PEER REVIEW HISTORY

ARTICLE DETAILS

TITLE (PROVISIONAL)	Characteristics of five year olds who catch-up with MMR: findings from the UK Millennium Cohort Study
AUTHORS	Pearce, Anna; Mindlin, Miranda; Cortina Borja, Mario; Bedford, Helen

VERSION 1 - REVIEW

REVIEWER	Dr Gabrielle Laing, Consultant Community Paediatrician, Associate Medical Director, Homerton University Hospital NHS Foundation Trust. London UK. I have no competing interests to declare.
REVIEW RETURNED	22-May-2013

GENERAL COMMENTS	This is a well written and valuable study which demonstrates clearly the characteristics of late MMR immunisers (those immunised between 3 and 5 yrs of age) and those remaining unimmunised at school entry from the Millennium cohort. It is not possible to identify children who may have been immunised in any catch ups over the last 5 years. Although of direct relevance to this years catch up which is targetting 10-16 year old children (some of whom will be in this cohort), it is important to emphasise that given the increase in measles cases and the waning of the "MMR scare", the characteristics of those chosing to catch up now, may be different. The authors make reference to this but it would be helpful to describe as a limitation of the study.

REVIEWER	Dr Meirion Evans Reader in Epidemiology and Public Health Cardiff University Cardiff, UK I have no conflicts of interest.
REVIEW RETURNED	24-May-2013

GENERAL COMMENTS	This paper examines predictors of MMR catch-up in a prospective cohort study of UK born children followed up until 5 years of age. The authors propose that their findings can be used by health professionals to help target efforts to improve MMR coverage. Importance of the subject This paper is very timely in the light of the forthcoming national MMR catch-up programme. Originality There have been very few studies of children who have/have not

	had catch-up MMR immunisations and this is the only one based on a UK-wide cohort. Scientific reliability 1. Research question. This is clearly stated. 2. Study design. The design, a prospective cohort study, is appropriate. The cohort is clearly defined as are the procedures used for data collection. The description of the study follows the STROBE checklist. 3. Study methods. Data on the main outcome measure (MMR catch-up status) is based on self-report of immunisation status by the mother. Have any efforts been made to validate these data e.g. against GP or child health system records? 4. Discussion. The validity of self-reported immunisation status should be discussed as a potential limitation of the study. MMR vaccine coverage data are based on records from the child health system. These include data on children who have entered the UK since birth (providing they have registered with a GP). As this study is based on a birth cohort, its findings only relate to UK-born children and may therefore not be relevant to children who were born abroad. Key messages It is worth highlighting that 'practical barriers' were a particular issue in ethnic minority groups and those who did not speak English at home.

REVIEWER	McIntyre, Peter Royal Alexandra Hospital, National Centre for Immunisation Research
REVIEW RETURNED	31-May-2013

GENERAL COMMENTS	This is a valuable study, which although not showing anything new or unexpected with respect to the divergence between immunisation participation behaviour among those who are less advantaged and have access problems and those who are more advantaged and have persistent concerns, is a strong confirmation of the importance of these characteristics. Given the stated sampling methodology, specifically targeting families of non-English speaking backgrounds, I was notable how few of these families there were. This may be because they had disproportionately been previously immunised - it would be relevant to include in the text or a table information about families who had been immunised and were therefore not considered in this study for comparison. My only criticism is of some aspects of the author's conclusions in the discussion. In particular, I feel they could say more about those families whose children were not immunised for "medical reasons" - are the authors certain that these were concerns of the parents, not shared by their GP versus advice they had been given by the GP who may have been misinformed about contraindications? This is important because it would require a different approach - perhaps the authors have this information.

VERSION 1 – AUTHOR RESPONSE

Reviewer: Dr Gabrielle Laing, Consultant Community Paediatrician, Associate Medical Director, Homerton University Hospital NHS Foundation Trust. London UK.
I have no competing interests to declare.

This is a well written and valuable study which demonstrates clearly the characteristics of late MMR immunisers (those immunised between 3 and 5 yrs of age) and those remaining unimmunised at school entry from the Millennium cohort. It is not possible to identify children who may have been immunised in any catch ups over the last 5 years. Although of direct relevance to this years catch up which is targetting 10-16 year old children (some of whom will be in this cohort), it is important to emphasise that given the increase in measles cases and the waning of the "MMR scare", the characteristics of those chosing to catch up now, may be different. The authors make reference to this but it would be helpful to describe as a limitation of the study.

*We thank the reviewer for these positive comments and agree that the characteristics of families of younger children choosing to catch-up now may be different to those of the MCS (who in our study were catching up by 2006). We have emphasised this further in the article summary (page 4) and the strengths and limitations (page 16)

Reviewer: Dr Meirion Evans
Reader in Epidemiology and Public Health Cardiff University Cardiff, UK I have no conflicts of interest.

This paper examines predictors of MMR catch-up in a prospective cohort study of UK born children followed up until 5 years of age.
The authors propose that their findings can be used by health professionals to help target efforts to improve MMR coverage.

Importance of the subject
This paper is very timely in the light of the forthcoming national MMR catch-up programme.
Originality
There have been very few studies of children who have/have not had catch-up MMR immunisations and this is the only one based on a UK-wide cohort.

Scientific reliability
1. Research question. This is clearly stated.
2. Study design. The design, a prospective cohort study, is appropriate. The cohort is clearly defined as are the procedures used for data collection. The description of the study follows the STROBE checklist.
3. Study methods. Data on the main outcome measure (MMR catch-up status) is based on self-report of immunisation status by the mother. Have any efforts been made to validate these data e.g. against GP or child health system records?

*We thank the reviewer for their positive comments. Unfortunately a validation against GP records/health systems has not been carried out in the MCS and we agree that this is a limitation of the study. We now state this on page 16.

4. Discussion.
The validity of self-reported immunisation status should be discussed as a potential limitation of the study.

*see above response and page 16.

MMR vaccine coverage data are based on records from the child health system. These include data on children who have entered the UK since birth (providing they have registered with a GP). As this study is based on a birth cohort, its findings only relate to UK-born children and may therefore not be relevant to children who were born abroad.

* We thank the reviewer for pointing this out. We now acknowledge this on page 17

Key messages
It is worth highlighting that ‘practical barriers’ were a particular issue in ethnic minority groups and those who did not speak English at home.

*This was indeed the case, although could not been concluded based on the data presented in the paper. We now verbally report this association in the results section on page 15 and also emphasise this in the article summary (page 3).

Reviewer: Peter McIntyre
Royal Alexandra Hospital, National Centre for Immunisation Research
I have no competing interests

This is a valuable study, which although not showing anything new or unexpected with respect to the divergence between immunisation participation behaviour among those who are less advantaged and have access problems and those who are more advantaged and have persistent concerns, is a strong confirmation of the importance of these characteristics. Given the stated sampling methodology, specifically targeting families of non-English speaking backgrounds, I was notable how few of these families there were. This may be because they had disproportionately been previously immunised - it would be relevant to include in the text or a table information about families who had been immunised and were therefore not considered in this study for comparison. My only criticism is of some aspects of the author's conclusions in the discussion. In particular, I feel they could say more about those families whose children were not immunised for "medical reasons" - are the authors certain that these were concerns of the parents, not shared by their GP versus advice they had been given by the GP who may have been misinformed about contraindications? This is important because it would require a different approach - perhaps the authors have this information.

*we thank the reviewer for their positive comments and have taken on board their suggestions.

*The characteristics of the children who were fully immunised at age three have been reported in an earlier paper (before information on catch-up up had been collected). We now summarise the characteristics of these immunised children and point readers to this paper (page 7).

*We were able to look at the presence of longstanding illness in children who were not immunised for medical reasons and none of the conditions appeared to be true contraindications. We now report this on pages 18-19. Unfortunately it is not possible to identify from the parents’ reports whether it was a health professional’s or parent’s own opinion that there was a medical reason for refusing immunisation.