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The Concept of Overcommitment in Rescue Operations: Some Theoretical Aspects Based on Empirical Data

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A B S T R A C T

Objective: Studies on Norwegian avalanche rescue operations have indicated high-stake searching of avalanches during elevated risk conditions. We perceive these characteristics as a sign of overcommitment. The purpose of this study is to explore the concept of overcommitment in Norwegian medical evacuation and rescue operations. How can overcommitment be described and understood as a uniform concept in rescue operations based on empirical data?

Methods: In a qualitative, exploratory study, 9 focus group interviews were conducted with a total of 30 crewmembers from the Norwegian air ambulance service.

Results: In this first in a series of 2 articles, crewmembers' reflections on the concept of overcommitment, important factors to consider when balancing risk and benefit in every mission, and a number of causal factors are presented. A definition of overcommitment in the context of rescue activities is presented.

Conclusion: Air ambulance personnel recognize overcommitment in a variety of situations. They broaden the concept to include both regular, everyday actions and hazardous rescue attempts in extraordinary incidents. The causal factors form recognizable constellations that may offer useful starting points for systems-based counteracting measures. The definition of overcommitment could provide a background for evaluation and learning in the rescue service.

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In a previous study on Norwegian road-related avalanche rescue operations, it was concluded that “human factors in avalanche rescue, like the roles of expectation, motivation and commitment, need further clarification.”¹ The study indicated high-stake searching of avalanches during elevated risk conditions in poor visibility and often with little information to justify the scale of rescue operations. These characteristics can be regarded as a sign of overcommitment. As a general concept, overcommitment in rescue operations has not been thoroughly approached in previous research. Implementing an intensive effort in a critical situation is in general regarded as a positive valued virtue; thus, doing more than expected is difficult to question, challenge, or criticize. Ash and Smallman² studied the conflicting imperatives of fulfilling a rescue mission and keeping rescuers safe in dynamic risk situations, claiming that rescue organizations are facing an increasing challenge of overcommitment. Basing their judgment of overcommitment on the definition of “rescue attempts in

circumstances that were judged too risky to personnel by the expert cohort,”² their main focus was the subject's choice of tactical mode, offensive or defensive, in various demanding emergency situations.

In conditions of high avalanche danger, rescuers need to make careful judgments about their own safety,³ which may not seem appropriate to bystanders or relatives of the victims. In these situations, private parties may initiate rescue activities rather than wait for an official rescue operation. A recent example is the tragic snow avalanche accident on November 22, 2017, in Anchorage, AK, in which friends and family recovered an avalanche victim while rescuers were awaiting safer and more favorable conditions.⁴ Further exacerbating the pressure on the individual rescuer in public emergency services is the duty to treat.^{5,6} Myhrer⁷ stated about Norwegian police officers that the statutory obligation to act is not unconditional but rests on a pyramid of necessary and legal factors. A pertinent question is whether rescuers can be allowed on their own initiative to take on a mission that is considered too risky by normal standards because rescue personnel are by law obliged to engage in safe work practices.⁸ On the other hand, the responsibility to assess and act related to available risk information is placed on the actors in the sharp end.

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They are not passive instruments acting in accordance with orders from a command center. Thus, what should be regarded as according to “normal standard” is highly contextual. It is difficult to formulate in detail in standing operational procedures. It is also closely related to the competence and previous experiences of the involved personnel. Risk acceptance criteria are not strictly defined in Norwegian land-based rescue operations or in absolute values or plain words, although one may assume that the risk shall be kept “as low as reasonably practicable.”⁹

Norwegian helicopter emergency medical service (HEMS) personnel are frequent first responders in both prehospital medical emergency and search and rescue missions.¹⁰ HEMS operations to provide immediate health care to critically ill and injured patients in uncertain situations and austere environments are stressful events^{11,12} that may challenge the crewmembers’ ability to balance the needs of patients and mission safety. Their operational decisions will directly affect their own vulnerability, sometimes to the extent that they suffer personal injuries and death.¹³ Although most emergency response organizations would support the recommendation of Blancher et al³ that “safety of the rescuers is the highest priority,” the commitment of altruistic and solution-oriented rescuers may override this principle.¹⁴

We wanted to explore the concept of overcommitment in Norwegian medical evacuation and rescue operations and based our study on the following research questions:

1. How can overcommitment be defined in the context of medical emergency and rescue operations?
2. Is overcommitment recognized as a phenomenon in Norwegian medical evacuation and rescue operations?
3. What are the characteristics of overcommitment in Norwegian rescue operations?
4. How is overcommitment identified by professional rescuers during real operations?

First, we explain how HEMS personnel contributed in data collection and concept development. Then, we present the empirical data before theorizing about working principles, comprehensions, and causal factors related to the degree of commitment in rescue operations.

Methods and Materials

In this study, we interviewed HEMS personnel from the National Air Ambulance Services of Norway about the concept of overcommitment and what they do to counteract unwanted exposure to high risk in rescue operations.

Selection

The National Air Ambulance Services of Norway operates 12 helicopter bases around the country, all with a 24/7 on base readiness for crewmembers. In 2016, they performed a total of 7,796 missions.¹⁵ The helicopters are staffed with 3 crewmembers: a pilot, an HEMS rescue paramedic, and an emergency doctor. The helicopter crews operate autonomously on request from emergency medical communication centers. The Governor of Svalbard operates 2 air rescue helicopters with a 5-man crew responsible for sea and land rescue in the Arctic north. Although the mainland HEMS and the air rescue helicopters on Svalbard are 2 different concepts, the crew members face similar challenges in sorting out the risk level and necessity of rescue missions.

Research Design

In this qualitative study, we explored how highly experienced prehospital personnel recognize and handle overcommitment. The interviewees were selected by way of convenience sampling¹⁶ after positive feedback to interview on-duty crews. Bases were selected by

location, and crewmembers were selected by random because they happened to be on duty on days requested to perform focus group interviews. All crewmembers were informed that participation was voluntary, and no one refused to take part.

Malterud et al¹⁷ presented a model for the assessment of sample size in qualitative studies in which information power is given by aim, sample specificity, theoretical foundation, dialogue quality, and analysis strategy. An exploratory study normally requires a large sample to counteract an imbalanced collection of relevant phenomena. This sample was chosen on the grounds of their unique experience in handling dangerous missions, allowing a smaller number of cases. We expected that the characteristic phenomena of overcommitment would find support in safety theory, effectively reducing the need for a large sample. The dialogue was marked by the fact that participants and moderators shared a common background from the emergency services and medicine, quickly establishing a trustful rapport. A cross-case strategy of analysis was a natural choice to “produce new knowledge and augment existing knowledge and experience.”¹⁸ Malterud et al¹⁷ state that “cross-case analysis requires more participants to offer sufficient information power . . .,” but too many participants would complicate the analysis.

The first author, moderating the interviews, has been a member of volunteer mountain rescue organizations for 40 years and has served as a police officer for nearly 30 years. In these positions, he frequently cooperates with air ambulance crews. This implies that he is acquainted with some of the interviewees and has taken part in some of the rescue operations mentioned during interviews. The second author, a medical doctor and professor in risk management and societal safety, observed 1 of the interviews and took part in planning the study and analysis of the data.

Material

Nine crews, altogether 30 crewmembers, were interviewed in the period from March 2017 until April 2018. The crews were stationed at 5 bases run by 2 different HEMS providers in North and South Norway. The HEMS doctors were linked to 4 regional health authorities (in-hospital service as anesthesiologists). Some interviewees had recent experience from Air Force–operated search and rescue helicopters, ambulance service, and commercial helicopter companies. The study was based on informed consent from each single participant. Each interview lasted 60 to 90 minutes. The interviewees were 3 women and 27 men aged between 30 and 60 years, with a mean age of 45 years. The mean length of experience from this service was 10 years, ranging from 0.5 to 34 years. In addition, all crewmembers upheld considerable professional experience from their previous employments.

All interviews except the first were tape-recorded to support transcription and summary. The material was transcribed immediately after the interviews, and the electronic sound files were deleted. Thus, no electronic material revealing voices or individual expressions that can be used for identifying respondents or tracing answers back to single individuals were stored. Therefore, there was no need for approval according to former data protection legislation or consultations in accordance with the new regulations of 2016/2018.

The written reports from these focus group interviews resembled police interview reports in that short summaries were given in combination with full transcriptions. To a large extent, linguistic pause fillers and formulaic language were omitted unless they clearly conveyed meaning to the sentence. All reports were anonymized with regard to place names and recognizable events. After write-up, the reports were sent to the individual interviewees for comments and validation, in line with Prudence Plummer-D’Amato’s member checking,¹⁹ to enhance credibility and trustworthiness. All reports were approved without corrective comments.

The interviews followed a common structure with an initial presentation of the background for the study followed by a clarification

of specific concepts and practical considerations. The interview guide contained 5 main themes: 1) associations with the concept of overcommitment, 2) recognition and sharing of operational cues, 3) causal factors in overcommitment, 4) preventive factors in overcommitment, and 5) overcommitment and learning. To support the exploratory nature of the study, we did not apply strict limitations to the topics and discussions that arose from introducing the main themes.

The interviews were exported to the software program QSR International NVIVO 11 (QSR International, Melbourne, Australia) to aid the necessary steps of systematic text condensation.²⁰ Starting from the original themes of the interview guide, main categories and meaningful key words emerged from the supplied answers and comments.

Results

The first part of this section concerns the crewmembers' thoughts on the concept of overcommitment and how they seek optimization by balancing rescuer and patient safety. The last part is a presentation of what they see as possible phenomena and situations that may lead to overcommitment.

The Concept of Overcommitment

Cost-Benefit Considerations

The term *cost benefit* was frequently used to indicate the considerations that crewmembers strived to make during rescue missions. In this context, cost is an undefined measure of life-threatening "risk," whereas benefit reflects the patient's prognosis given the assistance from air ambulance personnel. We identified four important elements of the Cost-Benefit considerations: Patient Situation; Rescue Situation; Triage and Rescuer Robustness. In the following sections, the interviewees are referred to by an uppercase letter and a number (eg, A1).

Patient Situation

Interviewee E2 pointed at communication about the patient's condition. "Can this patient wait until day light, or is it urgent to respond ASAP? That's . . . I think . . . the key to everyone having the same SA (situational awareness) . . ." C3 commented, "I have a small rating inside my head on how important it is that this is an air ambulance mission. Is it crucially important that we arrive right away, or will it be of significant benefit to the patient, or is it almost so that we will see if we will be of any use to the patient, at all. A mission is not just a mission." G2 commented to G3, "You are good at this. You use one tool when you think that we need to think twice about a nightly mission in poor weather conditions. Then, you present facts about the patient. Listen, this patient will actually do very well without us." G3 responded, "But that is a very important point to bring forward, I think. One has to consider the medical benefit of the mission." G3 later concluded that "As such, this is associated with risk, but if we can minimize the risk when it has no effect, then it makes sense, I think."

Rescue Situation

The interviewees do not accept, by principle, to risk their own life to save a patient's life. F3 stated, "No, we are all going to go home. None of us are going to die at work. Then, rather, the patient will have to die. And, I mean it. I am really not willing to sacrifice my own life . . . however, to a certain extent, we do that, anyway . . ." G2 presented a mountain rescue case in which they tried to land near a patient with a broken ankle when surprised by a serious down draft that nearly grounded the aircraft. "In retrospect, we staked incredibly much compared to the benefit." G3 added, "That ankle is not worth risking three other lives, because you can just go back and get him the following day."

Triage

Interviewee J3 compared overcommitment with "analogous concepts in medicine that we call over-triage or over-consumption of

resources." He then presented the medical epidemiological expression numbers needed to treat and numbers needed to harm²¹ as possible measures of necessity when approaching the apparent mismatch of high-risk–low-gain rescue operations. J3 illustrated this by saying, "If we over-expose ourselves in avalanche danger zones, we will eventually experience an accident with loss of rescue personnel." C2 underlined "but if you have something to gain, you may go an extra step, but not on all missions. Because, then you would do that all the time." G3 pointed at individual differences in judging patient needs relative to their own chances of safely reaching the patient. "But there are differences between crews, as well. Some crews provide healthcare, while others do not. Because, in one crew the composition is such that you do not respond, while in other crews the composition is such that you do respond and complete the mission. So that's how there is actually a difference. All the time. But that, I think, is quite OK."

Rescuer Robustness

Several crews pointed at the importance of personal robustness when choosing to abstain from a dangerous mission and linked this attribute to volume training and experience from similar situations. F3 stated, ". . . when we get a little more experience from this kind of work, we are a bit more robust at standing by that choice. In fact, we must choose our own safety rather than go in and take unnecessary risk?" C2 said, "We are used to turning back. We can go on a mission and turn around and be very pleased when we get home because we turned back—did the right thing."

Causal Factors

The crewmembers presented a great variety of phenomena and situations that could bring them beyond the diffuse border between accepting or abstaining from a dangerous act or mission.

Personal Affection and Risk Willingness

Crewmembers pointed at individual differences in mission commitment, causing a variability that both strengthens and challenges a high-reliability organization that relies on standards and procedures. Personal affection for specific activities, like mountain climbing or diving, interacts with risk willingness to give different responses in otherwise similar missions. A1 commented, "Well, it becomes a subjective opinion of the need for us to do it." G2 added, "Everybody has some preferences, and for me it's the mountains. And then, we're actually stretching it, because it's our arena and our own people . . ." D2 linked leisure-time activities and line of work, "Those who choose this profession are also risky within a certain limit. People have a hobby, often, which includes risk." A3 commented, "Indeed, we often have a very objective goal of how to do things, right? But then this overcommitment, if that's what we call it, comes in as a subjective thing. This is what we just have to do, or I want to take on this mission."

Tunnel Vision and Target Fixation

Tunnel vision was a frequently mentioned phenomenon that could jeopardize their collective mindfulness of mission-specific risk factors. F2 said, "As for myself, it's tunnel vision. Locking one's focus on one thing." Also, the expression "target fixation" was used, both literally to describe a hazardous phenomenon when flying and in a transferred meaning in rescue operations. "We suddenly isolate ourselves from the rest of the world, inside that little time window, right there and then" (G2).

Mission Creeping

Crews further warned about "mission creeping" in which previous positive experience in similar situations and initial efforts to access the patient tempted them to try harder. C2 identified it as "The negative spiral where everyone is completely set to solve the mission and pushes and pushes," whereas J3 described it as "Those situations

where one can suddenly feel that . . . I just have to go over and have a look . . . You should really get away from that place . . .” These situations are often related to flying in marginal conditions. “Weather-wise; on the border line, but then, it went well, and now it’s a success story” C3 concluded about a mountain rescue mission involving 2 critically injured patients.

Lack of Knowledge

Crewmembers quite unanimously praised knowledge as a prerequisite for sound judgment of operational risk and linked it to cue recognition, risk assessments, information flow, coordination of resources, and risk communication. To commit yourself beyond your own capacity was considered just as dangerous as consciously committing beyond an identified margin of safe practice. A3 asked, “About overcommitment, is that because you don’t know your own limitations or because you lack knowledge?” He found that a downside of feeling knowledgeable is overconfidence. “It may be a weakness if one comes in a situation where one believes a bit too much on one’s own abilities.”

Demanding, Low-Frequency Events

Interviewees find that infrequent, demanding events increase their feeling of stress and mostly positive excitement. F3 observed, “. . . when it comes to overcommitment, I feel that the more serious things we respond to, the greater the degree of overcommitment, because that’s not what we do . . . often, I think.” Challenging environmental factors and elements of technical rescue techniques were mentioned as important cofactors contributing to this feeling. F3 explained the following: “But I think . . . missions that we think are . . . not fun, but, interesting, then, and which we have trained for, then I think we need to keep at the back of our head that overcommitment plays a little . . . because . . . you feel that you get a little too geared up . . .”

Low-Risk, High-Frequency Events

Air ambulance crews are frequently in routine situations with generically defined risk factors that need to be analyzed and evaluated in each and every novel situation. One example was how they accept improvised landing sites to save time. G1 commented ironically, “Yes, we’ll save 20 seconds on landing, and then we’ll be there waiting for the ambulance.” A3 concluded, “It is a little stupid to land in the forest when there is actually an airport close by” and pointed at a need to “standardizing things a bit.” G2 explained the following: “We know about a number of risk factors in our daily lives, and we are really willing to continue to take that risk because we perceive it as low.”

Equipment Availability

There was no common understanding that equipment availability in a critical situation always led to increased and dangerous commitment. They pointed at nonstandard use of equipment in difficult, time-critical situations and modern equipment, like night vision goggles (NVGs) and moving maps, which allowed them to lower the weather minima for flying. A1 thought there were higher minima before without NVGs, “but then again, we were out flying in bad weather, without NVGs, in those times . . .” Some crewmembers pointed at increased safety as a result of new equipment and a focus on crew resource management (CRM). A2 answered “No, clearly not” when asked if their judgment of a situation remains the same with or without available equipment. He used their diving suits as an example; the old suit was too buoyant for diving, the new one “opens up to take much higher risk and do things that you could not do before.” In general, by their sheer arrival by helicopter, they feel an increased pressure to handle the situation, although usually being “quite good at saying STOP” (H2).

Expectations and External Pressure

Two types of expectations influence decisions to attempt a rescue effort: the crewmembers’ internal motivation and a variety of expectations from victims, bystanders, legislation, and cooperating rescue units. J3 illustrated the dilemma by asking, “And that’s typical; there are people there (in need of help), and then the specialized rescue service should choose not to help them?” C3 found that “You are increasingly aware of expectations, from the employer and the world around us. The fear of being held responsible, in retrospect, I think unfortunately is something that is becoming more and more applicable.” The pilots seemed to be less influenced by external factors. G1 asserted, “There is no judge who can point at me and say; I think you should have (chosen to fly).” H1 stated, “If you think about expectations or pressure, we don’t feel that very much,” adding that they always try to find good solutions.

The strongest urge to do something in critical situations arises when “Nobody else can do it.” A2 said, “The satisfaction of solving things where others are stuck. That’s definitely something that makes you push it a little . . .” A2 also said that he feels “less autonomous” when other air rescue bases “are in the loop” (eg, when the mission is transferred from another crew because of flight time limits). In a recent mission, he consulted a senior member of the other crew, getting the impression that flying conditions were OK. He sensed that “we should really try to fix it.” He attributed this to his respect for older colleagues and “an expectation that made him want to be a good soldier.”

Victim allegiance was not considered an unambiguous risk factor in this service, although children do trigger crews to greater efforts and higher risk tolerance. B1 said that “there is a difference between a 5-year-old and a 95-year-old” but maintained that compliance with flight minima, even in those situations, was “surprisingly easy.” A3 stated that flight minima remain the same, irrespective of type of emergency, and the doctors avoid stressing pilots by referring to the patient’s poor condition (D3).

Postquiescence Syndrome

Some air ambulance crews reported a stronger urge to engage in a mission after long, quiet periods, resembling volunteer rescuers who may wait for months and years in between call outs. This postquiescence syndrome, named by the authors, is characterized by increased activation levels and a strong desire to complete a mission. A2 mentioned an example in which they misjudged the consequences of high altitude and overloaded the aircraft when taking on 2 mountain rescue missions in the same area. He explained the following: “There was no time pressure related to the missions, but they had had very few missions and got two missions close to each other that they would like to solve.” F3 suggested, “Maybe it’s that feeling that now, it is finally happening what we have trained for in such a long time.”

Unforeseen Events

Although termed *unforeseen events*, the statements made by crewmembers indicate that the risk was reasonably conceivable²² and always retrospectively explainable. Often, these situations were related to natural hazards causing retreat or unplanned landings. C2 stated, “Coincidence rules, and the weather can be unpredictable.” Crews committed themselves in attempts to reach an accident site or search for missing people, later realizing that they had missed out on critical information, misinterpreted the circumstances, or found themselves in a conjunction of surprisingly adverse conditions. Overcommitment followed as a result of not allowing time to acquire sufficient information about the situation.

Organizational Overcommitment

Organizational factors were identified as sources to overcommitment in that rescue units are called out in excess numbers or

activated on-site in situations of uncertainty. J3 referred to rescue operations “with spontaneously released avalanches, then there are more spontaneous avalanches, and we have seen all rescuers, all gathered in the same area . . .” Crewmembers saw it as a part of the professional attitude to have “some kind of conscious overcommitment and then de-escalate when someone gets information saying it is not necessary.” C3 explained, “In search and rescue operations, it is very often uncertain, first of all, how many patients, if any, and if you have a number of people, then you do not know if there are patients or if they are stuck somewhere or missing.”

In a similar category are search operations in which no one was confirmed missing. C1 referred to that as special “avalanche winter,” where they regularly responded in poor weather conditions, on “things that people had only observed from the road.” “There were no observations or traces of people.” C2 suggested that “They . . . think that the volunteers are so seldom called out to avalanche incidents that when it's finally something, they'll be allowed to continue—as a reward.”

At the other end of the scale was the extrication of confirmed dead people. J4 stated, “There is one thing that is very interesting here, and that's when you're going to bring out dead bodies, in terms of risk. And then we have seen quite a few . . . or at least heard of . . . quite a few hairy operations where they pick up . . . yes . . . people who are in “the mountain wall.”

Discussion

This study is based on data from 30 respondents representing HEMS services in 4 regions of Norway. Thus, we claim that the study gives a representative picture of opinions related to the driving forces in rescue missions for personnel engaged in Norwegian HEMS services.

The reflections of air ambulance personnel broaden the concept of overcommitment to include regular, everyday actions as hazardous rescue attempts in extraordinary incidents. They point at flawed communication and unsafe control actions²³ preceding the “points of no return,” placing them in hazardous conditions that may have seemed surprising at the time. Their examples draw a fine, blurry line between a necessary change of pace to reach the patient in time and impetuous actions putting their lives in danger. The following definition of overcommitment in rescue work emerges from the findings of

this study: “situations in which rescuers make themselves or others vulnerable by committing more than is feasible, desirable, expected, recommended, or compellingly necessary in the given scenario and thereby run the risk of personal injury or death.”

Air ambulance personnel described emergency response situations in which they deviated from flight minima to reach the patient or a hospital in time. Although describing compliance with flight regulations as “flying in a square tunnel,” they obviously added flexibility to those tunnel walls. In line with their cost-benefit approach, they are occasionally willing to sacrifice some of their own safety margin to benefit the patient, even if this implies bending the rules. This seems to be in accordance with the conclusions of the United States National EMS Pilots Association survey that both “internal” and “external” pressure made pilots “fly in questionable weather conditions.”¹² Laws and regulations are not necessarily adapted to front-end rescue activity, which makes rule bending a natural choice in situations in which rescuers face strong conflicting interests. Over time, this may become institutionalized as organizations migrate toward higher risk levels.²⁴

Balancing rescuer and patient safety constitutes the core of risk management in rescue operations. Pietsch et al,²⁵ pointing at the dangers of mountain rescue operations, concluded that “medical tactics are dictated by those factors, and benefits and risks of medical interventions need to be carefully weighed.” CRM training is mandatory for all personnel engaged in HEMS services. Discussing risk connected with single missions is an integrated part of this training. The results of CRM training, no doubt, influenced the statements made by many of the interviewees. This was especially the case when discussing how they identified overcommitment and their strategies to prevent overcommitment in HEMS operations.

Four factors summarized the crewmembers' focus on cost-benefit considerations. Even if the weighting of these factors is uncertain and ill-defined in a dynamic rescue environment, they may be used to both predict and evaluate the level of commitment in a given rescue situation. Triage will build on the information that is linked to the 2 opposing weights, patient and rescue situation, and aim at decisions about necessity, urgency, and feasibility of the mission. Optimal evaluation cannot occur until after the intersection of decisional certainty and situational uncertainty²⁶ (Fig. 1), a point in time that may not even be reached during an ongoing rescue operation.

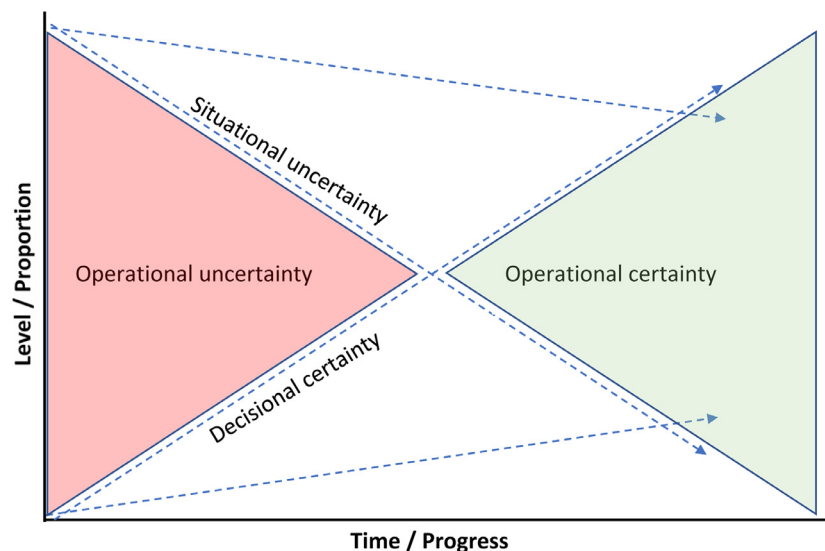


Figure 1. The role of uncertainty in cost-benefit considerations. Blue arrows indicate levels of situational uncertainty and decisional certainty. Triangles indicate the proportions of operational uncertainty/certainty over time as a rescue operation progresses from scramble until the end of operation.

This explains the fourth identified factor, rescuer robustness, because most decisions about cost-benefit will be made under uncertainty about both patient and rescuer safety. Sacrifice seems unavoidable, and satisficing²⁷ becomes a working principle.

One may assume that the tendency to overcommit will decrease as operational certainty increases. In view of the causal factors identified by crewmembers, certainty in operations may not be sufficient to counteract this phenomenon. Individual characteristics and considerations will still affect the perception of risk as well as the final judgments about cost and benefit in each and every new situation. Rescuers seek information or need to rely on their affective reactions.²⁸ In these situations, the “affect heuristic”²⁹ (ie, judging the risk as low and the benefits as high because they have positive feelings toward the activity) will unconsciously influence decision making.

Dealing with the specific risk issues related to every single rescue operation should be regarded as an important element of sound and prudent practice in the cross-professional group constituting the HEMS team. Even though both medical and aviation personnel have quite clear criteria for acceptable practice in their own fields, in rescue operations these criteria have to be melded together to ensure an optimization of the benefit without violating relevant safety measures in every single situation. Consciously addressing the phenomenon of “affect heuristic” during CRM training sessions may be a means for developing a sensible cross-professional safety practice in such situations. The data from this study indicate that this is done to a certain degree, but making this even more explicit might strengthen the cross-professional craftsmanship related to case-specific risk assessments in rescue operations.

The expression numbers needed to treat/harm may be applied to various parameters in rescue operations. In the context of Norwegian avalanche rescue operations in the period of 1996 to 2017, the simple ratio of completed search operations ($n = 610$) to the number of real rescues involving avalanche victims ($n = 250$) may serve as an indicator of organizational overcommitment (ratio of 1:7). Mair et al³⁰ reported nonvictim involvement in 56% of 221 helicopter avalanche rescue missions in the province of Tyrol in Austria (ratio of 1:8), concluding that this “can be reduced by a restrictive dispatch policy after avalanche accidents without clear information about human involvement.” Numbers needed to treat/harm measures could be introduced as lagging risk indicators in avalanche rescue.

Crewmembers recognized several trajectories toward overcommitment. The rescuer activity that leads up to the point of becoming a dangerous act is very likely within accepted practice in “the space of possibilities” with “degrees of freedom to be resolved according to subjective preferences.”²⁴ Apparent overcommitment may be experienced as rational, controllable, low risk by the rescuer in action influenced by what Neil D. Weinstein termed *optimism bias*.³¹ Along with the “affect heuristic,” these psychological mechanisms may explain why crewmembers found it difficult to detect overcommitment in real time. Over time, the optimism bias may be self-reinforcing, causing a wrong impression of being invulnerable.³¹ In a recent study of accidents in mountain sports, Vanpouille et al³² found that ski tourers ventured out in conditions identified to be hazardous and that they minimized, ignored, or banalized risk factors. This underestimation of obvious risk was attributed to human factors like risk normalization³³ and heuristic traps.³⁴ Previous reports from Norwegian avalanche incidents³⁵ showed similar phenomena in that rescuers regularly exposed themselves to the risk of naturally released avalanches during rescue operations. In those cases, large groups of rescuers responded to the same accident sites, perhaps also trapped by social facilitation.³⁴

Several of the causal factors may interact and converge to produce overcommitment. Slovic²⁸ argued that “extraordinarily generous

behavior toward identifiable victims, then, could simply result from the tendency to altruistic behavior to increase with the proportion of the reference group.” Crewmembers explained the ease with which they might reject a mission when at the base. Closer to the accident site, with an identifiable patient, there is an increasing tendency to experience victim allegiance, tunnel vision, mission creeping, target fixation, and expectations and external pressure. Rescuers, unlike ski tourers, cannot easily choose another place or another time and will consequently be left on the horns of a dilemma.

Conclusion

Norwegian air ambulance personnel have offered their reflections on the concept of overcommitment in medical evacuation and rescue operations. The results show that professional rescuers recognize overcommitment in a variety of situations. The concept is broadened to include both regular, everyday actions and hazardous rescue attempts in extraordinary incidents. These multifaceted aspects are included in our suggested definition of overcommitment—“situations in which rescuers make themselves or others vulnerable by committing more than is feasible, desirable, expected, recommended, or compellingly necessary in the given scenario and thereby run the risk of personal injury or death.”

Although always aiming at a perfect balance between patient and rescuer safety, HEMS crewmembers find that a number of personal, social, organizational, and situational factors distort equilibrium. Their comprehensions and assumptions can be linked to parallel explanations in cognitive and social psychology, such as heuristics, biases, group dynamics, and interpersonal relationships. Heuristics, biases, and various psychological mechanisms may be difficult to discover and neutralize in an ongoing rescue operation. On the other hand, the causal factors mentioned by HEMS personnel form recognizable constellations of factors leading to overcommitment. These constellations may offer useful starting points for systems-based counteracting measures, which easily could be included in the regular CRM training for HEMS personnel.

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Supplementary materials

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