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

TITLE (PROVISIONAL)	Association between reduced stillbirth rates in England and Wales and regional uptake of accreditation training in customised fetal growth assessment
AUTHORS	Gardosi, Jason; Giddings, Sally; Clifford, Sally; Wood, Lynne; Francis, Andre

VERSION 1 - REVIEW

REVIEWER	Dr Alphonse J Roex, MD PhD Northern Adelaide Local Health Network, Department of Obstetrics and Gynaecology The University of Adelaide Australia, School of Pediatrics and Reproductive Health
REVIEW RETURNED	19-Sep-2013

GENERAL COMMENTS	This is a clinically relevant study. A thorough and detailed analysis of the still birth rates 2007-2012 in 11 health care regions in England and Wales. Clinicians in 3 Trusts in England who succesfully completed a comprehensive GROW training program and continued to apply a dedicated guideline in their antenatal care did contribute to a significant reduction in stillbirth rates. There does not to appear to be another plausibe explanation for this significant downward trend. Please allow me to make 2 additional comments: - page 5/22 line 32 indicated R value of minus 0.77, whilst on page 17/22 line 6 R of plus 0.77 is given. Please correct. - page 9/22 lines 24 and 25: the 3 year moving average (should refer to figure 2 rather than fig 1) ..... with the stillbirth rates 3.91/1000.... etc please add: (Table 2)

REVIEWER	Professor SC Robson Newcastle University UK
REVIEW RETURNED	10-Oct-2013

GENERAL COMMENTS	This is an important topic and the paper provides unique data - I would like to see it published. Two key issues to be addressed; 1. The conclusions are primarily based on 3 year moving averages with trend analysis. My query relates to whether this is appropriate (vs using single year data) to avoid issue of 'double counting' - this is critical given the small number of 'statistically significant' results and the minimal (clinical) differences in SB rate within individual regions. 2. Interpretation & conclusion - I do not agree with the author that training & accreditation can be assumed to be the cause of reduced

	SB rates - nor can they assume that delivery of a training package resulted in implementation of the customised growth assessments in any one unit or region. Changes in fetal monitoring (e.g. umbilical artery Doppler) following 2002 RCOG guideline may have been a factor. In order to draw a cause/effect conclusion the reader needs a lot clearer evidence of implementation rather than simply one-off training. For example can they identify the number of Trusts

REVIEWER	Lesley McCowan University of Auckland New Zealand I co-organise an annual Fetal Growth meeting with Prof Jason Gardosi and communicate with him as necessary if queries arise about our NZ GROW program.
REVIEW RETURNED	18-Oct-2013

GENERAL COMMENTS	This study reports an association between high uptake of training and utilisation of customised growth charts and management guidelines for SGA and reduced stillbirth rates. The paper is written suggesting that this relationship is causal which may be the case but at present cannot be proven. Other as yet unknown factors may be responsible for the observed relationships. I have therefore suggested that the abstract could be more balanced and that the conclusion could be modified to reflect the fact that there is uncertainty as to whether this association is causative This is an audit and formal ethical approval is unlikely to have been required but ethical considerations need to be discussed in the methods. There is a mixture of terminology used in the paper regarding SGA and fetal growth restriction and this terminology should be clarified and defined and be more consistent. Many of the references used are from the Gardosi group and where possible I would recommend incorporating additional supporting literature from other researchers. I have attached a PDF of the paper with specific written comments which I am happy to have shared with the authors if appropriate.

VERSION 1 – AUTHOR RESPONSE

REVIEWER 1 - Alphonse Roex
1. page 5/22 line 32 indicated R value of minus 0.77, whilst on page 17/22 line 6 R of plus 0.77 is given. Please correct.
R: Thank you. It is a positive correlation (of negative slopes) and we have removed the minus on page 5
2. page 9/22 lines 24 and 25: the 3 year moving average (should refer to figure 2 rather than fig 1) ..... with the stillbirth rates 3.91/1000.... etc please add: (Table 2)
R: Corrected
REVIEWER 2 - Steve Robson
1. 3y moving average vs yearly analysis
R: Table 2 and the trend analysis are based on year-on-year data, as are the slopes of stillbirth rates and their correlation with training (Fig 1). Moving averages are commonly used with time series data to smooth out short-term fluctuations in relatively rare outcomes and to highlight longer-term trends. As an example, a relatively small region such as the North East has yearly rates with considerable variation (Table 2), while the 3yma is able to illustrate the downward trend. We have added a note under Methods - Data Analysis on page 4 (line 42) to explain the reason for employing moving averages. However, we have now also added a new Fig 2 which lists yearly rates for the individual high uptake regions and plots high vs low uptake areas.

2. Interpretation and conclusion
R: As described in Methods, the training included a rolling programme including 'training the trainers' and updated protocols, although this was not mandated. The 2002 RCOG recommendation to use Doppler had already been implemented in most units well before the start of our accreditation training in 2008, but our programme re-inforced other recommendations of the RCOG guideline. In some regions this probably constibuted to the drop in stillbirth rates after 2008, as we suggest in the discussion (pages 8/9).
REVIEWER 3 – Lesley McCowan
1. The paper is written suggesting that this relationship is causal which may be the case but at present cannot be proven.
R: See also response to Editor, above. To explore the type of association observed, we have included an examination of Hill's Causality Criteria (page 8 and Table 4)
2. This is an audit and formal ethical approval is unlikely to have been required but ethical considerations need to be discussed in the methods.
R: We included in Methods a note that the ONS data were fully anonymised (page 4, line 39)
3. There is a mixture of terminology used in the paper regarding SGA and fetal growth restriction and this terminology should be clarified and defined and be more consistent.
R: We added a definition for fetal growth restriction - page 6, line 19/20
4. Many of the references used are from the Gardosi group and where possible I would recommend incorporating additional supporting literature from other researchers.
R: Agree- we have added several references from relevant studies, in particular No's 29-31. We are conscious of the number of references used from our preceding work but feel they were needed to explain the local evidence, relevance and rationale for our accreditation training programme.

VERSION 2 – REVIEW

REVIEWER	Professor SC Robson Newcastle University, UK
REVIEW RETURNED	23-Nov-2013

- The reviewer completed the checklist but made no further comments.

REVIEWER	Lesley McCowan University of Auckland
REVIEW RETURNED	15-Nov-2013

GENERAL COMMENTS	The issues which I raised in my previous review have largely been addressed. The authors feel very strongly that the relationship is causative and will be interesting to see readers comments on this.