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Ministry of Health & Family Welfare
Government of India

National Strategy for prevention of unintentional injury

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Government of India

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World Health Organization
India

Disclaimer

National Strategy for Prevention of Unintentional Injury
ISBN :
Ministry of Health and Family Welfare , Government of India , Nirman Bhawan , Maulana Azad Road , New Delhi, India, 110011

The views expressed in this report are not necessarily those of the Ministry of Health and Family Welfare , Government of India, who commissioned the report as well as of the World Health Organization who provided technical guidance

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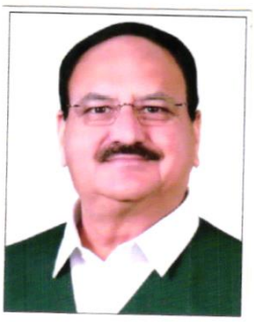

MESSAGE

The staggering number of unintentional injuries continues to pose a significant threat to public health and well-being in India. Every life lost, every injury sustained, represents a personal tragedy, and increases burden on families, and a drain on our healthcare resources.

The National Crime Records Bureau's report of 430,504 deaths from unintentional injuries in 2022 alone underscores the magnitude of this challenge. Furthermore, these injuries incur substantial economic costs, affecting both families and the healthcare system.

The path forward is clear i.e. **Prevention.**

By implementing a comprehensive National Strategy for the Prevention of Unintentional Injuries, we can significantly reduce the burden of injuries and create a safer India for all. This strategy, rooted in evidence-based practices and tailored to the specific needs of our population, will provide a roadmap for achieving this critical goal.

Such a National Strategy always requires a collaborative effort from all stakeholders. Public health officials, educators, community leaders, and individuals alike have a shared responsibility to translate these strategies into actionable steps at all levels.

Let us imagine and deliver a future where preventable injuries no longer impede our nation's progress and well-being. Let us empower communities with knowledge about safety and resources. A National Injury Prevention Strategy hopes to unfold the way for a brighter future.

I urge your unwavering support in the development and implementation of this vital strategy. Together, we can build a culture of safety and significantly reduce injury-related deaths and suffering in India.

(Jagat Prakash Nadda)

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स्वास्थ्य एवं परिवार कल्याण
व रसायन एवं उर्वरक
भारत सरकार

MINISTER OF STATE
HEALTH & FAMILY WELFARE
AND CHEMICALS & FERTILIZERS
GOVERNMENT OF INDIA

MESSAGE

Injuries are a major public health concern around the world. They cause a significant number of deaths and disabilities, placing a heavy burden on healthcare systems. Globally, nearly 8% of deaths and 10% of disability-adjusted life years are due to injuries.

In India, injuries have a devastating impact on young people and their families, causing immense financial strain. Road traffic injuries are the major cause of unintentional injuries in the country, followed by drowning, poisoning, falls and burns. To address this issue, we need effective strategies to prevent injuries. These strategies should involve everyone in society to significantly reduce preventable injuries, deaths, and disabilities.

The National Strategy for Prevention of Unintentional Injury unites various programs to lower injury-related mortality and morbidity burdens. This document assists and empowers stakeholders at every level to implement these strategies effectively. Let us join hands to make India a safer place. Working together, we can significantly decrease preventable injuries, lessen the burden on individuals and families, and ultimately build a healthier future for all Indians.

(Anupriya Patel)

June 27, 2024
New Delhi

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व
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भारत सरकार

MINISTER OF STATE
(INDEPENDENT CHARGE) OF
MINISTRY OF AYUSH AND
MINISTER OF STATE OF
MINISTRY OF HEALTH & FAMILY WELFARE
GOVERNMENT OF INDIA

MESSAGE

The majority of injuries are preventable. By implementing the strategies outlined in the National Strategy document, we can significantly reduce the number of deaths and disabilities caused by injuries in India.

Injuries are a major public health concern worldwide, claiming 4.4 million lives each year. These injuries are unintentional (accident) and intentional (violence-related). Unintentional injuries are the leading cause; accounting for 3.16 million deaths, while violence-related account for 1.25 lives a year. Unintentional injuries accounted for 430504 deaths and 170924 deaths were due to intentional injuries.

The National Strategy for Prevention of Unintentional Injury represents a crucial step towards reducing this burden. The document also outlines the risks associated with various injuries and provides concrete prevention strategies. This empowers the stakeholders at all levels- local, state, and regional to take effective actions. This document acts as a central platform, unifying existing programs aimed at achieving this goal.

It is pertinent to emphasize that the Government of India, under the dynamic leadership of Hon'ble Prime Minister Shri Narendra Modi ji and visionary guidance of Hon'ble Cabinet Minister for Health & Family Welfare Shri Jagat Prakash Nadda ji, is taking new initiatives to meet all the health needs of the people of India and is making all efforts to strengthen public health facilities across the States/UTs.

I urge all stakeholders to actively participate in implementing these strategies to create a safer India. By working together, we can significantly reduce the devastating impact of injuries.

सर्वे भवन्तु सुखिनः। सर्वे सन्तु निरामयाः।

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MESSAGE

In 2022 alone, a staggering 4,30,504 lives were tragically lost to accidental and avoidable deaths, representing an alarming 8.3% increase from the previous year. Road traffic accidents remain the leading culprit, accounting for 45.1% of all unintentional deaths, followed by drowning at 8.9%, falls (all types) at 5.5%, poisoning at 5%, and burns at 4.7%. Worryingly, over half of Indian States and Union Territories have accidental death rates exceeding the national average of 31.2 per 1,00,000 population.

While the statistics are alarming, these injuries are largely preventable with due precautions. The National Strategy for Prevention of Unintentional Injuries offers a critical roadmap to a safer India. This evidence-based strategy, grounded in a "safe system" approach, outlines practical steps tailored to the specific needs of our population.

The strategy empowers stakeholders across various sectors – public health officials, educators, community leaders, and individuals like yourself – to develop and implement effective interventions. By working collaboratively, we can create systemic change.

This comprehensive document is a result of the collaboration and dedicated work of stakeholders from across the nation. It paves the way for States to develop time-bound action plans at their local level. By actively implementing these strategies, we can collectively make India a safer place for all to live, work, and thrive.

I urge your unwavering support in promoting and implementing this vital strategy. Together, we can significantly reduce injury-related deaths and suffering in India.

Dated 20th June, 2024

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MESSAGE

Injuries are a leading global public health concern, claiming 4.4 million lives annually. Of these, unintentional injuries account for 3.16 million deaths. India too faces a significant challenge with unintentional injuries. According to National Crime Records Bureau (NCRB), India accounts for 430,504 deaths from unintentional injuries in 2022. Road traffic injuries are the leading cause (45.1%), followed by drowning (8.9%), poisoning (5%), falls (5.5%), and burns (4.7%).

Unintentional injuries have far-reaching consequences much beyond physical wounds and death. They can increase risk of mental health problems, and injured individuals are more likely to engage in unhealthy behaviors like smoking, alcohol abuse, and substance use. Preventing these injuries is crucial to achieve substantial health, social, and economic benefits throughout life. In India, the economic impact of injuries is significant, costing an estimated 0.29-0.69% of the nation's Gross Domestic Product (GDP).

Recognizing gravity of the situation, India has developed the National Strategy for Prevention of Unintentional Injury. This comprehensive strategy provides a detailed overview of unintentional injuries in the country, examining trends, risk factors, and the unique challenges faced by different regions. The strategy goes beyond simply providing information. It offers evidence-based and actionable interventions to guide injury prevention efforts at both national and state levels.

The National Strategy emphasizes importance of collaboration across various sectors and levels of government. By working together, stakeholders can develop and implement effective interventions to reduce injuries and their associated consequences. The strategy also provides technical guidance and targeted action plans, empowering diverse stakeholders to take ownership of injury prevention efforts.

The National Strategy prioritizes four key mechanisms of injury: road traffic crashes, drowning, burns, and falls from height. It also recognizes specific vulnerability of three population groups: workers, children, and older people. Tailoring intervention to address these priority areas will be crucial for achieving significant reductions in injuries. Strong advocacy, robust surveillance systems, and continuous capacity building are essential for successful implementation of this National Strategy. By prioritizing these areas, India can ensure that stakeholders have the required tools and resources to effectively address the challenge of unintentional injuries.

National Strategy for Prevention of Unintentional Injury represents a significant step towards a brighter future. This strategy has the potential to significantly reduce preventable injuries, deaths, and disabilities across the country.

(Atul Goel)

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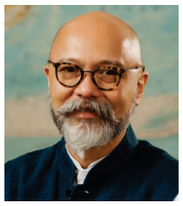

Message from WHO Representative to India

Injuries – both unintentional and violence-related – take the lives of 4.4 million people around the world each year and constitute nearly 8% of all deaths. Unintentional injuries account for 3.16 million deaths, while intentional injuries contribute to 1.25 million deaths each year. Globally, injuries are among the three major causes of death of individuals aged 5-29. India faces a particularly severe challenge with 430 504 deaths attributed to unintentional injuries in 2022 alone.

Beyond the immediate loss of life, unintentional injuries have far-reaching consequences. These incidents can lead to mental health issues and increased risk of substance abuse. Thus, it becomes crucial to prevent injuries to achieve substantial health, social and economic gains over the life-course.

Government of India's Ministry of Health & Family Welfare (MoHFW) has demonstrated exceptional leadership and unwavering commitment to public health by proactively addressing the pressing issue of unintentional injuries. The ministry has developed a robust National Strategy for Prevention of Unintentional Injury in collaboration with the World Health Organization (WHO) and diverse stakeholders. This evidence-based strategy provides actionable interventions to guide injury prevention efforts across all levels, highlighting the importance of intersectoral collaboration and whole-of-government approaches. Importantly, the national strategy is strategically aligned with numerous Sustainable Development Goal (SDG) targets including SDG 3.6 (road traffic deaths), SDG 8.8 (safe working environments) and SDG 11.5 (water-related disasters) among others.

The National Strategy for Prevention of Unintentional Injury represents a significant step towards prevention of deaths and disabilities due to injuries. The strategy focuses on four key injury types: road traffic crashes, drowning, burns, and falls. It also targets specific vulnerable groups such as workers, children, and older people. The interventions address priority areas crucial for achieving significant reductions in the injury burden. By prioritizing evidence-based interventions, fostering collaboration among various sectors, and building robust surveillance systems, the national strategy aims to significantly reduce the toll of unintentional injuries in India. This comprehensive approach is crucial for addressing the substantial health, social, and economic impacts of these preventable injuries.

We commend the Ministry of Health & Family Welfare for their dedication and foresight in developing a comprehensive framework for action to significantly reduce preventable injuries across the country.

Dr Roderico H. Ofrin
WHO Representative to India

Acknowledgements

The National Strategy for Prevention of Unintentional Injury is a national document consummated through a team of experts and institutions with National and International collaboration. I express my special gratitude to Prof (Dr) Atul Goel, Director General, Dte.GHS, Ministry of Health and Family Welfare, Government of India, for encouraging and guiding us with the challenging task of bringing out the first-ever National Strategy for Prevention of Unintentional Injury.

I wish to thank the World Health Organization (WHO), India for their productive contribution and generous support including organizing the Consultation Workshop to finalize the National Strategy for Prevention of Injury. I express my sincere gratitude to the WHO India Office, particularly to Dr Rodrico Ofrin, Dr Tashi Tobgay, Dr Yutaro Setoya, Dr Mohammed Asheel B, and Dr Sushma Adappa.

I am grateful and thank Dr Tanu Jain for her immense contribution to getting individuals on a single platform and finalizing this strategy. I am also grateful to Dr Jagnoor Jagnoor for her immense contributions through several iterations.

I sincerely acknowledge and thank all the contributors from prominent institutes for their multi-disciplinary expertise and valuable inputs in finalizing the strategy.

Last, but not least, I thank our team members Dr Manas Pratim Roy and all other staff for their hard work and dedication. I deeply appreciate every member of this team for showing relentless effort in developing this national strategy.

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Abbreviations

AED	Automated External Defibrillator
ANM	Auxiliary Nurse Midwives
ASHA	Accredited Social Health Activist
BIS	Bureau of Indian Standards
CDC	Centers for Disease Control
CHO	Community Health Officers
CMVR	Central Motor Vehicles Rules
CPR	Cardiopulmonary Resuscitation
DALY	Disability Adjusted Life Years
DDMA	District Disaster Management Authority
DoE	Department of Education
EMS	Emergency Medical Service
EMT	Emergency Medical Technicians
FFH	Falls from height
FFL	Fall and fracture liaison
GBD	Global Burden of Disease
GDP	Gross Domestic Product
GNP	Gross National Product
HIC	High-Income Countries
ICOPE	Integrated Care of Older Persons
IEC	Information Education Communication
IHF	Intentional High Falls
ILO	International Labor Organization
IPC	Indian Penal Code
IVA	Inland Vessels Act
LASI	Longitudinal Aging Study in India
LMICs	Low-Middle Income Countries
LSGD	Local Self Government Department
MBBL	Model Building Bye-Laws
MCCD	Medical Certification of Cause of Death
MoC&F	Ministry of Chemicals and Fertilizers
MoE	Ministry of Education
MHA	Ministry of Home Affairs
MoHFW	Ministry of Health and Family Welfare
MoHUA	Ministry of Housing and Urban Affairs
MoJS	Ministry of Jal Shakti
MoL&E	Ministry of Labour and Employment

MoRTH	Ministry of Road Transport and Highways
MSA	Merchant Shipping Act
MSIHC	Manufacture, Storage, and Import of Hazardous Chemicals
MVA	Motor Vehicle Act
MVAA	Motor Vehicle Amendment Act
NABI	National Association of Professionals involved in Burn Care in India
NALSA	National Legal Services Authority
NBC	National Building Code
NCRB	National Crime Records Bureau
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NGO	Non- Governmental Organisation
NISS	National Injury Surveillance System
NMHP	National Mental Health Programme
NPHCE	National Programme for the Health Care of Elderly
NPPMT&BI	National Programme for Prevention and Management of Trauma & Burns Injuries
OOPE	Out of Pocket Expenditure
OSH	Occupational Safety and Health
PHC	Primary Health Centre
PPE	Personal Protective Equipment
PWD	Public Works Department
RTC	Road Traffic Crashes
RTI	Road Traffic Injuries
SDMA	State Disaster Management Authority
SEAR	Southeast Asia Region
SOP	Standard Operating Procedures
SRS	Sample Registration System
STEADI	Stopping Elderly Accidents, Deaths, and Injuries
UHF	Unintentional High Falls
UNICEF	United Nations International Children's Emergency Fund
VHSNC	Village Health, Sanitation, and Nutrition Committee
VRU	Vulnerable Road Users
WCD	Women and Child Development
WHO	World Health Organization
WHOCCET	WHO Collaborating Centre for Emergency and Trauma Care
YLD	Years Lived with Disability
YLL	Years of Life Lost

Glossary

Burn injury is any injury to tissues of the body caused by hot liquids, objects, or flames, and contact with hot objects, electricity, chemicals, radiation, or friction from a fast-moving object.

Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid. This may result in a fatal or non-fatal outcome.

Fall is an unexpected event in which the person comes to rest on the ground, floor, or lower level. High fall is used in this document to denote any fall above 10 feet.

Fatal injury is a personal injury resulting in the death of the injured person.

Injury is physical damage that results when a human body is suddenly subjected to energy in amounts that exceed the threshold of physiological tolerance.

Intentional injuries are the occurrence of an event with identifiable intent to cause harm to oneself and others.

Mortality is the incidence of death in a population. It describes the proportion of deaths in a specified population over a period of time attributable to different causes.

Non-fatal injuries are injuries that don't have a high probability of death.

Occupational injury is defined by the International Labour Organization (ILO) as any personal injury, disease or death resulting from an occupational accident.

Preventable death is defined as causes of death that can be mainly avoided through effective public health and primary prevention interventions.

Unintentional injuries are occurrences of the event in the absence of predetermined intent.

Executive summary

Injuries represent a significant global public health crisis, claiming 4.4 million lives annually. Of these, unintentional injuries account for 3.16 million deaths, while intentional injuries contribute to 1.25 million deaths each year. The burden of injuries is particularly heavy in India, where the National Crime Records Bureau (NCRB) reported 430,504 deaths from unintentional injuries and 170,924 from intentional injuries in 2022 alone. Road traffic injuries (RTIs) constitute the leading cause of unintentional injuries in the country, accounting for 45.1% of cases, followed by drowning (8.9%), poisoning (5%), falls (5.5%), and burns (4.7%). The economic impact of injuries in India is substantial, estimated to cost 0.29-0.69% of the nation's Gross Domestic Product (GDP). Moreover, the average out-of-pocket expenditure (OOPE) for hospitalization and follow-up care for injuries reaches USD 446.5, placing an additional financial burden on individuals and families. Fall injuries are a particular concern among the elderly population, with a mortality rate of 7.7 per 1,000 individuals (LASI I). This issue is projected to intensify as the proportion of older people in India is expected to triple to 319 million by 2050, according to the 2011 Census.

This document provides a comprehensive overview of unintentional injuries in India, examining trends, risk factors, gaps, and challenges. It also delves into state-specific data on injury and death rates, offering insights into the unique circumstances faced by different regions. A national strategy for injury prevention is outlined, emphasizing evidence-informed interventions based on a safe system approach tailored to the Indian context. This strategy aims to guide stakeholders across sectors and levels in collaborative efforts to reduce injuries and their associated consequences. Strong advocacy, robust surveillance systems, and capacity building at various levels are crucial components of this strategy.

While the document prioritizes four key injury mechanisms—road traffic injuries, drowning, burns, and falls from heights—and three priority populations—workers, children, and older people—it acknowledges the importance of state-level understanding of local injury trends. By tailoring interventions to specific regional contexts, stakeholders can more effectively address the unique challenges posed by unintentional injuries and work towards achieving the desired outcome of reducing preventable injuries, deaths, and disabilities in India.

Section 1A

National Strategy for Prevention of Unintentional Injury

i) Purpose of the document

This document outlines India's National Strategy for Preventing Unintentional Injuries, providing evidence-informed or consensus-based, actionable strategies to guide interventions at both national and state levels. The framework aims to accelerate injury reduction efforts by offering technical guidance and targeted action plans to empower various stakeholders in preparing and implementing detailed action plans. States are encouraged to conduct baseline assessments to determine their current status, allowing them to tailor the proposed strategies to their specific needs and priorities.

ii) Vision, mission, and guiding principles

Vision
An India where every individual thrives in a safe environment, free from the disruptive impact of serious unintentional injuries.

Mission
To cultivate a national culture of safety by establishing a robust and inclusive injury prevention ecosystem that empowers all levels of society to eliminate preventable injuries through a collaborative safe system approach.

Objectives
Achieve a 30% reduction in the comprehensive injury burden by 2030, including a 30% reduction in fatalities, a 30% reduction in hospitalisations, and 30% reduction in the burden associated with disabilities due to injuries.

Guiding principles
1. Ensure equitable access to safety promotion, injury prevention, and protection for all.
2. Foster multi-sectoral collaboration through partnerships across sectors and system levels.
3. Implement evidence-informed, contextually relevant interventions focused on availability, accessibility, acceptability, and quality.
4. Establish a responsive evaluation and capacity development system to sustain the effectiveness of the strategic framework.

iii) Major recommendations
1. Review and strengthen injury prevention laws, prioritizing enforcement and enacting new legislation, as needed.
2. Allocate dedicated and sustainable funding for injury prevention initiatives across various levels.

3. Empower communities and engage cross-sector partners in injury prevention efforts.
4. Promote injury prevention awareness through a designated safety week.
5. Foster a safer environment throughout the life-course to prevent injuries.
6. Integrate emergency and injury care throughout the health system, from on-site response to hospital treatment.
7. Develop robust infrastructure within public and private institutions for injury management.
8. Expand capacity building and training in injury prevention and management.
9. Equip schools with first aid and emergency response training for injuries.
10. Establish a National Injury Surveillance System (NISS) and enhance existing data collection.
11. Support collaborative research to inform evidence-based injury policymaking.

The document outlines a road safety philosophy called the Safe System Approach which we have adopted to prevent unintentional injuries. The safe system approach takes a comprehensive view, recognising that humans make mistakes. The element of the approach includes safe people, safe environment, and product safety.

The document is divided into two sections.

- Section 1(A-H) gives insights on various unintentional injury strategies, and
- Section 2 includes the annexures which show successful state-level initiatives as additional reference.

Section 1 A also gives us an overview on the major recommendation in Figure 1 and strategies of various injuries are given in Table 1 below.

Figure 1: Safe Systems approach for prevention of injury in India.
*This provides a **'Birdseye view'** of all strategy recommendations, with more details in the annexures.*

Table 1: Overview: National Strategy for Prevention of Unintentional Injury.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Road safety **Section 2A**	**A1.1**: Review and strengthen road safety laws prioritising enforcement and enacting new legislation if indicated. **A2.1.** Enforce laws to prevent encroachment of roads, pavements, and buffer area.	**A1.2.** Improve and strengthen awareness in the public to ensure safe road user behaviour. **A1.3.** Strengthen behaviour change initiatives in the community in collaboration with the NGOs, associations of drivers and other stakeholders. **A3.1.** Create awareness on safety of vehicles.	**A1.4.** Create a skilled workforce including first responders to ensure essential prehospital care. **A1.5.** Strengthen facility-based emergency care at various levels. **A1.6.** Establish effective post-crash response and strengthen public health departments to manage road traffic injuries. **A3.2.** Encourage and promote safe designs/redesigns and technologies to enhance vehicle safety.	**A2.2.** Improve and strengthen planning, designing, and construction of safe road networks to reduce road fatalities and benefit road users in collaboration with MoRTH. **A4.1.** Strengthen coordinating mechanisms to facilitate multisectoral collaboration and promote accountability at National/ Sub-national levels. **A5.2.** Plan and conduct translational research to promote road safety in the country.	**A5.1.** Strengthen technical capacity and resources for data systems to measure, map and monitor road injury burden at all levels.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Drowning **Section 2B**	**B1.1** Enforce and strengthen laws to ensure the safety of people during recreational activities and while using ferries**.** **B3.1.** Encourage water transport safety for large and small vessels.	**B1.2.** Increase and improve awareness among the community/ schools/parents/ fisher/ vessel operators about water safety. **B2.2.** Promote safe practices for the utilisation of water for drinking, sanitation, and hygiene	**B1.3.** Constitute and maintain skilled personnel and cross-train a multidisciplinary prevention team to respond to emergencies. **B1.4.** Strengthen public health departments to provide emergency care, psychosocial support, and rehabilitation to handle drowning-related incidents. **B2.1.** Create a safe and accessible environment to reduce risk from water-related activities.	**B4.1.** Empower communities and enhance multi-sectoral collaboration among stakeholders to promote drowning safety. **B5.2.** Implement research to identify evidence-based strategies and measure progress toward drowning prevention.	**B5.1.** Establish a standardised data surveillance tool and integrate assessment/ audits to evaluate interventions across all levels.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Burns **Section 2C**	**C1.1.** Enhance policy implementation on burn-related injuries, and increase the capacity of concerned government officials to roll out burn regulations.	**C1.2.** Promote awareness on burn injuries among the general/vulnerable population during festivals.	**C1.3.** Empower teachers and health care professionals on burn prevention. **C1.4.** Establish and sustain adequate infrastructure and skillful multidisciplinary teams to reduce mortality, morbidity, and disability associated with burns. **C3.1.** Promote the use of safe equipment and redesign equipment to improve safety standards.	**C2.1.** Convene strong cross-sector participation in active planning and implementing prevention measures to promote a safe environment. **C4.1.** Empower communities and increase opportunities for collaborative burn injury prevention measures among various stakeholders. **C5.2.** Conduct research activities to provide scientific information on the burden, associated risks, and interventions towards burn injuries.	**C5.1.** Establish a national burn registry mechanism to collect, compile and analyse data related to burn injuries in the country.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Falls from height. **Section 2D1**	**D1.1.1.** Reinforce existing laws and policies to achieve behavioural and environmental change for safety. **D1.3.1:** Encourage the use of safe equipment and improve safety by periodic checks.	**D1.1.2.** Build resilience among the public/ workers/parents on dangerous hazards leading to fatal falls/ injuries.	**D1.1.3.** Create a skilled workforce to address uneventful circumstances at work sites and schools. **D1.1.4.** Strengthen public health departments to provide first aid/referral and management due to fall from heights. **D1.2.1.** Strengthen and create safe environment measures to eliminate fall-related hazards.	**D1.4.1.** Empower communities and enhance multi-sectoral collaboration among stakeholders to promote safety. **D1.5.2.** Conduct research activities to provide scientific evidence on the burden, associated risks, and interventions of injuries from heights.	**D1.5.1.** Establish a registry to collect data on injuries due to fall from heights in the country.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Fall at the same level – older people. **Section 2D2**	**D2.1.1.** Reinforce laws, policies or guidelines that demand best practices to promote fall safety in older people.	**D2.1.2.** Strengthen awareness and improve knowledge among older people and caregivers to make safer choices in preventing falls.	**D2.1.3.** Strengthen and maintain public health centers with appropriate resources to manage issues/ injuries of older people efficiently at all levels. **D2.3.1.** Enable opportunities to enhance mobility using assistive devices.	**D2.2.1.** Involve multi-stakeholders and make the environment more user-friendly to focus on fall safety in older people. **D2.4.1.** Support and engage community/hospitals for implementing activities/ programmes to focus fall prevention among older people. **D2.5.2.** Promote research by multi-sectoral collaborations and develop interventions to prevent injuries among older people.	**D2.5.1.** Create and strengthen the surveillance system to collect injury-related data among older people.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Occupational Injury **Section 2E**	**E1.1.** Reinforce laws to promote work safety measures in organised sectors and enforce policies or guidelines for safety of workers in unorganised sectors. **E3.1.** Promote the use of safe aids and enhance the safe design of machines in both organised and unorganised sectors.	**E1.2.** Build awareness of workplace-related hazards and improve knowledge of safe work practices in the community/workers.	**E1.3.** Create a skilled workforce to address uneventful circumstances at work sites in both organised and Un-organised sectors. **E1.4.** Establish occupational health clinics and strengthen public health departments to manage occupational-related injuries**.** **E2.1.** Identify and assess hazards to promote occupational safety in both organised and unorganised sectors.	**E4.1.** Support communities and involve multi-stakeholders to promote safety and health among workers in both sectors. **E5.2**. Implement research activities to provide scientific evidence of hazards/injuries, and plan interventions for occupational safety.	**E5.1.** Create a surveillance system to report occupational injuries in the country.

Domain					
Injury mechanism	**Policy** 	**Community driven initiatives** 	**Interventions/programmes** 	**Intersectoral collaborations** 	**Surveillance system** 
Child Injury **Section 2F**	**F1.1.** Enforce, reinforce laws to ensure the safety of children.	**F1.2**. Empower parents and improve awareness in the public on prevention of various child injuries. **F2.3**. Build a safe environment for children at home.	**F1.3.** Integrate safety education: Injury prevention and first aid in school syllabus. **F1.4**. Build a multidisciplinary team to combat injury related burdens. **F2.1**. Enhance road network for child safety. **F2.2.** Create a safe and accessible environment to reduce risk from water-related activities and promote safe practices among children. **F2.4.** Build a safe environment to eliminate fall-related hazards. **F3.1**. Promote safe designs/ redesigns and technologies to enhance vehicle safety for children. **F3.2**. Ensure the use of safe equipment and improve the safety of children.	**F4.1**: Support and involve multi-stakeholders to promote safety of children from various injuries and empower the community**.** **F5.2:** Plan and conduct translational research to promote child safety.	**F5.1:** Create a surveillance system to report injuries including children.

Section 1B

Introduction to injuries

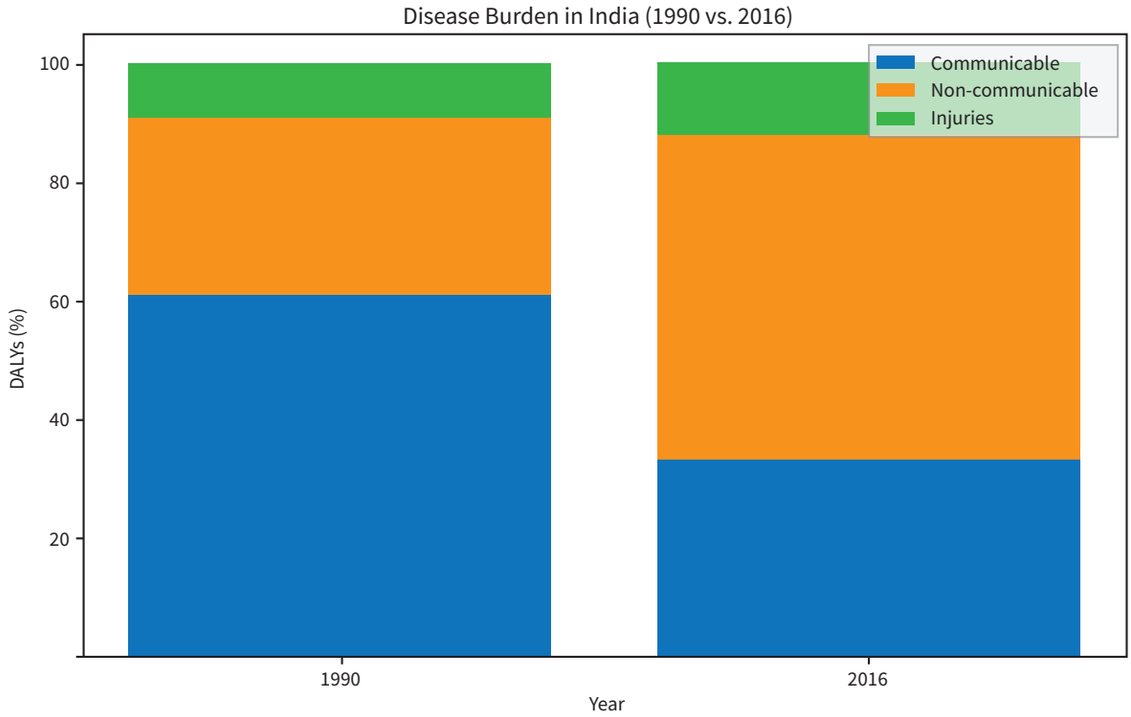
i) Background

The epidemiological profile of disease burden has evolved over the last three decades, globally. Over the years 1990-2016, in tandem with social and economic development in India, there has been an epidemiological transition for communicable diseases, non-communicable diseases, and injuries. Over the last two decades, there is a two-fold decrease in the disability adjusted life years (DALYs) of total disease burden due to communicable diseases, however nearly a two-fold increase in the DALYs of non-communicable diseases, and a minimal increase in DALYs of injuries. So, it is noted there is a double burden of disease in recent years.

Figure 2: Disease burden in India[1]

Injuries take lives of 4.4 million people globally year each year and constitute nearly 8% of all deaths. The disease burden in India is:

- **DALYs for communicable, non-communicable, and injuries were 61%, 30%, and 9% respectively in 1990.**
- **DALYs for communicable, non-communicable, and injuries were 33%, 55%, and 12% respectively in 2016.**



1. Indian Council of Medical Research, Public Health Foundation of India and Institute for Health Metrics and Evaluation. India: Health of the Nation's States- The India State-level Disease Burden Initiative. New Delhi,2017.

Globally, 3.16 million deaths and 1.25 million deaths occur annually due to unintentional and violence-related/intentional injuries[2]. The leading causes of injuries are RTIs, falls, drowning, burns, and poisoning. Three of the top five causes of death are injury related in the age group of 5-29 years[2]. Hence, in addition to fatalities and physical injuries, early exposure to trauma can heighten the risk of mental illness and predispose individuals to various behavioural risks, such as smoking, alcohol, and substance abuse[1]. Thus, it becomes crucial to prevent injuries that contribute to substantial health, social, and economic gains over the life course. Subsequently, global efforts are directed towards attaining the United Nations Sustainable Development Goals (SDGs), with a primary focus on the health and well-being of the individual. Likewise, in India, the Ministry of Health and Family Welfare (MoHFW) is working towards accomplishing these goals.

Figure 3: Injury and Sustainable Development Goals

Injury and sustainable development goals:
SDG 3.2: By 2030, end preventable deaths of **newborns** and **children under 5 years of age.** **SDG 3.6** targets to **halve the road traffic deaths and injuries** across the world by 2030. **SDG 3.8** focuses on **achieving universal health coverage** for all the essential health services including emergency services.
SDG 8.8: Protect labor rights and **promote safe and secure working environments** of all workers, including migrant workers, particularly women migrants, and those in precarious employment.
SDG 10.7: Facilitate **orderly, safe, regular, and responsible migration and mobility** of people, including through the implementation of planned and well-managed migration policies.
SDG 11.1: By 2030, ensure access for all to **adequate, safe, and affordable housing** and basic services and upgrade slums. **SDG 11.2:** By 2030, provide access to **safe, affordable, accessible, and sustainable transport systems for all,** notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older person. **SDG 11.5**: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by **disasters,** including **water-related disasters,** with a focus on protecting the poor and people in vulnerable situation.

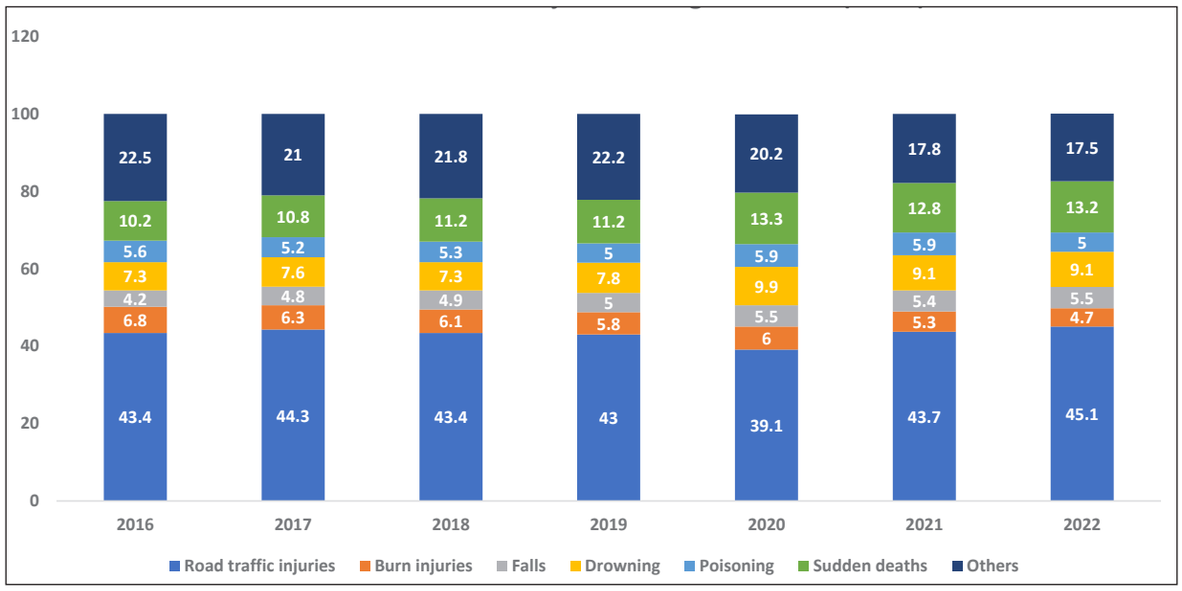
ii) Indian scenario

According to the National Crime Records Bureau (NCRB) 2022, India accounts for 430,504 deaths due to unintentional injuries and 170,924 deaths due to intentional injuries. Over the years, there has been a gradual increase in deaths due to unintentional injuries and

2. World Health Organization, Key facts -Injuries and violence: available at https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence

intentional injuries. However, there was a marginal decrease for deaths due to unintentional injuries during 2020 and 2021.

Figure 4: Trend of unintentional injuries during 2016-2022 (NCRB)



Road traffic injuries were reported as the major cause of unintentional injuries which accounted for approximately 45.1% in 2022 with minimal changes over the years. Both drowning and falls have minimally increased from 2016-2022, 7.3-9.1 and 4.2-5.5 respectively. However, burns and poisoning have reduced over these years[3].

More than 3/4th of deaths due to unintentional injuries were seen in persons above 18 years to below 60 years and approximately 1/4th of deaths is seen in vulnerable age groups of below 14 years and above 60 years. Therefore, a special mention of the strategies to prevent child injuries and injuries in older people is included in the document.

The rates of unintentional injury deaths were highest in Ladakh (78.7), Puducherry (65.7), Chhattisgarh (56.4), Haryana (53.5), Maharashtra (53), Andaman and Nicobar Islands (51.8), and more than half of the states/UTs were above the National average of 32.1[3].

Injuries are the primary cause of death in the country's economically productive age group of 15-29 years and the second leading cause of death in the age above 5 years[4]. The burden of injuries is catastrophic, as mentioned by most studies where the cost of injuries accounts for 0.29%-0.69% of the GDP and median Out-Of-Pocket Expenditure (OOPE) incurred, including hospitalisation and follow-ups in India is USD 446.5[5,6]. However, research from 2016 on the economic burden of hospitalisation owing to injuries states that OOPE due to hospitalisation was USD 388 for RTI and USD 369 for non-RTIs[5]. Hence, preventive strategies must be adopted to reduce the OOPE and productivity loss.

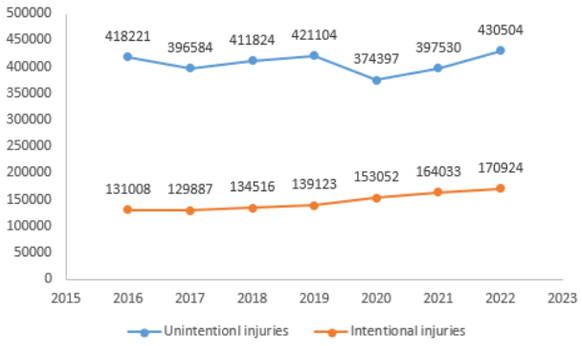
3. National Crime Records Bureau (NCRB): Available at: National Crime Records Bureau (ncrb.gov.in)
4. Mohan, D.; Anderson, R. Injury Prevention and Control: International Course on Injury Prevention and Control; TRIPP: New Delhi, India, 2000
5. World Health Organization. Global Health Estimate: Deaths by Age, Sex and Cause. 2014. Available online: http://www.who.int/healthinfo/global_burden_disease/estimates/en/index1.html (accessed on 29 September 2022).
6. Prinja S, Jagnoor J, Chauhan AS, Aggarwal S, Nguyen H, Ivers R. Economic Burden of Hospitalization Due to Injuries in North India: A Cohort Study. Int J Environ Res Public Health. 2016 Jul 2;13(7):673. doi: 10.3390/ijerph13070673. PMID: 27384572; PMCID: PMC4962214

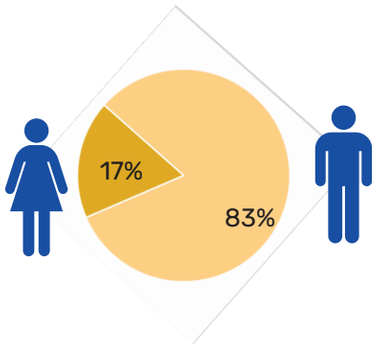
Figure 5: Statistics of injuries in India

INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

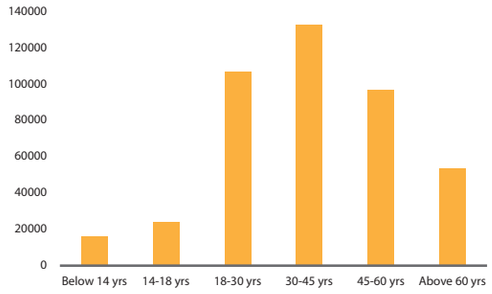
There were 430,504 deaths from unintentional injuries and 170,924 deaths due to intentional injuries in India in 2022. From 2016 to 2022, there has been a marginal increase in deaths due to unintentional and intentional injuries.

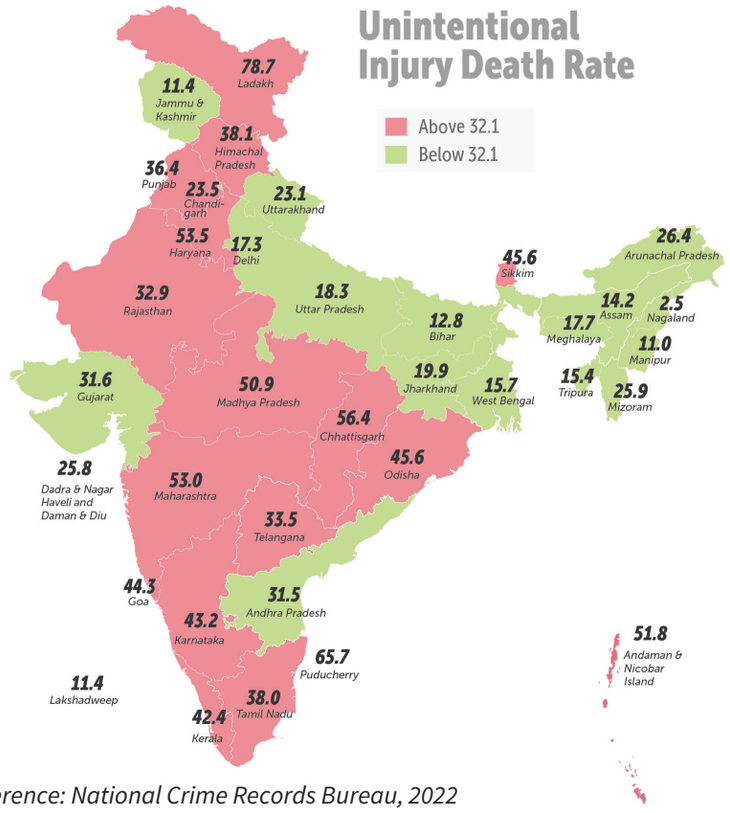




AGE-WISE BURDEN

Majority of deaths due to unintentional injuries are in persons above 18 years to below 60 years and ≈ 1/4th deaths are in vulnerable age groups of below 14 years and above 60 years.





Reference: National Crime Records Bureau, 2022

MAJOR CAUSES

Road Traffic Crashes

RTCs are the highest cause of unintentional injuries (≈45.1% of all injuries, 2022). Other injuries:

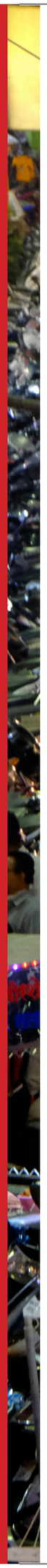
Drowning
7.3% to 9.1%

Falls
4.2% to 5.5%

Poisoning
5.6% to 5.0%

Burns
6.8% to 4.7%

Prevention of road traffic injuries

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Section 2A

Prevention of road traffic injuries

i) Background

Globally, RTIs are a devastating public health crisis, causing between 20 and 50 million non-fatal injuries and nearly 1.19 million deaths each year. Disproportionately affecting Low- and Middle-Income Countries (LMICs), RTIs account for 92% of fatalities despite these countries having only 60% of the world's vehicles. Sadly, RTIs are the leading cause of death for children and young adults aged 5-29 years. Vulnerable Road Users (VRUs), including pedestrians, cyclists, and motorcyclists, bear a significant burden, accounting for more than half of all RTIs[7].

As per the Global Status Report on Road Safety 2023, analysis of fatalities reveals that of those killed, 30% are occupants of four-wheeled vehicles, 23% are pedestrians, 21% are powered two and three-wheeler users, 6% are cyclists, and 3% involve e-scooters[8]. Road traffic injuries contribute to 2.87% of Disability-Adjusted Life Years (DALYs) and 1.96% of Years Lived with Disability (YLDs) as per the Global Burden of Disease (GBD) report of 2019. The economic impact is severe, with RTI costs reaching 3% of the GDP of most countries[9]. It is projected that by 2030, deaths due to RTIs will be the seventh leading cause, if necessary, action is not taken.

ii) Global and regional response to RTI

The Global Plan for the Second Decade of Action for Road Safety (2021-2030) aims to achieve a critical goal: halving the global number of deaths and injuries due to RTIs by 2030. This ambitious plan emphasises the safe system approach. The WHO, in partnership with UN regional commissions and UNRSC partners, spearheads this global effort and collaborates with national and international stakeholders for effective policy, implementation and evaluation in road safety. The WHO plays a vital role with its ongoing release of road safety guidelines. A notable example is 2017's 'Save LIVES: a road safety technical package', which focused on crucial measures such as speed management, road infrastructure design, vehicle safety, enforcement of laws, and emergency post-crash care. Despite these efforts, the Global Status Report on Road Safety 2023 reveals a shortfall in meeting the targets of the UN Decade of Action Plan. Progress has been made, but more work is urgently needed. Worryingly, the Southeast Asia region has seen the least progress, with only a 2% decline in road deaths since 2010[8].

7. WHO. Road Traffic Injuries. Key facts [Internet]; 2022 [updated on 18th December 2023]. Available from https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries
8. WHO. Global status report on road safety,2023. Available from https://www.who.int/publications/i/item/9789240086517
9. GBD data tool [Internet]. Institute for Health Metrics and Evaluation: University of Washington; 2019 [accessed on 6th Nov 2022]. Available from https://vizhub.healthdata.org/gbd-compare/

iii) Situational assessment

As per a MoRTH report, decadal trends reveal that there is minimal increase in fatalities. It is noted there were 1,34,513 and 1,68,491 deaths in 2010 and 2022 respectively due to RTI in these years. The population in India has also increased from 1.21 billion to 1.37 billion during 2010-2022 respectively. There is increase in decadal fatality rate of 11.1 -12.3 per 1 lakh population over these years.

Injuries and fatalities from RTIs place a significant economic burden on individuals, families, and the nation. India's death rate of 15 per 100,000 directly affects productivity and contributes to an estimated 5.7 million YLDs and 15.5 million DALYs[9]. To effectively address this issue, standardized injury data collection throughout India is crucial. Currently, a lack of uniformity in hospital records limits the development of targeted prevention strategies. While road safety legislation exists, the WHO's 2023 Global Status Report emphasizes the need for stricter enforcement to achieve a significant reduction in fatalities.

India as a nation is working towards attaining the SDG goals. The road safety scenario in our nation is alarming, and its societal costs are estimated to be phenomenal[10]. The WHO Road Safety Status Report reveals a 15% surge in fatalities, climbing from 1.34 lakh in 2010 to 1.54 lakh in 2021. According to the IIT Delhi and DMITS consortium commissioned by MoRTH, the total socio-economic cost of road fatalities reported by India in 2018 was Rs 1,47,114 crores, equivalent to 0.77% of the nation's GDP.[1] This problem is most likely to increase if immediate actions are not initiated.

In 2017, the Government of India initiated National Programme for Prevention and Management of Trauma and Burn Injuries (NPPMTBI). The NPPMTBI, is an attempt to mitigate the burden, and working for establishing a network of trauma care facilities to reduce the incidence of preventable deaths, with an emphasis on establishing pre-hospital, hospital, and post-hospital care**.** The MoHFW has supported 196 hospitals/medical colleges for setting up of trauma care facilities so far (Level I, II and III) across the country.

However, the traffic on roads in India is highly heterogeneous, consisting of pedestrians, bullock carts, bicycles, rickshaws, motorized two-wheelers, cars, buses, trucks, etc. In the past few years, India showed disquieting trends in fatalities due to RTI. According to the latest report by MoRTH, a total of 4,61,312 road accidents were reported in 2022, which included 1,68,491 fatalities and 4,43,366 injuries[11]. A significant increasing trend in mortality has been seen between 2016 to 2019. However, there was decrease in trend in 2020 which was attributed to COVID pandemic and underreporting of data. But morbidity due to RTI declined significantly from 2016-2019, but this positive trend was reversed in 2022[11].

Despite efforts to improve road safety, India continues to grapple with a high number of fatalities due to RTIs. The mortality ratio remains constant at approximately 86% for males and 14% for females. Over-speeding is the leading cause of these deaths, accounting for a staggering 75.2% of fatalities. Other major contributing factors include driving on the wrong side of the road (5.8%) and driving under the influence of alcohol or drugs (2.5%)[11]. These traffic violations highlight the need for stricter enforcement and public awareness campaigns. States like Uttar Pradesh, Tamil Nadu, Maharashtra, Madhya Pradesh, and Karnataka reported the highest number of RTI deaths in 2022, contributing 13.41%, 10.61%, 9.03%, 7.96%, and

10. A Verma, S. Velumurugan, N Chakrabarty and S Srinivas. Current Science. 2011 May 10; 100(9): 1373-1385.
11. Road Accidents in India. Ministry of Road Transport & Highways.2019. Available from https://morth.nic.in/road-accident-in-india

6.94% of the national total, respectively. However, death rates per lakh population reflect slightly different picture. Here, Tamil Nadu (23.38%), Ladakh (20.81%), Telangana (20.01%), Chhattisgarh (19.70%), and Karnataka (17.47%) rank highest[11], indicating a need for targeted interventions in these regions.

Analysis of RTIs reveal a significant disparity in mortality rates based on location. Rural areas bear the brunt of RTI fatalities, with a staggering 67.8% of deaths occurring there compared to 32.2% in urban areas[11]. Furthermore, the data suggests that open areas and residential zones might be particularly dangerous, with potentially higher fatality rates compared to other locations. Addressing this geographical disparity is crucial for improving overall road safety in India.

National Highways, which have a share of only 2.1% of total road length, account for the maximum number of road fatalities and are responsible for 45 lives per 100 Km in 2022 (Table 2).

Table 2: Road-category wise accident cases and fatalities in every 100km during 2022.

Type of Road	Length of road (in km)	Road accident cases	Total no. of deaths	Cases per 100km	Deaths per 100km
National Highways	1,32,499*	1,36,122	59,673	103	45
State Highways	1,79,535*	1,06,155	42,003	59	23
Other Roads	60,19,723*	2,04,491	62,424	03	01

**Source: Road Accidents in India – 2022, Ministry of Road Transport and Highways.*

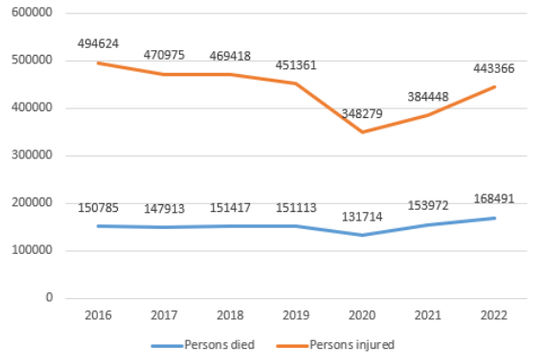
Studies indicate that high burden of road injuries and fatalities can be attributed to the non-usage of safety devices such as helmets and seat belts[11]. The drivers had the highest road fatalities and injuries due to non-wearing of helmets, and passengers had the highest injuries due to non-wearing of seat belts[11]. The Sec 129 of the Motor Vehicle Act (MVA), 2019, mandates the use of safety harness on motorcycle as well Sec 194 B ensures use of child restrains among the children.

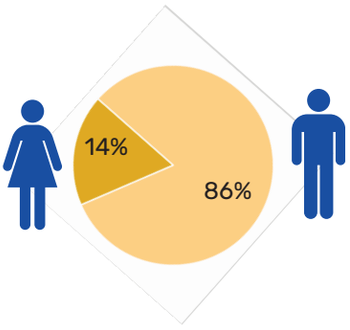
Figure 6: Statistics of road traffic injuries in India

ROAD TRAFFIC CRASHES IN INDIA

CURRENT STATISTICS (2016-2022)

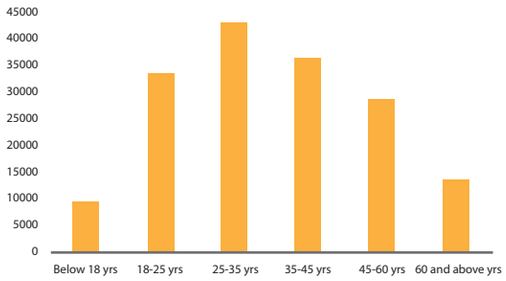
There were 168,491 deaths and 443,366 injuries from road traffic crashes in 2022. From 2016 to 2022, there was a dip in the number of deaths in 2020, post which there has been a steady increase. The number of injuries has slightly increased

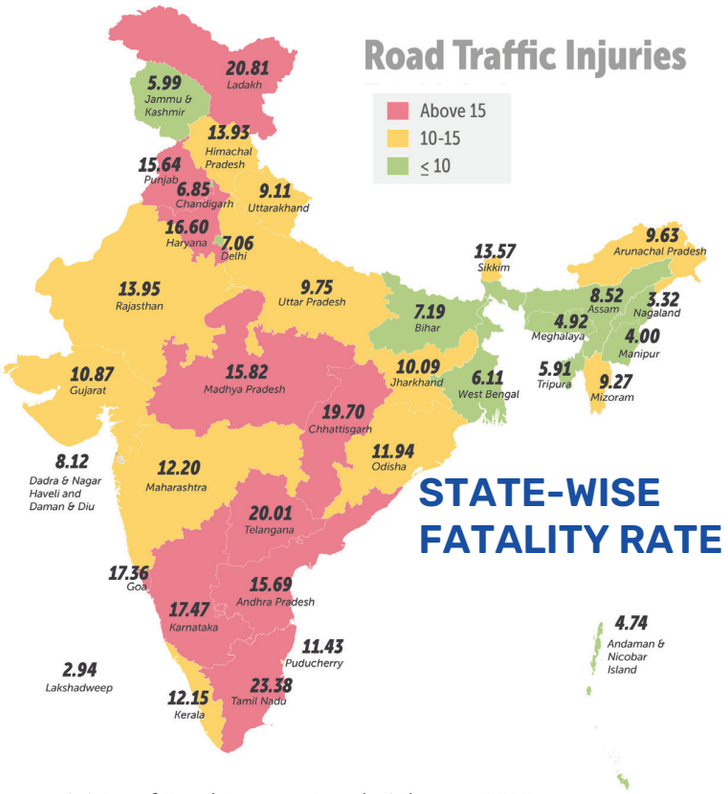




AGE-WISE BURDEN

Majority of deaths due to road traffic injuries are in persons aged 25 to 35 years, followed by persons aged 35 to 45 and 18 to 25 years.





STATE-WISE FATALITY RATE

ROAD USERS

Road Traffic Crashes

RTCs are the highest cause of unintentional injuries (≈43.7% of all injuries). Major fatality groups:

- **16.6%** Pedestrians
- **41.3%** Two wheelers
- **16.6%** Cars, taxis, vans
- **9.1%** Trucks, lorries
- **16.1%** Others

Reference: Ministry of Road Transport and Highways, 2022

Risk factors for RTIs

Risk factors for road injuries include[12]:

Table 3: Determinants and potential risk factors for road traffic injuries.

Factors influencing exposure to risk	Factors influencing crash involvement
1. Economic factors such as level of economic development and social deprivation. 2. Demographic factors such as age and sex. 3. Land-use planning practices which influence length of trip and mode of travel. 4. Mixture of high-speed motorized traffic with vulnerable road users. 5. Insufficient attention to integration of road function with decisions about speed limits, road layout and design. 6. Other community and environmental factors like lack of designated footpaths for people to walk and lack of open park spaces which decreases the tendency of leisure activities like walking and playing on roads.	1. Inappropriate and excessive speed. 2. Fatigue. 3. Young people particularly male, shift workers, people with untreated sleep apnea syndrome or narcolepsy. 4. High risk driving behaviours when young people are in a vehicle together. 5. Being a vulnerable road user in urban and residential areas. 6. Handheld mobile telephones while driving. 7. Traveling in darkness or poor lighting. 8. Vehicle factors – such as braking, handling and maintenance. 9. Defects in road design, layout, and maintenance. 10. Unmanned or dysfunctional signal system at road crossings. 11. Potholes. 12. Inadequate visibility because of environmental factors. 13. Poor eyesight of road users or color blindness. 14. Health impairment (sudden illness like myocardial infarction, stroke, hypoglycemia, epilepsy). 15. Driving under the influence of alcohol and other drugs.
Factors influencing crash severity	**Factors influencing post-crash outcome of injuries**
1. Inappropriate or excessive speed. 2. Seatbelts and child restraints not used. 3. Crash-helmets not worn by users of two-wheeled vehicles. 4. Roadside objects are not crash-protective. 5. Lack of traffic calming measures 6. Insufficient vehicle crash protection for occupants and for those hit by vehicles.	1. Delay in detecting a crash and in transport of those injured to a health facility. 2. Fire resulting after following a collision. 3. Leakage of hazardous materials. 4. Difficulty in rescuing and extricating people from vehicles. 5. Reluctant behaviour of bystanders because of legal concerns. 6. Lack of appropriate pre-hospital care. 7. Traffic congestion, delaying ambulance arrival at site and to reach hospital. 8. Lack of appropriate care in hospital emergency rooms.

12. Mohan D, Khayesi M, Tiwari G, Nafukho FM. Road traffic injury prevention training manual. World Health Organization; 2006.

Interventions to tackle these risk factors are an important part of global plan for second decade action.

Existing legislations

The MVA, 1988 and Central Motor Vehicles Rules (CMVR), 1989 form the foundation of India's regulations for motor vehicles. The MVA as the overarching law, and the CMVR as the rulebook puts law into practice. Both are crucial for ensuring road safety in India. The Motor Vehicle Amendment Act (MVAC) in 2019[13] is a significant reform with regard to road safety. It aimed to create a stricter and more comprehensive legal framework to promote road safety in India.

Highlights of the amendments include additional provision for the following:
a. Strengthening enforcement and road safety
b. Speedy assistance to accident victims
c. Simplification and citizen facilitation on issuing of driving license
d. Strengthening public transport
e. Automation and computerization

In accordance with the amended Act, the MoRTH has also set up the Motor Vehicle Accident Fund vide Gazette notification dated 25 February 2022. This fund (Sec 164B) is utilised for providing compensation to victims of hit and run motor accidents and to provide cashless treatment to road accident victims[14].

Three current accounts are mandated to be opened for the Motor Vehicle Accident Fund. They are:
1. Motor Vehicle Accident Fund – Account for Insured Vehicles.
2. Motor Vehicle Accident Fund – Account for Un-insured Vehicles.
3. Motor Vehicle Accident Fund – Hit and Run Compensation Account.

The MoRTH has taken several multi-pronged initiatives over the years for improving road safety across India. In the year 2021, few additional initiatives pertaining to road safety were included in annual report 2021-2022[15]. This include:

1. Vehicle Location Tracking System is used to track all the vehicles and the National Informatic Centre provides cloud infrastructure for implementation across the states.
2. Airbags for front seat passengers sitting next to the driver seat are mandated as an essential safety feature.
3. Accredited Driver Training Centre - Section 8 of the MVAA, 2019 empowers the Central Government to make rules regarding accreditation of driver training centers.
4. Availability of skilled professional drivers to handle vehicles safely and avoid crashes.
5. Provision for 48 hours cashless treatment for road traffic crash victims.

13. Ministry of Law and Justice. The Motor Vehicle Amendment Act, 2019. Available at: https://morth.nic.in/sites/default/files/notifications_document/MV%20Act%20English.pdf
14. Annual report, Motor Vehicle Accident Fund & Compensation to Victims of Hit and Run Motor Accidents Scheme, 2022.Government of India, Ministry of Road Transport & Highways.2019. Available from https://morth.nic.in/annual-report
15. Annual report, 2022-2023.Government of India, Ministry of Road Transport & Highways.2019. Available from https://morth.nic.in/annual-report

iv) Strategies and interventions

The strategies recommended for the prevention of RTI based on a safe system approach are as follows:

Table 4: Prevention of Road Traffic Injuries.

Section 2A: Prevention of road traffic injuries	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Review and strengthen road safety laws prioritizing enforcement and enacting new legislation if indicated.	Central/State Government
Action points: • Strictly enforce the motor vehicle amendment act 2019 with focus on road safety. • Implement applicable traffic laws related to vehicle speed (Section 112 of the MVA). • Strengthen the driver licensing system and ensure that all new driving licenses are issued through proper testing centers (Sec 8 of MVA). • Strict compliance with laws regarding driving under the influence of alcohol (Sec 185 of MVA). • Strictly enforce and mandate safety devices, including helmets and rear seatbelts (Sec 194 B and Sec 128 of MVA). • Impose penalties for all vehicle users for not following traffic rules. • Reinforce and implement prohibition use of phones/ electronic devices whilst driving. • Strictly enforce the prohibition of smoking in public and private vehicles. • Strictly apply blood alcohol concentration limits for new and professional drivers to prevent impaired driving (Sec 185 of the MVA). • Enforce maximum driving time and minimum rest periods limits for professional drivers. • Mandate minimum age and vision requirements for all drivers. • Set laws for safe use of autorickshaws and e-rickshaws with number of travellers	

Domain: Community driven initiatives	Central/State Government/Local Bodies
Strategy 1.2: Improve and strengthen awareness in the public to ensure safe road user behaviour.	
Action points: • Raise awareness on RTI prevention through IEC activities, including social media, radio and TV advertisements, display TV screens on bus stands, petrol pumps, railway stations and airports. • Run animated videos on RTI prevention, including first aid in movie theatres. • Conduct campaigns on road safety week/month, including seminars/workshops on various topics such as emerging safety trends, road safety engineering, motor vehicle insurance, first responder training, etc. • Spread awareness on the national toll-free helpline number. • Educate the community on Good Samaritan protection to enhance citizens' road safety. • Educate the public on the mandatory use of safety devices, including rear seatbelts and helmets, and reduce drunken driving, speeding, and other risks. • Educate the drivers on road safety regulations and improve driving knowledge to enhance driver competence and capability. • Encourage the public for using public transport.	
Strategy 1.3: Strengthen behaviour change initiatives in the community in collaboration with the NGOs, associations of drivers and other stakeholders.	
Action points: • Develop comprehensive programmes to improve road user behaviour to promote safety. • Leverage the potential of NGOs, association of drivers and other stakeholders.	
Domain: Interventions/programmes	Central/State Government/Local Bodies/Schools/Health Department/Hospitals
Strategy 1.4: Create a skilled workforce including first responders to ensure essential prehospital care.	
Action points: • Carry out training for basic first responders among the community on how to care for crash victims on regular basis. • Prepare and maintain a cadre of advanced first responders among and leveraging the potential of uniformed cadres (like NCC, scout and guides, etc.) • Provide first aid training in schools for the teachers and school bus drivers. • Train health-care professionals at grass root levels, including ASHAs, and community health workers, and involve them in emergency response to road crashes.	

Strategy 1.4 (cont...)	
Action points: • Train personnel/drivers in emergency prehospital care services as part of issuance of driving license. • Conduct refresher training regularly for the drivers operating commercial vehicles. • Provide an accredited training centers with dedicated driving test track to promote high-quality training. • Mandate mock drills on road safety in workplaces at least once a year	
Strategy 1.5: Strengthen the facility-based emergency care at various levels	
Action points: • Improve the availability of a skilled health team to ensure the proper functioning of emergency departments in subdistrict and district hospitals. • Create multidisciplinary, coordinated care models for health-care professionals across levels. • Organize regular mock drills at the subdistrict, district hospitals and medical colleges.	
Strategy 1.6: Establish effective post-crash response and strengthen public health departments to manage road traffic injuries.	Central/State Government/Health Department/Hospitals
Action points: • Develop Standard Operating Procedures (SOPs) for all components of response to road crashes, including prehospital, transport of patients and facility-based emergency care. • GIS based analysis of accident-prone areas and potential facilities to be conducted. This would help to establish a network of ambulances ensuring a minimum response time. • Increase the availability of trained emergency medical technicians (EMTs) to provide appropriate prehospital care. • Improve the documentation and reporting at the trauma centres. • Strengthen the existing health-care facility in providing appropriate care at the centres by improving the facilities, equipment, and infrastructure. • Provide early rehabilitation and support to road traffic crash victims and their families to minimize physical and psychological trauma. • Provide longer-term rehabilitation for crash victims, if necessary.	

2. Safe roads	
Domain: Policy	Central/State Government
Strategy 2.1: Enforce laws to prevent encroachment of roads, pavements, and buffer area	
Action points: • Strengthen enforcement of laws to prevent encroachment of the roads, pavements, and buffer area.	
Domain: Intersectoral collaborations	Central/Ministry of Road transport and Highways/ State Government/ Department of Road Transport
Strategy 2.2: Improve and strengthen planning, designing, and constructing safe road networks to reduce road fatalities and benefit road users in collaboration with MoRTH.	
Action points: • Conduct risk mapping (safety audit) of the existing highways/ roads regularly to identify and rectify black spots. • Apply infrastructure-based interventions, including improving street lighting, upgrading sidewalks for higher pedestrian safety, improving speed control by calming traffic designs, and provision of bicycle tracks. • Deploy speed cameras to monitor vehicle speeds near accident-prone areas such as schools and residences. • Encourage regular maintenance of roads, with a focus on ensuring its safety. • Display road signs and marking for drivers' information and replace them regularly if worn out. • Improve safety barriers like high embankments, medians, and bridges. • Create centres of excellence and train engineers and police in adequately designing and operating roads.	
3. Safe vehicles	
Domain: Community driven initiatives	Central/State Government/ Automobile industry
Strategy 3.1: Create awareness on safety of vehicles	
• Create awareness through involvement on automobile industries and related stakeholders on safe use of vehicles and on road safety.	

Domain: Interventions/programmes	Central/State Government/ Department of Road Transport
Strategy 3.2: Encourage and promote safe designs/redesigns and technologies to enhance vehicle safety.	
Action points: • Encourage harmonisation of relevant global standards (UNW29) and mechanisms to accelerate the uptake of new technologies impacting safety. • Encourage incentives for motor vehicles that provide high levels of road user protection. • Ensure that all new motor vehicles have minimum safety features like airbags and universal deployment of crash avoidance technologies such as electronic stability control and anti-lock braking systems in motorcycles. • Ensure safety in auto rickshaw and e-rickshaw with fixing standards for safety. • Improve the visibility and conspicuity of vehicles by using reflective tyres and high-mounted stop lamps in cars. • Include activities such as new car assessment programmes (NCAPs) so that consumers are aware of the safety performance of vehicles. • Promote redesigning of the vehicles using various safety aids, including cameras, audible alarms and reversing light.	
4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government/Local bodies
Strategy 4.1: Strengthen coordinating mechanisms to facilitate multisectoral collaboration and promote accountability at National/Sub-national levels	
Action points: • Encourage multi-sectoral partnerships and lead agencies to develop and support national road safety strategies. (Transport department, PWD department, police, education department, health department, etc.) • Empower community groups and religious groups in disseminating information related to trauma prevention and first aid. • Encourage capacity building of journalists for reporting on road safety. • Empower local leaders, religious heads, or faith community leaders as coalition partners for being trained as first responders. • Encourage community responsibility and a safe culture on road safety. • Involve the residential associations in various awareness programmes to ensure better percolation of the road safety efforts. • Support the establishment of appropriate road user insurance schemes to finance rehabilitation services for crash victims.	

5. Surveillance and research	
Domain: Surveillance system	Central/State /Health Department/Local Governments
Strategy 5.1: Strengthen technical capacity and resources for data systems to measure, map and monitor road injury burden at all levels.	
Action points: • Strengthen the lead agency (and associated coordination mechanisms) on road safety involving partners for data management and surveillance. • Strengthen the National Road Safety Board to oversee the issues related to road safety. • Assess emergency preparedness of hospitals periodically for handling RTI. • Strengthen the National Injury Surveillance System and mandate data collection from all hospitals for RTIs. • Integrate EDAR for on-going monitoring and evaluation at all levels. This centralized database allows comprehensive analysis of road accidents.	
Domain: Intersectoral collaborations	Research Organisations
Strategy 5.2: Plan and conduct translational research to promote road safety in the country.	
Action points: • Conduct studies to determine the possible risk factors responsible for mortality and morbidity due RTIs specific to local conditions. • Determine factors to improve effective post-crash response.	

Prevention of drowning

Section 2B

Prevention of drowning

i) Background

Globally, drowning is the third leading cause of unintentional injury death, accounting for 7% of all injury-related deaths. According to WHO 2021, an estimated 2,36,000 annual deaths occur globally, acknowledging drowning as a significant public health problem. The highest drowning mortality rates are reported among children. Males are at higher risk of drowning, with twice the overall mortality rate of females, often attributed to higher exposure to water and risk-taking behaviour such as swimming alone, drinking alcohol before swimming, and boating[16]. The burden of drowning is inequitable; 90% of unintentional drowning deaths happen in LMICs due to poor infrastructure, poor regulation for water safety on open water bodies, and low awareness of water safety risks and lesser population having swimming skills[17].

ii) Global and regional response to drowning

In 2021, the United Nations General Assembly (UNGA) adopted the resolution on drowning prevention, acknowledging the profound impact of drowning on a global scale. This significant resolution highlights the devastating consequences of drowning and emphasizes the need for concerted efforts to prevent such tragedies from occurring worldwide. The resolution also declared 25th July as World Drowning Prevention Day.

The 76th World Health Assembly (WHA76.18) adopted the resolution on drowning prevention requesting governments and their partners, in collaboration with the WHO, to accelerate action on drowning prevention through 2029[18]. It urges member states to:

1. To assess their national situations concerning the burden of drowning, ensuring targeted efforts to address national priorities, including through the appointment of a national drowning prevention focal point, as appropriate, and assuring that resources available are commensurate with the extent of the problem.
2. To develop and implement national multisectoral drowning-prevention programmes, with a focus on community, including emergency response planning and linkage with community first aid response and emergency care systems, as appropriate, in line with WHO recommended interventions, particularly in countries with a high burden of drowning.
3. To ensure that policy planning and implementation across sectors such as health, education, environment, climate adaptation planning, rural economic development, fisheries, water transport and disaster risk reduction, particularly policies that address the underlying drivers of increased flood risk, are undertaken in a manner that reduces drowning risks.

16. WHO key facts Drowning (2023) [Internet]. Accessed 18.12.2023. Available from https://www.who.int/news-room/fact-sheets/detail/drowning
17. M. Gupta , A. B. Zwi and J. Jagnoor (2020). Opportunities for the development of drowning interventions in West Bengal, India: a review of policy and government programs. BMC Public Health 20:704
18. WHO. Seventy Sixth World Health Assembly: Resolutions and decisions. Accessed on 08.04.2024.Available from : https://apps.who.int/gb/or/e/e_wha76r1-Int.html

4. To promote drowning prevention through community engagement and public awareness and behavioural change campaigns.
5. To promote capacity-building and support international cooperation by sharing lessons learned, experiences and best practices, within and among the regions.

As a part of WHA resolution WHO is in process of preparing the WHO Global report on drowning which would provide recommendations to the governments to implement effective drowning prevention action points, improve data surveillance, and develop national water safety plans. Presently, the MoHFW, Government of India in collaboration with various authorities/ departments is working on effective implementation of drowning prevention. Tasks initiated by various ministries/authorities include:

1. **Resource mobilization:** Various Ministries/Authorities/Departments have been doing several activities for drowning prevention from their existing budget; however, there is a need for designated budget allocation for identified priority areas.
2. **Improvement in data systems:** A uniform Portal/Authority/Department for capturing all events pertaining to drowning (fatal/non-fatal) is in process of development. This system will further give reliable data on drowning morbidity and mortality at the national level. This would help for Identification of high-risk populations/areas, followed by implementation of targeted contextually relevant interventions for reducing drowning burden.
3. **Targeted awareness campaigns**: Few good schemes and policies have been made that directly or indirectly contribute towards drowning prevention, but their awareness and compliance remains to be a challenge. A need for a national-level campaign on drowning prevention has been identified.
4. **Standardization of legislation to maximize gains:** The legislation and regulation for watercraft and vessels have been developed at the national and sub-national level according to the individual Department/Authority Effort has been done in the direction to standardize and enforce these rules.

iii) Situational assessment

India has a coastline of over 7516 kilometers and extensive inland freshwater systems, exposing large population groups to water and water-related hazards. Additionally, 71% of women from rural households rely on open water sources for everyday living activities such as washing[19].

According to the latest GBD data, 2019, drowning accounts for 0.58% of total deaths in the country. It also reported males had the highest percentage of mortality 0.72%, compared to females 0.41%. Of all drowning deaths, 6.2% occur among 5-14 years[9].

In India, NCRB captures fatal and non-fatal data in the country; however, the other common sources also captured drowning data through hospital admissions, hospital emergency departments, Central Bureau of Health Intelligence (CBHI), Indian Coast Guard, Ministry of Tourism, Sample Registration System (SRS), and Vital Registration System.

The NCRB 2022 report reveals a concerning number of drowning deaths in India, accounting

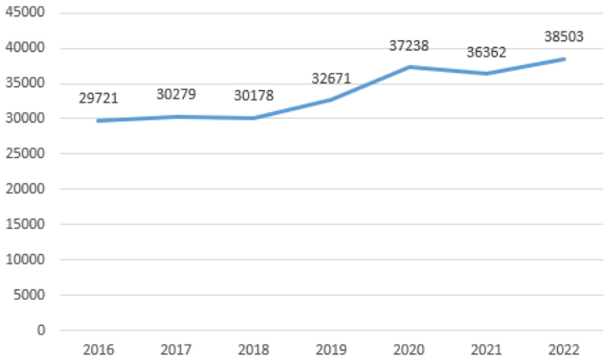
19. International Institute for Population Sciences (IIPS) and ICF. 2021. National Family Health Survey (NFHS-5), 2019-21: India: Volume I. Mumbai: IIPS. http://www.rchiips.org/nfhs or http://www.iipsindia.ac.in

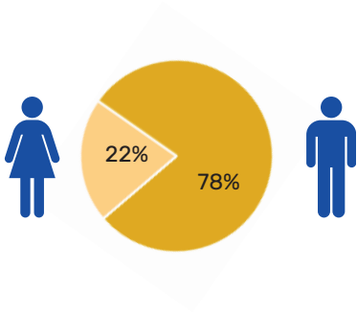
Figure 7: Statistics for drowning in India

DROWNING INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

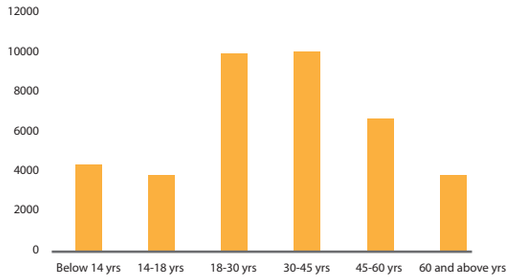
There were 38,503 deaths from drowning in 2022, which is an increase from the 29,721 deaths in 2016. A slight upward trend in drowning deaths can be noted over the years.

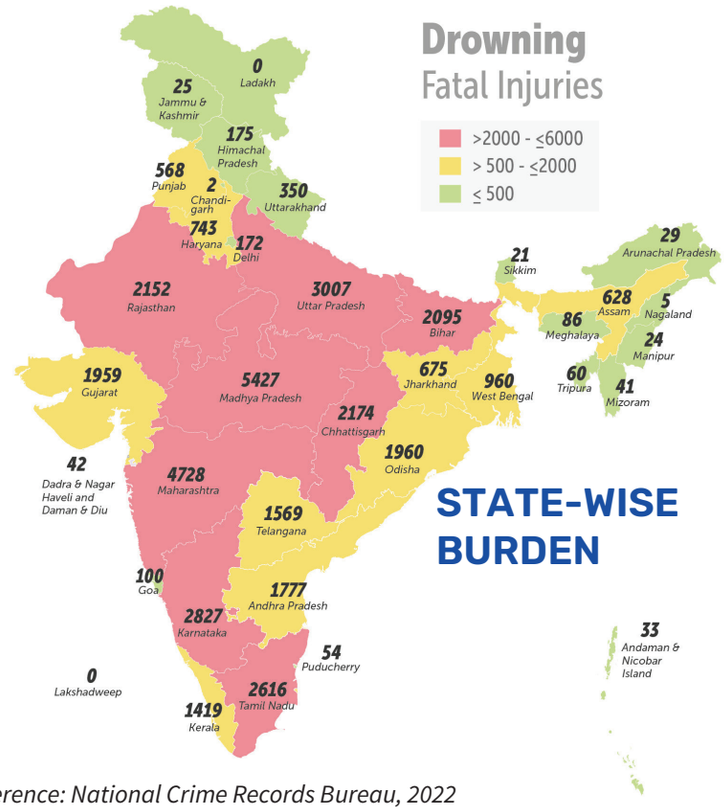




AGE-WISE BURDEN

Majority of deaths due to drowning are in persons aged 18 to 45 years, followed by persons aged 45 to 60 years.





STATE-WISE BURDEN

MAJOR CAUSES

The majority of near-drowning or drowning cases are attributed to accidents that occur near or in the water. Reasons for this include (2022):

73.3%
Accidental falls into water bodies

25.8%
Other cases

0.7%
Boat capsizing

Reference: National Crime Records Bureau, 2022

for 9.1% of all accidental fatalities. While there was a slight decrease during 2021 and 2022, the overall trend between 2016 and 2020 is worrying. Accidental falls into water bodies are the leading cause, making 73.38% of drowning deaths, and this number has been steadily rising. Across the years 2016-2022, males consistently have the highest drowning rates[3].

Stakeholders for drowning prevention

Sustainability of drowning prevention solutions requires deliberative engagement and increased capacity and capability across various levels of stakeholders. The following are the list of major stakeholders for drowning prevention and the details are in Annexure 1:

- India Meteorology Department Ministry of Earth Sciences
- National Disaster Management Authority
- Ministry of Human Resources
- Ministry of Home Affairs
- Maritime Safety/Maritime Administration
- Indian Coast Guard
- Ministry of Tourism
- Ministry of Water resource
- Ministry of Shipping

Inconsistent data on drowning deaths across various sources underscores the importance of collaboration among stakeholders involved in national drowning prevention efforts. Table 5 provides a starting point by listing potential collaborators, including government agencies, emergency response entities, maritime safety organizations, and public health institutions.

Table 5: Stakeholders involved in drowning prevention and reporting of data.

• National Crime Records of Bureau (NCRB) • Medical Certification of Cause of Death (MCCD) • SRS (Sample Registration System) • Ministry of Health (Dte.GHS) • Ministry of Education (Human Resource Development) • Police/Ministry of Home Affairs • National Disaster Management Authority	• Ministry of Transport/Tourism • Maritime Safety/Maritime Administration • Ministry of Information and Broadcasting • Ministry of Urban Development • India Meteorology Department Ministry of Earth Sciences

Additionally, community surveys and verbal autopsies could offer valuable insights.

Existing legislations

- Inland Vessels Act 1917[20]
- Merchant Shipping Act 1958[20]

20. Ministry of Ports, Shipping and Waterways. Available at: https://www.dgshipping.gov.in/Content/TheInlandVesselsActs1917.aspx

In the absence of nationwide uniform legislation pertaining to drowning prevention - The concerned Ministries/Authorities/Departments/States are taking initiatives at their own level.

- Vessels registered under MS Act, 1958 are required to conduct Blood Alcohol Concentration (BAC) checking.
- There is legislation mandating that enough buoyancy devices are available on watercraft to meet the needs of all occupants. Further, these watercrafts are classified by size (large watercrafts), by function (recreational use, occupational use by individuals and occupational use by larger entities) and by area of operation (travel distance from shore). Small traditional crafts are exempt from requiring a sufficient number of buoyancy devices on board.
- Geographical restrictions are imposed by the Inland Vessels Act 1917, under which a vessel is registered. Hence, a vessel registered under IV Act, 1917 is permitted to ply only on internal waters, and vessels registered under MS Act, 1958 can apply on wider areas.
- All registered watercrafts need to be registered under the IV Act, 1917.
- Vessels which do not have any engines and are used primarily for own consumption are not considered under the act such as non-motorized personal crafts, Kayaks, etc.
- Traditional crafts are not considered under the act.
- No motor craft is exempted from registration/licensing.

For prevention of overcrowding of watercrafts:

- Section 58 of IV Act, 1917[20]
- Indian Penal Code (IPC), Section 28[21]

iv) Strategies and interventions

The proposed strategic framework applies a safe system approach to address drowning prevention. Multi-stakeholders are involved in setting these strategies and interventions. They are as follows:

Table 6: Prevention of drowning.

Section 2B: Prevention of drowning	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Enforce and strengthen laws to ensure the safety of people during recreational activities and while using ferries.	Central/State Government
Action points: • Frame laws to avoid drinking/drugs during swimming/water-related activities with special attention for adolescents/parents with kids. • Reinforce the availability of lifejackets for all water recreational activities and vessels. • Enact and enforce isolation pool fencing laws for all swimming pools (including private ones). • Mandate the provision of personal flotation devices for all occupants of ferries and other vessels for their safety.	

21. Indian penal code 282. Available at : https://devgan.in/ipc/section/282/

Strategy 1.1 (cont...) • Enforce the availability of Automated External Defibrillator (AED) and promote training for attendants on cardiopulmonary resuscitation (CPR) at police stations, recreational pools/parks, and gram panchayats to resuscitate people in emergencies. • Enforce and confirm the presence of lifeguards in all swimming areas.	
Domain: Community - driven initiatives	Central and State Government, Department of Disaster Management, Local Organisations, Schools
Strategy 1.2: Increase and improve awareness among the community/schools /parents/fisher/vessel operators about water safety.	
Action points: • Build resilience to floods and related hazards in the community to be safer from floodwaters and to prepare them for safer ground if the risk arises. • Educate stakeholders at all levels on climate change to reduce its impacts mainly due to risky water exposure. • Conduct and expand targeted awareness of drowning using IEC materials such as visual aids, radios, and displays. • Create awareness to wear/carry personal flotation devices such as life jackets during swimming activities. • Ensure injury prevention week celebration at all levels of the community to raise awareness on water safety.	
Domain: Interventions/programmes	Central /State Government/ School/ Local health Departments
Strategy 1.3: Constitute and maintain skilled personnel, cross-train a multidisciplinary prevention team to respond to emergencies.	
Action points: • Provide rescue and resuscitation training to lifeguards at beaches, recreational water activities, or public swimming pools. • Create linkages and facilitate first responders for safe rescue and resuscitation. • Plan CPR training for teachers. • Promote regular refresher hands-on training to dedicated personnel. • Include training for the operators to perform pre-trip checks, vessel maintenance tasks, and spot checks. • Provide rescue and resuscitation training to vessel operators.	
Strategy 1.4: Strengthen public health departments to provide emergency care, psychosocial support, and rehabilitation to handle drowning-related incidents.	
Action points: • Ensure availability of immediate first aid including CPR and timely referral to a nearby hospital for appropriate treatment. • Facilitate psychosocial support to the family and victim to handle post-traumatic stress. • Access rehabilitation services for neurologically affected individuals due to drowning/near drowning events. For example, hypoxic brain injury.	

Strategy 1.4 (conti...)	
Action points: • Provide training on the use of AED at police stations/gram panchayats to the concerned personnel.	
2. Safe waterbodies	
Domain: Interventions/programmes	Central/State Government/Local Government
Strategy 2.1: Create a safe and accessible environment to reduce risk from water-related activities.	
Action points: • Install physical barriers that control access to water. For example, doorway barriers in the home, playpens, or fencing off a safe play area in or around the family home. • Create an embankment or/and build flood-control embankments, cover wells, or open barrels with grills. • Ensure the provision of signage at all water bodies for safety precautions. • Encourage good lighting or light demarcation near risky water places. • Ensure the availability of life jackets at all water recreational activities/and vessels. • Ensure the presence of lifeguards in swimming areas. • Prevent water collection/drain rainwater in the holes dug for building/construction purposes.	
Domain: Community driven initiatives	Central/State Government/Local Bodies
Strategy 2.2: Promote safe practices for the utilization of water for drinking, sanitation, and hygiene	
Action points: • Provide safe access to water for daily use and reduce the unnecessary usage of surface water leading to avoidable drowning exposure. • Build safe bridges and install piped water systems. Piped water means that people can avoid open bodies of water to bathe or wash clothes, thus reducing exposure to the potential hazards of water bodies and wells.	
3. Safe vessels	
Domain: Policy	Central/State Government/ Department of Shipping/ Department of Tourism
Strategy 3.1: Encourage water transport safety for large and small vessels.	
Action points: • Educate vessel/boat operators on safe vessel loading and stability and routine maintenance. • Introduce and enforce safe boating, shipping, and ferry regulations.	

Action points: • Establish regulations on the accommodation of passengers boarding small vessels. • Limit/ban intake of drugs and alcohol for vessel drivers and passengers. • Strengthen the registration of watercraft under the IV Act, 1917. • Enforce the IV Act, 1917 and Merchant Shipping Act, 1958.	
4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government
Strategy 4.1: Empower communities and enhance multi-sectoral collaboration among stakeholders to promote drowning safety.	
Action points: • Promote multi-stakeholder and cross-departmental approach to decrease water-related drowning incidents. • Recommend a participatory approach across communities, implementers, and policy stakeholders. • Engage and support NGOs, local leaders, and organizations to conduct drowning prevention activities such as training, and awareness.	
5. Surveillance and research	
Domain: Surveillance system	Central/State Government
Strategy 5.1: Establish a standardized data surveillance tool and integrate assessment/audits to evaluate interventions across all levels	
Action points: • Collect and analyze drowning-specific data at all levels (national, regional, and local) to understand the scope and nature of drowning incidents in India. • Monitor and evaluate embedded interventions or plans at the state and national levels.	
Domain: Intersectoral collaborations	Research Organisations
Strategy 5.2: Implement research to identify evidence-based strategies and measure progress towards drowning prevention.	
Action points: • Conduct studies to evaluate gap analysis by research bodies to plan interventions. • Include well-designed trials and translational research for practical implementation. • Promote cross-sector collaborative research to avail opportunities for policymakers to guide decision-making.	

Prevention of burn injuries

Section 2C

Prevention of burn injuries

i) Background

Burns are a significant global health threat, causing immense suffering and economic burden. According to the WHO, an estimated 11 million people suffer burn injuries each year, with over 1,11,000 deaths and eight million more, left with lasting disabilities[22]. These figures are likely underestimated, with many burn victims not seeking medical care[23]. The situation is particularly concerning in LMICs, where roughly 70% of burn injuries occur. This disparity is due to various factors, including limited access to safe cooking and heating fuels, inadequate fire safety measures, and lack of specialized burn care facilities[24, 25].

The alarming statistics on burn injuries highlight the urgent need for a multi-pronged approach to address prevention, treatment, and rehabilitation, particularly in LMICs. The strategies include public awareness campaigns, improved emergency medical services, specialized burn centres, and training programmes for health-care professionals. By implementing these comprehensive strategies, we can significantly reduce the burden of burn injuries globally, improve patient outcomes, and alleviate the suffering caused by this preventable public health crisis.

ii) Global and regional response to burn injury

Burn injuries are a major public health concern worldwide, with a devastating impact on individuals and health-care systems. The WHO recognizes the disproportionate burden faced by LMICs. In these countries, around four out of five burn victims are women and children.[26, 27]. The WHO has actively collaborated with partners promoting evidence-based interventions and launched Global Burn Registry in 2018. The registry allows the collection of standardized data on burn incidents across the globe. This data is crucial for understanding the true scope of the problem, identifying high-risk populations, and evaluating the effectiveness of prevention programmes. By fostering collaboration, promoting best practices, and facilitating data collection, the WHO plays a critical role in mitigating the global burden of burn injuries, particularly in LMICs.

22. World Health Organization. Global health estimates: Leading causes of death. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-leading-causes-of-death, accessed 12th May 2022
23. Mashreky SR, Rahman A, Chowdhury SM et al. Non-fatal burn is a major cause of illness: findings from the largest community-based national survey in Bangladesh. Inj Prev. 2009;15(6):397–402.
24. Zachary J Collier, MD, Ulrick S Kanmounye, MD, Priyanka Naidu, MBChB, MSc, Maria Fernanda Tapia, MD, Atenas Bustamante, MD, Daniel Bradley, MD BDS, Chifundo Msokera, MBBS, John Dutton, MD, William P Magee, III, MD, DDS, Justin Gillenwater, MD, 59 Burns in Low- and Middle-income Countries: A Scientometric Analysis of Peer-reviewed Research, Journal of Burn Care & Research, Volume 43, Issue Supplement_1, April 2022, Pages S41–S42, https://doi.org/10.1093/jbcr/irac012.062
25. Tandon R, Agrawal K, Narayan RP, Tiwari VK, Prakash V, Kumar S, Sharma S. Firecracker injuries during Diwali festival: The epidemiology and impact of legislation in Delhi. Indian J Plast Surg. 2012 Jan;45(1): 97-101.doi: 10.4103/0970-0358.96595. PMID: 22754162; PMCID: PMC3385409.
26. Stokes MAR, Johnson WD. Burns in the Third World: an unmet need. Ann Burns Fire Disasters. 2017;30(4):243-246.
27. Nthumba PM. Burns in sub-Saharan Africa: a review. Burns. 2016;42(2):258–66.

iii) Situational assessment

India faces a significant challenge with burn injuries, having a high burden compared to other countries. While data on different types of burns is limited, available statistics paint a concerning picture. The NCRB report of 2022 reported 20,789 deaths due to fire related incidents[3]. India accounts for roughly 20% of the global mortality burden from fire injuries. The impact extends beyond mortality, causing a substantial loss of healthy life years, with DALYs of 1.5 million and 1.1 million of YLL[28].

There is a concerning skew in the gender distribution to burn injuries. Women, particularly those between 15 and 49 years old are at three times higher risk than that of men[28]. The factors attributed are unsafe cooking practices (ground-level cookstoves, poorly regulated LPG cookstoves), suicides, and homicides associated with domestic violence and dowry-related conflicts. In addition, intentionally vitriol and chemicals are form of gender-based violence among women and girls. Socioeconomic disadvantage further exacerbates the burden of burns. These populations face both higher risks of burn injuries due to unsafe living conditions and limited access to quality treatment and rehabilitation, perpetuating a cycle of hardship[29, 30].

Burn survivors are often financially distressed, vocationally challenged and socially excluded[25]. Death and disability due to burn injuries are largely preventable, provided timely and appropriate treatment is provided by trained health-care professionals. It is, therefore, important to recognize the epidemiological and clinical pattern and develop action plans for prevention of burn injuries.

According to the NCRB 2022 report, major causes of burns were accidental fire (n=7435), electrocution (n=12,918), and accidental explosions (n=436). The common causes of accidental fire in 2016 and 2022 were due to the cooking gas cylinder/stove burst and electrical short circuit. Explosion of domestic gas cylinders was the common cause for accidental explosion. The cause-wise analysis of fire accidents revealed that 53% of total deaths were reported in residential/dwelling buildings during 2022. Deaths due to burns have drastically reduced over the years compared to burn injuries. The majority of the fatalities were seen in the age group of 30-45 years[3]. The data reporting on NCRB includes only major causes of burn injuries/ deaths reported as medicolegal cases. So, there can be unreported injuries related to burns.

In India, burn services are delivered through a network of specialized tertiary care burn centres including both public and private sectors. There are several centres functional in each of the states additionally under the NPPMTBI, 47 dedicated burn units are funded by the Central Government in the country. The geographical distribution of these centres and service availability is skewed and diverse[31]. Rehabilitation is very important in burn care. The poor penetration of rehabilitation services to rural regions and the inability to afford the costs associated with treatment results in poor utilization of rehabilitation services by burns

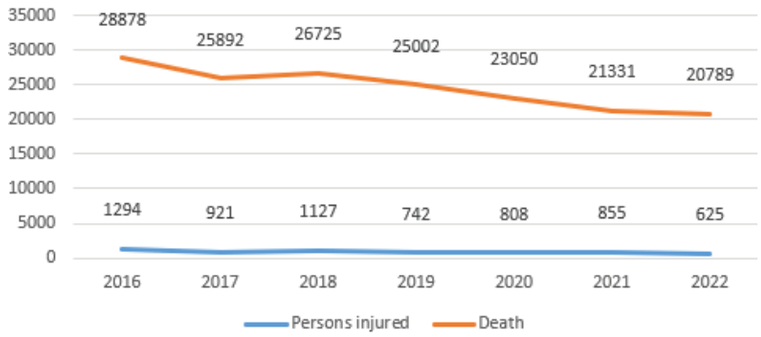
28. Keshri VR, Jagnoor J. Burns in India: a call for health policy action. Lancet Public Health. 2022;7(1):e8-e9. doi:10.1016/S2468-2667(21)00256-5
29. Bhate-Deosthali P, Lingam L. Gendered pattern of burn injuries in India: a neglected health issue. Reprod Health Matters. 2016; 24: 96-103.
30. Mehta K, Arega H, Smith NL, Li K, Gause E, Lee J, Stewart B. Gender-based disparities in burn injuries, care and outcomes: A World Health Organization (WHO) Global Burn Registry cohort study. Am J Surg. 2022 Jan;223(1):157-163. doi: 10.1016/j.amjsurg.2021.07.041. Epub 2021 Jul 24. PMID: 34330521; PMCID: PMC8688305.
31. Ranganathan K, Mouch CA, Chung M, et al. Geospatial Mapping as a Guide for Resource Allocation Among Burn Centers in India. J Burn Care Res. 2020;41(4):853-858. doi:10.1093/jbcr/irz210.

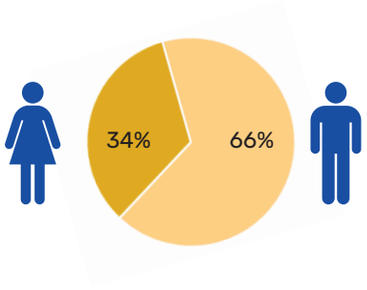
Figure 8: Statistics of burn injuries in India

BURNS INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

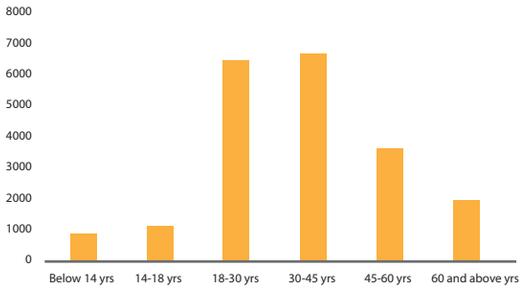
There were 20,789 deaths and 625 injuries from burns in 2022. From 2016 to 2022, there has been a decrease in the number of deaths as a result of burns while the number of injuries have remained largely unchanged.

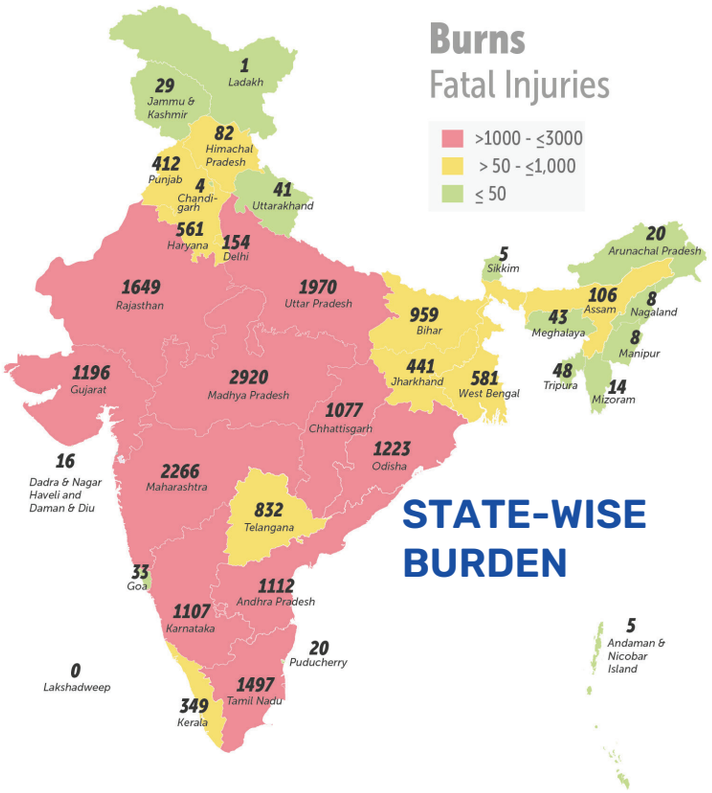




AGE-WISE BURDEN

Majority of deaths due to burns are in persons aged 18 to 45 years, followed by persons aged 45 to 60 years.





STATE-WISE BURDEN

MAJOR CAUSES

The majority of accidental burns are caused from accidental fires, electro-cution, and accidental explosions. No of cases include (2022)-

1,567
Electrical short circuit

1,551
Cooking cylinder or stove burst

90
Fireworks

Reference: National Crime Records Bureau, 2022

survivors. These barriers prevent efficient access and utilization of public services for burn care, force burn survivors to resort to private care, causing undue OOPE[32].

National programme and legislations:

Recognizing the significant burden of burn injuries in India, the government launched the National Programme for Prevention and Management of Trauma and Burns Injuries (NPPMT& BI) under the 12th Five-Year Plan.

This comprehensive programme aims to:

- Reduce the incidence of burn injuries: Through preventive measures and public awareness campaigns.
- Strengthen burn care infrastructure: By establishing dedicated facilities and equipment at various health-care levels.
- Enhance burn care capacity: By providing training and skill development for health-care professionals.
- Improve rehabilitation services: To ensure burn survivors regain function and reintegrate into society.

This initiative builds upon the foundation laid by the "Pilot Programme for Prevention of Burn Injuries (PPPBI)" launched in 2010 by the Ministry of Health and Family Welfare. The pilot programme's success paved the way for the broader and more comprehensive NPPMTBI.

Several legislative and judicial directives are also implemented to reduce burn injuries and support burn survivors.

- The Model Poisons Possession and Sale Rules, 2013 were framed under the Poisons Act, 1919 to regulate sale of acid and other corrosive substances[33]. The sale and possession of acids are prohibited under these rules and violation of the procedure as prescribed under the rules is a punishable offense. The sale of acid to minors is banned and corrosive substances can be sold to only those who have valid identity cards issued by the government, after they specify the purpose for the purchase in writing. The National Legal Services Authority has enacted the Compensation Scheme for women victims of burning and acid attacks (S. 357A CrPC)[34]. This legislative provision has been framed to reduce the incidents of acid attacks and subsequent burn injuries among women who bear the highest brunt of burn injuries in India.
- As per Section 79 in The Indian Electricity Rules, 1956, the safe distance for electrical wire near buildings is described[35]. However, provision for stronger legalisation is needed to improve safety and curb electrical injury.

Earlier burn due to dowry (bride burning) was a major social evil in our country; however, dowry-related burns have been reduced significantly due to strong legislation (Section 304B)[36, 37]. However, burns particularly in women of age group of 15-34 years is still a serious

32. Jagnoor J, Bekker S, Chamania S, et al Identifying priority policy issues and health system research questions associated with recovery outcomes for burns survivors in India: a qualitative inquiry BMJ Open 2018;8:e020045
33. The Model Poisons Possession and Sale Rules 2013 available at: https://thc.nic.in/Tripura%20State%20Lagislation%20Rules/The%20Tripura%20Poisons%20(Possession%20and%20Sales)%20Rules,%202013.pdf (last accessed -23/09/2022)
34. National Legal Services Authority. Compensation Scheme for Women Victims/Survivors of Sexual Assault/other Crimes. New Delhi. 2018. (https://wcd.nic.in/sites/default/files/Final%20VC%20Sheme_0.pdf)
35. The Indian Electricity Rules, available at https://www.dgms.net/IErules1956.pdf, (last accessed -23/09/2022)
36. Dowry death available at: https://www.indiacode.nic.in/show-data?actid=AC_CEN_5_23_00037_186045_1523266765688&orderno=342 (last accessed-23/09/2022)
37. International Institute for Population Sciences (IIPS) and ICF. 2021. National Family Health Survey (NFHS-5), 2019-21: India: Volume I. Mumbai: IIPS. http://www.rchiips.org/nfhs or http://www.iipsindia.ac.in

issue in the local context, as self-immolation and domestic violence among them is a major reason for burn mortality.

iv) Strategies and interventions

All burn injuries are preventable. Action for burn prevention will require intervention at all three levels of prevention:

1. Primary prevention:
    a. Health promotion: such as, introduction of burns prevention in school health programme, use of information education and counselling for population.
    b. Specific protection: high risk strategies for person and place, such as kitchen safety prevention, electric wire safety, and prevention of occupational hazards.

2. Secondary prevention:
    a. Early intervention: both pre-hospital care and timely triage and referral
    b. Timely and adequate treatment at a burn care facility.

3. Tertiary prevention:
    a. Disability limitation: Access to reconstructive surgeries to prevent or restore any disability or disfigurement.
    b. Rehabilitation: includes the spectrum of physical, psychological, and social rehabilitation.

The safe system approach provides a viable framework that examines the risk factors associated with burn injuries and provides interventions from a holistic perspective.

Table 7: Prevention of burns.

Section 2C: Prevention of burns	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Enhance policy implementation on burn-related injuries, build and increase capacity of concerned government officials to roll out burn regulations.	Central/State/Local Government
Action points: • Strengthen laws on dowry deaths (e.g.: 304B, 113 B). • Reinforce the laws for acid attack (Section 326A IPC). • Enforce supreme court direction on prevention of acid attack: sale of acid, treatment and rehabilitation and compensation. • Enforce, enhance, and ensure speedy action on punitive measures for all violators of vitriolage. • Strict implementation on the sale of acid/alkalis in open markets or through online portals. • Ensure proper implementation of building fire safety rules. • Frame laws for the availability of smoke detectors at the residence. • Set and enforce regulations on hot water tap/geyser temperatures.	

Domain: Community driven initiatives **Strategy 1.2: Promote awareness on burn injuries among the general/vulnerable population including awareness during festivals** **Action points:** • Increase campaigns for burn prevention through mass media, such as newspapers, radio and TV advertisements, social media. • Use animated video on burn prevention and first aids, in movie theatres in collaboration with respective ministries or education bodies and organisations like National Association of Professionals involved in Burn Care in India (NABI), and civil society organisations. • Impart information, knowledge, and facilitate first aid training among family members including children on prevention of burns. • Maintain fire safety standards and regular checks of the electrical system, and fire escape route. • Encourage mock fire drills in schools, high-rise buildings, and workplaces annually so that all are sure about the plan of action in case of any mishap. • Coordinate and promote precautionary measures (Do's and Don'ts) and adhere to best practices on burn injury prevention. It includes- » Prepare a fire escape plan and emergency evacuation maps for the family and identify a common meeting place outside to account for each member. » Keep a fire extinguisher and fire blanket at home and teach them how to use a fire extinguisher. In case, the clothes catch fire- "stop, drop, and roll" should be known to all. » Instruct to keep a bucket of water in the kitchen for fire dousing. » Avoid wearing loose clothing while cooking in the kitchen. » Avoid using pressured cans/perfumes/hand sanitiser near open flame/while smoking. » Avoid cooking while holding a child and never hold a cup of hot liquid near a child. » Turn away the handles of pan/cookers inwards to avoid spilling by knocking them off. » Avoid storing match sticks and lighters out of reach/sight of children. » Instruct on keeping away the hot iron box to cool/avoid touching the hot iron. » Educate on careful disposal of cigarettes after smoking in bedrooms and ensure no cigarette is lit before going to bed. » Instruct on safety precautions of electrical lighting during festivities. » Advise community display of firecrackers during Diwali and other festivals.	Central/State Government/Health Department/Local Organisations/ Schools/ Playschools/ Residential Societies

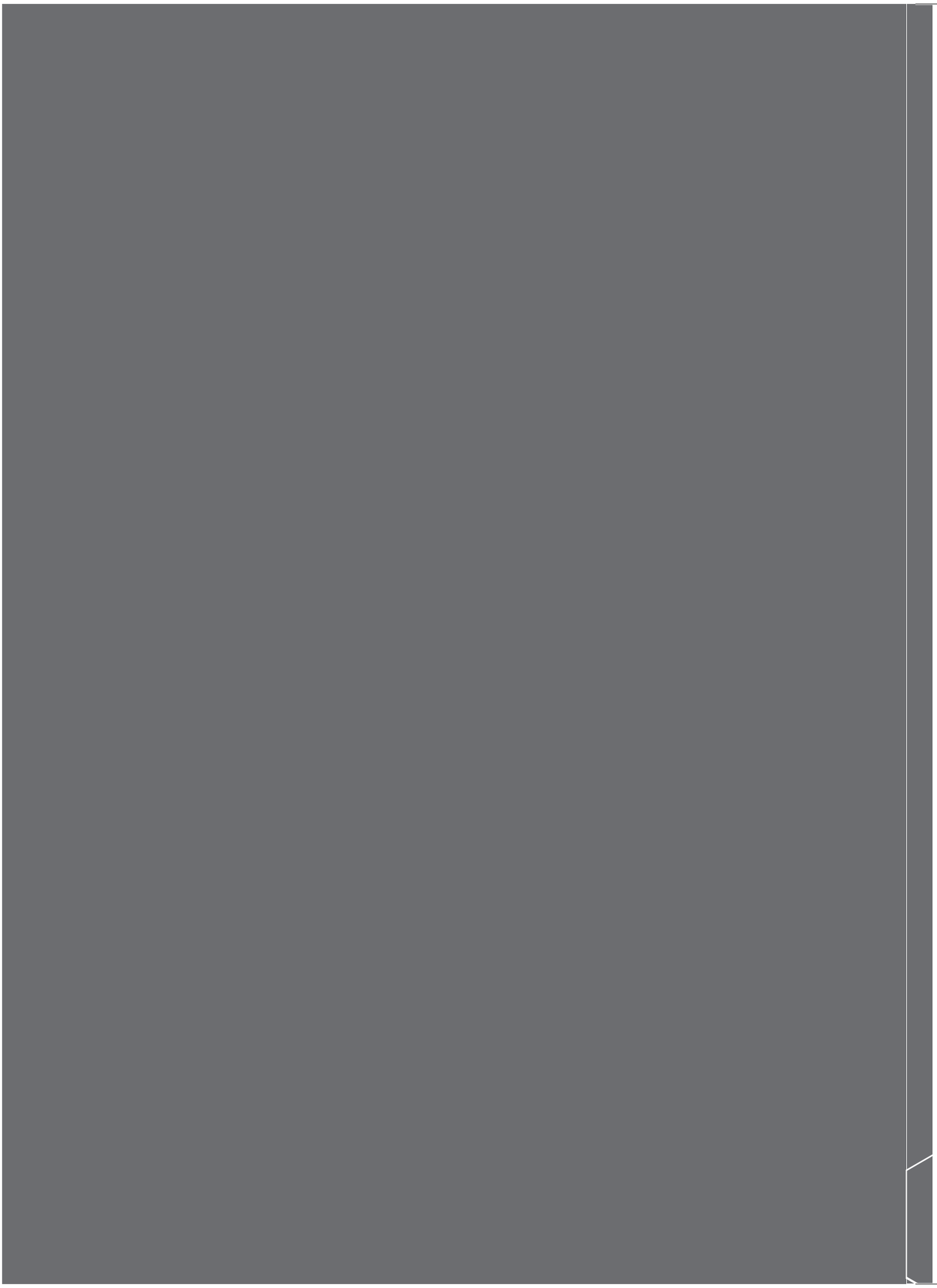
Strategy 1.2(cont...) » Use firecrackers on open grounds only with an adequate water supply for dousing the fire. » Ensure fire-resistant materials are used in pandals including all fire safety precautions. » Avoid burning firecrackers in hand and do not point the burning fireworks towards yourself. » Restrict fiddling with unburnt crackers. » Ensure safe placement of Diya's during pujas and avoid floor-level placement of Diya's near walking areas. • Educate people on the use of safe lamps and instructions may include: » Avoid using kerosene stoves or lanterns, candles for lighting, and highly flammable fuels within the house. » Avoid adding paraffin to burning lamps. » Use of solar powered lanterns. » Not to place lamps at the edge of the table. » Do not hang the lamps on the walls.	
Domain: Interventions/programmes **Strategy 1.3: Empower teachers and health-care professionals on Burn Prevention** **Action points:** • Include information on burn prevention and first aid in the school syllabus and school health programmes. • Develop standard training materials for schoolteachers, and students in coordination with health promotion, public health, and burns experts by engaging with their professional bodies, such as NABI, IPHA, IAPSM, and others. • Train schoolteachers by harnessing existing district level health programme, such as Rashtriya Bal Suraksha Karyakram (RBSK) and sensitize students. • Mandate one-day training for the prevention of burns and firecrackers injuries preferably before Diwali in schools as Burn Prevention Day annually. • Mandate one-day training for the prevention of burns and firecrackers injuries preferably before Diwali in schools as Burn Prevention Day annually. • Organize burn prevention training programmes for health-care professionals, including ASHAs and community health workers at least once a year. • Support short-term training courses for nurses specialised in burn care.	Centre/State Government/ Health Department/ Department of Education/Local Organisations

Strategy 1.3 (cont...)	
Action points: • Practice competencies and training can be identified for burns nursing staff to ensure safe and effective nursing care in burns units. • Create multidisciplinary coordinated care models for health-care workers involved in burn care.	
Domain: Interventions/programmes	Central/State Government Health Department
Strategy 1.4: Establish and sustain adequate infrastructure and skillful multidisciplinary teams to reduce mortality, morbidity, and disability associated with burns.	
Action points: • Focus on improving initial treatment including preventing shock and breathing problems by ensuring Airway (A), Breathing (B) and Circulation (C), infection control, ensuring adequate nutrition, and increased use of skin grafts. • Facilitate knowledge of health-care providers about the 'golden period' of resuscitation at the time of transportation. • Expand the scope of publicly financed health insurance schemes, such as PMJAY for burn care. • Indicate referral criteria to help providers in determining the timely transfer of patients to a burn centre. • Ensure a referral guideline and protocol for emergency and trauma care, including burns at all primary, secondary, and tertiary level health-care facilities. • Organise a burn management training program for all doctors, nurses, and paramedics working in the Emergency Department, at least once a year. • Ensure a standard protocol to address free transport of critical burn patients from a local hospital to a regional burn centre. • Educate health professionals on the burn rehabilitation process as a multidisciplinary approach, with proper support and timely therapeutic intervention, so patients can reach their maximum physical, psychological, and functional outcomes. • Educate about the importance of deformity prevention, functional restoration, aesthetic improvement, and return to family and society for patients and families and burn caregivers. • Provide awareness on the use of splints essential for positioning, stretching, and lengthening the contracted scar tissue. • Early use of skin grafting as intervention in managing burns. • Work on developing the burn rehabilitation guidelines focusing on the importance of teamwork, physiotherapy, occupational therapy, mental health component, and discharge criteria.	

Strategy 1.4 (cont...)	
Action points: • Ensure penetration of rehabilitation services to rural areas of the country (A hub and spoke model of rehabilitation where a burn unit under central government is linked to several peripheral centres to coordinate burn rehabilitation services to improve the utilisation of rehabilitation services by the rural population). • Encourage work hardening programs in recovered burn injured individuals with support of the MoHFW, and local organisations/ NGOs. • Improve the availability of essential skilled manpower to ensure proper functioning of burn care units.	
2. Safe home and kitchen	
Domain: Intersectoral collaborations	Central/State Government/ Department of Power/Local Organisations/ Residential societies
Strategy 2.1: Convene strong cross-sector participation in active planning and implementing prevention measures to promote a safe environment.	
Action points: • Enclose transformers in public areas. • Ensure sufficient safety measures for high tension wire passing though agricultural farms and residence in rural area. • Instruct to avoid high-tension/open wires inside the house, balcony, or terrace. • Recommend electric cables be placed underground in residential areas and use of MCB automatic switches in all houses. • Advise maintenance of the electric wire system regularly and specifically before the rainy season. • Involve a professional electrician for checking the wiring in the home at least once every 10 years. • Instruct the use of safety gear, rubber sole boots, goggles, and insulated gloves at workplace. • Encourage the use of smoke detectors/smoke alarms/fire sprinklers/fire guards at homes, and make electrical sockets child safe by covering them or keeping them at a height of 4 meters. • Ensure separate cooking areas from living areas, if possible, or else ensure safety practice during and after cooking. • Enclose kitchen fire safety and avoid floor-level cooking. • Recommend the use of a cooking counter or slab of at least 34 inches. • Encourage keeping fire blankets, especially in the kitchen. • Encourage availability of fire extinguishers at homes/workplaces/ schools. • Instruct to avoid flying kites in open areas/away from electric wires.	

3. Safe equipment	
Domain: Interventions/programmes	Central/State Government/ Department of Fire and Safety/ Residential Societies/ Automobile Industry
Strategy 3.1: Promote the use of safe equipment and redesign equipment to improve safety standards.	
Action points: • Ensure routine checks and maintain fire safety standards for all equipment. • Strengthen the regular checks on safety valves for the gas cylinders. • Inform people about avoiding the use of 5kg or smaller LPG cylinders or using them with high level of caution. • Encourage the use of thermostats in all geysers. • Communicate with concerned personnel to ensure safety on using immersion rod open coil heaters or replace them with safety devices. • Inform the automobile industry about the benefits of safety insulators in motorcycle silencers. • Facilitate developing safe stoves and use them out of doors and off ground to reduce exposure to indoor fumes.	
4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government/Local Bodies
Strategy 4.1: Empower communities and increase opportunities for collaborative burn injury prevention measures among various stakeholders.	
Action points: • Promote community and religious groups in the dissemination of information related to the prevention of burns and first aid. • Engage local leaders, religious heads, or faith community leaders as coalition partners to prevent self-immolation and homicides. Gatekeeper training might be provided to identify people under the larger umbrella of suicide and violence prevention in the communities in collaboration with National Mental Health Programme (NMHP). • Organise public education campaigns and awareness programmes in association with self-help groups, NGOs along with industries, schools, community groups, and residential society to ensure better percolation of the efforts.	
5. Surveillance and research	
Domain: Surveillance system	Centre/State Government /Local Governments
Strategy 5.1: Establish a national burn registry mechanism to collect, compile and analyse data related to burn injuries in the country.	
Action points: • Designate a national nodal agency for ensuring data quality, use, and dissemination. • Create and expand the burn injuries data registry at all levels. Integrate and expand burn data into routine Health Management Information Systems (HMIS).	

Strategy 5.1 (cont...)	
Action points: • Recruit the staff required for maintaining the data at various levels. • Conduct review meetings to monitor and evaluate the working of surveillance systems at various levels. • Conduct regular monitoring and evaluation of the above-mentioned interventions to see what works. • Utilise the data to guide policymakers to make informed decisions.	
Domain: Intersectoral collaborations	Funding bodies and Research Organisations
Strategy 5.2: Conduct research activities to provide scientific information on the burden, associated risks, and interventions towards burn injuries.	
Action points: • Conduct studies to evaluate gap analysis by research bodies to plan interventions. • Promote multisectoral collaborative research to guide policymakers to make informed decisions.	



Prevention of falls

Section 2D

D1: Prevention of falls

Considering that falls from height and same - level falls have distinct etiologies, distributions, risk factors, and interventions, the strategy presents falls in two subsections: fall from height and same- level falls, with a specific focus on older populations (Details in Section D2).

Section D1: Fall from height

i) Background

Falls are the second leading cause of unintentional injury death globally, following road traffic accidents. According to the WHO, falls claim an estimated 6,84,000 lives annually worldwide, with over 80% occurring in LMICs. Annually, approximately 37.3 million falls are severe which require medical attention and falls account for 38 million DALYs lost each year[38]. Furthermore, the global monitoring report by the WHO and the ILO reports that falls contribute to a significant number of work-related deaths and injuries. Falls account for 34996 deaths and 3.73 million DALYs at workplaces[39]. The ILO also reports occupational injuries and diseases represent 4% of the total Gross National Product (GNP) which also includes occupational falls[40].

ii) Global and regional response to fall injury

Globally, falls from height are the greatest cause of concern and have fatal consequences on workers' productivity and the country's economy. Fall from height represents one-third of the construction injuries[41]. Data from various countries illustrates the significant impact of falls, including emergency room admissions and fatalities. In the United Kingdom, falls account for 55.3% of emergency admissions and 3.5% of deaths[42], whereas in Japan it accounts for 41.4% of emergency admissions and 4.4% of mortality[43]. China reported that 41.7% of spinal cord injuries were caused by falls, of which 30.3% happened due to high falls[44].

38. World Health Organization. Key facts: Falls,2021. Available at https://www.who.int/news-room/fact-sheets/detail/falls
39. World Health Organization and International Labour Organization. Global monitoring report: WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury, 2000–2016. Available at : WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury, 2000–2016 | International Labour Organization
40. Mekkodathil A, El-Menyar A, Al-Thani H. Occupational injuries in workers from different ethnicities. Int J Crit Illn Inj Sci. 2016 Jan-Mar;6(1):25-32. doi: 10.4103/2229-5151.177365. PMID: 27051619; PMCID: PMC4795358.
41. Nadhim EA, Hon C, Xia B, Stewart I, Fang D. Falls from Height in the Construction Industry: A Critical Review of the Scientific Literature. Int J Environ Res Public Health. 2016 Jun 28;13(7):638. doi: 10.3390/ijerph13070638. PMID: 27367706; PMCID: PMC4962179.
42. Kennedy RL, Grant PT, Blackwell D. Low-impact falls: Demands on a system of trauma management, prediction of outcome, and influence of comorbidities. J Trauma 2001;51:717–724.
43. Nakada TA, Nakao S, Mizushima Y, Matsuoka T. Association between male sex and increased mortality after falls. Acad Emerg Med. 2015;22(6):708-13.
44. Zhang et al. Traumatic spinal cord injury caused by low falls and high falls: a comparative study. Journal of Orthopaedic Surgery and Research.2021; 16:222.

iii) Situational assessment

India grapples with a growing public health concern: the rising contribution of falls to overall mortality rates. Data suggests a significant increase, from 1.34% in 1990 to 2.49% in 2019[45]. This trend highlights the dangers of unintentional falls, which pose a substantial risk of injury and death across all age groups, from children to older people[46].

Falls from height are a particular concern, causing severe blunt trauma across various sectors in India. These falls can occur in workplaces, homes, and during recreational activities. Furthermore, falls from trees pose a unique challenge, especially among young boys and men in India, and also pose a significant risk within workplaces. According to the Ministry of Labour and Employment's (M/o L&E) annual report (2020-2021), an estimated 27% of serious injuries in coal mines resulted from falls[39]. Understanding the causes and factors contributing to these falls is crucial to prevent such injuries.

The common causes of high falls are as follows:

Table 8: Common causes and factors contributing to falls.

Site	Cause	Factors
Home	• Roofs - through holes, fragile materials, or roof light • Balconies	• Roofs - temporary access during construction • Roofs - periodic maintenance and repair during the life of a structure • Unprotected balconies • Unprotected roofs • Playing and sports e.g. kite flying, mobile selfie
Agriculture industry	• Trees • Coconut farming	• Tree maintenance - occasional at specific sites • Climbing on coconut trees • Tree maintenance - regularly on various sites by specific individuals
Mining and construction industry	• Elevated platforms • Ladders • Roofs » falls during erection » falls through holes » fragile materials or roof lights • Scaffolding collapse • Infrastructure construction including flyovers, bridges, metro rail, etc.	• Poor lighting and visibility at underground mines • Wet slippery surfaces in coal mines • Construction - temporary work at height for various trades • Maintenance and inspection - temporary working at height • Demolition - temporary working at height • Working on pillars at a height

45. Tan S, Porter K. Free fall trauma. Trauma 2006; 8: 157-167.
46. Ministry of Labour & Employment (Govt. of India), Annual Report 2020-2021.

Extraction and utility supply	• Towers/pylons (a tall tower like structure used for carrying electricity cables high above the ground)	• Construction of towers • Periodic access to towers • Periodic extraction of industry equipment • Regular maintenance of industry equipment
Manufacturing industry	• Forklift - from forks or working platform • Ladders • Machinery	• Periodic inspection of industry equipment • Regular cleaning • Regular sampling • Regular maintenance of industry equipment
Services industry	• Window cleaning • Lorries during loading or unloading • Warehouse racking	• Regular window cleaning • Periodic maintenance • Frequent loading and unloading of vehicles • Working at height in shopping malls • Working at elevators • Frequent access to warehouse racking

Table 9: Risk factors contributing to falls.

Age	• Children constitute a high-risk group. Childhood falls occur largely because of their evolving developmental stages, innate curiosity in their surroundings, and increasing levels of independence that coincide with more challenging behaviours, commonly referred to as 'risk taking'. While inadequate adult supervision is a commonly cited risk factor, the circumstances are often complex, interacting with poverty, sole parenthood, and particularly hazardous environments.
Gender	• Across all age groups and regions, both genders are at risk of falls. In some countries, it has been noted that males are more likely to die from a fall, while females suffer more non-fatal falls. Older women and children are especially prone to falls and increased injury severity. Possible explanations of the greater burden seen among males may include higher levels of risk-taking behaviour and hazards within occupations. Men and boys are common victims of fall in the Indian scenario[47].
Alcohol or substance use	• There is a linear dose-response relationship between fall and alcohol intake[48].
Socioeconomic factors	• Poverty, overcrowded housing, sole parenthood, young maternal age.
Underlying medical conditions	• Neurological, cardiac, or other disabling conditions.

47. Jagnoor J, Suraweera W, Keay L, et al. Childhood and adult mortality from unintentional falls in India. Bull World Health Organ 2011;89: 733-740.
48. Taylor B, Irving HM, Kanteres F, et al. The more you drink, the harder you fall: a systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. Drug Alcohol Depend 2010;110: 108-116.

Others	• Side effects of medication, physical inactivity, and loss of balance, particularly among older people. • Poor mobility, cognition, and vision, particularly among those living in an institution, such as a nursing home or a chronic care facility. • Unsafe environments (especially construction sites), particularly for those with poor balance and limited vision. • Lack of protective gears like safety harness.

According to the NCRB report (2022), the total number of falls has increased over the years. Fall from height accounts for approximately 50% of all falls during these years and other causes include fall into manholes, pits, and borewells. Falls are more commonly observed in males compared to females, and the death rate is also higher among males. Data also indicates a majority of fall-related deaths occur in the age group of 30-45 years, followed by 45-60 years[3].

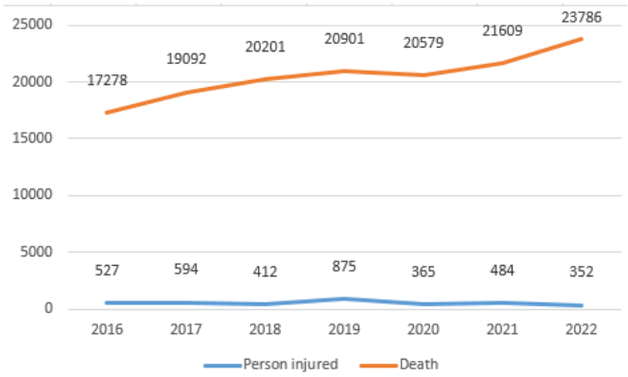
The states with the highest proportion of deaths due to falls during 2022 were Maharashtra (17.8%), Odisha (9.7%), Gujarat (8.5%), Rajasthan (7.7%), and Madhya Pradesh (7.2 %). These states account for approximately 50% of all deaths due to falls from height[3].

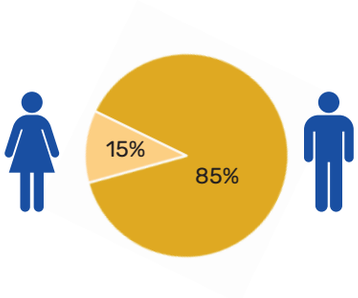
Figure 9: Statistics of fall injures in India.

FALL INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

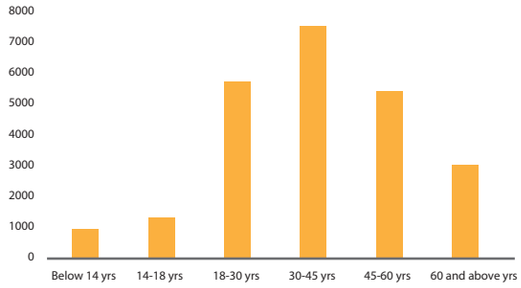
There were 23,786 deaths from falls in 2022, which is an increase from 17,278 in 2016. The number of fall injuries have decreased slightly over the years.

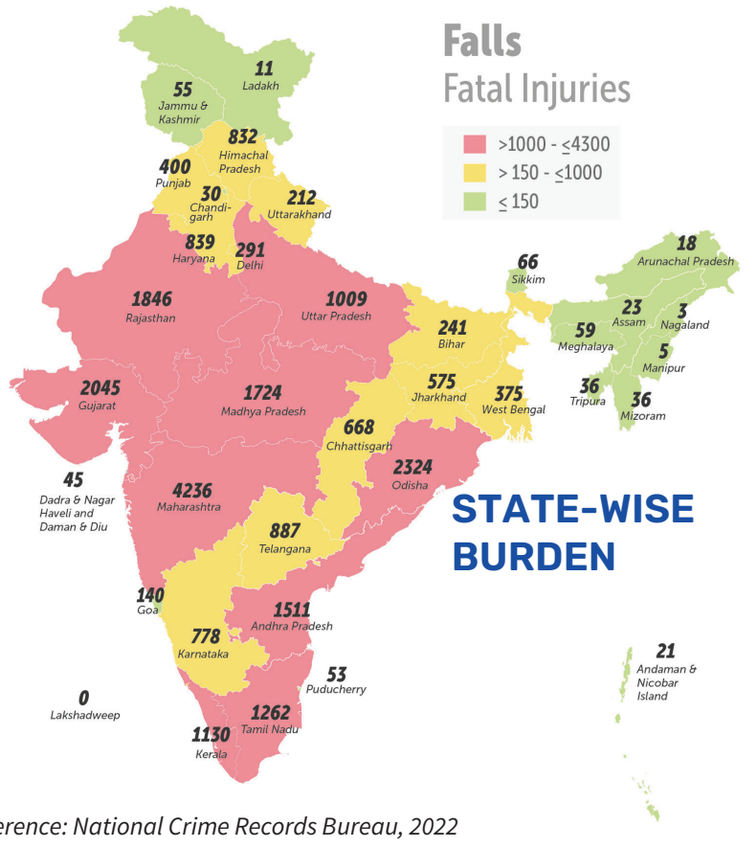




AGE-WISE BURDEN

Majority of deaths due to falls are in persons aged 30 to 45 years, followed by persons aged 45 to 60 years and 18 to 30 years.





STATE-WISE BURDEN

MAJOR CAUSES

All people who fall are at risk of injury, however the age, gender and health of the individual can affect the type and severity of injury. Some common instances include-


From heights


Into manhole


Into pit or borewell

Reference: National Crime Records Bureau, 2022

iv) Strategies and interventions

Fall from height is multifactorial, the variables that influence the seriousness of injury include the distance of fall, impact surface, body orientation at impact, victim's age, and depressed protective mechanisms.

Table 10: Prevention of Fall from a height.

Section 2E: Prevention of fall from a height	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Reinforce existing laws and policies to achieve behavioural and environmental change for safety.	Central/State Government/ Industries/Factories
Action points: • Recommend stakeholders to conduct a pre-employment assessment of all workers, including vision, hearing, and other medical conditions. • Strengthen the use of fall protection systems by employers for the workers' safety. • Mandate the use of safety equipment such as PPE wherever required. • Regulate timely health check-ups for all the people working at heights to reduce the risk of falls/injuries. • Enforce the availability of first aid services in case of a mishap at the workplace. • Enforce availability of emergency rescue plan in case of mishaps at worksites. • Support payment and reimbursement mechanisms for compensation to the workers/family in case of casualty. • Frame laws for residential societies/landlords to place window guards in high-rise buildings/homes.	
Domain: Community driven initiatives	Central/State Government/ Industries/Factories/ Local Bodies/Schools/ Playschools
Strategy 1.2: Build resilience among the public/workers/ parents on dangerous hazards leading to fatal falls/injuries.	
Action points: • Organise safety awareness events/campaigns for at-risk people across various levels. • Provide displays on safety awareness and use of equipment cautiously at the worksites. • Educate workers on reporting activity/defects that can endanger the work environment. • Educate employees/employers on adequate rest between the works at the workplace. • Create awareness of the strict use of PPEs among the workers. • Ensure safety mechanisms outside a factory setting, e.g. electricians, mine workers, painters, and those climbing coconut trees or putting a hoarding.	

Strategy 1.2 (cont...)	
Action points: • Emphasise avoidance of working under the influence of alcohol and risky weather conditions. • Improve workers' knowledge about pre-existing medical conditions and ensure the treatment/necessary follow-ups. • Use common communication technologies/media support to raise awareness of risk determinants and safety measures for high falls. • Eliminate or avoid recruiting persons diagnosed with mental issues/persons on treatment, to reduce the harm for himself/herself or the risk of a fall injury. • Improve workers' knowledge about their rights and responsibilities at workstations. • For patients with history of attempting suicide, the family members/family physician should take regular care about required counselling, medication like anti-depressants, avoiding crisis, addressing associated chronic health problem/substance abuse/cyber bullying (if any). • Ensure access to a physician/counsellor for at least 18 months following a suicidal attempt as it has high chance for FFH. For further details, please refer to the National Suicide Prevention Strategy (2022).	
Domain: Interventions/programmes	Central/State Government/Local Health Department/ Industries/Factories/ Schools /Playschools
Strategy 1.3: Create a skilled workforce to address uneventful circumstances at work sites and schools.	
Action points: • Train employees on easy/timely evacuation and rescue in case of emergency. • Train employers on planning and supervising workplace safety. • Educate workers on using PPE and equipment safely at the workplace. • Increase knowledge of workers on the selection of appropriate equipment required for work at heights. • Train employees/employers to handle risks associated with working in a risky environment/weather condition. • Train the employers to follow protocols and provide immediate measures in case of emergencies/medical aid in the event of a mishap. • Train school personnel on the first aid measures for high falls. For example, Injury identification, immobilisation, and referral. • Strengthen the health teams to provide regular health check-ups of the workers at worksites. • Assure treatment and follow-up of medical conditions identified during regular assessment.	

Strategy 1.4: Strengthen health units at worksites and hospitals to provide first aid/referral and management due to falls from heights.	Central/State Government/Health Department
Action points: • Indicate a standard protocol to address the timely transport of injured individuals to the nearby hospital. • Provide immediate care/first aid measures at the nearby hospitals to treat injuries from heights. • Strengthen detail assessment at the health centres including head, because head injuries and traumatic brain injuries are common in FFH. • Provide adequate treatment and timely referral, if needed. • Support adequate rehabilitation services, including mobility training and availability of assistive devices (crutches, walkers, wheelchairs, and prostheses) for home/community integration and to minimise long-term consequences of fall injuries	
2.Safe home and workplace	
Domain: Interventions/programmes	Central/State Government/ Industries/Factories/ Schools/Playschools/ Residential Societies
Strategy 2.1: Strengthen and create safe environment measures to eliminate fall-related hazards.	
Action points: • Mandate inspection of the workplace by competent authority for safety standards regularly. • Recommend the availability of safety checklists at workplaces. • Instruct personnel to lay down clear signages on danger areas at heights/ prevent entry to those sites. • Recommend construction of guardrails at the balcony at homes to prevent falls. • Educate people on avoiding slippery floors on the balcony as it increases the chances of tripping. • Communicate best practices to promote a safe environment. They include: » Ensure safety and prevent the fall of objects or persons stuck by falling objects from heights. » Educate on organizing and storing the materials/objects at heights to avoid the risk of falling. » Provide guard rails and install barriers while working at heights. » Ensure the provision of safe, suitable platforms (a working platform more than 2 meters in length) and should be inspected every seven days at the sites. » Ensure sufficient dimensions to permit safe passage of persons and avoid gaps while working at heights to prevent falls.	

Strategy 2.1 (cont...)	
Action points: • Provide stable, sufficient strength and rigid equipment for work at heights. • Ensure clear visuals of moving equipment at heights to reduce injuries/falls. • Provide nets/airbags on the grounds to prevent injuries related to falls from height.	
3. Safe equipment	
Domain: Policy	Central/State Government/ Industries/Factories/ Local Retailers/ Schools/Playschools
Strategy 3.1: Promote the use of safe equipment and improve safety through periodic checks.	
Action points: • Enforce safety and equipment audits regularly at work sites. • Ensure all the equipment used at work are in accordance with the safety standards and if not penalise the employers. • Confirm initial safe assembly of all the equipment and the maintenance appropriately. • Ensure regular checks of the cranes, ladders, and other equipment used for works at the height as per the safety standards. • Provide a safety harness while working at heights and ensure its functionality regularly.	
4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government/Local bodies/Industries/ factories/Schools/ Playschools
Strategy 4.1: Empower communities and enhance multi-sectoral collaboration among stakeholders to promote safety.	
Action points: • Organise public education campaigns in association with NGOs for risk factors associated with high falls and how to prevent them among the workers and community. • Empower the workers on the compensation that is to be paid to the victims of a fall from a height, at which such a scene arises due to negligence of an employer or the caretaker of the building or caretaker of a public place at a height. • Encourage schools/playschools to have a safety checklist to promote school safety standards with respect to playgrounds, sports-related equipment, classrooms, staircases, etc.	
5. Surveillance and research	
Domain: Surveillance system	Central/State/Health Department/Local Governments
Strategy 5.1: Establish a registry to collect data on injuries due to fall from heights in the country.	
Action points: • Create a registry for injuries related to falls including FFH. • Strengthen the National Injury Surveillance System	

Domain: Intersectoral collaborations	Research Organisations/ Industries
Strategy 5.2: Conduct research activities to provide scientific evidence on the burden, associated risks, and interventions of injuries from heights.	
Action points: • Conduct gap analysis studies to plan interventions. • Promote multisectoral collaborative research to guide policymakers to make informed decisions.	

Prevention of injuries in older people

D2: Prevention of injuries in older people

i) Background

Globally there are 962 million older people (aged 60 or above), and they comprise 13% of the total population. Unintentional injuries are a significant concern among older people worldwide, ranking as the fifth leading cause of death. Among these injuries, falls are particularly prevalent, accounting for two-thirds of all deaths in this age group[49].

The incidence of falls in older people is high, with an average of 30 falls occurring per 100 person-years. Falls among older people have substantial consequences, resulting in 4,50,000 deaths globally and contributing to around 1.4% of all deaths in this population. While death directly resulting from a fall is relatively infrequent, the complications arising from falls pose a significant risk to the health and well-being of older people. In fact, these complications are the leading cause of death among this age group[50].

Addressing falls and reducing their impact on older people is of utmost importance due to the associated morbidity and mortality. Efforts focused on fall prevention, such as interventions to improve balance, strength, and environmental modifications, can significantly reduce the incidence of falls and mitigate their consequences for older individuals.

ii) Global and regional response to injury in older people

Injuries among older people are quite common and dangerous. Worldwide, more than a million older people die annually due to injuries[51]. To address the issue, the Centers for Disease Control (CDC)'s Injury Center created STEADI (Stopping Elderly Accidents, Deaths, and Injuries) to provide a coordinated approach to implement the clinical practice guidelines for fall prevention. It consists of three core elements: screen to identify fall risk, assess modifiable risk factors, and intervene using effective clinical practice and community strategies to reduce the identified risk[52].

iii) Situational assessment

According to the Ministry of Statistics report, the number of older people has reached a projected figure of 137.9 million in 2021 from estimated 103.8 million in 2011[53]. Falls is

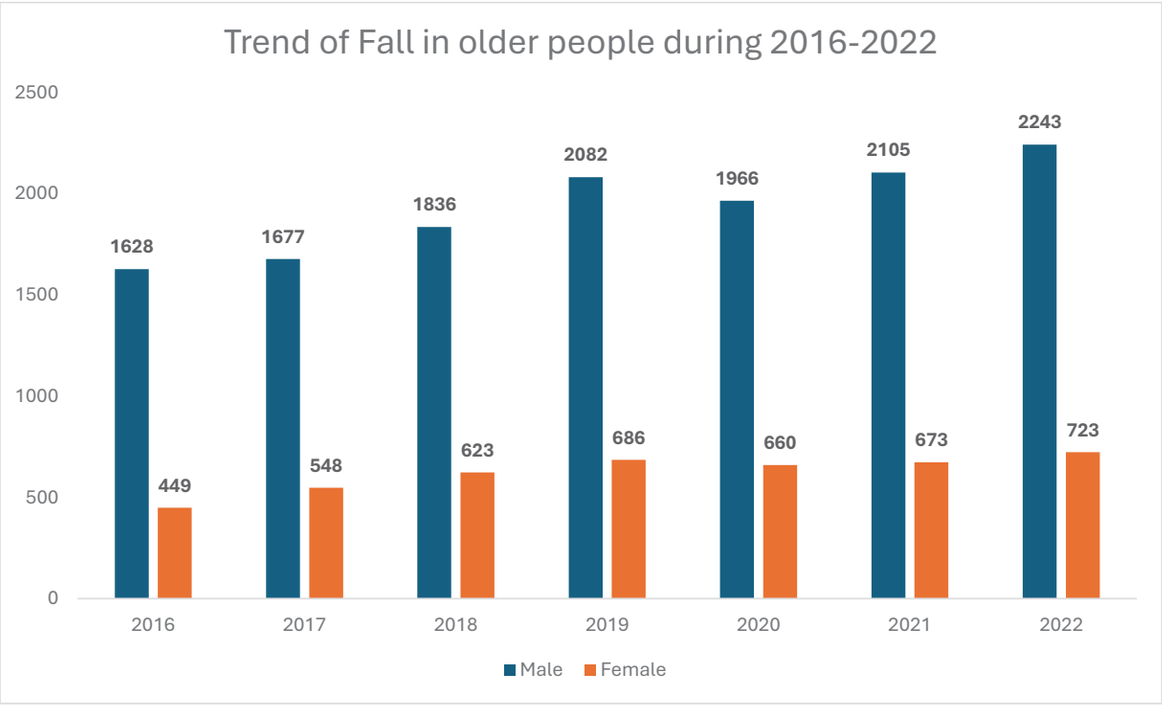
49. Sasidharan DK, Vijayakumar P, Raj M, et al. Incidence and risk factors for falls among community-dwelling elderly subjects on a 1-year follow-up: a prospective cohort study from Ernakulam, Kerala, India. BMJ Open. 2020;10(7):e033691. doi:10.1136/bmjopen-2019-033691
50. Lahiri A, Jha S, Chakraborty A. Elders suffering recurrent injurious falls: causal analysis from a rural tribal community in the eastern part of India. RRH. Published online October 21, 2020. doi:10.22605/RRH6042
51. Binder S. Injuries among older adults: the challenge of optimizing safety and minimizing unintended consequences. Injury Prevention. 2002;8 (suppl4):iv2-iv4. doi:10.1136/ip.8.suppl_4.iv2
52. About STEADI | STEADI - Older Adult Fall Prevention | CDC Injury Center. Published July 16, 2020. Accessed February 21, 2022. https://www.cdc.gov/steadi/about.html
53. Elderly in India,2021. Ministry of statistics and programme implementation, Government of India. Available at: https://mospi.gov.in/sites/default/files/publication_reports/Elderly%20in%20India%202021.pdf

a significant concern for this growing population. Data from a national study like LASI - 1 indicates that the prevalence of any injury/falls in older people is 25% higher than that injury/falls in older adults between the age of 45 -59 years (18%). Likewise, the self-reported prevalence of either injury or falls in older people is higher than that of older adults. This is true for both rural (26 % and 21%) and urban areas (21% and 14%)[54].

Unintentional falls are the leading cause of injuries in older people, accounting for over 70% of all injury cases[9]. Worryingly, a significant proportion of these falls (40-60%) result in some form of injury, with 10-15% leading to serious injuries such as hip fractures. Hip fractures are particularly concerning due to their high mortality rate - 10% within a month, 20% within six months, and 33% within a year[53].

India's growing older people population faces significant challenges. Data indicates a higher prevalence of injury/fall in women (27%) as compared to men (22%) and the prevalence of injury/fall was higher in widows (28%) and those living alone (29%). Additionally, LASI-1 reported mistreatment/abuse of older people as multidimensional, multilayered, and leads to serious consequences to health and wellbeing. The LASI-1 also reported that 5% of older people experienced ill- treatment in the previous year. Out of which, half experienced it occasionally (once in 2 months), one- third only a few times (at least once in a year), and 14% frequently (at least once in a fortnight). A higher proportion was seen in older women than men while abuse was seen more frequently in older people who lived alone, divorced/separated/deserted. Ill-treatment was more commonly seen in older people living in urban areas and in scheduled castes. It was also confirmed that the primary abusers were main caregivers who included spouses, children, and son-in-law/daughter-in-law. About two-fifths reported ill- treatment by son/daughter (41%), son-in-law/daughter-in-law (36%) and spouses (7%)[54].

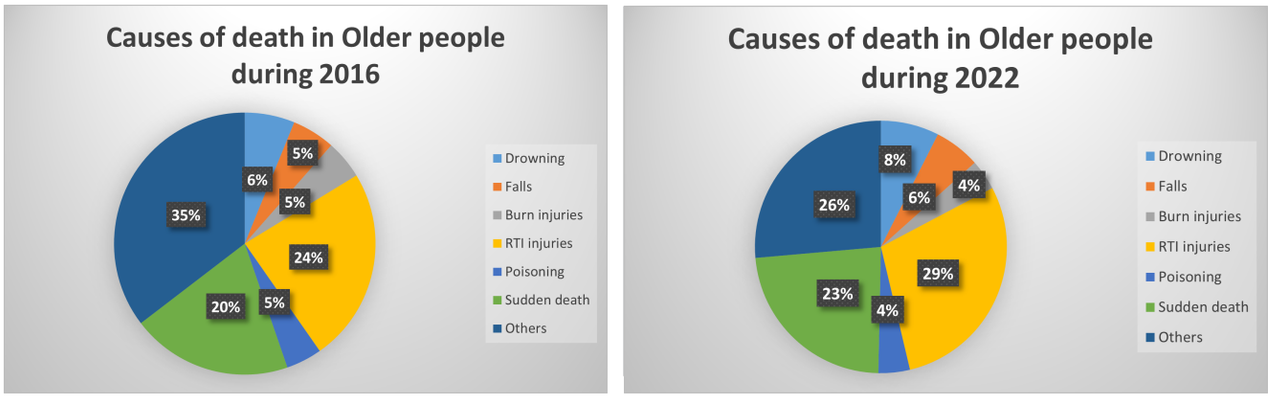
Figure 10: Trend of fall in older people during 2016-2022 (NCRB).



54. Longitudinal Ageing Study in India (LASI) Wave 1, 2017-18, India Report, International Institute for Population Sciences, Mumbai. Available: https://lasi-india.org/public/documentation/LASI_India_Report_2020.pdf

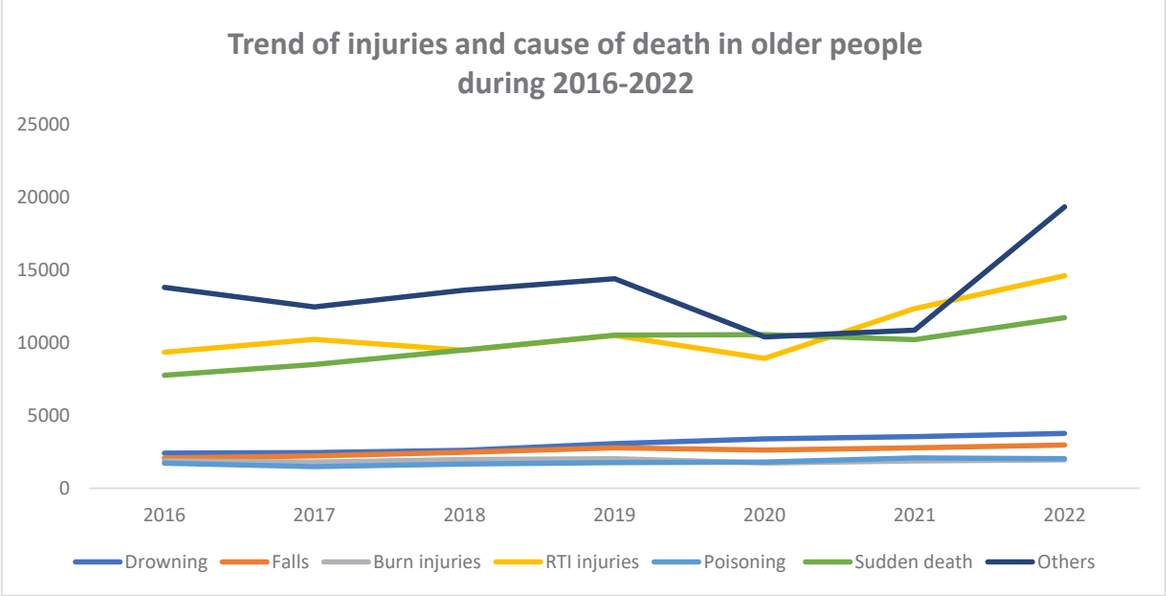
The NCRB for the last five years reported, fall among older males more as compared to the older females. The majority of the falls were from height during all these years[3].

Figure 11: Causes of injuries among older people during 2016 and 2022



Among the older population, injuries due to RTI have increased over years, as compared to drowning, injuries due to falls, burn injuries.

Figure 12: Trend of injuries and cause of death among older people during 2016-2022



As per NCRB report over the past five years, fall in older people have accounted for approximately 4-5% of total injuries annually. These falls are the primary cause of hospitalisation, functional decline, and mortality among older people. Despite this alarming trend there is a significant lack of awareness regarding falls and associated injuries among both the public and health-care professionals. This lack of awareness contributes to minimal understanding of fall prevention among older individuals and their caregivers. Furthermore, India currently lacks a comprehensive framework for fall reduction programs in the country. The absence of such programme hinders effective interventions to safeguard the well-being of our older population.

The National Programme for the Health Care of Elderly (NPHCE) was launched by the MoHFW in 2010. This program aims to provide dedicated health-care facilities for older people, focusing on preventive, curative, and rehabilitative services at various levels of the health-care system. It also works towards strengthening the referral system and promoting research activities related to older people's health. As part of the program, the establishment of 325 district geriatric units, dedicated geriatric outpatient departments (OPDs), and 10-bedded geriatric wards in 80-100 District Hospitals were targeted by the end of the 12th plan period. By implementing these initiatives, NPHCE strives to create a health-care ecosystem that effectively caters to the needs of India's aging population.

While the NPHCE offers a crucial step towards improved health care for India's aging population, a multifaceted approach is necessary to combat falls effectively. Furthermore, evidence suggests that physical activity, yoga, fall-related education, and environmental modifications can be beneficial in preventing falls among older people. These interventions should be considered as part of fall prevention strategies.

By implementing comprehensive initiatives like raising awareness about fall prevention, and incorporating evidence-based interventions, it is possible to reduce the incidence of falls, improve the well-being of older individuals, and minimise the associated burden of disability and mortality.

The WHO recommends physical activity for the older people:

Table 11: The WHO physical activity recommendations[55].

Moderate physical activity	At least 150 minutes of moderate-intensity physical activity throughout the week
Vigorous physical activity	At least 75 minutes of vigorous-intensity physical activity throughout the week.
Physically active	Either engaged in moderate physical activity or vigorous physical activity or an equivalent combination of moderate- and vigorous-intensity activity.

In India, approximately 11% of the older population aged 60 and above engage in yoga practices more than once a week. A higher percentage of men (14%) than women (9%) residing in urban areas (16%) participate in yoga activities compared to rural areas (9%)[53]. This leaves us with ample opportunity for increasing the adoption of yoga practices in their daily activities.

While the NPHCE and evidence-based interventions are crucial, a holistic approach requires additional elements. To ensure the safety and well-being of older people, the Ministry of Housing and Urban Affairs (MoHUA) issued guidelines on March 6, 2019, for the regulation and redevelopment of retirement homes. These guidelines include specific provisions such as the installation of grab rails and anti-skid tiles to create a safer living environment[56]. However, the effective enforcement of these guidelines throughout India is hindered by a lack of awareness. Furthermore, the guidelines are currently limited to retirement homes, neglecting other settings where older people reside.

55. World Health Organization. Key facts: Physical activity, 2022. Available at:https://www.who.int/news-room/fact-sheets/detail/physical-activity
56. Model Guidelines for Development and Regulation of Retirement Homes| National Portal of India. Accessed February 21, 2022. https://www.india.gov.in/model-guidelines-development-and-regulation-retirement-homes

Additionally, a national collaborative initiative called LASI provided comprehensive evidence on various aspects of aging. This initiative aimed to inform the development of policies and enhance scientific knowledge in the field.

Considering that women, widowed individuals, and older people living alone are more vulnerable to injuries and falls, interventions must specifically cater to the needs of these groups. By recognising and addressing the distinct risk factors and circumstances associated with these populations, fall prevention strategies can be more targeted and effective.

iv) Strategies and interventions

Fall in older people are usually multifactorial with a combination of both intrinsic (gait and balance impairment, neuropathy, dementia, orthostatic hypotension, osteoporosis, muscle weakness, polypharmacy, etc.) and extrinsic factors (environmental hazards, poor footwear, restraint, etc.). Since its causes are multifactorial, the prevention strategy requires a multipronged approach. In response, various countries have developed fall prevention strategies[57, 58, 59].

Table 12: Common fall prevention strategies.

Some common principles in fall prevention strategies
1. Annual fall assessment (includes history of falls; gait and balance assessment; postural hypotension; cognitive assessment; urinary incontinence, etc.).
2. Inclusion of strength and balance exercises.
3. Monitoring environmental hazards, including home safety assessment.
4. Optimisation of vision and hearing.
5. Medication review and reduce or withdraw potentially inappropriate medications.
6. Management of foot problems and footwear.
7. Inclusion of Vitamin D supplementation of at least 800 IU per day for persons with vitamin D deficiency.
8. Address undernutrition.
9. Information Education and Communication.
10. Encourage participation in fall prevention programmes.

The safe system approach provides a viable framework which examines the risk factors associated with injuries in older people and provides interventions in a holistic perspective.

57. RACGP - Falls. Accessed February 21, 2022.https://www.racgp.org.au/clinical-resources/clinical-guidelines/key-racgp-guidelines/view-all-racgp-guidelines/silver-book/part-a/falls
58. Guirguis-Blake JM, Michael YL, Perdue LA, Coppola EL, Beil TL. Interventions to Prevent Falls in Older Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA. 2018;319(16):1705. doi:10.1001/jama.2017.21962
59. Recommendations | Falls in older people: assessing risk and prevention | Guidance | NICE. Accessed February 21, 2022. https://www.nice.org.uk/guidance/cg161/chapter/1-Recommendations

Table 13: Prevention of injuries in older people.

Section D2: Prevention of injuries in older people	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Reinforce laws, policies or guidelines that demand best practices to promote fall safety in older people.	Central/State Government
Action points: • Enforce the engineering guidelines from National Building Code (NBC) of India 2016 and Model guidelines for development and regulation of Retirement Homes 2019 to establish homes for older people. • Recommend use of WHO Integrated Care of Older Persons (ICOPE) screening tool to identify at-risk people • Mandate annual assessment of older people in primary, secondary, and tertiary level care with WHO ICOPE. • Implement and expand the NPHCE for fall prevention in public health departments/ private hospitals.	
Domain: Community driven initiatives	Central/State Government/Health Department/Local Organisations/ Resident Associations/Old Age Homes
Strategy 1.2: Strengthen awareness and improve knowledge among older people and caregivers to make safer choices in preventing falls.	
Action points: • Encourage television, radio, and FM channels to have a dedicated program on older people issues and fall prevention. • Use displays IEC on fall prevention in hospitals, public transport, and public places. • Create awareness of the availability of state-sponsored care homes for older people in cases of abuse. • Increase awareness among older people and caregivers on the importance of annual assessments. • Create awareness on the reduction or withdrawal of potentially inappropriate medications, particularly with sedatives. • Educate older people on limiting their intake of alcohol. • Highlight the importance of sufficient sleep. • Educate older people and caregivers about the common risk factors (external), the benefits of regular physical activity, balance training, and the role of proper nutrition. • Encourage older people about the importance of physical activity: Adopt Strength and balance activities, at least 3 times a week. • Inform older people and caregivers on nutrition: High protein diet (1.2 gm/kg/day), for those with under-nutrition or chronic kidney disease (the protein recommendation will increase or decrease respectively). • Educate to change the beliefs and behaviour of older people and their caregivers for fall prevention.	

Strategy 1.2 (cont...) • Instruct wearing of appropriate footwear to prevent falls. • Deter the use of ladders, chairs, etc. to access heights at homes. • Emphasize on prevention of falls related to seizures in the epileptic older persons. • Develop a webpage for injury prevention with information about all kinds of injuries, preventive measures, and treatment protocols in older people. • Adapt an intergenerational teaching model to teach school kids and college students about fall and injury prevention in older people.	
Domain: Interventions/programmes	Central/State government/Local Health Departments/ Old Age Homes
Strategy 1.3: Strengthen and maintain the public health centres with appropriate resources to manage issues/injuries of older people efficiently at all levels	
Action points: • Provide skill training to ANMs and CHOs for annual assessment of older people at their respective health and wellness centre. • Support ANMs and CHOs in assessing associated risk factors in older people. • Train health professionals for the care of older people, to prevent injuries and problems associated with aging. This includes - » Annual assessment including WHO ICOPE assessment and balance problems. » Periodic screening for osteoporosis for those with a history of falls or high risk of falls on examination. » Evaluate gait and balance by various tests such as the Timed-up-and-go test (TUG), 4-stage balance test, or 5-times chair stand test. » Regular vision testing and use of appropriate glasses to avoid falls. » Review all medicines to avoid polypharmacy and examine medical conditions for the appropriate treatment. • Teach health-care providers to elicit a detailed history of unusual injuries, bruise marks, and repeated admission to hospitals. Questions related to relations between older people and caregivers and safe environments at homes/old age homes are to be elicited. • Support in registering a medico-legal case in the emergency department in case of serious injuries, sexual abuse, or unexplained injuries in older people. In case an older person does not wish to register a case against the caregiver, help from medical/social worker/police personnel can be suggested for an amicable solution.	

Strategy 1.3 (cont...)	
• Facilitate psychosocial support to older people through activities/recreation. • Set up and strengthen geriatric clinics at various levels to provide services near to their homes. The services are: » Biweekly geriatric clinics and rehabilitation units in all community health centres. » Weekly geriatric clinics in all primary health centres (PHC). » Provide equipment for community outreach services for the older people at the sub-centres.	
2. Safe home, workplace and public places	
Domain: Intersectoral collaborations	Central/State Government/Old Age Homes/Residential Societies
Strategy 2.1: Involve multi-stakeholders and make the environment more user-friendly to focus on fall safety in older people.	
Action points: • Communicate with stakeholders to create community-specific home-safety checklists considering the local settings and socio-economic context (details in Annexure III). • Make the environment user-friendly by adopting essential safety measures in outdoor/public spaces, indoor/housing, and common areas/recreation. They are as follows: **Outdoor/Public space (including hospitals & offices):** » Ensure wheelchair-accessible multi-storied buildings, including a lift facility with audio and visual signage. » Install illuminated/fluorescent/radium strips on all stairs and step ways. » Make unobstructed width for entrance & exits to buildings, corridors, and doors for the mobility of older people and the disabled. » Provide handrails on both sides in steps, ramps, corridors, etc., and it should not project into a transverse circulation path unless it is continuous. » Use of door handles, lift buttons at an accessible height, and a lever type of large size. » Ensure handrails and grab bars are securely fixed and rigid, slip-resistant with round ends, contrasting with the wall behind. » Build bathrooms anti-slippery, wheelchair accessible, wash basins at appropriate heights, and grab bars be installed in all public toilets. » Make bathrooms with outward-opening doors accessible in an emergency. » Avoid projecting nosing, open stairs, and spiral stairs in the building where older people stay.	

Strategy 2.1 (cont...)

- » Construct staircase as per 'Harmonised guidelines for elderly' (should have a width not less than 1500mm, avoid long flight of steps, in no case with more than 12 treads in a single flight).
- » Design the walkway smooth, and wheelchair accessible, with slip-resistant kerb ramps at all places.
- » Ensure walkways are devoid of barriers and hazards, with adequate lighting and signages wherever appropriate.
- » Make shopping areas, transport hubs (bus stands, railway stations, airport), and public places accessible for older people and the disabled.
- » Accessible public transport for older people and the disabled. The step height of buses and trains needs to be older people-friendly with grab bars.
- » Ensure the public transport vehicles provide adequate time for alighting and getting down of older people and the traffic signals should give adequate time for older people to crossroads.
- » Adhere to model building byelaws (MBBL) and NBC for all buildings including lighting, ventilation, and associated components.

Indoor/housing:

Most of the public space recommendations hold good for housing as well. Others are -

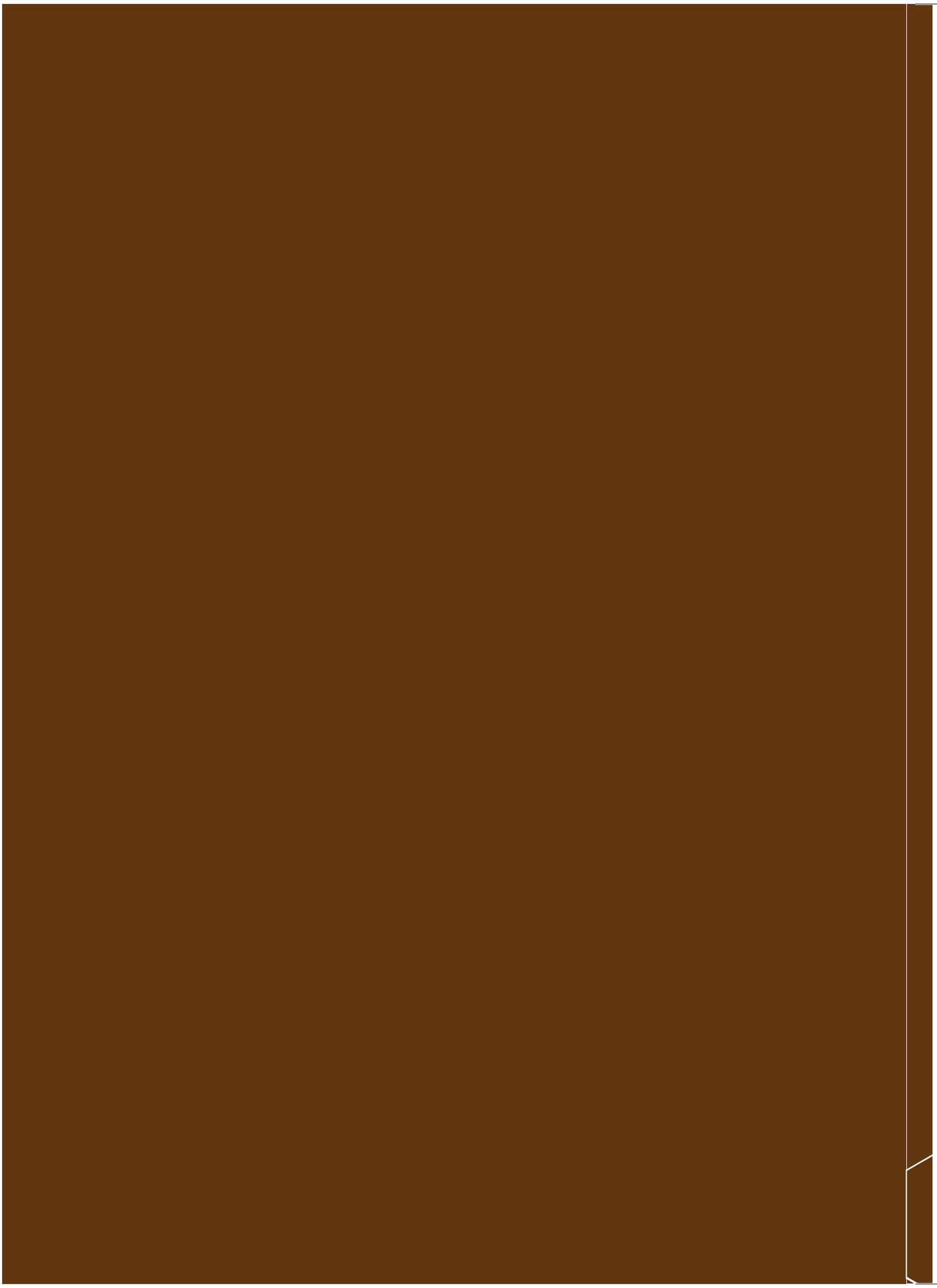
- » Avoid sturdy furniture and furniture with sharp edges at homes. The ergonomic design of furniture specific to the requirements of older people is preferable.
- » Limit the cluttering of objects at home to avoid falls.
- » Follow green building principles to minimize exposure to fumes and exhaust.
- » Install gas leak detection systems in the kitchen and rooms with attached kitchen.

Common areas/recreation:

- » Identify or establish public spaces (community halls, parks, etc.) for older people to socialise, similar to child play areas in the communities.
- » Use these spaces for group exercise, balancing exercise, cognitive exercise, and group activities (book reading, storytelling).
- » Run group activities for older people like Yoga, and Tai-chi for fall prevention in older people.
- » Provision of activity in the community/homes to strengthen the psychosocial health of older people.
- » Encourage regular exercise including balancing/cognitive exercises, Yoga in community parks.

3. Safe equipment	
Domain: Interventions/programmes	Central/State Government
Strategy 3.1: Enable opportunities to enhance mobility using assistive devices.	
Action points: • Recommend the use of assistive devices like canes or walkers for their day-to-day functioning. • Enhance the usage of manual/electric wheelchairs wherever appropriate. • Encourage the use of wearable personal alarms, fall sensors, and mobile phones with SOS emergency buttons among older persons.	
4. Empowerment	
Domain: Intersectoral Collaborations	Central/State Government/Local Bodies/Old Age Homes/Residential Societies
Strategy 4.1: Support and engage community/hospitals for implementing activities/programs to focus fall prevention among older people.	
Action points: • Empower the older person to live in a dignified manner which includes going out safely and pursuing their interests in an accommodating society. • Involve community groups and religious groups in the dissemination of information related to the prevention of falls in older people and the integration of awareness activities with the NPHCE programme. • Coordinate with the NGOs and private sectors for the consultative mechanism to redress difficulties in older people. • Create geriatric fall and fracture liaison (FFL) service in medical college hospitals, tertiary care hospitals, and district hospitals. Create a multi-disciplinary team at the state level to train and guide the liaison services team in their respective states (details in Annexure IV). • Support NGOs/private sectors to provide appropriate rehabilitation aid to older people. • Provide economic incentives to the old age communities, residential associations, panchayats who provide facilities for older people to augment the facility with injury prevention infrastructure. • Identify and facilitate awards for model communities with novel injury prevention strategies for older people.	
5. Surveillance and research	
Domain: Surveillance system	Central/State Government
Strategy 5.1: Create and strengthen the surveillance system to collect injury-related data among older people	
Action points: • Collect data related to injuries in older people at various levels of health care providers. • Set up a national registry for falls and related injuries for older people.	

Domain: Intersectoral collaborations	Central/State/ Local governments/ Research Organisations
Strategy 5.2: Promote research by multi-sectoral collaborations and develop interventions to prevent injuries among older people.	
Action points: • Plan and conduct research activities in collaboration with stakeholders to determine interventions for fall prevention among older people. • Analyse data collected from insurance agencies on fall related claims based on risk categorisation and plan further intervention.	



Prevention of occupational injuries

Section 2E

Prevention of occupational injuries

i) Background

The WHO and the ILO jointly estimates nearly 2 million deaths globally due to work-related causes each year. According to the global monitoring report 2016, occupational injuries proclaimed 3,63,283 lives and responsible for 26.44 million DALYs in world[60]. India records 17 million non-fatal injuries and 45,000 fatal injuries each year[61].

ii) Global and regional response to occupational injury

Occupational accidents and work-related diseases pose a significant global threat, claiming over 2.3 million fatalities, out of which over 3,50,000 are caused by occupational accidents and close to 2 million by work- related diseases[62]. The economic impact is equally staggering. The ILO estimates that occupational accidents and diseases result in a loss of more than 4% of the world's annual GDP[63]. These figures highlight the urgent need for improved workplace safety and health measures. By prioritising worker safety and well-being, we can not only save lives but also contribute to a more sustainable and productive global economy.

According to WHO-SEARO 1999, the following measures are essential to achieve occupational health for all:

- Strengthening of International and National policies for health at work and development of policy tools.
- Developing healthy work environments.
- Developing healthy work practices and promoting health at work.
- Strengthening occupational health services.
- Establishing support services for occupational health.
- Developing occupational health standards based on scientific risk assessment.
- Developing human resources for occupational health.
- Establishing registration and data system including development of information services for experts, effective transmission of data, and raising public awareness through strengthened public information system.
- Strengthening research.
- Developing collaboration in occupational health services and organisations.

60. WHO/ILO joint estimates of the work-related burden of disease and injury, 2000-2016: global monitoring report: Geneva: World Health Organization and the International Labour Organization, 2021.
61. National Programme for control & treatment of occupational diseases. National Institute of Health and Family Welfare 2014 [Internet]. Available from http://www.nihfw.org/NationalHealthProgramme/NATIONALPROGRAMMEFORCONTROL.html
62. Safety and health at work: a vision for sustainable prevention: XX World Congress on Safety and Health at Work 2014: Global Forum for Prevention, 24 - 27 August 2014, Frankfurt, Germany / International Labour Office. - Geneva: ILO, 2014.
63. ILO. World Day for Safety and Health at Work. Available from http://www.ilo.org/global/topics/safety-and-health-at-work/lang--en/index.htm

Action plans adopted by other countries for occupational safety

- Safety and Occupational Health Action Plan, Bureau of Reclamation Denver, Colorado
- Occupational safety and health in Bangladesh
- The National Institute for Occupational Safety and Health (NIOSH) U.S. CDC
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations, Health and Safety Executive (HSE), UK
- The Labour Force Survey, Health and Safety Executive (HSE), UK
- Census of Fatal Occupational Injuries (CFOI), U.S. Bureau of Labor Statistics
- Survey of Occupational Injuries and Illnesses (SOII), U.S. Bureau of Labor Statistics

iii) Situational assessment

India faces a significant challenge in protecting its workforce from occupational hazards. The major occupational diseases in India, grouped according to the etiologies include - occupational injuries: ergonomics related; chemical occupational factors: dust, gases, acid, alkali, metals, etc.; physical occupational factors: noise, heat, radiation, etc.; biological occupational factors; behavioural occupational factors; and social occupational factors[64]. Hence there must be a centralised system in India to examine occupational injuries precisely. Also, occupational injuries related deaths and the underlying causes should get documented and reported correctly so that targeted actions can be taken accordingly.

Existing data primarily comes from community-based studies and hospital-based studies. These studies consistently identify construction, agriculture, and manufacturing as the three main sectors contributing significantly to both fatal and non-fatal occupational injuries. Workers in these sectors face a heightened risk due to various factors, which require further investigation. However, the true extent of occupational injuries in India is likely to be even higher due to the limitations of the current system for registering such incidents.

Status, mode of injuries and risk factors in the various industries/sectors:

Table 14: Occupational injuries in India: Industry/Sector/Mode of injuries and Risk factors.

Industry/Sector	Mode of injuries[65, 66]	Risk factors[66, 67]
Construction • Construction sector in India provides employment to about 53 million workers[68]. • Third largest employer in India after the agricultural and service sectors.	• Hand tools - Most Common • Injury due to falls from height • Injury due to machines • Falling objects • Sharp objects • Lifting heavy objects	• Workers of temporary nature/daily wagers - not appropriately skilled and not sensitised in regards of safety and health at the workplace. • Workers of age <30 years and less experience of <1 year.

64. N R, Ramesh. (2017). NHPP22-National Programme on Occupational Diseases Quadrant – I.
65. Kaur, D., Rajan lilare, R., Dilip Rathod, N., Datta, B. & Kaswan, P. An organization based cross-sectional study of occupational injuries among bridge construction workers in an urban area of Mumbai. Int. J. Community Med. Public Heal. 6, 1211 (2019).
66. Serrao, A. & D'mello, M. Occupational injuries among building construction workers in Mangalore, India: A cross-sectional study. Int. J. Heal. Allied Sci. 9, 116 (2020).
67. Bharti, A. Hazard Exposure and Health Assessment of Construction Workers in New Delhi, India. Int. J. Prev. Curative Community Med. 06, 22–27 (2020).
68. India: sector-wise employment 2021 | Statista. https://www.statista.com/statistics/1283990/india-sector-wise-employment/.

Construction (cont...) • Minimum of 11,614 fatal accidents take place in the Indian construction sector each year. This means that an average of 38 fatal accidents occur per day in Indian construction sector[69]. • Based on this data, the fatality rate (fatal accidents/1000 workers), of Indian construction sector works out to be 0.22. This makes construction sector the second most hazardous in India after the mining sector in terms of fatality rate (0.24 for mining sector)[69].	• Hazardous chemical exposures • Electric Shock-related Injuries • Getting struck by vehicle. • Injuries occur in the form of abrasions (most common), lacerations, cut wounds, fractures, burn wounds, and death due to polytrauma[66].	• Not wearing appropriate PPE while working (due to factors like lack of provision of PPE by employers, uncomfortable to work with PPE, negligence of workers) • Prolonged working hours & shift work leading to sleep disturbances • Male gender - Engaged in riskier operations at the worksite • Alcohol Consumption during working hours • Fatigue/Exhaustion in hot environment, especially in summers.
Agriculture • The agricultural sector in India employs about 151.79 million workers (about 52% of the employed workforce)[68]. • As per data obtained from community-level studies, the overall accident incidence rate in the agricultural sector is 3.34 accidents/1000 workers, and the incidence rate of fatal accidents is 0.183 accidents/1000 workers[70].	**Mode of injuries**[71] • Due to farm machinery such as tractors (most common), threshers (second most common), chaff cutters, cane crushers, electric motors, power tillers, etc. • Injury due to use of hand tools like sickles, pickaxes, spades, etc. • Injury due to snake bites, animal bites.	**Equipment and machinery** • Guards and other safety devices missing or defective in the equipment. • Lack of training of the workers operating farm machinery. • Poor maintenance of the machineries. **Status of the agricultural worker** • Farm owners are at higher risk as compared to contract laborers. • Owners likely to perform risky/dangerous tasks to enhance productivity.

69. Patel Sardar Vallabhbhai, D. A. & Neeraj Jha, K. AN ESTIMATE OF FATAL ACCIDENTS IN INDIAN CONSTRUCTION. https://www.researchgate.net/publication/308155592 (2016).
70. Gite, L. P. & Scientist, E. Agricultural sector in India-OSH Perspective (Ex-Project Coordinator,AICRP on Ergonomics and Safety in Agriculture) Central Institute of Agricultural Engineering (Indian Council of Agricultural Research) Bhopal.
71. P. S. Tiwari, L. P. Gite, A. K. Dubey & L. S. Kot. Agricultural Injuries in Central India: Nature, Magnitude, and Economic Impact. J. Agric. Saf. Health 8, 95–111 (2002).

Injury among children: A study from India reported that around 16% of all agricultural injuries involve children below 14 years of age[72].	• A large bulk of injuries (~30%) in this age group was caused by Fodder cutting machines[72] • Due to fall in deep wells/ ponds, etc. • Due to exposure to extreme heat (sunstrokes). • Poisoning of agricultural chemicals. • Lightning strikes.	**Age** • Children and old-age groups are particularly at higher risk of agricultural injuries[72]. • Slow reflexes and carelessness with increased experience in older age group[72]. • In the younger age group, injuries result as children go to the farms for fun and play with the unguarded machinery, failing to take the required precautions[72]. **Gender** • Agricultural injuries occur more frequently in males, perhaps due to work divisions among different sexes. • Females - higher risk of animal-related injuries.
Manufacturing • The manufacturing sector in India employs about 27.39 million workers and is the fourth largest mode of employment in India after the agriculture, construction, and service sector[68]. • The overall rate of fatal accidents, including all manufacturing sectors, is about 0.09/1000/year[69]. • The mining (coal production) industry is associated with the highest rate of fatal accidents among all occupational sectors in India (0.24/1000 workers/year)[69].	The manufacturing sectors associated with high annual incidence rates of occupational injuries include[73]. • Transport equipment manufacturing (5.42/1000/year) • Textile industries (3.57/1000/year) • Machinery manufacturing (3.26/1000/year) • Metal and alloy industries (3.16/ 1000/year) • Electricity and gas production (2.64/ 1000/ year) • Manufacture of paper, chemicals, and non-metallic mineral products (1.63 to 1.97/1000/year)	1) **Machine factors:** Refers to faulty mechanical conditions • Improperly or inadequately guarded equipment. • Defective equipment. • Insufficient lighting, glare, etc. • Inadequate safety devices. • Defective electrical fitting. • Unsafe storage, • overloading, congestion, etc. • Unsafely designed tools, machines, etc. **2) Non-machine factors:** • Falling down from the ladder or slipping off the ladder itself, especially in construction work/ repairing/ innovating/ maintenance work, etc.

72. Kumar, A., Varghese, M. & Mohan, D. EQUIPMENT RELATED INJURIES IN AGRICULTURE: AN INTERNATIONAL PERSPECTIVE.
73. Suri, S. & Das, R. Occupational Health Profile of Workers employed in the manufacturing sector of India.

		• Loading or unloading of heavy material without taking due care or without giving proper warning. • Non-wearing of the right dress while working on or near an exposed moving part of a machine. • Lack of inspection of machines, etc., by experts. • Defective work methods. • Inefficient supervisor/ leadership. **3) Personal factors:** • Poor eyesight • Color-blindness • Physical aerobic capacity not in line with task requirements. • Ignoring safety instructions • Addiction to drugs, liquor, etc. • Suffering from diseases such as high blood pressure, diabetes, epilepsy, etc.
Transportation sector • Risk of accidents during transportation of humans or goods, via air, rail, waterways, or roads. • Transportation of products, materials, or people from one place to another is required for most businesses, whether it is a retail outlet, a farm, or a large manufacturing plant.	• Overturning of vehicles. • Falls from vehicles or objects falling off vehicles on the workers. • People being hit or run over by moving vehicles.	**Travel route conditions** • Uneven, unlevelled ground - can destabilise the vehicles. • Wet ground - may cause vehicles to skid. • Poor lighting on the travel routes. • Traffic signals availability at cross-roads. • Congested traffic routes. • Some workplace vehicles are designed to carry out operations that are inherently hazardous, e.g.: Mobile cranes, forklift trucks, tipper trucks and excavators.

		Vehicle-related factors • Vehicles equipped with heavy extending arms that compromise the stability of the vehicle resulting in overturns. • Some vehicles powered by highly pressurized hydraulic and pneumatic systems or high-tension cables - if defective, can cause serious physical hazards. **Load-related factors** • Toxic, flammable, corrosive or explosive chemicals not stored properly in appropriate containers. • Carrying loads more than the maximum vehicle capacity. • Irregular, haphazard arrangement of the loads compromising vehicle stability. **Driver-related factors** • Unqualified drivers without appropriate licenses. • Suffering from conditions such as fits, or on medications that cause sedation. • Continuous driving without adequate, regular breaks. • Driving in an inebriated state.
Health care sector	• Risk of needle stick injuries. • Musculoskeletal injuries due to awkward postures, prolonged standing, patient handling, etc. • Slips, trips, and falls (STFs).	**Type of health-care professionals** • Nurses are at the highest risk of needle-stick injuries as they more commonly deal with injections and sharp objects.

		Lack of training on needle-stick injuries among staff nurses • Replacing needle caps • Not wearing gloves when working with needles/ sharps • Improper disposal of needles/sharps/broken glass ampoules **Experience** • Risk increases with increased years of experience, due to complacency in performing the procedures. **Patient handling** • Includes the use of force by a person to lift, lower, push, pull, carry, move, and support the patients- most important risk factor for low-back pain. • Lack of availability of mechanical equipment to assist patients, like adjustable beds, adjustable stretchers, mechanical lift equipment, etc. **Awkward postures** • Kneeling and squatting are specific physical activities encountered commonly in the health-care sector - to perform clinical procedures. **Lack of adequate staff** • Increases the risk of sharp-related injuries as there is time pressure to complete tasks. Associated with longer working hours with inadequate rest breaks.

Figure 13: Chemical Injuries in occupational settings in India.

Chemical injuries in occupational settings

A chemical injury occurs due to acute exposure to a chemical agent that alters bodily structures or functions. Chemical injuries may occur through direct contact with the skin, inhalation, or ingestion. All forms of chemical exposure, namely liquids, gases, fumes, vapors, and solids may cause exposure-related injuries. The most common chemicals that cause work-related injuries include acids, alkalis, agricultural chemicals and pesticides, coal and natural gas, petroleum fuels and their by-products, aromatic compounds, hydrocarbons and halogens, and their derivatives, metallic dust, or powders, etc. The National Disaster Management Authority (NDMA) of India reported 130 'significant' chemical accidents that lead to 259 deaths and 563 major injuries in the last decade in India.[74] These experiences bring into focus India's regulatory capacity for preventing and mitigating chemical accidents while increasing accountability. A robust inventory of all chemicals used in industrial processes in India is necessary for a regulator to create rules for the informed handling of the chemicals. A dynamic repository of hazardous chemicals needs to be created, based on the information on chemical properties and uses, the risks they pose to vulnerable groups, and the geographical location of their use in India. It is noteworthy that human error has been cited very frequently during post-accident investigations, necessitating compulsory safety training programs for the workers. The European Union's (EU) REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulation is considered one of the EU's most complex, but successful legislations, which introduced in 2007 the model of inventorying chemicals and regulating their use based on the inventory. The EU currently has a database of over 22,000 chemicals which is publicly available for anyone to access. India could potentially use the inventories of chemicals built by other jurisdictions to build its own database of hazardous industrial chemicals and make guidelines for their use.

As mentioned previously, India has occupational injury data from organised sectors (factories/machine injuries and mines/quarry disasters), however, data from unorganised sectors are underreported.

The NCRB reported a concerning rise in occupational injury mortality over the years. Factory-related deaths followed a worrying upward trend in 2018 and 2019, with a subsequent decrease thereafter. In contrast, fatalities from mines and quarry disasters have shown a steady decline. But deaths due to Industrial Boiler/Gas Cylinder explosion remained same over the years. NCRB 2022 indicates that workers aged 18-30 and 30-45 years are most susceptible to occupational injuries within organised sectors. Males consistently experience a higher number of occupational injuries and fatalities compared to females between 2016 and 2022. The occupational injury mortality rate for organised sectors (factories/machines and mines) varied significantly across states. The State of Gujarat (17.6 %), Rajasthan (12.8%), Maharashtra (9.7%), Chhattisgarh (8.7%) and Madhya Pradesh (8.6%) reported the highest rates.

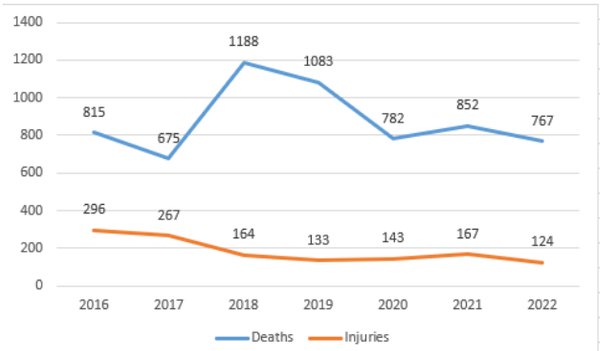
74. Chemical. National Disaster Management Authority, Government of India. [Internet]. Available from https://ndma.gov.in/Man-made-Hazards/Chemical.

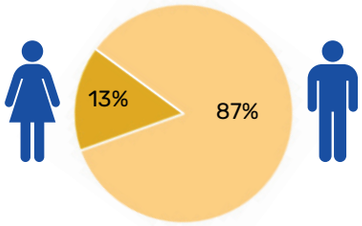
Figure 14: Statistics of occupational injuries in India.

OCCUPATIONAL INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

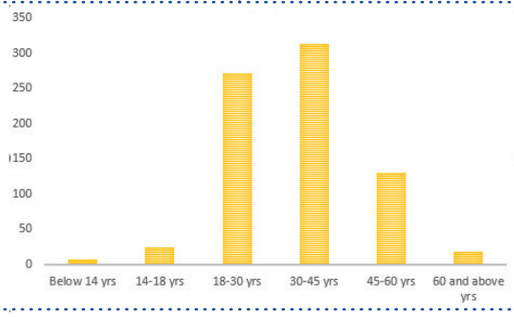
There were 767 deaths and 124 occupational injuries in 2022. From 2016 to 2022, although the number of injuries and deaths have remained largely unchanged, there was an increase in deaths in 2018 and 2019.

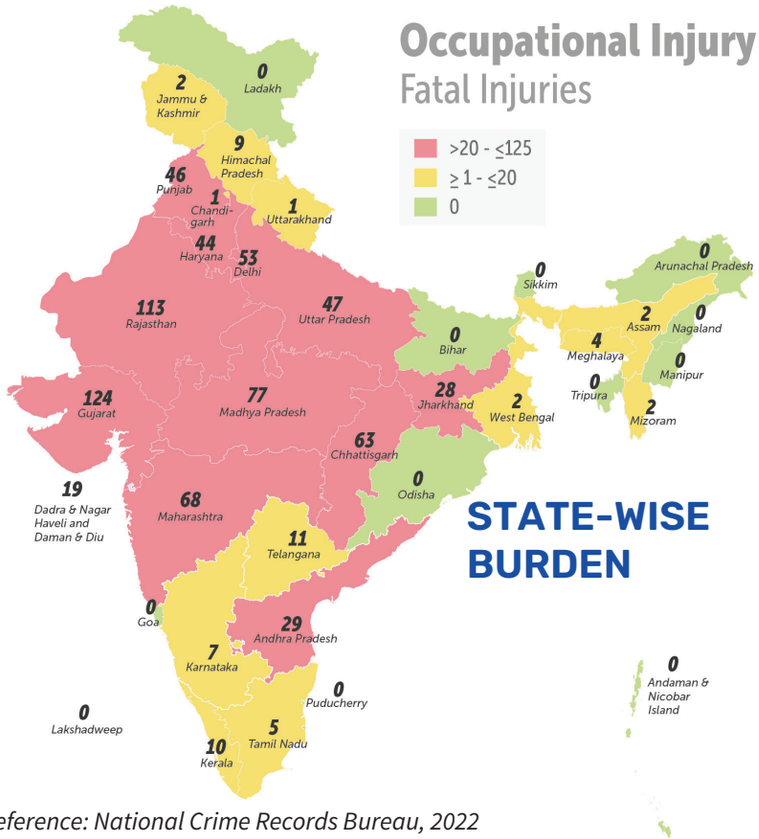




AGE-WISE BURDEN

Majority of deaths due to occupational injuries are in persons aged 18 to 45 years, followed by persons aged 45 to 60 years.





STATE-WISE BURDEN

MAJOR CAUSES

Occupational injuries refer to bodily damage resulting from working. Number of fatal cases include (2022)-

684
Factory or machine injuries

83
Mines or quarry disaster

Reference: National Crime Records Bureau, 2022

Occupational Health Legislations in India

Factories Act 1948[75]: The Factories Act, 1948, a central enactment, deals with occupational health and safety as well as welfare of workers employed in a factory. The Act empowers the State Governments to declare any process or operation as dangerous and to ensure protection of persons employed in the operation or in the vicinity. The rule has made it mandatory for the factories to notify 29 occupational diseases to the Chief Inspector of Factories should they happen to any worker in the factory.

The Employees' State Insurance Act, 1948[76]: The Employees' State Insurance Scheme (ESIS) in India is a multi-dimensional social security and health scheme that provides socio-economic and health protection to employees in the organised sector. Under this scheme, full medical care is provided free of cost to the insured employees and their family members, including financial assistance to the employees to compensate for the loss of wages during the period of abstention from work in the event of sickness, maternity, and disablement. "Employment Injury" is clearly defined under this act as a personal injury to an employee due to an accident or occupational disease arising from and during the course of insurable employment within or outside India.

The Workmen's Compensation Act, 1923[77]: Provides for payment of compensation to workmen (or their dependents) in case of personal injury caused by accident or certain occupational diseases arising out of and in the course of employment and resulting in disablement or death.

The Mines Act, 1952[78]: It deals with the matters relating to safety, health and welfare of persons employed in mines including oil mines. The Act specifies the provisions for regulating employment of persons, leave with wages, duties, and responsibilities of the owner, agent, and manager, drinking water, First-Aid and rest shelters, medical examinations, and occupational health surveys, notice of accidents and occupational diseases in addition to framing of rules, regulations and byelaws on specific subjects including the penalty provisions for violations of this Act. All reportable injuries (leading to forced absence from work for >72 hours) to be intimated to the Chief Inspector once in a quarter in the prescribed form.

The Manufacture, Storage, and Import of Hazardous Chemicals (MSIHC) Rules, 1989[79]: The MSIHC rules are applicable to specific hazardous chemicals. The rules prescribe safety measures to be taken by industrial installations handling hazardous chemicals, such as notifying the site of such activity before commencement, preparing safety reports, and conducting regular audits.

The Chemical Accidents (Emergency Planning, Preparedness and Response) (CAEPPR) Rules, 1996[80]: This act regulates the mitigation of chemical accidents once they have already occurred. These rules create crisis management groups at the Central, State, District and Local level that works with factories and industries to monitor:

75. Ministry of Labour and Employment. THE FACTORIES ACT, 1948 Available at: https://labour.gov.in/sites/default/files/factories_act_1948.pdf
76. Ministry of Labour and Employment. The Employees' State Insurance Act, 1948. Available at: https://labour.gov.in/sites/default/files/theemployeesact1948_0.pdf
77. Ministry of Labour and Employment. The Workmen's Compensation Act, 1923. Available at : https://labour.gov.in/sites/default/files/theworkmenact19231.pdf
78. Ministry of Labour and Employment. The Mines Act, 1952 Available at: https://labour.gov.in/sites/default/files/theminesact1952.pdf
79 Ministry of Environment and Forests. The Manufacture, Storage, and Import of Hazardous Chemicals (MSIHC) Rules, 1989. Available at : https://ciflabour.assam.gov.in/sites/default/files/MSIHC%20Rules.pdf
80. Ministry of Environment and Forests. The Chemical Accidents (Emergency Planning, Preparedness and Response) (CAEPPR) Rules, 1996. Available at: https://upload.indiacode.nic.in/showfile?actid=AC_CEN_16_18_00011_198629_1517807327582&type=rule&filename=ca(eppr)rules,_1996.pdf

- Emergency preparedness plans.
- Manage responses to accidents.
- Conduct post-accident analyses.
- Suggest measures to prevent a recurrence.

The Unorganised Workers' Social Security Act, 2008[81]: An Act of the Parliament of India enacted to provide for the social security and welfare of the unorganised workers (meaning home-based workers, self-employed workers or daily-wage workers). The act provides for the constitution of National Social Security Board at the Central level which shall recommend formulation of social security schemes viz. life and disability cover, health and maternity benefits, old age protection and any other benefit as may be determined by the Government for unorganised workers. Some of the unorganised worker groups are not covered under this scheme as there are special social security schemes for these unorganised worker groups as mentioned below:

- Handloom Weavers' Comprehensive Welfare Scheme
- Handicraft Artisans' Comprehensive Welfare Scheme
- Pension Benefit to Master craft persons
- National Scheme for Welfare of Fishermen and Training and Extension

e-SHRAM portal[82]: The major objective is the creation of a centralised database of all unorganised workers (UWs) including Construction Workers, Migrant Workers, Gig and Platform workers, Street Vendors, Domestic Workers, Agriculture Workers, etc., to be seeded with Aadhaar. The main aim is to improve the implementation efficiency of the social security services for the unorganised workers.

Occupational Safety, Health, and Working Conditions Code, 2020[83]: It ensures that no charge is levied on any employee for maintenance of safety and health at the workplace including the conduct of medical examination and investigation for the purpose of detecting occupational diseases.

Key stakeholders for prevention of occupational injuries

The major stakeholders/organisations in India with respect to occupational health:

- Ministry of Health and Family Welfare
- Ministry of Labour and Employment (including its regulatory bodies like Directorate General, Factory Advice and Labour Institutes (DGFASLI) and state inspectorates for industrial safety and health)
- Ministry of Commerce and Industry (for development and implementation of engineering controls)
- Ministry of Social Justice and Empowerment
- Ministry of Women and Child Development
- Ministry of Environment, Forest, and Climate Change (MoEFCC)
- National Institutes working on industrial health and safety
- Organised bodies of industries and employer groups
- Labour workers' Unions
- National Disaster Management Authority
- National Safety Council
- Organised bodies of industries and employer groups

81. Ministry of Law and Justice. The Unorganized Workers' Social Security Act, 2008. Available at: https://webapps.ilo.org/dyn/travail/docs/686/UnorganisedWorkersSocialSecurityAct2008.pdf
82. Ministry of Labour and Employment. Available at: https://eshram.gov.in/
83. Ministry of Law and Justice. Occupational Safety, Health, and Working Conditions Code, 2020. Available at: https://dgfasli.gov.in/public/Admin/Cms/AllPdf/OSH_Gazette.pdf

iv) Strategies and interventions

The Occupational Safety and Health (OSH) guidelines are essential for successfully managing organised and unorganised sectors to prevent workplace injuries and deaths. The recommended actions/interventions use a safe system approach to prevent work-related hazards and reduce risks in India.

Table 15: Prevention of Occupational Injuries.

Section 2E: Prevention of occupational injuries	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Reinforce laws to promote safety measures in organised sectors and enforce policies or guidelines for safety of workers in unorganised sectors.	Central/State Government
Action points: • Frame legislations to support safe work practices in unorganised sectors. • Recommend formulation of social security schemes in all unorganised sectors. • Strongly implement laws on safety control measures across all industrial sectors. • Mandate use of threshers, chaff cutters and sugarcane crushers with BIS logo on equipment and periodic revision of the BIS standards to fulfil safety requirements. • Strictly implement driving licenses for tractor operators and undergo periodic training on safe operations of tractors. • Reinforce and strictly adhere to chemical accident rules at factories and industries.	
Domain: Community driven initiatives	
Strategy 1.2: Build awareness of workplace-related hazards and improve knowledge of safe work practices in the community/workers.	Central/State Government/ Organised/Unorganised Sectors/ Local Bodies
Action points: • Create awareness on occupational injuries using IEC materials such as visual aids, radios, and displays among people of unorganised sectors. • Educate workers/farmers about appropriate safety measures for all machines including equipment and machine handling. • Educate workers/farmers about donning and doffing steps of PPE and ensure strict compliance of their use. • Make the farmers aware of accidents due to overloading of tractor trailers with agricultural materials.	

Strategy 1.2 (cont...)	
Action points: • Teach farmers to use indicators and rear lights while operating tractor-trailers. • Create awareness on avoiding work in fatigued state, particularly with hazardous equipment's/chemicals. • Disseminate appropriate information for employees exposed to potential hazards associated with chemicals around their work areas and educate them on proper handling of chemicals. • Communicate with workers to verify that all machines/ chemicals have certified standard operating procedures (SOPs) and display them at the workplace. • Encourage workers to minimise the use of hazardous machinery and condemn it wherever possible. • Encourage the farmers to construct the wells and ponds in proper manner (parapet and cover for dug well, fence for the pond, etc.) to reduce accidents caused by fall. • Improve knowledge on potential hazards that could lead to hand injuries in various sectors. For example, chemical handling, operating automated machines. • Increase knowledge on non-routine tasks/common situations around the workplace that could be fatal using common examples/simulation training among industry personnel. For example, working with high voltage, confined space, etc. • Increase knowledge on safe work practices among workers such as: » Use of adequate break/rest during work: Regular and frequent breaks increase productivity and safety. Encourage workers to rest, drink fluids and eat snacks during the break to re-energise themselves. » Reduce night work: Most accidents occur at late working hours and under situations of poor illumination. Thus, minimise night work, if possible or restrict it to a low-risk area of the work site. » Avoid working in an intoxicated state, for e.g., Alcohol/ drug consumption should be strictly prohibited.	
Domain: Interventions/programmes	Central/State Government/ Local Health Department / Organised/Unorganised Sectors
Strategy 1.3: Create a skilled workforce to address uneventful circumstances at work sites in both organised and unorganised sectors.	
Action points: • Promote pre-placement training and post-placement evaluation among industry personnel's/farmers. They are: » Adequate training for the workers on using machines or the tasks they will perform.	

» Sensitize workers/farmers about possible hazards at the work sites to prevent high-risk behaviours. » Make sure each worker is capable to perform the given task safely and carry out an evaluation/review of their performance before the actual task is done. » Organize training by concerned personnel to tractor operators for safe operations, including tractor-operated equipment, such as sprayers and dusters. » Train workers in identifying job hazards and ask workers to demonstrate if they recognise the hazards. » Teach workers about controlling hazard measures at the workplace. » Provide first aid training to workers and educate on timely referral to nearby hospital for immediate treatment. • Improve the skills of primary health care providers, including the general practitioners, nurses, environmental and public health technicians, and community health workers to provide essential occupational health services, such as: » Advice on improving working conditions. » Periodic monitoring of workers' health status. » Diagnose common occupational diseases in small companies, rural areas/farms, unorganised sectors, and migrant workers. » Include occupational health in the pre- and in-service training of all frontline health care providers and certain medical specialists dealing with cancer, skin, respiratory and neurological diseases, and musculoskeletal disorders. » Use of appropriate occupational injury checklist for proper documentation (annexure III). » Provide rescue and evacuation training to all types of workers, in both the organised and unorganised sectors.	
Domain: Interventions/programmes	Central/State Government/ Health Department/ Organised/Unorganised Sectors
Strategy 1.4: Establish occupational health clinics and strengthen public health departments to manage occupational-related injuries.	
Action points: • Set up Occupational health clinics with dedicated infrastructure and team across all public health departments. • Establish connections between occupational health services and PHCs to facilitate the care of workers suffering from chronic diseases and their return to work after long-term absence due to sickness.	

• Sensitize private hospitals to initiate occupational health clinics with dedicated teams. • Ensure first aid measures and a dedicated team at the nearby hospitals to treat occupational-related injury. • Facilitate rehabilitation training and guidance to an injured worker for safely and timely return to work post injury	
2. Safe workplace	
Domain: Interventions/programmes	Central/State Government/ Organised/Unorganised sectors
Strategy 2.1: Identify and assess hazards to promote occupational safety in both organised and unorganised sectors.	
Action points: • Use clear signage for possible danger; electricity supply to all equipment should be snapped when they are not in use and wires and high voltage areas should be marked. Barriers are to be installed whenever possible. • Make regular inspection of the workplace to enlist the possible new and recurring hazards to ensure the safety of workers. • Run mock drills to identify possible hazards associated with emergency or non-routine situations. • Develop a plan to investigate incidents and to identify the cause of injury-related hazards. • Collect and analyse information about workplace hazards. • Address trends in occupation-related hazards or injuries and report them regularly. • Create and update the control measures in priority orders for successful implementation. • Investigate that the work sites meet the country OSH standards. • While working at height certain precautions are to be maintained. (For details, please refer to Fall chapter) • Conduct regular safety audits for all types of industries to monitor risk reduction with the assistance of a dedicated safety committee.	
3. Safe equipment	
Domain: Policy	Central/State Government /Organised/Unorganised Sectors
Strategy 3.1: Promote the use of safe aids and enhance the safe design of machines in both organised and unorganised sectors.	
Action points: • Ensure availability and appropriate use of PPE, such as helmets, boots with good grip, eye protectors, and heavy-duty gloves at work sites.	

• Improve the safety measures of farm machinery for safety of farmers such as: » Make rollover protective structure (ROPS) on tractors to reduce deaths in case of overturning of tractors that may crush the operators underneath it. » Provide chaff cutters and cane crushers with built-in safe feeding devices to prevent hand injuries during their operation. » Provide rotating parts of all prime movers and farm equipment with protective guards.	
4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government /Organised/Unorganised Sectors
Strategy 4.1: Support communities and involve multi-stakeholders to promote safety and health among workers in both the sectors.	
Action points: • Empower organisations/companies with workplace health initiatives, and other work settings to take better care of health, without unduly relying on professional health services. • Involve stakeholders to develop roadmaps to scale up the access to essential services required for the prevention and control of occupational-related injuries. • Coordinate or create linkage with local bodies to map chemical factories with nearby health centre.	
5. Surveillance and research	
Domain: Surveillance system	Central/State/Health Department /Local Governments
Strategy 5.1: Create a surveillance system to report occupational injuries in the country.	
Action points: • Establish a registry to collect data on occupational injuries. • Evaluate and verify occupational-related safety measures annually to look into its effective implementation.	
Domain: Intersectoral collaborations	Research Organisations/ Organised Sectors
Strategy 5.2: Implement research activities to provide scientific evidence of hazards/injuries, and plan interventions for occupational safety.	
Action points: • Conduct studies to determine the severity of accidents related to each hazard and plan measures prioritizing corrective actions. • Promote multi-sectoral collaborative research to guide policy makers to make informed decisions.	

Prevention of child injuries

Section 2F

Prevention of child injuries

i) Background

Unintentional injuries are a major killer of children worldwide, claiming an estimated 8.2 deaths per 100,000 children. This makes them the second most common cause of death in this age group[84]. Traffic accidents are a particularly dangerous type of unintentional injury. According to the WHO, they are also the second leading cause of death in children aged 5-14 years, responsible for 5.1 deaths per 1,00,000 children. Drowning is another significant threat, ranking as the sixth leading cause of death in this age group[85]. The data is further supported by the GBD 2019, which highlights the broad spectrum of unintentional injuries impacting children aged 0-14 years[9]. Road traffic injuries accounted for 8.16% of total deaths followed by drowning (5.42 %). Other injuries, falls (1.77%), animal contact (1.66%), burns (0.86 %), and poisoning (0.69 %) also contributed to the overall burden of unintentional child deaths. The burden of unintentional child injuries is not evenly distributed. World report on child injury prevention concluded that LMICs bear the biggest burden of child injuries. Approximately 25% of child deaths resulting from these injuries occurred in Southeast Asia and East Asia, highlighting the challenges faced by these regions. Developed countries also face a significant burden, with 13.8% of such deaths occurring in high-income countries[86].

ii) Global and regional response to the child injury

The alarming number of child injuries and fatalities has spurred international collaboration among organisations, NGOs, and institutions. These efforts have yielded valuable results, including the development and implementation of national child injury prevention policies, strategies, and, interventions[87]. Recognising the critical need for child safety, prominent entities, such as the WHO along with countries the United States, and Europe, have published key reports and action plans. The WHO has played a significant role in promoting child safety through the release of various reports, including the World Report on Road Traffic Injury Prevention, World Report on Violence and Health, World Report on Child Injury Prevention, and the Global Report on Drowning. These reports aim to raise awareness and provide comprehensive insights into different aspects of child injury prevention.

To advance child safety, the WHO has recommended several common themes that can be incorporated into national and international plans. These themes encompass evidence-based strategies, evaluation of existing programs, policies, and interventions, improvement in awareness methods, education, and training programs, establishment of surveillance systems for data and access, setting priorities and research agendas for child safety,

84. Kumar M, Pathak VK, Tripathi S, Upadhyay A, Singh VV, Lahariya C. Burden of Childhood Injuries in India and Possible Public Health Interventions: A Systematic Review. Indian J Community Med. 2023 Sep-Oct;48(5):648-658. doi: 10.4103/ijcm.ijcm_887_22. Epub 2023 Sep 7. PMID: 37970167; PMCID: PMC10637604.
85. WHO. Injuries and violence. Key Facts [Internet]; updated on 19th March 2022. Accessed on 18.12.2023. Available from https://www.who.int/news-room/fact-sheets/detail/injuries-and-violence
86. Peden M., Oyegbite K., Ozanne-Smith J., Hyder A.A., Branche C., Rahman A.K.M.F., Rivara F., Bartolomeos K. World Report on Child Injury Prevention 2008. World Health Organization and UNICEF: 2008.
87. Sleet DA. The Global Challenge of Child Injury Prevention. Int J Environ Res Public Health. 2018;15(9):1921. Published 2018 Sep 4. doi:10.3390/ijerph15091921

strengthening the health-care system, and the adoption and implementation of necessary legislation.

By adhering to these themes, stakeholders can ensure a comprehensive and coordinated approach to child injury prevention, leading to the reduction of child fatalities and injuries on a global scale.

iii) Situational assessment

The type of injuries sustained by children is strongly influenced by their stage of life. Factors such as the child's age, stage of development, interaction with the environment, and the activities they engage in all contribute to this association. In India unintentional injuries accounts to 9.1 deaths per 1,00,000 population[84]. According to GBD 2019, RTIs, drowning, falls and fire, are the leading cause of death in children under 5 years of age, accounting for 3.06% of deaths and contributing to 2.29 million DALYs and 59,350 YLDs[9]. Among children aged 5-14 years, unintentional injuries accounted for 16.48% of deaths, 2.23 million DALYs, and 285,854 YLDs. As children become more independent beyond the age of five, drowning becomes leading cause of death (6.2%) followed by RTIs (4.52%). Interestingly, animal contact is the third most common cause of unintentional deaths among 5-14 years (4.39%). However, rabies, one of the examples of such deaths, are never reported to police and thus absent from NCRB statistics. In addition, there has been recent attention on injuries caused by poisoning, which accounted for 0.37% of deaths, 47,042 DALYs, and 4,293 YLDs[9].

In addition to biological factors, it is important to consider other risk factors for child injuries. These include socioeconomic factors such as poverty and overcrowded families, limited protective factors in the environment, and limited access to dedicated childcare facilities[86]. Addressing these social determinants alongside age-specific vulnerabilities is crucial for creating a safer environment for all Indian children.

Over years NCRB statistics showed, there is marginal decrease in mortality trend for child injuries (below 18 years). However, fatality was higher in children aged 14 -18 years as compared to below 14 years of age. Road traffic injuries have remained the leading cause of death among 14-18 years in terms of mechanisms over years followed by drowning and poisoning. All the causes have emerged as rapidly rising causes of unintentional deaths in children under 14 years except RTI, burns and falls have seen a decreased trend. Males are at the higher risk for majority of unintentional deaths in below 14 years and 14-18 years.

Figure 15: Trend of fatal injuries in children over the years

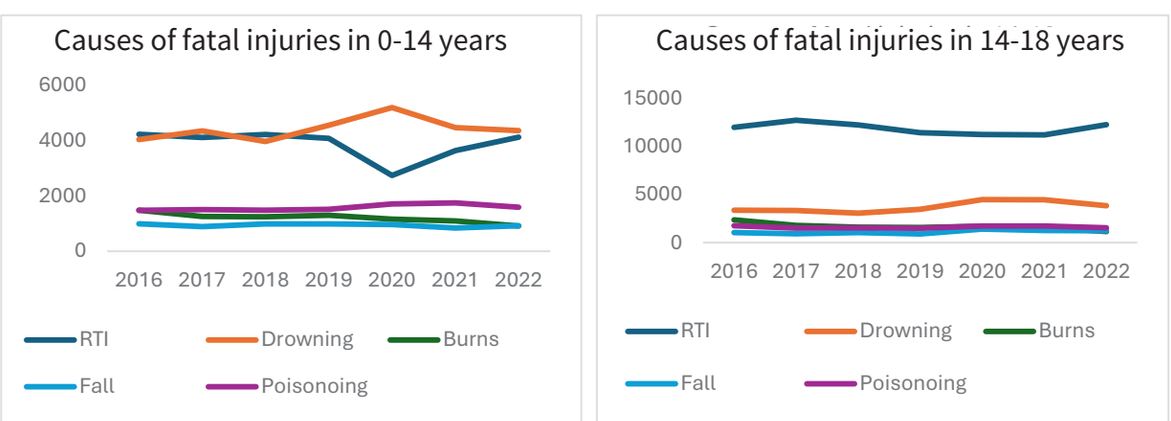
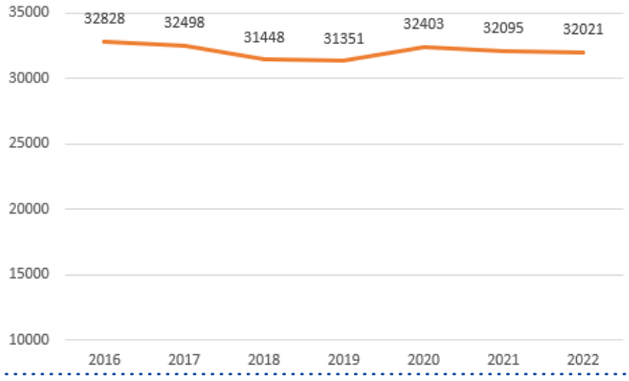


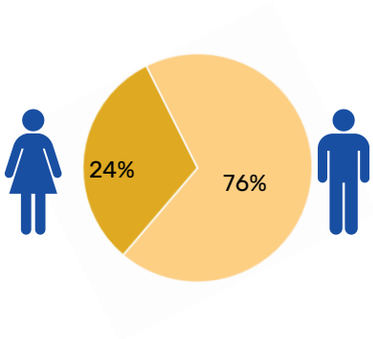
Figure 16: Statistics of child injuries in India

CHILD INJURIES IN INDIA

CURRENT STATISTICS (2016-2022)

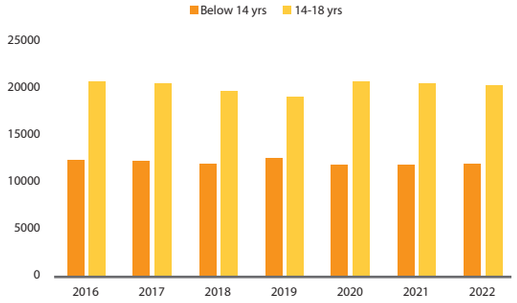
There were 32,021 deaths from unintentional injuries amongst children (aged 18 or below) in 2022, which is a marginal decrease from 32,828 in 2016. The prevalence rates have remained largely the same over the years.

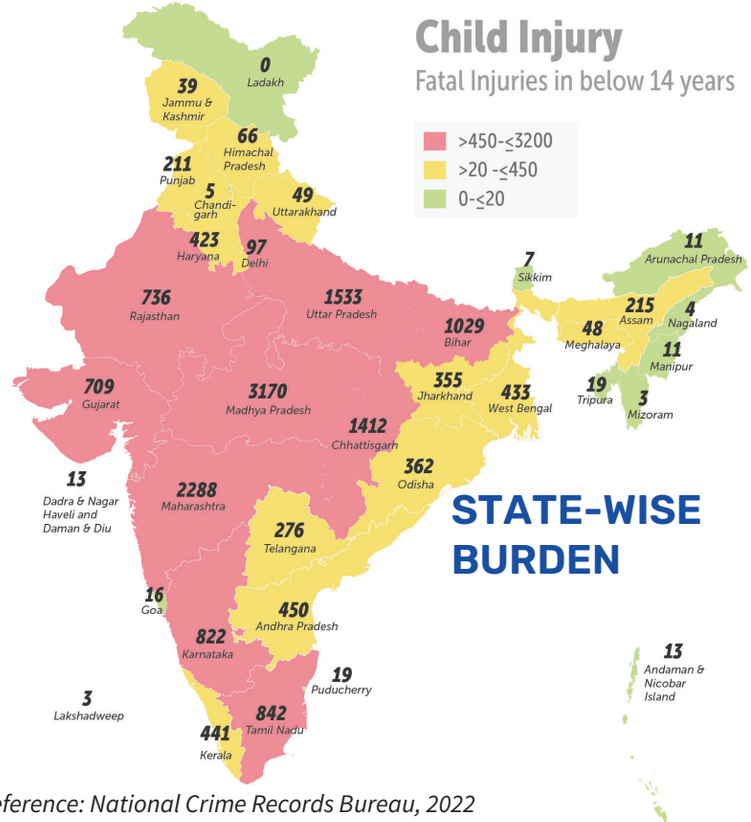




AGE-WISE BURDEN

Amongst child injuries, majority of deaths are in children aged 14-18 years of age as compared to children aged below 14 years.





STATE-WISE BURDEN

Reference: National Crime Records Bureau, 2022

MAJOR CAUSES

The majority of unintentional injuries among children are cased from (2022)-

4360
Drowning

4121
Road traffic crashes

1595
Poisoning

913
Burns

924
Falls

The states with the highest number of fatalities due to unintentional injuries among children under 14 years old are Madhya Pradesh (19.6%), Maharashtra (14.1%), Uttar Pradesh (9.5%), Chhattisgarh (8.7%), and Bihar (6.3%). The states with the highest number of fatalities due to unintentional injuries among children aged 14-18 years are Madhya Pradesh (12.5%), Odisha (11.1%), Bihar (8.9%), Maharashtra (8.6%), and Rajasthan (6.4%). States like Madhya Pradesh, Maharashtra, Bihar recorded higher fatalities in both the age groups.

iv) Strategies and interventions

Child injuries are largely preventable, and to achieve successful prevention, the implementation of a safe system approach is crucial. This approach entails comprehensive strategies and interventions targeting specific types of injuries. In addition to these specific measures, several general recommendations can be adopted to ensure effective result.

Table 16: Prevention of Injuries in Children.

Section 2F: Prevention of injuries in children	
1. Safe people	
Domain: Policy	**Key implementing partners**
Strategy 1.1: Enforce and strengthen laws to ensure safety of children	Central/State Government
Action points: RTI • Strict implementation of safety norms for children below 4 years of age on riding or being carried on a motorcycle with use of safety harness. • Strict use of safety harness and crash helmet for kids above 4 years of age on motorcycle and restriction of speed to 40 kmph • Implement on use of child restraints in the vehicles. • Consider laws in view of tactile mobility and advancing technology. Drowning • Reinforce the availability of right-fit/buoyancy lifejackets at all water recreational activities. • Enforce and confirm the presence of lifeguards in all swimming areas. • Enact and enforce isolation pool fencing laws for all swimming pools (including private ones)/water bodies. FFH • Frame laws for residential societies/landlords to place window guards in high-rise buildings/homes. • Set playground standards for using appropriate surface material, equipment height and structure. Poisoning • Enforce the pharma industries to use child-resistant packaging for all drugs.	

Domain: Community driven initiatives **Strategy 1.2: Empower parents and improve awareness in the public on prevention of various child injuries** **Action points:** RTI • Educate each child for road safety using IEC materials such as visual aids, radios, featuring stories of survivors and displays. • Focus on younger children and organise road safety education on the safe use of the road. • Educate parents - no child less than ten years goes on the road unsupervised. • Enrich practical skills or provide everyday examples to develop children's problem solving and decision-making skills on road safety. Some effective educational approaches include: » Teaching basic skills, such as finding a safe place to cross, crossing safely near parked vehicles, and crossing safely at junctions. » Use of simulated environment to teach pedestrian and cycle skills in a safe setting off the road. » Teaching basic cycle skills both on and off the road to the children. » Education on conspicuity aids. Children may encourage to use caps, vests, or bags in bright colours with retro-reflective materials to make them more visible, especially during dark evenings. Drowning • Educate parents/caregivers about the possible drowning risks for changing knowledge, beliefs, and attitudes, which determine a child's behaviour. • Ensure no child should do water-related activities for any purpose without parents'/caregivers' supervision. • Make the parents aware of the risk of shallow water and never leave the kids in a paddling pool/tub alone. Drowning may happen quickly and silently. • Store and cover washing tubs/barrels safely and avoid the filling with rainwater. • Ensure buckets and bathtubs are left empty when not in use, as children could drown in them if they contain liquids. • Create awareness among parents handling children and adolescents with epilepsy on the appropriate bathing process, as bathtubs pose the highest risk for unintentional death. Therefore, always use a shower and adhere strictly to other seizure control measures in epileptic children.	The Central/State Government/Local Bodies/ Schools/Playschools/Health Departments

Strategy 1.2 (cont...)

Action points:

Burns

- Include burn prevention and related first aid in the school syllabus.
- Conduct one-day training in schools for the prevention of firecracker injuries preferably, before Diwali annually.
- Educate each student on burn-related injuries and how to avoid firecracker injuries.
- Avoid unsupervised walking of small children on treadmills as children may fall and cause friction burns over hands and palms.
- Teach proper handling of toilet cleaning acid and chemical acids in school labs.
- Coordinate and promote precautionary measures (Dos and Don'ts) and adhere to best practices on child burn injuries prevention. It includes -
  - » Restrict toddlers from playing in the kitchen and monitor children constantly if in the kitchen.
  - » Ensure not to provide lighters/match sticks for playing as it may cause fire in the house.
  - » Check the water temperature before bathing the infant.
  - » Avoid drinking tea, coffee hot liquids on beds and near children.
  - » Avoid keeping hot food items open on the floor.
  - » Avoid placing tablecloths as children may pull the tablecloth, causing hot liquids/food to fall over them.
  - » Use of fire-retardant fabrics/clothes during the festivals.
  - » Carry out bursting of crackers under the supervision of elders/parents.

FFH

- Educate each child on high fall-related injuries during play activities in schools, parks, etc. using IEC materials such as visual aids, radios, and displays.
- Instruct children to restrict activities/games which encourage climbing trees.
- Educate parents/child on safe kite flying and ensure child supervision by a parent.
- Teach parents about the use of safe products for infants and children. For example, walkers, prams, and use belts in all child-related equipment.
- Recommend parents to use high-rise chairs with safety belts.
- Make sure no high stools, and chairs should be placed within the reach of children on the balcony.
- Ensure each child must have their personalised sports-related aids such as mouth guards, helmets, etc. to prevent any fall-related injury.

Domain: Interventions/programmes	Central/State Government/ Local Bodies/Schools/ Playschools
Strategy 1.3: Integrate safety education: Injury prevention and first aid in school syllabus	
Action points: • Include scene safety and shout for help for all injuries. • CPR training may be imparted for students aged above 14 years. RTI • Include activities on road safety in the school curriculum. • Include RTI prevention and related first aid in the school syllabus, preferably after the sixth standard. Drowning • Include activities on safe swimming in the school curriculum. • Train teachers to teach swimming and water survival skills among school-age children. • Teach each child over 5 years of age about safe swimming and water survival skills through formal instructions. • Train each child to identify hazards such as rocks, currents, and dangerous weather conditions, and escape from rip currents. • Facilitate appropriate rescue and resuscitation skills training for those who supervise children in and around water. Burns • Include information on burn prevention and first aid in the school syllabus. • Train schoolteachers to sensitise students with help of professional bodies like NABI. • Mandate one-day training for the prevention of burns and firecrackers injuries preferably before Diwali in schools as Burn prevention day annually. FFH • Train school personnel on the first aid measures for high falls. For example, Injury identification, immobilisation, and referral.	
Strategy 1.4: Build a multidisciplinary team to combat injury related burdens.	
Action points: Burns • Train parents and family members about the basic rules of burn prevention (what should and should not be done during burn-related incidents). The aim must be to cool the burn, prevent ongoing burning and contamination.	

Strategy 1.4 (cont...)	
Burns • Proper assessment of a child from head to toe should be conducted with careful attention given to any other trauma signs. • Sensitise first responders, parents, and health care personnel on pouring water and covering infants and children during transport to avoid excessive heat loss and resulting hypothermia. FFH • If it happens in school, ensure that a child must get immediate first aid followed by informing parents and safe transfer to the emergency centre for further management.	
2. Safe environment	
Domain: Interventions/programmes	Central/State Government/ Department of Road Transport
Strategy 2.1: Enhance road network for child safety	
Action points: RTI • Improve visibility of children and adolescents on the road by promoting the use of reflective clothing, especially during low-light conditions. Encourage the use of reflective accessories on bicycles and backpacks. • Consider developing safe space for walking, cycling, approaching schools, playgrounds, and shops. • Separate child cyclists by barriers or kerbs, or else by the demarcation of white lines, from other road users. • Ensure speed limits norm in residential areas and around schools. More details in the previous section on RTI. • Provide buses to transport children to school and encourage children to walk to school, using the concept of 'walking buses'. • Have adult volunteers accompany groups of children, who walk along safe routes wearing conspicuous aids, possibly fluorescent vests to ensure road safety. • Introduce school safety zones, including car-free areas, speed reduction measures and adult supervision to cross the road safely.	

Strategy 2.2: Create a safe and accessible environment to reduce risk from water-related activities and promote safe practices among children.	Central/State Government
Action points: • Provide safe play areas (daycare centre/creche) away from water for preschool children. • Ensure the safety of children, primarily using the existing facilities such as Anganwadi, and creches. • Provide safe venues for recreational swimming for the kids. • Install barriers around water bodies.	
Domain: Community driven initiatives	
Strategy 2.3: Build a safe environment for children at home.	Central/State Government/ Residential Societies
Action points: Burns • Encourage all electrical outlets in the home to be covered with safety locks where a child cannot reach them or over 4 feet height from the ground. • Ensure unplugging of hot irons and keep them out of reach of children till it is cooled. • Make sure not to smoke in or around children and smoking buds are to be disposed of properly in the metal bin. • Store matches and lighters in a locked cabinet, away from children. • Raise cooking facilities off the ground. Cooking appliances or pots with boiling liquids should be kept out of the reach of children. • Restrict toddlers and children to play in the kitchen or near open flames. • Store chemicals and toilet cleaning acids, out of the reach of children in locked cabinets.	
Domain: Interventions/programmes	Central/State Government/ Schools/Playschools/ Residential Societies
Strategy 2.4: Build a safe environment to eliminate fall-related hazards.	
Action points: FFH • Recommend construction of guardrails at the balcony at homes to prevent falls. • Identify 'at risk' areas to prevent kids from getting injured after falling such as downstairs, windows, from furniture/ bed, off kitchen work surfaces, and from highchairs.	

Strategy 2.4 (cont...)	Central/State Government/ Schools/Playschools/ Residential Societies
Action points: FFH • Teach parents about the application of safe home practices include - » Installation of safety gates at stairs. » Changing diapers on the floors. » Do not keep babies unattended even for a moment on a raised surface (bed/sofa/table). » Do not let toddlers climb on furniture. » Maintain caution at the play area/park, etc. and stress the fact that no height is safe when kids are involved. • Recommend parents to install window guards in high-rise buildings and guard rails in balconies to ensure a "safety first" approach. • Maintain and secure play spaces, with features that children find interesting. For example, use of laying rubber or bark ground surfacing of sufficient depth.	
3. Safe equipment	
Domain: Interventions/programmes	Central/State Government/ Automobile Industry
Strategy 3.1: Promote safe designs/redesigns and technologies to enhance vehicle safety for children.	
Action points: • Redesign the car fronts to reduce injuries to pedestrians/ children, as they are vulnerable to head injuries on impact. • Provide suitable facilities to fit child-restraints in vehicles by motor manufacturers to protect possible children fatalities. • Introduction of child restraint system in the vehicles.	
Domain: Interventions/programmes	
Strategy 3.2: Ensure the use of safe equipment and improve safety of children.	
Action points: • Redesign and make playground or sports and recreational equipment safer, such as slides, in terms of height and structure. • Provide adequate handrails or guard rails in play areas wherever applicable. • Install safety nets and soft-landing surfaces in school playgrounds and other areas where high fall are likely to occur. • Regular inspection and maintenance of playground equipment and sports equipment.	

4. Empowerment	
Domain: Intersectoral collaborations	Central/State Government/ Local Bodies/Schools
Strategy 4.1: Support and involve multi-stakeholders to promote safety of children from various injuries and empower the community.	
Action points: • Encourage multi-sectoral partnerships to promote strategies to prevent child injuries. • Recommend schools/playschools to conduct an injury prevention week celebration for awareness and safety. • Empower schools to teach injury prevention from a young age. • Encourage schools to have paramedical staff available to handle emergencies related to drowning. • Organise public education campaigns and awareness programmes in association with self-help groups, NGOs along with, schools, community groups, and residential societies to ensure better percolation of the efforts. • Encourage schools/playschools to have a safety checklist to promote school safety standards with respect to playgrounds, sports-related equipment, classrooms, staircases, etc.	
5. Surveillance and research	
Domain: Surveillance system	Central/State Governments/ Health Department/Local Governments
Strategy 5.1: Create a surveillance system to report injuries including children.	
Action points: • Strengthen the National Injury Surveillance System and mandate data collection from all the states including child injuries. • Strict reporting of serious injuries/deaths.	
Domain: Intersectoral collaborations	
Strategy 5.2: Plan and conduct translational research to promote child safety	
Action points: • Conduct studies to determine the possible risk factors responsible for mortality and morbidity due injuries in children. • Empower institutions/organisations to support research on the causes, consequences, costs, and prevention of child injuries.	

Children are more prone to poisoning. It can occur if a child swallows/inhale substance which may be toxic and cause serious effects to the body. So, it's important to take measures to prevent poisoning in children. Some include:

Figure 17: Prevention of child poisoning.

- Ensure no poisonous plants/trees grow in the home garden and near residential areas. For example, Odalam tree.
- Educate parents on the use of child-resistant locks on cabinets or put such hazards (detergents, medicines) above children's height.
- Ensure the use of child restraint bottles at home.
- Provide training to parents/schoolteachers on first aid measures for different poisonings. For example, swallowing poisons, poisons in the eye, on the skin, and inhaling or breathing in.

Young children (aged 5-9 years) are especially vulnerable to animal bites, with dog bites being the most common. Bites to the face are the most concerning as they are the exposed part of the body. The type of injury ranges from scratches to life threatening neck and facial injuries[88]. The most common circumstances which lead to the bites in children are playing with or near the dog, passing the dog (walking and cycling), cuddling the dog, feeding the dog, disturbing the dog while eating, pulling the dog's tail, and interfering during a dog fight[88].

The precautions to be considered:

- Dog owners and parents should be extra vigilant whenever children are around dogs.
- It is crucial to remember that dog bites are not the child's fault, but rather a situation that can be prevented with proper adult supervision.
- Always supervise young children closely when they are interacting with dogs, regardless of how familiar the dog seems.

The table below summarises precautions to minimise attacks by dogs[88]:

Figure 18: Precautions to minimise attacks by dogs

- Allow dog to sniff the child before the child pets the dog.
- Do not run past dogs and do not try to outrun a dog.
- Ask the child to remain calm if dog approaches towards him/her.
- Avoid infants/small children kiss a dog.
- If attacked by dog, shout for help, protect neck and face with arms and hands if possible.
- If attacked by dog while lying, ask the child to stand up or keep face down and cover the ear with hands if possible and don't move.
- Ask the child not to stop the fighting dogs.

In India, Ministries/Organisations/Departments at all levels should understand the gravity of child injuries and recognise the loss of productive young lives. Working towards child safety and preventing child injuries are the need of the hour and must be a priority in the country.

88. Agrawal A, Kumar P, Singhal R, Singh V, Bhagol A. Animal Bite Injuries in Children: Review of Literature and Case Series. Int J Clin Pediatr Dent. 2017 Jan-Mar;10(1):67-72. doi: 10.5005/jp-journals-10005-1410. Epub 2017 Feb 27. PMID: 28377659; PMCID: PMC5360807.

Way forward

To achieve the vision of the National Strategy for Prevention of Unintentional Injury, it is vital to strengthen the existing health system at the national/state/district levels. Strengthening of health system must focus on:

1. Service delivery: It includes improving existing infrastructure/dedicated centres to provide appropriate care at all levels of health care facilities for the injuries. Providing high-quality support and care services to victims of all types of injuries to be the priority as this can prevent fatalities and reduce the short/long term disabilities associated with injuries.
2. Health workforce: Availability of efficient personnel at the facilities to address the various injuries. Hands-on training of the dedicated team is very essential and should be done on a regular basis.
3. Health information: Reliable and timely information should be made available at the centres and should be disseminated through appropriate channels to various levels focusing injuries prevention and related disabilities. Engagement with local agencies/ organisations can be roped in to create awareness on injury prevention.
4. Data and research: Collection and compilation of injury data at district/state/national level is essential to prioritise action plans. The available data needs to be analysed to fill the gaps identified through research projects using a multisectoral approach.
5. Finance: Adequate and dedicated funds for injury prevention programmes must be in place so that people are protected from financial catastrophe due to various injuries.
6. Leadership and governance: Coordination and collaboration between various key sectors and government authorities need to be ensured. This can be done by establishing Steering committee at all levels.
7. Monitoring and reporting: A robust framework to map the progress and outcomes resulting from implementation of the strategy at all levels. The action plans to be prioritised based on the results at each of these levels.

So overall, the National Strategy for Prevention of Unintentional Injury will facilitate achievement of SDG targets and the MoHFW have a key role. However, involvement of other stakeholders at all levels from various industries require immediate attention to achieve the vision.

Section 3: Annexures

Annexure I: Stakeholders for drowning prevention

Recommended interventions	Stakeholders
Policy: Enforce, reinforce laws on child safety	Local: Department of Police Schools, Transport Department, Residential Associations, Pharma industries, Sports club State level: Department of Police, DoE, Transport Department, Residential welfare societies, Department of Pharmaceuticals, Department of WCD, Department of Water Safety (DWS) National Level: Ministry of Home Affairs, Ministry of Education, MoRTH, Ministry of Chemicals and Fertilizers (MoC&F), Ministry of housing and Urban affairs, Ministry of Jal Shakti.
Community driven initiatives: Strengthen awareness generation	Local: Health Departments, Schools, Panchayats/Municipalities, Residential societies, Department of water safety, NGOs, State level: Health Department, Education Department, Social Justice Department, Residential societies, Department of water safety, NGOs, etc. National Level: MoHFW, Ministry of Education, Ministry of Social Justice and Empowerment (MoSJE), MoHUA, Ministry of Jal Shakti (MoJS), WHO, Other development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen emergency childcare services at all levels	Local: Health Departments, Schools, Transport Department, PWD, Residential societies, Department of Water Safety, NGOs, etc. State level: Health Department, DoE, Transport Department, PWD, Residential societies, Department of Water Safety, NGOs, etc. National Level: MoHFW, Ministry of Education, MoRTH, Ministry of housing and Urban affairs, Ministry of Jal shakti, WHO, Other development partners, NGOs, etc.
Intersectoral collaboration: Multisectoral collaboration	Local: Schools, Health Department, PWD, Department of water safety, Research institutes, NGOs, etc. State level: Health Department, DoE, PWD, Department of water safety, Research institutes, NGOs, etc.

Intersectoral collaboration: Multisectoral collaboration	National Level: MoHFW, MoE, MoRTH, MoHUA, MoJS, WHO, Development partners, NGOs, etc.
Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, PWD, Department of water safety, NGOs, etc. State level: Health Department, PWD, Department of Police, Department of water safety, NGOs, etc. National Level: MHA, MoHFW, MoRTH, MoJS, WHO, Other development partners, NGOs, etc.

Annexure II: Stakeholders for prevention of RTI

Recommended interventions	Stakeholders
Policy: Enforcement of laws	Local: Department of Police, PWD State level: Department of Police, PWD National Level: MHA, MoRTH
Community driven initiatives: Strengthen awareness generation	Local: Subcentres, PHCs, Schools, Panchayats/Municipalities, Police, Association of drivers, NGOs, State level: Department of Health, DoE, Social Justice department, Department of Police, NGOs etc. National Level: MoHFW, MoE, MoSJE, MHA, WHO, Other development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen emergency care at all levels	Local: Health Departments, Transport Department, PWD, NGOs, etc. State level: Health Department, Transport Department, PWD, NGOs, etc. National Level: MoHFW , MoRTH, WHO, Other development partners, NGOs, etc.
Intersectoral collaboration: Multisectoral collaboration	Local: Police, Schools, Department of Health, PWD, Research institutes, NGOs, etc. State level: Department of Police, Health Department, DoE, PWD, Research institutes, NGOs, etc. National Level: MoHFW, MoE, MoRTH, WHO, Development partners, NGOs, etc.

Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, Transport Department, NGOs, etc. State level: Health Department, Transport Department, Department of Police, NGOs, etc. National Level: MoHFW, MoRTH, MHA, WHO, Other development partners, NGOs, etc.

Annexure III: Stakeholders for prevention of burns

Recommended interventions	Stakeholders
Policy: Implementation of laws related to burns	Local: Department of Police, Department of Health, Department of Pharmaceuticals, State level: Department of Police, Department of Health, Department of Pharmaceuticals, National Level: MHA, MoHFW, MoC&F
Community driven initiatives: Strengthen awareness generation	Local: Health Departments, Schools, Panchayats/Municipalities, Police, Residential societies, Department of Power, NGOs. State level: Health Department, DoE, Social Justice department, Department of Police, Department of Power, NGOs, etc. National Level: MOHFW, MoE, MoSJE, MHA, Ministry of Power (MoP), WHO, Other development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen burn care at all levels	Local: Health Departments, Department of Power, Residential societies, Department of Fire and Safety, Automobile Industry, NGOs, etc. State level: Health Department, Department of Power, Department of Fire and Safety, Automobile Industry, NGOs, etc. National Level: MoHFW, MoP, MHA, MoHUA, Ministry of Heavy Industries, WHO, Other development partners, NGOs, etc.

Intersectoral collaboration: Multisectoral collaboration	Local: Police, Schools, Department of Health, Department of Power, Research institutes, NGOs, etc. State level: Department of Police, Health Department, DoE, Department of Power, Research institutes, NGOs, etc. National Level: MoHFW, MoE, MHA, MoP, WHO, Other development partners, NGOs, etc.
Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, NGOs, etc. State level: Health Department, Department of Police, NGOs, etc. National Level: MoHFW, MHA, WHO, Other development partners, NGOs, etc.

Annexure IV: Stakeholders for prevention of fall

Recommended interventions	Stakeholders
Policy: Reinforcement of laws	Local: Department of Police, Factory associations, Residential societies State level: Department of Police, Factory associations, Residential societies National Level: MHA, Ministry of Commerce and Industry, MoHUA
Community driven initiatives: Strengthen awareness generation	Local: Health departments, Schools, Panchayats/Municipalities, Factory associations, Residential associations, old age homes, NGOs State level: Department of Health, DoE, Department of Commerce and Industry, Residential associations, old age homes, NGOs, etc. National Level: MoHFW, MoE, Ministry of Commerce and Industry, MoHUA, WHO, Other Development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen emergency care services at all levels	Local: Health departments, Schools, Factories, Residential associations, Old age homes, NGOs, etc. State level: Department of Health, Department of Commerce and Industry, Residential associations, Old age homes, NGOs, etc. National Level: MOHFW, Ministry of Commerce and Industry, MoHUA, WHO, Other development partners, NGOs, etc.

Intersectoral collaboration: Multisectoral collaboration	Local: Health Department, Schools, factories, Old age homes, Residential societies, Research institutes, NGOs, etc. State level: Department of Health, DoE, Department of Commerce and Industry, Residential associations, Old age homes, Research institutes, NGOs, etc. National Level: MoHFW, MoE, Ministry of Commerce and Industry, MoHUA, WHO, Other development partners, NGOs, etc.
Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, Factories, NGOs, etc. State level: Health Department, Department of Police, Department of Commerce and Industry NGOs, etc. National Level: MoHFW, MHA, Ministry of Commerce and Industry, WHO, Other development partners, NGOs, etc.

Annexure V: Stakeholders for prevention of occupational injury

Recommended interventions	Stakeholders
Policy: Reinforcement of laws	Local: Department of police, Local organised and unorganised sectors State level: Department of police, Department Social Justice, Associations of organised and unorganised sectors National Level: MHA, Ministry of Commerce and Industry, MoSJE
Community driven initiatives: Strengthen awareness generation	Local: Health departments, Factories, Associations of organised and unorganised sectors, NGOs State level: Health Department, Factories, Associations of organised and unorganised sectors, Social Justice department, NGOs, etc. National Level: MoHFW, MoL&E, MoSJE, WHO, Other development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen emergency care services at all levels	Local: Health departments, Factories, Associations of organised and unorganised sectors, NGOs State level: Department of Health, Factories, Associations of organised and unorganised sectors, Social Justice department, NGOs, etc. National Level: MoHFW, MoL&E, MoSJE, Ministry of Heavy Industries, WHO, Other development Partners, NGOs, etc.

Intersectoral collaboration: Multisectoral collaboration	Local: Police, Health department, Research institutes, Associations of organised and unorganised sectors, NGOs, etc. State level: Department of Police, Health department, Research institutes, Associations of organised and unorganised sectors NGOs, etc. National Level: MoHFW, MoL&E, MoSJE, WHO, Other development partners, NGOs, etc.
Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, Factories, NGOs, etc. State level: Health department, Department of commerce and industry, Department of Police, NGOs, etc. National Level: MoHFW, MHA, MoL&E, MoSJE, WHO, Other development partners, NGOs, etc.

Annexure VI: Stakeholders for prevention of child injury

Recommended interventions	Stakeholders
Policy: Enforce, reinforce laws on child safety	Local: Department of Police, Department of transport, Residential associations, Pharma industries, Sports club State level: Department of Police, DoE, Transport Department, Residential welfare societies, Department of Pharmaceuticals, Department of WCD, Department of Water Resources National Level: MHA, MoE, MoRTH, MoC&F, MoHUA, MoJS
Community driven initiatives: Strengthen awareness generation	Local: Health departments, Schools, Panchayats/Municipalities, Residential societies, Department of Water Resources, NGOs State level: Health Department, Education Department, Social Justice department, Residential societies, Department of Water Resources, NGOs, etc. National Level: MoHFW, MoE, MoSJE, MoHUA, MoJS, WHO, Other development Partners, NGOs, etc.
Interventions/ Programmes: Create Skilled workforce and strengthen emergency childcare services at all levels	Local: Health departments, Schools, Department of transport, PWD, Residential societies, Department of Water Resources, NGOs, etc. State level: Department of Health, DoE, Transport Department, PWD, Residential societies, Department of water resources, NGOs, etc. National Level: MoHFW, MoE, MoRTH, MoHUA, MoJS, WHO, Other development partners, NGOs, etc.

Intersectoral collaboration: Multisectoral collaboration	Local: Schools, Health department, PWD, Department of water resources, Research institutes, NGOs, etc. State level: Department of Health, DoE, PWD, Department of water resources, Research institutes, NGOs, etc. National Level: MoHFW, MoE, MoRTH, MoHUA , MoJS, WHO, Development partners, NGOs, etc.
Surveillance system: Strengthen surveillance system	Local: Department of Police, Department of Health, PWD, Department of water safety, NGOs, etc. State level: Department of Health, PWD, Department of Police, Department of water safety, NGOs, etc. National Level: MHA, MoHFW, MoRTH, MoJS, WHO, Other development partners, NGOs, etc.

Annexure VII: Occupational injury reporting checklist (Sample)

1	**Personal details of the injured**		
	Name:	Address:	Telephone Number:
	Age:	Sex:	Occupation:
2	**Details of person reporting the injury**		
	Name:	Address:	Telephone Number:
	Age:	Sex:	Relation to the injured person:
3	**Details of the injury**		
	Date of injury:	Time of injury:	Place of injury:
	Type of injury:	Body part involved:	Reason for injury:(Details on working conditions, use of PPE etc.)
	Remarks: (Details of events leading to injury and number of person/persons injured):		

4	**Health status after injury:**		
	Level of consciousness:	Pulse:	BP:
5	**Treatment at injured site**		
	First aid:	Definitive care:	Treated by:
6	**Diagnosis**		
	Final Diagnosis: Details if any		
7	**Referral**		
	Status of the injured at the time of referral:	Mode of transport:	Referred place/hospital:
			Referred by:

Annexure VIII: Home safety checklist

1. **Entrance and Exit:**
   a. Is the entrance to home slippery or sloping? ☐Yes ☐No
   b. Does the entrance have safe railings or ramp (if the entrance to the house is at higher height)? ☐Yes ☐No
   c. Does the entrance to home have uneven or cracked pavement? ☐Yes ☐No
   d. Are there any obstructions (such as bushes, garbage, etc.) at the entrance? ☐Yes ☐No
   e. Is there a good working light for the night at the entrance? ☐Yes ☐No
   f. Is the door lock at appropriate height and easily operable? ☐Yes ☐No
2. **Stairs and Steps (Indoor and Outdoor):**
   a. Is there a handrail or strong support on both sides? ☐Yes ☐No
   b. Are the handrails loose, broken or of inappropriate height? ☐Yes ☐No
   c. Is there adequate lighting? ☐Yes ☐No
   d. Is there a working light with a switch at the top and bottom of stairs? ☐Yes ☐No
   e. Is the staircase too steep or too long (>12 steps per flight)? ☐Yes ☐No
   f. Is the staircase too narrow (<1.5 m)? ☐Yes ☐No
   g. Are some steps broken or uneven? ☐Yes ☐No
   h. Are the stairs slippery or covered by loose carpets or rugs? ☐Yes ☐No
   i. Is there an electric cord or clutter on the stairs? ☐Yes ☐No

3. Bedrooms:

a. Are there electric cords, objects, or clutter on the floor? ☐Yes ☐No
b. Is there uneven, torn, curled up or unsafe carpet or rug on the floor? ☐Yes ☐No
c. Is there a light switch near the bed that is easily accessible in dark? ☐Yes ☐No
d. Is there a flashlight or other emergency light source near to the bed in case of a power cut? ☐Yes ☐No
e. Is the path from your bed to the bathroom dark? ☐Yes ☐No
f. Is the bed height appropriate (neither too high nor too low) for safe transfer in and out of bed? ☐Yes ☐No
g. Is the height of the door lock or catch appropriate? ☐Yes ☐No

4. Bathrooms:

a. Is the bathroom outside the house or too far from the bedroom? ☐Yes ☐No
b. Is there adequate lighting in the bathroom? ☐Yes ☐No
c. Is the light switch easily accessible? ☐Yes ☐No
d. Is the shower floor or tiles slippery? ☐Yes ☐No
e. Is the shower floor often wet due to inadequate drainage or leaking plumbing? ☐Yes ☐No
f. Is there clutter or debris on the bathroom floor? ☐Yes ☐No
g. Is there a bathroom stool or chair for the bath area? ☐Yes ☐No
h. Is there some support such as a grab bar to help you to get up during the bath? ☐Yes ☐No
i. Is there some support such as a grab bar to help you get up from the toilet? ☐Yes ☐No
j. Is the toilet height too high or too low? ☐Yes ☐No
k. Does the bathroom have outward opening door for easy access in case of emergency? ☐Yes ☐No

5. Kitchen:

a. Are the commonly used items within reach? ☐Yes ☐No
b. Are the shelves or cupboards too high or difficult to reach? ☐Yes ☐No
c. Is your step stool sturdy? ☐Yes ☐No
d. Is there adequate lighting? ☐Yes ☐No
e. Is the floor slippery or has a scatter rug? ☐Yes ☐No
f. Is there a non-slip mat in the sink area to soak up spilled water? ☐Yes ☐No

6. Common Rooms (Living room, hallways, etc.)

a. Is there adequate lighting and ventilation? ☐Yes ☐No
b. Is the furniture (chairs/table) of proper height with good stable base? ☐Yes ☐No
c. When you walk through a room, do you have to walk around furniture? ☐Yes ☐No
d. Do you have uneven or slippery floors? ☐Yes ☐No
e. Do you have loose rugs on the floor? ☐Yes ☐No

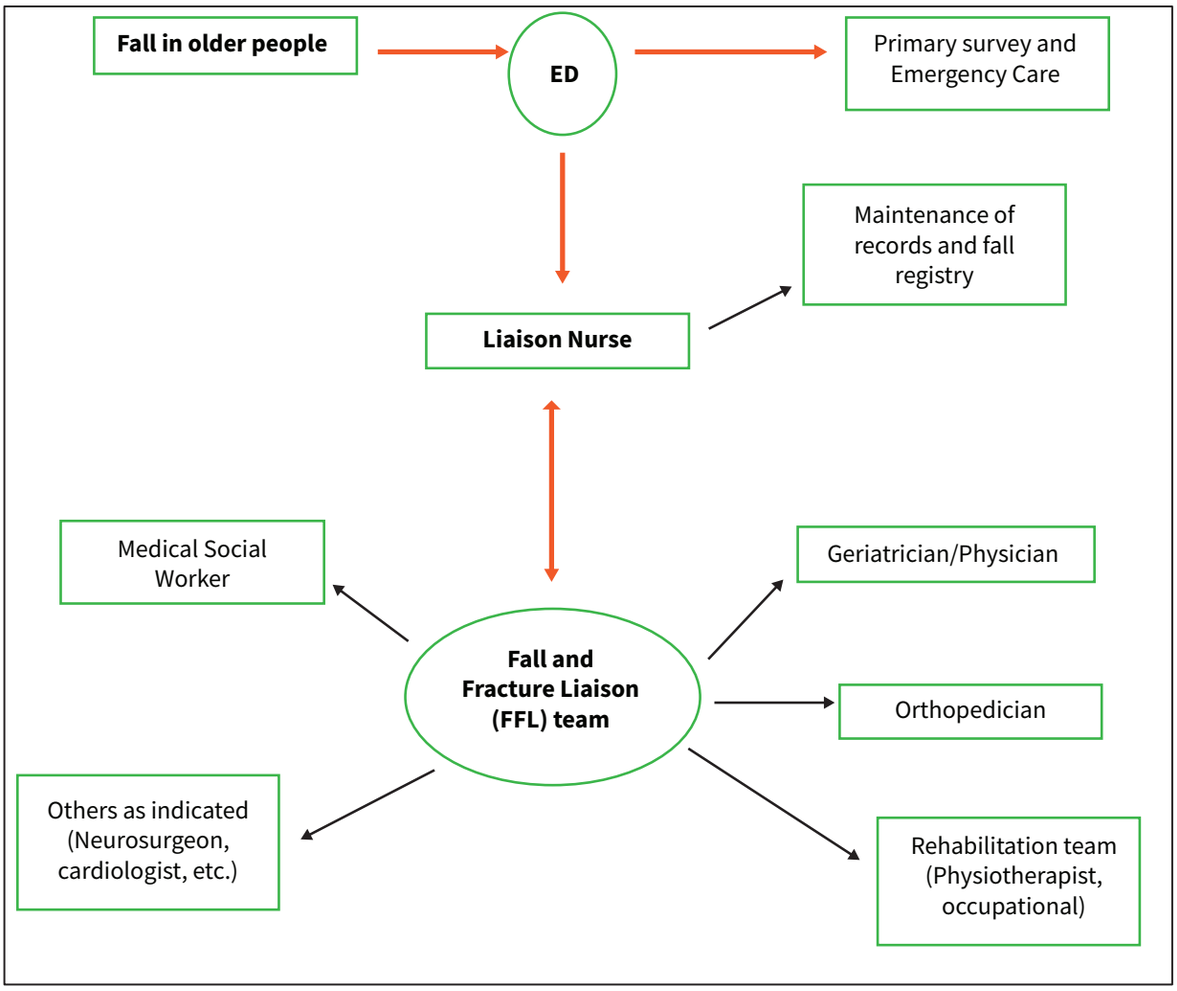
f. Are there papers, shoes, books other objects on the floor? ☐Yes ☐No
g. Do you have to walk over or around wires or cords (like lamps, telephones, or extension cords)? ☐Yes ☐No
h. Do you have storage space (such as a cupboard or shelf) that is too high to reach? ☐Yes ☐No
i. Is the height of the door lock or catch appropriate? ☐Yes ☐No
j. Is there an escape plan for safe exit in case of emergency such as fire, or an earthquake? ☐Yes ☐No

**This is a sample checklist. Home-safety checklist as per the local socio-cultural environment can be created depending on urban and rural areas and type of home (pucca or kutcha).*

Annexure IX: Fall and fracture liaison

The (FFL) team in higher levels of care will essentially evaluate an older person for fall risk. The goal is to identify the cause for present fall, optimisation of co-morbidities, early intervention, identification & treatment of risk of future fall, identification & treatment of fracture risk, early mobilization, and prevention of disability. Whenever an older person with a history of fall is admitted in the emergency department, that needs to be immediately communicated to the FFL team. The FFL team will assess the patient after initial stabilization. An initial assessment needs to be done in the initial 24 hours and a plan of action needs to be made. Detailed assessment may not be possible in the initial visit if the patient has serious injuries or significant disability. A plan to revisit such patients should be made and then assessed for future fall risk. All the modifiable (extrinsic) risk factors should be addressed and for those with non-modifiable (intrinsic) risk factors, preventive strategies should be started to avoid future fall. The FFL team can also update the injury details in a national registry/portal.

Figure 19: Fall-and-fracture liaison (FFL) team in emergency rooms



Members of the fall and fracture liaison team:

Geriatrician/Physician, orthopedic surgeon, neurosurgeon, nurse, physiotherapist, occupational therapist, dietician, neuropsychologist, medical social worker). The team can vary depending on the availability of personnel. They should be trained in fall assessment and preventive management.

Suggestive hub and spoke model of FFL:

It is suggestive that within 1 year the FFL team be created in at least one medical college hospital in each state. These teams can be integrated with a national team for the design, implementation, and creating registry of falls & related injuries in older people. In the next phase (next 2 years), each state may have an FFL team in at least 75% of medical college hospitals and 25% of district hospitals. In another 2 years, a FFL team in all medical colleges and 50% of district hospitals. These teams can be part of existing Trauma and Emergency units of each state to facilitate smooth operationalisation. This will ensure a high quality data on the falls and related injuries in older people to identify areas of improvement and focused evaluation of causes of falls in the rapidly growing segment of population.

Annexure X: Logical framework model – Action plan for the States

Table 17: Example action plan for reducing road injury mortality and severe injuries.

Example of an Action plan for reducing road injuries mortality and severe injuries in a State				
	Intervention/Policy	**Indicators**	**Source and means of verification**	**Assumptions**
Overall Aim (Impact)	20% decrease in road traffic deaths within 3 years in the target area 30% decrease in severe non-fatal traffic injuries requiring hospitalization within 3 years in the target area	Road traffic death rate (per 1,00,000 population) Annual incidence on non-fatal road traffic injuries (per 1,00,000 population)	National Crime Records Bureau reports Data from state departments/agencies Hospital records Insurance data	Reliable data on road traffic deaths and injuries Change in government leadership or policy priorities
Specific Objective/s (Outcome)	Establish and enforce speed limit laws in the target area	Increase in documented speed limit violations in the first year Decrease in speed limit violations in subsequent years compared to the previous year	Records of fines and penalties issued for speed limit violations Data from speed cameras	Sufficient level of public support for road safety initiatives
Expected Results (Output)	Increased enforcement of speed limit laws in the target area through traffic police patrols and fines for speeding violations Install and monitor speed cameras on lower- speed roads and fine for speeding violations	Number of annual traffic police patrols Number of speed limit violations identified by the speed cameras	Records of fines and penalties issued for speed limit violations Data points from speed cameras	The effectiveness of enforcement may be limited by resource constraints and corruption

Activities	Develop and implement educational campaigns and public announcements to increase awareness of speed limit laws among road users and the risk of casual speeding Provide training and capacity building for traffic police officers to improve their skills in speed limit enforcement Mandatory remedial training for repeat traffic offenders	Means: (personnel/equipment/ training etc.) The Number reached and evaluated with educational campaigns conducted Number of community events organised Number of police officers trained Number of repeat traffic offenders trained	Primary data collection effort for monitoring and evaluation Stakeholder feedback Secondary sources: Media coverage	Implementing partners should have the necessary expertise, financial resources, and commitment to carry out activities

Table 18: Example action plan for strengthening the institutional capacity for burn injury management.

Example of an action plan for strengthening the institutional capacity for burn injury management in a state				
	Intervention/Policy	**Indicators**	**Source and means of verification**	**Assumptions**
Overall Aim (Impact)	To strengthen the institutional capacity for burn injury management in the state within 3 years	Increase number of reported burn injuries per 1,00,000 population in the state Percentage decrease in burn injury- related deaths in the state (per 1,00,000 population)	Hospital records National Crime Records Bureau reports	Sufficient political will and support from the state government
Specific Objective/s (Outcome)	To improve the quality and accessibility of burn injury management in the state	Percentage of burn injury patients who receive appropriate medical treatment according to their injury severity Patient satisfaction with burn injury services Percentage of population with access to a burn injury management facility within 60-minute travel time	Document the recovery outcomes from hospital records Primary data collection through survey and observation	Adequate funding to support training and infrastructure

Expected Results (Output)	Improved knowledge and skills of health-care professionals in burn injury management Improved infrastructure and equipment for burn injury management	Percentage of medical professionals who can apply appropriate first aid and medical treatment for burn injuries Number of health-care facilities with adequate burn injury management infrastructure	Facility assessment and surveys by trained professionals	The willingness of health-care professionals to participate in capacity-building activities
Activities	Conduct training programs on burn injury management for health-care professionals, including doctors, nurses, and community health workers Develop standardised guidelines for care Develop guidelines for referral and rehabilitation Establish or upgrade burn injury management units in health-care facilities including the provision of burn beds, burn dressings, and other equipment and supplies	Number of health-care professionals trained in burn injury management Percentage of health-care facilities that have appropriate stock levels of burn injury management supplies and medication	Training records Pre and post-training assessments Inventory records	Limited availability of health-care facilities and professionals

Table 19: Example action plan for drowning prevention among children and adolescents.

Example of an action plan for drowning prevention among children and adolescents				
	Intervention/Policy	**Indicators**	**Sources and means of verification**	**Assumptions**
Overall Aim (Impact)	20% decrease in incidence of drowning deaths among children and adolescents within 2 years in the target area	Annual incidence of drowning deaths among children and adolescents (per 1,00,000 population)	National Crime Records Bureau reports Data from state department/agencies Hospital records	Reliable data on drowning-related death Adequate policy frameworks and enforcement mechanisms for water safety and drowning prevention
Specific Objective/s (Outcome)	To increase awareness of water safety and improve swimming and water survival skills among children and adolescents in the target area	Percentage increase in the number of children and adolescents who are aware of water safety Percentage increase in the number of children and adolescents who know how to swim and possess basic water survival skills Reduction in the number of drowning incidents among children and adolescents in the target area	Primary data collection through representative surveys	Sufficient funding for program implementation and evaluation

Expected Results (Output)	Output 1: Increased knowledge and awareness of water safety among children and adolescents Output 2: Improved swimming and water survival skills among children and adolescents	A percentage of children and adolescents use appropriate safety equipment such as lifejackets A percentage of children and adolescents know how to respond in situations such as drowning or near- drowning incidents Percentage of children and adolescents demonstrating proficiency in swimming skills appropriate for their age and ability level	Observations and assessments conducted by trained instructors Surveys or self-report	Stakeholders and communities should be supportive of drowning prevention activities
Activities	Output 1: Develop and disseminate age-appropriate educational materials on water safety and drowning prevention Engage with parents and caregivers to educate them about water safety and drowning prevention Output 2: Provide swimming lessons and water safety training for children and adolescents	Means: (personnel/ equipment/training etc.) Number of educational materials developed and distributed Number of parents and caregivers engaged Number of children and adolescents receiving swimming and water safety training Number of children and adolescents demonstrating proficiency in water survival skills	Records of materials distributed Attendance registers for campaigns Sign-in sheets for parents and caregiver meetings Attendance registers for swimming and water safety training Observation by trained instructors	Implementing partners should have the necessary expertise, financial resources, and commitment to carry out activities

Table 20: Example action plan for reducing high fall injuries among adult workforces.

Example of an action plan for reducing high fall injuries among adult workforce in a state				
	Intervention/Policy	**Indicators**	**Source and means of verification**	**Assumptions**
Overall Aim (Impact)	To reduce the incidence of high falls injuries among the workforce in the state by 30% by 2025	Annual incidence of high fall injuries among the workforce in the state	Workplace injury data from the Suvidha Portal Primary data collection through	Reliable data sources for high injuries in worksite Regulatory bodies have capacity to conduct inspections and enforce compliance
Specific Objective/s (Outcome)	Increased compliance with fall prevention measures for employers	Increase in the number of workplace inspections conducted to identify and address fall hazards Increase in the number of employers who have been certified as compliant with fall prevention standards	Official records of inspections conducted by relevant regulatory authorities Official records of certifications issued by relevant regulatory authorities	Employers are aware of fall prevention measures and the importance Certification is seen as a value incentive for employers to prioritise fall prevention
Expected Results (Output)	Output 1: Develop and implement an inspection program to identify and address fall hazards in workplaces Output 2: Establish a certification process for employers who demonstrate compliance with fall prevention standards	Percentage of high-risk workplaces inspected for fall hazards Percentage of identified fall hazards that have been addressed Number of employers who have applied for certification Percentage of employers who have maintained compliance over time	Official records of inspections conducted by relevant regulatory authorities Official records of certification applications received by relevant regulatory bodies Official records of re-certification applications received by relevant regulatory bodies	Employers will take action to address identified fall hazards Employers may resist or avoid inspection

Activities	Output 1: Conduct a needs assessment to determine the status of fall prevention measures in the workplace Develop comprehensive inspection protocol and training materials for inspectors Conduct inspection of workplaces at regular intervals to identify fall hazards Output 2: Develop certification criteria and standards for fall prevention Develop a database to track certified employers and verify compliance with certification	Number of employers who participated in the needs assessment Number of inspectors trained Number of workplaces inspected Completion of corrective action plans Number of certification criteria and standards developed Number of certification reviews and site visits conducted	Needs assessment report Training attendance records Inspection reports Certification database Site visit reports	Sufficient funding and resources to conduct needs assessment Availability of subject matter experts to assist in the development of inspection protocol and lead training sessions Regulatory authorities have sufficient funding and resources to conduct follow-up visits