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ARTICLE DETAILS

<table>
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<tr>
<th>TITLE (PROVISIONAL)</th>
<th>Unintentional, non-fatal drowning in children: U.S. trends and racial/ethnic disparities</th>
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<tbody>
<tr>
<td>AUTHORS</td>
<td>Felton, Heather; Myers, John; Liu, Gil; Davis, Deborah</td>
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VERSION 1 - REVIEW

<table>
<thead>
<tr>
<th>REVIEWER</th>
<th>Richard Franklin</th>
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<td>James Cook University, Australia</td>
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<th>REVIEW RETURNED</th>
<th>15-Jun-2015</th>
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GENERAL COMMENTS

The reviewer also provided a marked copy with additional comments. Please contact the publisher for full details.

<table>
<thead>
<tr>
<th>REVIEWER</th>
<th>Belinda Wallis</th>
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<td>Centre for Child Health Research, University of Queensland, Australia</td>
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<th>REVIEW RETURNED</th>
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GENERAL COMMENTS

Overall comments:

This paper makes a valuable attempt to describe non-fatal drowning aetiology in the United States. Unfortunately, the lack of detail in the data to distinguish if cases appear in both datasets has the study flawed from the outset. There is no estimation of how often this might occur to give any sort of credibility to limitations. The paper would be better analysed as ED compared to Inpatient, which was the major aim, but is only described as rates. Methodological issues and more complete referencing would be required for this to be a publishable paper.

Keywords in the title page don’t match the abstract.

Abstract:

L 23 Dates Jan 2006 to Dec 2011?

L28 Is there a difference between non-Hispanic White and White?

L42 The first two sentences are not conclusions from this study.
Introduction

Please describe the difference between CDC data (quoted in ref 2) compared to NEDS and NIS data as a rationale for this study. Otherwise L24 is a contradiction.

L27 and L38 and 43 require references.


Methods

P5 L6 “The current study aimed to ..... frequency with which these children were seen in an ED compared to inpatient settings”. These data are not presented in the results, although they are mentioned in Discussion P13 L11. Therefore the main aim of the study has not been achieved.

Risk Factors

L25 “This is consistent with previous literature (reqs ref) is not a Result. L51 “characteristics” not characters P7 Table 1: as stated previously “Other” category skews data and p values. Percents column in Total Non-fatal drowning do not total 100% P8 Table 2: Table 1 reports 15143 male non-fatal drowning events, so please explain what the figures are in column 1 non-fatal drowning/ Total No of what?
This first sentence is not a result.

Figure 2 has two axes – which data uses which axis?

Table 3:
Is Insurance a valid indicator of income?
What do the categories Home, Home Health, Skilled Nursing Facility, and Other entail for the patient? Are they a valid indicator of severity?
How were costs calculated?

Table 4:
Were 20yr olds removed from the data? How many were there?

These data are not presented in Results.

L30 refer to reduction in morbidity – the referenced article is on fatal data.

Also mentions fatal drowning – this study is about non-fatal.

L34 – 43 requires references for each suggestion.

In conclusion … the following paragraph are not conclusions of this study. The US study requires a reference and should be in Discussion not Conclusions.

See ref Quan, L, 2001 Do parents value drowning prevention information at discharge from the emergency department?

VERSION 1 – AUTHOR RESPONSE

Reviewer 1
Reviewer Name Richard Franklin
Institution and Country James Cook University, Australia

Please leave your comments for the authors below Dear Authors

This is a good paper which adds to our understanding of non-fatal drowning in the US. I have added some comments to the paper which I have attached.

You are missing information about ethics.
Statement added to p. 5. Data are de-identified.

Could you specifically check:
Table 3 last line, these either need a decimal place which brings them into line with the text or they should not be statistically significant and have a range as cannot have -$.
The standard deviations in Table 3 are correct. The standard deviations in the text have been edited/corrected to represent $12K and $15K, respectively. This is a traditional method for displaying the dispersion of values in a table. The associated p-value is from an unpaired t-statistic, which uses the standard errors of the mean (SEMs), which are $94.62 for the ED group and $260.41 for the inpatient group. However, SEMs are difficult to interpret and are rarely reported

Table 4 the rate per 100,000 children should be higher for all setting than any of the other setting as you are grouping up the numerator but not the denominator, unless you have adjusted for pool ownership.
The “All Settings” rates should fall in between the rates of the individual settings. In essence, it is a
weighted mean of the means. Both the numerator and denominator are pooled across the three settings (pools, natural waterways, and other). As such, it has to fall in between the other rates. It will be closer/further to an individual setting’s rate based upon the leverage the individual has on the overall rate.

Also you need to discuss exposure as a limitation i.e. we do not know what the exposure by groups is and as such cannot adjust for this in the figures.

Added


Thank you. This paper has been cited.


Thank you. This paper has been cited.

I also think there is some conflicting information about income levels as ownership of pools is a proxy for higher incomes, as is private insurance (which is why I think these are at greater risk for pool drowning incidents), yet you found more ED and less in-patent in the higher income group and found those form lower groups at greater risk of non-fatal drowning. Also the difference between inpatient and ED presentations is not clear, it is normally a proxy for severity and this is seen in the number requiring skilled nursing facility, often we adjust for length of stay as well, with younger children admitted overnight for observation just in case. You might like to discuss these issue. Added

Bmjopen 2015-008444

Unintentional, non-fatal drowning in children: Trends and racial/ethnic disparities
Reviewer: 2
Reviewer Name Belinda Wallis
Institution and Country Centre for Child Health Research, University of Queensland, Australia

Overall comments:
This paper makes a valuable attempt to describe non-fatal drowning aetiology in the United States. Unfortunately, the lack of detail in the data to distinguish if cases appear in both datasets has the study flawed from the outset. There is no estimation of how often this might occur to give any sort of credibility to limitations. There was no attempt to combine these data sets. As seen in Table 3 and in the section entitled “Inpatient compared to ED” our goal was to compare the ED patient characteristics to the inpatient characteristics. One limitation to the HCUP databases is they fail to link patients that may be present in both data sets. As such, analysts cannot pair data from an individual who may appear in both data sets; HCUP states that this is a “rare occurrence (<2% chance)”. However, for non-fatal drowning events, in our data, that were seen at the ED (i.e., data from the NEDS dataset), 3.8% were transferred out to a short-term hospital. Correspondingly, 2.2% of inpatient near-drowning victims (i.e., data from the NIS data set) were admitted from the ED. Again, since the HCUP databases are not linked, and don’t collect data from the same hospitals, a disconcordance in these numbers is likely.

The paper would be better analysed as ED compared to Inpatient, which was the major aim, but is
only described as rates.
It is unclear what the reviewer wants. Table 3 makes a comparison between the demographic information between those seen in the ED and those admitted to an inpatient facility.

Methodological issues and more complete referencing would be required for this to be a publishable paper.
More details on methods and more references provided

Keywords in the title page don’t match the abstract.
The keywords on the title page were generated from the online manuscript review system that consists of broad categories from which we were required to select. However, the keywords that were provided after the abstract were our own specific selection of words related to the content. No change was made unless otherwise instructed.

Abstract:
L 23 Dates Jan 2006 to Dec 2011?
It is unclear what the reviewer is asking. These date represent the most current years that complete data are available in the two datasets that were used. This is stated in the middle of the first paragraph in the Methods section.

L28 Is there a difference between non-Hispanic White and White?
I only see reference to non-Hispanic White children around L28 of the abstract (as pasted below) However, when compared to non-Hispanic White children, children from racial/ethnic minorities were more likely to drown in natural waterways than swimming pools. Despite the overall lower rate of non-fatal drowning among non-Hispanic White children, the highest rate of all non-fatal drowning was for non-Hispanic White children ages 0-4 in pools.

L42 The first two sentences are not conclusions from this study.
Replaced with the following:
Data from two large U.S. national databases show relatively flat incidence rates of drowning admissions from 2006-2011. Discrepancies are seen in location of drowning events and demographic characteristics.

P4 Introduction
Please describe the difference between CDC data (quoted in ref 2) compared to NEDS and NIS data as a rationale for this study. Otherwise L24 is a contradiction.
The CDC collects information regarding deaths as cited in lines 15 and 19. There is no systematic data collection for non-fatal drowning. We are reporting on those children who show up in the ED or who are admitted to an in-patient facility, which is an under-estimation, but worth reporting, in our opinion. The following was also added to the Discussion:
Lastly, we can only report those non-fatal drowning events that presented to the hospitals (emergency departments or inpatient facilities) that are in the sampling frame as described in the methods. Non-fatal drowning events that presented to primary care or other non-hospital settings were not included.

L27 and L38 and 43 require references.
References added

L55 regarding statement “has not been shown” see refs:
Drowning is a serious public health problem worldwide.1 In the United States, ten people die every day from drowning with one out of every five deaths being a child under 15 years of age.2 Drowning is the second leading cause of accidental death in children.2 For each drowning victim in the U.S., it has been estimated that five children go to the hospital for non-fatal drowning submersion events;2 however, the incidence of non-fatal drowning may be underestimated as some children may be seen in primary care offices and urgent care facilities and there is no systematic reporting mechanism for non-fatal drowning as there is for fatal drowning. In a recent study from Australia, non-fatal drowning rates are rising.3 In that study, the authors reported that, on average, there were three child or adolescent fatal drowning events per week in Queensland with an additional 10 non-fatal drowning events for every fatality.3 Non-fatal drowning may have serious long-term consequences due to hypoxia and subsequent brain damage.4-6 Although the mortality and morbidity of drowning and non-fatal drowning is known to be a public health problem and 85% of drowning events are preventable,6 preventive interventions have not been effective in lowering the incidence.1 7 Patterns of fatal drowning have been described and risk factors have been identified such as location of drowning, age, gender, and race/ethnicity.8 9 In contrast, less is known about non-fatal drowning. Pearn and colleagues,10 in 1979, and Quan et al.,11 in 1989, each reported on both fatal and non-fatal drowning events in children from one U.S. county. Race/ethnicity data were not reported in either study. Cohen, in 2003, reported on a representative sample of U.S. children who were admitted to U.S. hospitals for submersion-related-injuries.12 Again, no race/ethnicity data are reported.12 More recently, Wallis et al. reported on both fatal and non-fatal drowning in a population study of children in Queensland, Australia.3 Data were reported by age and gender Since the prevalence of non-fatal drowning is at least five times that of fatal drowning, it is important to determine if there are similar risk factors for each, by age and location of submersion event in U.S. children.2 Additionally, children from racial/ethnic minority groups in the U.S. are at greater risk for numerous health-related disparities,13-19 including fatal drowning.9 A clearer picture of the risk for non-fatal drowning by race/ethnicity, in additional to age and location of event for U.S. children is needed. In order to develop and target effective interventions, more data are needed to understand the patterns of non-fatal drowning events. For example, it has been shown that males, younger children, and children from racial/ethnic minorities are at greater risk of fatal drowning and the distribution varies across different locations (pools, natural waterways, etc.).9 However, characteristics of children at greatest risk for non-fatal drowning in a representative, national, United States sample have not been shown. The current study aimed to identify risk factors associated with non-fatal drowning of infants and children in the United States using two large, national databases and to describe the frequency with which these children were seen in an Emergency Department (ED) compared to inpatient settings.

Comparisons to these articles were also added to the Discussion.

Methods

P5 L18 Please explain the difference between CDC data and the data selected for this study, and
what a “20% stratified of US community hospitals” means for the data specifically.

What percentage of emergency attendances and hospital presentations does this represent? The CDC data include fatal drowning, but not non-fatal drowning.

The sampling methods for both the NIS and the NEDS are now described in more detail on pages 4 and 5.

Incidence rates are presented, but how are you sure you have all fatal and non-fatal presentations? The following was added to the limitations:

Lastly, we can only report those non-fatal drowning events that presented to the hospitals (emergency departments or inpatient facilities) that are in the sampling frame as described in the methods. Non-fatal drowning events that presented to primary care or other non-hospital settings were not included.

L30 why up to the age of 20yrs, when incidence rates are presented up to age 19yrs. Were 20 year olds excluded from the data when calculating rates? Children 0-20 were included in all be the final analysis presented in Table 4 due the groupings in the U.S. Census data. Therefore text was added (see below).

The following was added at the end of the statistical analysis section:

In these final analyses, comparisons were made for children 0-4, 5-9, 10-14, and 15-19 years because of the groupings used with the U.S. Census data. This allowed the calculation of incidence rates per 100,000 children in the population.

P6 L6 “Other category” for locations includes diving and assault. Neither of these are locations and should be excluded from analyses.

We apologize for this oversight. Luckily there were no assaults that led to a near-drowning, and diving was not included. Unfortunately, that nomenclature was left when we were using a previous paper as a template. The updated text below represents what we actually meant by “other” site. We apologize for the confusion.

“The “other” non-fatal drowning sites included, for example, falling into a well, falling into a storm drain, falling into another hole. “

L13 requires a reference.

Added

Risk Factors

L25 “This is consistent with previous literature (reqs ref) is not a Result.

Removed

L51 “characteristics” not characters

Corrected

P7 Table 1: as stated previously “Other” category skews data and p values.

Please see response above.

Since the ‘other’ category is the smallest category in comparison to the other two categories it has the least amount of leverage on the test statistics. Unless it’s estimate (proportion or mean) is extreme in comparison. The “other” category had no extreme values. Most of the values fell in between the other two categories with the exception of gender and insurance.

For gender, the conclusion of males being more likely to have a near-drowning is supported.
Likewise, children who had private insurance more frequently experienced non-fatal drowning in pools is also supported.

Percents column in Total Non-fatal drowning do not total 100%
It is unclear what the reviewer is wanting here. Individuals can be in more than one category in a column (male, black, private insurance) so the numbers should not add up to 100%. However, within categories such as race, accounting for rounding, the percents add up to 100%

P8 Table 2:
Table 1 reports 15143 male non-fatal drowning events, so please explain what the figures are in column 1 non-fatal drowning/ Total No of what?

The header in No. non-fatal drowning/no. total and the non-fatal drowning events are presented by type such that 9961 of the events in pools were males divided by the total number of drowning events by males (15143) so 65.8% of male non-fatal drowning events were in pools, 27.5% of male non-fatal drowning events were in natural waterways, and 6.8% of male non-fatal drowning events were in other places. I don't know a better way to present these data. Please advise if changes are needed.

P9 L30 This first sentence is not a result.
Revised
Figure 2 P20 has two axes – which data uses which axis?
Figure was modified for clarity

P10 Table 3:
Is Insurance a valid indicator of income?
Income and insurance status are both included in Table 3. In general, private insurance is an indicator of income in the U.S. as public insurance eligibility is established based on family income and size of household.

What do the categories Home, Home Health, Skilled Nursing Facility, and Other entail for the patient? Are they a valid indicator of severity?
Probably, although specifics are not available to quantify. If one goes home without additional support services, it could be assumed that the child is probably more stable than someone that was transferred to another hospital or skilled nursing facility. More text was added to this paragraph.

How were costs calculated?
Thank you. Costs were calculated in 2011 dollars using a 3% discount rate. Sorry for this oversight in reporting.

p.11 Table 4:
Were 20yr olds removed from the data? How many were there?
20 year olds were not included in Table 4 in order to match up with the U.S. census data age groups. The following text was added to the end of the Methods section to clarify:

In these final analyses, comparisons were made for children 0-4, 5-9, 10-14, and 15-19 years because of the groupings used with the U.S. Census data. This allowed the calculation of incidence rates per 100,000 children in the population.

P13 L11 – These data are not presented in Results.
This is reported in the first row of Table 3

L30 refer to reduction in morbidity – the referenced article is on fatal data.
References added

L32 also mentions fatal drowning – this study is about non-fatal. Interventions would likely address both fatal and non-fatal drowning. We are only reporting on non-fatal drowning to better understand the larger picture of risk.

L34 – 43 requires references for each suggestion. References added

P14 L16: “In conclusion … the following paragraph are not conclusions of this study. The US study requires a reference and should be in Discussion not Conclusions. “In conclusion” removed; reference added

P14 L32 See ref Quan, L, 2001 Do parents value drowning prevention information at discharge from the emergency department? Added text and citation to Discussion
Unintentional, non-fatal drowning of children: US trends and racial/ethnic disparities

Heather Felton, John Myers, Gil Liu and Deborah Winders Davis

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