

Christmas Special Article

'Santa baby, hurry [extra carefully] down the chimney tonight' – Prevalence of Christmas related injuries 2007–2016 in the United States: Observational study

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ABSTRACT

Objectives: To assess the prevalence of Christmas-related injuries for Santa Claus, Santa's helpers, Santa impersonators and Christmas revellers.

Methods: Data were obtained from the US using National Electronic Injury Surveillance System (NEISS), a national probability sample of U.S. hospitals with 24-hour accident and emergency services. Data from 2007 to 2016 were analysed regarding emergency visits involving injuries related to Christmas products, and weighted prevalence and patterns of Christmas-related injuries were reported.

Results: No injuries directly affecting Santa Claus, Santa Claus' helpers, or Santa impersonators were identified. U.S.-wide, 277 children were injured by Santa impersonators. Further injuries were reported in association with artificial Christmas trees (17,928 injuries), real Christmas trees (2216 injuries), Christmas tree stands/supports (2839 injuries), tree lights (31,855 injuries), electrical decorations (36,054 injuries), non-electrical decorations (80,208 injuries), and Christmas presents (2305 injuries). Almost all injuries occurred in Caucasians and injuries were most common in children, adults aged 30–60, and in those aged 70 or older. Injuries related to electrical Christmas decorations were more common in males; those related to non-electrical Christmas decorations were more common in females.

Conclusions: Despite inherent dangers associated with his work, Santa Claus appears to be safe and is not responsible for Christmas-related injuries. In contrast, the considerable safety hazards of Santa impersonation practices and Christmas products require further investigation.

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What is already known on this topic

Santa Claus may be a negative public health role model causing indirect harm to those celebrating Christmas.

Anecdotal evidence suggests Christmas might be a considerable safety hazard for Christmas revellers.

What this study adds

Our study suggests that Santa Claus himself remains safe at Christmas and does not cause direct harm to others.

However, Santa Claus impersonators and Christmas products do pose potential safety hazards.

1. Introduction

Christmas is the most important religious holy day for Christians, and it commemorates the birth of Jesus Christ [1]. It became one of the first federal holidays in the US in 1870, and is one the most widely celebrated holidays worldwide. More than 90% of people in the United States celebrate Christmas each year regardless of gender, age, and community type [2]. Christmas is typically regarded as a time of joy and reunion with friends and family together with the exchange of gifts are considered essential parts of Christmas holidays for most Americans [2].

Yet, the understandable focus upon fun and high spirits tends to overshadow the inherent and real dangers of the holiday season. While alerts in the entertainment sector are numerous (e.g. Clark

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Griswold illustrating risks such as burning down the Christmas tree, falling from the roof while installing Christmas lighting and being attacked by a squirrel hidden in the Christmas tree) [3], serious health warnings are often ignored due to the preponderance of Christmas spirit. Indeed, important public health discussions are far too often dismissed as Scrooge-like ‘humbug’ attitudes, serving only to distract revellers from the joy of the festive season.

But the risks of Christmas carry far beyond just ordinary community-based revellers; Santa Claus himself, and Santa’s helpers (elves or gnomes working in Santa Claus’ factories, or providing care for Santa’s reindeers) are also prone to injuries – an occupational hazard of having to produce and deliver presents for billions of children globally over a relatively short time frame [4]. Recent estimates show Santa has to travel 510 million kilometres at near-speed of light each night before Christmas – while controlling the estimated 5.6 million reindeer necessary to pull his 2.3 million tonnes sleigh [5]. Considering one fatality in commercial aviation about every 23 billion passenger kilometres [6], and assuming that Santa’s sleigh is not considerably safer than a standard airplane (economy class only but every seat has a window view), Santa would die on duty every 45 years! Statistically speaking, Santa should have already died 4 times since his first appearance in the 18th century [7], yet lucky for us Santa seems to outlive against all the odds. The consequences of any accidents involving Santa can hardly be overestimated, as Santa Claus and gifts remain core Christmas ingredients for most kids and for a considerable proportion of adults [8]. Given that Christmas holidays already seem to be associated with increases in dysphoric mood [9], one can easily imagine how disruptive Christmas without Santa would be, not to mention the lack of any Christmas presents (we may all have to start buying our own socks and hand-knitting our own jumpers!). As such, it is imperative not only to examine the very real risks of Christmas for Christmas revellers, but more so the risks that Santa himself is exposed to due to Christmas. In direct response to these grave issues, this paper reports the first in-depth analysis of empirical data in order to estimate the risk of Christmas for Santa Claus and Christmas revellers.

2. Methods

For this analysis the National Electronic Injury Surveillance System (NEISS) data – a national probability sample of hospitals in the U.S. and its territories with 24-hour accident and emergency services, and patient information is collected for every emergency visit involving injuries in relation to consumer products – were utilised for a 10-year period from 2007 to 2016. The dataset is freely accessible from the Consumer Product Safety Commission (CPSC) website (www.cpsc.gov), and contains information on the date of the incident, the product involved, the patients’ age, gender, diagnoses, dispositions and affected body parts, and the location of where the injury occurred. For all injuries a narrative description of the incident is included. Since the data provides information on the probability, strata, and sample weights, the data can be used to calculate national estimates.

2.1. Outcomes

For this study several types of Christmas-related injuries were analysed. First, the prevalence of injuries associated with sleds and toboggans, and with chimneys was estimated, with close attention paid to whether Santa Claus was involved in such mishaps. The manual search was then extended across all incident narratives to identify any other type of incidents that Santa Claus, Santa’s helpers or Santa impersonators (defined as any Santa lookalike working at Christmas events or in shopping malls) may have been

involved in. Furthermore incidents associated with Christmas products were investigated, including artificial trees, Christmas decoration (tree lights, electrical, and non-electrical decoration), and Christmas stands and supports. Lastly a keyword search for Christmas (or Xmas) was conducted to identify any other common injuries occurring in association with Christmas.

2.2. Statistical analysis

All incidents were reported in absolute frequencies (cave: all numbers refer to injuries over 10 year period), and relative frequencies. Sample weights were used to extrapolate the findings to the entire US population. Cross-tabs were provided to examine the injuries in relation to years and months, patients’ age, and ethnicity, and to analyse the locality of injuries. Statistical analysis was performed using the Statistical Package for Social Sciences software (IBM SPSS Statistics for Windows, release 24.0. Armonk, NY: IBM Corp.).

3. Results

3.1. Potential threats to Santa Claus, Santa’s helpers and Santa impersonators

Overall 6351 injuries have been reported in association with sleds and toboggans, equalling a total of 240,626 injuries in the US between 2007 and 2016, most of which occurred during the winter season. The corresponding number of injuries related to chimneys was 213, equalling a nationwide prevalence of 10,492. The analyses of those incidents showed that the injured party could not be identified as Santa Claus (or a male person of at least 200 years of age), Santa’s helpers (or any elves or gnomes) or Santa impersonators in any of the reports. Furthermore, a keyword search of incident reports did not reveal a single mention of Santa Claus, Santa’s helpers or Santa impersonators seeking help for injuries during the Christmas period.

3.2. Potential threats from Santa Claus, Santa’s helpers and Santa impersonators

Analyses did indicate several incidents caused by Santa Claus or, perhaps more likely, caused by Santa impersonators (this was not clearly specified in all cases). During the study period, three children reported to ER after ‘falling off Santa’s lap’, and another child reported to ER after she fell when due to being so scared she tried to run away from Santa. These numbers reveal 277 children nationwide experienced an injury directly caused by Santa Claus or Santa impersonators.

3.3. Potential threats to Christmas revellers

A large number of Christmas-related incidents occurred in association with products and props between 2007 and 2016, namely artificial Christmas trees (374 injuries, corresponding to 17,928 injuries nationwide), Christmas tree stands and supports (63 injuries, corresponding to 2839 injuries nationwide), Christmas decorations such as tree lights (715 injuries, corresponding to 31,855 injuries nationwide), electrical decorations (771 injuries, corresponding to 36,054 injuries nationwide) and non-electrical decorations (1949 injuries, corresponding to 80,208 injuries nationwide). A manual search also indicated that Christmas presents were mentioned in 45 injury reports (corresponding to 2305 injuries nationwide); and 48 injuries were reported in relation to Christmas tree accidents (non-artificial trees, 2216 nationwide) most of which were associated with the use of knives and saws to trim or cut the tree. Overall, the number of annual

injuries did not vary much over the last decade. However, a small decrease in injuries was found after 2012 for a variety of products, see Fig. 1. Fig. 1 also shows the distribution of injuries per months, and the majority of injuries associated with Christmas products were found to occur between November and January. It was also found that almost all injuries occurred in Caucasian people with only a very small proportion of injuries amongst in Black, Asian and Indigenous people. Lastly, injuries were most common in children up to grade school, in adults aged 30–60 (roughly around popular parenting ages), and in those aged 70 or older (roughly around popular grand parenting ages), see Fig. 1. There was a clear gender difference in the type of injuries experienced with injuries related to electrical Christmas decorations being more common in males and injuries related to non-electrical Christmas decorations being more common in females (Fig. 2).

Another 39 incidents (equalling 2002 nationwide) were reported in relation to Christmas parties with the majority of those occurring in association with alcohol intoxication. While 96% of all Christmas injuries occurred in a private home, 56% of Christmas party injuries occurred in public settings.

4. Discussion

This study reports a number of interesting findings. First, it appears that Santa Claus, Santa’s helpers and Santa impersonators are safe, and that sure is good news for all Christmas revellers preparing for this year’s festivities. No reports have explicitly

indicated harm to Santa Claus, his helpers or impersonators. However, one may query if these findings should necessarily encourage a feeling of relief - the CPSC dataset does not report the identity of individuals involved in the injury due to patient confidentiality protection and it cannot be ruled out that Santa Claus was not actually involved in some of the reported injuries. Unfortunately, the data does not capture facial hair status, waist circumference or attire and further quality data along these lines would certainly aid the empirical investigation of this issue in future enquiry. Furthermore, it is possible that Santa Claus may have sought treatment in an ER setting not participating in the data collection or in an ER outside the US and this too may well mean Santa Claus’ injury risk has been underestimated in our analyses. It may actually just be a matter of time until extensive ageing (beyond 200 years) and the growing demand for presents of an ever growing world population [4] will eventually catch up with Father Christmas. There is however another indicator that might provide a more reliable estimate of Santa Claus injuries, which is delays in Christmas. So far this has never been reported, so one can only hope that Santa Claus will remain alive and beyond the reach of lifestyle conditions associated with obesity and high intake of sherry and fruit mince pies – an occupational hazard that may be stubborn to change - to continue to bring joy and presents for those celebrating Christmas.

Interestingly, while the US population has held its end of the bargain in terms not to harm Santa Claus, it is evident that Santa himself is not returning the favour. This study has indeed found

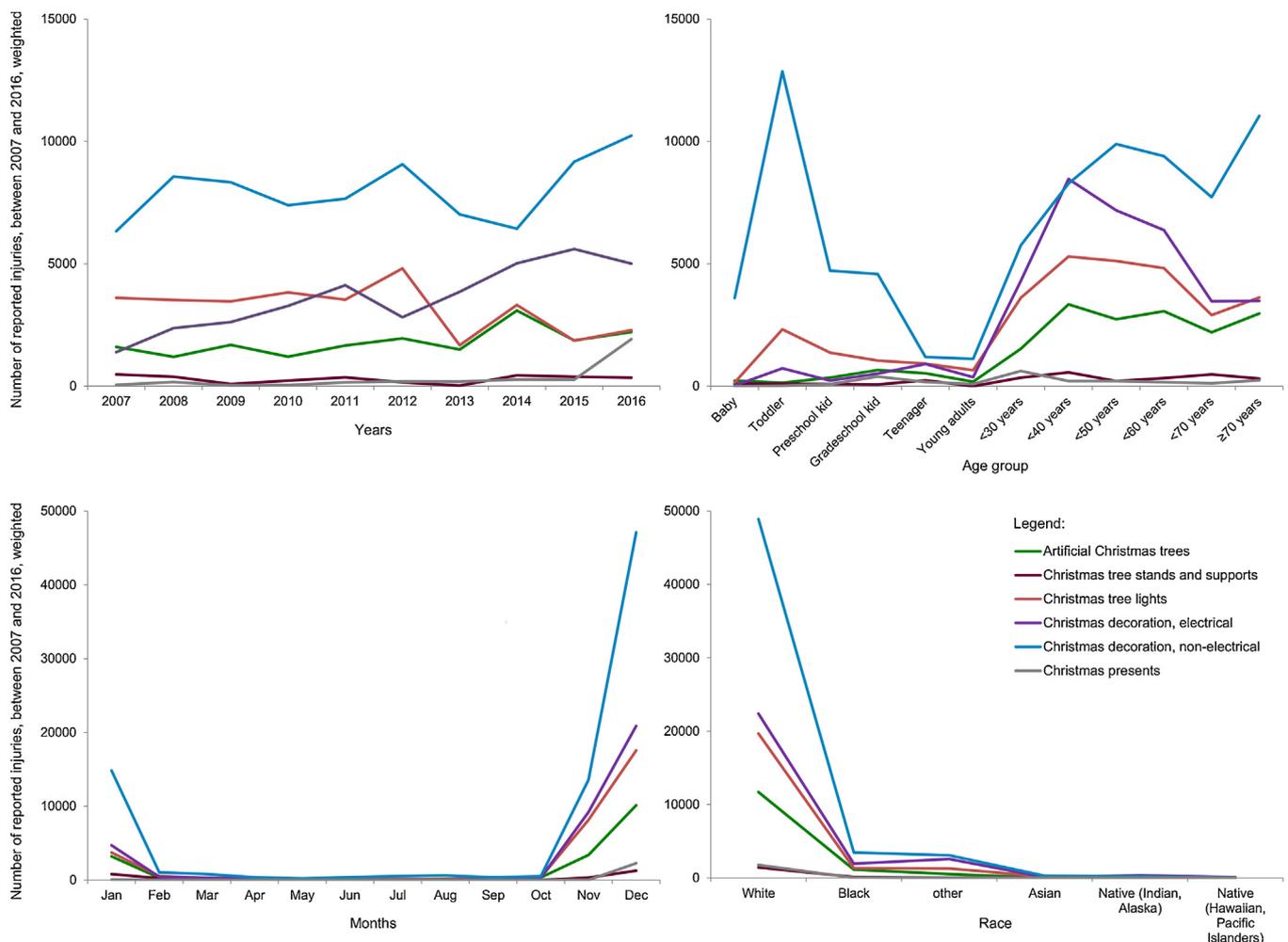


Fig. 1. Number of Christmas-related injuries (weighted) reported in the US between 2007 and 2016, as per years, months, and age and ethnicity groups.

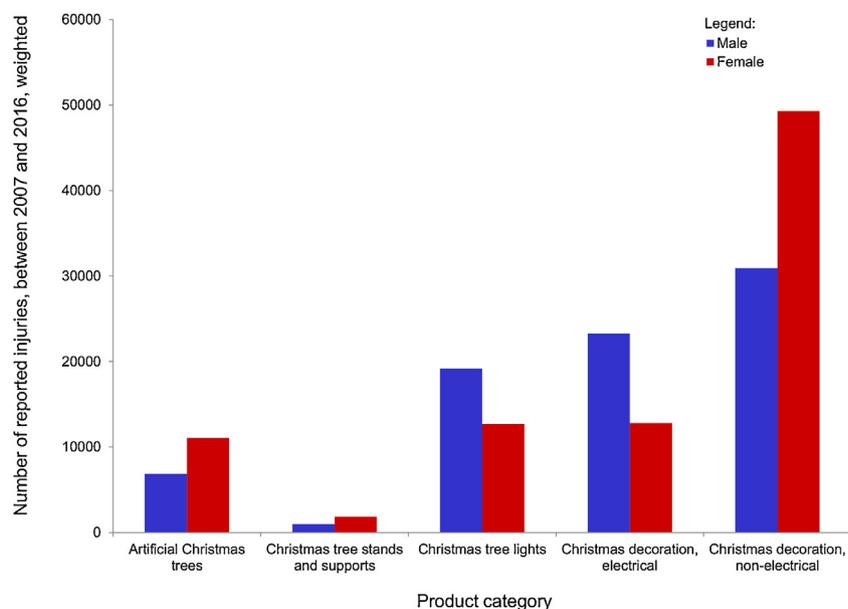


Fig. 2. Gender distribution of Christmas-related injuries reported in the US between 2007 and 2016 (in percentage of all injuries within the respective categories).

several injuries where Santa Claus was a causal factor. Numerous cases of injuries were reported in the CPSC database involving children meeting Santa Claus in shopping malls. Previous studies have already questioned whether Santa Claus might be considered a public health pariah and negative role model due to the majority of photographic evidence showing him smoking, drinking and being overweight [10]. A previous study also discussed his role as a potential infectious disease source [10]. Additionally, our study suggests that Santa may have a more direct role in causing harm to Christmas revellers. However, some commentators have suggested in his favour that none of the mall Santa are 'real Santa', but instead Santa impersonators of some sort [11]. Given the compelling evidence of Santa impersonator-caused injuries, governments need to think about appropriately regulating Santa impersonation practices including visible warning labels on Santa's red suit, and some sort of accreditation processes to protect the public. This is highly important considering the number of Santa impersonators showing up in vulnerable settings such as hospitals [12]. Due the ambiguity around the nationality of Santa Claus, an international regulatory framework may also be required to ensure Santa is safe across numerous jurisdictions worldwide.

This study further found that the vast majority of injuries occurring to those celebrating Christmas were related to Christmas products such as electrical and non-electrical decorations. Almost all injuries involving decorations occurred between November and January, while the months between February and October seemed to be nearly free of injuries associated with Christmas decorations, and moving Christmas to the summer months may be one potential intervention to reduce these kinds of injuries. However, research from Australia suggests that such injuries may simply be replaced by more summer-oriented injuries such as those involving propellers and jet-skis [13]. While there are case reports on individuals celebrating Christmas throughout the calendar year [14], unfortunately, these reports failed to provide information on Christmas-related injuries. Further research on the impact of climate or temporal location on Christmas injuries warrants further examination, to identify what patterns are simply seasonal in nature, and which risks are Christmas-specific.

In our analysis Christmas-related injuries occurred less frequently in young adults than in older adults or young children. We suggest a potential hypothesis for this is the "non-believer

hypothesis", whereby injuries are negatively correlated with Christmas spirit, meaning that Christmas is safest for those who believe least in the magic of Christmas. Christmas spirit is most present in children (equivalent to believing that Santa exists [15,16]), but is known to wane over time, reaching almost negligible levels in teenage years and early adulthood [15,16]. The presence of children in later life stages (via parenthood) re-infects older adults with Christmas spirit. The exuberance those with high levels of Christmas spirit (and potentially high levels of ingested spirits) possess may lead them to become overconfident in their abilities to perform physical tasks, or practice potentially dangerous activities safely. Overconfidence is a known risk factor for injuries in motor vehicle accidents [17,18] and workplace accidents [19,20], and as such is likely to also be a factor in Christmas-related injuries. Any campaigns targeting the risks of Christmas need to address this issue, and future research should directly assess associations between levels of Christmas spirit and the risk of injuries.

Despite the regularity and predictability of the Christmas season each year, Christmas-related injuries remain similar. This suggests that previous strategies aimed at reducing holiday injuries may not be effective. If it is not clear already, we suggest humour as a potential communication strategy for highlighting the inherent dangers of Christmas and the need to be vigilant about safety even in this most festive of seasons.

4.1. Limitations

This research poses several limitations. Currently we do not have proof of the existence of Santa Claus other than the regular occurrence of presents under the Christmas tree. Since the CPSC does not include information on the injured parties' identity, no conclusive judgement on the safety and well-being of Santa Claus can be made. Furthermore only US data were available for this analysis, and it remains unclear whether our findings are applicable to other countries where there may be a shorter (and in many aspects differing) tradition of celebrating Christmas.

5. Conclusion

Despite inherent dangers associated with his work, Santa Claus appears to be safe and is not responsible for Christmas-related

injuries. In contrast, the considerable safety hazards of Santa impersonation practices and Christmas products require further investigation.

6. A serious note at the end

Although none of the injuries have been associated with a fatality at the time of reporting to the emergency department, injuries in relation to Christmas should not be taken lightly, especially with the large number of children being involved. Appropriate actions and precautions should be taken by manufacturers, consumers, and authorities to improve consumer's safety and overall Christmas experience. Research should also clarify the role that ethnic origin might play in Christmas-related injuries, as the majority of injuries have been reported by Caucasians despite Christmas being celebrated independent of racial background.

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Data sharing

Data is available online for researchers at www.cpsc.gov

RL: Conceptualization; Methodology; Data curation; Formal analysis; Interpretation; Writing - original draft; Writing - review & editing

JW: Conceptualization; Methodology; Interpretation; Writing - original draft; Writing - review & editing

WP: Methodology; Data curation; Interpretation; Writing - review & editing

JA: Interpretation; Writing - review & editing

HC: Conceptualization; Methodology; Interpretation; Writing - original draft; Writing - review & editing

Conflict of interest

All authors and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

None of the authors has a personal relationship with Santa Claus, however all authors have 'contacted' Santa Claus before, and requested to be considered on the Nice side of his Naughty or Nice List in the past. Furthermore some of the authors might have been

Santa's impersonators from time to time, however no compensation, or payment was received from Santa Claus, or any of his representatives.

Ethical statement

No ethics approval was required to use the publicly available data.

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