

DomPrep Journal

DILEMMA: Acceptable Losses

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- The Wicked Problem
- Acceptable Loss-The Trolley Dilemma
- Epitome of Failure, Part 2
- Avoiding the Three As
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Disasters & Their Acceptable Losses

By Catherine L. Feinman



One of the biggest challenges that emergency preparedness professionals face is how to balance the choices they make. Mitigating every risk is not realistic, but ignoring threats is reprehensible. Lessons learned from any disaster exposes the successes and [failures](#) of those tasked with keeping their communities safe. Some decisions have immediate impact, whereas the consequences of other decisions may not be seen until sometime in the future. In both cases, people and decision makers will be held accountable.

The current pandemic response has exposed the consequences of decisions made in the past – for example, the purchasing of personal protective equipment in advance of the outbreak and the management of the [Strategic National Stockpile](#). This outbreak also highlights decisions currently being made or those that will be made in the near future regarding [lifting social distancing restrictions](#). Each decision, good or bad, comes with a cost.

In some cases, the cost is measured in monetary amounts. In other cases, it may be measured in lives lost. Without having a magical crystal ball to foretell the future and see the outcome of each decision, emergency preparedness professionals are faced with the dilemma of predicting possible futures, weighing the costs, and determining [how much loss is acceptable](#) to achieve the best possible outcome. In the case of COVID-19, at what point does the economic impact outweigh the potential loss of life?

The answer is easier for those who are directly affected than for those who are tasked with answering this question for an entire community, state, or nation. There is no simple answer: the crisis evolves, information is accrued, and the public's focus shifts. The best answer today may be the wrong answer tomorrow. This is not a time for [apathy or atrophy](#).

Regardless the decision, there will be some level of negative consequences. The question is, "What is the threshold for 'acceptable' losses?" DomPrep has and will continue to provide critical information to the preparedness, response, and resilience communities. The decisions community leaders must make each day are challenging, but DomPrep strives to support the process by sharing lessons learned and best practices to help current and future leaders as they weigh the benefits and consequences of their decisions.

The Wicked Problem of Lifting Social Distancing & Isolation

By Galen Adams & Jeremy L. Kim

The issue of when or how to lift social distancing and isolation is a wicked problem. A “Wicked Problem” in policymaking defeats standard solutions because of the interaction between the wicked problem and its potential solutions. The application of the correct solution to one aspect of the wicked problem often complicates another aspect of the problem. Solving wicked problems is best done through the iterative process in which a partial solution is applied, the problem is re-defined, the next partial solution is applied, and the process is repeated. This process is termed “Muddling Through”, and it is dependent upon the ability to test a partial solution and react to it.



The prospect of lifting social distancing is a wicked problem because a greater social association of the public will likely increase the number of infected persons. However, to not lift social distancing measures will worsen the economic recession and will not only exacerbate the deprivation of impoverished families, but also impair the eventual economic recovery due to bankruptcy of key businesses. A key ethical question is: Do lives serve dollars, or do dollars serve lives? The answer is not one or the other, but how to achieve a balance of both.

Influenza A vs. COVID-19

The infectivity of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is expressed by the reproduction number or R_0 (R-naught). The R_0 expresses the average number of people a single person may infect. For example, an $R_0 = 1$ would indicate that, on average, each infected person transmits the disease to 1 additional person. Although there are solutions to both the infectivity and economic recession problems caused by the coronavirus disease 2019 (COVID-19) pandemic, each solution complicates the other. The key decisions will be where, when, and how much to lift social distancing. To guide this process, a model of risk balancing may be useful. Fortunately, the seasonal influenza A serves as a model of risk balancing for a communicable, lethal infectious disease at a tolerable but still regrettable loss (see Table 1).

Table 1. Comparison of COVID-19 and Influenza

| | COVID-19 | Influenza |
|------------------------------------|---------------|-----------|
| $(1.6)R_0$ | 2.2-2.7 (2.5) | 1.3-1.8 |
| Case fatality rate | 3.0% | 0.1% |
| Vaccination effectiveness | None | 45% |
| Effectiveness of medical treatment | None | Variable |
| Deaths per year | N/A | 34,157 |

The propagation of viral disease is determined by its R_0 until the disease runs out of persons to infect. For example, if 10 people are infected with SARS-CoV-2, they will infect 2.5 individuals making a total of 35 by the end of their two-week disease cycle. These 35 will then infect 2.5 individuals making a total of 122.5 by the end of the second two-week disease cycle, effectively increasing the number of infections by 10 times the original number in 4 weeks, 3.6 of whom would succumb to the disease. Unchecked, another four weeks would bring 1,225 infections with 36 deaths and so forth. Without vaccination or effective treatment, the best management strategies for COVID-19 are social distancing, isolation of infected persons, and quarantine of persons who were exposed.

Healthcare Workers vs. General Public

Essential workers such as healthcare workers demonstrate an interesting empirical experiment in opening the economy. Presumably, essential workers such as healthcare, law enforcement, emergency medical services (EMS), and other first responders use personal protective equipment (PPE) in their work. A recent Morbidity and Mortality Weekly Report (MMWR) publication documented the incidence of [SARS-CoV-2 positive healthcare workers at 19%](#). There are [18 million healthcare workers](#) in the United States, or approximately 5% of the population. While the rate of infection in healthcare workers is concerning, healthcare workers do expose themselves to a much greater number of infected people than other forms of employment. A SARS-CoV-2 positive rate of 19% among healthcare workers means that, even with PPE, lifting social distancing for a segment of the population incurs a greater risk of contracting the disease in that segment. One might reasonably expect the risk of contracting SARS-CoV-2 will be higher in the general public who would not have the compliance nor training to use personal protective equipment.

The rate of COVID-19 illness is not uniform across the United States. In locations with a high incidence of disease, lifting social distancing will clearly result in enhancement of the epidemic curve of disease. In some locations, this may be a return to a logarithmic growth of illness and death. However, in areas where there is low incidence of disease with good testing capability and public health surveillance, it may be possible to safely lift social distancing for a limited number of jobs. A surrogate model for reopening employment may be found in a recent MMWR on the incidence of SARS-CoV-2 positive testing among homeless shelters of various cities. The highest [rate of SARS-CoV-2 positive](#) was found in San Francisco (66%) and the lowest in Atlanta (4%). That study also documents a significant proportion of homeless shelter staff members infected (1-30%), presumably due to their occupation. This finding reinforces the MMWR report on the incidence of healthcare worker disease. Presumably, certain job types are at higher risk than others for disease exposure. Some occupations in the transportation and entertainment venues that require close association of people for prolonged periods of time may be unacceptably high risk until a vaccine, prophylactic medication, or effective treatments are developed.

In this scenario, the potential acceptable loss model from contagious infectious lethal disease is the nation's experience with seasonal influenza A. To make the comparison more relevant, the vaccination effect for influenza must be considered and added back to the

Table 2. Acceptable Loss of Life From Influenza Without a Vaccination Program

| | | | |
|---------------------------------|----------------------------|--|-----------------|
| Influenza case fatality rate | Vaccine effectiveness (VE) | Vaccine prevalence | U.S. population |
| 0.001 | 0.44 | 0.6 | 325,000,000 |
| Deaths with vaccination | 34,000 | | |
| Total cases with vaccination | 34,000,000 | Deaths/CFR | |
| Vaccinated population | 195,000,000 | | |
| Unvaccinated population | 130,000,000 | | |
| Infection risk without vaccine | 0.1421 | Total cases/(Vacc Pop*(1-VE)+Unvacc Pop) | |
| Infection risk with vaccine | | Infectivity*(1-VE) | |
| Total cases without vaccination | 46,195,652 | | |
| Deaths without vaccination | 46,196 | | |

denominator of the at-risk population for COVID-19. Assuming that the [34,000 deaths](#) are a result of a higher proportion of the unvaccinated segment (40%) of the population being affected and that the vaccine is 44% effective, the influenza case fatality rate may translate to as many as 46,196 deaths. This number would represent the empirical acceptable risk for COVID-19 modeling (see Table 2).

Scenario: Lift Social Distancing on the Entire United States

In the estimation of COVID-19 case fatality, the best-case scenario is the empirical model of the case fatality rate of healthcare workers, and the worst is the prevalence of SARS-CoV-2 among homeless shelters (assuming no PPE use). Using the best-case infection rate of PPE-clad healthcare workers at 19% and a case fatality rate of 3% as constants, the maximum number of workers is 8,104,561 to achieve an acceptable yearly loss of 46,196 (see Table 3).

Table 3. Influenza Acceptable Loss Model Applied to COVID-19

| | | | | |
|----------------------------|-----------------------------------|--------------------------|------------------------|-----------------|
| | COVID-19 case fatality calculator | | | |
| | COVID acceptable loss | COVID case fatality rate | COVID infectivity rate | U.S. population |
| | 46,196 | 0.03 | 0.19 | 325,000,000 |
| Maximum infected per year | 1,539,867 | | | |
| Maximum number of workers | 8,104,561 | | | |
| Percent of U.S. population | 2.5 | | | |

The current number of medical personnel working is 18,000,000 (18 million). Assuming an approximately equal number of law enforcement, EMS, and essential commerce are working, or 36,000,000 (36 million), the U.S. has exceeded the maximum number of acceptable loss of workers predicted in the influenza A model* by about a factor of 4. If the homeless shelter empirical model with a much higher incidence of disease were used, the maximum number of workers that would result in the same acceptable loss would be drastically lower. Given that the COVID-19 healthcare worker model indicates this COVID-19 year already exceeds the theoretical unvaccinated influenza death total at the current level of social distancing, opening the economy without further exceeding the notional “acceptable loss” of life is challenging. The COVID-19 associated deaths would be accounted in multiples of the acceptable deaths attributable to influenza.



An alternative to the flu-based acceptable loss analysis is econometric, in which the loss of life is weighed against the value of the economic recovery. Although the best-case scenario is to recover the economy with no loss of life, that will not be possible without significant medical advances in the areas of effective treatment and/or vaccination. In the economic analysis, the use of a quality adjusted life year (QALY) is useful. One QALY = 1 year of life at perfect health. If one is disabled, one QALY is degraded by some fraction of loss of utility. The value of one QALY is generally around \$50,000 (with a high of around \$150,000). Applying the QALY concept to the economic valuation of loss of life due to COVID-19, the age of the victim determines the economic impact of the death. If a younger person dies from the COVID-19, the cost in QALY would be the difference in estimated life span and the age of the person multiplied by \$50,000. For example, in a given area where life expectancy is 78 years, if an 18-year-old succumbs to the disease, the QALY value is:

- $(78-18)(\$50,000) = \$3,000,000.$

Conversely, if a 68-year-old person succumbed to the disease, the QALY value is:

- $(78-68)(50,000) = \$500,000.$

The 2019 GDP of the United States is about \$21 trillion (\$21,427,675,000) and has lost an estimated 5.3% or about \$1.6 trillion (\$1,665,666,775) in 2020. Because the COVID-19 case fatality rate trends strongly toward the elderly, the acceptable loss based on QALY valuation would be based on an average age of death (see Table 4). As of 6 May 2020, of 44,016 deaths,

Table 4. Current Cost of Life by QALY Estimation in COVID-19 Deaths

| Average age | QALY cost incurrent liveslost due to COVID-19 | | |
|-------------|---|---------------------------|------------------|
| | N | Life span impact in years | QALY |
| Under 1 | 4 | 310 | \$15,500,000 |
| 2.5 | 2 | 151 | \$7,550,000 |
| 10 | 4 | 272 | \$13,600,000 |
| 20 | 48 | 2,784 | \$139,200,000 |
| 30 | 317 | 15,216 | \$760,800,000 |
| 40 | 796 | 30,248 | \$1,512,400,000 |
| 50 | 2,262 | 63,336 | \$3,166,800,000 |
| 60 | 5,422 | 97,596 | \$4,879,800,000 |
| 70 | 9,359 | 74,872 | \$3,746,600,000 |
| Total | 18,214 | 284,785 | \$14,239,250,000 |

there are currently [18,214 COVID-19 deaths](#) under the age of 75. By applying a life expectancy of 78 years at full utility to the COVID death by age distribution, there would be 284,785 years of lost life at a QALY value of approximately \$14 trillion (\$14,239,250,000).

The current loss of life by QALY estimation is 14 times the economic losses in GDP, so this analysis does not support the lifting of social distancing and isolation. Further, a weakness of the econometric analysis is whose lives are lost for whose dollars. Given the disproportionate loss of life in poorer and minority communities, this approach can be offensive to those groups.

Perhaps the better question than “when to open” is “how to open” responsibly. In areas of low SARS-CoV-2 prevalence, in employment categories that can responsibly mitigate transmission risk by methods such as physically distancing workers or the use of PPE, and with public health monitoring, it may be possible not only to open segments of the economy, but also to quickly detect an increase in disease and re-impose social distancing. In this way, the economy may start and stop with good public health monitoring. To do otherwise is irresponsible.

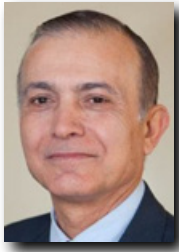
**This model assumes that both the case fatality and occupational infectivity rate remains static. While there are COVID-19 deaths not accounted for in the model – including deaths at home or deaths prior to wide recognition of the syndrome – the likelihood is that the case fatality rate will fall when greater testing is available. With falling case fatality rate and increased ability to trace COVID-19 positive individuals and enforce their quarantine, the available work force will increase. Selected employment positions may have lower infectivity rate (e.g., clerical work), but some may be higher (e.g., entertainment, theaters, transportation). Public hygiene programs may mitigate these issues.*

Dr. Galen Adams is a retired emergency medicine physician and Canadian Forces (Forces arm’ees Canadienne) veteran. He has served as a consultant to the Royal Canadian Mounted Police as well as the Canadian Forces Medical Services in the areas of civilian response to terrorism and disasters. He currently resides in Dodge City, Kansas. “Dr. Adams” is a nom de plume for a very well respected physician who is both known to DomPrep and is unable to affix actual byline to the article.

The Acceptable Loss – The Trolley Dilemma of Managing COVID-19 Pandemic

By Isaac Ashkenazi & Carmit Rapaport

The COVID-19 pandemic takes its toll in terms of human lives and global economic consequences. Social distancing has proven to be the most promising strategy against emerging viruses without borders, but the heavy economic damage that follows puts in question the possibility of its continuation. In fact, weighing the two elements raises an important debate: What is the acceptable loss in order to win this battle?



Strategically, the burden of considering acceptable loss is on the decision makers. This means the price the nation is willing to pay for achieving a balance between the length of the quarantine, economic losses, level of public compliance, and healthcare capacity. Evaluating the acceptable loss is a professional, financial, ethical, legal, social, cultural, and historical dilemma. Despite this, it is an inevitability in order to choose the appropriate crisis management strategy and, more importantly, the condition to end it.

In the military perspective, the *acceptable loss* refers to the assessment of the fatalities and damages that might be caused by a specific action or operation. Industries use acceptable risk to define the degree of risk to human lives and environmental damage that is acceptable after mitigating the maximum risks.

When managing a pandemic, many questions must be asked to determine acceptable losses and risks:

Managing a pandemic raises many questions regarding acceptable losses and risks. When triaging deaths and dollars, an optimal balance should be reached.

- Loss of what: loss of lives, economic aspects, or loss of control?
- Acceptable by whom: the public, decision makers, politicians?
- Contrary to the acceptable loss, what is the benefit?
- How much loss is acceptable in order to achieve (an adequate degree of) benefit?
- How many fatalities of various groups (e.g., young, healthy, unemployed, elderly) of COVID-19 are considered 'acceptable'?
- What is the alternative economic cost of 100, 150, etc. coronavirus deaths? Are these costs acceptable?
- Since this pandemic puts the elderly at higher risk, is the cost of an 85-year-old lower than a child's life?
- How can the economic cost of the lives be measured for those who developed mental health conditions, lost their jobs, or committed suicide?



Saving lives also depends on the meaning of the number of COVID-19 deaths against the meaning of the economic losses damage to the healthcare system. It is not just about examining the numbers – deaths and dollars.

Similar to the triage performed by medical personnel in mass casualty events, the acceptable loss should be put forward to a public debate. Discussing the

price of life is complicated but inevitable. As in the case of medical triage, it is based on two basic principles: beneficence and distributive justice. And, as in the case of triage, one way should be prioritized over the other.

Eventually, one fact should be remembered: *DEAD people do not work.*

This article is adapted from a LinkedIn post published on 4 April 2020.

Professor Isaac Ashkenazi is an international expert on disaster management and leadership, community resilience, and mass casualty events with both extensive professional and academic experience. He is considered one of the world's foremost experts in medical preparedness for complex emergencies and disasters. He is the former director of the Urban Terrorism Preparedness Project at the NPLI Harvard University. He is also an adjunct professor in the Department of Epidemiology at Emory University; an adjunct professor of disaster management at the UGA; a Professor of Disaster Medicine at Ben-Gurion University in Israel; founder of NIREC Center at the College of Law & Business; commander at Mobile Med One Foundation; Advisory Board of Israel Homeland Security; and a consultant to Harvard University, Centers for Disease Control and Prevention, the U.S. Department of Health and Human Services, the U.S. Department of Homeland Security, FEMA, the White House, the World Bank, High Threat Institute U.S., Tactical Combat Casualty Care US, Rio Olympic Games, the Brazilian Ministry of Defense, India NDMA, SAMUR – Protección Civil, China Ministry of Health and other national and international agencies. He served as the Surgeon General for the IDF Home Front Command.

Carmit Rapaport (Ph.D., the Technion-Israel Institute of Technology, 2011) is the academic coordinator of the MA programs in Disaster Management and Fire Studies at the Department of Geography and Environmental Studies at the University of Haifa, Israel. She is also the director of the Institute for Regulation of Emergency and Disaster at the College of Law and Business in Israel. Recently, she was appointed as the academic advisor and head of the evaluation unit at Israel's National Center for Resilience. Her fields of interests are population behavior during emergencies and disasters, crisis leadership, adaptive behavior, and business continuity. She has received research grants from the Ministry of Science and Technology, Ministry of Tourism, and Ministry of Defense among others. She participated as a senior researcher the EU FP7 BEMOSA project.

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The Epitome of Failure – Part 2

By William H. Austin

The aeolian winds took control of the surrounding environment. A death-defying vortex formed and, along with it, a perturbation as inconceivable as the Camp Fire was overwhelming. This article continues to chronicle the story of a mega-disaster. Part 1 described how the Pacific Gas & Electric Company (PG&E) spent the last decade causing major life and property losses due to seemingly incompetent organizational leadership. In the next segment of the story, PG&E may not be the villain its public image would suggest. Other influences and factors that may have played a role in its public image will be revealed.



A red-flag warning is issued by the National Weather Service when winds are high and humidity is low. On 6 November 2018 – two days before the Camp Fire occurred – a red-flag warning was issued for most of the state of California. Over the next 48 hours, PG&E tweeted 17 different warnings of an impending electricity shut-off. The shut-off order was never given, leaving citizens and investigators to question, “Why?”

Influencers

Research has shown several institutional, cultural, and mitigating influencers were at work in the unfolding of the Camp Fire catastrophe. The lack of a certain action or the making of a certain decision can only be explained in some examples as the direct result of a lifetime’s experience in the “that’s just the way it is” philosophy. Here are some examples of the influencers:

- Wildfires in California have a history of being wind-driven and creating tremendous losses.
- The roads were narrow, limited, and gridlocked quickly, resulting in abandoned vehicles and citizens fleeing on foot. The subject of road capacity was/is a political question being debated in the area.
- Paradise had a seldom exercised and limited evacuation plan. The evacuation plan called for sequential evacuation of each neighborhood instead of all at once due to limited street capacity.
- The 2005 state fire management plan identified an “east-wind” fire as the greatest risk to Paradise. The Jarbo Gap winds occur every year.
- Like many emergency agencies, Paradise planned for the most probable events in the community and not an event that is expected only once in 50 years.
- Climate change over the past decade as well as drought problems were constant in the state.
- PG&E considered a shut-off of power an action of last resort, and its policy indicated that no single factor drives the decision-making process. However, most experts opined that “high-wind speeds” should be given the most consideration.



Investigative Facts

The Camp Fire would come to be one of the most devastating fires to ever occur in California. It could also be considered one of the most investigated events in the history of the state. The disaster was investigated by a dozen news media agencies, numerous California state agencies (including regulatory and CalFire investigators), and various legal representatives for pending legal actions and insurance settlements.

The investigative facts revealed the following key points:

- At 4:00 a.m. on November 8, expected wind gusts were 55 mph and humidity less than 15%.
- In total, 86 people died and approximately 14,000 buildings were destroyed.
- The fire grew at a rate of 4,600 acres an hour. Analysis found the speed of the fire to be unprecedented.
- Evacuation initially worked as planned. However, CodeRed Logs (the town's warning service provider) showed initial alert failure rates of 40%, loss of fiber optic lines and cell towers shut down the warnings.
- The PG&E pending shut-off never occurred. The action was canceled several hours after the start of the fire.
- The miracle of this disaster is how many citizens survived.

Final Decision

On 15 May 2019, California Department of Forestry and Fire Protection (CAL Fire) released their investigative report for the Camp Fire. The fire started in the early morning hours in the community of Pulga in Butte County. CAL FIRE determined that the Camp Fire was caused by electrical transmission lines owned and operated by PG&E located in the Pulga area. Dry vegetation and red-flag conditions promoted the fire and caused a quick burn to Concow, Paradise, Magalia, and the outskirts of East Chico.

The investigation also identified a second ignition sight near the intersection of Concow Road and Rim Road. The cause of the second fire was determined to be vegetation blowing into the PG&E electrical distribution lines. The second fire was ultimately consumed by the original fire.

The exact failure that resulted in the fire was traced to a C-Hook that had broken on a 115,000-volt line. PG&E internal documents show the average age of its transmission lines on the Caribou-Palermo line is 68 years old. PG&E normally inspected transmission lines



Pacific Gas and Electric Co. has released a photograph of the broken hook on its Butte County power tower involved in the ignition of the deadliest and most destructive wildfire in California history in 2018 (Source: U.S. District Court).

every five years. However, PG&E delayed safety work on the Caribou-Palermo line and documented the need to replace most of the steel towers due to age and/or integrity.

Previously, on 26 November 2018, the California Public Utilities Commission ([CPUC](#)) Safety and Enforcement Division (SED) had determined in its report that the PG&E committed 12 safety violations related to the Camp Fire. Based on the investigations and the admission from PG&E that their equipment was at fault, PG&E declared [bankruptcy](#) as a direct

result of the tens of billions of dollars in liabilities incurred from the 2017 and 2018 wildfires. Under the doctrine of [inverse condemnation](#), California utilities may be held responsible for wildfire damage caused by their equipment, regardless of whether or not they were negligent.

An Image Problem

It could be said that PG&E cannot get out of its own way. Its public image has been highly questionable for a decade. As the fines accrue for regulatory failures and the revolving-door CEO policy continues, PG&E seems to be reinforcing the very image it wants so badly to change. Over the horizon, the impending reorganization will involve replacing nine of the twelve board members and another complete change in both leadership and policy direction.

Some would argue that things are getting worse for PG&E. The company has over 16 million customers and, in 2019, pre-emptively cut power to over one million of them. The company is working to resolve a dispute with Governor Gavin Newsom, who has questioned the amount of debt in the PG&E re-structuring plan. The governor has threatened a state takeover of the company. Also, California lawmakers have argued that PG&E is too large to operate safely.

As expected, PG&E stock has been significantly impacted. As recently as October 2017, the stock was listed at \$53.00 a share. In October 2019, it listed at \$8.00 a share and is currently in the \$11.00 range.

The New Plan

One of the philosophical changes to occur, as a result of the terrible wildfire seasons in 2017 and 2018, motivated the CPUC to endorse the concept of a pre-emptive power shutdown as a method to control damages and loss of life from wildfires in the state. The concept was a natural extension of the policy of cutting power in dangerous situations where wildfires were already burning. The new plan allowed public utilities to use the data that supports a red-flag warning and decide if a pre-emptive shutdown would at least make a potential disaster situation less likely to occur if the high-voltage potential was eliminated.

Certain actions or decisions can only be explained as the direct result of a lifetime's experience in the "that's just the way it is" philosophy.

PG&E announced its plan to proactively shut off power in the fire-prone zone of its service delivery area. The fire-prone areas were home to 5.4 million people and the plan immediately drew criticism from just about every sector of society, including those who need electricity for medical needs.

Finally, the test came, on 10 October 2019, every fear of any constituent seemed to be realized. Traffic lights stopped working, 800,000 homes were without power, schools and businesses shut down, 248 hospitals and 304 police and fire agencies were impacted. Based on the first two days of the shutdown, the economic impact was projected to be between \$65 million and \$2.5 billion in losses, as determined by Michael Wara of the Stanford University Climate and Energy-Policy Program.

The uproar was so bad that the CPUC had an emergency meeting within a few days. The CPUC wanted to know what went wrong. Bill Johnson, PG&E's chief executive officer's response was predictable and surprising when he stated that, "making the right decision on safety is not the same as executing that decision well."

The story will conclude in Part 3 of this article.

William H. Austin, DABCHS, CFO, CHS-V, MIFire, currently teaches in the Emergency Management Master's Degree Program at the University of New Haven in Connecticut (2016-present). He formed his own consulting firm, The Austin Group LLC in 2011. He served as fire chief of West Hartford, CT (1996-2011) and as the fire chief of Tampa, FL (1985-1995). He has a Master's Degree in Security Studies (Defense and Homeland Security) from the United States Naval Postgraduate School (2006) and a Master's Degree in Public Administration from Troy State University (1993). He is a member of the Preparedness Leadership Council and has served on various Governing Councils both in Florida and Connecticut.

Avoiding the Three As: Apathy, Atrophy & Attrition

By Christopher Tantlinger

Emergency management is everything to everybody, but it often lacks the glue that is so desperately needed to manage catastrophic events. This is likely the result of two common pitfalls that the profession has long suffered from, pitfalls that can begin as soon as one walks out of the meeting or training room door: apathy and atrophy. Apathy can be defined as a lack of interest, passion, excitement, or concern. When not effectively addressed, apathy can then lead to atrophy, a long gradual decline in effectiveness. Such weakening is caused by underuse of key knowledge, skills, and abilities.



There have been shining moments such as the 2003 Space Shuttle Columbia Recovery Mission across 300 miles of the southern United States or the 2007 I-35W Mississippi River Bridge collapse in Minneapolis, Minnesota. These incidents showed that it is absolutely possible to manage personnel, resources, jurisdictions, and subject matter experts – and do it all while providing the public the relevant information. There was no existence of apathy or atrophy in these operations.

A History of Disaster

Looking at events that were rife with atrophy and apathy can be seen in the “snowmageddon” of 2009-2010. This North American blizzard began threatening days before, but it was not managed well and people died. The *Washington Post* headlined the 7 February 2010 Sunday Edition with “[A Historic Mess.](#)” A subtitle described how tens of thousands were powerless and stalled without heat and transportation for air, rail, and roads. Over a half-page photo of a disastrous street scape of downed power lines and an impassable road showed how communities were struggling to dig out.

Snowmageddon is aptly dubbed because of the end-of-world scenario that it created. However, emergency managers had been learning how to implement the Incident Command Structure (ICS) and manage existential-threat scenarios for many years prior to this event. This headline should have read, “City Crippled by Snow of the Century,” with a subhead “Emergency Managers Provide Life-Saving Resources and Shelter for Those Affected.”

Major exercises, written articles, catastrophic logistics, All-Hazards Incident Management Team training, Homeland Security Exercise and Evaluation Program ([HSEEP](#)) developments, and other professional works written – as well as an emerging post-secondary academia track – were creating an “age of enlightenment” in emergency management. Atrophy and apathy, though, ruled some aspects of this disaster.

Emergency managers regularly respond, manage, and organize disasters. Terror events like 9/11 in 2001 and natural disasters like Hurricane Katrina in 2005 had shown what

disasters could be. Yet, a snowstorm still incapacitated a region. Implementation of ICS up to that time archived 40 plus years as a part of the emergency management foundation. Although the National Incident Management System ([NIMS](#)) curriculum was a requirement of all emergency managers by 2010, emergency management systems still suffered apathy and an atrophy from a known emerging snowstorm.

Infusing a New Safety Culture

It is imperative that these terms are countered and defeated with exercise and the promotion of leaders that have vital cultural safety skills when it comes to disaster management. An atrophied limb needs exercised. Vitalizing the means to create enthusiasm, interest, and concern can make all the difference when the next local, state, or federal disaster falls upon the public.

A culture of safety must be infused in every aspect, at every level. Elected officials must be told, firmly, that information technology (IT) is not just a way to manage data. IT serves as a shield and sword that produces information sharing and a common operating picture with real-time data integrated from all stakeholders – public and private alike – when the next snowmageddon is upon the region. Every aspect of an organization must have the safety culture engrained in it. Private resources that support public resources need to be resilient and collaborative and not operate in a vacuum. If a paralyzing storm, public health crisis, or other disaster is impending, there should already be collaborations for supply chain, safety, operations, information sharing, verifying contacts and tangible resources, and identifying gaps. There is no room for assumptions in emergency management.



The Sterling, Virginia, NWS Forecast Office (February 2010).

Reality Check

Checklists have been developed for nearly every scenario, every position, every contingency, but they are not exercised. They sit unused, with no regular snowmageddon practice day executed. Everyone has been guilty of the apathy dance that occurs regularly with exercises. A tabletop exercise is scheduled for next month, all the stakeholders are identified, and there is an enthusiasm and a plan to exercise. The large conference room is scheduled, everyone ensures they will be there, and the one or two critical emergency support functions (ESF) are locked in. The IT group is ready to present how situational

awareness and data can be merged in real time to handle a resource-heavy, vocation-wide management of the emergency.

Then, the day before the exercise, the other A word, attrition, rears itself. So, now the scramble is on as a critical partner drops out, one of the major response agencies has a critical personnel issue, the scribe is pulled away for a “priority” incident, and all the same members are there to conduct the exercise.

The Next Step

Here is what needs to be done:

- Exercises need to be mandatory, no exception.
- The leaders of the organization need to be present (not assign the 2nd in command to be the incident commander on the exercise claiming they need to get practice).
- All leadership should be involved.
- All main stakeholders and machinery that makes them work and can make decisions need to be included.
- Finally, a “real” hot wash and after action/improvement plan needs to be conducted.

Doing this while avoiding atrophy of the department and reducing apathy is difficult but can be done by engaging someone other than the training officer to develop the exercise. It needs to be someone in the organization that can put vitality and concern into a meaningful exercise with fresh ideas. This will let the training officer concentrate on some of the ideas they have been wanting to explore to enhance the product. It does not have to be perfectly done with all the forms and documentation properly parsed out. It just needs to be done – scenario, participants, actions, goals, capabilities, analysis, hot wash, debriefing, and improvement plan. This can be accomplished on one page in an agenda-like format and should be realistic to what the hazard vulnerability analysis and risk assessment tool determine about the community.

This kind of exercise can help in countless ways to keep atrophy from creeping in, and apathy can be shunned and purged out of the organization. Westmoreland County, Pennsylvania, Department of Public Safety has conducted dozens of tabletop exercises for municipalities, response agencies, churches, colleges and universities, car dealerships, personal care homes, schools, hazmat, human services, and whoever else wants a straightforward, timely, and usable learning experience and tool that they can emulate or expand to foster the culture of safety through all strands of their operation. Sharing this knowledge and building relationships with all of these stakeholders will better prepare communities for all kinds of disasters and perhaps reduce the severity of the next snowmageddon.

Addendum

In the current “snowmagedon,” COVID-19, the level of apathy, atrophy, and attrition before the outbreak contributed to the current level of preparedness and response for this often talked about, sometimes exercised, but never experienced event. Going forward, some formats may have to temporarily change (e.g., virtual vs. in-person tabletop exercises), but the concept and need to exercise using a whole community approach remains.

As of 2 May 2020, the Westmoreland County Department of Public Safety has been engaged in a Virtual Emergency Operations Center (VEOC) with a full ICS executing its reworked 2006 Pandemic Response Plan. This VEOC has effectively interfaced every facet needed to effectively collect data, unmet needs, and immediate actionable intelligence. The planning “P” has virtually come to life on a video conferencing platform as tactics, strategy, and planning meetings create a congregate of thought for the next operational period.

Emergency managers had been learning how to implement ICS and manage existential-threat scenarios for many years prior to snowmagedon.

This event has enabled data mining of over 40,000 9-1-1 calls to date and illuminated trends through the computer-aided dispatch (CAD) on a daily basis. This process helps responder awareness, hospital capability, logistics and procurement status, legal, and human resources safety and concerns, all of which are either addressed immediately or provided an interim strategy to be flushed out at the operational period planning meeting. This concept has identified needs in real time and has successfully brought the culture of safety that has been outlined for many years to all the stakeholders on the virus battleground.

This pandemic has reached every corner of organizational response capabilities and exposed the three As. Although many agencies have risen to the occasion, it is still critical to be ever vigilant and to not let the three As creep back into emergency management missions and purpose.

Christopher Tantlinger is the deputy emergency management coordinator, Westmoreland County Department of Public Safety, Pennsylvania. He serves as chief of the county HAZMAT team. He has 27 years in the fire service, is past president of the Fire Chief’s Association of Westmoreland County, and is a proboard-certified HAZMAT technician. He serves as a rescue technician instructor for a rescue tool manufacturer. Activities include serving on the board of the Pennsylvania Association of Hazardous Materials Technicians. He is a cum laude honors graduate of Saint Francis University in Loretto, PA with a BS in criminal justice and holds a professional certification from the Pennsylvania Emergency Management Agency. The author can be contacted for more information or to discuss collaborative ideas at: ctantlin@co.westmoreland.pa.us

Management of the Strategic National Stockpile, A Path Forward

By Carl Brewer

Publisher's Message: Carl Brewer was the president of Upp Technologies Inc., a Chicago-based supply chain management software company that developed an inventory management and distribution system used by 40% of the states for emergency management and distribution of the Strategic National Stockpile (SNS). With the management and delivery of personal protective equipment (PPE) being "breaking news," Carl was asked to provide his insight on this highly debated topic to DomPrep's readers.

Because of COVID-19, it is time to reevaluate preparedness and reconsider threats to the homeland. Good intentions and grand theories do not make good programs. Programs work best when they're based on a detailed understanding of the problem begin solved and how they are implemented on the ground with solid funding commitments and realistic expectations.



As a short backdrop, in 1999, the National Pharmaceutical Stockpile was created to ensure the nation's readiness against potential agents of bioterrorism like botulism, anthrax, smallpox, plague, viral hemorrhagic fevers, and tularemia. The mission was to assemble large quantities of essential medical supplies that could be delivered to states and communities during an emergency within 12 hours of the federal decision to use the stockpile.

The 9/11 terrorist attacks prompted federal legislation and directives to strengthen public health emergency readiness. In 2003, the National Pharmaceutical Stockpile was renamed the Strategic National Stockpile (SNS). Today, the SNS works with government and nongovernment partners to upgrade the ability to respond to a national public health emergency, ensuring that federal, state, and local agencies are ready to receive, stage, and distribute products.

The SNS has been deployed to multiple large-scale emergencies including floods, hurricanes, and influenza pandemics. It has also supported small-scale deployments for life-threatening infectious diseases like anthrax, smallpox, and botulism.

- 1999 – Stockpile established
- 2001 – World Trade Center & anthrax attacks
- 2005 – Hurricanes Katrina & Rita
- 2008 – Hurricanes Gustav & Ike
- 2009 – H1N1 pandemic influenza & North Dakota flooding

- 2010 – Hurricane Alex & North Dakota flooding
- 2012 – Hurricanes Isaac & Sandy
- 2014 – Botulism outbreak & Ebola
- 2015 – Ebola
- 2017 – Zika & Hurricanes Harvey, Irma & Maria
- 2019 – Hurricane Dorian
- 2020 – Novel coronavirus

The 2009 novel influenza A (H1N1) virus was the first large-scale, multi-territory deployment of the SNS. H1N1 had spread quickly across the United States and the world. Much like the events of today, this new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. From 12 April 2009 to 10 April 2010, the Centers for Disease Control and Prevention (CDC) estimated there were 60.8 million cases (range: 43.3-89.3 million), 274,304 hospitalizations (range: 195,086-402,719), and 12,469 deaths (range: 8,868-18,306) in the United States due to the H1N1 virus.

On Saturday, 25 April 2009, under the rules of the International Health Regulations, the director-general of the World Health Organization (WHO) declared the 2009 H1N1 outbreak a public health emergency of international concern and recommended that countries intensify surveillance for unusual outbreaks of influenza-like illness and severe pneumonia.

On 26 April 2009, the U.S. government determined that a public health emergency existed nationwide; CDC's SNS began releasing 25% of the supplies in the stockpile that could be used to protect and treat influenza. This included 11 million regimens of antiviral drugs and personal protective equipment – including over 39 million respiratory protection devices (masks and respirators), gowns, gloves, and face shields – to states (allocations were based on each state's population).

Good intentions and grand theories do not make good programs. Programs work best when they're based on a detailed understanding of the problem begin solved and how they are implemented on the ground with solid funding commitments and realistic expectations.

The 2009 H1N1 pandemic occurred against a backdrop of pandemic response planning at all levels of government, including years of developing, refining, and regularly exercising response plans at the international, federal, state, local, and community levels. This is critically important as regular exercises and response plans kept everyone communicating and ensuring that SNS products are properly grouped, rotated, and managed based on the

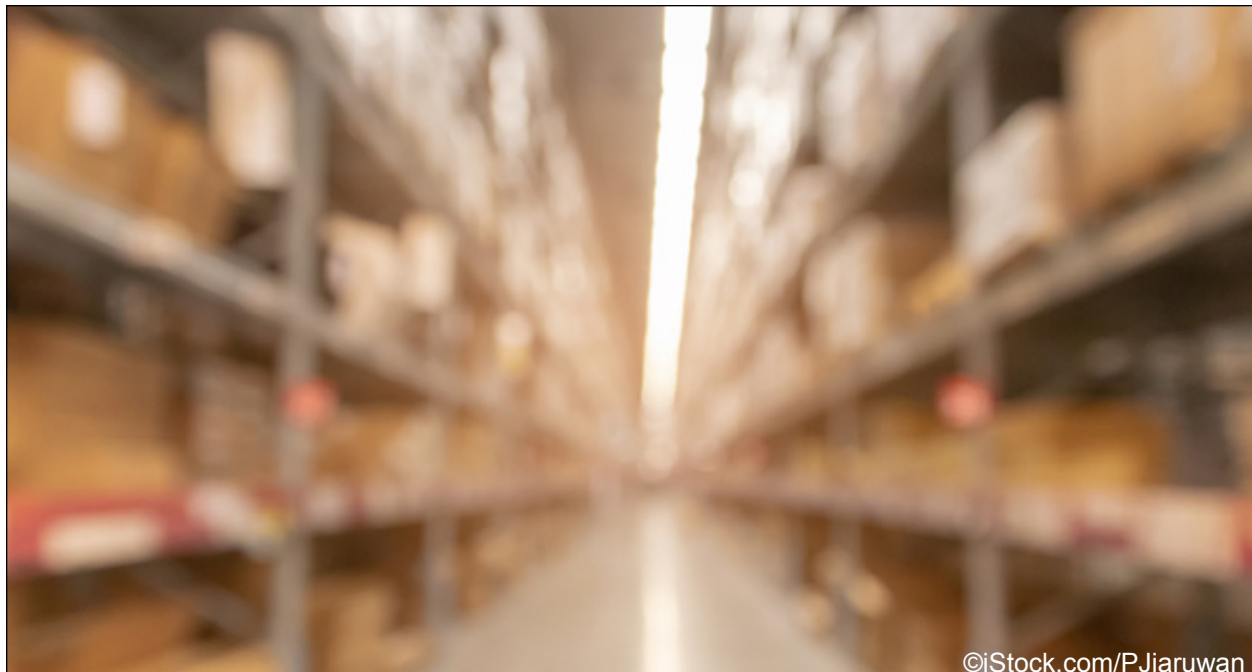
exercise “threat response.” Equally as important is ensuring stock rotation as it manages products with shelf life, expiration dates, or certification requirements. In 2009 when funding was widely available, the state, local, and federal health agencies regularly practiced their response plans and included the local healthcare agencies, hospitals, and transportation service providers.

Ten Years Later – Response, Preparedness & Funding?

While the SNS reportedly holds some 16,000+ ventilators, of those deployed in March 2020, several states reported issues with ventilators not working, challenges with external battery packs, and ventilators with missing hoses to attach to the facilities’ oxygen supply. The various configurations in the SNS added to the confusion: the Zoll (Impact Instrument) Uni-Vent 754 kitted with one oxygen hose and one air hose; while the Covidien (Puritan Bennett) LP10 and Vyaire (CreFusion) LTV 1200 models do not come with oxygen hoses or air hoses.

Obviously, there was a lack of communication and expectation between federal and local levels that should have been addressed in response exercises by both parties. Similar challenges were reported with the N95 masks that were distributed – proper fitting and sizing, as well as certification validation are critical factors. Apportionment and distribution of limited supplies like the ventilators and masks became more of a political than a medical issue.

Based on the distribution challenges and readiness of PPE for the local healthcare professionals – the nation was not prepared. Reserves and replenishment pipelines were



ill-prepared, ill-equipped, and responses delayed by politicians. This raises numerous questions, including:

- How can these response gaps be corrected going forward?
- What lessons were learned?
- Will there be a “hot wash” on the SNS once this pandemic is over?

In 2009, the successful response was based on federal funding, funding based on the threat of terrorism, but the enemy was not Anthrax. It was H1N1. Fortunately, the nation was prepared with enough PPE and antiviral drugs. With the reduced risk of terrorism, the funding has diminished at the state and local levels, leaving only the federal government. Undoubtedly, a reduced budget item based on risk – but now the nation has seen its new enemy.

As forecast by Bill Gates in 2015 and undoubtedly foreseen by leading epidemiologists, the new threat is a highly infectious virus. The nation as a whole has failed to invest in preparedness for an epidemic. It is now necessary to reinvent, reinvest, and renew the mission of the SNS. Relying on contractors will not ensure the readiness of medical protection, neither will relying on government employees to manage the rotation and inspection of medical supplies. Medical professionals must be incorporated and relied upon to forecast, define, and prepare the contents of a new revised SNS, one prepared for a highly infectious virus pandemic event.

Questions Need to Be Answered

The following images raise serious questions about the nation’s readiness and its ability to respond: when healthcare workers are televised begging for personal protection equipment (PPE) and seen wearing makeshift solutions so they can serve the health of citizens; when state governors are saber rattling with the president of the United States about ventilators; and when government officials are standing in front of medical professionals. These images spur questions like: Who is in charge? Who is responsible? Who should have ownership (federal, state, local, regional, or private)? Is the United States any better prepared than most 3rd world countries?

When the smoke clears and a “new normal” settles in, there needs to be a reassessment of SNS’s ownership, contents, maintenance, and distribution plans in order to better prepare for the next pandemic.

Carl Brewer was a founding partner and president of Upp Technology, a Chicago based innovative solutions firm that designed and implemented the nation’s first state-level emergency management and distribution solution integrated into the Strategic National Stockpile (SNS). His clients included 40% of the State Emergency Management Offices. He worked closely with retired Rear Admiral W. Craig Vanderwagen, former Assistant Health and Human Services Secretary for Preparedness and Response to incorporate a scalable solution to help manage the SNS at the state and local level.

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