

PEER REVIEW HISTORY

BMJ Paediatrics Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

This paper was submitted to a another journal from Archives of Disease in Childhood but declined for publication following peer review. The authors addressed the reviewers' comments and submitted the revised paper to BMJ Paediatrics Open. The paper was subsequently accepted for publication at BMJ Paediatrics Open.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Responses of Paediatric Emergency Departments to the First Wave of the CoVID-19 pandemic in Europe: a cross sectional survey study.
AUTHORS	Rose, Katy Bressan, Silvia Honeyford, Kate Bognar, Zsolt Buonsenso, Danilo Da Dalt, Liviana De, Tisham Farrugia, Ruth parri, niccolo Oostenbrink, Rianne Maconochie, Ian Moll, Henriette Roland, Damian Titomanlio, Luigi Nijman, Ruud

VERSION 1 – REVIEW

REVIEWER	Reviewer name: Javier Benito Institution and Country: Hospital de Cruces, Division of Pediatric Emergency Medicine Competing interests: 08-Jun-2021
REVIEW RETURNED	
GENERAL COMMENTS	<p>Thank you for the opportunity to review this manuscript entitled "Understanding the response of Paediatric Emergency Departments to the First Wave of the CoVID-19 pandemic in Europe: a cross sectional survey study"</p> <p>This is an interesting and well-written study that attempts to assess the impact of the first wave of the COVID-19 pandemic on the organization of services provided by Pediatric Emergency Departments (PED) in Europe. I believe it is a timely and relevant study due to the exceptional epidemiological situation experienced, the special characteristics of COVID-19 in children and the different impact of the COVID-19 pandemic on health services that care for children. Although we know that the number of episodes seen in the PEDs has fallen drastically during the pandemic and the changes in the diagnostic profile of the patients seen during this time, there is little information on the possible changes that these circumstances have caused in the organization of health care for acutely ill children.</p> <p>In this cross sectional survey study, the authors using an on-line</p>

	<p>questionnaire find that the situation created by the COVID-19 pandemic has not led to appreciable changes in the organization or delivery of services in the 38 European PEDs participating in the survey. In my opinion this study add knowledge on the subject although there are some aspects that should be commented or clarified.</p> <p>MAJOR CONCERNS</p> <p>My main concern is whether in reality the sample of participating hospitals is truly representative of the totality of European hospitals and therefore whether the results of this survey accurately reflect the impact of the COVID-19 pandemic on the organization of care provided in European PEDs. It is likely that many PEDs of first and second level hospitals were closed for the care of children in order to increase the supply of care to adult patients.</p> <p>On the other hand, I miss that the survey did not explore the possible changes in the internal organization of the PEDs included in the study, caused by the decrease in the number of visits and the need to maintain two separate patient streams. It is possible that there have been changes in the provision of human and material resources, especially in those hospitals that are not exclusively pediatric. I believe that if these aspects had been included, the conclusions of the study might have been somewhat different.</p> <p>OTHER COMMENTS</p> <p>I believe it is necessary to explain in greater detail how the hospitals that participated in the study were recruited, such as the number and characteristics of the hospitals to which the survey was sent. I believe that this is important to know the representativeness of the participating centers.</p> <p>It would be important to know the number of episodes usually attended by each PED and the percentage reduction during the pandemic period.</p> <p>The results section does not mention possible changes in some of the treatments administered in the emergency department. The last question of the questionnaire addresses this aspect.</p> <p>The first sentence of the discussion states that the results of the study show minimal changes "in provision of care in PEDs across Europe during the first wave of the COVID-19 pandemic". I think they should replace "in PEDs across Europe "with "in these European PEDs"</p> <p>Page 13, line 25. authors say: "burden of disease in the USA was greater necessitating a larger degree of staff". On the other hand, the survey does not ask in detail about possible changes in the number of PED staff.</p> <p>Page 13, line 44. authors say: "However, it was surprising that the demands on adult services did not impact the paediatric service provision in the study more". I think that the survey does not provide enough information to state this.</p> <p>Page 13, line 60, page 14, lines 3,4. Limitations paragraph: authors say "However, the majority of sites were not receiving diverted paediatric patients from regional hospitals which suggests that major restructuring was not being experienced more widely" I think that taking into account the questions included in the survey, it is difficult to make this statement. Families could have attended directly at the participating PEDs without being diverted from smaller hospitals.</p>
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	Tables and figure are suitable
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VERSION 1 – AUTHOR RESPONSE

VERSION 2 – REVIEW

REVIEWER	Reviewer name: Dr. Peter Flom Institution and Country: Peter Flom Consulting, United States Competing interests: NOne
REVIEW RETURNED	01-Sep-2021

GENERAL COMMENTS	<p>I confine my remarks to statistical aspects of this paper. I think a much better method is possible, so I marked "major revision" but the current analysis is not really wrong, just sub-optimal.</p> <p>Given that the dependent variable (or outcome) is either a count or a proportion, the authors could use either a count regression model (probably negative binomial regression) or beta regression on the proportion. These would allow inclusion of covariates (some good ones are in table 1) and would match the setup better as the authors are investigating whether the count is related to COVID severity.</p> <p>Another issue is whether counting all the changes equally is sensible. I can't really comment on whether it is or not, as that is a substantive question, but, one better way of dealing with it might be factor analysis.</p> <p>*More mundane matters*</p> <p>p. 7 line 1 - Please don't use Excel for analysis. One problem here is that it is hard to record what was done. (Unlike R where you can save the program). Excel isn't really a great data analysis tool.</p> <p>p. 10 line 48 Insert "significant" between "no" and "relationship"</p> <p>The figures weren't numbered, but what looks like fig. 3 (changes compared to peak cum. incidence) is not a good graph. Dual axis graphs are misleading, and a scatterplot would be much better here.</p> <p>Supp fig 1 This would probably be better as a mosaic plot.</p> <p>Peter Flom</p>
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REVIEWER	Reviewer name: Dr. Abdullah E. Laher Institution and Country: University of the Witwatersrand Faculty of Health Sciences, South Africa Competing interests: None
REVIEW RETURNED	24-Sep-2021

GENERAL COMMENTS	<p>Thank you for the opportunity to review this manuscript entitled: "Understanding the response of Paediatric Emergency Departments to the First Wave of the CoVID-19 pandemic in Europe: a cross sectional survey study"</p> <p>Overall, the manuscript is generally well written. The authors have evaluated the effect that COVID-19 had on the organization and delivery of services across European PEDs during the first COVID-19 wave. I have no major comments.</p> <p>Minor comment: The authors may want to emphasize at the outset that due to the</p>
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	fact that COVID-19 related morbidity and mortality was minimal among the paediatric population, major changes to PED services were not expected. Perhaps the authors could also suggest that if the paediatric population is also spared in future waves, staff and resources could be redeployed to adult services if the need arises.
REVIEWER	Reviewer name: Dr. Luis Rajmil Institution and Country: Homer 22 1st 1, Barcelona, 08023, Spain Competing interests: None
REVIEW RETURNED	17-Sep-2021
GENERAL COMMENTS	<p>The study analyzes the response of Pediatric Emergency Departments (PED) to the first wave of the CoVID-19 pandemic in Europe by means of a cross sectional survey to 39 hospitals of 17 European countries</p> <p>The study is well presented. However, it seems that some factors that may be important in terms of the use of pediatric emergency services have not been analyzed or have not been taken into account in depth, and perhaps may have had an important influence on the changes during the first wave of the pandemic:</p> <p>1- PEDs represent only a part of the pediatric care system. The type of healthcare system and primary care in each participating country / region, public spending on health, may play an important role on the access, equity and use of services, and mainly the PED. Access to these services and the flow of pediatric patients could be very different even if all countries have universal access. No aspect of these factors is discussed and they are only mentioned superficially in the limitations of the study.</p> <p>2- As expressed in the intro (refs 9-13), one of the most important aspects that changed during the first wave of the pandemic was the decrease in consultations for other reasons. This aspect should perhaps be analyzed (eg: number of PED pre and during the pandemic or comparing with previous years if it would be possible), and its possible influence on the changes. I have not found a central point on this aspect.</p> <p>3- According to the main results presented, a multivariate analysis could be carried out taking into account the factors included in the study and other factors, such as those mentioned above, that could influence changes in PED.</p> <p>Minor changes</p> <p>4- Who answered the questionnaires? Were they responsible for the PED or any available pediatrician?. Although it can be found at the other EPISODE study publication it could be interesting to know the characteristics of respondents and to include it in the analysis</p> <p>5- Are there data on the validity and reliability of the administered questionnaires?</p>

VERSION 2 – AUTHOR RESPONSE

Dear Dr. Shu-Ling Chong and Prof. Imti Choonara

RE: bmjpo-2021-001269 - "Understanding the response of Paediatric Emergency Departments to the First Wave of the CoVID-19 pandemic in Europe: a cross sectional survey study."

Thank you for considering our paper for publication. The authors would first like to express our thanks to all the reviewers for their considerable efforts and thoughtful opinions around our piece. We hope to have addressed concerns adequately in the following and throughout changes within the manuscript.

For editorial ease we have chosen to address each point in turn and trust this to be a useful format. Line numbers refer to the clean resubmission document.

Many thanks

Dr Katy Rose on behalf of the authors

Formatting Amendments (where applicable):

Supplementary file / Appendix - Please be informed that this should be in PDF Format.

This is now complete.

Title delete "Understanding the response" and replace with "Responses"

We have done this throughout

Reviewer: 1

Given that the dependent variable (or outcome) is either a count or a proportion, the authors could use either a count regression model (probably negative binomial regression) or beta regression on the proportion. These would allow inclusion of covariates (some good ones are in table 1) and would match the setup better as the authors are investigating whether the count is related to COVID severity. Another issue is whether counting all the changes equally is sensible. I can't really comment on whether it is or not, as that is a substantive question, but, one better way of dealing with it might be factor analysis.

We agree completely with the reviewer, we were hesitant as to whether to include a model, because, as you point out, counting all changes as equal may not be sensible. We deem the paper to be substantively a descriptive piece, with a clear narrative commenting on the responses made in paediatric emergency departments, and not a detailed quantitative analysis, and as such the survey was not designed with this in mind. However, we agree that a negative binomial model is more appropriate, Poisson was rejected as you anticipated because of over-dispersion, and allows for us to adjust the model for relevant factors which may confound the association. We have modified the Methods, Results and Discussion as shown below.

Methods – Analysis: p. 6 Lines 39 – 42 to p7. Line 1 -8

Results - Changes and Burden of Covid – 19: p.10 Line 28 - 35

Discussion: p. 10 Lines 40 - 43 and p. 11 Lines 11 - 14

p. 7 line 1 - Please don't use Excel for analysis. One problem here is that it is hard to record what was done. (Unlike R where you can save the program). Excel isn't really a great data analysis tool.

All analysis has now been completed in R. p7 Line 9

p. 10 line 48 Insert "significant" between "no" and "relationship"

This paragraph has been restructured as part of the changes to the Results section as above.

The figures weren't numbered, but what looks like fig. 3 (changes compared to peak cum. incidence) is not a good graph. Dual axis graphs are misleading, and a scatterplot would be much better here.

We apologise that figures were not clearly labelled. We had presumed they would pull across with the titles assigned in the file names. The reviewer had assumed correctly. The authors feel that it is useful for readers from specific countries to be able to identify the rates of change in their own country or similar countries but understand that dual axis graphs are confusing. We have chosen to replace the figure as suggested with a scatter plot but retain the other in the supplementary files.

Supp fig 1 This would probably be better as a mosaic plot.

Having considered different plot options, and given that this essentially demonstrates the simple result that there was almost no change to the provision of consultant care or on responsible speciality the authors believe the initial plot is of a style will be more familiar to readers, however we have added an explanatory footnote.

Reviewer: 2
Dr. Luis Rajmil

The study is well presented. However, it seems that some factors that may be important in terms of the use of pediatric emergency services have not been analyzed or have not been taken into account in depth, and perhaps may have had an important influence on the changes during the first wave of the pandemic:

1- PEDs represent only a part of the pediatric care system. The type of healthcare system and primary care in each participating country / region, public spending on health, may play an important role on the access, equity and use of services, and mainly the PED. Access to these services and the flow of pediatric patients could be very different even if all countries have universal access. No aspect of these factors is discussed and they are only mentioned superficially in the limitations of the study.

Thank you for this very important comment; the complexity of health care systems beyond the ED is of course crucial to what occurs within it. We highlight that though this study focussed on the experiences within the PED it does not detract from the importance of exploring the rest of paediatric health care pathways. This has been further highlighted in rephrasing within our introduction (p. 5 lines 25 – 27). We did indeed report on changes to flow from primary care during the pandemic, in terms of changes in referral pathways. It is possible that changes in other parts of the system may have ‘protected’ ED from changes. We have expanded our commentary on this further in the discussion. P.11 Line 36 – 45 and p.12 line 1 - 6)

2- As expressed in the intro (refs 9-13), one of the most important aspects that changed during the first wave of the pandemic was the decrease in consultations for other reasons. This aspect should perhaps be analyzed (eg: number of PED pre and during the pandemic or comparing with previous years if it would be possible), and its possible influence on the changes. I have not found a central point on this aspect.

This manuscript sits alongside a large piece of work looking at the wider epidemiology of paediatric presentations during covid. To combine all of this work in one piece risks missing key learning from smaller elements of work. Multiple papers are under submission with extensive analysis of the known fall in numbers. This work is highlighted in the final paragraph of this discussion (p12 lines 30 – 33)

The survey, and resulting paper, looked specifically at the changes brought into effect by the health system in response to the pandemic, and not in response to changes in numbers of attendances. This is important work which will be the focus of additional exploration by the EPISODE study group. Here we were interested in whether changes in attendances/consultations seen in other studies, and our own work, could be explained by ED responses, or more associated with other factors. In this sense, we do not consider the reduction in consultations as a central point of this paper. We believe the discussion explores this well but we have expanded this paragraph slightly to highlight this (p.11 line 36 – 41)

3- According to the main results presented, a multivariate analysis could be carried out taking into account the factors included in the study and other factors, such as those mentioned above, that could influence changes in PED.

We have now included a multiple negative binomial regression to allow us to adjust for important potential confounders. We described this in more detail above in our response to Reviewer 1.

Minor changes

4- Who answered the questionnaires? Were they responsible for the PED or any available pediatrician?. Although it can be found at the other EPISODE study publication it could be interesting to know the characteristics of respondents and to include it in the analysis

We feel this is a valid point and have expanded our description within our methods (Lines 133-146)

5- Are there data on the validity and reliability of the administered questionnaires?

Our survey was designed specifically for the study and has not been externally validated as such. However, as we have described in our Survey Development section, it was built around similar existing surveys such as that of Bressen et al 2020, in an iterative manner by the study team, clinical experts and the EPISODE Steering Committee. The final version of the survey was then piloted by the EPISODES Steering Committee members, and further refined before it was disseminated to all participating sites. In addition the survey includes questions on objective variables that are not subject to interpretation, thus enhancing the reliability of the responses. Follow up online discussions took place where survey results were complex, contradictory or required clarification for any other reason.

See Methods – Survey Development: p6

Reviewer: 3

Minor comment:

The authors may want to emphasize at the outset that due to the fact that COVID-19 related morbidity and mortality was minimal among the paediatric population, major changes to PED services were not expected. Perhaps the authors could also suggest that if the paediatric population is also spared in future waves, staff and resources could be redeployed to adult services if the need arises.

Many thanks for your encouraging words. We highlighted the low acute impact of COVID-19 on paediatric patients within our opening paragraph (p. 5 line 5 - 13) and mention this again in the discussion (p. 11 lines 11 – 14). The thoughts towards redeployment in future are poignant and we have included these within our discussion (p.12 lines 3 – 6) and conclusion (p.12 40 – 42).

VERSION 3 – REVIEW

REVIEWER	Reviewer name: Dr. Peter Flom Institution and Country: Peter Flom Consulting, United States Competing interests: None
REVIEW RETURNED	29-Oct-2021

GENERAL COMMENTS	The authors have addressed my concerns and I now recommend publication. Peter Flom
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REVIEWER	Reviewer name: Dr. Abdullah E. Laher Institution and Country: University of the Witwatersrand Faculty of Health Sciences, South Africa Competing interests: None
REVIEW RETURNED	11-Nov-2021

GENERAL COMMENTS	The authors have appropriately attended to the reviewers comments.
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VERSION 3 – AUTHOR RESPONSE