

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Cross-sectional study of the hospital management of adult patients with a suspected seizure (EPIC2)
AUTHORS	Dickson, Jon; Dudhill, Hannah; Shewan, Jane; mason, suzanne; Grünewald, Richard; Reuber, Markus

VERSION 1 - REVIEW

REVIEWER	Fabrice Dami Lausanne University Hospital, Switzerland Emergency Department
REVIEW RETURNED	25-Jan-2017

GENERAL COMMENTS	<p>Thank you for giving me the opportunity to review this manuscript. It is a very interesting topic, mainly because of volume of patients it concerns for EDs</p> <p>General comments:</p> <p>It is not clear enough for the readers that you finally study only one month of suspected seizure patients arriving to your ED, and that you study in details only 82 patients.</p> <p>Also: you included 91 patients transported to your ED, but most of your article is about the 82 patients with suspected seizure treated in your ED. It is often unclear when you mention percentages if they are related to the 91 or 82 patients. Especially in the abstract</p> <p>It is not clear what are today's official recommendations of Emergency medicine and neurology societies for the care of those patients in the ED. This should be mentioned to compare of your handling in your ED. Otherwise, mentioning patients do not receive enough specialized care is just based on your opinion which is not relevant.</p> <p>Specific comments:</p> <p>Abstract:</p> <p>Design: you must be clear it is a retrospective study (same in the Methods section)</p> <p>Result: start mentioning that out of the 178 patients, there were only 91 cases transported to the ED that were analyzed once exclusion criteria applied.</p> <p>Line 24: your percentages 2.4, 19.5 and 69.5 are related to the 82 patients and not to the 91: this is not clear. Also, this does not make a 100% total....</p> <p>Line 26: the percentage 74.7 is related to the 91 patients? But just before we were talking about the 82...not clear</p> <p>Line 28: explain AED (first time used)</p> <p>Line 28: 18.8% of what number??</p> <p>Line 28: 63.4 discharged from ED and 31.7 admitted....not equal to 100%. The self discharged are missing I suppose. And percentage of what group are we talking?? Always the same question....:)</p> <p>Conclusion: I believe this paper "provides" and not "has provided"...</p>
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Line 37: you mention costs: this is not the topic of your study. You have no information neither collected info on that topic. You should therefore not mention costs in your abstract.

Line 38 to 41: do not mention costs. Stay put with your data

Strengths and limitations

Line 8: you can delete "relatively": it is a very small sample. The size of your sample is a major limit to this study (only 82 patients finally studied in details)

Line 8: it would of course have been feasible to have more patients, but that just means more work. Saying it is not feasible is false.

Line 20-22: you believe your data are of international interest. Well, it is your belief...but again, you analyzed only 82 patients...so....

Another limit should be mentioned: Only one author worked on the compilation of all patients' files. This is a major limit (no second look by independent doctor).

Introduction

Line 7: you mention that epilepsy leads to unnecessary care. Do you have references to support that?

Line 10: you mention EMS is often called for epileptic patients and that those patients do not require emergency care. This should be explained by the fact 911 most of the time does not know the patient having seizure is epileptic

Line 23: you mention specialist should urgently review those patients: what specialists? ED specialist? Neurologist? Not sure all epileptic patients having seizure need to see urgently a neurologist...

Line 27: seizure free: what is the length you are talking about? What is the standard?

Methods

Line 55: Mention clearly at this time you only worked one a one month period

Page 5 : line 25 to 40: all exclusion criteria visible on figure 1 (on every step) should be clearly mentioned

Line 45: define ILAE as it is the first time you mention it

Results:

Line 16: the reason you chose the month of May should figure in Methods and not in Results

Line 17: you mention exclusions: which one? What criteria?

Line 30: if male percentage is mentioned, it is no use to mention the female percentage (and vice-versa)

Line 45: the total of 2.4 + 69.5 + 19.5 does not equal 100....as in the abstract...to be explained

Line 50-51: 61 + 14 does not equal 80. Explain

Page 7

Line 3 to 10: most percentages are different from those in the abstract. Normal?

Line 53: what is a "qualified doctor"? It should be defined

Page 8

Line 13: (52/82) this is not 63.4% of all patients transported to the ED. They were 91.

Line 25: define AED if used for the first time

Line 56: it would be interesting to list the 9 medications given by paramedics and the access used (IV, IM, IN)

Page 9:

Line 7 to 16: here you use the total patient of 91. Why not the 82?

Discussion

Line 28: I would not use the word "accurately" ...a bit presumptuous?

Line 31: "could benefit from urgent review": based on what recommendation?

	<p>Line 32: "Despite clear clinical need for specialist review": based on what recommendation?</p> <p>Line 37: here it is ok to mention costs, but you need to add references to prove your saying</p> <p>Line 42: to the lack of confidence, I would add the lack of medical responsibility for paramedics to leave patients on site</p> <p>Line 57: "further recurrence». On short term? Other?</p> <p>Page 10</p> <p>Line 8-9: define NASH and NHS if used for the first time</p> <p>Line 20: where does those 79 patients come from?</p> <p>Line 29: "suboptimal rates of referral": what is the norm? established by?</p> <p>Line 33 to 38: it is quite contradictory: emergency call for seizure is an opportunity to try to improve seizure free periods, but at the same time most of those patients do not require to go to the ED. This needs to be reformulated I believe.</p> <p>Figure 1: define A&E</p> <p>Figure 2: define the high, normal, low values. Give explanations (short) on the SHEWS score which may not be known by your readers, even if mentioned in the text. What is a worrying SHEWS score for example?</p> <p>Figure 4: In patients diagnoses: you mention 27/132, but it should be 27 /91 (or 83)</p> <p>Figure 4: the color used are a problem when document is printed in black and white. Many of your future readers will read black and white copy of your text. You should use other colors so it is readable on black and white.</p>
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REVIEWER	<p>Leone Ridsdale King's College London Institute of Psychiatry, Psychology & Neuroscience Department of Basic & Clinical Neuroscience (PO Box 57) Rm A1.09, Academic Neuroscience Centre, Denmark Hill, London, SE5 8AF.</p>
REVIEW RETURNED	27-Jan-2017

GENERAL COMMENTS	<p>I think this is an interesting and important health services evaluation.</p> <p>Here are some comments:</p> <ol style="list-style-type: none"> 1. Page 4, line 22 – 23 'active epilepsy should trigger urgent specialist review to prevent further seizures'. I think this is rather a strong statement, there are a lot of people having seizures in the community, in fact about 30 or 40% of people with epilepsy and they represent 1% of the population - that is the total number of people with epilepsy. So it would be a big demand to place on either GPs or specialists to be getting reviews. Having said this clearly it would be better if poorly controlled epilepsy when the patient hadn't seen a specialist recently probably should be referred. 2. Again page 4, line 34 it says that approximately 1 in 5 patients are unnecessarily having seizures. This is a bit of a sort of open ended sentence and perhaps reads rather unclearly or strongly. 3. Page 6. In the past medical history of the patients on line 40 it says that 43.9% had a history of a seizure disorder and 36.6% had a history of epilepsy. I am not sure what the distinction is here, if both of these represent epilepsy it might be better to say so and put them
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together.

4. Again on page 7, line 7 -8 it says that in the opinion of the ED clinician 28% had an epileptic seizure with a history of recurrent seizures but without an established diagnosis of epilepsy. This is a bit confusing, I wondered whether some of these had alcohol problems although alcohol problems are mentioned in the next paragraph – I am not sure if it is possible to clarify this either here or in the discussion.

5. On the same page 7, line 29 the authors say which proportion of the patients were referred to an epilepsy clinic and that 1 was referred to an epilepsy nurse and that 36.5% had no documented referral. I think some of this could be brought up more, and more clearly in the discussion. It may be that in most areas people might be followed in a neurology clinic rather than an epilepsy clinic, but that there is scope for the expansion of nurse specialists. In a study done by Noble et al., which is cited in the references it was found that the history of the patient being followed by the nurse specialist was associated with earlier discharge from hospital. The suggestion is that if there was more nurse specialist capacity patients might be discharged earlier or be followed up by nurse specialists, and this is a useful point I think to make in publications.

6. Again on page 8 they say that there is only one epilepsy clinic in the city on line 14. Again in many areas it will be that these people are followed up by a neurologist and not necessarily at a sub-specialist epilepsy clinic. So I think although this may be the specifics of this area in turning to the discussion one might be a little bit more generic.

7. Page 9, line 8 again it said that only 30.8% had a diagnosis of epilepsy and this leads to this question around what recurrent seizures mean if they aren't epilepsy which perhaps could be clarified more. If it couldn't be clarified from the notes then perhaps this issue of records needs to be made more clearly. It has been suggested in the past that people with epilepsy need to have med alerts or shared information between the GP and hospital and perhaps shared information with the ambulance service, and this might alleviate this problem.

8. Page 9, in the discussion line 43, there is something about the paramedics lacking confidence and that leading to people being brought to the hospital, there is a study by Ridsdale et al in *Epilepsy & Behaviour* which suggests that lack of confidence amongst patients, their carers and general public also leads to these ambulance calls. So it is a combination of the patients and the paramedics that leads to hospital attendance.

Explanations given by people with epilepsy for using emergency medical services: a qualitative study Ridsdale, L., Viridi, C., Noble, A. & Morgan, M. 2012. *Epilepsy & Behavior*. 25, 4, p. 529-533.

9. We return to the issue of alcohol and so on on page 10, there are in most district hospital alcohol nurses and it seems to me there is scope for collaboration between the nurses that treat those with alcohol and seizures and the epilepsy nurse or neurologist. Some of the patients clearly have epilepsy that is made worse by alcohol and some people have more DTs. But there is not much joint working at the present time or referral that is appropriate.

	<p>10. Again on page 10 there is a mention of specialist epilepsy services when perhaps it could be neurology services. I can see that sometimes people say this because they want to include psychiatrists who have an interest in epilepsy however I think it is a bit confusing if we recommend that everyone with epilepsy sees a specialist in epilepsy, when a general neurologist should be able to manage this and indeed there is not the capacity for a neurologist with a special interest in epilepsy to see all people with epilepsy.</p> <p>11. Comment with regard to the figures and tables. I think a lot of this information in the nice coloured pictures particularly; let's start on figure 3 is said in the words and I think it may be cheaper not to have the coloured pictures. I am not absolutely sure what the journal's view of this is.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer(s)' Comments to Author:

Reviewer: 1
Dami, Fabrice
University Hospital Lausanne, Emergency Department

Please leave your comments for the authors below

Thank you for giving me the opportunity to review this manuscript. It is a very interesting topic, mainly because of volume of patients it concerns for EDs. **Thanks for taking the time to review the manuscript and for making such positive and helpful suggestions. We have addressed each of your comments. We have added notes below in red.**

General comments:

It is not clear enough for the readers that you finally study only one month of suspected seizure patients arriving to your ED, and that you study in details only 82 patients. **We have amended the abstract to make this clear.**

Also: you included 91 patients transported to your ED, but most of your article is about the 82 patients with suspected seizure treated in your ED. It is often unclear when you mention percentages if they are related to the 91 or 82 patients. Especially in the abstract. **We have amended the abstract to make this clear.**

It is not clear what are today's official recommendations of Emergency medicine and neurology societies for the care of those patients in the ED. This should be mentioned to compare of your handling in your ED. Otherwise, mentioning patients do not receive enough specialized care is just based on your opinion which is not relevant. **We have added a citation to the UK's National Institute for Clinical Excellence (NICE) guidelines which state that people with epilepsy with a recent suspected seizure '...should be seen urgently by a specialist. This is to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs'. They define a specialist as 'a medical practitioner with training and expertise in epilepsy'. They also say that patients "...presenting to an Accident and Emergency department following a suspected seizure should be screened initially. This should be done by an adult or paediatric physician with onward referral to a specialist when an epileptic seizure is suspected or there is diagnostic doubt".**

Specific comments:

Abstract:

Design: you must be clear it is a retrospective study (same in the Methods section). **We have made the retrospective design clear in the abstract (and Methods).**

Result: start mentioning that out of the 178 patients, there were only 91 cases transported to the ED that were analyzed once exclusion criteria applied. **We have amended the abstract so that this is clear now. Figure 1 plus Paragraphs 1 and 2 of the Results also make this clear.**

Line 24: your percentages 2.4, 19.5 and 69.5 are related to the 82 patients and not to the 91: this is not clear. Also, this does not make a 100% total.... **We have added the numerator and denominator in the abstract. We think that this is clear now (it is also made clear in the main Results section).**

Line 26: the percentage 74.7 is related to the 91 patients? But just before we were talking about the 82...not clear **We have added the numerator and denominator in the abstract so that this is clear now.**

Line 28: explain AED (first time used). **To keep the abstract focussed and within the word limit we have removed this sentence.**

Line 28: 18.8% of what number?? **To keep the abstract focussed and within the word limit we have removed this sentence.**

Line 28: 63.4 discharged from ED and 31.7 admitted....not equal to 100%. The self discharged are missing I suppose. And percentage of what group are we talking?? Always the same question....) **We have added the numerator and denominator in the abstract so that this is clear now (it is also made clear in the main Results section).**

Conclusion: I believe this paper "provides" and not "has provided"... **We have corrected this.**

Line 37: you mention costs: this is not the topic of your study. You have no information neither collected info on that topic. You should therefore not mention costs in your abstract. **We have removed any mention of costs in the abstract.**

Line 38 to 41: do not mention costs. Stay put with your data. **We have removed any mention of costs in the abstract.**

Strengths and limitations

Line 8: you can delete "relatively": it is a very small sample. The size of your sample is a major limit to this study (only 82 patients finally studied in details). **We have changed this as suggested.**

Line 8: it would of course have been feasible to have more patients, but that just means more work. Saying it is not feasible is false. **Yes, we have changed this as suggested.**

Line 20-22: you believe your data are of international interest. Well, it is your belief...but again, you analyzed only 82 patients...so....**We have deleted the phrase international interest and combined the remainder of that sentence with the first sentence in this section.**

Another limit should be mentioned: Only one author worked on the compilation of all patients' files. This is a major limit (no second look by independent doctor). **Yes, we have changed this as suggested.**

PS Immediately prior to resubmission the abstract of the final unmarked version of the manuscript needed to be edited to fit within the word limit. There are therefore minor discrepancies between the marked and unmarked versions of the revised manuscript but they are just minor and stylistic. Sorry for any inconvenience.

Introduction

Line 7: you mention that epilepsy leads to unnecessary care. Do you have references to support that? **Yes, there is a large literature on the relationship between good quality scheduled care and potentially avoidable, or unnecessary, emergency care. We have added a citation to Manjunath 2012, which shows that poorly controlled epilepsy results in higher emergency health care utilisation.**

Line 10: you mention EMS is often called for epileptic patients and that those patients do not require emergency care. This should be explained by the fact 911 most of the time does not know the patient

having seizure is epileptic. Yes, there is often quite a lot of uncertainty about the diagnosis when the telephone call handler makes the decision. In the UK the number is 999 (not 911) and specialised call handlers, but not paramedics, answer the phone. We have added the following text to the beginning of the third sentence of the first paragraph of the introduction: "Calls are rapidly triaged by specialised call handlers, an emergency response vehicle is usually dispatched ..."

Line 23: you mention specialist should urgently review those patients: what specialists? ED specialist? Neurologist? Not sure all epileptic patients having seizure need to see urgently a neurologist... Yes, we have removed the phrase 'specialist review' and replaced it with 'medical review' to reflect this point. However, we feel that contacting EMS after a seizure is often a reflection of sub-optimal epilepsy care and that many of these patients would benefit from specialist review by which we mean a member of a neurology team such as a neurologist, a physician with a special interest in epilepsy or an epilepsy specialist nurse. We agree that this is not necessary for all patients but at the moment too many patients with epilepsy do not have their diagnosis and treatment reviewed after a seizure and this means that the chance to prevent a future seizure is lost.

Line 27: seizure free: what is the length you are talking about? What is the standard? We have added (≥ 12 months) to reflect the standard definition and the one used in the papers cited.

Methods

Line 55: Mention clearly at this time you only worked on a one month period. Done. We added: "We analysed data from a sample month (May 2012)."

Page 5 : line 25 to 40: all exclusion criteria visible on figure 1 (on every step) should be clearly mentioned. We have already done this in paragraphs 1-2 of the Results in the section headed 'Case Ascertainment, Exclusions and Missing Data'. In response to your comment, we have moved this section into the Methods as you suggested.

Line 45: define ILAE as it is the first time you mention it. Done.

Results:

Line 16: the reason you chose the month of May should figure in Methods and not in Results. Done (this whole section has been moved to the results after one of your earlier comments).

Line 17: you mention exclusions: which one? What criteria? These are specified in the legend of Figure 1. I have added "see Figure 1" to the text to direct the reader to this.

Line 30: if male percentage is mentioned, it is no use to mention the female percentage (and vice-versa). I have removed the female percentage.

Line 45: the total of 2.4 + 69.5 + 19.5 does not equal 100...as in the abstract...to be explained. Thanks for pointing this out. The missing 7 incidents were: 6 'status not clear from the notes' and 1 missing data point. We have amended the Results to include the 6 whose status was not clear. And we have added the following to clarify how we handled missing data specifically variables where just a very small number of data points were missing: "Where there was missing data it was coded as such in SPSS. Variables with large numbers of missing data points were excluded from the analysis and are not reported in the Results. Small numbers of missing data points in specific variables are not reported in the Results."

Line 50-51: 61 + 14 does not equal 80. Explain. There were 5 missing data points. As above, we have added the following sentence to the Methods which now covers this issue: "Where there was missing data it was coded as such in SPSS. Variables with large numbers of missing data points were excluded from the analysis and are not reported in the Results. Small numbers of missing data points in specific variables are not reported in the Results."

Page 7

Line 3 to 10: most percentages are different from those in the abstract. Normal? We had initially presented data in the abstract which drew from different stages in the care pathway (A&E, inpatient, best available including epilepsy clinic). The care pathway is complex so we agree that this might seem confusing to the reader (especially if he/she hasn't read the whole paper). We have simplified

the abstract so that it is easier to read and so that it makes sense even if the reader hasn't read the full paper in detail. The abstract's Results section, now only contains data on the best available aetiological explanation for the seizure and data from ED. And we hope it is now clear when we are referring to each of these.

Line 53: what is a "qualified doctor"? It should be defined. We have deleted the phrase 'qualified doctor' and replaced it with 'historical diagnosis' which is defined in the Definitions section of the Methods.

Page 8

Line 13: (52/82) this is not 63.4% of all patients transported to the ED. They were 91. Yes, you're right. We meant to say 'patients with a suspected seizure transported to the ED'. This is 52/82 (63.4%). We have changed the text.

Line 25: define AED if used for the first time. Done.

Line 56: it would be interesting to list the medications given by paramedics and the access used (IV, IM, IN). The pre-hospital management of these patients, including medication for the emergency treatment of status epilepticus, was covered in EPIC1, and is described in the detail there. This is an edited extract from that paper: "Of the cohort of 132 pre-hospital incidents, 11/132 (8.3%) had emergency drugs to terminate the seizure. In 3/11 drugs (clobazam and midazolam) were administered by a carer prior to arrival of the ambulance clinicians (none of these patient received a second dose). In 8/132 cases, emergency treatment was administered by an ambulance clinician. In total, 6/132 received a single drug (4 intravenous diazepam, 2 PR diazepam), and 2/132 received two drugs (1 intravenous diazepam twice, 1 PR diazepam followed by intravenous diazepam)."

JM Dickson, LH Taylor, J Shewan, T Baldwin, RA Grünwald, M Reuber A Cross-Sectional Study of the Clinical Characteristics and Pre-hospital Management of Patients With a Suspected Seizure (EPIC1) *BMJ Open* 2016;6:e010573 doi:10.1136/bmjopen-2015-010573

Page 9:

Line 7 to 16: here you use the total patient of 91. Why not the 82? As per Figure 1, there were 91 patients who were transported to our hospital for whom medical records were available. Of these 8/91 were given a non-seizure diagnosis leaving 83 (the non-seizure diagnoses are listed in the legend of Figure 1). 82/83 were transported to A&E (1/83 was taken direct to an in-patient ward). So when we are looking at ALL patients we use the denominator of 91 to include the non-seizure diagnoses. But sometimes, earlier in the manuscript, we focus on patients with seizure diagnoses and use the denominator of 83 (or 82 if just looking at A&E patients). Sorry that this is complex, but it reflects the complexity of the actual care pathway of the patients in the study which we have tried to present at accurately and simply as possible.

Discussion

Line 28: I would not use the word "accurately" ...a bit presumptuous? **Accurately has been deleted.**

Line 31: "could benefit from urgent review": based on what recommendation? Line 32: "Despite clear clinical need for specialist review": based on what recommendation? To address both of these points I have rewritten paragraph 1 of the Discussion. I have removed the phrase 'clear clinical need for specialist review' but added a citation to the UK NICE (National Institute of Clinical Excellence) Guidance which states "adults presenting with a suspected seizure [should be] seen by a specialist in the diagnosis and management of he epilepsies within 2 weeks of presentation".

Line 37: here it is ok to mention costs, but you need to add references to prove your saying. We have added the citation to Manjunath 2012 that we mentioned earlier in this document.

Line 42: to the lack of confidence, I would add the lack of medical responsibility for paramedics to leave patients on site. You're right, this is an important point. I have added "and medicolegal concerns" to this paragraph.

Line 57: "further recurrence». On short term? Other? Yes, we have changed this to short-term recurrence.

Page 10

Line 8-9: define NASH and NHS if used for the first time. **Done.**

Line 20: where does those 79 patients come from? **This is referring to the 79 patients rather than the 83 incidents. 4/79 (5.1%) patients generated two incidents during the one-month study period (as stated in the first paragraph of the Results).**

Line 29: "suboptimal rates of referral": what is the norm? established by? **I have added a citation to the NICE guidance as per earlier comments.**

Line 33 to 38: it is quite contradictory: emergency call for seizure is an opportunity to try to improve seizure free periods, but at the same time most of those patients do not require to go to the ED. This needs to be reformulated I believe. **Sorry this was confusing. We intended to say that although many of these patients do not require emergency treatment, they would benefit from urgent specialist epilepsy care (within the next few weeks) to optimise their treatment. We have clarified this in the manuscript now.**

Figures

Figure 1: define A&E **Done.**

Figure 2: define the high, normal, low values. **Done.** Give explanations (short) on the SHEWS score which may not be known by your readers, even if mentioned in the text. What is a worrying SHEWS score for example? **Done.**

Figure 4: In-patients diagnoses: you mention 27/132, but it should be 27 /91 (or 83). **Yes, it should be 83. We have changed it to 83 – thanks.**

Figure 4: the color used are a problem when document is printed in black and white. Many of your future readers will read black and white copy of your text. You should use other colors so it is readable on black and white. **We agree that it will be difficult to interpret the figures if printed in black and white. We have tried to find a scheme which just uses black and white but because of the multiple categories within the pie charts we found this impossible. One of the benefits of BMJ Open is that we think the paper, if published, will largely be accessed online or by PDF file which will mean most of the time most of our authors will have the benefit of colour figures. We'd be happy to reconsider this or discuss the figures with the production team to optimise them as much as possible. But we feel that the current format is the best way to present our data.**

Reviewer: 2

Ridsdale, Leone

King's College London, Department of Basic and Clinical Neuroscience, Institute of Psychiatry,
Psychology & Neuroscience

Please leave your comments for the authors below

I think this is an interesting and important health services evaluation. **Thanks for taking the time to review the manuscript and more making such positive and helpful suggestions. We have addressed each of your comments. We have added notes below in red.**

Here are some comments:

1. Page 4, line 22 – 23 'active epilepsy should trigger urgent specialist review to prevent further seizures'. I think this is rather a strong statement, there are a lot of people having seizures in the community, in fact about 30 or 40% of people with epilepsy and they represent 1% of the population - that is the total number of people with epilepsy. So it would be a big demand to place on either GPs or specialists to be getting reviews. Having said this clearly it would be better if poorly controlled epilepsy when the patient hadn't seen a specialist recently probably should be referred. **Yes, that is a good point. We have changed line 22-23 (first line of paragraph 2 of the introduction) to: "An epileptic seizure may be the result of sub-optimal treatment and should lead to consideration of whether specialist review is required. But this opportunity to prevent further seizures and/or to refine the patients emergency care plan is often missed".**

2. Again page 4, line 34 it says that approximately 1 in 5 patients are unnecessarily having seizures. This is a bit of a sort of open ended sentence and perhaps reads rather unclearly or strongly. **Yes, DITTO. We have changed that sentence to read: "This means that as many as one-in-five patients with epilepsy may be unnecessarily having seizures."**

3. Page 6. In the past medical history of the patients on line 40 it says that 43.9% had a history of a seizure disorder and 36.6% had a history of epilepsy. I am not sure what the distinction is here, if both of these represent epilepsy it might be better to say so and put them together. **Of the 43.9% (36/82) of patients with a 'seizure disorder', 36.6% (30/82) had epilepsy, 6.1% (5/82) had psychogenic non-epileptic seizures (PNES), and 1.2% (1/82) had epilepsy plus PNES. I hope that makes sense.**

4. Again on page 7, line 7 -8 it says that in the opinion of the ED clinician 28% had an epileptic seizure with a history of recurrent seizures but without an established diagnosis of epilepsy. This is a bit confusing, I wondered whether some of these had alcohol problems although alcohol problems are mentioned in the next paragraph – I am not sure if it is possible to clarify this either here or in the discussion. **In this sentence we wished to highlight the high prevalence of patients attending ED with recurrent seizures, which in the opinion of the ED doctor were likely to be epileptic, but where the patient had never been formally diagnosed with epilepsy. When we look at the same issue using a denominator of 91 i.e. the whole cohort, we find that 20.9% (19/91) had recurrent seizures which are likely to be epileptic but where the patient had never been diagnosed with epilepsy. We agree that alcohol may be significant factor in this group and this is raised in the Discussion section headed "Non-Compliance, Alcohol and Difficult to Reach Groups". I hope that makes sense and is clear.**

5. On the same page 7, line 29 the authors say which proportion of the patients were referred to an epilepsy clinic and that 1 was referred to an epilepsy nurse and that 36.5% had no documented referral. I think some of this could be brought up more, and more clearly in the discussion. It may be that in most areas people might be followed in a neurology clinic rather than an epilepsy clinic, but that there is scope for the expansion of nurse specialists. In a study done by Noble et al., which is cited in the references it was found that the history of the patient being followed by the nurse specialist was associated with earlier discharge from hospital. The suggestion is that if there was more nurse specialist capacity patients might be discharged earlier or be followed up by nurse specialists, and this is a useful point I think to make in publications. **Yes, we agree. We have added the following to the end of the section in the Discussion titled Demographics, Re-Attendance and Specialist Review: "Follow-up by specialist epilepsy nurses has been shown to be associated with earlier discharge from hospital [Noble et al]. Expansion of the specialist nurse role may be a solution**

to problems with lack of capacity in some consultant-led services.” We have addressed the issue of neurology clinic vs epilepsy clinic below in point (6).

6. Again on page 8 they say that there is only one epilepsy clinic in the city on line 14. Again in many areas it will be that these people are followed up by a neurologist and not necessarily at a sub-specialist epilepsy clinic. So I think although this may be the specifics of this area in turning to the discussion one might be a little bit more generic. Yes, that’s a good point. Our local hospital has three consultant neurologists with a specialism in epilepsy and a large integrated specialist nurse service. And you’re right that in many areas such a service does not exist. I think that there is a tension between the level of specialism specified by NICE for people with epilepsy and what is actually provided throughout the NHS. The NICE guideline states that people with epilepsy or with a recent suspected seizure ‘...should be seen urgently by a specialist. This is to ensure precise and early diagnosis and initiation of therapy as appropriate to their needs’. They define a specialist as ‘a medical practitioner with training and expertise in epilepsy’. They also say that patients “...presenting to an Accident and Emergency department following a suspected seizure should be screened initially. This should be done by an adult or paediatric physician with onward referral to a specialist when an epileptic seizure is suspected or there is diagnostic doubt”.

We have changed the conclusion (main body and abstract) from ‘a specialised epilepsy service’ which we acknowledge may not exist in some areas to ‘an epilepsy specialist’ which is what NICE stipulates.

7. Page 9, line 8 again it said that only 30.8% had a diagnosis of epilepsy and this leads to this question around what recurrent seizures mean if they aren’t epilepsy which perhaps could be clarified more. If it couldn’t be clarified from the notes then perhaps this issue of records needs to be made more clearly. It has been suggested in the past that people with epilepsy need to have med alerts or shared information between the GP and hospital and perhaps shared information with the ambulance service, and this might alleviate this problem. Thanks, yes. It may at least in part be a reflection of poor record keeping but combining all the data sources allowed us to get a good sense of whether the patient had previously been diagnosed with epilepsy. Our data show that a significant proportion of patients in our cohort, seem to be having regular epileptic seizures, without ever formally having received a diagnosis and therefore presumably the benefit of an epilepsy specialist and epilepsy treatments.

We have modified the manuscript in response to your comment with the following additional text in the Methods, we have discussed this in the Discussion section “Non-Compliance, Alcohol and Difficult to Reach Groups” plus we have added an extra sentence in the Discussion about records.

“This allowed triangulation of the data, which allowed resolution of inconsistencies between, for example, accounts in the ED notes and in the epilepsy clinic notes, and it allowed us to draw robust conclusions about the best available aetiological explanation for the index event. If the best available aetiological explanation for the suspected seizure was an epileptic seizure it allowed us to determine if the patient had a historical diagnosis of epilepsy.”

8. Page 9, in the discussion line 43, there is something about the paramedics lacking confidence and that leading to people being brought to the hospital, there is a study by Ridsdale et al in *Epilepsy & Behaviour* which suggests that lack of confidence amongst patients, their carers and general public also leads to these ambulance calls. So it is a combination of the patients and the paramedics that leads to hospital attendance. Explanations given by people with epilepsy for using emergency medical services: a qualitative study Ridsdale, L., Viridi, C., Noble, A. & Morgan, M. 2012. *Epilepsy & Behavior*. 25, 4, p. 529-533. Yes, I agree. We have added the Ridsdale et al citation and changed those sentences so that they read as follows: “These results are consistent with qualitative data suggesting that major factors in deciding to call for an emergency ambulance and transporting patients to hospital after a suspected seizure are lack of confidence, and medico-legal concerns, amongst patients, carers, the public and paramedics rather than true clinical need”.

9. We return to the issue of alcohol and so on on page 10, there are in most district hospital alcohol nurses and it seems to me there is scope for collaboration between the nurses that treat those with alcohol and seizures and the epilepsy nurse or neurologist. Some of the patients clearly have epilepsy that is made worse by alcohol and some people have more DTs. But there is not much joint working at the present time or referral that is appropriate. **Yes, good idea. We have added the following sentence to the end of that paragraph: "Hospital-based alcohol nurses and ambulance-service alcohol referral pathways may be able to intervene in these cases and facilitate joint working between epilepsy services and alcohol services. "**

10. Again on page 10 there is a mention of specialist epilepsy services when perhaps it could be neurology services. I can see that sometimes people say this because they want to include psychiatrists who have an interest in epilepsy however I think it is a bit confusing if we recommend that everyone with epilepsy sees a specialist in epilepsy, when a general neurologist should be able to manage this and indeed there is not the capacity for a neurologist with a special interest in epilepsy to see all people with epilepsy. **We have removed all mention of specialist epilepsy services and replaced it with epilepsy specialist as per point 6 above.**

11. Comment with regard to the figures and tables. I think a lot of this information in the nice coloured pictures particularly; let's start on figure 3 is said in the words and I think it may be cheaper not to have the coloured pictures. I am not absolutely sure what the journal's view of this is. **One of the benefits of BMJ Open is that we think the paper, if published, will largely be accessed online or by PDF file which will mean that the journal and authors do not need to consider print costs. We agree that much of the data in the figures is in the text but we think that it is helpful to have a visual summary of the data for people who do not have time to read the full text. Plus it acts as a nice way of simplifying/summarising the data to accompany the text. We feel that Figure 3 in particular acts as a easily accessible summary of one of the main results of the paper. We would also like to keep Figure 4 in the main text (but perhaps this could be moved to additional online content if the Editor feels that it is too complex). We'd be happy to reconsider this or discuss the figures with the production team to optimise them as much as possible. But we feel that the current format is the best way to present our data.**

PS Immediately prior to resubmission the abstract of the final unmarked version of the manuscript needed to be edited to fit within the word limit. There are therefore minor discrepancies between the marked and unmarked versions of the revised manuscript but they are just minor and stylistic. Sorry for any inconvenience.

VERSION 2 – REVIEW

REVIEWER	Fabrice Dami Lausanne University Hospital, Switzerland
REVIEW RETURNED	17-Mar-2017

GENERAL COMMENTS	<p>thank you for this revision. The paper is way easier to understand I believe</p> <p>I have two minors comments:</p> <p>page 9 line 35 (first paragraph of the Discussion): you mention patients could benefit form an "urgent review by an epilepsy specialist". This is confusing: readers may believe those patients need to see a specialist immediately or at least the same day, while you probably mean they should see a specialist within the next few days as you wrote in your answer to the reviewers. I strongly suggest you change the "urgent review" by "a review in the next few days"</p> <p>Table 2: the color are now really confusing: 3 legends have the same color and 2 others share the same one: you should either</p>
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	reduce the number of legends or have a different color for each
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REVIEWER	Leone Ridsdale Institute of Psychiatry, Psychology and Neuroscience, Kings College London
REVIEW RETURNED	29-Mar-2017

GENERAL COMMENTS	<p>Two small points remain.</p> <p>(A) 19 patients did not have a historical epilepsy diagnosis. I think we should say diagnosis confirmed in the data sources examined. I dare say the GP records would have amplified information and reduced the number in this category.</p> <p>(B) There is a proper emphasis on the number without follow-up provided. However I would not say follow-up in an epilepsy clinic. Neurologists might push back saying there are not enough epileptologists, and with reason. It would be better to say follow-up by a specialist, be it a neurologist or a super-specialist. I agree that everyone with difficult to control epilepsy should have access to a specialist. But if we insist on a super-specialist then this will be more difficult due to capacity issues. All neurologists should be able to manage epilepsy. They need to step-up to providing this. Only by doing this as diabetologists have will GPs get more advice on how to manage epilepsy and perhaps mortality will be reduced too.</p>
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VERSION 2 – AUTHOR RESPONSE

Reviewer: 1
Fabrice Dami
Institution and Country, Lausanne University Hospital, Switzerland

thank you for this revision. The paper is way easier to understand I believe. **Thanks, yes your comments were very helpful and I'm very pleased with the current version.**

I have two minors comments:

page 9 line 35 (first paragraph of the Discussion): you mention patients could benefit form an "urgent review by an epilepsy specialist". This is confusing: readers may believe those patients need to see a specialist immediately or at least the same day, while you probably mean they should see a specialist within the next few days as you wrote in your answer to the reviewers. I strongly suggest you change the "urgent review" by "a review in the next few days". **Done. We have changed the text as you suggested.**

Figure 2: the color are now really confusing: 3 legends have the same color and 2 others share the same one: you should either reduce the number of legends or have a different color for each. **Done.**

Reviewer: 2
Leone Ridsdale
Institute of Psychiatry, Psychology and Neuroscience, Kings College London

Two small points remain.
(A) 19 patients did not have a historical epilepsy diagnosis. I think we should say diagnosis confirmed in the data sources examined. I dare say the GP records would have amplified information and reduced the number in this category. **Done. We have changed the text as you suggested.**

(B) There is a proper emphasis on the number without follow-up provided. However I would not say follow-up in an epilepsy clinic. Neurologists might push back saying there are not enough epileptologists, and with reason. It would be better to say follow-up by a specialist, be it a neurologist or a super-specialist. I agree that everyone with difficult to control epilepsy should have access to a specialist. But if we insist on a super-specialist then this will be more difficult due to capacity issues. All neurologists should be able to manage epilepsy. They need to step-up to providing this. Only by doing this as diabetologists have will GPs get more advice on how to manage epilepsy and perhaps mortality will be reduced too. **Done. Yes, we agree with this.**