

**Research Article**

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**Construction of the Yunnan disaster health emergency pioneer assistance team****Jibo He; Nian Pengying; Lihua Chen\***

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**Abstract**

Natural disasters and public health emergencies occur frequently in Yunnan Province, which is facing the double pressures of prevention and control of infectious diseases at home and abroad. Under the background of implementing the national “One the Belt and One Road” initiative strategy, We established Yunnan Disaster Health Emergency Pioneer Assistance Team to deal with the emergency rescue and disposal tasks of natural disasters and major public health emergencies under extreme conditions at home and abroad. Combining with the construction process of Yunnan National Health Emergency Response Advance Detachment, the authors summary the approaches and problems in team functional orientation, team member composition, material equipment and team management and other aspects.

**Keywords:** Pioneer team; Construction; Management.

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**Introduction**

Natural disasters and emergencies in Yunnan are frequent, facing the dual pressure of prevention and control of infectious diseases at home and abroad. In the context of implementing the national “One Belt and One Road” initiative strategy, the Yunnan Disaster Health Emergency Pioneer Assistance Team was established to respond to emergency rescue disposal tasks for natural disasters and major public health events under extreme conditions at home and abroad. Suggestions are made from the professional configuration of the team, material and equipment, management and team training, and drills. Yunnan in China’s border, and Myanmar, Laos, Vietnam borders, natural disasters and public health emergencies frequent, facing the double pressure of infectious disease prevention and control at home and abroad.

Yunnan has become a major transport hub for our country’s “One Belt and One Road”, making it a hub for south and south-east Asia; the tasks of domestic and foreign health emergency rescue teams are becoming more and more arduous.

When a disaster occurs, in 2011, Yunnan established an acute infectious disease outbreak prevention and control team. In May 2015 on behalf of the country to Nepal to participate in the 8.1 earthquake relief mission. In 2016, eleven National Health Emergency Mobile Disposal Centres were established in sub-regions of the country, with a focus on professional disposal, equipment support and long-distance delivery capabilities [2]. Yunnan Province has built a National Mobile Health Epidemic Prevention Center, which was completed at the end of 2017. We want to meet the need for health emergency response under the “One Belt and One Road” framework and the need for national emergency response to natural disasters in extreme conditions.

We aim to arrive at the disaster site in a timely manner and carry out rescue work. In October 2018, Yunnan established a Health Emergency Pioneer Assistance team (hereinafter referred to as “Pioneer team”). The Pioneer team is a 20 person rescue vanguard team jointly formed by the Yunnan Provincial Health Commission, the Yunnan Center for Disease Control and

Prevention, and the hospital. We described the health emergency response of the rescue vanguard, as well as the job responsibilities, professionalism, management, and equipment of the team members.

### Basic situation

#### Functional positioning

The Pioneer team aims to build a sharp unit of the Yunnan National Health Emergency assistance team to deal with the emergency rescue and handling tasks of domestic and foreign natural disasters and major public health emergencies under extreme conditions. Under the condition of the interruption of traffic, communication, and power, and when the vehicle-borne and tent-based health emergency team could not reach the scene, the advance team arrived at the disaster area for health emergency tasks at the first time by means of helicopter delivery and foot crossing, and self-protection for survival in the field was at least 72 hours.

#### Personnel composition

The advance team consists of 10 men, with one captain and one vice-captain. In order to ensure that the team can respond at any time, each post is allocated according to the A or B angle, with a total of 20 people. The members were selected from the health emergency teams of Yunnan Province, according to the principle of selecting the best, and in accordance with the procedures of voluntary application, unit recommendation, examination and approval of the management department, and filing for the record. The selection conditions include excellent political quality, good health, strong professional knowledge and skills, strong on-site working ability and rich practical experience, and the age is not more than 45 years old. The advance team is composed of professionals such as health emergency management, epidemiology, disease surveillance, laboratory testing, drinking water sanitation, disinfection and insecticide, information publicity, and logistics support. It is divided into five groups: disease Surveillance and risk Assessment Group, Medical treatment and epidemic Prevention Group, Inspection and testing Group, Integrated Information Group, Safety and Logistics support Group, with two people in each group and one team leader in each group. The team can carry out the following work on the site: formulation of post-disaster health and epidemic prevention work plan; post-disaster public health needs rapid assessment and risk assessment; risk communication; symptom surveillance of settlement sites in disaster areas; epidemiological investigation and sample collection; drinking water safety assessment; environmental eliminate virus; on-site self-rescue and emergency medical treatment; water sample collection; physical and chemical hygiene index detection of drinking water; on-site emergency communication guarantee. Image/video data acquisition; external liaison and comprehensive information release; camp construction; camp vigilance and security; camp logistics support; small vehicles and large professional vehicles driving.

#### Materials and equipment

Materials and equipment are divided into personal materials and team materials, personal materials are mainly carried equipment, team materials are mainly to meet the on-site work

and team logistics support. All materials and equipment are integrated in the mountaineering backpack of 50 L+10 L for each team member, which is about 23 kg. Each team member has a set of personal goods with a total of 62 items, which are divided into rucksack, clothing, food, camping and carrying (Table 1). Team materials, a total of 41 items, divided into logistics support category, professional category, communication category (Table 2).

#### Image identification

According to the requirements of the national health emergency team identification system and the technical specification of health emergency clothing, the team members' clothing, equipment identification and team flag are arranged, in which the image logo is consistent with the emergency infectious disease prevention and control team of Yunnan.

#### Team management

##### System management

The team management department formulated the system, documents and manual management team, issued the notice on the Establishment of the advance team of Yunnan Health Emergency Pioneer Assistance Team, and defined the team management organization, the composition of the members, the grouping and responsibilities of the team, and formulated the measures for the Management of Yunnan Health Emergency Pioneer Assistance Team. The duties, powers and obligations of the team and its members, the selection of members, the withdrawal mechanism, the management of emergency equipment, the motivation and responsibility of the members were clarified, and the work Manual of the advance team of Yunnan National Health Emergency team was compiled. standardize the on-site work flow, guide the members to carry out the work on the spot, and formulate the annual activity plan of the advance team of Yunnan National Health Emergency team. Define the team's annual training, training, drill time and content, etc.

##### Daily management

Yunnan Center for Disease Control and Prevention is the management department of the advance team, which provides daily management, training, drills and all kinds of support for the team. The team members usually work in relevant departments, and when there are active tasks and emergency tasks, they shall be uniformly dispatched and managed by the management department. In addition, the team management department takes out year-round personal accident injury insurance for advance team members to eliminate worries in the process of training, drills and emergency tasks.

In principle, the team members are adjusted once every three years, and those who meet the requirements may remain in office; if they are unable to perform their duties and obligations due to political quality, age, health, going abroad (more than one year) or other reasons, the management department shall put forward suggestions for termination of appointment and adjustment, which shall be implemented after the study and approval of the team management leading group, and shall be reported to the Provincial Health and Health Commission for the record.

**Table 1:** List of personal material allocation of Disaster Health Emergency Pioneer Assistance Team in Yunnan.

Category	Name of item	Unit	Quantity	Remarks
Rucksacks	Dott mountaineering bag	Individual	1	Capacity: 50 L+10 L
	Hand-held travel bag	Individual	1	
Clothing category	Harvard red suit	Piece	1	China Hygienic Standard Clothing
	Blue Split Pants	Strip	1	China Hygienic Standard Clothing
	Square collar white T-shirt	Piece	1	China Hygienic Standard Clothing
	Long-sleeved quick-drying clothes	Set	1	
	Emergency vest	Piece	1	China Hygienic Standard Clothing
	Emergency hat	Top	1	China Hygienic Standard Clothing
	Athletic & Outdoor Shoes	Double	1	
	Emergency helmet	Individual	2	
Food category	Individual soldier self-heating milk	Box	2	
	milk	Bottle	2	
	Nuts	Bag	1	
	Beef jerky	Bag	1	
	Apple	Individual	4	
	Chocolate	Strip	4	
	Compressed biscuit	Bag	1	
	Spring Water	Bottle	2	
	Instant noodles	Bag	2	
Camping class	Individual tent	Top	1	
	Cold-proof sleeping bag	Individual	1	
	Damp-proof pad	Individual	1	
	Inflatable cushion	Individual	1	
	Inflatable pillow	Individual	1	
Carrying class	First aid kit	Set	1	
	Mosquito repellent	Box	1	
	Climbing staff	Individual	1	
	Umbrella	Put	1	
	Raincoat	Set	1	
	Wash bag	Set	1	
	Anti-cutting gloves	Deputy	1	
	Office kit	Set	1	
	Solar charging panel	Set	1	
	Heat preservation water cup	Individual	1	
	Multi-function lunch box	Set	1	
	LED flashlight	Individual	1	
	Head lamp	Individual	1	
	Tent lamp	Individual	1	
	USB reading lamp	Individual	1	
	power bank	Individual	1	
	Sunglasses	Set	1	
	Compass	Individual	1	
	Multi-function portable tool	Set	1	
Waist bag	Individual	1		

Carrying class	Knee pads	Pair	1	
	Elbow guard	Pair	1	
	Wrist guard	Pair	1	
	Eye mask	Deputy	1	
	Ear plugs	Pair	1	
	Belt	Strip	1	
	Work notebook	Ben	1	
	Notepad	Ben	1	
	Safety reflective belt	Strip	5	
	Glow stick	Strip	2	
	High frequency rescue whistle	Individual	1	
	Small notebook	Ben	1	
	Neutral pen	Branch	2	
	3 L water bag	Individual	1	
	Folding bucket	Individual	1	
	Wind-proof fire machine	Individual	1	
	stem or root of plants	PKG	1	
Drawing paper	PKG	1		

**Table 2:** Material allocation list of advance team of Disaster Health Emergency Pioneer Assistance Team in Yunnan (in terms of 10 personnel / team).

Category	Name of item	Unit	Quantity	Remarks
wLogistics support category	Portable liquefied gas furnace	Individual	3	
	Miniature liquefied gas cylinder	Individual	6	
	Multi-function engineer shovel	Individual	3	
	Machete	Put	1	
	Hunting axe	Put	1	
	Saw	Put	1	
	Electric baton	Individual	1	
	Eyeglasses	Individual	1	
	Life-saving rope	Root	3	
	Portable water purifier	Set	1	
	Strapping tape	PKG	1	
	Warning belt	Volume	2	
	Colored striped cloth	Meter	5	
	Transparent adhesive cloth	Volume	5	
	Garbage bag	Volume	5	
	Snake repellent	Bottle	3	
	Flag (national flag, party flag, team flag)	Face	Each 1	
Professional category	Protective clothing	Set	5	
	Protective masks	Individual	10	
	Protective glasses	Deputy	5	
	Latex gloves	Deputy	10	
	Shoe cover	Double	10	
	Disposable mask	PKG	20	
	Disposable gloves	Double	10	
	Sampling bottle	Individual	1	
	Sampling tube	Tube	5	
	Pick-up box	Individual	2	

Professional category	Water-based marker	Branch	3	
	Portable sprayer	Set	1	
	Disinfection spirit	Bottle	2	
	Achieve great success	Bottle	2	
	Portable PH meter	Set	1	
	Water quality multi-function tester	Set	1	
	Arsenic rapid detection kit	Set	1	
Communication class	Camera	Set	1	
	GoProHigh definition motion camera	Set	3	
	Camcorder	Set	1	
	Drones	Set	1	
	Walkie-talkie	Set	10	
	Maritime satellite telephone	Set	2	
	Notebook computer	Set	1	

### Team support

The Yunnan Center for Disease Control and Prevention is responsible for the support of the advance team, and is responsible for the technical and financial support of the team's daily training, training, material procurement, drills, and the implementation of emergency tasks, and gives priority to the guarantee.

### Training and drills

In addition to strictly following the management of the Yunnan National Emergency Infectious Diseases Prevention and Control team and the Yunnan National Health Mobile epidemic Prevention Center, the advance team organized training and drills for the team in accordance with the activity plan formulated at the beginning of the year. Team members usually self-training (walking, fitness, etc.) include: report daily steps (no less than 10,000 steps), report weekly training every weekend. The team will concentrate on activities once a month, including queue training, physical training (10 km field weight-bearing hiking, mountaineering, etc.); professional skills training and training (field survival skills, camp construction, on-site rapid risk assessment, drinking water testing, first aid technology, disinfection and insecticide, photography skills, field logistics, etc.). Comprehensive training and drills are carried out at least once a year, and well-known domestic experts in military and civilian related fields are invited to give lectures. The drills follow the principle of "rehearsal and light drills," and are mainly desktop drills and unscripted actual combat drills. In 2018, the earthquake scene simulation exercise was carried out jointly with the National Health Emergency team of the Chinese Center for Disease Control and Prevention and the National Health Emergency team of Guangdong Province. Under the condition of 48 hours without any guarantee, the emergency rescue mission was carried out on the spot. The team has been greatly trained and improved. In addition, it also commissioned the three detachments of the Yunnan Armed Police Corps to carry out militarization training for the team, and commissioned the Beijing Red Cross 999 Emergency Center to carry out aeromedical rescue training.

### Discussion

The national health emergency response team construction project has greatly promoted the improvement of national and

local health emergency response strength [4]. Relying on the national health emergency team construction project, Yunnan Province has established the Yunnan National Emergency Infectious Diseases Prevention and Control team and the Yunnan National Health Mobile epidemic Prevention Center. The emergency team has achieved the goal of vehicle, information, integration, tent and self-protection. However, at present, there is a general lack of health emergency advance team that can enter the scene at the first time under extreme conditions and heavy health emergency equipment cannot enter the scene. Based on this situation, Yunnan Province began to explore the establishment of a health emergency advance team in 2018, which is the first attempt in the domestic medical and health field, and there is no mature experience for reference. Although there are still many problems in the establishment of the team, to a certain extent, it has improved the ability of Yunnan national health emergency team to deal with health emergency tasks under extreme conditions.

The advance team immediately entered the site under extreme conditions, equipped with personnel and equipment to ensure that the team was self-sufficient to carry out health emergency rescue work for at least 72 hours under severe conditions, and its requirements and capabilities met the requirements and capabilities of the highest level (level 1) response team of the United States disaster Medical Rescue team (Disaster Medical Assistance Teams, DMATs) [5-9]. The life and work materials used by the team on the spot can only be carried by the rucksack. How to find a balance between function and weight is a difficult problem encountered in the construction of the advance team. According to repeated drills and tests, the author suggests that the weight of the backpack is about 20 kg, and the capacity of 50 L+10 L is the best. In addition, all carrying materials take "light weight, small size" as the principle, try to purchase outdoor ultra-light supplies, work equipment is also light and compact as the principle. At the same time, it is necessary to strengthen the daily use drills of equipment, verify the quality and practicability of equipment, and update and replace equipment with poor quality and poor practicability in a timely manner.

The number of advance teams is relatively small, but it also requires a comprehensive professional mix. An advance team of 10 people was sent to the scene, and from the point of view of

the needs of the site and the work that the team could carry out, its health emergency response capacity was equivalent to that of a miniature CDC. Therefore, special attention should be paid to the comprehensiveness and rationality of professional collocation when setting up the advance team. At the same time, the daily management of the team members should strengthen the cultivation of the comprehensive ability of the team members, the contents of daily training and training should be diversified, and the team members should participate regardless of specialty. To create a professional and multi-capable personnel to meet the requirements of “one person with multiple posts, one person with multi-skills and one person with multiple abilities” at the scene [10], and improve the combat ability of individual soldiers on the spot. To create a “high-quality compound professional and technical team” [11].

Full preparation and training of advance team in peacetime is the basis of rapid and effective health emergency rescue. In addition to the regular intra-team training exercises, on the one hand, the advance team, as a national health emergency team, may be dispatched to carry out health emergency tasks abroad on behalf of the country at any time, in addition to professional skills training, we should also pay attention to the training of English and small language skills of Southeast Asian countries around Yunnan, international norms, relevant regional etiquette and customs, etc. On the other hand, we should organize and carry out multi-provincial, cross-regional, and cross-disciplinary joint exercises on a regular basis, focusing on actual combat and non-script drills, so as to achieve “retraining and light drills,” so as to effectively improve the actual combat capability of the team.

At present, there are some problems in China’s health emergency equipment, such as simple outer packaging, single function, large volume, heavy mass and small capacity, and the lack of standardization and unification of product specifications [12]. There is a lack of special and targeted health emergency equipment to meet the needs of the advance team, which does not meet the needs of the advance team’s on-site work. It is suggested that the country should increase the research on health emergency equipment. Research and development of multi-functional, miniaturized, packaged, standardized and information-based, high-performance, emergency equipment.

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