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IMPROVING PRE-HOSPITAL CARE AT MASS GATHERING EVENTS: APPLYING MILITARY INTELLIGENCE METHODOLOGY TO THE ST JOHN AMBULANCE WA EVENT HEALTH OPERATIONS

A dissertation submitted in partial fulfilment of the requirements for the degree

Y85 Bachelor of Science (Security) Honours

By

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Supervisor: Mr Jeffery Corkill

Submission Date: 30th of October 2014

ABSTRACT

With the growth of the mass gathering event domain and its ever constant place within the contemporary Australian lifestyle, the number of patrons who attend these events that require medical assistance rises (Zeitz et al., 2007, p. 23; Zeitz, Zeitz, & Arbon, 2005, p. 164; Zeitz, Zeitz, & Kadow-Griffin, 2012). This increased demand and inherited risk to the event organiser, the patrons attending and the pre-hospital care or first aid provider creates a need for the investigation into enhancements to the medical care operations at these events. The provision of pre-hospital care at mass gathering events in Western Australia is a vital service to the health of the community members in attendance and requires in depth planning, resourcing and staff to ensure that the risk of permanent injury or death to patrons is mitigated or reduced.

This study aimed to examine the viability of the introduction of the military intelligence methodology, Intelligence Preparation for the Battle Space (IPB), to the St John Ambulance WA Ltd planning process to improve the decision making ability within all levels and at the planning and operational stages of a mass gathering event.

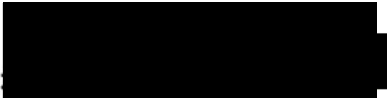
Through the utilisation of a case study and documentary analysis methodological processes, supported by a constructivist framework, the existing knowledge base was examined and the integration of intelligence based concepts was introduced. The study has concluded that, utilising the Big Day Out Perth 2009 contextual setting and case study variable comparisons, that the introduction of IPB or a variation of its intelligence based methodological concepts is a viable and beneficial undertaking.

The study has demonstrated that this would allow for the enhanced examination of potential clinical presentations and the identification of required physical, human and information resources as a result of an event's unique planning variables, risk inputs and their casual relationships within an event's contextual setting. Though theoretically possible, the study highlights that further research is required to refine and explore the utilisation of the proposed model to other event types and/or organisations in order to validate its results.

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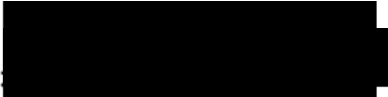
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In memory of

Professor Ian Jacobs OSU

Clinical Services Director, St John Ambulance WA

Whose contribution to St John Ambulance WA, the academic world and the Western Australian community not only shaped the lives of many but saved the lives of many more. His sudden passing has shocked us all; his legacy will never be forgotten nor his commitment to the Service of Humanity. His academic and professional achievements will always remain a source of inspiration for my own.

ACKNOWLEDGEMENTS

This thesis would not have been completed without the assistance, guidance and support of the following people.

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To my partner, my best friend and my rock - Miss Aimee Retallack. For the many days I spent in seclusion working on this study, for your endless love, understanding and constant support throughout. Without you by my side, throughout life and during this process, I would be lost.

To my mother, your years of nurturing and love, endless hours of encouragement and desire to support me in every endeavour has been a crucial source of inspiration to complete this study.

Lastly, to the men and women of St John Ambulance WA and around the globe, your dedication, compassion and selflessness were a source of inspiration for me at every key stroke, during the endless nights and even longer days - *Pro utilitate hominum*

DEFINITION OF TERMS

For the purpose of this study, the following working definitions will apply throughout:

[An] Event - “A gathering of people brought together for a common purpose by some prearrangement” (Department of Health Western Australia, 2009, p. 6)

Critical Infrastructure - “those physical facilities, supply chains, information technologies and communication networks that, if destroyed, degraded or rendered unavailable for an extended period, would significantly impact on the social or economic well-being of the nation or affect Australia’s ability to conduct national defence and ensure national security” (Rothery, 2005, p. 45)

Critical Medical Infrastructure - See Critical Infrastructure, refers to major hospitals and the State Ambulance Service.

Event Health Services Operation: “The provision of medical, first aid and/or health services at a mass gathering event by St John Ambulance WA Event Health Services.”

Intelligence: “Intelligence is the collection of open source and/or confidential information provided by other legally accessed sources for analysis to be disseminated as a product to assist with the decision making processes during all stages of the pre-hospital care operation at a mass gathering event.”

Mass Gathering Event: “a situation (event) during which crowds gather and where there is the potential for a delayed response to emergencies because of limited access to patients or other features of the environment and location” (Ranse & Hutton, 2012, p. 543)

OB12 Form - The patient care record form utilised by the St John Ambulance WA Ltd to record patient information and treatment (Mulligan, 2013)

Pre-Hospital Care - is provision of skilled medical help at the scene of an accident, medical or other clinical emergency, and during transport of that patient to hospital (Noble-Mathews, 2005, p. 61)

Pre-Hospital Care Operation: See Event Health Services Operation

ABBREVIATIONS

BDO - Big Day Out

EHS - Event Health Services (a department of St John Ambulance WA Ltd)

IPB - Intelligence Preparation for the Battle Space

IPEHO - Intelligence Preparation for the Event Health Operation

MAP - Military Appreciation Process

MEDINTEL - Medical Intelligence (Military Domain)

MDMP - Military Decision Making Process

OPP - Operational Planning Process

SJAA - St John Ambulance Australia

SJAWA - St John Ambulance WA Ltd

WA Police - Western Australia Police Service

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“Knowledge is power. Information is Power. The secreting or hoarding of knowledge or information may be an act of tyranny camouflaged as humility.”

Robin Morgan

Chapter 1: Introduction

Introduction

Mass gathering events have become a key feature of the contemporary Australian lifestyle, reflected in the sheer number of events, growing event attendance and the diversity of the events held each year (Zeitz et al., 2007, p. 23; Zeitz, Zeitz, & Arbon, 2005, p. 164; Zeitz, Zeitz, & Kadow-Griffin, 2012). With this cultural embedment of mass gathering events into the social landscape of most Australians, ranging from music festivals, sporting events and beyond, there is an inherent effect posed on current medical infrastructure at the event and in the surrounding areas. With a significant population influx into a single area resulting from a mass gathering event, it is crucial for on-site medical resources to be well planned, appropriately qualified and resourced. As any lack of proficiency to deliver these services to a high professional standard can result in the death of a patron or have a significant impact on a state's ambulance service and health systems operational capacity (Zeitz et al., 2007, p. 13).

This study investigated the viability of introducing military intelligence methodology in the form of Intelligence Preparation for the Battle space (IPB) to the planning processes of a pre-hospital care operation at a mass gathering event. The study's objectives were to utilise case study and documentary analysis techniques to examine the potential impact of an intelligence informed planning process, with the introduction of IPB into the current St John Ambulance WA Ltd (SJAWA) operational planning processes.

Data and information utilised within this study was obtained through publically available sources and does not utilise any internal St John Ambulance WA Ltd information or data. Access to internal data and information was requested by the researcher but it was unavailable as a result of a number of factors outside the control of the researcher or St John Ambulance WA Ltd. Application was made to the St John Ambulance WA Ltd Research Advisory Group but due to the sudden death of the head of this group, access could not be arranged within the defined time frame required. The impact of not being able to access and use internal SJAWA information is addressed in [Chapter 5](#).

Background of the Study

As events grow in terms of attendance numbers, frequency and fiscal investment, the risks associated with these types of events increases (Department of Health Western Australia, 2009). As a result, St John Ambulance WA Ltd will be required to invest greater human and medical resources to ensure the safety of the patrons, to reduce the flow on effect to other medical infrastructure and the liability towards the client (event organiser). It is essential that SJAWA have the correct people, with an adequate skill set and resources at a mass gathering event to perform this function in a cost effective and efficient manner that is beneficial to all parties involved or affected by the mass gathering.

The manner in which SJAWA, like its interstate counter parts, prepares for a mass gathering event operation requires extensive operational planning and coordination (Luke, 2011). Currently within Western Australia, the planning for mass gathering events and the required medical considerations are set by the state government's guidelines for concerts, events and mass gatherings (Department of Health Western Australia, 2009). It has been highlighted that in Western Australia, there is little enforceable event legislation relating to medical resources at mass gathering events and as discussed by Luke (2011, p. 51) this trend does extend to other St John Ambulance organisations within Australia. This limited amount of enforceable legislation and imprecise nature of a number of guidelines that can be applied in Western Australia (Department of Health Western Australia, 2009; Emergency Management Australia, 1999) creates a greater need for justification of resources to clients who are utilising a fee paying service (Luke, 2011) as well as the need for in-depth operational planning to increase cost effectiveness whilst maintaining high levels of pre-hospital care.

Significance of the Study

The death of Gemma Thoms on the 2nd of February 2009 and the subsequent State Coroner's inquest into her death at Big Day Out Perth 2009 (Mulligan, 2013) demonstrated a number of issues pertaining to the medical resourcing at the event in 2009 as well as a number of implemented changes for Big Day Out events in the future. It is Thoms' death at Big Day Out Perth 2009 that demonstrates a deficiency within the pre-hospital care operation by St John Ambulance WA. It is the deficiencies

highlighted within the coronial findings or aspects of these which articulate the significance of examining the planning processes of the organisation (Mulligan, 2013). The death of Miss Thoms' is a contemporary and relevant case study to demonstrate the need for continual improvement within Western Australia relating to the governance, planning and provision of pre-hospital care services at mass gathering events. For the purpose of this research, the Big Day Out Perth 2009 event in Western Australia was utilised as the sole case study. This case study has been selected to allow for the identification of areas where the application of Intelligence Preparation for the Battle Space (IPB) may assist the St John Ambulance WA planning processes when providing pre-hospital care services to an event organiser and allow for the identified deficiencies to be tested for improvement once IPB is applied.

This study has investigated and analysed a determined set of processes for the planning of medical resources at mass gathering event utilising the Big Day Out in Perth, WA as a control event setting from publically available information and data. The effectiveness of the event medical or operational plan process was assessed through post event documentary analysis and measurement against academic literature and industry practices. Following this analytical process, the investigation of military methodology, specifically, the potential use of 'Intelligence Preparation of the Battle Space' (IPB) principles or aspects were compared, contrasted and tested against the results of the documentary and case study analysis conducted.

The use of intelligence has traditionally been used for military, law enforcement, and business activities and operations in order to gain a competitive edge (Davies & Corkill, 2013; Gill & Phythian, 2006; Omand & Phythian, 2013). This research has allowed for the critical assessment of operational decision making and planning variables in which an IPB based integrated model could assist with the planning and provision stages of a mass gathering event medical operations. This study proposed that by allowing for a greater understanding and insight into potential patient presentation types, likelihood and the resources needed to treat those patients, SJAWA's capacity to respond to potentially life threatening situations at a mass gathering event will increase and lower the risk of another death such as the 2009 death of Gemma Thoms. The recommendations and outcome of the Gemma Thoms Coroner's Inquest (Mulligan,

2013) will provide an insight into the contemporary and related issues that an intelligence based model such as IPB can influence.

Purpose and Objectives of the Study

The provision of pre-hospital care at mass gathering events has long been a key function of St John Ambulance WA and one that will continue into the future as capacity and demand for this service grows. The purpose of this study was to investigate pre-hospital care at a pre-determined historical event, Big Day Out Perth 2009. It was the purpose of the study to identify and examine the IPB planning model inputs and resulting outputs in contrast to those present within current St John Ambulance WA Ltd planning practices that can demonstrate elements of improvement as a result.

The proposed utilisation of military based intelligence methodology, namely Intelligence Preparation of the Battle Space (IPB), formulates the scholarly and real world tested foundation for the application of intelligence methodology into the mass gathering event pre-hospital care environment. This study has examined literature relating to the pre-hospital care at mass gathering event domain as well as examined the introduction of an intelligence supported model to be applied to this domain spaces planning processes. Specifically this research has endeavoured to answer questions such as: What is the viability of utilising all or parts of IPB concepts or methodology within the pre-hospital care operational environment at a mass gathering event?

The objective of this study was to:

- Undertake an extensive review of literature to determine the current understanding and gaps within the body of knowledge relating to planning methodology and provision of pre-hospital care at mass gathering events.
- Conduct a case study and documentary analysis of publically available documentation relating to St John Ambulance Australia event health operations focussing specifically on the delivery of pre-hospital care at the Big Day Out Perth 2009.

- Investigate how pre-hospital care can be improved at mass gathering events with the integration of IPB concepts and methodology in full or partial integration to the planning practices of St John Ambulance WA Ltd.

The primary purpose of this study was to investigate if the application of an intelligence function would improve operational planning for a pre-hospital care operation at a mass gathering event

Research Questions

Principal Research Question

1. What is the viability of utilising all or parts of IPB concepts or methodology within the pre-hospital care operational environment at a mass gathering event?

Secondary Research Question

- a. What impact would the application of the IPB concepts or methodology have on the pre-hospital care operation outputs in on Big Day Out Perth 2009?

Structure of Thesis

In order to achieve the objectives of this study and to answer the posed research questions the following five stage research process formulates the structure of this thesis (Figure 1).

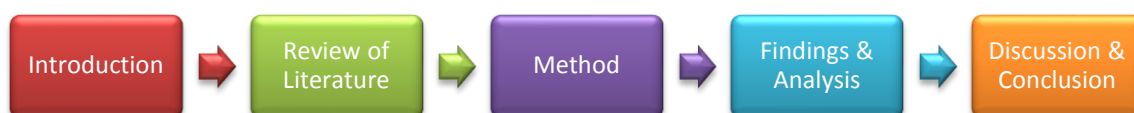


Figure 1 - Five Stage Research Process (Structure of Thesis)

Chapter One - Introduction presents the background of the study, its significance to the body of knowledge, purpose, key objectives and research questions as well as the structure of the thesis.

Chapter Two - Review of Literature examines the current body of knowledge, outlining core research into this field whilst expanding on current information available and identifying gaps within this body of knowledge.

Chapter Three - Method demonstrates the research design, reasoning for the selection of a case study methodology, the studies theoretical framework, ethical considerations and measures to ensure the reliability and validity of the data collected. In addition, this section also highlights requirements and resulting limitations about the collection of data from internal St John Ambulance WA Ltd sources.

Chapter Four - Findings & Analysis outlines the results of the data collection and a brief interpretation of the ensuing findings.

Chapter Five - Discussion & Conclusion provides a summary of the study including a discussion of the findings, limitations and strengths of the study, directions of future research and finally a conclusive statement.

Conclusion

This chapter introduced the study and provided context to the issue under investigation by reviewing the nature of mass gatherings in Australia before examining the significance, purpose and objectives of the study. The first part of the chapter demonstrated the need to examine the planning process of pre-hospital care for mass gathering events. It also considered the potential impact the research might have on future planning for mass gathering events. The second part of the chapter then went on to detail the research questions that the study sought to answer before finally describing the overall structure of the thesis.

Chapter 2: Review of Literature

Introduction

This chapter examines the literature informing the study. As previously noted access to official SJAWA planning data was limited to that available in the public domain. Notwithstanding that there is a significant body of literature encompassing research into operational planning, risk analysis, intelligence and pre-hospital care at mass gathering events that is contemporary in context. This literature is drawn upon to compensate for that lack of access to specific SJAWA documentation.

As risk to a pre-hospital care or first aid provider grows, not to forget the risk to their patrons, demands on pre-hospital care provider to deliver a high level of medical care to those in attendance of a mass gathering event is more crucial than ever (Hogan & Burstein, 2007; Wallis & Smith, 2013, p. 228). The not for profit nature of many of these organisations such as St John Ambulance Australia Inc (SJAA) and St John Ambulance WA Ltd demonstrates the additional need to be both conservative yet effective and efficient in operation to ensure that an events patron's medical needs are all met in a timely and cost effective manner without forgoing their high standards of patient care (Clark, 2004; Dutch, Senini, & Taylor, 2008; Luke, 2011; Moutia, Ranse, & Banu-Lawrence, 2014).

This chapter comprises of four distinct sections. Section one will explore the historical and contemporary literature about pre-hospital or first aid operations at mass gathering events, with a primary focus on literature relating to St John Ambulance within Australia. Current literature related to the specific planning methodology and processes of St John Ambulance WA Ltd for mass gathering events is limited within the contemporary and publically available body of knowledge. A combination of academic literature relating to St John Ambulance Australia, other organisations and academia will be examined to bridge this gap within the literature. The second section of this review has identified and examined the legislative measures and guidelines within Western Australia that govern the provision of pre-hospital care at mass gathering events.

The third section of the review examines IPB literature exploring its conception as intelligence methodology and its contemporary development within this domain. The

production of Medical Intelligence or MEDINTEL will also be explored as a sub-section of the overall IPB process to demonstrate its adaptability to other domains. The fourth section of this review has examined current literature relating to the operational decision making processes within the military and pre-hospital care domain to position the outcomes of the study and the introduction of an intelligence informed planning process within the overall context required.

St John Ambulance - Pre-Hospital Care & First Aid Provider

Background

The provision of pre-hospital care or first aid at events has been a predominate function of St John Ambulance Australia since its inception in 1883 (St John Ambulance Australia Inc., 2013). In Western Australia, St John Ambulance WA Ltd (SJAWA) has been providing pre-hospital care to the Western Australian Community since 1903 beginning originally as the St John Ambulance Brigade, later becoming the Volunteer First Aid Service, and, in 2013, being renamed Event Health Services after a short period as Event First Aid Services (St John Ambulance WA Ltd, 2014b). The SJAWA Event Health Services treat over 6000 Western Australian's every year and provide pre-hospital care at major Western Australian Events such as the IGA Perth Royal Show, City of Perth Skyworks and City to Surf Marathon to name a few (St John Ambulance WA Ltd, 2014a). As a predominately volunteer organisation, event based pre-hospital care and first aid provider as well as the Western Australian State Ambulance Service, SJAWA have a responsibility to be prepared not only for emergency situations but also to prepare for the mass gathering events they attend.

Role of Pre-Hospital Care at Mass Gathering Events

As suggested by Luke (2011) mass gathering events, like emergency situations, can place a significant strain and large demand on surrounding Ambulance Service and hospital resources. In addition to this Arbon (2007), Zeitz et al. (2007) & Zeitz et al. (2005) highlight that the provision of pre-hospital care or first aid at mass gathering events can be a difficult task with a unique set of characteristics that can have an impact not only on the client but also their patrons and the surrounding areas medical infrastructure. The body of literature surrounding pre-hospital care at mass gathering events highlights the common goal of providing onsite medical care as well as ensuring

the continuance of normal abilities or functionality associated to surrounding ambulance and hospital emergency services (Arbon, 2004; Dutch et al., 2008; Hutton, Brown, & Verdonk, 2013; Hutton, Ranse, Verdonk, Ullah, & Arbon, 2014; Luke, 2011; Milsten, Maguire, Bissell, & Seaman, 2002; Moutia et al., 2014; Wallis & Smith, 2013; Zeitz et al., 2007; Zeitz et al., 2008)

The ability of organisations such as St John Ambulance WA Ltd to provide this service to high professional standards is becoming more relevant within the contemporary Australian lifestyle (Zeitz et al., 2005, p. 164). Research into medical care at mass gathering events have focussed on the development of patient presentation and predictive models (Arbon, Bridgewater, & Smith, 2001; Zeitz et al., 2005) as well as a focus on medical care at specific mass gathering events (Dutch et al., 2008; Hutton et al., 2014; Luke, 2011; Moutia et al., 2014; Zeitz et al., 2007; Zeitz, Haghghi, Burstein, & Williams, 2013). Literature pertaining to the utilisation of 'Intelligence' is discussed in brief by Zeitz et al. (2007), highlighting only the use of 'Event Intelligence' as the examination of past history of the event relating to medical presentations as well as the expected number.

In addition to this, research into the understanding of a crowds psychosocial elements at a mass gathering event by Hutton, Zeitz, Brown, and Arbon (2011) demonstrates an attempt by academia to fill a knowledge gap relating to the provision of pre-hospital care at mass gathering events. The combination of understandings relating to the biomedical, psychosocial and environmental domains or factors shows a relationship between patient presentations and these factors as well as the effective resourcing and managing the pre-hospital care at a mass gathering event (Arbon, 2004; Hutton et al., 2011; Zeitz et al., 2013). Within the context of this study, the biomedical domain relates the influence of the types and rate of patient presentations, the psychosocial is inclusive of the psychological and social variables within a crowd, and the environmental domain encompasses variables such as the weather or terrain of the mass gathering event.

The identification of the biomedical, psychosocial and environmental domains within this context demonstrates a degree of similarity with factors considered in the IPB process. Elements considered by IPB such as the social, economic, cultural and political

features of a geographical battle space show how the intelligence methodology within IPB can be applied within other domains. The introduction of an intelligence informed planning process to the pre-hospital care planning of St John Ambulance WA Ltd will be demonstrated in later chapters of this study.

Though there is a gap within the literature relating to the use of intelligence as well as research within the Western Australian St John Ambulance domain, current literature reflects academic inquiry in an attempt to improve the planning and response of medical operations at mass gathering events.

Risk Assessment and Predictive Tools at Mass Gathering Events

The notion of a medical risk assessment is a process outlined by the Western Australian Department of Health Guidelines for Mass Gathering Events (2009). This guideline makes a number of key suggestions about the factors influencing the potential for medical incidents occurring at a mass gathering event as well as other considerations relating to the planning of an event. Within Western Australia there is no specific legislation that requires event organisers to have set requirements on a state level, but these policies do exist at a local level of government (Department of Health Western Australia, 2004, 2009). A key aspect of the Western Australian Department of Health (2004, 2009) guidelines is the Medical Risk Classification Tool that is designed to assist event organisers to identify specific medical risks from the event and the level of medical planning that may be required based on the identified risks and other variables. In addition to this, the guidelines have various other tools to assist with the identification of public health risks as well as guidelines for action based on the results for the above classification tool.

The recommendation and utilisation of these tools by the Department of Health WA (2009), all form a foundation for event organisers and event pre-hospital care providers, such as St John Ambulance WA, to assess the medical risks and identify what would be considered appropriate medical staffing levels for individual events until others are implemented by Government (Mulligan, 2013). Though this guideline is thorough it is relatively out of date and requires updating after the Thoms Inquest recommendations and improvements made by SJAWA at Big Day Out Perth 2013 (Mulligan, 2013). Currently there is no mention of utilising intelligence or patient

prediction tools to ensure that medical staff are adequately qualified for the specific aspects and likelihood of serious medical incidents at a mass gathering event; suggesting an opportunity for the integration of IPB to the planning process.

As a result of internal St John Ambulance WA Ltd information and data being unavailable, publically available literature has been utilised and indicates that current operational planning and decision making processes use a methodological process where information from various sources is utilised to create an event operational plan (Luke, 2011; Moutia et al., 2014; Mulligan, 2013) and is heavily based upon the Western Australian Department of Health (DoH) Guidelines for Mass Gathering Events (2009). Medical risk assessments, inclusive of the development of various patient prediction models (Arbon et al., 2001), along with the operational planning that is formulated from this risk assessment, is currently a process that is not well documented within publically available literature (Luke, 2011; Moutia et al., 2014; Mulligan, 2013). Within the current body of literature, studies have been completed to understand the quantity of both patient presentations as well as ambulance transports rates to hospital resulting from a mass gathering event (Arbon et al., 2001; Krul, Sanou, Swart, & Girbes, 2012; Lund, Turriss, Amiri, Lewis, & Carson, 2012; Woodall et al., 2010; Zeitz et al., 2005; Zeitz et al., 2012).

Research examining differing types of events, for example a sporting event in contrast to a large scale music event, has been extensive (Dutch et al., 2008; Hutton et al., 2011; Krul et al., 2012; Luke, 2011; Zeitz et al., 2007; Zeitz et al., 2005; Zeitz et al., 2008). This research when compared suggests that there are a number of key variables that affect the way in which a crowd behaves as a collective, resulting from a number of key factors influencing not only the number but also the types of injuries that are likely to be presented at the event (Arbon et al., 2001; Hutton et al., 2014; Zeitz et al., 2005).

Legislation & Guidelines

Legislative Requirements & Guidelines

As outlined by the Department of Health Western Australia (2013), the planning for an events medical resources is reliant on the application of risk management standard ISO 3100:2009 (Standards Australia, 2009) as well as the Department of Health WA's Guidelines for Concerts, Events and Mass Gathering Events (2004, 2009) and the Emergency Management Australia (1999) Safe and Health Mass Gatherings: A Health, Medical and Safety Planning Manual for Public Events. Literature within Australia supports the utilisation of such guidelines alluding to no specific requirement for legislation on a state level to govern the medical requirements for a mass gathering event (Luke, 2011). This legislative gap, along with the exclusion of the *Event sustainability management systems - Requirements with guidance for use* (Standards Australia, 2013) from these guidelines, partially due to the guidelines age, suggests that there is an inherent and potential risk associated with the use of contractors such as St John Ambulance WA or one of the alternatives listed by the Department of Health WA (2009) to provide medical services at a mass gathering event.

The frequency and utilisation of the Department of Health WA Guidelines (2009) by event managers in WA, as well as event pre-hospital care providers during their planning stages, is not stipulated beyond that of the Thoms Inquest Report (Mulligan, 2013), nor within publically available literature and presents a significant gap within the study. For the purpose of this study, Guidelines for concerts, events and organised gatherings (Department of Health Western Australia, 2009) and extracts from this document were utilised in support of the research ([Appendix A](#) & [Appendix B](#)). The reviewed version of these guidelines from December 2009 was released post Big Day Out Perth 2009. Its key features such as the Medical Resources Planner and Risk Considerations for Planning Medical and First Aid Resources (Department of Health Western Australia, 2004, 2009) have followed identical calculation models seen within both editions of the guidelines e.g. 20,000 patrons = 22 First Aid Staff in both documents. The identical nature of these calculations between the Department of Health Western Australia 2004 and 2009 guidelines enables this study to utilise the either resource interchangeably or in a combined nature. The Department of Health Western Australia (2009) guidelines provide greater depth in regards to these tools,

examination of both documents validates that the understanding of medical planning requirements at mass gathering events has improved even though the tools for doing so have not changed.

As a result this literature provides a bench mark for risk considerations during the medical planning stages of a mass gathering event in the context of this study. This bench mark and set of considerations outlined by the Department of Health Western Australia (2004, 2009) Guidelines will be integrated into this study as a tool to formulate the initial St John Ambulance WA planning processes as well as the inputs (planning variables & risk inputs) and resulting outputs from the initial plan and the integrated IPB inputs and outputs.

Beyond Western Australia

Furthermore, on a national level the Emergency Management Australia (1999) mass gathering event planning manuals (which are currently withdrawn from circulation due to a review) and on an international level the Canadian Emergency Preparedness Guidelines For Mass, Crowd-Intensive Events (Hanna, 1994) highlight a number of key processes to ensure medical care at an event is well planned and provided; with aspects of both highlighting key areas of focus during the planning stages as further utilised by Arbon et al. (2001). This cross reference of principles and a brief mention of 'intelligence' in the Emergency Management Australia (1999) mass gathering event planning manuals and the Canadian Emergency Preparedness Guidelines For Mass, Crowd-Intensive Events (Hanna, 1994) demonstrates further that understanding the crowds dynamics by either reviewing media reports or actually speaking to the crowd can lead to a number of insights into the likelihood of presentations of patients as the event progresses. This insight further demonstrates the need for this study and the potential for intelligence based methodology to play a role in the planning and provision stages of a pre-hospital care operation at a mass gathering event.

Conceptual Model Development - Mass Gathering Event Variables

<i>Psychosocial domain</i>	<i>Biomedical domain</i>	<i>Environmental domain</i>
Crowd: a. behavior b. mood	Crowd and individual health status	Crowd: a. attendance b. density
Individual: a. motivation b. behavior	Latent potential for illness and injury	Venue: a. bounded/unbounded b. extended/focused c. locale/terrain
	⇐ ⇒	⇐ ⇒
Crowd interests/ morays/ culture	Crowd average age/ gender	Type/ nature of event
	⇐ ⇒	⇐ ⇒
Rationale/ reason for attendance	Activity level (participant/ spectator)	Predominantly seated or mobile
	⇐ ⇒	⇐ ⇒
Length of stay	Heat- or cold-related physiology	Outdoor or indoor weather (temperature/humidity)
	⇐ ⇒	⇐ ⇒
Use of alcohol or drugs	Alcohol- or drug-related physiology	Availability of alcohol or drugs
	↓	↓
	Effect	Response
	Risk of injury or illness: a. Patient presentation rate (PPR) b. Transport to hospital rate (TTHR)	Level and extent of healthcare services

Figure 2 - Arbon (2004, p. 211) Proximity model for mass gathering health care with indicated domain interactions and key characteristic relationships

The identification of key characteristics of a mass gathering event and the resulting influences that affect the provision of pre-hospital care at the event is crucial to the understanding of the planning processes of SJAWA, as well as to this study. As demonstrated by Arbon (2004, pp. 210-211) in Figure 2, the key characteristics of an event can be broken down into three inter-related domains: (1) biomedical, (2) psychosocial; and (3) environmental. The biomedical domain includes a number of risk inputs or variables that influence the types and rate of patient presentations, the psychosocial highlights the psychological and social variables within a crowd, and the environmental domain highlights aspects such as weather or terrain that may influence the presentation of patients at a mass gathering event (Arbon, 2004; Milsten, Seaman, Liu, Bissell, & Maguire, 2003; Zeitz et al., 2013).

This conceptual model (Figure 2) and its individual characteristics or risk inputs are supported in the academic literature (Milsten et al., 2002; Milsten et al., 2003; Ransie & Hutton, 2012) in addition to the presence of these individual risk inputs (partially or in full) within the Department of Health Western Australia (2004, 2009) guidelines. This conceptual model assists this study by providing a clear indication of domains and their interactions that require examination during the planning process for a mass gathering event. The Arbon (2004, p. 211) conceptual model, in conjunction with Luke (2011),

demonstrates the need for the development of a mass gathering health focused guidelines to assist with the planning and delivery of pre-hospital care.

Intelligence preparation of the Battle Space (IPB)

Defining Intelligence

Intelligence, more specifically, the development of a 'one size fits all' definition is a task that government agencies, private industry and academia have been debating for decades (Black & Cornall, 2011; Clark, 2004; Gill & Phythian, 2006). Currently the defining of intelligence is focussed on the final product, in the form of a verbal or written intelligence, and the set of processes or methodology utilised to transform raw information or data into an intelligence product (Black & Cornall, 2011). For the purpose of this paper a number of definitions have been examined, encompassing both military and civilian literature, in order to develop a working definition to encompass both the final product and process itself. Gill and Phythian (2006) present the following definition that encompasses both of these requirements:

“Intelligence is the umbrella term referring to the range of activities – from planning and information collection to analysis and dissemination – conducted in secret, and aimed at maintaining or enhancing relative security by providing forewarning of threats or potential threats in a manner that allows for the timely implementation of a preventative policy or strategy, including, where desirable, covert activities.”(Gill & Phythian, 2006, p. 7)

Though this definition presents a general scope to encompass many aspects of intelligence as a product and as a process, the activities highlighted within such as the described “covert activities” and the desired end goal for this domain space in the form of “maintaining or enhancing relative security” (Gill & Phythian, 2006) do not fit with the role for which intelligence can potentially play within pre-hospital care or first aid operations at mass gathering events. Other definitions proposed by Black and Cornall (2011) highlight the varying nature and at times limited scope of definitions in regards to intelligence as a product or a process (or both) and remains a source of ongoing debate within the domain and amongst the scholars whom study it.

As an analysis of literature revealed, the complicated understanding and definition of intelligence is centric to the breakdown of intelligence into three levels of utilisation to formulate a definition or basis to formulate a definition (Black & Cornall, 2011; Omand & Phythian, 2013). Within the intelligence domain the utilisation of intelligence as either a process or product can be broken into either the utilisation of intelligence at a tactical, operational and strategic intelligence level (Black & Cornall, 2011).

The role of intelligence within a mass gathering medical context is an aspect of the event management process that at times can be overlooked due to a number of economic, capability or awareness issues; alternatively this process may occur as segmented mental processes and be attributed to the experienced operators within this domain space (Arbon, 2004; Woodall et al., 2010, p. 443). As discussed by the Australian Independent Review of the Intelligence Community (Black & Cornall, 2011, p. 5), the intelligence community and its functions are broad in definition and each tailor their individual definition of intelligence based on the means in which the intelligence is collected or the objectives that the collected intelligence supports. Supporting this further Davies and Corkill (2013) note that it is generally agreed that intelligence is usually defined as a product, a process, an agency or a combination of all three aspects. The idea of one universal definition of intelligence is unfeasible due to the limitations which a universal definition, whether it is legislative or academic, would result in (Davies & Corkill, 2013). This being the case, the combination of this understanding and a greater refinement towards the aspects of intelligence use at mass gathering events has resulted in the following working definition:

“Intelligence is the collection of open source and/or confidential information provided by other legally accessed sources for analysis to be disseminated as a product to assist with the decision making processes during all stages of the pre-hospital care operation at a mass gathering event.”

This working definition, unlike those posed by Gill and Phythian (2006), Black and Cornall (2011), Davies and Corkill (2013), incorporates a targeted function towards the potential utilisation of intelligence by St John Ambulance WA. Intelligence methodology has not traditionally been considered for mass gathering events by Ambulance Services or event pre-hospital care providers such as St John Ambulance

WA, there is a significant gap within the literature; thus resulting in the need to create a board working definition.

Intelligence Preparation of the Battle Space (IPB)

Intelligence Preparation of the Battle Space or IPB is a model that has long been used by the military as an operational planning support tool (Jin & William, 2008; Medby & Glenn, 2002; Steele, 2001). IPB is a methodical continuing set of intelligence processes that assist military leaders in the decision making process by constantly analysing a number of threats and open source intelligence variables such as population demographics, commodities, and environmental aspects to name a few (Steele, 2001). As a military operation begins, intelligence and information requirements change in both scope and importance, resulting from the evolving nature of operations within the confined geographical area that is the battle space or battlefield (US Army Intelligence Center, 1993, 2009; Wineera, 2011). IPB is an intelligence modelling tool that provides instructive products that enable decision makers and planners to understand a number of implications relating to threat, environmental, social and geographical features situated within the battle space (Fontaine, 1995; US Army Intelligence Center, 1993, 2009). For the purpose of this paper Intelligence Preparation of the Battle Space will be defined as:

“...a systematic, continuous process of analysing the threat and environment in a specific geographic area” (US Army Intelligence Center, 1993, 2009)

As discussed by Wineera (2011), the US Army Intelligence Center (1993, 2009) and Steele (2001) there are four basic and continuous functions that occur during IPB:

- The defining of the battlefield or the battle space
- The development of descriptions of the battlefield or battle space’s effects
- Evaluations of a single or multiple threats
- Determination of courses of action to be taken by threats

In addition to this, literature also suggests a number of areas of interest for consideration by analysts prior to and during an operation such as the political, military, economic, social, infrastructure and information domains within the battle

space (Rudner, 2002, p. 561). A gap can be identified with the literature in regards to the application of IPB principles into the civilian domain, but as discussed by Kostadinov and Kanev (2009) areas of interest tailored towards medical intelligence or MEDINTEL is not something that is new to the military domain. Kostadinov and Kanev (2009) suggest that adversaries actions, endemic and epidemic disease, environmental pollution, local flora and fauna, climate, geography, healthcare system, road accidents, stress, culture, customs, beliefs, religion, tribal and ethnic division all need to be considered when producing MEDINTEL for input into an operation's IPB (Kostadinov & Kanev, 2009).

As demonstrated by literature relating to the definition of the intelligence and IPB, the purpose of an agency or the operational needs of a group determine the areas of interests considered by analysts to be matched to the continuous and parallel process of IPB outlined above (Fontaine, 1995; Jin & William, 2008; Medby & Glenn, 2002; Steele, 2001; US Army Intelligence Center, 1993, 2009). This has significant relevance to the purpose of this research and highlights a methodological way to bridge the gap identified earlier between the use of IPB in the Military domain, current MEDINTEL considerations and its potential utilization by St John Ambulance WA Ltd during the planning and provision stages of pre-hospital care operations at mass gathering events.

MEDINTEL is an effective tool within the military domain and an example of the application of IPB beyond the context of warfare operations. The considerations of MEDINTEL products for input into the overall IPB assessment demonstrate that IPB can be applied within other contexts due to its broad methodology concepts. The application of IPB as an intelligence informed planning process, as demonstrated by the MEDINTEL case, within a different context or as a sub section to its original purpose allows its application outside of the military domain. Like MEDINTEL products intelligence informed planning processes based on IPB concepts could be applied within the pre-hospital care at mass gathering events domain.

Limited literature currently exists in relation to utilising IPB for civilian mass gathering events and/or the provision of pre-hospital or first aid care at these events, it can be confidently established that this study will assist in the filling of a potential knowledge

gap. The principal and secondary research question posed within this study has required a broad range of literature to be examined in order to identify current research trends, gaps in the literature and the current limitations relating to the inability to access internal St John Ambulance WA Ltd internal information and data. In addition to this, the coronial findings from the death of Gemma Thoms (Mulligan, 2013) at Big Day Out Perth 2009 and the growing risk to patrons attending mass gathering events demonstrates the significance of this study in conjunction with the above review of the literature.

Operational Decision Making

Decision making and the associated cognitive processes are an aspect of many industries as well as the social, economic and cultural aspects of human life featuring in academic literature (Bouyssou, 2009; Huder, 2012; Hugh, David, & Ellis, 2005; Klein, 1993; Muecke, Curac, & Binks, 2013; Ranyard, Crozier, & Svenson, 1997). For the purpose of this study the focus was placed on literature relating to the contemporary military decision making processes as well as literature with a focus on decision making within the pre-hospital care domain.

Military Decision Making

Decision making within the military context is widely studied and published within the academic world. Hoskin (2009) provides insight into the Australian Army decision making doctrine, Military Appreciation Process (MAP). The MAP has a number of similarities to the NATO Operational Planning Process OPP utilised by the Canadian Defence Force and the United States Army's Military Decision Making Process (MDMP) as demonstrated in Table 1. The Australian Army MAP involves four linear steps (1) Mission Analysis, (2) Course of Action Development, (3) Course of Action Analysis, (4) Decision and Execution (Holmes, 2012; Hoskin, 2009; Walker, 2011) and are similar to the others utilised by various military organisations are demonstrated in Table 1.

MAP (Australian Army)	OPP (Canadian Defence Force)	MDMP (United States Army)
	Initiation	Receipt of Mission
Mission Analysis	Mission Analysis	Mission Analysis
Course of Action Development	Course of Action Development	Course of Action Development
Course of Action Analysis		Course of Action Analysis
Decision and Execution	Decision	Course of Action Approval
	Plan Development	
	Plan Review	Orders Productions

Table 1- Comparison of Military Decision Making Processes / Methodology - Source: Hoskin (2009, p. 8)

Hoskin (2009) and Holmes (2012) both suggest that each of the respective processes are based, in their original form, on a bounded rational decision making model with a combined logical analysis of real world assumptions to account for the unique situations that may be encountered during an operation. It is this process, in conjunction with parallel and continual IPB inputs (see Figure 3), that allows for improved decision making from the commander at the operational and tactical levels, as they are able to identify relevant considerations relating to a problem followed by the balancing of these considerations towards a set of potential actions (Holmes, 2012).

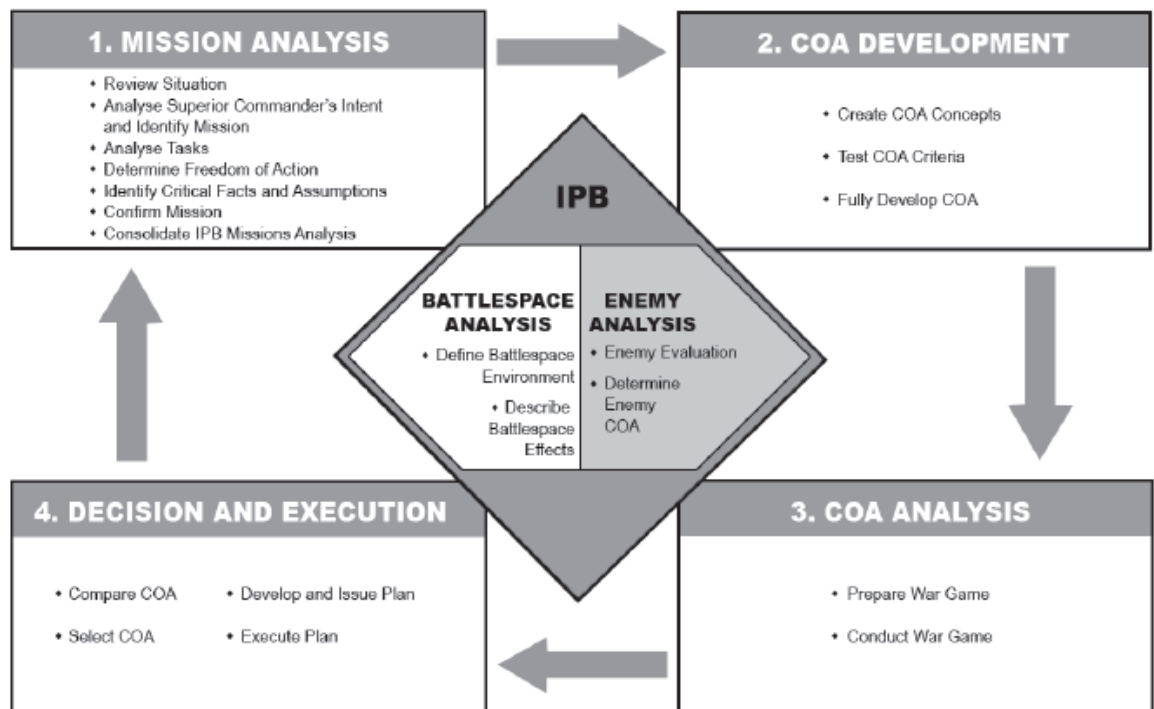


Figure 3 - Military Appreciation Process - Source: Hoskin (2009, p. 7)

As demonstrated in Figure 3 and Table 1, the Australian Army MAP utilises the inputs of IPB to assist with the decision making and planning process by allowing the commander to have access to analytical inputs to make calculated decisions about assumptions and to fill potential information gaps. Both Hoskin (2009) and Holmes (2012) suggest that the MAP is a useful planning tool but there are some weaknesses present relating to the reliance on human factors such as the skills and experience of the commander (Hoskin, 2009), the linear nature of the doctrine (Walker, 2011) and its complexity resulting in poor application by junior officers (Holmes, 2012).

Some literature suggest that MAP is a useful tool (Holmes, 2012; Hoskin, 2009) but there are some conflicting arguments relating to the ability for the MAP to deal with a complex operational environment (Walker, 2011). Walker (2011) suggests that the sequential nature of MAP does not allow for the considerable complexity of the modern day operation and tends to focus heavily on a sequential step by step doctrine. In contrast, and possibly a factor as to why Walker (2011) may hold this opinion, may be seen in Holmes' (2012) research that highlights how the sequential nature acts as a foundation and educative tool for young and inexperienced officers. Holmes (2012) describes how the complex nature of MAP, outside of its sequential

process, may discourage a number of junior military officers from utilising the decision making methodology.

The body of knowledge about the MAP decision making process and the fact that it has been tried and tested, suggests that concerns raised by some literature about its utilisation may be a result of a misunderstanding of the purpose of the sequential process within MAP. Overall the body of literature about military decision making will contribute significantly to the study as it demonstrates how relatively simple sequential decision making processes can be utilised as a foundation for the growth of skill sets within junior leaders if provided with the sufficient guidance (Holmes, 2012; Hoskin, 2009). Currently there is a gap within the literature that does not demonstrate the application of the MAP or similar military decision making process to the civilian or pre-hospital care domain. Though this gap in the literature is present, the contemporary body of knowledge about MAP as well as its Australian context allows for the framing of how IPB can assist with the planning of not only military operations but also pre-hospital care operations at mass gathering events. The MAP demonstrates the interrelationship of IPB and planning and subsequently decision making. This interrelationship of IPB into a decision making and planning process such as MAP exhibits the flexibility and beneficial influence that IPB can have in any domain including its introduction into the pre-hospital care mass gathering domain.

Pre-Hospital Care Decision Making at Mass Gathering Events

Decision making in a pre-hospital and primary or hospital care setting has a significant amount of literature pertaining to a vast number of areas within the domain (Booker, Simmonds, & Purdy, 2014; Burrell, Noble, & Ridsdale, 2013; Eadie, Carlyon, Stephens, & Wilson, 2013; Halter et al., 2011; Muecke et al., 2013; O'Meara, Tourle, & Rae, 2012). Literature relating to the decision making within the mass gathering event domain is limited but has highlighted a need for extensive pre-planning of events and the ability for decision makers to monitor medical incidents and the flow of patients in real time to assist with operational decision making (Başdere et al., 2014; Sabra et al., 2014). It must be acknowledged that pre-hospital care at a mass gathering domain does benefit from a large body of knowledge indirectly within the overall pre-hospital care or medical domain (Booker et al., 2014; Burrell et al., 2013; Eadie et al., 2013; Halter et al., 2011; Muecke et al., 2013; O'Meara et al., 2012) but specific and

publically available literature related to the planning processes is limited. In addition to this limitation, the access to internal St John Ambulance WA Ltd data and information would have been able to bridge this gap but due to this being unavailable it must be earmarked for future research.

The nature of mass gathering events and the resulting pre-hospital care operations are a complex and contextual set of decisions that need to be made in order to deliver the required outcomes to not only the client, but also to the patients who seek the assistance of providers such as St John Ambulance WA Ltd. Luke (2011) notes the close links between the decision making skill set required by St John Ambulance Event Operation Commanders and Emergency Management professionals within their respective domains. This well-drawn and relevant comparison, demonstrates the need for a comprehensively-trained and resourced pool of decision makers not only within the command function of an event health operation but within the clinical decision making roles as well. Beyond this literature, no specific literature relates to the decision making process or capabilities of an Event Health Operations Commander or Staff member during a mass gathering event. This significant gap within the literature, with the assistance of the general operational decision making principles particularly from the military domain, demonstrates the need for improved planning processes by pre-hospital care providers within this domain.

Conclusion

The principal research question posed required a broad range of academic literature to be examined to identify similar areas of research within the current body of knowledge and the resulting gaps within this body of literature. This first section of this chapter examined the historical and contemporary role of pre-hospital care providers, particularly St John Ambulance Australia, at mass gathering events within Australia as well as the guidelines or legislation that govern this domain. This examination demonstrated a gap within the current body of knowledge relating to the defined planning processes of St John Ambulance WA Ltd, particularly in the publically available domain and the lack of focussed guidelines or legislation pertaining to the provision of pre-hospital care at mass gathering events.

Analysis of literature within the second section of this chapter demonstrated the development of conceptual models and frameworks, particularly by Arbon (2004), as well as government literature in the form of guidelines demonstrated further research is required within this field. This literature has highlighted the basic process for planning a pre-hospital care operation at a mass gathering event as well as provided a set of planning and risk variables that have formulated a base for this study's analytical undertakings. Furthermore, this section of the literature review has highlighted the consequent lack of specific or tailored guidelines, or legislation relating to the provision of pre-hospital care at mass gathering events.

The third section of the literature review provided an in-depth understanding of the Intelligence Preparation for the Battle Space methodology and its applications within the military domain. A gap within the literature was identified relating to the implementation of this methodological process or elements of it into the civilian as well as the pre-hospital care domain. This gap within the literature demonstrated a clear need for further research into the incorporation of IPB or intelligence methodology into other domains due to its success not only on the battle field but its high level of theoretical support within academia.

The fourth section of the review of literature identified a gap within the literature relating to the operational decision making process of St John Ambulance WA and its lack of intelligence informed decision making or planning processes. This information gap suggests that there may be potential for the adoption of intelligence methodology in support of the planning functions within the pre-hospital care mass gathering event operations domain.

Overall the study's review of literature highlighted a significant number of gaps within the current body of knowledge but also provided a basis for a number of key aspects of this study and its analytical findings. Furthermore, this review of literature demonstrates the significance of the study and its potential to fill the gap within the domains body of knowledge.

Chapter 3: Method

Introduction

This chapter details how this study was designed and conducted; it explains the research methods utilised and the underlying theory informing the study. Also addressed are the ethical implications of the study, how reliability and validity was addressed and importantly limitations that impacted the study.

This study initially required the collection of documentary and case study data from the internal SJAWA event operations plan and the Coroner's inquest in to the death of Gemma Thoms (Mulligan, 2013) as a result of Big Day Out 2009. This data and information was to be primarily obtained through the application and written consent of St John Ambulance WA Ltd Research Advisory Group and via the open source publication of the Thoms inquest. Due to unfortunate circumstances beyond the control of the researcher and St John Ambulance WA Ltd, access to internal St John Ambulance WA Ltd data and information was unable occur within the time frame of this study.

Research Design

The purpose of this study was to examine the potential for the application of IPB methodology to mass gathering event pre-hospital care planning. Given the limited time available in which to conduct the research it was determined that documentary analysis was the most feasible option of accessing the necessary data. Case study research provided a useful research method that would be appropriate to the task given that it can be undertaken in a variety of ways, via observation, interview or documentary analysis. The key element of case study analysis relevant to this study is the ability to focus on a singular event, entity or organisation and this forms part of the rationale for its use during the design of this study. For the purpose of this study a singular event was chosen the Big Day Out Perth 2009. This event was worthy of examination as a young patron died and a coronial inquiry was conducted as a result. This provided a rich body of documentary evidence that could be utilised within the present study.

Case study research is a methodology for conducting academic research in which a researcher or group of researchers collect, analyse and integrate data from a single or multiphase study in order to develop an empirical understanding (Creswell, 2014; R. Johnson, Onwuegbuzie, & Turner, 2007; Leech & Onwuegbuzie, 2009). This study's case study research design, underpinned by a constructivist theoretical framework was considered the optimal approach for the answering of the principal research question within the defined scope and limitations discussed later.

Case Study Research

Case study research through the examination of an organisation's documented processes is a form of analysis regularly used within the academic domain to scrutinize and extract empirical data about how an organisation operates. Case study research is particularly useful when attempting to understand a phenomenon with a particular outcome and why this outcome may be so within the contemporary and real life context (Creswell, 2014; Gillham, 2000; Hancock & Algozzine, 2011; Yin, 2014). Within the case study research design there are typically four types of documents that can be analysed; these include (1) the internet, (2) private & public records, (3) physical evidence and (4) instruments created by the researcher (Hancock & Algozzine, 2011, pp. 51-52).

Furthermore, academic authors such as Creswell (2014), Yin (2014), Hancock and Algozzine (2011) and Gillham (2000) strongly argue that this form of research design is the most appropriate for this type of study. Creswell (2014), Yin (2014), Hancock and Algozzine (2011) and Gillham (2000) highlight 4 key reasons to why this is the case. First, case study research is particularly useful when attempting to understand a phenomenon with a particular outcome and why this outcome may be so. Second, there is a limited or non-existent amount of control the researcher has on the over the event that is being studied. Third, the ability to ensure that populations being utilised in the study are well defined and contained. And fourth, the ability to conduct a historical and contemporary examination of issues in a real-life context.

After the examination of numerous research designs and methodologies, a case study methodology was selected for this study as the optimal option. Whilst a number of research designs had potential, case study research was chosen for the below reasons.

The examination of a singular event, with a focus on a single organisation and process demonstrated that a case study research was optimal for the answering of the posed research questions and the meeting of the study's objectives (Bowen, 2009). Furthermore, the studies scope and focus on a singular event and organisation meant that a case study research design would allow for the well defining and containment of the process being studied as well as the development of an understanding relating to a phenomenon that resulted in a particular outcome and how this outcome could be improved (Creswell, 2014). The required examination of documentation from multiple sources, to ensure quality and credulity of the research, allowed for a focussed review of literature as a result of the defined event and organisational setting being examined. Additionally, the presentation of real life variables as a result of the case, that were validated by multiple sources, also added to the ability of the study to examine the impact of an intelligence supported planning process as a result of the case study research design (Hancock & Algozzine, 2011).

The review of literature within this study has utilised publically government documents, academic literature and the coronial inquest into the Thoms' death to formulate the basis of the study's analytical findings. This study's initial design called for the documentary analysis of internal St John Ambulance WA planning documentation. As a result of this documentation being unavailable the researcher has utilised the documentary analysis and triangulation of the Thoms' inquest (Mulligan, 2013), government guidelines and academic literature within the domain to conduct the required analysis.

Theoretical Framework

For the purpose of this study, the ontological and epistemological assumptions are a result of the underlying theory of constructivism. Constructivism allows for the questioning of an already existing world, process or social construct to allow for its enhancement or knowledge to build upon the already existing foundation (Brandon & All, 2010; Creswell, 2014). The purpose of this study was to examine how IPB could contribute to enhancing major event or mass gathering pre-hospital care planning. The study looked at integrating elements of an accepted military intelligence analysis process into the already existent planning process; therefore rather than simply create new knowledge this study will build on the existing planning process. A foundation of

existing operational planning knowledge, supported by the coronial findings relating the Thoms' death (Mulligan, 2013), will allow the researcher to utilise the IPB methodology to demonstrate the improvement from an intelligence informed planning process within this domain. It is the construction of new knowledge from the foundation knowledge base mentioned above that allows the application of the constructivism theoretical framework, in conjunction with a case study research process that will assist with the answering of the principal research question.

Procedures

Broadly, the study adhered to the following procedure to ensure academic rigour and ethical integrity was upheld after the submission and approval of an ethics declaration by Edith Cowan University. Firstly, the researcher requested access to planning documents, event related data and process documents from St John Ambulance WA Ltd Event Health Services with a specific focus on the Big Day Out Perth 2009. Secondly, the researcher had to ensure all relevant confidentiality and ethical guidelines are understood and applied to the study as requested by St John Ambulance WA Ltd prior to final approval being given by the SJAWA Research Advisory Group. Third, a collection of all open source data and information was conducted.

Fourth, a documentary analysis and review of literature was undertaken to identify gaps within the domain. Fifth, as a result of access to internal St John Ambulance WA Ltd data and information being unobtainable the identification of key planning variables and risk inputs that could benefit from the IPB model was conducted utilising planning practices established from publically available information only. Finally, the researcher analysed, presented and discussed the study's findings in order to answer the principal and secondary research question highlighted a future direction for research and some key recommendations as a result of the study's findings.

Ethical Considerations

As this study was designed to utilise documentary data only and involved no actual participants within the context of ECU's ethical guidelines the study simply required that an ethics declaration be completed. However in order to access SJAWA planning data separate ethical approval was required from St John Ambulance WA Ltd Research Advisory Group chaired by the organisations Clinical Services Director. All information

gathered by the researcher was to be done so initially in a 'commercial-in-confidence' manner and at a later date be approved for use at the discretion of St John Ambulance WA Ltd under the delegated authority of the organisation's choice. Due to the nature of this study, no identifying data was to be collected in order to protect the identities of staff (including intellectual property), patients and the clients of St John Ambulance WA Ltd. As a result of a number of variables beyond the control of the researchers including the unfortunate and untimely death of the Chair of the St John Ambulance WA Ltd Research Advisory Group prior to the final approval of study, no internal St John Ambulance WA Ltd information, documentation or data has been utilised.

All data or information that was to be released by St John Ambulance WA Ltd would have only been viewed by the researcher. All data, regardless of origin, was stored on a secure hard drive and is available upon request from Edith Cowan University and St John Ambulance WA Ltd. No data will be released to any third parties without the express permission of all parties listed above including the researcher.

Conflict of Interest Declaration

The author declares the following for consideration:

- At the time of submission the author was employed by St John Ambulance WA (April 2013 - Date of Submission) as the Youth Engagement Officer within the Event Health Services department.
- At the time of submission the author was (December 2010 - Date of Submission) a St John Ambulance WA Ltd Volunteer Event Ambulance Officer within the Event Health Services department.
- The author was employed by St John Ambulance WA Ltd (December 2010 - August 2012) as the Logistics Coordinator within the Event Health Services Department.

This declaration is to be noted for ethical consideration and no documentation or data was wrongfully collected or utilised by the researcher as a result of the above and outside of the processes aforementioned.

Limitations

Data Collection Limitation - St John Ambulance WA Ltd

The collection of data pertaining to internal St John Ambulance WA Ltd required the approval of the St John Ambulance WA Ltd Research Advisory Group led by the organisation's Clinical Services Director. Due to circumstances beyond the control of the researcher and St John Ambulance WA Ltd, this was unable to occur as a result of a number of delays and subsequent death of the Clinical Services Director. The researcher acknowledges all efforts made by St John Ambulance WA Ltd during this difficult period to provide this approval but a set of unfortunate circumstances has meant that this approval was not gained within the required time frame; thus resulting in a change the study's design from its initial conception. This has led to the researcher being unable to access the *Big Perth 2009 - Operational Plan* (St John Ambulance Australia Western Australia Inc, 2009) outlined by the coronial findings into the Gemma Thoms death (Mulligan, 2013).

As a result of the above, the researcher has utilised a number of publically available academic, industry and government documents to fill this gap within the study and produced its findings without this aspect.

Reliability and Validity of Data

The reliability and validity of data within academia is essential to maintaining rigour and without rigour academic research could be seen as worthless or fictitious (Morse, Barrett, Mayan, Olson, & Spiers, 2008, p. 14). Within the contemporary context the issue of reliability and validity of data within qualitative research tends to focus more so on the quality and credibility of the information and sources of the study (Elliott, Fischer, & Rennie, 1999; Morse et al., 2008; Shenton, 2004). The research method within this study, case study analysis, utilised documents from various sources to establish background, context and process to ensure the quality and credibility of the study's data (Bowen, 2009; Yin, 2014).

In order to achieve quality and credibility within this study a number of processes and procedural enhancements were added to preserve the academic rigour of the study. Bowen (2009) emphasised the utilisation of academic triangulation of information and data found within the documents of a study to ensure the quality and credibility of its

sources to emphasise academic rigour. Specifically within this study, contextually relevant government guidelines, peer reviewed academic literature and the coronial findings into the death of Gemma Thoms (Mulligan, 2013) were triangulated to ensure the quality and credibility of the information and resulting analysis presented.

Cohen and Crabtree (2008) highlighted seven criteria that need to be evaluated when considering what is or is not good qualitative research. First, is the research ethical in its methods prior to and throughout the study? Second, what is the importance of the research? Third, is their clarity and coherence of the research report? Fourth, does the study use appropriate and rigorous methodological processes? Fifth, is the importance of addressing researcher bias recognised? Sixth, is the researcher's data from valid or credible sources? And Seventh, has the researcher verified or determined the reliability of data? As demonstrated throughout the study the researcher has been ethical in nature, provides an important addition to the body of knowledge in a coherent form, has utilised the optimal research design; addressed researcher bias and ensured the credibility and quality of the study's sources utilising a number of recognised qualitative methods. These seven features of this study demonstrate that the utilisation of reliable, valid, credible and quality data and sources has ensured that academic rigour and integrity is maintained to the required standards for qualitative research.

The purpose of this study was to analyse a historical and singular event occurrence with a set of unique characteristics utilising a method with a number of methodological advantages and limitations. This study presents a strong case to test the model developed utilising the documentary analysis of publically available documents, with the further examination of internal SJAWA documentation to validate the study's results in on-going future research. The need for this validation has been mitigated partially by the validation of the case study analysis of the planning process with the triangulation of the coronial findings from the Thoms inquest (Mulligan, 2013), peer reviewed academic sources, and relevant government guidelines within the study.

Conclusion

This chapter of the study presented the method and resulting considerations for its production. The design of the study utilised a case study and documentary analysis methodology underpinned by constructivist theoretical framework for its production. Due to a number of unforeseen circumstances relating to the inability to be granted approval to access internal St John Ambulance WA Ltd data, beyond the organisations and the researcher's control, a number of procedural adaptations were made but did not affect the core processes or outcomes within the study as presented above. In the final section of this chapter, an outline of ethical approval was highlighted in addition to the proposed processes if the researcher were to be granted access to SJAWA data at a later date. This chapter was concluded with a declaration of any conflict of interest relating to the researcher's professional positions within St John Ambulance WA Ltd to ensure the maintenance of academic integrity and rigour.

Chapter 4: Findings & Analysis

Introduction

The key to this study was the analysis of various documents that described and examined the Big Day Out 2009. This documentary analysis enabled the extraction of information that threw light onto the planning processes of the day, how the event was actually managed and where failures occurred. On the basis of this reconstruction the researcher was able to overlay the planning processes onto the relevant government guidelines and then onto the IPB planning methodology. The outcome of which was the investigation of the planning process of SJAWA that has been structured and broken down into a number of staged processes. This break down of the planning processes has then allowed for the identification of the planning variables, any process or processes associated with this input, the resulting risk inputs and effect these have on the pre-hospital care operation at the event.

Within this chapter the Department of Health WA guidelines (2004, 2009), have been analysed and broken into the thematic areas represented in [Figure 4](#) as planning variables to allow for the analysis of individual aspects of the planning process. For each planning area, the risk inputs, and the process by which the overarching planning variable is constructed or discovered and the resulting output/s, are highlighted. Following this, an analytical break down of each planning area is presented.

In the final section of this chapter this process is then repeated once again with the addition of the inputs and processes and resulting outputs likely generated from the IPB methodology that has been contextual applied to this domain. This application has allowed for the contrasting and measuring of the impact from the introduction of IPB in support of the principle and secondary research questions of this study.

Pre-Hospital Care Operational Planning at Mass Gathering Events

Event Planning Summary

As outlined by the Department of Health Western Australia (2009) the production of a “medical plan based on risks identified utilising the process outlined in AS4360:2004 Risk Management” (Department of Health Western Australia, 2009, p. 35) is essential for any high risk event such as the Big Day Out Perth 2009 (Mulligan, 2013, pp. 29-33); it must be noted that this standard has been superseded by ISO 3100:2009 Risk Management (Standards Australia, 2009) and the relevant guidelines are yet to be updated. A medical plan was produced for Big Day Out Perth 2009 on behalf of the event organiser by St John Ambulance WA Volunteer First Aid Service¹ as the contracted provider for the event.

As noted by Mulligan (2013), the relevant department of health guidelines at the time of the Big Day Out Perth 2009 were the Guidelines for concerts, events and organised gatherings (Department of Health Western Australia, 2004) but since this coronial inquest these guidelines have been superseded by the Department of Health Western Australia (2009) Guidelines for concerts, events and organised gatherings. As a result of this, the below study focuses on the Department of Health Western Australia (2009) guidelines as well as comments made in the Coronial Inquest into the Gemma Thoms death (Mulligan, 2013)

St John Ambulance WA Contextual Considerations

In order to frame this study a number of key contextual factors require consideration when reading the below analysis of the planning model:

- St John Ambulance WA is primarily a volunteer organisation, as suggested by the departments name and coronial findings into the Thoms case (Mulligan, 2013), and there is no indication of formal training in the preparation of these plans by volunteers in the publically available domain.
- The Big Day Out Perth 2009 occurred on February 1st 2009; thus the Department of Health Western Australia (2009) were not published until December of that year. As a result this paper must consider the Department of

¹ NB: St John Ambulance WA Volunteer First Aid Service is now known as the St John Ambulance WA Event Health Services

Health Western Australia (2004) and Department of Health Western Australia (2009) guidelines as seen within the Coronial Inquest into the death of Gemma Thoms at the event (Mulligan, 2013).

- No specific operational guidelines, policies, procedures or legislation are available directly relating to medical planning at mass gathering events (Luke, 2011).

Government Guidelines and Academic Literature - Event Planning

Guidelines for concerts, events and organised gatherings (Department of Health Western Australia, 2009)

The Department of Health Western Australia (2009) Guidelines for concerts, events and organised gatherings (and its superseded 2004 edition) provides a number of event planning tools to identify an overall medical risk rating that allows for the event organiser to contract a listed provider with an understanding of the required number of ‘staff’² and ‘first aid posts’ for the event based on the event risk rating as well as the events attendance. Upon initial examination the Medical Resource Planner ([see Appendix A](#)) outlined by the Department of Health Western Australia (2009) provides a tool for event organisers and pre-hospital care providers to quickly utilise an estimated or expected pre event attendance figure to guide the number of medical resources that may be required.

As the document progresses, a number of questions are posed under the “Risk Considerations For Planning Medical and First Aid Resources” (Department of Health Western Australia, 2009, pp. 107-108) section ([see Appendix B](#)) that further prompt an event organiser or pre-hospital provider when conducting a risk assessment to establish the medical and first aid resources required at an event. Overall the Department of Health (2009) documentation provides a set of tools greatly influenced by the theoretical practices and principles of ISO 3100:2009 Risk management - principles and guidelines (Standards Australia, 2009) such as those mentioned above as well a number of clarifying classification statements as to why certain aspects or risk

² Department of Health Western Australia (2009, p. 102) medical resource planner notes that ‘staff’ refers to the required number of staff, including doctors, nurse, paramedics and first aiders as determined by the medical plan.

variables carry a greater risk weighting than others (Department of Health Western Australia, 2009, pp. 109 - 110).

The Department of Health Western Australia (2009) Guidelines for concerts, events and organised gatherings is a relatively out of date document as the nature of mass gathering events in Western Australia is constantly changing as social, cultural and economic variables evolve . As a high level planning document for event organisers, the documents set out and high level risk classification tools are suitable to allow for a basic understanding of need in regards to pre-hospital care or first aid provisions at a mass gathering event. In the pre-hospital care provider domain the document lacks a depth and consideration of a number of risk variables or sufficient depth of consideration into outlined risk variables that influence the presentation rate and types of patients at mass gathering events (Luke, 2011; Mulligan, 2013). Overall the document must be seen not as an in-depth planning document for this domain and should be considered as such due to its relative size and nature as guidelines that encompass a significant number of event related considerations.

Data from the wider literature

Milsten et al. (2002) provides an academic review of mass gathering medical literature, though dated, the review reconfirms a number of key risk variables that are considered within the Department of Health Western Australia (2009) guidelines. This academic literature review of mass gathering events research and the medical literature relating to singular events (Burdick, 2005; Madan, 2011; Moutia et al., 2014; Sabra et al., 2014; Zeitz et al., 2012) demonstrates further justification and support for the risk variables outlined by the Department of Health Western Australia (2009) guidelines. Analysis of the Milsten et al. (2002) and Department of Health Western Australia (2009) risk variables highlights that the event type, attendance figure, type of crowd or crowd mood, age groups of attendees, location (indoor or outdoor), duration, probability of alcohol and drugs, weather conditions and available / distance to local medical infrastructure are present in both documents. The presence of these key risk variables in both documents demonstrates that when assessing and determining the information or resources required for pre-hospital care providers to plan for and provide the required level of care to patrons at a mass gathering event it is agreed that the aforementioned key risk variables are rarely considered.

The analysis and comparison of the planning risk variables outlined by Milsten et al. (2002) and the Department of Health Western Australia (2009) shows that the mobility of patrons and the crowd density of patrons at the event are not considered directly by the Department of Health Western Australia (2009). Furthermore, a number of risk inputs or considerations differ significantly between the two in relation to the sub-factors that are to be considered within each risk variable. For example, the Department of Health Western Australia (2009) guidelines do not consider the planning variable in the form of crowd density that is considered by Milsten et al. (2002). In addition to this the subsequent risk inputs or planning factors, including the decreased access to patrons, effects on crowd mood and decreased access to water and bathroom facilities may influence the number of or type of patient presentations that may be experienced (Earl, Parker, Tatrai, & Capra, 2011; Hutton et al., 2011; Milsten et al., 2003).

Developing the Pre-Hospital Care Operational Plan

Planning Variables & Inputs



Figure 4 - Planning Variables & Inputs for a Pre-Hospital Care Event Operations

Figure 4 highlights a number of planning variables which are seen to be considered by pre-hospital care providers when developing an event medical or operational plan. The planning variables ability to identify various risks associated with the event that may relate to the presentation of patients; these are termed as a risk input. The planning variables and subsequent risk inputs allow for examination of the planning process against the Department of Health Western Australia (2004, 2009) guidelines, selected academic literature (Milsten et al., 2002) and the measurement of improvement from the application of the IPB methodology in full or partial format. Though the SJAWA plan is unavailable for comparison, previous analysis within this chapter as well as comments made by Mulligan (2013) relating to SJAWA's operational plan meeting government guidelines (Department of Health Western Australia, 2004) highlights the significant amount of information and examination of various variables and their

resulting risk inputs that are required for the development of an appropriate pre-event planning document.

The Planning Process

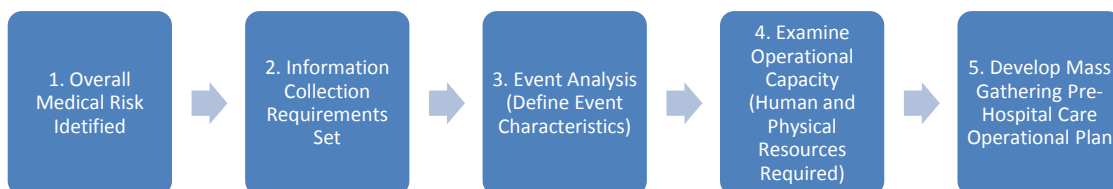


Figure 5 - Mass Gathering Event Medical Planning Process

The Department of Health Western Australia (2004, pp. 61-65; 2009, p. 35) provides guidance for the event organiser about the basic process, heavily reliant on AS4360:2004 Risk Management (Australian and New Zealand Standards, 2004), to address issues identified by the events medical risk classification. This section of the guideline Department of Health Western Australia (2004, pp. 61-62; 2009, p. 35) assists with the demonstration of the basic process for the development of a pre-hospital care operational plan for a mass gathering event. Of relevance to the Big Day Out Perth 2009 event, the Department of Health Western Australia (2004, p. 61) outlines that the events medical plan or an operational plan within the St John Ambulance WA context (Mulligan, 2013, p. 30) will identify likely patient types and numbers, staff required, staff qualifications, staff rosters, number of first aid posts and equipment requirements.

This process provided the basis for which the operational planning process for St John Ambulance WA was devised and provided a significant insight into the organisations pre-event planning processes. Further insight to this planning process is also provided by Luke (2011, p. 37), Moutia et al. (2014, p. 3) and Emergency Management Australia (1999, pp. 44-50) who each highlight various aspects of the 5 steps presented in Figure 5. This process, as depicted in Figure 5, initially utilises provided tools to assess and identify the event's overall medical risk and followed with the identification of information collection requirements, which needed to be provided by the event organiser to the pre-hospital care provider. Following this the pre-hospital care

provider is able to analyse the event's characteristics and unique variables trailed by the determination of the provider's operational capacity; the need for human and physical resources for the operation. Upon completion of this process the pre-hospital care provider is then able to develop a mass gathering pre-hospital care operational plan for incorporation into the event organiser's overall risk management plan (Department of Health Western Australia, 2004, pp. 61-65; 2009, pp. 33-41; Luke, 2011; Moutia et al., 2014; Mulligan, 2013, p. 30).

The process depicted in Figure 5 is a result of analysis of the Department of Health Western Australia (2009, p. 35) guidelines, the Standards Australia (2013) AS ISO 20121:2013 Event sustainability management systems - Requirements with guidance *for use* provides further justification in support of relevant academic literature of the required process for the development of an operational plan. Though it must be noted that this standard does not mention 'first aid', 'medical' or 'pre-hospital care' considerations but does show how operational planning processes can assist with sustainable event management (Standards Australia, 2013). The ongoing trend identified within various standards (Standards Australia, 2009, 2013), academic literature including relevant contemporary case studies (Luke, 2011; Moutia et al., 2014), and the various government guidelines (Department of Health Western Australia, 2004, 2009; Emergency Management Australia, 1999) demonstrates how these operational or medical plans are within the risk management domains set of principles and without a copy of the Big Day Out Perth 2009 Operational Plan outlined within the Thoms Inquest (Mulligan, 2013, p. 30) the supported assumptions above provide an example planning process for this study.

Mass Gathering Events Domains - Health Risk Variables & Inputs

Psychosocial Domain Risk Variables

Biomedical Domain Risk Variables

Environmental Domain Risk Variables

Figure 6 - Key Characteristics of a Mass Gathering Event (Risk Variable Domains) - Adapted from Arbon (2004, p. 210)

As discussed previously in the study's review of literature, Arbon (2004) in the development of a conceptual model for mass gathering medical operations highlighted three inter-related domains that related to the presentation of patients and the rate in which they present. These domains can be broken into the (1) biomedical, (2) psychosocial; and (3) environmental domain. The biomedical domain examines and influences the types and rate of patient presentations, the psychosocial examines the social and physiological characteristics of a crowd and the environmental domain examines risk inputs or variables such as weather or terrain (Arbon, 2004; Milsten et al., 2003).

Psychosocial Domain	Biomedical Domain	Environmental Domain
Crowd:	Crowd & Individual health status	Crowd:
a) behaviour		a) attendance
b) mood		b) density
Individual:	Latent potential for illness and injury	Venue:
a) motivation		a) bounded/unbounded
b) behaviour		b) extended/focussed
		c) locale/terrain
Crowd interests / Morays / Culture	Crowd average age / gender	Type/Nature of event
Rationale / Reason for Attendance	Activity level (participant or spectator)	Predominantly seated or mobile
Length of Stay	Heat - or cold-related physiology	Outdoor or indoor weather (temperature/(humidity)
Use of Alcohol & Drugs	Alcohol - or drug-related physiology	Availability of alcohol or drug

Table 2 - Psychosocial, Biomedical & Environmental Domains at Mass Gathering Events (Arbon, 2004)

The domains presented by Arbon (2004) reflected in Table 2 have allowed for the classification of different aspects of a mass gathering event health operation as well as the risk variables that need to be considered or may have a direct or indirect influence on the types and numbers of patient presentations at a mass gathering event. The [proximity model for mass gathering health care](#) presented by Arbon (2004) clearly demonstrates the complex and interrelated nature of risk variables and the required input of information relating to these (a risk input). These risk variable domains are similar to those proposed within the IPB methodological outlines by the US Army Intelligence Center (2009) and further highlight how there is potential for IPB to be mapped effectively across to the pre-hospital care mass gathering planning domain.

Planning Variables & Risk Inputs Explained

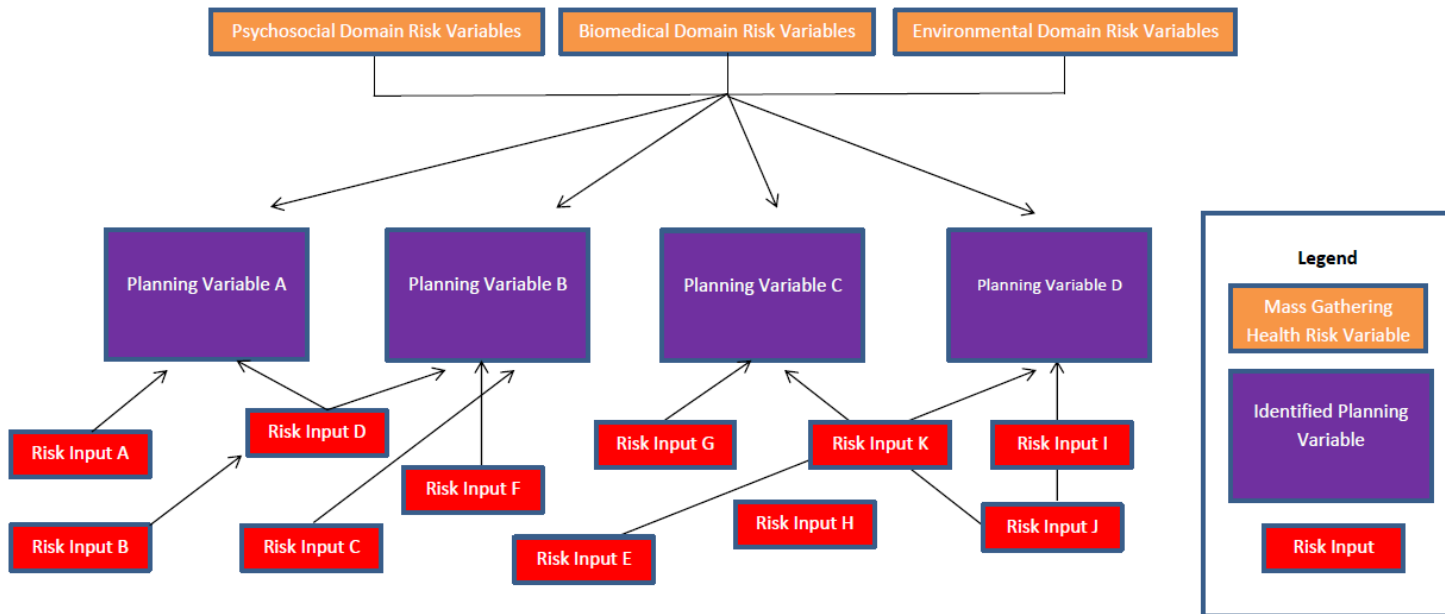


Figure 7 - Domain Risk Variables, Planning Variable & Risk Input Relationship Model

[Appendix C](#) of this document demonstrates the relationships between the planning variables and risk inputs for consideration within the domains presented in Table 2 as well as formulating the basis for Figure 7. As represented in

Figure 7, the mass gathering pre-hospital care domain consists of a number of risk variable domains. Within each of these domain a singular or number of planning variables can be identified that will have an effect on the pre-hospital care operations. Each of these planning variables consists of a number of risk inputs or information plug in that are interrelated and at times complex in nature. The risk input within the Figure 7 model is the smallest unit and at times may have a direct, indirect or no effect on the planning variables that are being considered by the pre-hospital care provider.

The Planning Process & Mass Gathering Domain Risk Variables

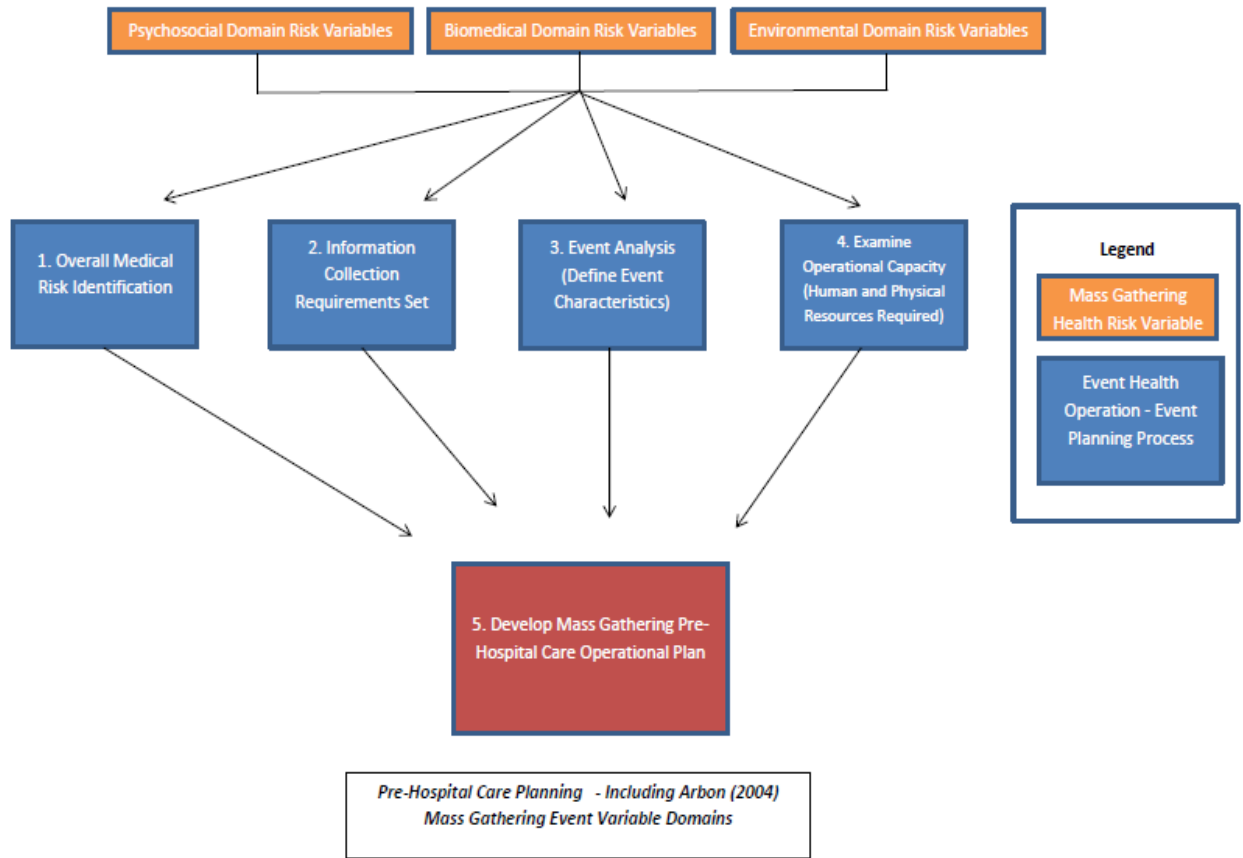


Figure 8 - Pre-Hospital Care Planning Model - Including Arbon (2004) Mass Gathering Event Variables Domains and their relationships with stages of the Event Medical Planning Process

Figure 8 highlights how the variables relating to the patients' presentation at a mass gathering event can potentially influence each stage of the Event Medical Planning Process. Each of the mass gathering event variables, within the context of this study and process, act as risk variable with a number of resulting inputs that have an effect on the decision making at each stage of the planning process. The combination of the above demonstrates how each domain of variables directly and at times indirectly influences each stage of the event planning process as well as the penultimate inputs for the final stage and development of a mass gathering pre-hospital care operational plan. Simply put the planning process for a mass gathering event such as the Big Day Out Perth 2009 would have a large number of risk variables thus requiring a large number of inputs to be considered.

For example within the psychosocial domain of the event the risk variable examined by the planning organisation would be the 'crowd mood'. This crowd mood risk variable would then have a number of risk inputs and information associated with the social, cultural and economic likelihoods of the estimated patronage (Hutton et al., 2011). The psychosocial domain like the biomedical and environmental domains are a complex set of variables beyond a singular variable or input that contextually fluctuate in cause and effect between different events (Arbon, 2004; Hutton et al., 2011). The process and relationships shown in Figure 8 demonstrates that the planning processes of a mass gathering pre-hospital care provider such as SJAWA, as portrayed in government guidelines (Department of Health Western Australia, 2004, 2009) and conceptualised by academic literature (Arbon, 2004; Luke, 2011; Milsten et al., 2002; Milsten et al., 2003), is a complex process of variables where information inputs about those risks is essential to the formation of an adequate event operational or medical plan.

Introducing IPB to the Domain

IPB in Brief

IPB is a methodical continuing set of intelligence processes that assist military leaders in the decision making process by constantly analysing a number of threats and open source intelligence variables such as population demographics, commodities, and environmental aspects to name a few (Steele, 2001). IPB provides a theoretical set of intelligence practices, processes and classifications that assist with the development of Military Intelligence (MI) products (Fontaine, 1995; US Army Intelligence Center, 1993, 2009). Within the IPB methodology there are four basic and continuous functions that occur during IPB. First, the defining of the battlefield or the battle space within its geographical context is examined. Secondly, the development of descriptions of the battlefield or battle space's effects on operations is investigated. Third, continuous evaluations of a single or multiple threats are conducted by intelligence staff. And fourth, the determination of courses of action to be taken by threats including their potential impact on the operation is considered.

Within the military domain, intelligence and information requirements change in both scope and importance, resulting from the evolving nature of operations within the confined geographical area that is the battle space or battlefield (US Army Intelligence Center, 1993, 2009; Wineera, 2011). A mass gathering event pre-hospital care operation is also of an evolving nature within a pre-defined geographical area with a large amount of information and planning requirements for its success (Başdere et al., 2014; Department of Health Western Australia, 2009). The following section will outline how IPB can be effectively mapped to the pre-hospital care at mass gathering events domain.

Intelligence Preparation for the Battle-space (IPB) & Event Planning

IPB and its application to the event domain have resulted in a number of key outcomes that are crucial to this study. As discussed by the US Army Intelligence Center (1993, 2009) IPB consists of four steps that include the definition of the operational environment (aka the Battle-space), the development of descriptions of the battlefield or battle space's effects on an operation, an evaluation of a single or multiple threats and the determination of courses of action to be taken by threats that may impact the operation.

IPB Contextual Process and its Event Planning Conversion & Risk Variable Domains		
<i>IPB Context</i>	<i>Event Planning Contextual Conversion Examples</i>	<i>Mass Gathering Risk Variable Domains (Arbon, 2004)</i>
Define the operational environment	→ Event Type Event Location Crowd type	←→ Psychosocial Domain Variables Environmental Domain Variables Biomedical Domain Variables
Environmental Effects on the operation	→ Venue Terrain Crowd Type Weather	←→ Psychosocial Domain Variables Environmental Domain Variables
Evaluate the Threat	→ Likely patient presentation Rate of patient presentation Medical Risk Assessment	←→ Psychosocial Domain Variables Biomedical Domain Variables
Determine Threat Course of Action	→ Develop a mass gathering pre-hospital care operational plan	N/A

Table 3- Examples of IPB Contextual Process and its Event Planning Contextual Conversion including Arbon (2004) Mass Gathering Risk Variable Domain

As seen in Table 3, within the IPB context a detailed analysis of social, economic, political, environmental and cultural factors are considered to assist with the decision making process. As an input for decision makers at all stages and in an ongoing nature the IPB methodology provides an easy to understand but detailed level of consideration of a number of factors. When compared and contrasted with the Department of Health Western Australia (2009) guidelines a number of the IPB

variables that are considered are applicable to the event planning or pre-hospital care operation at a mass gathering event. Furthermore, the methodological approach of IPB is reflected by the risk variable domains as depicted in Figure 8.

The methodological process found imbedded within IPB and its role within the pre-planning of military operations can be affectively applied within the pre-planning process of a pre-hospital care provider. As demonstrated within Table 3 the IPB process to support planning and decision making not only maps across to the event planning context but can also be seen to consider the event variable domains outlined by Arbon (2004). The detailed analysis of social, economic, political, environmental and cultural factors required by IPB clearly supports the analysis of the interactive relationships seen within the psychosocial, biomedical and environmental domains of a mass gathering event as it does within a military operation.

Mapping IPB and the Planning Process

The mapping of the IPB process and demonstration of its applications to the event planning domain represent how improvement in the planning for pre-hospital care providers can be supported by an intelligence methodology.

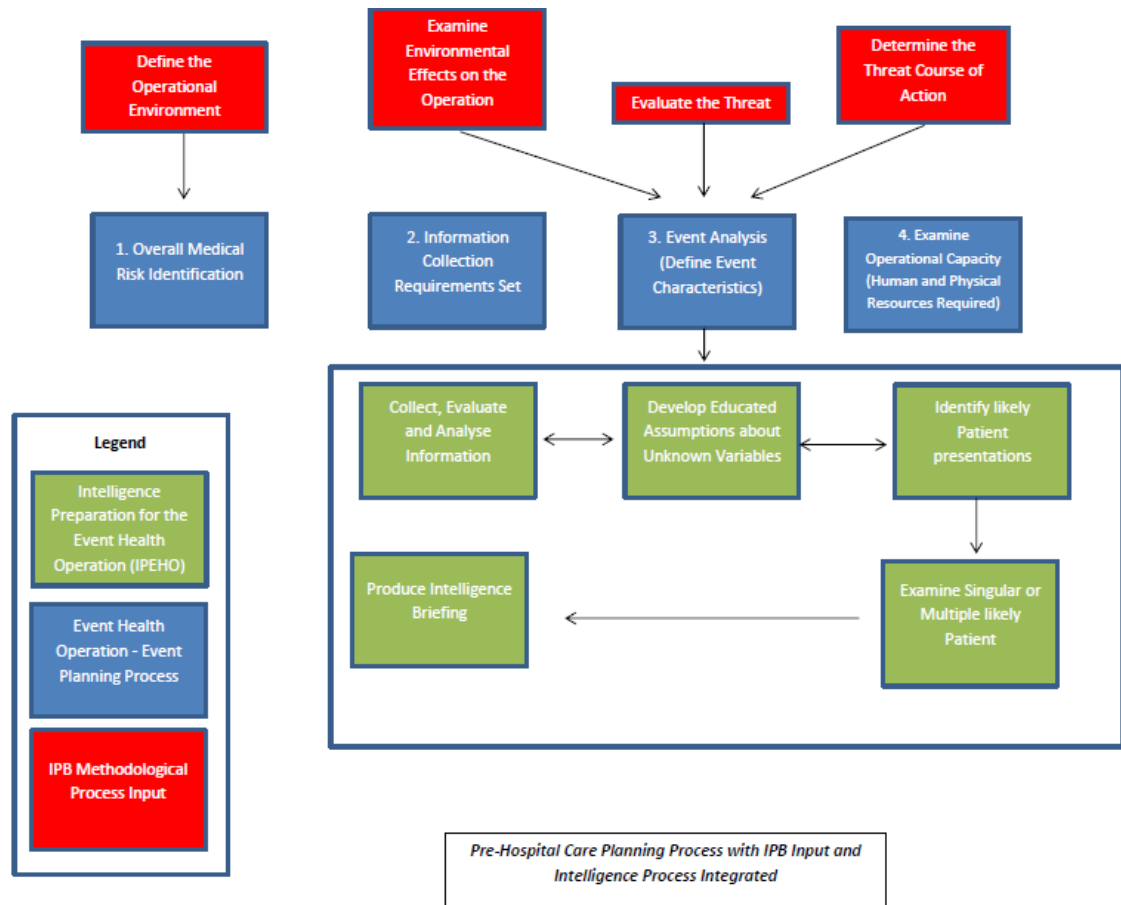


Figure 9- Pre-Hospital Care Planning Process with IPB Input and Intelligence Process Integration (Partial)

Figure 9 demonstrates how the IPB methodological process can be seen and reflected within the event health operation planning process. Currently within this planning process there is no consideration for the utilisation of analytical techniques traditionally seen within the intelligence domain. When overlaid it is clear that if integrated into the planning process IPB would ensure a greater focus is placed on the analysis of and definition of the characteristics of an event. This is supported throughout the academic literature by Arbon (2004) and Milsten et al. (2003) who re-iterate the need for greater analysis of the Psychosocial, Biomedical and Environmental variables seen within a mass gathering event with a two layered

analysis of the event and development of the operational or event plan (Arbon, 2004, p. 212).

Furthermore, Figure 9 also demonstrates that a basic intelligence cycle consisting of the planning & direction, collection, processing, analysis and dissemination stages (Gill & Phythian, 2006, p. 3; Hulnick, 2006; L. Johnson, 2007) would provide a greater level of valued added information to specific areas of a mass gathering care operation and planning steps. This integration of IPB methodological process and resulting intelligence process, termed Intelligence Preparation for the Event Health Operation (IPEHO), will allow for a greater consideration or third layer of analysis during the analysis of the event planning stage when investigating singular or multiple risk inputs. The analysis of singular or multiple risk inputs such as the likelihood of illicit drug use can produce an intelligence product to support the planning process, re-affirm the risk assessment and provide vital information for decision makers in a resourcing and clinical decision making capacity.

The IPEHO process would occur generally within the Event Analysis stage of the planning process (partial integration) but, as discussed later, if used extensively would be incorporated within the information collection requirements and event analysis stage of the planning process (full integration).

Pre-Hospital Care Planning Model with Full Intelligence Methodology Integration

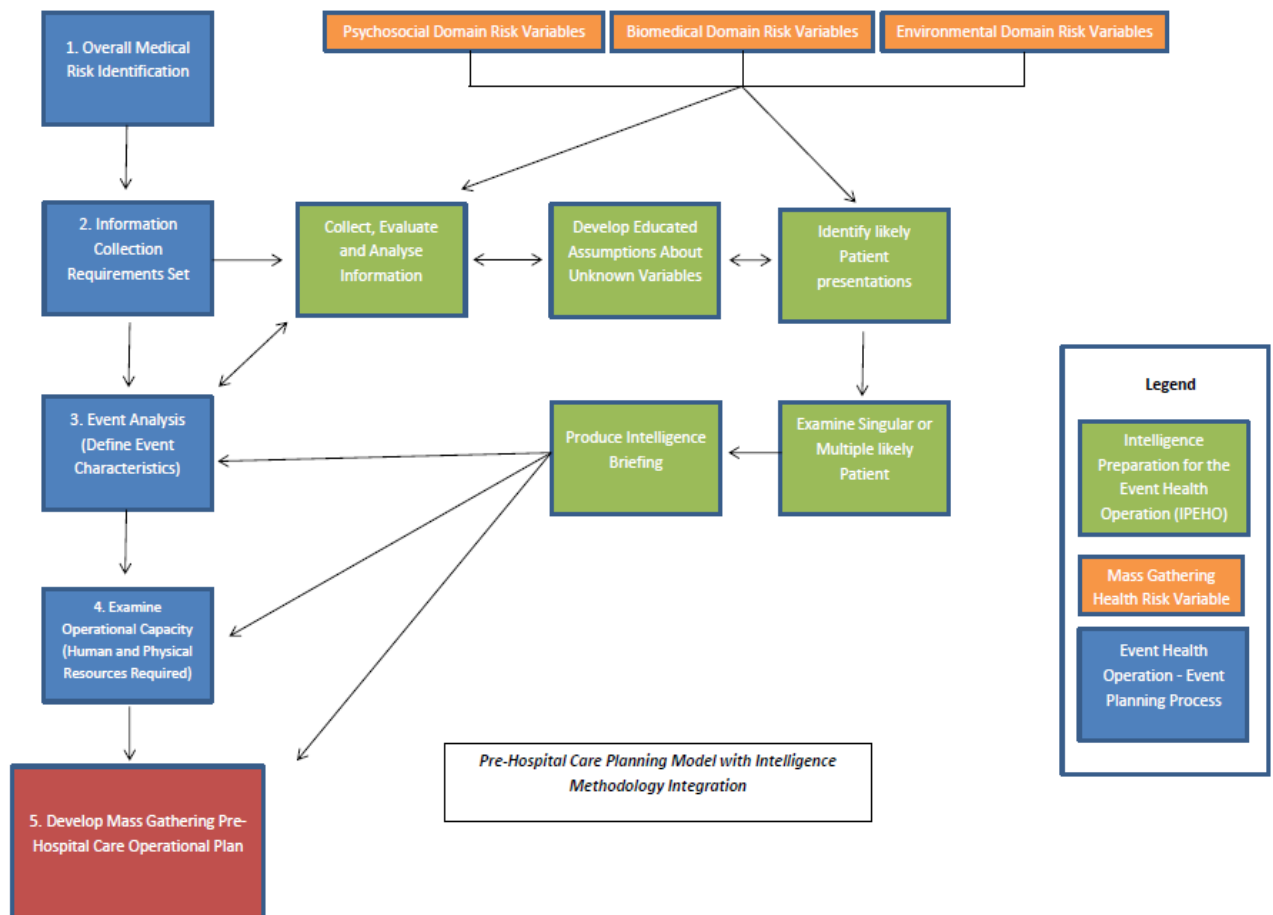


Figure 10 - Pre-Hospital Care Planning Model for Mass Gathering Events with Full Intelligence Methodology Integration (Full IPEHO)

The determined current SJAWA planning process features a broad five stage process that can be utilised and interpreted in a number of ways. Analysis of the current planning process has revealed a significant gap in the consideration for a number of risk variables and resulting risk input information. Arbon (2004), Hutton et al. (2011) & Milsten et al. (2003) presented a focus on three district risk variable domains; the psychosocial, biomedical and the environmental. These domains, similar to the analytical considerations within the IPB methodology (US Army Intelligence Center, 1993, 2009), allow for the categorisations of a number of risk inputs that potentially may have an effect on the impact pre-hospital care operation.

The application of the IPB methodology to the SJAWA planning process in conjunction with the consideration for the domains presented by Arbon (2004) in Figure 10 demonstrate a number of key improvements that will further improve the operational

planning efforts of SJAWA. After the initial identification of an overall medical risk, information collection requirements can be set beyond the traditional information required for the operational plan. As an integral part of the proposed model (IPEHO) in Figure 10, the full intelligence model integration would see an information collection requirement set based on a risk input such as a likelihood of illicit substance use.

This identification would then allow analytically trained members of the team to seek open source information to identify possible indications of the type, amount and likely effects X type of drug may have. This, in conjunction with the use of educated assumptions as seen within the IPB methodology, would then allow for the identification of likely patient presentation indicator, as well as numbers or rates of these presentations. Furthermore, information about X drug in conjunction with an analytical overview of other risk inputs would also see the identification of other potential patient presentations relating to other biomedical, psychosocial or environmental risk variables.

Improvement and Impact

By increasing the flow of valued added information to decision makers, as seen within the military domain (Holmes, 2012; Walker, 2011) and others (Gee, Coates, & Nicholson, 2008; Kostadinov & Kanev, 2009; Lahneman, Gansler, Steinbruner, & Wilson, 2006), the knowledge gained by decision makers and planners can allow for a more informed decision making process. Analysis of this model shows that at the operation planning stage of a mass gathering a number of key benefits from the input of intelligence informed planning or preparation, such as those proposed in Figure 10, will be seen as a result. In comparison to the standard planning process described in Figure 5, the two layered analysis of events that typically occurs as a result (Arbon, 2004) will have a third and more intensive and directed level of analysis added; thus improving the quality, relevance and impact of the information provided within an operational plan by SJAWA.

The measurement of improvement as a result of the implementation of the full intelligence model integration (IPEHO) can be determined through a number of comparisons. As highlighted within the Thoms Inquest (Mulligan, 2013) further information provided to volunteer first aiders at Big Day Out Perth 2013, in regards to

illicit drug use, may have better prepared the medical staff to assess and treat patients presenting with possible drug overdoses. Greater collection, analysis and communication of information to those who may not be aware of it, such as the SJAWA volunteer staff in the Thoms inquest, would increase the likelihood of an improved and tailored clinical approach to patients at the event. Adding further to this, SJAWA volunteers from Big Day Out Perth 2009 reported that if provided with more information or better training about illicit drugs the death of Miss Thoms may have been avoided (Mulligan, 2013, pp. 31-33). The proposed IPEHO model would provide this information with a level of detail beyond the standard information available publically with specific details about drug types, brands, possible contents and relevant clinical guidance to treat those affected thus becoming tailored and more relevant to it key objectives.

The identification of casual relationships between planning variables by Arbon (2004) highlights further how full intelligence model integration into the planning process would assist with the delivery of pre-hospital care at mass gathering events. The casual relationships posed by Arbon (2004) provide a significant insight into the potential risk inputs and their relationships to one another that may determine the likely patient presentations at events. For example, at Big Day Out Perth 2009 the maximum ambient temperature for the event was 35.8 degrees Celsius (Department of Health Western Australia, 2009, p. 111) and in-conjunction with the availability of alcohol and illicit drugs (Mulligan, 2013, p. 28) would have presented two clear risk inputs that would have an impact on the decision making process during the operational planning stages of the event.

Though this level of analysis may have occurred, it is the greater exploration of these risk inputs, their variable relationship with one another and potential outcomes relating to medical risk that demonstrate how IPEHO can provide an insight into the potential patient presentations on the day. This insight would allow for the adequate scaling up of clinical staff (in numbers and clinical qualification), the identification of potentially high use medical resources and an overview of possible information gaps that may be present previously unidentified risks. Overall the implementation of the methodological principles and process of IPB, in partial or full form, can have a significant and positive impact of the pre-event operational planning for pre-hospital

care providers. An increase in knowledge or information is essential within the military environment where intelligence informed proactive planning is key to the success of an operation and as demonstrated so too is the case with the implementation of military intelligence methodology to St John Ambulance WA Event Health Operations.

Conclusion

This chapter presented a detailed interpretation of the study's qualitative analysis of the St John Ambulance WA Event Health Operational Planning process as well as the findings relating to the introduction of the military intelligence methodology IPB into this process. Initially the contextual and established planning variables as well as inputs were highlighted utilising both government guidelines and academic sources to demonstrate a number of key planning variables and risk inputs seen with this domain. Subsequent analysis of the basic process as well as the introduction of the Arbon (2004) risk variables domains and IPB methodology have highlighted how improvement can be seen within a number of areas that are to be discussed in the following chapter.

Overall the study has benefited from the input of a varied range of sources and as a result a number of analytical findings have been presented. As noted earlier, due to the researcher being unable to access internal St John Ambulance WA planning documentation, the study's findings and accuracy rely on the available data. Though this data was not available the academic rigour applied to the use of sources and analytical techniques, including their triangulation and methodological considerations, have ensured that this study's findings have presented a strong basis for the answering of the posed research questions.

Chapter 5: Discussion & Conclusion

Introduction

This chapter will discuss the analysis and key findings of the study relating to the posed research questions. In subsequent sections of this chapter the results of the research findings in relation to the supporting questions and the principal research question are discussed, concluding the study's proposed implementation of IPB has found that the intelligence model would provide a greater level of valued added information during the planning and operational stages of a pre-hospital care operation at a mass gathering event. The study's outcomes have demonstrated the benefits of having intelligence fed decision making and planning process as seen within the military domain and similar recommendations by academics within the event pre-hospital care field.

Within this chapter the study's limitations and future research direction are also discussed, such as those relating to the inability to access internal SJAWA data and the possible further testing of the model presented. Recommendations are made, based on the outcomes of the study and a direction for further research within this domain will be presented. Finally a conclusive statement relating to the study is offered.

Summary of Study

This study has presented a case study and documentary analysis, supported by a constructivist theoretical framework, of St John Ambulance WA Event Health Services pre-hospital care planning processes for mass gathering events. The 2009 Big Day Out Perth and subsequent death of Gemma Thoms (Mulligan, 2013) as a result of the event demonstrated a significant need for this research to make an academic contribution to the current body of knowledge where gaps within the literature have been identified. In order to do so, the study's objectives required the review of literature and identification of gaps within the body of knowledge and the undertaking of in-depth case study and documentary analysis of government documentation and academic literature. Furthermore the identification of and analysis of the integration of the IPB methodology into the SJAWA planning processes was required as a result.

Principal Research Question

What is the viability of utilising all or parts of IPB concepts or methodology within the pre-hospital care operational environment at a mass gathering event?

The principal research question above was examined utilising case study and documentary analysis techniques demonstrating the overall viability of integrating IPB concepts and methodology into the planning practices within the St John Ambulance WA pre-hospital care environment at a mass gathering event.

The IPB concepts and methodological process are a crucial aspect to the modern day military operational decision making model and the adaptation of this tried and tested approach has significant merit within the mass gathering pre-hospital care environment. Firstly, as a specific guide to the application of an intelligence methodology to a domain beyond its origins, IPB is not only a complex task but reflective of the adaptive nature of intelligence based methodology. The adaptation of IPB into the pre-hospital care planning processes of St John Ambulance as demonstrated in previous chapters, and as supported by academic and government literature, can give an additional level of value added information for all levels of decision makers within the SJAWA Event Health Services team.

The concepts and overarching methodology found within IPB fills a significant gap within the planning processes within this domain identified earlier during a review of the literature chapter. Currently planning processes within this domain are reliant on the principals of Risk Management Standard ISO 3100:2009 (Standards Australia, 2009) and its predecessor Risk Management AS/NZS 4360:2004 Risk Management (Australian and New Zealand Standards, 2004) as well as various non-specific government guidelines relating more so towards the event organiser rather than the pre-hospital care provider (Department of Health Western Australia, 2004, 2009). The introduction of IPB methodology into the existing planning processes is a viable, cost effective and potentially lifesaving addition that will increase the decision makers' ability to assess the situation during the planning and operational stages of a mass gathering event.

This study demonstrates that the integration into existing planning processes, as seen within the military domain, is not only a viable but effective way to increase the operational preparedness of staff when preparing for and responding to medical situations at mass gathering events; a key recommendation and improvement seen at Big Day Out Perth 2013 as noted in the Thoms Inquest relating to the education of staff about illicit substances (Mulligan, 2013, pp. 35 - 39). The viable integration of IPB would allow for the identification and greater analysis of risk inputs that are identified during the risk assessment process of the event organiser and the pre-hospital care provider. It is highly likely that any intelligence product produced relating to an event such as Big Day Out Perth 2009 would highlight the need for a significant increase in clinical expertise, overall staff numbers and resources (Mulligan, 2013, p. 42), regardless of the risk assessment provided as a result of various tools within government guidelines (Department of Health Western Australia, 2004, 2009).

Secondary Research Question

What impact would the application of the IPB concepts or methodology have on the pre-hospital care operation outputs in on Big Day Out Perth 2009?

The secondary research question above was examined in addition to the posed principal research question. Like the principal research question, this secondary research question utilised case study and documentary analysis techniques to demonstrate and measure the impact the application of IPB methodology and concepts would have if applied to the St John Ambulance WA planning process and the operations outputs.

As demonstrated by the analysis presented in [Chapter 4](#), the integration of IPB methodology and concepts is not only a viable exercise but is also one that has a significant impact on the outputs or results of a pre-hospital care operation. An increase flow of value added information at the planning and operational stage of a mass gathering event would assist decision makers with a number of key areas. Analysis of the integrated models (Figure 9 & Figure 10) demonstrates how the traditional two layered analysis of planning and risk variables would now have a

directed and identified third level of analysis which would highlight specific psychosocial, biomedical and environmental factors and relationships that would impact the operation.

The identification of high drug use rates amongst the demographic attending Big Day Out Perth, the environmental conditions and likelihood of misrepresentation of age demonstrate how an analytical element to the planning process can identify a number of variables and relationships that impact the clinical aspects of the operation. By examining, analysing and identifying the likelihood of patient presentation as a result of these variables and their relationships the outcomes of Big Day Out Perth 2009 may have been avoided, as a tailored approach to the likely clinical presentations may have been developed. The development or insight into the likely clinical presentations as a result of the use of IPB methodology or concepts would impact the number of staff, clinical skill level, preparation of medical resources and efforts to inform those staff at mass gathering events such as Big Day Out Perth 2009 and others (Lim, Hellard, Hocking, Spelman, & Aitken, 2010; Moutia et al., 2014; Rosenthal & Smith, 1997).

Mulligan (2013) comments on the improvements made at Big Day Out Perth 2013 by St John Ambulance WA during the coronial findings of the death of Gemma Thoms. His comments highlight how a greater number of staff and an increased clinical skill level relating to St John Ambulance WA staff present at the event as well as the utilisation of a 'drug information sheet' to inform staff about the clinical presentations relating to illicit drug use (Mulligan, 2013, p. 37). The events of Big Day Out Perth 2009 and resulting changes at the Big Day Out Perth 2013 demonstrate how the full integration of IPB concepts into the St John Ambulance WA planning processes can assist with the development or identification of mitigation strategies in a pro-active manner rather than a re-active manner; potentially saving a life and improving the service delivery demanded of St John Ambulance WA by the community and its clients.

Overall the implementation of the methodological principles and process of IPB, as demonstrated within the study can have a significant impact on the operational planning of St John Ambulance WA. Any increase in knowledge or information is essential within many domains as shown by the use of IPB in the military domain and now the use of its concepts and methodology in the pre-hospital care mass gathering

domain, where proactive planning practices and greater support of operational decision making can allow for the best possible chance of success on the battlefield as well as at a mass gathering event when attending a medical emergency.

Recommendations Based on Study Results

The study highlighted the potential positive impact the introduction of IPB concepts and methodology can have on the planning and operational aspects of St John Ambulance WA Event Health Services at a mass gathering event. The review of academic literature, government documentation, coronial findings and the resulting analysis within the study has led to the identification of the following recommendations based on the results within. These recommendations are as follows:

1. Review of government guidelines relating to the planning and provision of pre-hospital care at mass gathering events (Department of Health Western Australia, 2009) with the possible production of in-depth guidelines or best practices relating to all stages of the provision of pre-hospital care at a mass gathering event.
2. The introduction of IPB concepts and methodology to promote intelligence driven and supported risk assessment and operational planning.

These recommendations, as a result of this study, require further research and the conducting of a cost vs benefit analysis as well as an impact study on the implementation of the above recommendations for all stakeholders. Initial indications from this study and the Thoms Inquest (Mulligan, 2013) demonstrate that this is required to pro-actively prevent further deaths at or as a result of mass gathering events such as Big Day Out Perth 2009.

Limitations and Strengths of the Study

Methodological limitations and strengths have been recognised within this study, thus presenting a future direction for research within this domain. The collection of data from academically sound sources in the open source domain was key to the success of this study, even more so as a result of the inability to access internal St John Ambulance WA documentation. Access to this data, as a result of a number of internal St John Ambulance WA Ltd time frames and the significant loss of the head of the research advisory board has resulted in this access to documentation with ethical approval unavailable within the required time frame of this study.

This resulted in a change of focus from for the primary collection of information to establish the SJAWA planning processes from SJAWA documentation to a greater reliance on information from the publically available body of academic and government literature. This shift in focus proved to be beneficial for the study as the analysis of government guidelines (Department of Health Western Australia, 2004, 2009) presented a number of contextual gaps within the domain supported by current academic literature. As a result of this limitation within the study a foundation for future research examining government guidelines in Western Australia that are utilised by pre-hospital care providers in a mass gathering context is now demonstrated as a clear gap or fallacy within the domains body of knowledge.

This inability to access internal St John Ambulance WA has limited the scope of the study to further validate the analytical findings within the study in the context of the Big Day Out Perth 2009. This limitation, though minor, shifted the study's primary focus from case study analysis to documentary analysis and qualitative validation from a variety of sources. Limitations relating to the time restrictions of an honours project also contributed and have impacted the studies ability to a conduct cross-country analysis of the Big Day Out series around Australia in 2009 as well as the presence of a comprehensive coronial investigation such as seen within the Big Day Out Perth 2009 case (Mulligan, 2013).

With this restriction in mind, a recent publication by Moutia et al. (2014) focusing on the operational aspects of World Youth Day 2008 in New South Wales provides a solid insight of the likely operational planning process undertaken by St John Ambulance

Western Australia Ltd. Furthermore, this paper and others by Luke (2011) and Dutch et al. (2008) demonstrates the tendency for St John Ambulance, on a national level, to plan major operations for mass gathering events based on previous experience, organisational traditions and established policies (Moutia et al., 2014, p. 3; Woodall et al., 2010, p. 443). Though this may be the case for St John Ambulance NSW, the dynamics and structure of St John Ambulance WA Ltd as not only a first aid training and event pre-hospital care provider but the state's ambulance service contractor will have an effect on the way in which operational planning, medical risk assessments and operations are carried out; thus eluding to the need for access to SJAWA documentation to bridge this gap in the literature and to validate the results presented in future studies.

This study also contains a number of general methodological limitations as a result of the research's design is seen as a set of academically acknowledged limitations. These general limitations to case study and documentary analysis research designs include the possible inability for the researcher to control or recreate variables in an identical fashion due to a number of changing variables (Yin, 2014), the need for secondary data to validate and support the analysis of the case study documentation presented by other researchers may not be specific to the event and limited (Creswell, 2014; Yin, 2014). The identification and awareness of these limitations has allowed the researcher to ensure that the risks associated did not negatively affect the studies academic rigour or integrity.

Within the current study a number of strengths have been acknowledged. Firstly, the study has made an original contribution to the academic body of knowledge by examining the planning processes of St John Ambulance in a critical manner as well as applying a traditionally military methodology to this process to improve its outcomes and practices. Secondly, the study utilised case study and documentary analysis across a range of fields to fill a knowledge gap presented by a key limitation whilst allowing for a sound corroboration of findings as a result of strong academic inquiry. Third, the study utilised a proven intelligence methodology and applied its concepts to the planning processes to demonstrate a potential positive impact on the end result similar to its results within the military domain. Fourth, the study used a sound knowledge of academic methodological principles and analytical techniques to

produce findings within the requirements of academia and academic inquiry. Finally, this study acknowledges its limitations and presented an original contribution to the domains body of knowledge with a positive significance to a real world and contemporary issue.

Directions for Future Research

The current study demonstrated a gap with the contemporary body of knowledge but also served to narrow the gap pertaining to the integration of IPB concepts and methodological processes into the St John Ambulance WA Event Health Services operational planning processes for mass gathering events. As a result of the findings and recommendations of this study a number of future avenues of study are presented. Further research incorporating internal St John Ambulance WA data such as a review of training for staff, interviews with planning or operational staff and the measuring of impact the communication of value added intelligence rather than information would be beneficial to the identification and validation of this study. In addition to this, the further studying of the relationships between various planning variables and risk inputs would allow for the identification of related clinical indicators for planners thus triggering the most appropriate response driven by increased utilisation of value added information or intelligence products. Finally, the in-depth quantitative and qualitative analysis over an extended period of time consisting of a broader range of event samples and patient presentation data sets would allow for the further validation of this models impact.

Conclusion

The current study has presented a number of recommendations for improvement as a result and with consideration of its limitations mentioned previously, a foundation for future research has become evident. The current study demonstrated how the application of IPB's methodological processes or general intelligence practices to the St John Ambulance WA planning processes for mass gathering event operations is a viable and beneficial exercise. The study has concluded that, as demonstrated by the Big Day Out Perth 2009 case study variable comparisons, that the implementation of IPB methodological processes would provide greater levels of information for utilisation during operational decision making situations at all levels and stages. As discussed within the study's findings and supported by analysis of the Thoms inquest

(Mulligan, 2013) that improvements to the communication of relevant, quality and value added information in the form of intelligence to staff may see critical incidents prevented in the future as a result. The integration or introduction of IPB into the planning processes of SJAWA would be significant and valuable in terms of impact, providing a viable method of improving the service delivered by St John Ambulance WA at mass gathering events such as Big Day Out Perth 2009 and possibly other pre-hospital care operations. This study has demonstrated that the integration of an intelligence informed decision making and planning set of processes at all stages of the operation, as a result of the incorporation of the IPB methodology, would be beneficial to SJAWA, its clients and the patrons at mass gathering events in Western Australia.

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Appendices

Appendix A - Medical Resource Planner (Department of Health Western Australia, 2009, pp. 102 - 103)

Medical Resource Planner

Event size	Casualty Range*		Ambulance*		Presentations/hour*		First Aid Posts	Staff
	Probable	Possible	Probable	Possible	Probable	Possible		
500	5	10	0	0	0.5	1	1	2
1000	10	20	0	0	1	2	1	4
2000	20	40	0	1	2	4	1	6
3000	30	60	1	1	3	6	1	7
4000	40	80	1	2	4	8	1	8
5000	50	100	1	2	5	10	2	10
6000	60	120	1	2	6	12	2	11
7000	70	140	1	3	7	14	2	12
8000	80	160	2	3	8	16	2	13
9000	90	180	2	4	9	18	2	14
10000	100	200	2	4	10	20	3	16
12000	120	240	2	5	12	24	3	17
15000	150	300	3	6	15	30	3	18
18000	180	360	4	7	18	36	3	19
20000	200	400	4	8	20	40	4	22
25000	250	500	5	10	25	50	4	24
30000	300	600	6	12	30	60	4	28
35000	350	700	7	14	35	70	4	30
40000	400	800	8	16	40	80	4	32
45000	450	900	9	18	45	90	4	36
50000	500	1000	10	20	50	100	4	40

NOTES:

1. "Staff" referred to in the end column refers to staff required for the effective operation of the first aid plan and may include doctors, paramedics or first aiders as the plan determines.
2. Actual medical requirements must be determined in accordance with a comprehensive plan that identifies likely issues and realistic treatment responses.
3. These rates are based on a 10 hour event. The minimum rates are almost certain to be achieved. For dance events the higher ranges are often reached
4. Each first aid post requires at least 2 first aiders plus 1 for reception/triage and consideration must also be given for retrieval teams, breaks and co-ordination with other agencies.
5. Hourly rates are based on an average across the event; in practice presentation rates are generally slow for the first 2 hours and then ramp up thereafter.
6. The 2009 recommended staffing levels are a guide; the actual requirements must be determined by a comprehensive medical plan which will consider the identified risks, site conditions, ambulance response and time to transport casualties to tertiary treatment.
7. Ambulance patients allow 2 people 30 minutes minimum per patient.
8. Other referred patients 2 people 20 minutes per patient.
9. All other casualties allow 5 minutes, 1 person.
10. Allow a minimum 2 paramedics per first aid post after 4000 patrons

***Appendix B - Risk Considerations for Planning Medical and First Aid Resources
& Risk Tool Logic (Department of Health Western Australia, 2009, pp. 107 -
109)***

Risk Considerations For Planning Medical And First Aid Resources

The following issues are included to assist with identifying hazards that may be applicable to events.

Event

Identify any hazards associated with the event or primary purpose?

Identify any inherent dangers to participants/entertainers.

Identify any dangers caused by crowd interaction with the entertainers or other segments of the crowd.

Identify if there are any other concurrent events that may cause delays to emergency responders or unduly interrupt event access and egress both before and after the event.

Venue

Are there any environmental hazards within the venue or near vicinity?

Does the location cause any delays with regards to transport of staff or the injured?

Are there multiple areas of interest, or crowd segments that need to be staffed separately?

Is the event a regular occurrence at this site?

What services/utilities are available?

What temporary services/utilities are required?

Are backup resources required?

Are there existing designated emergency evacuation routes or do these need to be established?

Are there any dangers associated with these routes?

Is there parking for those vehicles (And turning space)?

What is the topography of the venue? What dangers can this bring?

Is off road transport required?

What staffing issue does this raise?

Crowd

What numbers are expected (and when)?

What age range are the crowds expected to be? What problems can this cause (elderly – medical conditions, young – fighting)?

Is the nature of the entertainment likely to cause the crowd to crush?

Are there likely to be mobility impaired persons there?

Is the crowd likely to be drinking or using drugs?

Is any of the crowd likely to be carrying weapons?

What is the ethnic composition of the crowd?

Appendix B - Continued

Are cultural issues involved or interpreters needed?

Can any of these problems or resulting dangers be prevented?

Weather

What type of weather is it likely to be - before, during and after the event?

What effects can the weather have on the crowd, entertainment and your staff?

What effect can the weather have on resources, transport and communication?

Timings

What time is the event being held?

How long does it last for?

Will staff require shifts, rest periods, meals etc?

Communications

What communications are there between essential stakeholders?

Have the communications been tested?

Do you have redundancy in your communication systems?

How does request for support with regard to patient transfer or other requirements occur?

How will batteries be recharged?

What call signs/frequencies etc have been allocated for radios?

Will communications interfere with the event broadcast systems?

Does the local Ambulance Operations Centre know of your key locations?

Is there a command/coordination centre for services on site?

Are support services such as hospitals aware of this event?

How will hospitals be notified if they are required to respond?

Transport

How will patients be transported to on site medical centres?

How will patient transfers to hospital or other places be arranged?

How will staff get to and from the site?

What access and egress routes should routine/emergency transport follow?

Medical Plan and Coordination

Has a copy of the medical plan been provided to the event organiser and the Health risks included in the Risk management plan?

Have the medical/first aid providers been invited to attend the pre-event planning meetings, briefings, and post op debrief?

Have regular briefings throughout the event been organised?

Appendix B - Continued

Risk Classification Tool Logic

Number of people = Number of patrons, does not include staff

The number of patrons is a critical issue, the more people that attend, the greater the risk that something may go wrong.

Up to 100 people are a relatively minor risk but at 200 there is a far greater risk.

For assemblies of 1000 people there is an acute risk and all such assemblies should be subject to an approval process. Accordingly an automatic approval requirement is triggered as soon as this threshold is reached.

Numbers above 1000 are included to show degrees of risk and have a bearing on surveillance.

Entry Restrictions

Private family functions are considered to be relatively safe and it is not an area where regulation is preferred. However recently some private functions have been uncontrolled and serious issues have occurred. Other contributing factors need to be considered before formal public building approval is required.

It is recognised that general admission, free events and those available to the general public represent a significant risk as there is no prior knowledge to determine how many may attend and it is also difficult to control them without prior seating allocations.

Crowd Dynamics

Healthy – active interaction between patrons and the entertainment e.g. club sporting fixture, Neil Diamond concert

Hostile – interaction between patrons and entertainment e.g. Kylie Minogue

Harsh – hostile interaction between patrons and entertainment e.g. National sporting competitions, motor races, rodeo, rock concert and the like.

Lighting

Places with dimmed or extinguished lighting are a high risk. Therefore the threshold is set at the level required for them to be formally approved.

Duration

The longer the event the greater opportunity a risk may develop.

The time that public will attend the event e.g. a concert with overnight camping would = 24 hours.

Structures

Structural stability is critical and there is a greater risk applicable to a temporary structure. Therefore temporary facilities attract more points than permanent facilities

All seating stands should be formally approved; therefore a seating stand automatically exceeds the approval threshold.

Appendix C - Planning Variable and Risk Input Analysis - Working Tool

Planning Analysis - Working Tool					
Planning Variables		Risk Inputs			
Medical Risk Classification Category - Event Medical Planning Variables for Consideration (Department of Health WA, 2009 p. 36 - 40)	Event Medical Planning Variables for Consideration (Milsten et al., 2003)	Department of Health WA Risk Inputs (Department of Health WA, 2009 p. 36 - 40)	Risk Inputs & Planning Factors	IPB Risk Inputs & Planning Factors	
Event Description	Event Type	Cat 1: Classical Music / Children's Concert / Youth Camps Cat 2: Family events & shows / local sporting events / schoolies Cat 3: Festivals / major sporting events Cat 4: Rock concert / extreme sporting events	Music: Drugs, alcohol, duration, mobility, age Sports: Alcohol, hazards for sports	Economic	
				Social	
				Infrastructure	
				Physical Environment & Time	
Number of People	Attendance	< 2000 2001 - 5000 5001 - 10,000 10,001 - 50,000 50,001 - 100,000 > 100,000	Dilutional Effect Staffing Levels Fixed Location Events, may anticipate attendance by past events or ticket sales Crowd size predictions for one-time events is haphazard Crowd size predictions for one-time events is haphazard	Social	
				Troops & Support Available	
				Civil Considerations	

Type of People Attending	Crowd Mood	Families	Music Type	Social - Demographics
		International stars / competitors / visitors	Revival Aspect	Civil Considerations
		Fan clubs / support groups	Team Rivalry	
		VIPs		
Age Group	Age	30 - 65 inc family	Behaviour & judgement	Social - Demographics
		>65 / 0 -12 years of age	Frailty & vulnerability	Civil Considerations
		12 - 16 years of age		
		16 - 30 years of age		
Event Location / Confinement	Outdoor vs Indoor	Outside - Open area	Exposure to Temperature extremes Exposure to sun and geographical objects Crowd Mobility	Physical Environment - Weather
		Outside - Confined area Inside - Space Inside - Crowded		

Not Considered	Seated vs. Mobile	Not Considered	Exposure to Hazards when Mobile Increased Crowding when Mobile Risky Behaviour	Battle Space Evaluation Terrain
Not Considered	Crowd Density	Not Considered	Increased exposure to microbes Effects on mood Decreased access to patients Decreased access to water, family and bathrooms	Battle Space Evaluation - Terrain
Available Health Resources	Available Health Resources	Tertiary Hospitals Regional / General Hospitals Integrated district health services Small hospital or Multi purpose centre	Not Considered	Battle Space Evaluation - Terrain

Distance to local health resource	Distance to local health resource	<p>< 10kms</p> <p>10 - 50 kms</p> <p>50 - 100 kms</p> <p>>100 kms</p>	Not Considered	Battle Space Evaluation - Terrain
Time to tertiary health resource	Time to tertiary health resource	<p>< 30 mins</p> <p>31 - 60 mins</p> <p>61 - 90 mins</p> <p>91 - 120 mins</p> <p>121 - 151 mins</p> <p>> 153 mins</p>	Not Considered	Battle Space Evaluation - Terrain
Duration of the Event	Duration of the Event	<p>< 1 hour</p> <p>2 - 4 hours</p> <p>4 - 8 hours</p> <p>8 - 12 hours</p> <p>12 - 24 hours</p>	<p>Extended Exposure</p> <p>Incubation Periods Elapse</p> <p>Increased Exhaustion</p> <p>Cumulative Morbidity</p>	Time Available
Alcohol & Probability of Drugs	Alcohol & Drugs (Combined)	<p>[Alcohol] - None</p> <p>[Alcohol] - Restricted</p> <p>[Alcohol] - Readily available</p> <p>[Alcohol] - No controls</p> <p>[Drugs] - None</p> <p>[Drugs] - Possible</p> <p>[Drugs] - Probable</p>	<p>Toxicological effects of poly-substance abuse</p> <p>Misrepresentation of drugs</p> <p>Drug-drug interactions</p> <p>Dose and route - binging at the gate</p> <p>Decreased coordination and judgement</p> <p>Increased Violence</p> <p>Direct physiological effects</p>	Social - Demographics & MEDINTEL

Time of the Event	Not Considered	Morning Afternoon Evening All day	Not Considered	Physical Environment - Weather
Season of the Event	Weather	Spring / Autumn Summer / Winter	Heat & Cold Exposure Lighting Precipitation	Battle Space Evaluation
Not Considered	Locale/Physical Plant	Not Considered	Barriers to ingress & egress Protection from the elements Exposure to hazards	Not Considered