PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) 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

TITLE (PROVISIONAL)	Patient care pathways using chlamydia and gonorrhoea tests are evolving: point of care nucleic acid amplification tests may reduce genitourinary medicine service delivery costs.
AUTHORS	Adams, Elisabeth; Ehrlich, Alice; Turner, Katy; Shah, Kunj; Macleod, John; Goldenberg, Simon; Meray Patel, Robin; Pearce, Vikki; Horner, Paddy

VERSION 1 - REVIEW

REVIEWER	Sarah Creighton Homerton University Foundation NHS Trust, UK
REVIEW RETURNED	30-Apr-2014

GENERAL COMMENTS	This is an interesting study which adds to the existing literature on the cost effectiveness of point of care chlamydia tests (POCT). It has different methods to the existing literature, namely that it is modelled on real life clinic flows, rather than presumptive models. The limitations include:- 1) An assumption that the POCT eliminates the need for traditional chlamydia test. As the POCT has lower sensitivity than the POCT, it is not clear that this is a justifiable assertion. It is plausible that traditional chlamydia testing would need to be introduced alongside POCT. 2) Assumed cost reductions from removing the need for gonorrhoea cultures. This can be implemented without POCT, by recalling anyone with a positive traditional gonorrhoea result for culture at the time of recall for treatment. 3) Presumed reduction in partner treatment costs for partners with negative POCT. As the window period of the POCT is undefined, coupled with the sensitivity of <100%, it is unclear that this is a justifiable assumption. 4) The patient flow pathway is derived from opinion rather than observed patient flow. Additionally, there is a lack of clarity as to the precise breakdown of how the cost per patient has been derived and this detail should be included in the supplementary files for scrutiny. Without this information, it is not clear whether the patients remain in clinic during the wait for POCT result, (obviating the need for repeat registration etc., but likely to be problematic for patients and clinical staff) or whether they leave and are informed of the result by SMS message, returning (and requiring repeat registration) if positive but with a potential loss to follow up. Incidentally, p22 seems to have 2 references which are already included in the reference list on p11-12

REVIEWER	Lucy Watchirs Smith Sexual Health Program The Kirby Institute, UNSW Australia Level 6, Wallace Wurth Building University of New South Wales
REVIEW RETURNED	07-Jun-2014

GENERAL COMMENTS	Reference 11- links to a webpage which is not active Limitations are discussed before the manuscript but not in the body of the manuscript I am not a Health Economist so my comments relate to the patient pathway mapping aspects of this manuscript. This paper is well written and addresses important issues around the implantation of POCTs in clinics in the UK. These are some comments on specific sections of the manuscript, which I hope will be helpful. Introduction: This section would benefit from some re-structuring of paragraphs (for example some paragraphs are quite short). Methods: Where do the cost estimates per test come for Cephid Xpert CT/NG come from? (These costs seem low); where do the assumptions about the number of tests annually come from? Re: Reference 11- Could a journal citation be used instead? Have costs associated with specimen transportation (e.g. couriers) for standard care been incorporated into the model? This did not seem to be the case when reading the supplementary methods. Have costs/time associated with client follow up using conventional testing been accounted for? In some cases it takes a number of attempts to reach clients. Results: Figure 1 is informative and easy to read Discussion: This section would also benefit from some re-structuring of paragraphs (for example some paragraphs are too long). Study limitations should be added to the discussion.

VERSION 1 – AUTHOR RESPONSE

Reviewer Name Sarah Creighton
Institution and Country Homerton University Foundation NHS Trust, UK

This is an interesting study which adds to the existing literature on the cost effectiveness of point of care chlamydia tests (POCT). It has different methods to the existing literature, namely that it is modelled on real life clinic flows, rather than presumptive models.

The limitations include:-
1) An assumption that the POCT eliminates the need for traditional chlamydia test. As the POCT has lower sensitivity than the POCT, it is not clear that this is a justifiable assertion. It is plausible that traditional chlamydia testing would need to be introduced alongside POCT.
Reply: In fact, the new generation Cepheid PCR test has very similar sensitivity to current PCR tests (Gaydos). However, if POCTs with lower sensitivity were used, then yes we agree this would be a

limitation. Hence, we have added a section to the discussion.

2) Assumed cost reductions from removing the need for gonorrhoea cultures. This can be implemented without POCT, by recalling anyone with a positive traditional gonorrhoea result for culture at the time of recall for treatment.
Reply: Yes, we absolutely agree. Some of the benefits of redesigning patient pathways do not require a POCT. However, we did find that all of the clinics we spoke to are still taking a culture for NG at point of initial consultation for symptomatic patients.

3) Presumed reduction in partner treatment costs for partners with negative POCT. As the window period of the POCT is undefined, coupled with the sensitivity of <100%, it is unclear that this is a justifiable assumption.
Reply: Yes, we agree and this is a really good point, and warrants further thought/discussion. Guidance could be drawn in either way – you are either over-treating your partners, or perhaps missing some that should have treatment (if you do not treat POCT negatives who may in fact be positive but just too recently infected). We have added a sentence to the discussion about this – thanks for pointing it out.

4) The patient flow pathway is derived from opinion rather than observed patient flow.
Reply: Yes it is, and we have clarified this in the methods and in the discussion as a limitation. We would really welcome a validation study of the pathways pre- and post- implementation of a POCT to confirm/amend actual times for pathways.

Additionally, there is a lack of clarity as to the precise breakdown of how the cost per patient has been derived and this detail should be included in the supplementary files for scrutiny. Without this information, it is not clear whether the patients remain in clinic during the wait for POCT result, (obviating the need for repeat registration etc., but likely to be problematic for patients and clinical staff) or whether they leave and are informed of the result by SMS message, returning (and requiring repeat registration) if positive but with a potential loss to follow up.
Reply: We have now provided all of the details of the pathways. We left this out of the original submission for simplicity but are happy for it to be included as a supplementary file. Also to point out, for the POCT pathways, we either assumed that they would drop off a sample in the morning and book in for a later appointment, or would wait for their result OR be texted and return for treatment. We did assume that 100% of patients would return for treatment, but this assumption is being challenged in follow-up work we are conducting.

Incidentally, p22 seems to have 2 references which are already included in the reference list on p11-12
Reply: Actually p22 will form part of the separate Supplementary materials online: File 1, so has its own reference list.

Reviewer Name Lucy Watchirs Smith

Reference 11- links to a webpage which is not active
Reply: amended, the new link to the website is now given: http://www.pathwayanalytics.com/sexual-health/about-the-tariff

Limitations are discussed before the manuscript but not in the body of the manuscript
Reply: they are also included in the discussion.

I am not a Health Economist so my comments relate to the patient pathway mapping aspects of this

manuscript. This paper is well written and addresses important issues around the implantation of POCTs in clinics in the UK. These are some comments on specific sections of the manuscript, which I hope will be helpful.

Introduction:
This section would benefit from some re-structuring of paragraphs (for example some paragraphs are quite short).
Reply: We have deliberately tried to keep the paper as concise as possible, and are not sure if we can restructure the introduction any more than we have.

Methods:
Where do the cost estimates per test come for Cephid Xpert CT/NG come from? (These costs seem low); where do the assumptions about the number of tests annually come from?
Reply: These costs come from Cepheid, who provided an estimate of their test costs based on volume for England. In the absence of other commercially available POC tests at the time of the study, we used their estimates. The annual number of tests was based on an assumption about the total number of CT/NG tests that an average genitourinary medicine clinic would perform annually. We have clarified this in the text.

Re: Reference 11- Could a journal citation be used instead?
Reply: The results of the original work were not published in an academic journal. They also seem to have been taken down from the website where we downloaded them originally. The new link to the website is now given: http://www.pathwayanalytics.com/sexual-health/about-the-tariff

Have costs associated with specimen transportation (e.g. couriers) for standard care been incorporated into the model? This did not seem to be the case when reading the supplementary methods.
Reply: Transportation costs have not been explicitly included. However, we believe that they were included in the standard NAAT-based test cost. If they were to be included in the model, they would increase the costs of the standard pathways and the POCT pathway costs would remain the same. We have mentioned this in the methods.

Have costs/time associated with client follow up using conventional testing been accounted for? In some cases it takes a number of attempts to reach clients.
Reply: Yes this is included in the “contact positive” step.

Results:
Figure 1 is informative and easy to read
Reply: Thanks!

Discussion:
This section would also benefit from some re-structuring of paragraphs (for example some paragraphs are too long). Study limitations should be added to the discussion.
Reply: We have restructured the discussion, and we have incorporated limitations in the discussion.