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(Excerpted from:)

SITUATIONAL AWARENESS:
IMPROVING EMERGENCY DECISION-MAKING
IN EMERGENCIES

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November 1990

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INTRODUCTION

One of the least understood subjects in emergency management is decision-making. For analysts of emergency operations, it is often difficult to determine the conditions under which decisions were made. Emergency operations are dramas played without a script and concealed behind self-serving reports and a lack of hard introspection and analysis. The actors in the drama are far more concerned with playing their roles than recording events and the various participants see different or even conflicting versions of the same activities. Therefore, it is all too easy for participants to gain an impression of events which is not borne out by subsequent reconstruction.

Emergency operations are surrounded by uncertainties and difficulties rapidly accumulate, often compounded by poor decisions made at an earlier point in the operation. These end up by producing what may be called "frictions" that tend to slow operations and reduce their effectiveness.

Five frictions can be identified. The first, and most important, is the political environment. Disasters are political events. The provision of assistance quickly becomes a contest for resources. The attitude of the government towards the victims can range from very supportive to benign neglect and, in many cases, can be openly hostile. Whatever the official attitude, significant obstacles and red tape can be expected that will slow relief operations and affect the ultimate success or failure of plans.

The second is less than perfect information about the overall situation -- information which is vital to decision-making.

Third are the psychological pressures on the decisionmakers. In the immediate aftermath of a disaster when human lives are at stake, decisions must be made quickly and often key decision-makers are put in a situation where their choices literally mean life for some and death for others. Added to that burden are demands from many quarters: survivors, the homeless, the hungry, donors, the press, and scores of others. A decision-maker who is unsure of him or herself will soon be reduced to a near catatonic state and will find it more and more difficult to make decisions.

The fourth friction is the physical stress of prolonged emergency operations. Long hours in the field with little rest, protracted series of meetings, constant travel over rough roads, etc.,

lead to fatigue and tend to lower the efficiency of the individual, reducing his or her performance.

The fifth friction is the demoralizing effect of the unexpected. Just when a decision-maker thinks that he or she has a situation under control, suddenly all is not as it seems. The classic case is that of a leader of a refugee assistance program. After procuring stockpiles of food for the refugees, a new influx of refugees in a group two or three times the size of the existing population, arrives unexpectedly. Suddenly, from a good operational position, the decision-maker finds himself or herself in a poor position to meet the needs of the people and, unable to procure sufficient food locally, must initiate a massive airlift to get food in time to prevent massive starvation. This sort of shock can paralyze a decision-maker and its affect cannot be overrated.

The overall affect of these frictions is to lower the performance of the decision-maker by an unquantifiable amount, interrupting the smooth operation of the relief effort. To a great degree emergency operations are a matter of team work and just one member of the team performing below his or her best can jeopardize the entire effort.

How can we reduce the impact of these frictions, especially as they relate to the imperfect information and the impact of the unexpected? One method advocated by increasing the emergency manager's situational awareness, or "SA". SA is a factor which minimizes these frictions, helping to overcome less than perfect information and helping the decision-maker to instinctively do the right thing under stress, anticipating and often avoiding the unexpected. If a decision-maker has a high level of SA, it should raise his or her effective performance by a considerable margin.

What is situational awareness? SA is a combination of many things but basically it is the ability of a decision-maker to keep track of events and foresee occurrences in the fast moving, dynamic environment of emergency operations. The decision-maker who can best handle a rapid rate of change survives. Situational awareness has little relationship to either managerial ability or experience -- some of the best emergency managers have been on their first tour -- although at a practical level, the right sort of experience certainly helps. SA can be called the decisive factor in leadership and it is this factor that we want to inculcate in emergency managers.

The purpose of this book is to lay down rules for emergency operations in a manner never before attempted. It says to the novice, this is what we expect of you and this is how you should do it. Here are some of the critical situations in which you can expect to find yourself and this is how the situation should develop. Having studied and absorbed the information, the emergency manager should then be able to see the situation and anticipate what is going to happen. Armed with this information, he or she should be better equipped to make decisions in a timely and decisive manner.

For the purposes of this discussion, situational awareness will be described as a technique for improving emergency decision-making. It provides a framework for identifying and

analyzing recurring operational problems. Application of SA enables emergency managers to determine appropriate interventions and when and where to take them.

Developing situational awareness requires a two-part process. The first is situation analysis. This consists of:

1. identification of recurring relief problems or "scenarios";
2. identification of the decisions that were made by emergency managers during the course of a scenario, including the sequence or chain, of decisions and their timing;
3. identification of the assumptions upon which each decision was based and the outcome that the decision-maker expected as a result of the decision; and
4. comparison of the expectations with the actual results.

The second step may be called situation modification. This consists of applying corrective actions or measures to alter the outcome of a scenario. These modifications can be classified into two groups, those that work under best case scenarios, where the decision-maker is in charge from the very beginning, and worst case scenarios where the decision-maker must intervene to correct a deteriorating situation and alter a decision chain put into motion by earlier decisions made by others -- in other words, to take corrective actions to alter the outcome.

It should be noted that bad decisions are often irreversible. Once a scenario is set in motion it may be impossible to change the outcome. (For the emergency management consultant it is important to recognize these for what they are and not to waste time or effort in trying to change the outcome for, ultimately, the client will resent the interference and the consultant may set up an adversarial relationship that will damage his or her effectiveness. Knowing where and when to intervene is the key to emergency consulting as well as to emergency leadership.)

The goal of situational awareness is to improve overall decision-making by emergency managers. This is accomplished principally by expanding the awareness of the emergency manager about the outcome of decisions he or she may make and the cause and effect relationships.

In emergencies, decision-making is carried out under three conditions: certainty, risk, and uncertainty. When a decision-maker knows or is certain of all the variables on an issue, "certainty" exists and accurate decisions should be possible. In practice, this condition is present only in long-term, established programs.

In some situations, a decision-makers can make a reliable estimate of the situation and base their decisions on the probability of an expected outcome. When estimates are made, a degree of risk is involved. In this case, experience is a major factor.

Uncertainty is the most difficult condition under which decisions must be made. It is the usual condition at the beginning of an operation and unless decision-making is sound, the entire

outcome of the operation can be jeopardized.

Types of Decisions

In emergency management, decisions can be divided into routine, technically-guided, and non-routine decisions. If a problem or situation occurs often, a routine procedure is usually developed for solving it. These decisions are usually codified and become routine. These routine decisions, sometimes referred to as "programmed" decisions, are guided by policies, guidelines, or procedures (often known as standard operating procedures, or SOPs).

In many cases, determination of which course to choose is guided by technical factors beyond the control of the decision-maker. For example, if measles vaccine is required for a refugee population, a cold chain must be set up -- without a decision to set up the chain, the vaccines would be useless.

When problems are broad, novel and unanticipated, they require decisions that have not been covered in the organization's planning, thus, they are said to be non-routine. Unfortunately, non-routine decisions must usually be made under conditions of risk or uncertainty.

To improve decision-making under these circumstances, most agencies try to structure the decision-making process or to provide a policy framework against which to evaluate choices. However, by teaching emergency managers to recognize an unfolding scenario, they can identify the point the scenario has reached and determine the decisions that have already been made, and then decide when, where and how (or if) to intervene. Our ultimate goal is to make tough decisions more routine by taking out the unknown, or unanticipated, elements.

The Decision Chain

A key concept in emergency decision-making is the decision string or "chain." Each decision that is made sets the stage for subsequent decisions. If the initial decision is bad, every subsequent decision is marginalized. Progressively the emergency manager is faced with having to choose between "least worse choices" and ultimately runs out of options. In subsequent chapters, we shall attempt to diagram some decision chains and identify at what point good choices run out. In some cases corrective measures can be taken for a fairly long time without penalty, in others, least worse choices soon predominate and, in too many, once the initial decision is made there is no possible way to influence or prevent a disastrous outcome.

By using the situational awareness technique, the emergency management consultant should be able to help the decision-maker realize that the penalties for poor decisions are high. In least worse options, the trade-off literally becomes one of lives versus high capital costs. All too often, it is the lives that are sacrificed.

SCENARIO I

MEASLES IN FOOD EMERGENCIES

Introduction

One of the major killers in famines is measles. Epidemics have broken out in camps on every continent, but have been especially devastating in Africa. In 1985, in the refugee camps of Sudan and the famine camps of Ethiopia, measles, coupled with high rates of malnutrition, were responsible for pushing death rates to an unprecedented level, as high as 14 per 10,000 per day, a level almost seven times higher than any previously recorded mortality rate.

Typical Scenario

A typical scenario is as follows: During the initial stages of a famine, decision-makers concentrate on food, water, shelter and providing medical attention to combat the diseases already present among the refugee population. Suddenly measles is detected and the decision-makers order measles vaccine. It takes several weeks for the vaccine to arrive and for a cold chain to be established. Immunizations are eventually carried out in the camps where measles are reported with the immunization efforts following the various outbreaks as they spread throughout the famine zone. Despite all efforts, death rates remain high.

Analysis

Despite the fact that measles is a major killer, situational awareness among decision-makers about this disease and how to fight it is universally low among not only are emergency managers deficient in this respect, many of the medical personnel to whom they turn for advice are also unknowledgeable. In 1984 in eastern Sudan, expatriate medical were urged teams to begin immunization campaigns before measles broke out in the camps. At the time measles was unreported, and universally the medical personnel responded that measles was "only a childhood disease" and should not be given precedence over other, more immediate, life-saving medical activities. It was also stated that if the disease were to breakout it could "be quickly controlled by immunization".

It is true that in the more technologically advanced societies measles is a disease that is generally regarded more as a nuisance than as life-threatening. Most medical schools fail to emphasize that in the Third World it is still a major killer, especially among those elements of the society where malnutrition rates are high. If a malnourished child or even an adult contracts the disease, the chances are better than 50 - 50 that death will result.

Specifically, there is a general lack of awareness of:

1. measles epidemiology, especially the pattern of transmission;

2. the purpose of the vaccine; and
3. the need for, or how to execute, a proper cold chain.

Another contributing factor is that there is also little awareness about the cyclic nature of the disease. In other words, the fact that in many areas of the world measles recurs at approximately two year intervals.

Information Needs

It is important to understand the transmission mechanism and the purpose of the vaccine. Measles is spread as an aerosol. When an infected person breaths, the disease is expelled on small droplets of moisture. When someone in close proximity inhales the aerosol, he or she ingests the virus and it immediately begins to incubate. Incubation normally takes a period of ten days to two weeks before the disease presents and outward signs of the infection are noticeable. During the incubation period, the person who is infected can also infect others. This is an extremely important point to note, for it means that the disease can be spreading up to ten days before it is detected. In a camps or feeding centers where interpersonal contact is increased by convergence of people for gathering water, food, firewood, etc., standing in line for medicine, and just through living in multi-family shelters, everyone can be exposed to the disease before it is detected.

The purpose of the vaccine is also almost universally misunderstood. Its purpose is not to cure measles, but to prevent it. The vaccine is essentially for the purpose of giving the patient a controlled case of the disease that is low intensity and not life threatening. This means that the person has to receive the vaccine and have his mild case before coming in contact with a more virulent strain of the disease. Again, the vaccine is preventive, not curative. The perception by most relief administrators, and indeed by a surprising number of medical personnel; that measles can be cured by the vaccine creates an unwarranted expectation that the disease can be controlled after an outbreak occurs. Unfortunately, by the time it is detected in a specific population, it is usually too late to take action for that group.

Generally, decision-makers are unaware of:

1. the potential impact of the disease;
2. the threat of the disease and its recurring (biennial) recurrence:
3. the purpose of the vaccine; and
4. epidemiological control strategies.

The largest contributing factor to a failure to control the disease is the false expectation emergency managers that the vaccine can be used to "cure" the disease once it has been detected.

The Decision Chain

The diagram in Figure 2 depicts a typical decision chain that leads to high mortality. At the point where the disease is detected, the decision-maker enters the zone of "least worse choice" options. He or she must immediately initiate an expanded immunization effort, not only to the famine affected population, but also to surrounding communities, and to all host country nationals who may be entering the camps and mingling with the refugee population. Some vaccine will also have to be targeted to communities which already have been affected, but where the disease is still undetected in hopes of controlling an outbreak in that community. In cases where refugees have been transferred from one camp to another, this is at best a hopeful strategy only. In all likelihood, the disease is already there, but until it is confirmed, chances cannot be taken, and valuable resources must be expended. If the disease presents, then immunization should stop immediately, and be shifted to other areas.

By analyzing the decision chain it can be seen that most elements of the chain are not decisions, but rather a failure to make decisions or take action at the proper time. A failure to make a decision or take action is a decision in itself.

Note that the "window of opportunity" for making a successful intervention is relatively narrow -- for all practical purposes, it is the period of time from the initial border crossing to the time when the famine victim is registered and "processed" into the camp or feeding center.

Corrective Measures

How can we increase the emergency manager's situational awareness? First, relief administrators must be taught to determine at what point in the biennial cycle the famine is occurring. If it is in a peak year, immunization must take place immediately. If it is at the end of the peak period, slightly more time may be available.

Second, administrators must be taught to immunize all vulnerable groups in this case all who are malnourished or who have not been exposed to measles previously. If the influx is occurring in the high year of the measles cycle, heat stable vaccine should be procured since, in the immediate confusion of an emergency, it will be difficult to set up a viable and effective cold chain. If the emergency is occurring during the low period, the use of the normal measles vaccine is permissible, but only if measles have not been reported anywhere within a 1,000 kilometer radius of the focus of the emergency and if suitable cold chain equipment can be made immediately available.

Third, if an outbreak occurs during an immunization campaign, immunization efforts must immediately be transferred to other areas, and a measles containment strategy must be put into affect. Only after camps and nearby settlements where the disease has not presented have been immunized should a manager elect to continue vaccinations in settlements where it has been confirmed.

Measles immunization is a first priority in all famines and should become a routine part

of every agency's emergency response doctrine. Since measles vaccine is normally a live virus, it must be kept in a temperature-controlled environment from the time that the vaccine is manufactured until it reaches the patient's arm. Maintaining a cold chain is not easy, and millions of dollars of vaccine are wasted annually because relief agencies fail to maintain the integrity of the cold chain in remote areas. In the Ethiopian famine, it took from November 1984 until May 1985 to establish a workable system. It requires proper equipment and a dedicated staff with sole responsibility for maintaining the integrity of the chain. Without these, a cold chain will not work.