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Research on the Characteristics and Emergency Capability Assessment Index System of Urban Metro Violent Incidents

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Abstract

The metro system, which is the symbol of urban civilization, has become the focus of terrorist gangs and terrorists in creating terrorist incidents currently. This article counts 19 typical metro violent incidents that have taken place in the world since 2001, and analyzes the characteristics of the metro violent incidents in terms of attacking methods, attacking tactics, attacking locations and attacking time. Based on the theory of emergency management life cycle, we construct an emergency capability assessment index system of metro violent incidents, which includes terrorism prevention capability, terrorism dealing capability and terrorism resilience capability.

Keywords

City Safety, Terrorism, Metro Violent Incidents, Characteristics, Emergency Capability Assessment, Index System

1. Introduction

Urban metro has become an important means of transportation for modern urban residents and become the pulse of the development of a city because it is not easy to cause traffic congestion, large passenger load, fast speed, wide coverage of lines, and so on. China's urban metro has entered a new stage of comprehensive development. By 2017, a total of 30 cities in mainland China opened urban rail transit operation, totaling 133 lines, and the total length of operation lines reached 4152.8 km, of which the length of metro lines reached 3168.7 km, accounting for 76.3%. However, while serving the public, the risks of the metro are also getting worse. With the gradual increase of metro passenger flow, metro

stations and metro cars have become highly crowded places at some times. In addition, some cities have a weak foundation for subway safety. The level of subway emergency management is incompatible with the requirements of modern urban development. As a result, great security risks are hidden and become a new venue for violent terrorists to commit crimes against crime and retaliate against the society. According to incomplete statistics, since 2001, a total of 19 typical metro violent terrorist incidents occurred around the world, resulting in that about 525 people were killed and 2951 injured. An average of 31 people were killed and 174 injured in each accident. Thus, violent terrorist attacks have become a major threat to the safety of urban metro. In the current perspective of risk society, the cultivation and promotion of emergency response ability is undoubtedly the key to effectively prevent and respond to metro violent terrorist incidents. First of all, we need to have a clear and comprehensive understanding of the emergency response ability of metro violent terrorist incidents, and then achieve the purpose of improving the comprehensive response ability of institutions or organizations to metro violent terrorist incidents. The establishment of metro emergency response assessment system can provide an effective tool and uniform standard for evaluating the emergency capability of metro violent and terrorist incidents, and make clear the advantages and disadvantages of the relevant responsibility groups in the metro emergency management system, which has important scientific value and practical significance (Lu & Peng, 2012).

2. Core Concept of Metro Violent Incidents

Literally speaking, violent incidents means terrorist activities, such as assassinations, explosions, poisoning, hostage-taking, hijacking of vehicles, etc., through acts of violence or threats of violence. Federal Bureau of Investigation (FBI) defined a violent terrorist incident as "an act of violence against the government or the public in violation of the criminal law of the United States or any country and the use of violent means to achieve political or social ends" (Federal Bureau of Investigation, 2005). At present, there is no consistent definition of violent terrorist incidents, which is often related to terrorism. According to *The Anti Terrorism Law of the People's Republic of China*, terrorism refers to "the use of violence and intimidation to deliberately create social panic, endanger the safety of public life and property, or threaten government organs in order to achieve their political, ethnic, religious and other purposes".

Furthermore, considering the characteristics of metro rail transit system, this paper considers that city subway violent terrorist incident refers to the violent attacks that occur within the subway transportation system and violate or attempt to endanger the safe operation of the subway transportation system or the life and property safety of the ordinary people in the subway transportation system through illegal means such as violence, sabotage and intimidation.

3. Analysis on Characteristics of Metro Violent Incidents

This paper takes the urban subway violent incidents as the research object, with the subway violent incidents, subway attacks, metro violent incidents, metro attacks, metro Violent incidents, etc. as the key words, using Google, known network, VIP, Wanfang, EBSCO, Web of Science and other search tools to collect and sort out the 19 typical subway storms that occurred in the world since 2001, see Table 1 for details. Below will combine the global metro violent terrorist event, and from four aspects including the attack mode, the attack strategy, the attack specific location and the attack time concretely analyze metro violent terrorist incident characteristic.

3.1. Main Attack Mode of Metro Violent Terrorist Incidents

Throughout the world, terrorist activities which have taken place mainly include bombings, kidnapping and hostage-taking, armed attacks, hijacking and hijacking of vehicles and ships, assassinations, poisoning and destruction of computer information systems. Of these, bombings, armed attacks and attacks on critical infrastructure are the main means or sites of attack (Guo, 2007). As an important infrastructure for modern transportation, the metro system is often the focus of attention of violent terrorist groups or extremists. At the same time, the violent nature of incidents highlights the extreme violence of their means, violence often depends on the body, technology, equipment and weapons, etc. Whether the tools and means are advanced determines the effectiveness of violence (Huang, 1989). Metro violent terrorist attacks also need to use the relevant tools or weapons. Statistics on the attack modes of the typical global subway terrorist attacks since 2001 (as shown in Figure 1) shows that at present, the main types of attacks used by terrorists in the urban metro system are explosion, arson, chemical attack, and knife attack. Among them, the use rate of explosion is the highest, accounting for more than 1/2, followed by arson, accounting for more than 1/4. Gas and knife attacks are also commonly used by violent terrorists.

1) The explosion. Explosive activities are the most frequent acts of violence in the metro. Terrorists often carry bombs into the metro and place them in hidden areas, which are detonated by the rush of people in order to undermine public safety and achieve their political goals. As the explosive activity is destructive and will cause a large number of casualties, it is bound to arouse the high concern

Table 1. Summary of metro violent incidents at home and abroad since 2001.

Time	Attack on specific locations	Way of attack	Casualties	After the attack
2001.09	Montreal Montreal Downtown Subway Station	poison gas	40 injured	Rare Tear Gas Attack on Passengers at Subway Station
2003.02	Daegu Metro, South Korea	Arson	134 dead and 136 injured	A man spills combustibles and ignites and then flees

Continued

2003.07	Brooklyn Metro, New York City, USA	Arson	Dozens injured	A fire broke out in the subway. Dozens of passengers were sent to the hospital for treatment due to smoke inhalation
2003.11	New York City Subway	Explosive gas	6 injured	Unexplained substance emits odor gas after explosion, and immediately smokes 6 subway pipeline operators
2004.01	Hong Kong MTR Admiralty Station	Arson	14 injured	A mental patient ignites flammable liquids based on revenge mentality
2004.02	Russia Moscow City Metro	Suicide explosion	50 dead and 130 injured	At peak hours of work, terrorists used 4 to 5 kilograms of TNT explosives to carry out terrorist attacks
2004.03	Madrid City Metro, Spain	Chain explosion	190 dead and 1500 injured	In the morning, 10 explosive incidents occurred in the four commuter trains. The attacks were carried out by al-Qaida terrorist organizations
2004.08	Moscow City Metro Station, Russia	Suicide explosion	10 dead and 51 injured	A female suicide attacker detonates explosives on the crowded subway station
2005.07	London, UK Metro	Chain explosion	52 dead and more than 700 injured	Six subway stations in London were blasted during morning peaks
2010.03	Russia Moscow City Metro	Suicide explosion	41 dead and more than 70 injured	Two suicide bombers blew themselves up during Moscow's peak commuting period
2011.01	China Guangzhou Metro Line 5	Arson	4 injured	A arsonist lit a small gas tank
2011.04	Minsk, Belarus Metro	Bomb explosion	15 dead and 204 injured	The two attackers first placed home-made bombs under a seat in the subway platform. When the train entered the station, the remote bomb was used to detonate the bomb
2014.05	Taipei Jiangzi Cui Station	Knife attack	4 dead and 21 injured	The attackers chose to commit crimes on the Taipei MRT Bannan line with numerous crowds
2014.06	Cairo Metro, Egypt	Chain explosion	5 injured	The attacker placed the explosive device in the trash can of the subway platform in advance and detonated during the morning crowding of the peak passengers.
2014.10	China Guangzhou Wanshengwei Subway Station	Knife attack	2 injured	An attacker slams two passengers with a kitchen knife and flees
2015.12	Flyover near Istanbul metro station, Turkey	explosion	1 dead and 1 injured	A sudden explosion occurred during the busy hours of the evening and the bomb made by the “earth-made iron pipe bomb”.
2016.03	Metro station near EU headquarters in Brussels, Belgium	Chain explosion	15 dead and 10 injured	About three terrorists make three consecutive explosions during peak hours
2017.02	Hong Kong MTR Tsuen Wan Line	Arson	1 dead and 18 injured	A psychiatric patient burns a self-ignition oxidant
2017.04	St. Petersburg, Russia Metro	Suicide explosion	16 dead and more than 50 injured	Premeditated terrorist attacks may be associated with religious extremist groups

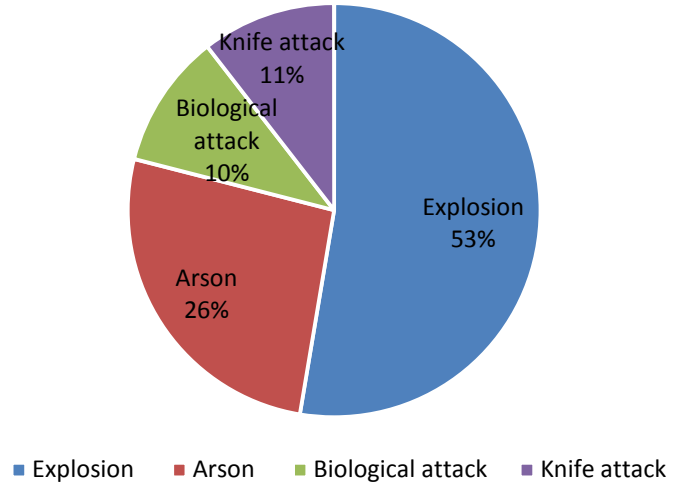

Figure 1. Main attack patterns of metro violent incidents.

of the government and public opinion, thus becoming the first choice for the violent terrorist elements to create the metro storm. At present, violent terrorists or violent terrorist groups mainly use the form of bomb explosion, suicide body bomb explosion, remote control explosion, self-made bomb explosion and other forms of metro explosion terrorist activities. Among them, suicide bombing uses the form of suicide, hides the device on the human body and carries it into the metro, then detonates the bomb near the target group (Shen, 2016). Because of the strong flexibility and great harmfulness of human body bomb, it is easy to cause great social panic. At present, it has been accepted and used by more and more violent terrorists abroad, especially female suicide bomber. In 2003, Israel captured 405 "suicide bombers". In addition, Chechen female suicide bombers were responsible for a number of major terrorist incidents in Russia in 2004, which are known as "Black Widows".

2) Arson. The arson is caused by violent terrorists who carried unknown sources of fire into metro cars and deliberately set fire, causing panic among passengers and causing a large number of casualties. Due to the small space and dense staff of metro cars, arson may also cause secondary disasters such as crowd stampede, and its social impact is very bad. In February 18th 2003, a mental patient in Daegu, South Korea set fire in the metro regardless of passengers' dissuasion, killing at least 134 people and injuring 136. In July 19th 2003, a fire broke out on the metro in New York City, and dozens of passengers were admitted to the hospital because of heavy smoke.

3) Biological attack. The main manifestations of chemical and biological attacks in metro are violent terrorist groups or individuals releasing biochemical toxic gases with bacteria, viruses, toxins and other casualties in metro sites. Biological warfare agents and chemical agents are extremely destructive and hidden. After their release, ordinary people are even difficult to detect for a short period of time, so violent terrorists often use this method to create mass destruction incidents, such as the sarin gas incident on the Tokyo metro on March 1995. The

distribution of sarin gas on the five trains of the Tokyo metro by members of the Om Shrine cult resulted in 13 deaths and more than 5510 injuries, causing serious social consequences.

4) Knife attack. In the case of a metro riot, if a violent terrorist group or individual decides to use a knife to launch an attack, he will generally use a certain lethal weapon, such as a control knife, to carry out an attack by means of stabbing, chopping, and so on. The instant killing power is less than explosive violent terrorist attack, and the scope of killing and killing is smaller than biological attack, arson and so on. However, domestic violent terrorist cases show that knife attacks can also easily cause panic among passengers, spread social panic, and even lead to serious consequences such as stampede. In October 2014, an assailant in the ticket office in the metro station of Wanshengwei in Guangzhou, China, escaped after cutting two passengers with a kitchen knife, causing two people to be injured and resulting in great public panic at the same time.

3.2. Metro Violent Terrorist Attack Strategy

Any form of terrorist attack, whether organized or individual, requires secret planning. The exposure of vulnerability in the development of urban metro provides more options for terrorists, but at the same time, the security, intelligence and other counter-terrorism work of urban metro is also further enhanced. It actually reduces the exposure and sensitivity of potential targets. Therefore, the terrorist attack launched in the city metro must have targeted attack strategy to ensure the success of the attack. Through the analysis of the typical metro violent terrorist incidents, terrorist attacks in the strategic level have the following two main characteristics.

1) "Grass-rooted" metro attacks. Today, terrorist groups, including al-Qaida and the Islamic State, have generally accepted such tactics, the main manifestation of which is the frequency of "lone wolf" terrorist attacks. The attackers can act alone, not under or at the command of a terrorist organization, and the planning and execution of the operations are not directed by the outside world. However, the emphasis on "individuals" and "clear links to terrorist organizations" shows that the number of "lone wolf" terrorist attacks has increased rapidly from relevant data and recent metro incidents in Europe and the United States and that such attack has become a major threat to the safety of metro in Europe and the United States. In the April 2017 metro bombing in the Russian city of St. Petersburg, violent terrorists acted alone and set off suicide bombs inside the metro cars, with a motive linked to extreme Islam. Compared with the group metro terrorist attack, the "lone wolf" terrorist attack has the characteristics of small casualties and difficulty to predict and control, so the "lone wolf" terrorist attack is more likely to be copied by terrorists.

2) The metro raid carried out "at the same time". While the "grassroots" trend of the metro terrorist attacks is increasing, the destructive power and influence of the organized terrorist attacks are also increasing. One of the outstanding

features is that the terrorist attacks are carried out at the same time. The so-called "multiple points at the same time" means that terrorists do not have a unified target at the time of the attack. Each person searches for the target separately and launches an attack on the target one after another within the agreed time frame, so that the attack takes place in different areas within the same time period. This feature can be seen, in particular, in the London bombings of July 7 and the Brussels bombings on 22 March. On July 7th 2005, six metro stations in London were hit by explosions during the morning rush hour. In March 22nd 2016, terrorists in Brussels International Airport and the European Union Headquarter near the metro caused three explosions. The reason for the terrorists to choose this attack strategy is to maximize the attention of metro security forces, improve the success rate of attacks, and expand the loss of life and property and social influence.

3.3. Location of Metro Violent Terrorist Attacks

When planning a violent terrorist attack, a violent terrorist group or individual will stampede the target metro station several times for the purpose of observing which areas are best suited to attack in order to increase saturation and maximize social impact. Violent terrorist groups or individuals generally choose densely populated areas of the station to carry out attacks. Through field investigations and combined with past cases of metro violent terrorist incidents, it is found that the incidents are likely to occur in the following locations: the location where the metro is convenient for violent terrorists to enter or exit; the area with a high volume of people in the metro station; a position of high concealment. Figure 2 shows the specific locations and frequency of typical global subway terrorist attacks since 2001. The figure shows that near the subway station,

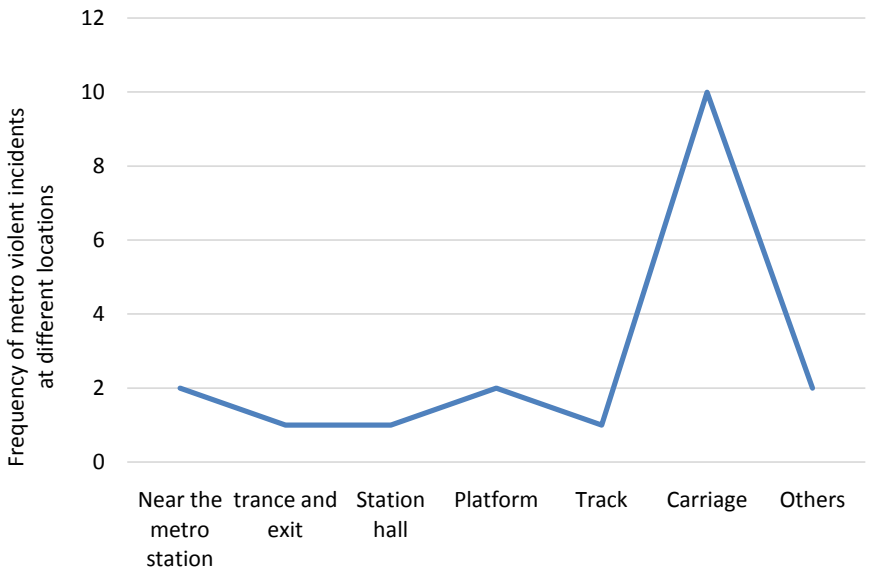

Figure 2. Location and frequency of typical metro violent terrorist incidents in the world since 2001.

entrances and exits, station halls, platforms, trains, compartments, etc. are the key areas for the occurrence of terrorist incidents. Among them, the number of violent incidents in the subway cars is the largest, accounting for over 52%, and the risk of violent attacks is largest. The next is near the metro station and platform location, where the risk of violence is also relatively high. Due to the airtight structure of metro train compartments, the population density in the morning and evening peak period is extremely high, reaching more than 10 people per square metre. The confined space of the train compartment provides a great advantage for violent and terrorist attacks. If a violent terrorist group or individual attacks in the car by explosion, arson or knife, the rate of success and saturation of killing is very high, so it becomes the preferred target site for violent terrorist groups or individuals to carry out metro violent attacks. The area near the metro station is easy to escape after the occurrence of the violent terrorist incident, and the traffic is more convenient for the violent terrorist elements. The metro platform has a large flow of people and strong concealment. Violent terrorists often choose to place the bomb device under the platform seat or other hidden area, and to detonate the bomb with remote control equipment during the peak period of the passenger flow. Therefore, it is necessary to strengthen the risk identification and safety check of metro to prevent violent and terrorist elements from taking advantage of false entry.

3.4. Time of Attack in Metro Violent Incidents

According to the statistical analysis of the time of the above-mentioned global metro violent terrorist incidents, it is found that the metro violent terrorist incidents are mainly concentrated in the morning or evening. The reason is that the violent terrorist elements often choose the morning and evening commuting hours to create the metro terrorist attacks, so as to expand the impact of incidents and increase the attention of incidents. In cities, large numbers of people often use the metro to travel between their workplace and their homes, so during the morning and evening rush hour (7 - 9 in the morning peak, 17 - 20 in the evening peak), the metro will usher in a boom in traffic volume, which will form a huge mobile population. In the mobile state of metro traffic system, protection capacity is reduced and is more likely to cause great damage and panic. In addition, if terrorists use pathogenic organisms or germs in an attack, the consequences of the attack can be expanded through large-scale population movements, resulting in more serious harm.

4. Construction of Emergency Capability Assessment Index System of Metro Violent Incidents

4.1. Related Concepts of Emergency Capability Assessment Index System of Metro Violent Incidents

In view of the high risk and serious harm of unexpected incidents, the state, local governments or enterprises at all levels must carry out scientific and practical

research on the emergency response capacity of relevant departments in advance or afterwards, in order to find the emergency response in the process of existing or possible deficiencies and timely correct them. The assessment of emergency capability is to analyze the advantages and disadvantages of emergency management in the process of emergency management by means of scientific and reasonable assessment theory, effective and feasible assessment method and assessment model in accordance with the actual situation. It is used to improve the current situation of emergency management, optimize emergency preparedness, and then achieve the purpose of improving the comprehensive response ability of organizations to emergencies.

Combined with related concepts of metro violent incidents and emergency capability assessment, emergency evaluation of urban subway storms and terrorist incidents is, for the urban metro system, violent terrorist attacks that affect public safety. It is, considering the whole process of emergency management of prevention, response and recovery, the process and activity which constructs an index system of practical science, and uses an effective evaluation method to evaluate the advantages and disadvantages in the emergency management of the terrorist incidents in the subway, so as to improve the emergency management and optimize the contingency plans, and to improve the ability of the comprehensive emergency response to the terrorist incidents in the subway (Deng et al., 2005).

4.2. Theoretical Basis for Evaluating the Emergency Response Ability of Urban Metro Storm Incidents

The assessment of emergency response ability runs through the whole process of emergency management, and should not be limited to any single stage before, during or after the event, but should be recognized as a continuous cycle system in different disaster environment. All stages of emergency management should be included in the scope of Emergency Capability Assessment, forming a "circular and complete" assessment model. Therefore, this paper studies the assessment of urban metro emergency response ability from the perspective of development, and evaluates it based on the theory of emergency management life cycle.

For the theory of emergency management life cycle, scholars have developed three kinds of life-cycle models according to different contents of emergencies, which are William Haddon's three-stage model (Haddon Jr., 1972), the four-stage model of Fink (Steven, 1986) and the five-stage model (Mitroff, 1988). According to the three-stage model of William Haddon, this paper divides the emergency management process into three stages: prevention, disposal and recovery. These three phases are for crisis prevention, crisis outbreak and crisis closure, as shown in **Figure 3**. Each stage should formulate corresponding emergency plan and strategy, prevent and control the situation as much as possible, and reduce the crisis.

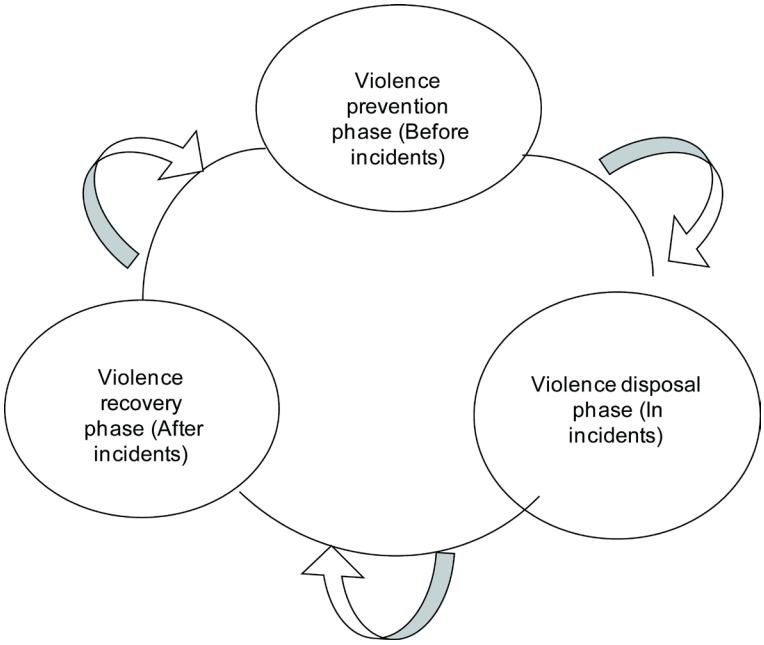

Figure 3. Three phases of emergency management of metro storm and terrorism.

1) Violence prevention phase: During the crisis prevention period, we should do our best to monitor and warn the risk, manage daily, train the emergency, improve the resilience of metro system, prevent and identify the threat, or mitigate the impact of metro storm and terrorism.

2) Violence disposal phase: In the metro crisis outbreak period, the emergency response should be carried out quickly, and emergency command and rescue work should be done to minimize the loss and impact caused by the incident.

3) Violence recovery phase: At the end of the crisis period, we should clean up the scene of the incident in time, ensure the metro to resume operation as soon as possible, and at the same time do a good job of life and property loss assessment and summary analysis of prevention and control and disposal of violent and terrorist incidents.

4.3. Assessment Index System of Emergency Response Capacity of Urban Metro Storm and Terror Incidents

Based on the three-stage model of emergency management life cycle theory, combined with the basic characteristics of metro storm and terror incidents, and drawing on the domestic and foreign research achievements in the field of Emergency Capability Assessment, this paper starts from the whole process of emergency management of metro violent and terrorist incidents. The emergency response capability of metro storm and terror incident is divided into three aspects: the ability of preventing violence and terrorism, the ability of dealing with violence and terror, and the ability of recovering from violence and terror. The evaluation index system takes the emergency response capacity of the stampede in urban subway as the target level (A), and extracts three first-level indicators

(B), eleven second-level indicators (C) and 38 third-level indicators (D), as shown in Table 2.

Table 2. Framework of emergency capability assessment. Index system of metro violent incidents.

Target layer	Primary indicator	Secondary index	Tertiary index
Emergency capability of metro violent incidents A	Violent terrorism prevention ability B_1	Monitoring early warning C_1	Risk identification D_1
			Information sharing D_2
			Criminal investigation against terrorism D_3
			Safety inspection monitoring D_4
		Daily management C_2	Anti-terrorist regime building D_5
			Professional team building D_6
			Safety facility construction D_7
			Counter-terrorism preparedness D_8
			Network security D_9
		Emergency training C_3	Emergency skills training D_{10}
			metro anti-terrorism drill D_{11}
			Passenger safety publicity D_{12}
			Relief supplies preparation D_{13}
		Resource preparation C_4	Standby strength configuration D_{14}
			Violent and dangerous alarm D_{15}
	Violent terrorism disposal ability B_2	Fast response C_5	On-site information sent to D_{16}
			Grade of attack identified as D_{17}
			Information public opinion guide D_{18}
			Field emergency decision D_{19}
		Emergency command C_6	Field communication coordination D_{20}
			Emergency resource dispatch D_{21}
			Counter-terrorism site disposal D_{22}
		Emergency rescue C_7	Emergency linkage rate D_{23}
			Social Emergency Rescue D_{24}
			Emergency communication support D_{25}
			Logistics support management D_{26}
			Emergency awareness of violence and terrorism D_{27}
		Public response C_8	Violent terrorist response D_{28}
			Psychological recovery from violence and fear D_{29}
			Accident site cleaning D_{30}
	Violent terrorism recovery ability B_3	Restoration construction C_9	metro resumed operation D_{31}
			Reconstruction of counter-terrorism facilities D_{32}
			Life and property compensation D_{33}
		Loss assessment C_{10}	Property loss assessment D_{34}
			Investigation of violent terrorist incidents D_{35}
		Summarize and analyze C_{11}	Emergency rescue assessment D_{36}
			Counter-terrorism plan revision D_{37}
			Anti-terrorist exercise Assessment D_{38}

Among them, the emergency response capacity A of the urban subway in case of terrorist incidents includes three first-level indicators of panic-guarding capability B_1, panic-fighting disposal capability B_2 and panic-fighting capability B_3; Panic-proofing prevention capability B_1 includes four second-level indicators of monitoring and early warning C_1, daily management C_2, Training C_3 and resource preparation C_4; The ability to deal with violence B_2 includes four secondary indicators of rapid response C_5, emergency command C_6, emergency rescue C_7 and public response C_8; Violence and resilience B_3 includes three secondary indicators of the restoration and construction C_9, Loss assessment C_{10}, and summary analysis of C_{11}.

5. Conclusion

This article takes the urban metro violent incidents since 2001 as the research object, combines the characteristics of urban metropolitan violence and domestic and foreign emergency capability assessment system to build relevant research results, from the whole process of emergency management of subway violent incidents, and sets out a more scientific and systematic framework for assessing the emergency capability of urban metro for tidal and terror incidents. It strives to help test and promote the reform and development of safety in urban metro, further improve the emergency management of urban metro violent incidents, and establish and improve the subway anti-terrorist emergency response system and mechanism. It promotes the establishment of a comprehensive, omni-directional and systematic safety development system, to ensure the safety and sustainable development of urban metro. The main conclusions of the paper are as follows:

1) By studying the relevant achievements in the field of anti-terrorism at home and abroad in the area of metropolitan anti-terrorism, it is found that the research on anti-terrorism and anti-terrorism in urban metro in China is still at a preliminary stage. Concretely, there is a vague definition of the concept of metro violent incidents, and countermeasures against terrorism are not practical, metro anti-terrorism security technology and the metro emergency capacity assessment is not systematic enough.

2) Combining domestic and international terrorism related theories and the characteristics of China's metro transportation system, the concept of urban metro violent incidents was defined, and 19 typical metro violent incidents occurring since 2001 in the world were counted. The characteristics of the urban metro violent incidents were specifically analyzed in terms of attack methods, attack strategies, specific locations of attacks, and attack times.

3) Based on the three-phase model of emergency management life cycle theory, absorbing and drawing on domestic and foreign research results in the area of emergency capability assessment, proceeding from the whole process of emergency management of metro violent incidents, we divide the emergency management process of metro violent incidents into three stages: violence pre-

vention phase, violence disposal phase, violence recovery phase, and build a set of assessment index system on emergency capability of metro violent incidents. In the system, emergency capability assessment of metro violent incidents is the main body, the ability to prevent terror, the ability to deal with terror and the ability to recover from terror is the framework.

6. Discussion

Based on the characteristics of urban metro violent incidents and the related research results of the assessment system of emergency response capacity at home and abroad, a set of assessment index system of emergency response capacity of metro storm and terrorism incident is constructed in this paper. It has some reference value for the assessment of emergency response ability of urban metro storm and terrorism in our country, but there are still many deficiencies, which need to be further studied and explored in the future.

1) With regard to the construction of the assessment index system for the emergency response capability of the metro storm and terrorism incident, we still need to go deep into the field investigation of the metro transportation system, and combine the actual situation of the metro anti-riot prevention work with the actual situation, so as to establish a more practical and targeted metro emergency response capacity assessment index system.

2) In the field of assessment of emergency response capability of metro storm and terror incident, this paper constructs a set of assessment index system. The selection of assessment method, the determination of index weight and the case analysis of emergency response ability of metro storm and terrorism in each city are the points that need to be further improved in the future research.

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