Author's response to reviews

Title: Changing epidemiology patterns of deliberate self poisoning in rural Sri Lanka

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Version: 3 Date: 25 April 2012

Author's response to reviews: see over
Submission of revised manuscript: 1965686604628096– Changing epidemiology patterns of deliberate self poisoning in rural Sri Lanka

Thank you for your valuable comments to our above article and those were useful to strengthen the focus of it. We have done necessary changes to the manuscript to address reviewers’ comments and detailed responses for each comment is given below.

In this paper we present the epidemiology and changing pattern of poisoning in a rural Sri Lankan district. But these findings can be generalised to other rural districts in Sri Lanka and to similar settings of other developing countries with agriculture based economy. We believe these findings to be important because they would suggest that interventional studies in primary prevention and harm minimization could be done in feasible short time frames in relatively small areas.

The data collection for this study in the peripheral and referral hospitals was done in two observational cohorts using the similar data collection methodology. This data collection was funded within a RCT targeted hospital staff only and therefore had no effect on the community or incidence of poisoning. We have clarified this both in our attached response to the reviewers comments and also in the revised manuscript. We believe that the revised manuscript describes that main point clearly.

Thanking You,

Lalith Senarathna
Reviewer 01

Reviewer's report

Title: Changing epidemiology patterns of deliberate self poisoning in rural Sri Lanka

Version: 2 Date: 13 January 2012

Reviewer: Ruchi Bhandari

Major compulsory revision

1. Methods: Biases and confounders have neither been identified nor controlled for in the paper.

   This is an observational study which collected data from a rural area’s referral hospital and peripheral hospitals. During the study design and conduct, we identified possible avenues for biases and took precautions to minimize those.

   1. There could be misclassification bias in case a poisoned patient is recorded with different diagnosis or other patient is wrongly entered as poisoned patient. We cross checked the list of all poisoned patients with the admission record book in each hospital ward to make sure that there are no misclassification bias

   We have explained this in the data collection section in the methodology. “The patient records were compared to the admission log books in each hospital to ensure no patients were missed or wrongly diagnosed during data collection.

2. Data was collected retrospectively by trained data extractors from peripheral hospitals patient notes with data collection occurring on average every 3 weeks. In the peripheral hospital data concerning exposure was recorded in the notes by the treating doctor. At the referral hospitals data was collected prospectively by medically qualified research assistants who directly interviewed the patient. Approximately 80% of patients initially presented to peripheral hospitals and 20% to the referral hospital, subsequently 75% of patients were transferred from the peripheral hospital to the referral hospital. In this situation, ascertainment bias, misclassification bias can occur during data collection. In addition to that, confounding factors such as the level of training and skills of research assistants (data collector), quality of the patient records and the time and the duration of can effect to the results. To minimize those potential biases and to control the confounding factors, we used following procedure.

   Used a structured data collection form for all hospitals.
   In every hospital – both peripheral and referral - hospital admission books were checked against individual patient records to minimize record errors and misclassifications
   The duration for this study was selected as 17 months to minimize seasonal variations. The agricultural pattern of this area – and in many rural parts of the country – consist of two main seasons per years.
As 75% of patients were transferred from peripheral hospitals to the referral hospital we were able to compare the peripheral hospital record of exposure with the data collected in the referral hospital. The level of agreement was 89% for pesticides, 97% for medicine and 98% for oleander.

We have changed the manuscript in the methodology section to explain this (pages 4 & 5) and added further to the limitation section of the discussion (Page 12).

3. Our data collection was limited to hospitals, and poisoned patients who were not admitted to hospitals or poisoning deaths which happened outside hospitals could create bias. But the Sri Lankan health care network is well established and there is a hospital for every 3-4 villages and the community response to poisoning is very high. Therefore almost every poisoning incident ended up in a hospital despite the severity. According to previous research and observations, there are very few poisoning deaths occurring outside hospitals. Any deaths – due to any condition - outside hospitals are recorded in Police Stations and in the Coroner’s Office. We conducted a record check in these two locations for the study duration and there were no deaths by poisoning reported outside the hospitals.

We have added to the methods “Coroners and police records where checked in the study district for any cases of out of hospital deaths from poisoning that may have occurred during the study period.” and the results to make this clearer”. Page 5

And also added to the limitation section of the discussion “As we found no evidence of out of hospital deaths from poisoning in coroner or police records it seems likely that most severe cases present to hospital. It is possible that less severe poisonings may not present to hospital and that our population estimates for poisoning may be an underestimate.” Page 13

Results:

2. Page 6: “The annual population incidence for the adult population (above age 15 years) in this area was 447/100,000 while the population incidence for females was slightly higher than males (458 Vs 430/100,000).” Is this the incidence for all ages above 15 years or the age group of 15-19 years?

This is the incidence for all ages above 15. The sentences was changed as follows

“The annual population incidence for the adult population (above age 15 years) in this area was 447/100,000 while the population incidence for females in the same age group was slightly higher than males (458 Vs 430/100,000).” Page 5 &6
Figure 1 on page 19 shows that the incidence for females in age-group 15-19 is 1226 per 100,000. That should bring the overall incidence for females much higher than 458.

We disagree with the reviewer’s comment. The distribution of female poisoned patients in our data shows that approximately 35% (698/1858) of the total admissions are in 15-19 age group (Table 1), while only 14% of the total female population in the district is within that 5 years group. That results in a higher population incidence for 15 to 19 years aged female group. Comparatively, the distribution of female poisoning incidence drops sharply after the age 30 while there are no similar differences in the distribution of the female population across age groups in this district (See the table below). Thus the incidence of poisoning for older age groups is lower than in the youngest age group resulting in an average population incidence of poisoning of 458 for the general female population.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number of Males</th>
<th>Population</th>
<th>Population Incidence Per 100,000</th>
<th>Number of Females</th>
<th>Population</th>
<th>Population Incidence Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>282</td>
<td>42,803</td>
<td>465.06</td>
<td>698</td>
<td>40,173</td>
<td>1226.45</td>
</tr>
<tr>
<td>20-29</td>
<td>626</td>
<td>74,628</td>
<td>592.11</td>
<td>738</td>
<td>74,010</td>
<td>703.88</td>
</tr>
<tr>
<td>30-39</td>
<td>357</td>
<td>65079</td>
<td>387.22</td>
<td>250</td>
<td>61519</td>
<td>286.86</td>
</tr>
<tr>
<td>40-49</td>
<td>306</td>
<td>55728</td>
<td>387.60</td>
<td>109</td>
<td>52532</td>
<td>146.47</td>
</tr>
<tr>
<td>50-59</td>
<td>169</td>
<td>32556</td>
<td>366.43</td>
<td>41</td>
<td>30716</td>
<td>94.22</td>
</tr>
<tr>
<td>&gt;60</td>
<td>73</td>
<td>26422</td>
<td>195.02</td>
<td>22</td>
<td>27006</td>
<td>57.50</td>
</tr>
<tr>
<td>Total</td>
<td>1813</td>
<td>297,216</td>
<td>430.58</td>
<td>1858</td>
<td>285,956</td>
<td>458.65</td>
</tr>
</tbody>
</table>

We did not change the manuscript on this comment

3. Table 4: What is “Mortality (95% CI)”? Mortality data are actual data from the hospital patients from the entire hospital patient population in Anuradhapura district. Since the 95% CI has been provided for these mortality rates, authors should specify what larger population they are referring to in this estimation.

We agree that the mortality rate for the district using the entire hospital patient population and so have deleted the confidence intervals from Table 4.

Minor essential revision

4. Title:
Since the study does not cover the whole rural Sri Lanka, but only a district in Sri Lanka, the title may read: Changing epidemiologic patterns of deliberate self poisoning in a rural district of Sri Lanka.

We agree and have change the title to “Changing epidemiologic patterns of deliberate self poisoning in a rural district of Sri Lanka”.
Although this study setting is one rural district, the agricultural patterns, health care network and socio-economic status are similar to other rural areas in the country. Therefore we believe the epidemiological data from this study is generalisable to other rural areas of the country.

The following sentence was added to the discussion section “The agricultural patterns, health care network and socio-economic status in this district are similar to other rural areas in the country. This is more evident due to the smaller size of the country – Sri Lanka is a small country with 65610 square kilometers. Therefore we believe the epidemiological data from this study is generalizable to other rural areas of the country. And also, it is likely to be generalizable to other developing countries areas that are primarily agriculturally based.” Page 13.

5. Methods:
Page 4: “The data collection from all consecutive poisoned patients admitted into the study hospitals was started on September 2008 and continued up to January 2010.” What is the rationale for choosing this period? Since the study period was 17 months and not a whole year (1, 2 or 3), seasonal influences may affect the incidence and mortality rates.

The study period of 17 months was decided based on the available funding. But this duration is long enough to include all seasonal variations (wet and dry). In addition as all of these areas are irrigated this minimizes seasonal impact on variation in agriculture practices and by extension variation in pesticide use as this is dictated by the type of agriculture. The predominant agriculture in this region is paddy rice and domestic vegetables. With the availability of water and a paddy growing season that lasts within 3-4 months, rice is grown year round.

Therefore we believe that 17 months is long enough to examine any seasonal variations in patterns of poisoning.

This is already explained as a limitation in the discussion section (page 12). The relevant section of the discussion was strengthened by adding following sentences. “As all of these areas are irrigated this minimizes seasonal impact on variation in agriculture practices and by extension variation in pesticide use which is dictated by the type of agriculture. The predominant agriculture in this region is paddy rice and domestic vegetables. With the availability of water and a paddy growing season that lasts within 3-4 months, rice is grown year round”. Page 12.

Results
6. Page 6: “For the age group of 10 – 14 years, the estimated annual incidence was 60.9/100,000 for males and 147.7/100,000 for females.” Since data were not available for 10 and 11 year old children, how was the incidence estimated for them?
Based upon our peripheral hospital data, admission of patients less than 12 years of age is rare. Extrapolating this data to the referral hospital suggested that we would have missed 3 patients (See the table below). It showed that the incidence in children aged 10 and 11 years is very low and these few cases would not substantially change the estimate for the 10-14 year age group. Our estimation of the population incidence for 10-14 age groups was based on the above assumption.

<table>
<thead>
<tr>
<th></th>
<th>Age 10 -11 Yrs</th>
<th>Age 12 – 13 Yrs</th>
<th>Age 14 Yrs</th>
<th>Total</th>
<th>10-11/Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripheral Hosital</td>
<td>14</td>
<td>43</td>
<td>54</td>
<td>111</td>
<td>12.6%</td>
</tr>
<tr>
<td>Referral Hosital</td>
<td>NA</td>
<td>9</td>
<td>14</td>
<td>23</td>
<td></td>
</tr>
</tbody>
</table>

We re-considered our assumption after the reviewers’ comments and altered the estimation as follows. The population data for this district is available for 5 year age groups and population for the age group 10-14 years is available. We assumed that the distribution of population is approximately equal for ages in this group. Based on the assumption, we estimated the population for age group 12-14 (age 12, 13 & 14) using 10 – 14 group data. We used this estimated population data to calculate the population incidence for age group 12 – 14.

These new population incidences were added to the results section (page 6) and explained as a limitation in the discussion section. “In the referral hospital data was only collected for patients who were 12 years or above. The population data from the Department of Statistics are only available in five year age groups and has population for 10 – 14 year age group. The lack of complete poisoning data from children aged 10 and 11 years meant we could not calculate an exact population incidence for the 10 – 14 years age group. As there was a high incidence in 15–19 year age group it was important to make an estimate of incidence in the 12-14 year age group as this would be valuable in planning the timing of delivery of public health interventions. As there is population data for the 10-14 year age groups, we assumed that these populations are evenly distributed in all ages and used an estimated population for the calculation of population incidence 12 to 14 year age group.” - Page 12.

7. Page 6: “There were 21 patient records found without age and excluded from age related comparisons.” Were these 21 patients similar to or different from the rest of the patients in other characteristics?

These 21 patients represent 0.6% of the total population in this study. Despite the small numbers, we compared the characteristics of these 21 patients with the rest of the group. There were 12 males and 9 females and there were 2 op and carbamate patients, 6 other pesticide patients, 4 medicine patients, 1 oleander patient and 8 patients with other poison types. These proportions are not different from the main dataset therefore the exclusion of these 21 patients doesn’t create bias to the data analysis.
The following sentence was added to the results section of the manuscript “This group had similar characteristics to the rest of the study population.” Page 7

8. Table 1 gives n = 1849 + 1943 = 3792 Table 3 gives n = 704 + 77 + 783 + 785 + 392 + 1050 = 3791. So, there is discrepancy of 1 person.

We thank for pointing this out and the discrepancy in Table 3 has been corrected. The total number is 3792.

9. There is also a discrepancy in the numbers in Tables 2 and 3. Table 2 has n for pesticides as 1560 but Table 3 has n for pesticides as 1564 (=704+77+783).

We thank for pointing this out and the discrepancy in Table 2 has now been corrected.

In this correction process, we changed the total number of pesticide poisoning patients in Table 2 as 1572 (1564+8). This is including 8 patients (2 op & carbamate and other poison types) who were excluded from Table 3 due to the unavailability of age data. Please see the response for reviewers’ comment number 7.

There are 21 patients without age data and represent 0.6% of the total population in this study. Despite the small numbers, we compared the characteristics of these 21 patients with the rest of the group. There were 12 males and 9 females and there were 2 op and carbamate patients, 6 other pesticide patients, 4 medicine patients, 1 oleander patient and 8 patients with other poison types.

Discretionary revision

10. Background: Page 2: Since the aim of this paper is to “identify the changing patterns and epidemiology of poisoning” in rural Sri Lankan district, it might help to show these patterns for the rest of Sri Lanka (as a country, what is the poisoning trend for the last few years?). If data are not available for Sri Lanka, you may wish to include these patterns for other developing countries.

Government statistics exist that describe hospital admissions for poisoning in whole country. However because of a number of methodological issues which include poor exposure categorization and double counting of hospital transfer. These statistics and estimations have significant inaccuracies. Our recent work has studies this situation extensively (L Senarathna, NA Buckley, SF Jayamanna, PJ Kelly, MJ Dibley & AH Dawson. Validity of referral hospitals for the toxicovigilance of acute poisoning in Sri Lanka. Bulletin of the World Health Organization- In Press).
There are limitations of using data from other developing countries. The availability of accurate data is the main issue. For an example, data from India is under represented considering that self poisoning is illegal and punishable. Similarly, many other developing countries in the region do not have relevant statistics for poisoning due to the unavailability of proper data collection or monitoring mechanisms.

We did not change the manuscript based on this comment

11. Methods: Page 3: “This study was conducted as a part of a cluster randomised controlled trial (ISRCTN73983810) of a brief educational intervention in all peripheral hospitals.” The paper does not give any information about the intervention and its impact. The intervention may have changed the incidence and mortality rate. It would help to know briefly about the intervention and how it may have impacted the results.

This cluster RCT delivered a brief educational intervention to hospital staff members to promote adherence to poisoning treatment guidelines. The intervention had no components related to the community that would have altered the incidence of poisoning events. Furthermore, the effects of the educational intervention if successful on mortality would likely be small and not have a substantial impact on the estimates of mortality reported in this paper.

In response to this comment we have made changes in the manuscript. An extra sentence was added to the results section “The observational patient data collection in this study was conducted as a part of a cluster randomized controlled trial (ISRCTN73983810) of a brief educational intervention promoting poisoning treatment guidelines to hospital staff members. As this intervention was not directed to the community or patients it would not influence the incidence of poisoning”. (pages 3& 4).

Following sentence was also added to the discussion section – as a limitation of the study “The observational data collected on patients was collected in the context a cluster RCT of brief educational interventions to hospital staff members to promote adherence to poisoning treatment guidelines. As the RCT had no components directed to the community there would be no expected effect on the incidence of poisoning in the community. The effects of the educational intervention if successful on mortality would likely be small and not have a substantial impact on the estimates of mortality reported in this paper.” Page 11.

Results

12. The only demographic data available are age and gender. Since this is part of a randomized control trial, would there be data available on SES (e.g., education, income, or employment)?
These data are not available. The RCT was designed to assess the treatment behavior of hospital staff and was not focused on the patient demographic data. The observation data from patients were collected as a measure of staff treatments.

We used only the observational data from the RCT by extracting information from patient records and did not have access to the socio-demographic and economic characteristics of this population.

We did not change the manuscript based on this comment.

13. It would be useful to know what was the average length of time for a patient to be in the hospital (maybe separately for peripheral and secondary hospitals, and also separately for the different poison categories).

The duration of stay in the hospital is beyond the scope of this paper. As 75% of patients in the peripheral hospital are transferred the length of stay is skewed. In Sri Lanka length of stay is not purely dependent upon poisoning severity. Without a proper mechanism of psychiatric referrals, some patients stay longer in the hospital waiting for psychiatric counseling. In addition to that there other reasons like waiting for re-transferring to peripheral hospital are common. Therefore, it is difficult to determine whether the length of hospital stay is due to poisoning or due to other socio-psychological reasons.

We did not change the manuscript based on this comment.

14. It would help to know the data for sale of medicines (especially, paracetamol) and pesticides in the area (Anuradhapura district)?

These data are not available. The sales data of pesticides are commercial and confidential. Paracetamol and most of other drugs are over the counter and not based on prescriptions. Therefore retrieving sales data is not possible.

We did not change the manuscript based on this comment.

Discussion

15. Page 9: Mostly all comparisons of the results are with developed countries. It would help to compare with other developing countries.

We appreciate the reviewer’s comment but it is difficult to find reports to compare with our results because data about poisoning events from other developing countries are not available or are under reported, or focus on specific toxins.
The population incidence data of acute poisoning is also not available for developing countries. Although the population incidences are given for suicide or self harm, those figures include not only poisoning, but also other methods such as hanging, burning etc.

While Sri Lanka is economically a developing country, the Sri Lankan healthcare indicators are comparable to those of developed countries. So in this context the comparisons are appropriate.

We did not change the manuscript based on this comment.

16. It is difficult to assess the generalizability of the study results – within the country and in other countries.

The agricultural pattern, socio-economical status and population distribution data of this district is similar to other rural districts in the country. This is more evident due to the smaller size of the country – Sri Lanka is a small country with 65610 square kilometers. It is likely to be generalizable to other developing countries areas that are primarily agriculturally based. Certainly other countries similar data on pesticide exposures suggest that this is the case.

We changed the discussion section to further explain this as follows “The agricultural patterns, health care network and socio-economic status in this district are similar to other rural areas in the country. This is more evident due to the smaller size of the country – Sri Lanka is a small country with 65610 square kilometers. Therefore we believe the epidemiological data from this study is generalizable to other rural areas of the country. And also, it is likely to be generalizable to other developing countries areas that are primarily agriculturally based.” Page 13.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests: I declare that I have no competing interests.
Reviewer 2

Review: Changing epidemiology patterns of deliberate self poisoning in rural Sri Lanka

The authors have highlighted an issue that could be of great importance to public health in Sri Lanka, but it is not clearly articulated in the article. The narrative for those individuals under 30 years of age and for females seems to be the core story, but it is perpetually lost in the paper. With a clear and focused narrative supported by a lucid description of the data, data structures, and processes, this would be a much stronger paper.

*We agree with the reviewer that poisoning is an important public health issue in Sri Lanka and we have strengthened the paper to make the key findings clearer by changes to the manuscript in response to the reviewer’s specific comments that follow.*

Major Compulsory Revisions:
1. Combining data sets is not an uncommon practice, but the rationale for bringing together the observational and randomize trial (RT) data was unclear.

*As described above:*  
*Although one set of data was collected as a part of randomised controlled trial, it contained only the observational data which are not related to the outcome of the trial. Therefore only observational data involved in this combination.*

*The RCT aimed to see if a simple education intervention could improve adherence with treatment protocols. To examine this question we had to collect information about the poisoning cases being treated. It is this data that we have used in this observational epidemiological study.*

*We changed the methodology section to explain this further “The observational patient data collection in this study was conducted as a part of a cluster randomized controlled trial (ISRCTN73983810) of a brief educational intervention promoting poisoning treatment guidelines to hospital staff members. As this intervention was not directed to the community or patients, it would not influence the incidence of poisoning.” page 3 & 4.*

a. A clear description of both data sources is needed in terms of how the data was collected, a nice descriptive table comparing the variables used from each data source (important since it is being used for statistical testing), and a clear description of the independent unit of observation. Since multiple data sources are being used for description and analysis in this
paper, a clear and succinct description of the data within the text itself would be highly recommended.

*The independent unit of observation is individual poisoned patient in this study. Details of individual patients were extracted from records and consisted of age and gender details, ingested poison type, assessment and treatment details and hospital outcome.*

*Both data sources contained observational data as described above and the procedures used for data collection are similar. Structured data collection forms were used to extract data from records in peripheral hospitals and the similar forms were used to collect data from records in referral hospitals. Therefore the difference between datasets is minimum.*

*In both settings (peripheral and referral hospitals), collected data were cross-checked with the hospital admission records. This ensured the inclusion of all poisoned patients and also the accuracy of entered data with less misclassification bias.*

*We have changed the methodology section according to these comments and added the “data collection” as a sub-topic under methodology section. And also the text is modified to explain the data collection procedures including types of data. Pages 4 & 5.*

b. If the independent unit of observation is the individual, then how were individuals tracked in both studies. In particular, there is no information about repeated observations of individuals in the RT study. This could be problematic with respect to repeated exposure to the intervention or any switching between intervention exposures if an individual could be treated at multiple locations participating in the trial. Details are given for how the data is recorded and maintained, but clarity on the exact nature of the data as it pertains to the observational unit is lacking.

*Please refer to the answers for the comment number 11, reviewer one.*

*The intervention of the RCT didn’t target patients or the communities; it was an educational intervention for hospital staff. The intervention was directed at treatment behaviour in the peripheral hospitals, the referral hospital did not receive any intervention. As there were no patient transfers between peripheral hospitals there would not be repeated exposure. In addition this would not affect what the patients had taken or the subsequent calculation of incidence of poisoning.*

*The independent unit of observation was the individual patient.*
Data was taken from the patients’ primary presentation to either a peripheral hospital or the referral hospital. Data linkage of patients transferred to the referral hospital was undertaken and these patients data at the referral hospital was not included as a primary admission thus there were no repeated observations. We used age, gender, poison type, date time data and name of the patient to link the peripheral hospital data and secondary hospital outcome.

Outcome for all patients was recorded including the outcome of transferred patients (from peripheral hospitals to referral hospitals).

We have changed the methodology section of the manuscript to explain this further as “The peripheral hospital patients who were transferred from peripheral hospitals to secondary care hospitals were followed up to record their hospital outcome. This was done by linking their outcome details with the peripheral hospital details by using simple algorithm which used hospital name, age, gender, date/time and poison type information. This linking also prevented double counting or repeat entry of individual patients. “Page 5

c. Examples of unclarity

i. What is does consecutive poisoned patients mean? Is this the sequence of patients who were poisoned or is this a patient who was repeatedly poisoned? Both?  
   This is the sequence of patients

   We do not understand the difficulty the reviewer has with our description of “consecutive poisoned patients”. This is the sequence of poisoned patients admitted to the hospitals involved in the study. To us this seems a common way of describing that all patients were over a period of were included in the study rather than a selection of patients.

   We have not changed the manuscript in response to this comment.

ii. Does the patient information follow the patient? Is it only stored by the care facilities and requires a data linkage to create a full patient profile? How is the linkage done – unique identifiers, names, and/or government health numbers? Is the linkage deterministic or probabilistic? Was linkage done? Are these truly independent data sets or are the same people measured in the various data sets. How this is resolved and are there methodological issues that need to be addressed.

These patient records are truly independent. The linkage was needed only for the transferred patients to referral hospitals (from peripheral hospitals). A short list of possible linkages was
done using probabilistic methods and final linkage was done by examining the list and was more deterministic. Linkage was done as an identification process which used age/gender, poison type, data/time and hospital name to identify transferred patients in referral hospitals. The main purpose of the linking was to collect the outcome details from referral hospitals and to provide a method to validate documentary evidence of treatment in primary hospitals with patient experience as part of the measurement of primary outcomes of the RCT. The incidence of poisoning was taken from information provided in the primary presentation.

We have added details to the data collection section of methodology in the manuscript to explain this. Page 5

iii. The observational data is coming from an ongoing observational study. How was the study designed? Is this an interim analysis? Why were the particular independent variables chosen?

We have conducted an observational cohort study in the referral hospital in this district since 2002. The study registers all poisoned patients admitted to hospitals and collect exposure, clinical symptoms, treatment and outcome data. Within this study there have been other nested studies and RCTs. But we used the observational data which include patient basic characteristics and exposure, treatment and outcome details.

This is not an interim analysis of another trial.

Type of poison was chosen as the independent variable as it is important in health planning and in public health responses.

Based on this comment and the previous comments from reviewer 2 (1.a), we have changed the methodology section (see Page 5).

iv. Is the previous cross-sectional study, the same as the mentioned observational study? Why is the period July to December available? If a longer time span was available, why was this portion of the year chosen? Is it the growing/crop season in Sri Lanka?

The previous cross-sectional study in peripheral hospitals used the same methodology as the current study of peripheral hospitals. The difference was that in the previous study retrospective review of admissions was undertaken for the previous 6 months whereas in the current peripheral hospital study the review was conducted prospectively on average every 3 weeks. In
both studies retrieved notes were checked against the ward log of all admissions to ensure no cases were missed. For the comparison of changes over time we used the same hospitals and the same months of the year.

The previous study was planned for six months period based on the available funding and the likelihood of being able to retrieve all the clinical notes (which can degrade in poor storage conditions). As detailed previously this area engages in year round agriculture as it is irrigated and these six months is long enough to encompass major crops such as paddy rice.

There are two main crop growing seasons in Sri Lanka per year and each season last for about 3-4 months. A six month period would cover the 1-2 months gap between two seasons and one complete season. Therefore it will represent all the poisoning changes related to seasonal crop change.

We changed the methodology section of the manuscript to explain the comparison “This study used the same methodology as the current study of peripheral hospitals. The difference was that in the previous study retrospective review of admissions was undertaken for the previous 6 months whereas in the current peripheral hospital study the review was conducted prospectively on average every 3 weeks. In both studies retrieved notes were checked against the ward log of all admissions to ensure no cases were missed. This was compared with data collected from the same hospitals during the same time of the year -July to December 2009.” Page 5

And also the effect of the seasonal variation of poisoning on study duration was explained in the discussion section – page 12.

2. No comment on the excluded patients. Are these participants different that those included? If so, how are they different and would these differences change the results of the analysis? Though it is a small group, details on this group are important even if a complete case analysis is performed.

Please see the responses to the reviewer 1.

These 21 patients represent 0.6% of the total population in this study. Despite the smaller numbers, we compared the characteristics of these 21 patients with the rest of the group. There are 13 males and 8 females and there were 2 op and carbamate patients, 6 other pesticide patients, 4 medicine patients, 1 oleander patient and 8 patients with other poison types. Therefore, these excluded patients do not show different characteristics to the analyzed group.
We have added more information in the results section to answer this comment “There were 21 patient records found without age and excluded from age related comparisons. This small group of 21 patients had the similar basic characteristics to the rest of the group and less likely to effect to the comparisons. Overall, patients were young, with 30% in 12 to 20 years range of age and over 50% less than or equal to 30 years of age.” Page 7.

3. As this is appears to be a secondary analysis of RT data, there is an absence of comment on issues surrounding this study design.

This is not a secondary analysis of a randomised trial. Although we used observational data which were collected during a RCT, the intervention would have had no effect on the poisoning incidence (intervention is for the hospital staff). The effects of the educational intervention if successful on mortality would likely be small and not have a substantial impact on the estimates of mortality reported in this paper. Therefore issues related to the RCT design may not be relevant to these analysis as the intervention is not targeting patients (please see the previous comments on the study type)

We explained this under the limitation section of the discussion section of the manuscript. “Although this data collection was conducted alongside a cluster RCT which delivered a brief educational intervention to hospital staff members to promote adherence to poisoning treatment guidelines, the intervention had no components related to the community that would have altered the incidence of poisoning events. Furthermore, the effects of the educational intervention if successful on mortality would likely be small and not have a substantial impact on the estimates of mortality reported in this paper. Pages 11 & 12

4. The results section should be revised for overstatements. a. An example is on page 7 where it is stated that ingestion was mainly be males over twenty years old. This Is not precise, based on table 1, in that 53.2% were ages 20 to 39 with almost 70% being Between 20 and 49 years of age. The older group, 50+, represents 13.1% which is less than the 12---19 year olds!

We thank the reviewer for this useful comments whih we agree with.. As there are approximately 70% is between 20-49 years of age, the statement “there were much larger population of males among who were middle aged and older” was added. Page 7

Minor Essential Revisions

1. Table 4 needs units either in the column heading or in the table description.

Agreed. Added as “n”

2. Table 5 is not a percent difference. This is a difference between proportions (a test statistic) for a difference between population proportions. The numbers are correct with little
difference between the pooled and unpooled approaches, but the column heading is imprecise.

*Agreed and changed as “difference of proportions”*

3. Figure 2 has lots of data but little usable information. Using stacked graphs obfuscates key comparisons. Although stacked graphs can be used to represent the percent share, but that does not seem to be the emphasis of Figure 1. It is very difficult to compare the proportions between 2005 and 2009 categories.

*We agree with the reviewers and figure 2 was deleted from the main text*

4. The inclusion/exclusion criterion seems to be spread between the methods and the Results section. The total number of participants is not really a result, but a function of the selection criteria.

*As the aim of the paper is to describe the epidemiology of poisoning in this district and we considered the total number of patients – the total number of poisoning incidents- as a result.*

*As an observational study, we considered all patients with poison ingestion for this study are hospital admission. We did not have access to all patients below 12 years of age -as the details of this group are not available from secondary care hospitals – and our data presentation was limited to group over 12 years of age. Other than that, there are no exclusion criteria for this observational data collection.*

*We added a sentence to the data collection section of the methodology to explain this “The data collection from all consecutive poisoned patients admitted into all hospitals was started on September 2008 and continued up to January 2010. Details of all the patients who were 12 years of age or older, and who had a history of acute poisoning ingestion, were collected in this study (See Page 4).*

**Discretionary Revisions**

1. A nice flow chart for how the data is collected, linked, transferred, etc. Would be very helpful in addressing data structure issues.

*Please see the diagram below. It explained the data collection procedures in different places. Following reviewers comments, we have explained these details in the methodology section in the text. Therefore the following diagram was not included in to the text.*
Poisoning in the community

Peripheral Hospitals
- Patient details – Age, gender, date & time of admission
- Exposure details - Types of poison, ingestion details
- Initial Assessment and Treatment details
- Outcome details – Death, discharged, transferred

Primary admission to referral hospital

75% - Transferred to referral hospital

Primary Admission to Referral Hospital
- Patient details – Age, gender, date & time of admission
- Exposure details - Types of poison & ingestion details
- Initial assessment and treatment details
- Outcome details – Death, Discharged

Patients from peripheral Hospitals
- Patient details – Age, gender, date & time of admission
- Exposure details - Types of poison & ingestion Details
- Initial assessment and treatment details
- Outcome – Death, discharged