11. Page 14, table 1: The 95% confidence intervals should be stated (applies also to the rest of the manuscript).

We have added the confidence intervals to all the results in Tables 2 and 3 and to the 2011 data in Table 1. We have not added the confidence intervals to the other years in Table 1 as we feel that it complicates the Table and makes it difficult for the reader. We have added a foot note saying that the

full CIs are available on request from the authors.

12. Page 14, table 1: Is there any information if those who said they expected an antibiotic for flu were more likely to think that Tamiflu is an antibiotic? I assume not, since the Tamiflu questions were asked separately to a different sample of the population?

Yes, to reduce bias when answering this question after they had answered all the other questions about the treatment of their recent RTI and whether they had had Tamiflu, we asked this question on a separate day to a separate group of respondents. We have added this to the strengths and limitations section.

13. Page 15, line 34: "In 2011 8.9% of respondents reported that they or someone in their household had had suspected or confirmed swine flu (4.3% themselves, 4.7% someone else)" How well does this correlate with surveillance data about clinically symptomatic infections? (possible reference Miller E, Hoschler K, Hardelid P, Stanford E, Andrews N, Zambon M. *Lancet*. 2010 Mar 27;375(9720):1100-8. Epub 2010 Jan 21.)

Thank you. Just over 4% of our respondents said that they personally had had suspected or confirmed swine flu. Almost 800,000 (CI 375-1644,000) cases of influenza like illness due to H1N1 were estimated to have occurred in England in 2009, Evans this equates to 1.5% (CI 0.7 -3.2%) of the population. Our percentage includes respondents with suspected influenza and therefore it is not surprising that it is higher, furthermore Evans et al do not include patients who did not consult a health professional with ILI and they observed that consultations were much lower in the second phase of the pandemic.

14. Page 16, line 40: "they did for their most recent RTI and would not have done before the swine flu outbreak) was washing their hands more often (16%)." This could also be shortly mentioned in the discussion section (possible reference: Fleischman DS, Webster GD, Judah G, de Barra M, Aunger R, Curtis VA. *BMJ Open*. 2011 Nov 24;1(2):e000127. Print 2011.)

Thank you we have mentioned this in the discussion. A survey in a service station lavatories in England also showed that the media had an impact on hand-washing with rates increasing during the time in which H1N1 influenza featured prominently in blogs and in the news. Fleischman

15. Page 18, line 59: "The small subgroup of respondents who had experienced H1N1 influenza themselves (4.3%) were more likely to consult their surgery with their most recent RTI (35% vs. 19%)." This could also be due to the fact that people who have a tendency to consult more often were more likely to have been diagnosed with H1N1. I thus think it is difficult to claim that H1N1 necessarily changed behaviour in that aspect.

Absolutely we agree with this statement and have partly covered this in the discussion on page 24 – but we have added another sentence to cover this.

16. Page 22, line 25-27: "... a targeted public health campaign might be needed to correct the view that taking Tamiflu© is protective against future influenza." The same (i.e. not being protective against future influenza, at least not in the long run) could also be said about the yearly vaccine. I am not sure how much can be inferred from the inability of a large proportion of the surveyed public to identify Tamiflu© correctly as an antiviral agent. I think it a rather positive finding that not more of the surveyed people assumed Tamiflu© to be an antibiotic.

Thank you we have added to the discussion that only 7% thought it was an antibiotic and that this is an encouraging finding.

17. Page 22, line 34: "This year's European Antibiotic Awareness Day public campaign messages do not need to be changed as a result of the H1N1 influenza" Maybe specify the year and also add "in England" (The results may not be applicable to other European countries).

Thank you we have changed this.

18. Pages 31 and 52, figures 2a-c: Please add number of respondent in each group and explain meaning of red dot and bars (I assume actual percentage of respondents and 95% CI?).

Thank you we have done this.

19. It might be preferable to switch the order of figures 2b and 2c (2a and 2c could maybe be combined in the same figure since they both relate to the same variable "personal experience of recent RTI").

We have put the figures in this order as figures 2a and 2b refer to contact with a GP and Figure 2c refers to expectation for an antibiotic. When these are edited for the final paper 2a and 2b could be put next to one another.

20. Page 40, line 34-60: I did not see the answers to questions 5a and 5b in the Ipsos MORI (Capibus) Questionnaire mentioned in the results section. The same applies to some other questions.

Some of the questions asked were not relevant to the aim addressed in this paper. In addition some of the data collected did not add to the results sufficiently to be included. The results of the other questions will be published separately, but we give the questions in the appendix so that readers can see what other questions were asked.

21. Page 51, figure 1: Similar graphs for 2008 and 2009 showing the timing of the survey in relation to influenza like illness consultations would be useful (the curves for 2008 and 2009 could maybe even be added to the same graph).

Thank you this has been added.

22. I would suggest substituting "swine flu" with "H1N1" throughout the article.

In most places we have substituted swine flu for H1N1, however the respondents were asked about the effect of the "swine flu outbreak" on their behaviour. H1N1 influenza was not mentioned to respondents in the interviews or questionnaire as this was not common parlance in the winter of 2010/11. This has been added to the methods.

23. Introduction: Some information about the clinical impact of H1N1 in England (e.g. mortality etc.) might be useful. Possible reference: Mytton OT, Rutter PD, Mak M, Stanton EA, Sachedina N, Donaldson LJ. *Epidemiol Infect.* 2011 Nov 1:1-9. [Epub ahead of print] Mortality due to pandemic (H1N1) 2009 influenza in England: a comparison of the first and second waves.)

We have added this to the introduction and referenced an epidemiological report on the pandemic in England.

24. Page 2, line 7-14: "The H1N1 (2009) Pandemic has 'medicalised' acute respiratory illness presenting with flu-like symptoms including cough, cold, sore throat and fever. The general public now have a greater expectation that they should seek a consultation ..." I assume this was the

hypothesis? This should be made clearer by framing the statement accordingly.

Thank you – yes we apologise we have framed the hypothesis and aims in the article focus appropriately.

25. Page 6, line 17: “England, as well as other European countries,5 has implemented public health campaigns,....” It might be useful to cite a newer reference regarding public campaigns here “Huttner B, Goossens H, Verheij T, Harbarth S; CHAMP consortium. Lancet Infect Dis. 2010 Jan;10(1):17-31.”

Thank you we have included this in the references and replaced Finch et al.

26. The references have been renumbered to allow for the additions.

### VERSION 2 – REVIEW

<b>REVIEWER</b>	Benedikt Huttner Postdoctoral research associate Division of Epidemiology University of Utah Salt Lake City, USA  Competing interests: none (except having collaborated with one of the authors in the European CHAMP project)
<b>REVIEW RETURNED</b>	17/02/2012
<b>GENERAL COMMENTS</b>	All comments from my initial review have been satisfactorily addressed and I have no further comments.