

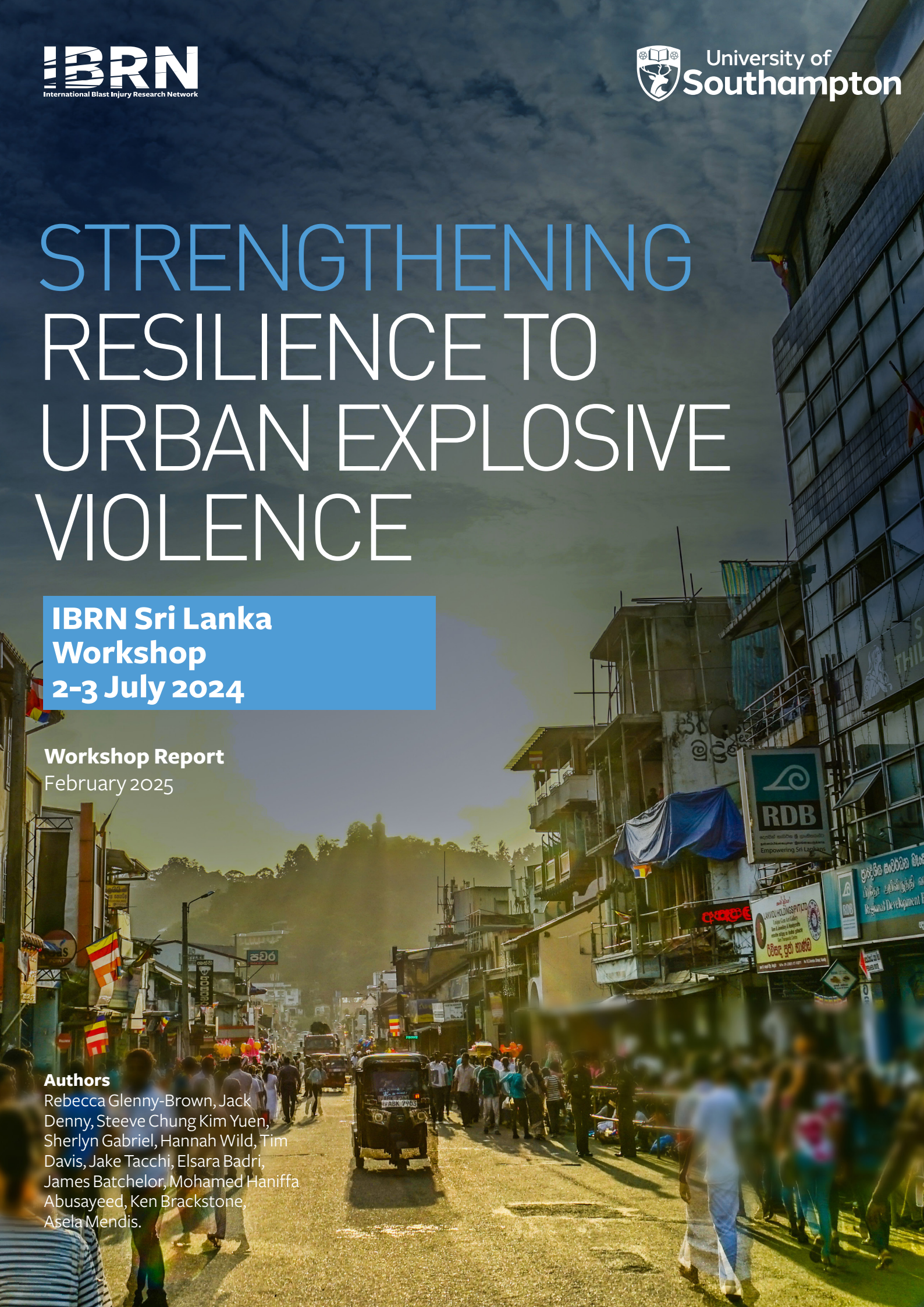
STRENGTHENING RESILIENCE TO URBAN EXPLOSIVE VIOLENCE

**IBRN Sri Lanka
Workshop
2-3 July 2024**

Workshop Report
February 2025

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INTRODUCTION

THE IBRN

The International Blast Injury Research Network (IBRN) conducts multidisciplinary and cross-sectoral research to improve the understanding of the consequences of explosive violence on civilians.

We aim to improve the protection and treatment of those injured by explosive violence, to inform risk reduction strategies, and minimise harm and suffering of affected populations.

PILLARS OF IBRN ACTIVITY



- 01** Research
- 02** Challenge-focussed and state-of-the-science events
- 03** Collaboration and engagement
- 04** Policy and impact

IBRN THEMATIC AREAS



- 01** Blast engineering
- 02** Systems approaches to preparedness & resilience
- 03** Health systems response and interventions
- 04** Forensic research
- 05** Monitoring and reporting

OUR STORY

The IBRN was launched in 2019 by the University of Southampton in collaboration with the University of Cape Town. Five years ago, we identified that blast research was primarily focused on military contexts, overlooking civilian situations and perspectives.

To address this gap, we brought together the multidisciplinary IBRN team to improve research within the civilian context and to approach the issue from a more holistic level.

What We Do

As a proactive network, we:

- Produce and publish **high-quality research**
- Organise annual **international forums**
- Run challenge-focused **workshops**
- Hold regular online **research seminars**
- Support student projects in blast injury research
- Contribute to **explosion protection policy**
- Present and participate at UN events and conferences

Who We Are

We are **a unique global network** of prestigious, **research-intensive universities and experts in the blast engineering and injury fields** working with partners in humanitarian and defence sectors.

Our High-Quality Research

The IBRN has an active portfolio of innovative research, including:

- **The Explosive Weapons Trauma Care Collective (EXTRACCT)** - an initiative established to improve care for injured civilians in settings impacted by explosive weapons.
- **Impacts of IEDs** - research into the harm, effects, and impacts of improvised explosive devices (IEDs).
- **Urban Blast Effects** - blast experiments and computational modelling.
- **Experimental Guidelines** - blast engineering approaches to determine appropriate parameters for injury experiments.
- **Systems Modelling and Simulation** - integrated modelling and simulation approaches for urban blast scenarios and health system optimisation.

- **Health Needs in Ukraine** - consequences of explosive violence on Ukrainian civilians.
- **The Beirut Blast** - the contextual and spatial factors that influence blast injury patterns.
- **Clinical Guidelines** - optimising and harmonising clinical approaches to treat blast injuries.
- **Psychological Impact** - short- and long-term psychological impact of witnessing explosive violence, such as PTSD and resilience
- **Explosive Violence Monitor** - monitoring global explosive violence by AOAV.
- **Research Funding Analysis** - exploring the funding landscape of blast injury-related research.

CONTRIBUTING TO THE UN SDGS

The IBRN's activities **respond to the global challenges of terrorism and explosive violence**, and supports international agendas tackling the use of explosive weapons in populated areas (EWIPA). The UN Institute for Disarmament Research has shown that the use of EWIPA directly impacts 8 out of the 17 SDGs and the International Committee of the Red Cross has designated EWIPA as a key priority.

While advocacy is critical, it must be substantiated by methodologically rigorous research to inform practical solutions that mitigate harm and nurture sustainable improvements.

THE SRI LANKA WORKSHOP

Explosive violence increasingly occurs in populated settings due to the shifting nature of conflict and the prevailing threat of terrorism using explosive weaponry. These incidents create complex emergencies that place significant stress on health systems and emergency services. The resulting blast injuries have devastating consequences for individuals' health outcomes and welfare. This highlights an urgent need for improved protection, emergency response systems, enhanced data collection, and potential new interventions to enhance resilience and preparedness to explosive violence.

This workshop aimed to assess the strengths and challenges of Sri Lanka's health system and emergency responses in the aftermath of the 2019 Easter Sunday bombings. Alongside this, it explored the rebuilding efforts in Colombo and lessons learnt across the last five years. Through this, the event sought to identify potential research and policy opportunities for further strengthening response and preparedness in Sri Lanka and other regions.

The workshop focused on two main themes: the **response** to the 2019 Sri Lanka Easter bombings and the **rebuilding** following the devastating event, covering the following topics:

- Explosive violence data collection and casualty reporting
- Communication and decision-making processes during emergencies
- Patterns of blast injuries
- Opportunities to strengthen emergency response
- Reverberating effects on communities
- Mitigating blast injury threats
- Blast-resilient design in urban settings
- Sharing best practice

The 2019 Sri Lanka Easter Bombings

On the morning of 21st April 2019, Easter Sunday, three churches in Sri Lanka and three luxury hotels in Colombo (Sri Lanka's capital), were targeted in a series of coordinated suicide bombings, occurring within a one hour period. This was followed later in the afternoon by two smaller explosions in the suburbs of Colombo. The bombings killed 269 people, including 45 foreign nationals, and injured over 500 people.

Sri Lanka has a long history of explosive violence and mass casualty incidents, with notable examples being the Sri Lankan Civil War (1983 – 2009) and 2004 Boxing Day Tsunami. The country endured numerous blast incidents throughout the civil war, causing significant numbers of casualties and extensive damage to buildings. Many incidents employed the use of IEDs, leading to mass casualty incidents (MCIs) that strained health services in Sri Lanka. Later In 2004, the Boxing Day tsunami caused devastation to the coastal areas of Sri Lanka, killing thousands of people.

While tragic in nature, such incidents increased Sri Lanka's preparedness to MCIs. However, following the end of the civil war in 2009, there were no such events until the 2019 Easter Bombings.



EVENT DETAILS

- Presentations and group discussions facilitated by members of the IBRN team
- Held at the Shangri-La Hotel, Colombo 2nd-3rd July 2024



Photo: St Sebastian church at Negombo on 21 April 2019 following a bomb blast during the Easter service



PRESENTATIONS

Session 1: Overview & Response to the Sri Lanka Easter Bombings

Session Chairs:

Prof James Batchelor, University of Southampton, and **Prof Asela Mendis**, University of Colombo

- Lessons from Easter Attack and Strategies for Way Forward - Prof Rasheen Bappu, Ministry of Defence Sri Lanka
- Overview and Response to the Easter Sunday Bombing: Blast Injury Management in National Hospital Colombo - Dr Mahanama Gunasekara, National Hospital of Sri Lanka/The College of Surgeons Sri Lanka
- Past Experience and Current Readiness for a Blast Situation - Mr Sohan De Silva, Suwasariya, Ambulance Service
- Management of Dead Bodies - Dr Ajith Tennakoon, Institute of Forensic Medicine and Toxicology

Session 3: Blast-Resilient Design, Rebuilding & Protection for the Future

Session Chairs:

Prof Steeve Chung Kim Yuen, University of Cape Town, and **Maj Gen Lanka Amarapala**, Sri Lanka Army

- Minimising Blast Damages and Risks through Resilient Infrastructure - Prof Ranjith Dissanayake, Institution of Engineers Sri Lanka (IESL)
- IED Mechanisms Used and Engineering Response to the Easter Sunday Bomb Blast and Lessons Learned - Lt Col Jeewa Wickramarachchi and Maj Janaka Salgado, Sri Lanka Army
- Understanding Blast Loading in the context of Urban Explosions - Prof Steeve Chung Kim Yuen, University of Cape Town

Session 2: Explosive Violence Data Collection & Wider Impacts

Session Chairs:

Dr Tim Davis, Uniformed Services University, and **Dr Ajith Tennakoon**, Institute of Forensic Medicine and Toxicology

- Institutional Memory in Mass Casualty Management - Dr Kirthi Abayajeeva, National Health Service
- Explosive Violence: A Decade of Harm - Dr Iain Overton, Action on Armed Violence
- Open-source Intelligence and Blast Research: Tools, Techniques & Possibilities - Mr Jake Tacchi, BBC World Service
- The Economic and Psychosocial Impacts of Bombings in Sri Lanka - Muttukrishna Sarvananthan and Abisaajini Kirushanth, University of Jaffna and Point Pedro Institute of Development.

Session 4: Building Opportunities for Future Research

Session Chairs:

Dr Sherlyn Gabriel, University of Cape Town, and **Prof Asela Mendis**, University of Colombo

- The Power of Interdisciplinary Research - Prof James Batchelor, University of Southampton
- Spatial and Contextual Factors Influencing Blast Injury Patterns from the 2020 Beirut Explosion - Dr Jack Denny, University of Southampton
- Interpretation of Injuries and Proper Scene Examination: A Tool in Blast Injury Research - Prof Asela Mendis, University of Colombo
- Defining a Research Agenda: Injury Prevention and Trauma Care for Civilians Affected by Explosive Weapons - Dr Hannah Wild, University of Washington.

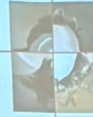
BISRU BLAST IMPACT & SURVIVABILITY RESEARCH

Understanding Blast Loading in the context of Urban Explosion

Steeve Chung Kim Yuen



2015 Tianjin explosion



IBRN
International Blast Injury Research Network

Strengthening Resilience
to Urban Explosive Violence
Colombo, Sri Lanka

Dept of Mechanical Engg
UNIVERSITY OF CAPE TOWN
YUNIBESITHI YASEKAPA • UNIVERSITEIT VRIJESBURG



GROUP DISCUSSION 1

RESPONSE TO THE SRI LANKA EASTER BOMBINGS

This group discussion addressed the challenges, limitations, and successes in response to the Easter bombings, including lessons learnt.

Resilience and Capacity Building from Past Experiences

Health System Preparedness

The Sri Lankan Ministry of Health's strong and well-established communication network with the National Hospital and other health facilities in Colombo significantly enhanced coordination and communication in the aftermath of the explosions. This enabled a more efficient response.

Ambulance Services

The establishment of an ambulance service in 2016 provided crucial resources for responding to the mass casualty event. The presence of these services improved the speed and effectiveness of medical response, unlike during the 2004 tsunami when no formal ambulance service existed.

Experienced Medical Personnel

Due to Sri Lanka's civil war and previous conflicts, many hospitals and medical personnel had extensive experience dealing with blast injuries and mass casualty events. This experience meant that doctors and nurses were better prepared, having developed practical skills and protocols from handling similar incidents in the past.

Disaster Preparedness

The lessons learned from the 2004 Boxing Day tsunami led to the development of a robust disaster preparedness infrastructure, including the Disaster Management Centre and emergency guidelines. Regular disaster preparedness drills and mass casualty simulations ensured that first responders and health professionals were well-prepared, minimising chaos and enhancing coordination during the Easter Bombings.

Community Resilience and Civil Society Support

Civilians and civil society groups played a crucial role in the immediate aftermath of the bombings. Many civilians provided transport to hospitals, which was vital given the scale of the event and the limitations of the available ambulance services. This community involvement significantly reduced harm and fatalities. The issues faced with civilian transport, such as the use of three-wheelers or tuk-tuks that sometimes exacerbated injuries, led to the implementation of training programmes on first aid and proper patient transport practices after the bombings.

Rapid Deployment and Coordination

The swift deployment of the military and law enforcement prevented further attacks. This was aided by policies that allowed immediate actions, such as curfews without

bureaucratic delays. This quick response was crucial in containing the situation and preventing additional casualties. Collaborative efforts between various agencies, including intelligence support for judicial processes, facilitated a comprehensive response. Additionally, international support was quickly received, providing additional resources and expertise.

Post-Event Coordination and Review

Review and Adaptation: A review meeting was promptly held to assess the response and identify areas for improvement. This demonstrated a commitment to learning and adapting from the experience, with a focus on enhancing future responses.

Challenges and Limitations

Evacuation and Public Communication

The response highlighted a need for better evacuation planning. There was significant confusion about how to safely evacuate people from affected areas, indicating a need for clear, practised evacuation plans for various scenarios. The spread of misinformation, particularly on social media, posed a major challenge. Although social media was temporarily banned to curb misinformation, some external accounts remained active, complicating efforts to manage public communication.

School Reopening and Public Assurance

Reassuring parents and children about safety during the reopening of schools was challenging. Although security measures like bag checks were introduced, these could have been implemented more proactively to build public confidence and ensure safety.

Data Integration and Analysis

Despite the availability of data from crime scenes, hospitals, forensics, and CCTV, there was no integrated analysis. This lack of coordination hindered a comprehensive understanding of the attacks and delayed informed decision-making.

Logistical and Operational Issues

There were delays in mobilising resources and teams, which was compounded by communication breakdowns. In some instances, networks were informed via media rather than through direct channels, highlighting the need for improved communication protocols. The forensic team was only able to visit one site due to a lack of staff, who were urgently needed at other institutions. There was a need for better coordination between medical teams and ambulance services to ensure timely and effective care.

Legal and Coordination Challenges

The deployment of bomb squads was complicated by legal limitations, such as the lack of emergency law activation, which restricted the Army's ability to respond effectively. Inter-unit Coordination: Insufficient coordination between the Police Special Task Force and the Army led to suboptimal decisions, such as the controlled detonation of a vehicle full of explosives instead of defusing it.

Weapon Type and Civilian Impact

The use of homemade, improvised explosive devices (IEDs) posed challenges to traditional explosive ordnance disposal strategies, complicating the response. Furthermore, there was a recognition that teams were not adequately prepared for chemical blasts and their civilian impacts, highlighting a gap in preparedness for non-traditional threats.

Ethnic and Religious Tensions

The bombings exacerbated ethnic and religious tensions, leading to retaliatory actions and discrimination against minority groups. There was a need for messaging that emphasised law and order to maintain social cohesion and prevent further violence.

Multiple Simultaneous Attacks

The coordination of responses was complicated by the fact that the bombings occurred in multiple locations simultaneously, stretching resources and complicating command and control efforts.

Lessons Learned and Suggested Improvements

Enhanced Evacuation Planning

Develop and regularly practise clear evacuation plans for various scenarios, including those involving multiple locations, to ensure efficient evacuations during crises.

Improved Communication Strategies

Establish robust systems for quickly countering misinformation, possibly through official channels that can immediately disseminate accurate information to the public.

Proactive School Security Measures

Implement security awareness programmes in schools as a standard practise, including regular drills and visible security measures to reassure students and parents.

Integrated Data Analysis

Develop protocols for the real-time integration and analysis of data from various sources (crime scenes, hospitals, forensics) to improve situational awareness and inform response strategies more effectively.

Faster Mobilisation and Coordination

Streamline communication channels and ensure better integration between forensics, medical, and emergency teams for faster resource mobilisation and coordination.

Legal Reform

Address legal barriers to deploying military and specialised units in emergencies. Consider legal reforms that enable the rapid activation of necessary authorities in crisis situations.

Enhanced Coordination Between Units

Improve coordination and training between different response units, particularly between the Army and Police forces, to handle complex explosive devices more effectively.

Preparation for Chemical and Non-Traditional Threats

Enhance preparedness for chemical and other non-traditional attacks, including specialised training and equipment for responders.

Promote National Cohesion

Implement civic education programmes that emphasise national unity and the importance of law and order to prevent ethnic and religious tensions from escalating in the aftermath of such events.

Adaptation for Multiple Simultaneous Incidents

Develop specific response plans for handling multiple simultaneous incidents to avoid overstretching resources and ensure effective command and control.

The response to the Easter Bombings showcases both strengths and areas for improvement. The existing preparedness from past experiences, strong civilian involvement, and rapid response were notable successes. However, challenges such as misinformation, logistical coordination, and legal barriers revealed critical areas needing enhancement.

Reflecting on these challenges and successes, and implementing lessons learned, can significantly enhance the effectiveness and efficiency of responses to future incidents of this nature, ensuring better preparedness, quicker mobilisation, and more coordinated actions across all relevant sectors.

GROUP DISCUSSION 2

EXPLOSIVE VIOLENCE DATA COLLECTION & WIDER IMPACTS

This discussion focused on challenges of data collection during and following explosive violence.

Challenges in Data Collection and Analysis

Institutional Silos

Data from different sources, such as the Ministry of Health, hospitals, and other institutions, is often siloed, which makes comprehensive data access and the collective analysis challenging. Medical records are not integrated across institutions, and access to these typically requires authority and clearance.

Focus on Casualty Data

Participants noted that much of the data captured during and after the Easter Bombings focused primarily on casualty rates. There was a significant lack of intricate data that could provide deeper insights into the event's broader impacts. Additionally, the lack of follow-up reporting meant that health data captured in the weeks, months, and years following the attacks was almost non-existent. As a result, some fatalities that occurred months or years after the event took place were not included in the overall casualty figures.

Experienced Medical Personnel

Due to Sri Lanka's civil war and previous conflicts, many hospitals and medical personnel had extensive experience dealing with blast injuries and mass casualty events. This experience meant that doctors and nurses were better prepared, having developed practical skills and protocols from handling similar incidents in the past.

Initial Chaos and Prioritisation of Immediate Response

The chaotic environment necessitated prioritising life-saving measures over data collection during the immediate aftermath of the bombings. Medical personnel were overwhelmed and had to focus solely on clinical work, which left little room for accurate data reporting. Participants highlighted that this environment often led to incomplete or imprecise data collection due to the urgency to treat patients and the high levels of panic and emotional stress experienced.

Explosive events often destroy or disrupt forensic evidence, creating significant gaps in data. Handling materials and gathering information on-site was particularly difficult under such stressful conditions, and forensic teams were often unable to access all affected sites promptly.

Accuracy, Verification, and Information Gaps

Verification Challenges

Distinguishing between accurate and false information is a challenge in the immediate aftermath of this type of event. Misinformation and miscommunication can spread panic, which can further complicate the data collection process.

Delays in disseminating data arise from the need for careful verification since data cannot be retracted once released. This necessitates caution and consequently slows the process. A lack of immediate and accurate data hampers real-time decision-making and post-event analysis.

Inconsistent Data Collection Protocols

Participants noted the lack of standard protocols for data collection, leading to inconsistencies in what was collected and reported. The involvement of multiple parties means there is the potential for bias which affects data quality and contributes to information gaps.

Economic Impact Data Limitations

Discussions during the group sessions highlighted the absence of accurate figures to measure the economic damage caused by the Easter Bombings. While there were discussions on health impacts and casualties, the overall cost of damage remains largely unknown.

Security and Ethical Concerns

There are significant legal and ethical challenges in collecting and sharing data, particularly when it involves sensitive information such as victim identities, injuries, and the types of explosives used. These concerns further restrict access to comprehensive data necessary for a thorough analysis of the incident and its aftermath.

Types of Data Needed and Desired Improvements

Critical Data Points for Comprehensive Analysis

To improve response and preparedness, critical data points include the type and approximate amount of explosives used, injury types and severities, demographics of the affected population, available medical resources, structural damage, and the effectiveness of security measures.

Follow-Up and Long-Term Data

Crucial data is often missing on long-term disabilities, trauma recovery, psychosocial impacts, and follow-up consultations with victims. Similarly, understanding how blast events affect structural integrity and the functional outcomes of survivors can inform better preparedness and infrastructure resilience.

Improving Data Collection and Integration

The establishment of a centralised repository for data, accessible to all relevant stakeholders (medical, security, engineering, psychological, and victim advocacy), would streamline data sharing and improve coordination. This would ensure that data is not only collected more consistently, but also analysed in a more integrated manner.

Technological Enhancements

Utilisation of technologies such as CCTV, AI, and geofencing for real-time data collection and analysis, along with digitisation of health and defence records, could enhance the accuracy and availability of data. Implementing standard protocols for data collection and dedicating teams specifically for this purpose could also improve data quality and usability.

Post-Incident Data Collection and Follow-Up

Implementing systematic follow-up with victims for both medical and psychological assessments is essential. This data is crucial for understanding the long-term impacts of explosive violence, which can improve future response strategies.

Multidisciplinary Perspectives on Data Requirements

Security forces require data on the types of explosives, deployment methods, and potential subsequent threats to prevent future incidents. Rapid analysis is essential for determining immediate risks and effectively deploying bomb disposal teams. Further, data on injury patterns, resource availability, and rapid evacuation strategies is critical for optimising medical response. This information helps in planning and improving future responses to similar incidents. Finally, assessing structural damage and understanding how buildings respond to blasts is crucial for enhancing the design of infrastructure to be more resilient against future explosive events.

The challenges of data collection during and following explosive violence, such as the Easter Bombings, are substantial. These challenges are compounded by the chaotic nature of such events, fragmented data sources, and the need for immediate life-saving responses. The lack of comprehensive and integrated data hampers both immediate response efforts and longer-term recovery and resilience planning. However, by improving coordination among agencies, utilising advanced technology, and centralising data repositories, these challenges can be mitigated. This approach would lead to better preparedness, more effective response strategies, and more comprehensive recovery efforts, thereby, enhancing resilience to future incidents.



GROUP DISCUSSION 3

BLAST-RESILIENT DESIGN, REBUILDING & PROTECTION FOR THE FUTURE

This group discussion focused on the role of infrastructure, services, and policy on mitigating impacts from explosive violence.

Infrastructure and Building Design

Historical Buildings

The churches targeted in the Easter Bombings were constructed over a century ago and were not designed with modern blast resistance in mind. Despite this, their substantial masonry construction helped mitigate against total structural collapse, a common cause of death and injury in explosive events. This construction type likely prevented a higher death toll since many of the larger, supporting walls remained intact. Complete structural collapse can cause significant casualties, so the preservation of these load-bearing walls was crucial.

Material Impacts and Secondary Injuries

While the robust construction of the churches prevented total structural collapse, other architectural features did contribute to blast injuries. For example, blast damage to the roof meant that old, heavy tiles fell and caused head injuries to congregants below. Participants also expressed concerns about the potential release of asbestos, a harmful substance that might have been present in the church's construction materials. In addition to fragments from the IED itself, some injuries resulted from wood fragments from church benches.

Differences in Hotel Infrastructure

Unlike the churches, many of the hotels targeted were modern buildings which often incorporated tempered, laminated glass. The hotel explosions occurred inside, which meant that the glass was blown outwards, reducing potential injuries from glass fragments. This contrasted with incidents such as the 2020 Beirut Port explosion, where glazing failure and glass fragments blown into homes were responsible for many injuries. The hotels' modern infrastructure, with laminated glass facades, may have mitigated some of the blast effects, although fragmentation injuries remained prevalent.

Building Materials and Design Considerations

The contrast between older church buildings and modern hotels highlights the importance of architectural design in determining the impact of explosive events. Older buildings typically lack modern protection and are more vulnerable to blast events. In contrast, the Shangri-La Hotel's modern design stronger glass facade may have amplified internal blast effects, but prevented external tertiary injuries from building collapse. This suggests that incorporation of blast-resistant features into building design is essential, though often neglected due to cost concerns.

Security Measures and Policy Responses

Prior to 2009, security measures such as random checks, barricades, and checkpoints were standard, particularly during Sri Lanka's civil conflict. However, following the end of the civil war in 2009, there was a reduction in vigilance, which led to a sense of complacency. The 2019 Easter Bombings prompted a reintroduction of heightened security protocols, including the deployment of sniffer dogs, the installation of scanners, and a more visible police and military presence, particularly during religious holidays. These measures aimed to reassure the public. However, they also created discomfort among some community members due to the heavy security presence.

In response to the attacks, new laws were proposed to restrict access to certain chemicals that could be used in explosives. Participants noted that previous regulations on commercially available chemicals were insufficient and poorly enforced. The proposed measures aimed to improve monitoring of chemical purchases to prevent misuse. Additional barriers have been constructed around religious sites to prevent further attacks. Further, vehicles are increasingly banned from certain religious festivals to reduce the risk of vehicular bombs. These measures are part of broader efforts to secure public spaces and protect vulnerable targets.

Legacy of Previous Attacks

Participants noted that some security mitigations, particularly structural and planning changes to city infrastructure, had already been implemented in the 1990s following the Central Bank bombing. However, these measures were primarily focused on government and military buildings and did not extend comprehensively to religious sites or hotels.

Challenges in Addressing Radicalisation

There is a growing awareness of the need to address radicalisation as a key factor in preventing further attacks. However, participants expressed that there is less clarity on the specific policies and practices that would effectively mitigate this threat. This represents a significant area for future policy development and community engagement.

Services and Emergency Response

In the aftermath of the Easter Bombings, civil society groups, particularly church organisations, played a crucial role in providing support to victims. The Catholic Church, with assistance from the Vatican, provided substantial aid. However,

this support was often limited to specific communities, which led to concerns about unequal access to assistance.

Limitations in Government and International Support

Participants highlighted a lack of a uniform government compensation scheme for those affected by the blasts. While international support was provided for security and investigation (e.g., assistance from the FBI and Scotland Yard), there was a notable gap in support for medical services, which were often overstretched.

Gaps in Long-Term Care and Monitoring

There was a consensus among participants that there had been insufficient follow-up with victims in the months and years following the attacks. This gap represents a significant area of concern, as long-term monitoring and support for addressing ongoing health and psychological needs are essential. In particular, psychosocial support was identified as a weak point, with minimal counselling services available and a lack of comprehensive strategies for addressing the long-term psychological impact of the attacks.

Challenges and Limitations in Mitigation Efforts

Financial and Legal Barriers:

Financial support for victims was inadequate, with only partial government compensation available. The absence of a clear legal framework for addressing religiously motivated attacks further complicates efforts to provide justice and adequate compensation to victims.

The cost of incorporating blast-resistant features into building designs is a significant barrier to widespread adoption. Engineering standards for blast resistance are not widely practised due to economic constraints, with priorities often placed on aesthetic and practical considerations instead of safety and resilience.

Future Considerations for Mitigating Impacts of Explosive Violence

Balancing Security Measures with Daily Life

While increased security measures are necessary to prevent future attacks, there is a delicate balance to be struck between ensuring public safety and preserving personal freedoms. The presence of armed forces in religious spaces, for example, provides reassurance to some but is unsettling to others.

Enhancing Public Education and Awareness

Additionally, better integration of security protocols into urban planning and building design can help mitigate the effects of explosive violence and enhance community resilience.



While infrastructure improvements, enhanced security measures, and civil society support have helped mitigate some impacts of the Easter Bombings, significant challenges remain. These include the need for better integration of blast-resistant designs in buildings, more comprehensive psychosocial support, and a balance between security and personal freedoms. Continued vigilance, public awareness, and targeted regulatory measures are essential to preventing future attacks and minimising their consequences.

GROUP DISCUSSION 4

BUILDING OPPORTUNITIES FOR FUTURE RESEARCH

This group discussion explored research opportunities between the IBRN and Sri Lanka. Research into mitigating the effects of explosive violence in Sri Lanka presents a range of opportunities for collaboration between the IBRN and local stakeholders. A multi-faceted research approach focusing on infrastructure, services, policy, and community resilience is crucial to effectively address these challenges.

Research Focus Areas

Emphasising Social Aspects Over Engineering

There is a significant opportunity to conduct social research focusing on preparedness, awareness-raising, and risk education. Understanding how communities perceive risks and respond to explosive violence is essential for shaping effective public information campaigns and preparedness strategies. Research could examine community-based responses similar to those developed for mine clearance, which have proven successful in other conflict-affected regions.

Community-Based Studies

Investigating how individuals and communities respond to explosive incidents would help identify best practices and public information needs. These studies could focus on understanding why some individuals survive bombings while others do not, which could be instrumental in formulating safety guidelines and educational materials for the public.

Vulnerability Analysis

Research should prioritise the unique needs of vulnerable groups, such as single-headed households, orphaned children, the elderly, people with disabilities, and LGBTQ+ communities. These populations often face specific challenges, including accessibility issues, psychological rehabilitation needs, and socio-economic burdens. These must be better understood and addressed through targeted studies.

Identifying gaps in service provision for individuals with disabilities and LGBTQ+ communities is critical, especially given the lack of specialist services and fear of stigmatisation. Research in this area could inform more inclusive policy development and service delivery models.

Psychological Rehabilitation and Radicalisation

Understanding the psychological impact of explosive violence on survivors, armed forces, and communities affected by decades of conflict is vital. This includes research on the rehabilitation of radicalised individuals and the prevention of radicalisation, which remains a critical area of concern for preventing future attacks.

Research could explore effective strategies for deradicalisation and rehabilitation, focusing on community-based approaches and the psychological needs of those affected by radical ideologies or engaged in violent extremism.

Technology and Engineering Research

Civilians and civil society groups played a crucial role in the Researching the application of AI for security screening and threat protection can enhance current security measures and improve threat detection capabilities. This could involve collaborations between technology experts and security agencies to develop more sophisticated predictive models.

Evaluating the effectiveness of earthquake-resilient buildings against blast threats is another promising area. This research could help identify cost-effective materials and designs that enhance building resilience without imposing prohibitive costs.

Research Methodology

Surveys and Key Informant Interviews

Conducting surveys and interviews with survivors, community members, and key informants would provide valuable insights into community needs, vulnerabilities, and perceptions of safety and preparedness. These findings could inform target interventions and public information campaigns.

Mapping Existing Services:

A comprehensive mapping of existing services, including gaps in response capacity in regional areas, would help identify where additional resources are needed. This could be particularly useful for improving emergency medical services and ensuring equitable access to care.

Gap Analysis and Time Analysis

Performing gap analyses across different sectors and analysing the timeline from injury to discharge could highlight areas for improvement in emergency response and care. This research would be particularly valuable for optimising pre-hospital care and ambulance services, addressing transport time challenges, and improving overall service delivery.

Interdisciplinary and Multidisciplinary Research

Encouraging interdisciplinary collaboration among experts in security, public health, engineering, and clinical psychology would provide a more comprehensive understanding of the challenges and potential solutions. This approach would facilitate the development of integrated strategies to mitigate the impacts of explosive violence.

Positive Impact and Potential Users

Policymakers and Security Agencies

Research outcomes can guide policies on disaster preparedness, threat detection, and community resilience. Policymakers and security agencies could use these insights to enhance vigilance, improve security measures, and prevent future incidents.

Healthcare Providers

Understanding injury patterns, psychological impacts, and service gaps would enable healthcare providers to refine emergency response protocols and develop comprehensive care plans for victims, including long-term psychological support.

Community Organisations and NGOs

Research into community needs and vulnerabilities would help NGOs and community organisations better tailor their support services, particularly for vulnerable groups. This could enhance the effectiveness of interventions and ensure that resources are directed where they are most needed.

Engineers and urban Planners

Research findings could prompt a re-evaluation of school curricula and public health strategies, improving public awareness and preparedness. Educators and public health officials could use these insights to develop educational programmes and initiatives that enhance community resilience.

Educators and Public Health Officials

Streamline communication channels and ensure better integration between forensics, medical, and emergency teams for faster resource mobilisation and coordination.

Unique Needs of Vulnerable Communities

Women, Children, Elderly and LGBTQ+ Individuals

These groups face unique challenges, such as socio-economic burdens, lack of accessibility, and stigmatisation. Research should focus on improving transportation, accessibility, and inclusive support services to ensure that all community members are adequately supported in the aftermath of explosive incidents.

Single-Headed Households and Orphaned Children

Research is needed to understand the specific needs of single-headed households and orphaned children following an explosive incident. This could help ensure that appropriate support mechanisms are in place to assist these vulnerable populations.

Missing Resources and Expertise

Data and Funding

Research outcomes can guide policies on disaster A significant limitation identified by participants is the lack of comprehensive data. Research efforts would require fresh data collection, as existing datasets are often incomplete or inaccessible. Improved data collection methodologies and infrastructure would be essential to support meaningful research.

Funding for research in Sri Lanka is currently minimal, with limited opportunities from international agencies and a lack of support from local ministries due to economic constraints. Securing adequate funding for multidisciplinary studies remains a key challenge.

Interdisciplinary Expertise

Bringing together experts from various fields is crucial for conducting impactful research. This interdisciplinary approach would ensure a holistic understanding of the issues and facilitate the development of integrated solutions.

Community Involvement

Involving local communities in research, both as participants and as partners in data collection, would help ensure that research is relevant and that its findings are applied effectively. Community involvement is essential for building trust and ensuring that interventions are culturally sensitive and locally appropriate.

By addressing these areas through well-coordinated, interdisciplinary research, the impact of future explosive incidents in Sri Lanka can be significantly reduced. Collaborative efforts between the IBRN and Sri Lankan stakeholders could protect lives, improve resilience among all segments of society, and foster a safer and more secure environment for all citizens.

WORKSHOP ATTENDEES

Abisaajini Kirushanth	University of Jaffna
Ajith Tennakoon	Institute of Forensic Medicine and Toxicology
Aruna Suraweera	National Hospital of Sri Lanka
Asela Mendis	Department of Forensic Medicine and Toxicology, Faculty of Medicine, University of Colombo
Bhishman Thevarajah	Ministry of Health
Charuni Bandara	Ministry of Defence Sri Lanka
Dileepa Premarathne	Sri Lanka Army
Elsara Badri	Global Alliance on War, Conflict & Health
Franklin Joseph	Sri Lanka Army
Gamini Wickramaarachchi	State Intelligence Service
Hannah Wild	University of Washington
Hashini Pathirana	National Building Research Organization (NBRO)
Indika Devi Bulankulame	Centre for Poverty Analysis
Ishanka Talagala	Department of Community Medicine and Family Medicine, University of Moratuwa
Jack Denny	University of Southampton
Jake Tacchi	BBC World Service
James Batchelor	University of Southampton
Janaka Salgado	Sri Lanka Army
Kirithi Abayajeewa	National Health Service
Lahiru Kodituwakku	Ministry of Health
Lanka Amarapala	Sri Lanka Army
Loku Liyanage Charith Sudharshana Cabraal	Sri Lanka Army
Mohamed H Abusayeed	University of Southampton
Mahanama Gunasekara	National Hospital of Sri Lanka / The College of Surgeons of Sri Lanka
Muttukrishna Sarvananthan	University of Jaffna and Point Pedro Institute of Development
Nalin Herath	Ministry of Defence/Institute of National Security Studies
Palliyage Lakmi Chathuwini Perera	Gap Research and Development Center
Pasindu Dilshan Wijeratne	Ministry of Health
Pradeep Gajanayake	University of Sri Jayewardenepura
Ranjith Dissanayake	IESL
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