PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Current and future use of point-of-care tests in primary care: an international survey in Australia, Belgium, The Netherlands, the United Kingdom, and the United States
AUTHORS	Howick, Jeremy; Cals, Jochen; Jones, Caroline; Price, Chris; Pluddemann, Annette; Heneghan, Carl; Berger, Marjolein; Buntinx, Frank; Hickner, John; Pace, Wilson; Badrick, Tony; van den Bruel, Ann; Laurence, Caroline; van Weert, Henk; van Severen, Evie; Parrella, Adriana; Thompson, Matthew

VERSION 1 - REVIEW

REVIEWER	Dr Gary Thorpe MBA, PhD, MSc, BSc, FRCPath Director Gary Thorpe Associates Limited Birmingham England
REVIEW RETURNED	15-May-2014

GENERAL COMMENTS	This is a very useful, comprehensive and well written paper. I have only a number of very minor questions or suggested amendments. a) Although the paper states why the question of protein/creatinine ratio was not included in the Australian version it is unclear why leucocytes/nitrites testing was not asked. b) page 6, Survey, line 34 …… either current used …. change to currently c) Could the references be checked to ensure all the inclusive page numbers for articles are included (eg refs 5, 8, 10, 11, 26) d) Table 1 first column, bottom cell states “year qualified as a doctor: average (range)” – however range does not appear in the table. e) Appendix VI (page 29 of 46) Q3 reduction of referrals - it currently states “I do not believe POCTS would help me make a diagnosis” should it be “I do not believe POCTS would help me reduce referrals”

REVIEWER	Professor Paul Collinson St George's Hospital and Medical School, United Kingdom
REVIEW RETURNED	20-May-2014

GENERAL COMMENTS	The authors have undertaken a survey of primary care physicians across 5 countries to assess the subjective and objective use of point of care testing. They present their findings. There are 2 areas where the manuscript would benefit from clarification.

	1. Some of the selected tests may not be appropriate for primary care. In particular, the concept of testing for acute cardiac disease. Although the authors touch on this briefly in the discussion the area needs some expansion and some consideration as to how they would study general practitioner understanding of the use of these tests. 2. The web appendix tables are rather confusing I infer from the text that the discordance between current use and desired use represents current utilisation versus utilisation were the testing available. Hence, 74% of 298 undertake blood glucose measurement and only 1% refuse to do so. It would be helpful if the tables were annotated to make explicit exactly what current use and desired use constitute, that the columns for current use and actually used (current use item 1 and current use item 2) are expressed as individual numerical values and the percentages of the combined total given in parentheses. The data should be similarly expressed for the desired use column. It is important that numerical data for the 4 categories is available in addition to the percentages. It also makes clear how the percentages were calculated. This should be done or for all the web appendix tables.

REVIEWER	Melody Ni Imperial College London
REVIEW RETURNED	21-May-2014

GENERAL COMMENTS	This paper is the first attempt at its scale towards understanding a very interesting and pressing topic. Huge amount of effort went into questionnaire development and data collection in an internal setting. These are to be commended. However perhaps because of the nature of the survey and the amount of the data received, reading the paper, I can't help but wondering whether more depth and accuracy can be achieved by more meticulous survey design and data analysis. Clarification needed: 1. How language issues in different countries is tackled 2. Why sample size calculation is needed (page 7) 3. Why 25% as the barriers for high usage frequency (page 7, line 41) 4. Demand for POCT is defined as high desire and high usage of a test but is it possible despite being a current user, I would rather not use it? 5. Are top lab tests from Oxford sufficient to cover the scope of the tests that physicians might want or use in all five countries? 6. Representativeness: obviously from what's presented in page 8, data, apart from those collected in UK is non-representative in all the remaining countries – abstract however state otherwise. Need to address implications and generalizability of the results in discussion. For instance, given the low response rate in other countries, what population did the author believe are more likely to have responded to the survey? If the population contains a large number of POCT enthusiasts, then the high usage and demand could be a biased conclusion 7. Percentage of desire is reported as the proportion of the total sample. However this question is only answered by those who are not currently using a device. A far more accurate measure to use the latter as the basis for computing proportions 8. Discussion in terms of barriers to implementation that author discussed in the introduction

REVIEWER	Kaman, Wendy Erasmus Medical Center, Rotterdam
REVIEW RETURNED	28-May-2014

GENERAL COMMENTS	The authors describe the results obtained from a large international survey on the use of POC tests in primary care. The results probably contain useful information for policy makers, clinicians and industry, though better representation and discussion of the results is needed. Major comments: As the tables are depicted now it is unclear which POC test should be targeted for future development (one of the goals of the study). The tables should be simplified and the results more extensively discussed. Recommendations for the industry on POCT development should be added to the discussion section. For non-GP readers it would be nice to have a column included in Table 3 and 4 with information regarding the condition (disease) for which the POCT is used. More information on statistics is needed (test used, significant differences between countries etc). Statistics results (CI and P-value) should be added to Table 1. To my opinion the POC pregnancy test should be excluded from the study (not disease related). Minor comments: P4 Line 46; Delete `to` P5 Line 13: Delete `the condition` Table 2 UK pregnancy column: 06% should be 16% Web Appendix Table III 20.: the text `Staphylococcus aureus`is missing

REVIEWER	Anne Dawnay, Consultant Biochemist University College London Hospitals NHS Foundation Trust, UK.
REVIEW RETURNED	02-Jun-2014

GENERAL COMMENTS	This is a novel survey on the current and potential future use of point of care (POC) tests as an aid to diagnosis in primary care across five developed countries – Australia, Belgium (Flanders), the Netherlands, the UK and the USA. The stated purpose is to influence policy in deciding which tests may be usefully introduced into patient care pathways and to inform industry as to which tests should be developed. The authors have assessed as far as is practicable that the respondents were broadly representative of their country's primary care practitioners in general. The survey asked clinicians to identify five health conditions for which POC testing might help them make a diagnosis, five for monitoring or managing their patients, and five for reducing referrals for specialty care. Clinicians were also asked to indicate whether or not they currently used any from a list of 50 POC tests and whether

	or not they would use the other tests were they available to them. The frequency of current or desired usage was also recorded. However the question missing from the survey is what are the blocks to your adoption of POC testing? Page 9 and Table 4 show that many of the tests that clinicians desire to use, but do not use currently, are available as POC tests. So why are they not being used? Reimbursement (yes or no) is discussed (page 10, lines 14-23) but test reimbursement at a fixed price vs test cost may also be a factor since POC is usually more expensive than a lab test. The authors speculate that more isolated rural practices in the US and Australia compared with Europe (page 10, lines 23-28) may be a factor – the authors have the data for rural vs urban practice usage and it would be informative if this were analysed by country. Other factors are likely to be space, staff time and expertise, regulatory requirements and uncertainty over the cutoffs to be used since for many POC tests these have not been as extensively validated as for lab tests. Page 7, lines 54-55. 'At least 10% of respondents reported using 47 of the tests in the US and 46 of the tests in the UK'. The authors note that the test numbers used by at least 10% in the other countries were much lower (between 5 and 9). One factor likely to directly affect the available POCT is practice size. To be able to offer almost 50 POC tests would necessitate substantial resource likely to be found only in large primary care centres with many clinicians – an analysis of the influence of practice size on the number of tests used would be informative and the authors have this information. This may be the biggest barrier to the widespread adoption of POC tests. Only the results (Table 2) for the question on conditions for which clinicians would like a POC test for diagnosis (page 28, Q1) are presented yet clinicians were also asked about conditions for which they would like POC tests for monitoring (page 28, Q2) and reduction of referrals (page 29, Q3). Why are these results not presented? Presumably the results in Table 3 documenting current POC test usage include their use for diagnosis, monitoring and reducing referral. The authors discuss (pages 8-9) the only partial correspondence between the most frequently used POC tests and the conditions for which clinicians would like a POC test to help in diagnosis and suggest (page 9, lines 6-8) that this reflects 'an unmet clinical need for a more widely accessible range of POCT...'. Are the data confounded by comparing most desired tests only for diagnosis with usage figures for diagnosis, monitoring and reducing referral? Glucose may well be more used more for monitoring than for diagnosis. As the most extreme example, in the Netherlands 94% of respondents use pregnancy tests yet pregnancy is not among their top 10 conditions for which they want POC to make a diagnosis – is it being used to reduce referral eg for secondary amenorrhoea? In table 2, since PE and PE/DVT were chosen by some clinicians in the Netherlands the summing of the two (to >100%) is not helpful. For all countries it would be more helpful to know how many clinicians wanted PE and/or DVT and not double count. Corrections – table 2, UK pregnancy test used by 06% - should be 16%. In Table 2, for all countries except Australia the conditions are listed in decreasing order of frequency – shouldn't Australia be ordered similarly?

VERSION 1 – AUTHOR RESPONSE

REVIEWER(S) REPORTS: DR GARY THORPE MBA, PHD, MSC, BSC, FRCPATH

Author reply

THIS IS A VERY USEFUL, COMPREHENSIVE AND WELL WRITTEN PAPER. I HAVE ONLY A NUMBER OF VERY MINOR QUESTIONS OR SUGGESTED AMENDMENTS.

Thank you for this encouraging feedback. We found all your feedback useful for improving the manuscript.

ALTHOUGH THE PAPER STATES WHY THE QUESTION OF PROTEIN/CREATININE RATIO WAS NOT INCLUDED IN THE AUSTRALIAN VERSION IT IS UNCLEAR WHY LEUCOCYTES/NITRITES TESTING WAS NOT ASKED.

We explained the reason for excluding the leucocytes/nitrites in the Australian study on page 5.

B) PAGE 6, SURVEY, LINE 34 …… EITHER CURRENT USED …. CHANGE TO CURRENTLY

Thank you for pointing out this typo, which we have corrected.

C) COULD THE REFERENCES BE CHECKED TO ENSURE ALL THE INCLUSIVE PAGE NUMBERS FOR ARTICLES ARE INCLUDED (EG REFS 5, 8, 10, 11, 26)

Thank you for reminding us about the page numbers, which we have inserted where relevant (note that for recent online journals eg BMJ in ref 8 page numbers have been replaced by, for example "b1374".

D) TABLE 1 FIRST COLUMN, BOTTOM CELL STATES "YEAR QUALIFIED AS A DOCTOR: AVERAGE (RANGE)" – HOWEVER RANGE DOES NOT APPEAR IN THE TABLE.

Thank you for pointing this out. We have deleted "(range)" in column 1 of Table 1.

E) APPENDIX VI (PAGE 29 OF 46) Q3 REDUCTION OF REFERRALS - IT CURRENTLY STATES "I DO NOT BELIEVE POCTS WOULD HELP ME MAKE A DIAGNOSIS" SHOULD IT BE "I DO NOT BELIEVE POCTS WOULD HELP ME REDUCE REFERRALS"

Thank you for pointing this out. We have changed the text in the appendix.

REVIEWER NAME PROFESSOR PAUL COLLINSON

Author reply

THE AUTHORS HAVE UNDERTAKEN A SURVEY OF PRIMARY CARE PHYSICIANS ACROSS 5 COUNTRIES TO ASSESS THE SUBJECTIVE AND OBJECTIVE USE OF POINT OF CARE TESTING. THEY PRESENT THEIR FINDINGS.
THERE ARE 2 AREAS WHERE THE MANUSCRIPT WOULD BENEFIT FROM CLARIFICATION.

Thank you for suggesting ways to improve the quality of our survey.

SOME OF THE SELECTED TESTS MAY NOT BE APPROPRIATE FOR PRIMARY CARE. IN PARTICULAR, THE CONCEPT OF TESTING FOR ACUTE CARDIAC DISEASE. ALTHOUGH THE

AUTHORS TOUCH ON THIS BRIEFLY IN THE DISCUSSION THE AREA NEEDS SOME EXPANSION AND SOME CONSIDERATION AS TO HOW THEY WOULD STUDY GENERAL PRACTITIONER UNDERSTANDING OF THE USE OF THESE TESTS.
This is a useful point and we have added:

“Some of the tests, for example tests for acute cardiac disease, may not be suitable or relevant in primary care settings” to the discussion.

It is important to remember that we are simply reporting what general practitioners claimed they would like; however the focus of the questions was in what conditions a POC test might be of value in decision making, rather than what tests were desired. In conversation some of the authors of the study who work after hours seem to feel that a test for acute cardiac disease (if it demonstrated the required diagnostic accuracy) could be useful for reducing hospital admissions.

2. THE WEB APPENDIX TABLES ARE RATHER CONFUSING I INFER FROM THE TEXT THAT THE DISCORDANCE BETWEEN CURRENT USE AND DESIRED USE REPRESENTS CURRENT UTILISATION VERSUS UTILISATION WERE THE TESTING AVAILABLE. HENCE, 74% OF 298 UNDERTAKE BLOOD GLUCOSE MEASUREMENT AND ONLY 1% REFUSE TO DO SO. IT WOULD BE HELPFUL IF THE TABLES WERE ANNOTATED TO MAKE EXPLICIT EXACTLY WHAT CURRENT USE AND DESIRED USE CONSTITUTE, THAT THE COLUMNS FOR CURRENT USE AND ACTUALLY USED (CURRENT USE ITEM 1 AND CURRENT USE ITEM 2) ARE EXPRESSED AS INDIVIDUAL NUMERICAL VALUES AND THE PERCENTAGES OF THE COMBINED TOTAL GIVEN IN PARENTHESES. THE DATA SHOULD BE SIMILARLY EXPRESSED FOR THE DESIRED USE COLUMN. IT IS IMPORTANT THAT NUMERICAL DATA FOR THE 4 CATEGORIES IS AVAILABLE IN ADDITION TO THE PERCENTAGES. IT ALSO MAKES CLEAR HOW THE PERCENTAGES WERE CALCULATED. THIS SHOULD BE DONE OR FOR ALL THE WEB APPENDIX TABLES.

We agree that the web appendix tables can be confusing and have expanded on the headings of the columns to clarify. The headings for frequency of use are now:

“Percentage of respondents who indicate they currently use the test” and

“Percentage of respondents who indicate they would use the test if it were made available in their practice”

REVIEWER NAME MELODY NI

Author reply

THIS PAPER IS THE FIRST ATTEMPT AT ITS SCALE TOWARDS UNDERSTANDING A VERY INTERESTING AND PRESSING TOPIC. HUGE AMOUNT OF EFFORT WENT INTO QUESTIONNAIRE DEVELOPMENT AND DATA COLLECTION IN AN INTERNAL SETTING. THESE ARE TO BE COMMENDED.

Thank you for these very positive and encouraging comments.

HOWEVER PERHAPS BECAUSE OF THE NATURE OF THE SURVEY AND THE AMOUNT OF THE DATA RECEIVED, READING THE PAPER, I CAN’T HELP BUT WONDERING WHETHER MORE DEPTH AND ACCURACY CAN BE ACHIEVED BY MORE METICULOUS SURVEY DESIGN AND DATA ANALYSIS.

Thank you for your suggestions to improve the paper, which we have taken into account.

CLARIFICATION NEEDED:
1. HOW LANGUAGE ISSUES IN DIFFERENT COUNTRIES IS TACKLED
This is an important issue, thank you for the opportunity to clarify. We have added that the survey was translated (see page 6: "The survey was translated in Dutch for the Netherlands and Belgium (translation led by JC) so each respondent was able to complete the survey in their own language."

2. WHY SAMPLE SIZE CALCULATION IS NEEDED (PAGE 7)

Thank you for the opportunity to clarify. We have changed the paragraph to: "To measure representativeness, the target sample size ranged between 357 (for Belgium/Flanders with 5000 practicing family care physicians) and 383 (for the US with 208807 primary care physicians) based on 95% confidence ±5% interval and an estimated proportion of 50%."

3. WHY 25% AS THE BARRIERS FOR HIGH USAGE FREQUENCY (PAGE 7, LINE 41)
The reviewer is correct that the choice of 25% is arbitrary. Some decision about what to include had to be made to make the tables user-friendly, and using 25% achieved this because tests used or desired by less than 1 in 4 doctors does not seem to represent a pressing need. We believe that the important thing was therefore to be transparent about our choice.

4. DEMAND FOR POCT IS DEFINED AS HIGH DESIRE AND HIGH USAGE OF A TEST BUT IS IT POSSIBLE DESPITE BEING A CURRENT USER, I WOULD RATHER NOT USE IT?
This is an interesting point, and we believe it is covered by the option "I do not believe POCTs would help me make a diagnosis" in the survey.

5. ARE TOP LAB TESTS FROM OXFORD SUFFICIENT TO COVER THE SCOPE OF THE TESTS THAT PHYSICIANS MIGHT WANT OR USE IN ALL FIVE COUNTRIES?
This is an important potential limitation. However the list of tests underwent modifications after discussion with other countries' authors. We therefore modified the relevant sentence to (p5-6):

"The list of 50 tests used in the survey was based on the most commonly ordered laboratory tests by primary care in Oxfordshire, UK, and was modified based on input from general practitioners in other countries"

6. REPRESENTATIVENESS: OBVIOUSLY FROM WHAT'S PRESENTED IN PAGE 8, DATA, APART FROM THOSE COLLECTED IN UK IS NON-REPRESENTATIVE IN ALL THE REMAINING COUNTRIES – ABSTRACT HOWEVER STATE OTHERWISE. NEED TO ADDRESS IMPLICATIONS AND GENERALIZABILITY OF THE RESULTS IN DISCUSSION. FOR INSTANCE, GIVEN THE LOW RESPONSE RATE IN OTHER COUNTRIES, WHAT POPULATION DID THE AUTHOR BELIEVE ARE MORE LIKELY TO HAVE RESPONDED TO THE SURVEY? IF THE POPULATION CONTAINS A LARGE NUMBER OF POCT ENTHUSIASTS, THEN THE HIGH USAGE AND DEMAND COULD BE A BIASED CONCLUSION

This is an important suggestion. We feel that the limited data do suggest representativeness (see Table 1). At the same time the reviewer is correct that further detail is needed for confirmation. We therefore added:

"Our limited data suggest (but do not confirm) were representativeness" to the abstract,

In the results we believe that the current statement ("These results suggest that our samples were broadly representative, yet the lack of comparative national average data prevents us from drawing firm conclusions.") is accurate

We also believe that the current sentences in the discussion are accurate:
- "However, representativeness could not be confirmed with certainty due to limited data about national primary care clinician characteristics."
"Specifically, overrepresentation of primary care clinicians interested in POC testing could have occurred despite high response rates in some countries."

7. PERCENTAGE OF DESIRE IS REPORTED AS THE PROPORTION OF THE TOTAL SAMPLE. HOWEVER THIS QUESTION IS ONLY ANSWERED BY THOSE WHO ARE NOT CURRENTLY USING A DEVICE. A FAR MORE ACCURATE MEASURE TO USE THE LATTER AS THE BASIS FOR COMPUTING PROPORTIONS

The reviewer is correct to point out that an option would be to use those not currently using a test as the denominator. However that option informs the reader about which participants would use the test, from among those who do not currently use the test. It is also useful to know the proportion of respondents who report a desire to use from among all respondents, which is what we reported. So both methods are acceptable. We also believe that our method of reporting is more understandable by a wider audience who might be confused by changing the denominator.

8. DISCUSSION IN TERMS OF BARRIERS TO IMPLEMENTATION THAT AUTHOR DISCUSSED IN THE INTRODUCTION
This is a useful suggestion and we modified the discussion to state:

"Studies of POC test clinical effectiveness will depend on adherence to quality control protocols, while cost-effectiveness studies will have to address known barriers to cost-effectiveness of diagnostic studies in general, and POC testing in particular, 23 as well as the barriers to implementation such as concerns about the over-reliance on tests"

REVIEWER NAME W.E. KAMAN

Author reply

THE AUTHORS DESCRIBE THE RESULTS OBTAINED FROM A LARGE INTERNATIONAL SURVEY ON THE USE OF POC TESTS IN PRIMARY CARE. THE RESULTS PROBABLY CONTAIN USEFUL INFORMATION FOR POLICY MAKERS, CLINICIANS AND INDUSTRY, THOUGH BETTER REPRESENTATION AND DISCUSSION OF THE RESULTS IS NEEDED.

Thank you for these encouraging comments and opportunity to improve our paper.

MAJOR COMMENTS:
AS THE TABLES ARE DEPICTED NOW IT IS UNCLEAR WHICH POC TEST SHOULD BE TARGETED FOR FUTURE DEVELOPMENT (ONE OF THE GOALS OF THE STUDY). THE TABLES SHOULD BE SIMPLIFIED AND THE RESULTS MORE EXTENSIVELY DISCUSSED. RECOMMENDATIONS FOR THE INDUSTRY ON POCT DEVELOPMENT SHOULD BE ADDED TO THE DISCUSSION SECTION.

This is a useful suggestion, so we modified the relevant subsetion title in the discussion to:
"Implications for clinicians, policy makers, commissioners, and industry"

“Conditions that primary care clinicians claim POC tests would help them diagnose, as well as POC tests that are widely desired, deserve further research and industry development to see whether and how they might fit into evidence-based diagnostic pathways”

We also added the following sentence (to the same section):

“Once this research is done, the tests which are likely to improve patient care in a cost-effective way require targeting by industry for development and optimization.”

FOR NON-GP READERS IT WOULD BE NICE TO HAVE A COLUMN INCLUDED IN TABLE 3 AND 4 WITH INFORMATION REGARDING THE CONDITION (DISEASE) FOR WHICH THE POCT IS USED.

This might indeed be helpful. However for some of the tests it is quite clear, and for others the tests are used to diagnose many conditions. More importantly, the aim of this paper is to present data from GPs which will inform diagnostic test development, and these are all widely used tests in health care. We therefore don't think that further clarification is needed

MORE INFORMATION ON STATISTICS IS NEEDED (TEST USED, SIGNIFICANT DIFFERENCES BETWEEN COUNTRIES ETC). STATISTICS RESULTS (CI AND P-VALUE) SHOULD BE ADDED TO TABLE 1.

This is an interesting suggestion. However given there 50 tests (and four options: use, don't use, desire, don’t desire) and several respondent characteristics, statistical tests would almost certainly reveal several spurious correlations. Comparing differences between countries could be further confused because:
1. The sampling frame in each country was different.
2. The table would become incomprehensibly large.
The differences between countries are quite clear with Table 1 and other tables.
TO MY OPINION THE POC PREGNANCY TEST SHOULD BE EXCLUDED FROM THE STUDY (NOT DISEASE RELATED).

This is an interesting suggestion. However the questions we posed in relation to a condition rather than a disease, which represents presenting symptoms. We believe that a key strength of our survey is that it relates to clinical questions and what general practitioners (family doctors) claim they need.

In addition, although pregnancy is not to be considered a disease, it is an important target condition that primary care clinicians need to diagnose. For example, patients with acute abdominal pain may suffer from acute appendicitis or from an extra-uterine pregnancy and ruling out the latter possibility is important in the referral process.

We therefore feel it would be a mistake to remove pregnancy and have left it in.

MINOR COMMENTS:
P4 LINE 46; DELETE `TO`

Thank you for pointing this out: we have deleted the extra “to”.

P5 LINE 13: DELETE `THE CONDITION`

This is a useful suggestion, thank you.

TABLE 2 UK PREGNANCY COLUMN: 06% SHOULD BE 16%

Thank you for pointing out this error, which we have corrected.

WEB APPENDIX TABLE III 20.: THE TEXT `STAPHYLOCOCCUS AUREUS`IS MISSING

Thank you for pointing this out; the term was hidden in the table formatting and we have corrected it.

REVIEWER NAME ANNE DAWNAY, CONSULTANT BIOCHEMIST

Author reply

THIS IS A NOVEL SURVEY ON THE CURRENT AND POTENTIAL FUTURE USE OF POINT OF CARE (POC) TESTS AS AN AID TO DIAGNOSIS IN PRIMARY CARE ACROSS FIVE DEVELOPED COUNTRIES – AUSTRALIA, BELGIUM (FLANDERS), THE NETHERLANDS, THE UK AND THE USA. THE STATED PURPOSE IS TO INFLUENCE POLICY IN DECIDING WHICH TESTS MAY BE USEFULLY INTRODUCED INTO PATIENT CARE PATHWAYS AND TO INFORM INDUSTRY AS TO WHICH TESTS SHOULD BE DEVELOPED. THE AUTHORS HAVE ASSESSED AS FAR AS IS PRACTICABLE THAT THE RESPONDENTS WERE BROADLY REPRESENTATIVE OF THEIR COUNTRY'S PRIMARY CARE PRACTITIONERS IN GENERAL.

Thank you for this encouraging feedback.

HOWEVER THE QUESTION MISSING FROM THE SURVEY IS WHAT ARE THE BLOCKS TO YOUR ADOPTION OF POC TESTING? PAGE 9 AND TABLE 4 SHOW THAT MANY OF THE TESTS THAT CLINICIANS DESIRE TO USE, BUT DO NOT USE CURRENTLY, ARE AVAILABLE AS POC TESTS. SO WHY ARE THEY NOT BEING USED? REIMBURSEMENT (YES OR NO) IS DISCUSSED (PAGE 10, LINES 14-23) BUT TEST REIMBURSEMENT AT A FIXED PRICE VS TEST COST MAY ALSO BE A FACTOR SINCE POC IS USUALLY MORE EXPENSIVE THAN A LAB TEST. THE AUTHORS SPECULATE THAT MORE ISOLATED RURAL PRACTICES IN THE US AND AUSTRALIA COMPARED WITH EUROPE (PAGE 10, LINES 23-28) MAY BE A FACTOR – THE AUTHORS HAVE THE DATA FOR RURAL VS URBAN PRACTICE USAGE AND IT WOULD BE INFORMATIVE IF THIS WERE ANALYSED BY COUNTRY. OTHER FACTORS ARE LIKELY TO BE SPACE, STAFF TIME AND EXPERTISE, REGULATORY REQUIREMENTS AND UNCERTAINTY OVER THE CUTOFFS TO BE USED SINCE FOR MANY POC TESTS THESE HAVE NOT BEEN AS EXTENSIVELY VALIDATED AS FOR LAB TESTS.

This is an important point, and we added the following sentence to the discussion (p9):

"Other factors that could affect inter-country variability include: type of reimbursement (fixed price versus test cost), space, staff time, expertise, regulatory requirements, and uncertainty about test accuracy."

The reviewer is also correct that it would be very useful to analyze not only potential correlations between practice location and desire for particular tests. However given there 50 tests (and four options: use, don't use, desire, don't desire) and several respondent characteristics, statistical tests would almost certainly reveal several spurious correlations.

PAGE 7, LINES 54-55. 'AT LEAST 10% OF RESPONDENTS REPORTED USING 47 OF THE TESTS IN THE US AND 46 OF THE TESTS IN THE UK'. THE AUTHORS NOTE THAT THE TEST NUMBERS USED BY AT LEAST 10% IN THE OTHER COUNTRIES WERE MUCH LOWER

(BETWEEN 5 AND 9). ONE FACTOR LIKELY TO DIRECTLY AFFECT THE AVAILABLE POCT IS PRACTICE SIZE. TO BE ABLE TO OFFER ALMOST 50 POC TESTS WOULD NECESSITATE SUBSTANTIAL RESOURCE LIKELY TO BE FOUND ONLY IN LARGE PRIMARY CARE CENTRES WITH MANY CLINICIANS – AN ANALYSIS OF THE INFLUENCE OF PRACTICE SIZE ON THE NUMBER OF TESTS USED WOULD BE INFORMATIVE AND THE AUTHORS HAVE THIS INFORMATION. THIS MAY BE THE BIGGEST BARRIER TO THE WIDESPREAD ADOPTION OF POC TESTS.

This is an interesting point that we had not thought of. We added the sentence: “The number of tests used could be a function of practice size (which was much higher in the UK than other countries where it was reported, see Table 1).”

ONLY THE RESULTS (TABLE 2) FOR THE QUESTION ON CONDITIONS FOR WHICH CLINICIANS WOULD LIKE A POC TEST FOR DIAGNOSIS (PAGE 28, Q1) ARE PRESENTED YET CLINICIANS WERE ALSO ASKED ABOUT CONDITIONS FOR WHICH THEY WOULD LIKE POC TESTS FOR MONITORING (PAGE 28, Q2) AND REDUCTION OF REFERRALS (PAGE 29, Q3). WHY ARE THESE RESULTS NOT PRESENTED? PRESUMABLY THE RESULTS IN TABLE 3 DOCUMENTING CURRENT POC TEST USAGE INCLUDE THEIR USE FOR DIAGNOSIS, MONITORING AND REDUCING REFERRAL. THE AUTHORS DISCUSS (PAGES 8-9) THE ONLY PARTIAL CORRESPONDENCE BETWEEN THE MOST FREQUENTLY USED POC TESTS AND THE CONDITIONS FOR WHICH CLINICIANS WOULD LIKE A POC TEST TO HELP IN DIAGNOSIS AND SUGGEST (PAGE 9, LINES 6-8) THAT THIS REFLECTS ‘AN UNMET CLINICAL NEED FOR A MORE WIDELY ACCESSIBLE RANGE OF POCT...’.

Thank you for the opportunity to clarify. We did not report the results from questions 2, 3 because it was not asked outside the UK. We added “(In the UK version of the survey we also asked a similar question about reducing referrals and monitoring acute conditions – see Appendix VI – however because these questions were not asked in other countries we did not report them in the international survey.)” to our methods section.

ARE THE DATA CONFOUNDED BY COMPARING MOST DESIRED TESTS ONLY FOR DIAGNOSIS WITH USAGE FIGURES FOR DIAGNOSIS, MONITORING AND REDUCING REFERRAL? GLUCOSE MAY WELL BE MORE USED MORE FOR MONITORING THAN FOR DIAGNOSIS. AS THE MOST EXTREME EXAMPLE, IN THE NETHERLANDS 94% OF RESPONDENTS USE PREGNANCY TESTS YET PREGNANCY IS NOT AMONG THEIR TOP 10 CONDITIONS FOR WHICH THEY WANT POC TO MAKE A DIAGNOSIS – IS IT BEING USED TO REDUCE REFERRAL EG FOR SECONDARY AMENORRHOEA?

In the Netherlands the survey did not ask about monitoring or reducing referral. The discrepancy (94% reported usage whereas the test was not listed in the top 10) could be explained by the fact that pregnancy tests are already available. Since they are available, respondents would not have listed pregnancy as a condition for which they desired a test.

IN TABLE 2, SINCE PE AND PE/DVT WERE CHOSEN BY SOME CLINICIANS IN THE NETHERLANDS THE SUMMING OF THE TWO (TO >100%) IS NOT HELPFUL. FOR ALL COUNTRIES IT WOULD BE MORE HELPFUL TO KNOW HOW MANY CLINICIANS WANTED PE AND/OR DVT AND NOT DOUBLE COUNT.

This is a good point. We modified the explanation to say: “*>100% since we combined PE and DVT. This is because some respondents in the Netherlands listed both PE and PE/DVT. In other countries we faced similar problems. Since it was impossible to split PE from DVT when respondents listed PE/DVT as a single condition, we lumped them together.”

CORRECTIONS – TABLE 2, UK PREGNANCY TEST USED BY 06% - SHOULD BE 16%. IN TABLE 2, FOR ALL COUNTRIES EXCEPT AUSTRALIA THE CONDITIONS ARE LISTED IN DECREASING ORDER OF FREQUENCY – SHOULDN'T AUSTRALIA BE ORDERED SIMILARLY?

VERSION 2 – REVIEW

REVIEWER	Melody Ni Imperial College UK
REVIEW RETURNED	20-Jun-2014

GENERAL COMMENTS	Authors' response to my previous comments is satisfactory

REVIEWER	Anne Dawnay University College London NHS Foundation Trust, UK
REVIEW RETURNED	15-Jul-2014

GENERAL COMMENTS	No further comments on this revision.