**The STEP Safely guidelines: A catalyst to address the burden of falls in children and adolescents**

**Authors** order to be agreed, but please add your details

\* Margie Peden, Head Global Injury, The George Institute UK, Imperial College London, United Kingdom, Email: mpeden@georgeinstitute.org.uk,

Shanthi Ameratunga, Honorary Professor, Section of Epidemiology & Biostatistics, School of Population Health, Faculty of Medical & Health Sciences, University of Auckland, New Zealand. Email: s.ameratunga@auckland.ac.nz

Julie Mytton, Professor of Public Health, School of Health and Social Wellbeing, University of the West of England, Bristol, UK. Email: julie.mytton@uwe.ac.uk

Joanne Vincenten, Health Specialist, Child Injury Prevention and Environmental Health, UNICEF Headquarters, New York, USA
Email: jvincenten@unicef.org

Iris Wainiqolo, Senior Lecturer, Centre for Pacific Health, University of Otago, Dunedin, New Zealand. Email: iris.wainiqolo@otago.ac.nz

Prasanthi Puvanachandra, Injury Epidemiologist, The George Institute UK, Imperial College London, United Kingdom, Email: pattwood@georgeinstitute.org.uk

Caroline Lukaszyk, Technical Officer, Department of Social DeterminantS of Health, World Health Organization, Geneva, Switzerland, Email: lukaszykc@who.int

\* Corresponding author

Globally, falls caused an estimated 684,277 deaths in 2019 [1] and 36.4 million DALYs [2]. Although the majority of these are in older adults, they are also a leading cause of injury for children and adolescents (<19 years) accounting for more than 100 children dying every day or 38,000 every year [1]. Additionally, falls account for up to 56% of all injury-related hospital visits by children in less resourced settings [3] and are a top 10 cause of years lived with a disability for those 5-19 years [1]. The recently published *STEP Safely technical package* by WHO provides evidence for action – at primary, secondary, and tertiary prevention levels - on this important child and adolescent public health issue [4]. However, most evidence is from high-income countries and is not easily generalized to low-resourced settings where the greatest burden of childhood falls occurs.

All children fall – it’s a part of their development – but not all falls need to result in serious injury. Every child has the right to a healthy and safe environment - this includes settings that reduce risks of injurious falls. What is critical to understand to optimize prevention is the context in which these falls occur.

In Nepal, for example, most children live in rural communities where typical homes are two-storey wooden buildings with an open external staircase leading to a balcony running around the building. Play areas are informal, often on steeply terraced land, and many children will support family smallholdings, including climbing trees to cut leaves to feed buffalo. Falls from trees are the leading cause of spinal injury in Nepal [5].

In a population-based injury surveillance study in Fiji, falls accounted for 48% of injury admissions in childhood with fractures and head trauma being among the commonest types of injury [6]. Some of the strongest advocates for fall prevention interventions in this context were clinicians concerned about the unmet needs in health and trauma care, rehabilitation, education, disability and social support for children surviving these injuries.

In Uganda, falls account for 57% of all unintentional injuries among children. Most are the result of playing on and falling off double/triple bunk beds in crampedhomesteads or down inadequately covered pit latrines. Utilizing a Human Centered Design process, which puts end users at the centre of developing solutions to the challenges they face [7], work is being undertaken to develop a multipurpose playmat which absorbs the impact when children fall from beds.

The WHO STEP Safely technical package recommends several proven and promising interventions for children in three settings: home, school and sport/recreation (Table 1). Parent awareness of child falls risk can be increased through home safety education delivered through parenting programmes. Installing soft-fall surfaces below and around play equipment, alongside providing school-based teaching on safe falls techniques, are promising interventions in schools and playgrounds. Policies that ensure the use of protective equipment, such as helmets, can reduce fall injury risks during sports and activities. The notable lack of evidence-based interventions for preventing falls specifically among children in workplaces requires attention, especially given the diversity of work environments involved.

Over the coming months and years, WHO will increase its support for falls prevention. UNICEF has also raised its commitment to act on child and adolescent injuries – including falls prevention – through their current strategic plan [8]. Mainstreaming recommended and promising interventions can support the scale up and sustainability of falls prevention efforts – including programming and polices by governments. We encourage general practitioners, paediatricians, nurses and other health care workers who attend to children who have been injured in a fall to utilize the teachable moment to raise awareness among parents and caregivers and enable them to take preventive action or be referred to preventive services where these exist. Health providers can be powerful advocates for intersectoral action addressing safer environments (e.g., housing, schools, playgrounds and employment settings) and the wider social determinants of health (e.g., poverty alleviation, community support, access to education and healthcare). In addition, we call for more participatory and qualitative research to be conducted to better understand contextual issues around falls in less resourced settings so that locally owned, sourced and evaluated solutions can be developed and implemented.

In summary, through creating safe physical environments, underpinned by supportive legislation and informed by context-specific data, a holistic and evidence-based approach can be taken towards promoting safe and healthy development. All health care workers, those that see children in primary care as well as educators, caregivers and governments have a role to play in prevention and management.

**Table 1: Proven and promising interventions [4] to prevent or mitigate childhood falls**

|  |  |  |
| --- | --- | --- |
| **Setting** | **Intervention** | **Strength of intervention** |
| **Recommended** | **Promising** |
| In the home | Parental information about risks and risk reduction | ✓ |  |
| Parenting programme for vulnerable families | ✓ |  |
| Home visits and safety assessments |  | ✓ |
| Window guards, bars and childproof window locks in high-rise blocks |  | ✓ |
| Stair guards or gates |  | ✓ |
| Discourage baby walkers |  | ✓ |
| In school | Soft-fall surface playgrounds and playing fields |  | ✓ |
| Teaching martial arts-based fall techniques and exercises |  | ✓ |
| During sport & leisure | Policies requiring protective equipment such as helmets |  | ✓ |

**References**

1. *Global Health Estimates 2020: Disease burden by Cause, Age, Sex, by Country and by Region, 2000-2019*. 2020, World Health Organization Geneva, Switzerland.

2. James, S.L., et al., *The global burden of falls: global, regional and national estimates of morbidity and mortality from the Global Burden of Disease Study 2017.* Injury prevention, 2020. **26**(Suppl 2): p. i3-i11.

3. Hyder, A.A., et al., *Global childhood unintentional injury surveillance in four cities in developing countries: a pilot study.* Bull World Health Organ, 2009. **87**(5): p. 345-52.

4. *Step safely: strategies for preventing and managing falls across the life-course* 2021, World Health Organization: Geneva, Switzerland.

5. Willott, A., et al., *The demographics and traumatic causes of spinal cord injury in Nepal: an observational study.* Trauma, 2021. **23**(4): p. 330-337.

6. Naisaki, A., et al., *Fatal and hospitalised childhood injuries in F iji (TRIP P roject‐3).* Journal of Paediatrics and Child Health, 2013. **49**(1): p. 63-67.

7. Chen, E., et al., *Enhancing community-based participatory research through human-centered design strategies.* Health promotion practice, 2020. **21**(1): p. 37-48.

8. *UNICEF Strategic Plan 2022–2025*. 2022, UNICEF: New York, USA.