

Paediatric fire deaths: perspectives from Hong Kong

KL Hon¹*, MB, BS, MD, Karen KY Leung¹, MB, BS, MRCPCH, Celia HY Chan², PhD, WF Hui¹, MB, ChB, MRCPCH, WL Cheung¹, MB, BS, MRCPCH, FS Chung¹, MB, ChB, MRCPCH, Patrick Ip³, MB, BS, MD

¹ Department of Paediatrics and Adolescent Medicine, Hong Kong Children's Hospital, Hong Kong SAR, China

² Department of Social Work and Social Administration, The University of Hong Kong, Hong Kong SAR, China

³ Department of Paediatrics and Adolescent Medicine, The University of Hong Kong, Hong Kong SAR, China

* Corresponding author: ehon@hotmail.com

This article was published on 10 Aug 2023 at www.hkmj.org.

Hong Kong Med J 2023;29:363–5

<https://doi.org/10.12809/hkmj219680>

Injuries and deaths caused by fire occur in every region of the world but are most concentrated in middle- and lower-income areas; fire is also one of the top 15 leading causes of child death.¹ Accidents and burns (12.5%) were major killers in children aged 1 to 6 years.² In a worldwide epidemiological study of burns from the 1980s to 2004, a decrease in the rates of both fatal and non-fatal burns was observed for many countries.³ However, paediatric deaths from burns in the developing world occur at >10 times the rate seen in the developed world. For instance, a study in 12 rural child care centres situated in the urban slums of Patna in India in 1987 found that most burn injuries in children occurred in the home were accidental and were most common amongst the poorest patients.³ The presence of a developmental disability is another risk factor for burns in children in the developing world.⁴ In Hong Kong, fire-related deaths were seldom reported until recently; as such, there is no registry or any peer-reviewed publications from which researchers can obtain data regarding incidence.

Physical injury is a major health problem among children in Hong Kong, having surpassed infectious diseases as the leading cause of childhood mortality.^{5–8} In 2018, thermal injuries accounted for <15% of accidents and injuries for which children were admitted to a paediatric intensive care unit, the majority being hot water scalds.⁷ There had been no mortality due to a fire or burn injury involving

a child over the past decades in the city. However, there have been several fatal incidents since 2020 (Table^{9–12}), and these appear to have some features in common.

The latest incident, which occurred in July 2021, involved the deaths of two girls, aged 8 and 10 years, and their mother after a fire.⁹ The partner of the mother was arrested for murder and arson. In April 2021, an electric massage chair short circuited, causing a fire in a public housing estate that killed four members of a single family, including a 2-year-old girl, and critically injured a fifth.¹⁰ In an incident that occurred in November 2020, seven Nepalese people, including a 9-year-old child, were killed and several others were critically injured after a fire broke out in a flat suspected to be an unlicensed restaurant in a tenement building.¹¹ Finally, in February 2020, local media reported the death of a 7-year-old boy caused by a fire resulting from the short circuiting of an electric scooter that was charging near the entrance of the 13th floor estate unit where he lived.¹² The father and his son were trapped, though they were subsequently rescued. The man was admitted to hospital in a critical condition but the boy unfortunately died. Apparently, both parents and the child each had a scooter that were stored in the corridor outside their apartment. Child health professionals should be alerted to an incident of fire death associated with electric scooter.

These incidents all involved a single family,

TABLE. Deaths related to paediatric burns in Hong Kong

Date and citation	Details	Factors
12 July 2021 ⁹	Three deaths (including 2 girls aged 8 and 10 years) and 1 in critical condition after a fatal fire; man arrested for murder and arson	Child abuse or murder suspected Disputes
16 April 2021 ¹⁰	An electric massage chair caused a fire in a public housing estate, killing four members of a single family (including a 2-year-old girl) and 1 critically injured	Overheat of lithium battery
15 November 2020 ¹¹	Fire in an apartment building killed 7 (youngest is 9 years old) and injured 11 Nepalese whilst celebrating Diwali (Hindu festival of lights)	Crowdedness
29 February 2020 ¹²	A short-circuit from an electric scooter causing a fire at a public housing flat, killing a 7-year-old boy with his father in critical condition	Electric scooter

occurred in public housing or a single apartment unit, and happened during the evening but not when the children were sleeping. Crowdedness and living environment may be considered as one of the risk factors. A United States report on childhood fire-related death highlighted that poverty and living in rural counties are key risk factors for fire-related fatalities.¹³ In another United States report, a case of three children dying in a house fire due to a non-functional smoke alarm and a sleeping arrangement without easy egress was described.¹⁴ Although these risk factors do not seem to apply completely to those discussed above, the storage of electric scooters in an escape route such as a corridor would delay escape for others if a fire broke out.

Electrical appliances were involved in two of the cases discussed above. In the incident that occurred in February 2020, the child died and this was likely the first case of a paediatric fire death due to the short circuiting of a trendy city gadget. Worldwide, there has been a significant rise in fires caused by batteries or charging of electric scooters or bikes. A 1993 study in New Zealand found that most house fires were started by smoking paraphernalia or electrical appliances and that children were more likely to die in house fires than from any other thermal injury event.¹⁵ The sale and purchase of these scooters in Hong Kong must be further reviewed and supervised. According to the Transport Department, even riding self-balancing electric scooters or hoverboards on streets and pavements is illegal. Due to the increased use of scooters and other two-wheeled gadgets across the world, the department has recently classified them as motor vehicles, requiring registration and licensing before they can be used on public roads.¹² Without this, they are deemed a threat to road safety and a driver of an unlicensed vehicle is liable to a fine and imprisonment for 3 months on a first conviction.

This commentary seeks to generate further attention around the issues of paediatric burns and fire-related deaths, as well as the legislation governing the use of electric scooters. Healthcare policy makers should set up a Hong Kong-specific registry to assess our local circumstances. It is recommended that childhood injury prevention, especially for fire-related deaths, be given prime consideration in all policies involving children.

Author contributions

All authors contributed to the concept or design of the study, acquisition of the data, analysis or interpretation of the data, drafting of the manuscript, and critical revision of the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

As an editor of the journal, KL Hon was not involved in the peer review process. Other authors have no conflicts of interest to disclose.

Funding/support

This commentary received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

1. James SL, Lucchesi LR, Bisignano C, et al. Epidemiology of injuries from fire, heat and hot substances: global, regional and national morbidity and mortality estimates from the Global Burden of Disease 2017 study. *Inj Prev* 2020;26(Suppl 1):i36-45.
2. Choudhary SR, Jayaswal ON. Infant and early childhood mortality in urban slums under ICDS scheme—a prospective study. *Indian Pediatr* 1989;26:544-9.
3. Peck MD. Epidemiology of burns throughout the world. Part I: distribution and risk factors. *Burns* 2011;37:1087-100.
4. Forjuoh SN. Burns in low- and middle-income countries: a review of available literature on descriptive epidemiology, risk factors, treatment, and prevention. *Burns* 2006;32:529-37.
5. Hong Kong Childhood Injury Prevention Research Group. Childhood injury prevention in Hong Kong. *Hong Kong Med J* 1998;4:400-4.
6. Hon KL, Huang S, Poon WS, Cheung HM, Ip P, Zee B. Mortality and morbidity of severe traumatic brain injuries; a pediatric intensive care unit experience over 15 years. *Bull Emerg Trauma* 2019;7:256-62.
7. Hon KL, Leung TF, Cheung KL, et al. Severe childhood injuries and poisoning in a densely populated city: where do they occur and what type? *J Crit Care* 2010;25:175.e7-12.
8. Chan CC, Cheng JC, Wong TW, et al. An international comparison of childhood injuries in Hong Kong. *Inj Prev* 2000;6:20-3.
9. Lo C. Triple murder suspect arrested after Hong Kong mother and 2 young daughters killed in deadly lovers' quarrel. *South China Morning Post*. July 12, 2021. Available from: <https://www.scmp.com/news/hong-kong/law-and-crime/article/3140746/mother-and-two-young-daughters-killed-hong-kong-lovers>. Accessed 7 Sep 2021.
10. Lo C, Leung K. Four family members, including 2-year-old girl, killed in Hong Kong housing estate blaze after massage chair catches fire. *South China Morning Post*. April 16, 2021. Available from: <https://www.scmp.com/news/hong-kong/society/article/3129759/deadly-blaze-kills-four-hong-kong-public-housing-estate>. Accessed 7 Sep 2021.
11. Mok D. At least seven dead, several others critically injured as fire rips through flat in Hong Kong tenement building. *South China Morning Post*. November 15, 2020. Available from: <https://www.scmp.com/news/hong-kong/society/article/3109950/least-eight-hurt-fire-rips-through-flat-hong-kong-tenement>. Accessed 7 Sep 2021.
12. Leung K. Short-circuit from electric scooter suspected to be cause of fire at Hong Kong public housing flat.

- South China Morning Post. February 29, 2020. Available from: <https://www.scmp.com/news/hong-kong/society/article/3053009/short-circuit-electric-scooter-might-have-triggered-fire>. Accessed 7 Sep 2021.
13. Wick NA, Jaffe DM, Gnauck KA, Quayle KS. Childhood fire related death: socio-demographic influences • 463. *Pediatr Res* 1997;41:80.
 14. Randall B, Wilson A; Regional Infant and Child Mortality Review Committee. The 2008 annual report of the Regional Infant and Child Mortality Review Committee. *S D Med* 2009;62:471-3, 475-7.
 15. Waller AE, Marshall SW. Childhood thermal injuries in New Zealand resulting in death and hospitalization. *Burns* 1993;19:371-6.