

Application of the Ethical Triangle in the 2014 Ebola Epidemic: A Case Study

by Katie Martinez and Marcos Martinez

I don't think that there could be any fair distribution of something which is available in such a small quantity.

*— Marie-Paul Kieny, Assistant Director General
of the World Health Organization*

Since 1976 there have been 25 Ebola outbreaks reported worldwide. Eight of these outbreaks occurred in the West Africa region.¹ Although recent drug research shows promising results, there are no approved vaccines or known curative therapies available. At the time of the 2014 Ebola outbreak, experimental Ebola therapies had not yet made it through human trials. The 2014 West Africa Ebola epidemic resulted in an international containment effort and expedited the research and development of experimental drugs and vaccines. However, the supply and availability of these experimental therapies were extremely limited. Two American aid workers were among the first to be treated with an experimental drug called ZMapp. The provision of this experimental drug to two Americans ignited international controversy over the ethical allocation of a limited supply of experimental treatment.

Background

The 2014 West Africa Ebola epidemic was the largest outbreak of the virus in history.² Initial outbreak estimates indicated 70 percent case-fatality rates; the World Health Organization

Major Katie Martinez serves as the Deputy Chief of Pharmacy at Carl R. Darnall Army Medical Center, Fort Hood, Texas. She received a Pharm.D. from Ohio Northern University, a MBA and MHA from Baylor University, and a Master of Military Art and Science in Strategic Studies from the U.S. Army Command and General Staff College.

Major Marcos Martinez serves as the S8 for 1st Medical Brigade, Fort Hood, Texas. He received a MBA from Webster University and holds Defense Financial Management Certification Program (level 2) and Certified Defense Financial Manager certifications.

(WHO) declared a “public health emergency of international concern.”³ The Centers for Disease Control and Prevention (CDC) estimates more than 11,000 individuals died in West Africa during the 2014 Ebola crisis.⁴

Humans contract the Ebola virus from contact with the blood, skin, or bodily fluids of infected primates.⁵ Symptoms are relatively non-specific and include fever, headache, muscle pain, vomiting, diarrhea, fatigue, and unexplained hemorrhage.⁶ Left untreated, the Ebola virus typically results in death. There is currently no Food and Drug Administration (FDA) approved vaccine or curative therapy available for the Ebola virus.⁷ Treatment is focused on supportive care to allow the patient’s immune system to mount an adequate response to the virus.

During previous outbreaks, offering African patients drugs that had not been tested on humans or proven safe and effective for Ebola was considered unethical. One example of why this is considered unethical occurred in 1996 when Pfizer conducted a clinical trial of an experimental antibiotic in children during a meningitis outbreak in Nigeria.⁸ The Nigerian government and ethical council of Nigeria approved the provision of the experimental drug. However, Pfizer did not seek FDA approval because the clinical trial occurred outside the U.S.⁹

The use of this unproven experimental antibiotic was widely considered unethical for many reasons. Consent was not documented, there were charges that the patients were unaware that they were receiving experimental treatment, the medication had not been previously proven safe or effective in children, and some children receiving the therapy experienced complications or died as a result of receiving the medication.¹⁰ This Pfizer clinical trial conducted outside commonly accepted ethical guidelines is just one example of why using experimental therapies during disease outbreaks has historically been

considered unethical.

In August 2014, the WHO shifted its stance and declared that it was ethical to offer patients experimental treatments for the Ebola outbreak.¹¹ Due to the size and fatality rate of the 2014 West Africa outbreak, the consensus at the WHO was that the change in ethical guidelines was necessary to help contain the spread of the Ebola virus and reduce the fatality rate. Because these experimental treatments are not commercially made and available, the quantity and availability were limited, and not everyone infected with Ebola would receive them. This

During previous outbreaks, offering African patients drugs that had not been tested on humans or proven safe and effective for Ebola was considered unethical.

decision by the WHO led to a significant shift in the ongoing ethical debate about experimental drug use during a disease outbreak. The previous ethical question centered around the ethics of using experimental treatment during a disease outbreak. The WHO’s declaration that experimental treatment was ethical during the 2014 Ebola Crisis spawned a debate over a different ethical question: Who should receive the limited quantity of experimental drugs available during an epidemic?

In its statement declaring the shift in ethics regarding provision of experimental treatments, the WHO also issued a set of guidelines. One of these guidelines was a mandate to fairly distribute the scarce resource of experimental drugs.¹² The WHO acknowledged in its declaration that further ethical analysis and guidance would be needed to achieve this fair distribution.¹³ However, no further guidance to ensure ethical distribution of scarce experimental treatment was ever published by governing medical bodies

such as the WHO, CDC, or National Institutes of Health. There have been several authors who have provided ethical guidance for the allocation of a limited quantity of experimental drugs.¹⁴ However, none of these guidelines have been adopted by the international community.

ZMapp, the experimental drug for Ebola, garnered the most attention. Mapp Biopharmaceutical developed this experimental treatment in collaboration with the Public Health Agency of Canada, Defyrus, the U.S. Army Medical Research Institute of Infectious Diseases, and Kentucky BioProcessing.¹⁵ The

Further convoluting the ethical question of how to allocate experimental treatment is the question of who makes this determination.

Department of Defense has a long history of involvement in research surrounding infectious diseases such as Ebola.¹⁶ This involvement stems from the military's concern of diseases that could potentially impact the effectiveness and readiness of troops. Two American aid workers were among the first individuals to receive ZMapp. Questions soon arose over why Americans were the first to receive the experimental treatment over others infected with Ebola in West Africa. This led to a global debate over the ethical allocation of experimental treatments available in limited quantities. This question has proven challenging to answer.

Further convoluting the ethical question of how to allocate experimental treatment is the question of who makes this determination. When responding to the ethical questions that arose after the provision of ZMapp to the American aid workers, it was made clear that Mapp Biopharmaceutical's only role in the distribution of experimental treatment was to respond to requests for the treatment.¹⁷ With no agency

stepping forward to provide concrete guidelines to ensure fair distribution, the determination of who would receive experimental treatment fell largely to the government. For example, Liberia received the last three doses of ZMapp in August 2014, and it was left to its government to determine who should receive the doses.

The Ethical Triangle

The Ethical Triangle is a model that can be used when faced with an ethical dilemma (see Figure 1). This ethical model allows the user to test a course of action (COA) against three different ethical approaches: principles, virtues, and consequences.¹⁸ Although the Ethical Triangle was originally intended for use by an individual, it can also serve as a model beyond the individual level because it allows for the testing of complex ethical decisions through three different approaches. Applying the Ethical Triangle to a situation allows for greater understanding of complicated ethical decisions. A more complete understanding of an ethical dilemma leads to the development of a logical and ethically-justified solution.

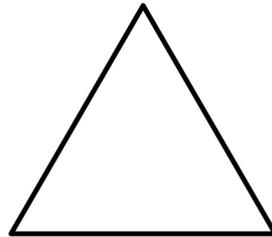
A principles-based approach emphasizes making ethical decisions on universally-accepted rules that always apply. These rules are often referred to as maxims. This approach also takes into consideration one's moral obligation. With a principles-based ethical approach, there is little focus on the immediate effects of a decision. More consideration is given to universally-applicable maxims that apply in the situation. When using a principles-based approach, two key questions are considered: "What rules exist?" and "What are my moral obligations?"¹⁹

A consequences-based ethical approach can also be considered a utilitarian-based approach. A consequences-based ethical approach primarily considers the consequence(s) as part of the act itself.²⁰ A key tenet of this approach is to focus on what decision produces the greatest good for the greatest number of people.²¹ When

THE ETHICAL TRIANGLE

Principles

“Act as if the maxim of your action
was to become a
universal law of nature.”
What rules exist?
What is my moral obligation?



Consequences

“Do what produces the greatest
good for the greatest number.”
What gives the best “bang for the buck?”
Who wins and loses?

Virtues

Golden Rule: “Do to others what
you would have them do to you.”
What would Mom think? WWJD?
What if my actions show up on the front page?

Figure 1. The Ethical Triangle depicting three different approaches to an ethical dilemma.

*Source: Source: Jack D. Kem. “Ethical Decision Making: Using the ‘Ethical Triangle,’”
Command and General Staff College, Fort Leavenworth, KS, August 2016.*

using a consequences-based approach, two key questions are considered: “What gives the biggest bang for the buck?” and “Who wins and who loses?”

A virtues-based ethical approach focuses on making ethical decisions based on a set of requisite skills or virtues.²² Virtues are not innately known, but are instead learned from others and practiced.²³ A fundamental tenet of a virtues-based approach is the old axiom “do unto others what you would have them do unto you.”²⁴ When using a virtues-based approach, two key questions are considered: “What would my grandmother think?” or “What if my actions showed up as the lead story in the news?”

The Ethical Triangle provides an ethical model that brings together three very different ethical approaches. This three-dimensional approach provides greater insight into complex ethical decisions and ensures that the resulting answer is well-reasoned and ethically sound. Application of the Ethical Triangle will ensure that the allocation of a limited supply

of experimental drugs during an epidemic or pandemic is ethically sound.

Application of the Ethical Triangle to Experimental Drug Allocation

Application of the Ethical Triangle to the decision of experimental drug allocation is a six-step process (see Figure 2, page 38).

To demonstrate the validity of applying the Ethical Triangle to the allocation of experimental drugs during an epidemic or pandemic, this article uses a case study from the 2014 Ebola Crisis. The case study chosen occurred in August 2014 when Liberia received three doses of the experimental drug ZMapp. Although not yet tested in humans, the results of using this drug in animal trials showed promise in the treatment of Ebola. These were the last known available doses of this potentially lifesaving drug. This case study will look at how the Liberian government could have used the Ethical Triangle when determining how to allocate these doses of ZMapp.

The Ethical Triangle Decision Making Model

1 *Truth v. Loyalty *Individual v. Community *Short-term v. Long-term *Justice v. Mercy

Step 1. Identify the ethical dilemma in terms of right versus right.

2 Step 2. Determine possible actions.

Step 3. Examine actions (alternative courses of action) through the lens of the three ethical systems.

- 3a. Principles-based ethics
- 3b. Consequences-based ethics
- 3c. Virtues-based ethics

4 Step 4. Step back and see if a “third” response, or an alternative COA presents itself.

5 Step 5. Make a choice.

6 Step 6. Implementation.

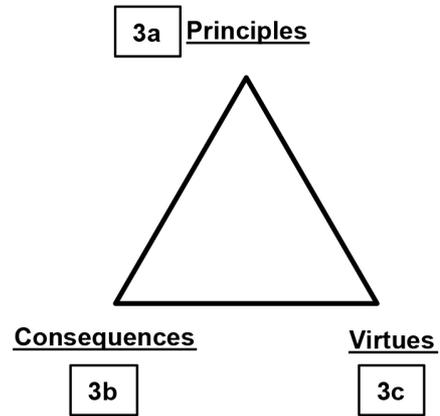


Figure 2. Depiction of the six-step process used when applying the Ethical Triangle to an ethical dilemma.

Source: Jack D. Kem. "Ethical Decision Making: Using the 'Ethical Triangle,'" *Command and General Staff College, Fort Leavenworth, KS, August 2016.*

Application of the Ethical Triangle: Step One

The first step is to identify the ethical dilemma.²⁵ This step is critical because identification of the ethical dilemma provides clarity and ensures that a predetermined decision is not made. As stated in the *Army Leadership Manual*, "Ethical choices may be between right and wrong, shades of gray or two rights."²⁶ Using the Ethical Triangle, the ethical dilemma of allocation of experimental treatment is defined in terms of right versus right. There are four categories of right versus right dilemmas: truth versus loyalty, individual versus community, short-term versus long-term, and justice versus mercy.²⁷ Framing the ethical problem in this manner will allow testing of recommended actions.

It is critical to take into consideration relevant contextual factors when fully ascertaining the ethical dilemma. One important contextual factor is that the supply of the experimental treatment

is extremely limited. In our case study, only three doses of ZMapp are available. Because the number of patients infected with Ebola greatly outnumber the number of available ZMapp doses there are many individuals who will not receive the treatment. Cultural attitudes toward the receipt of experimental treatment should also be a consideration. Studies have shown that fear of treatment already exists in the Liberian population despite communication about the treatments.²⁸ When taking these contextual factors into account, the ethical dilemma can be stated as, "Who should the Liberian government select to receive the three doses of ZMapp for the Ebola virus?"

Application of the Ethical Triangle: Step Two

The second step is to determine the possible COAs or decisions that can be made.²⁹ Although there may be COAs which are obvious, such as doing nothing, it is critical that all COAs be considered. In this case study, after considering

all choices, three possible COAs are identified:

- COA 1 would be to provide ZMapp to those involved in the provision of healthcare to others infected with Ebola. The rationale for this COA is that healthcare workers provide supportive care to others infected with Ebola. Supportive care could contribute to additional lives saved. At first glance, this course may provide the “biggest bang for the buck.”
- COA 2 takes a more egalitarian approach. Everyone infected with Ebola, who could clinically benefit from the drug, would be entered into a lottery providing a truly equal chance of receiving ZMapp.
- COA 3, doing nothing is always COA. The Liberian government could take an all-or-nothing approach and choose not to provide the three remaining doses to anyone with the Ebola virus. While no action may seem like it wastes the limited supply of ZMapp, with thousands of people infected with Ebola, COA 3’s “do nothing” approach is one way to ensure equitable distribution. In other words, if no one is prioritized to receive the experimental treatment, then everyone is treated fairly with regards to the distribution of ZMapp.

Application of the Ethical Triangle: Step Three

The third step is to examine the two most likely COAs through the perspectives of the three ethical systems of the Ethical Triangle.³⁰ When considering the three courses of action identified in step two, the first and second courses of action are the two most likely. The first is prioritizing healthcare workers infected with Ebola to receive the experimental treatment. The second is conducting a lottery, which includes all individuals infected with Ebola, to determine who receives the three

ZMapp doses. We will examine these courses of action from a principles-based ethical approach, a consequences-based ethical approach, and a virtues-based ethical approach.

Principles-based approach

When looking at each COA through the lens of a principles-based approach, the focus is on universally accepted rules and one’s moral obligation. Two primary questions are asked to analyze each COA through a principles-based viewpoint: “What rules exist?” and “What are my moral obligations?”³¹ The answers to these questions will provide insight into the ethical ramifications of each COA from a principles-based ethical lens.

The first question when analyzing courses of action from a principles-based approach is “What rules exist?”

In general, there are commonly-accepted, egalitarian principles that require resources to be distributed to minimize inequality in any form.³² When conditions of scarcity and competition for resources exist, the principles of material distributive justice come into play.³³ There are six commonly agreed upon material distributive justice principles: to each person an equal share, to each person according to need, to each person according to effort, to each person according to contribution, to each person according to merit, and to each person according to free-market exchange.³⁴ Which of the six principles are applied varies depending on the context and nature of the situation.³⁵

- The principles of “to each person an equal share” and “to each person according to need” do not apply to this case study given that the thousands of patients with Ebola who need treatment greatly outnumber the three doses of ZMapp available. There is no feasible way to provide each person an equal share, and the need was overwhelming in the 2014 Ebola outbreak.

- The principle of “to each person according to effort” refers to how much an individual “tries” in a society regardless of the outcome.³⁶ This rule is not applicable to the case study or the courses of action chosen due to the sheer volume of individuals needing this medication and the extremely limited supply.
- The principle of “to each person according to contribution” refers to the overall economic contribution of an individual to society and could be considered applicable in this case.³⁷
- The principle of “to each person according to merit,” which is distribution based on what each person deserves would only apply on a small scale in this case. For example, an individual in prison for having committed murder would arguably be less

...given the limited supply of ZMapp there is no feasible way to ensure that all citizens were provided equal treatment.

deserving of receiving a drug that was in limited supply than an individual who abides by the laws of society. However, given the scale of this Ebola outbreak, it is not practicable to distribute three doses of ZMapp based on merit.

- The principle of “each person according to free-market exchange” refers to a capitalist-type approach of supply and demand.³⁸ Given that there is a clear demand for a drug in limited supply in this case study, this principle is applicable. The supply of ZMapp in this case is limited, which inherently brings about competition for who will be selected to receive this potentially life-saving experimental treatment.

Choosing COA 1 violates the basic egalitarian principles of minimizing inequality by prioritizing a group of individuals (health care workers) above another (non-healthcare workers). It is also important to analyze COA 1 with the principles of distributive justice that apply to this case: to each person according to contribution and to each person according to free-market exchange. It appears that prioritizing healthcare workers supports the principle of “to each person according to contribution” by considering the healthcare workers’ current contribution to society. The healthcare workers provide necessary supportive care to other patients with Ebola, contributing to the saving of lives in Liberia. Prioritizing healthcare workers does not support the principle of “to each person according to free-market exchange.”

COA 2, a lottery including all Ebola patients, appears to better support egalitarian principles by minimizing inequality. A lottery does not support the two distributive justice principles that apply in this case which are: to each person according to contribution and according to free-market exchange. This COA essentially negates any form of consideration of a person’s contribution. It also does not allow for free-market distribution of ZMapp in this case.

The second question when analyzing COAs from a principles-based approach is “What are my moral obligations?”

Inherently, one’s moral obligations would be to treat all individuals as equal. In this case, the Liberian government is the decisionmaker, and the state’s moral obligation is to ensure that all its citizens are provided equal treatment and have equal access.³⁹ Regardless of which COA we are looking at, given the limited supply of ZMapp there is no feasible way to ensure that all citizens were provided equal treatment. However, equal access to treatment could also be considered a moral obligation. A third moral obligation should also be considered and that is the obligation of the Liberian government to save as many lives

as possible.

COA 1, which prioritizes healthcare workers does not align with the moral obligation of ensuring equal access for all citizens to ZMapp. If the experimental treatments save the lives of the healthcare workers, then arguably additional lives will be saved because of those healthcare workers continuing to provide care to other Ebola patients. While this may border on a consequences-based ethical approach, it still supports the moral obligation that the Liberian government should save as many of its citizens lives as possible.

COA 2, a lottery, would better ensure equal access to treatment. With no established prioritization, everyone is given a fair shot at receiving ZMapp. This COA firmly supports the moral obligation of the Liberian government to ensure that all its citizens are provided equal access to treatment. COA 2 does not support the moral obligation that the Liberian government should save as many lives as possible.

From a principles-based ethical approach, there are arguments for both COAs. Prioritization of healthcare workers supports the widely-accepted distributive just principle “to each person according to contribution.” It also supports the moral obligation that the Liberian government should save as many lives as possible. COA 2 supports the moral obligation of the Liberian government is to provide equal civilian access to treatment. COA 2 also supports the egalitarian principle of minimizing inequality. Following a principles-based approach, it appears that both COAs are on relatively equal ethical footing. However, there are still two other ethical approaches to take into consideration when deciding between these two COAs.

Consequences-based approach

When looking at each COA through the lens of a consequences-based ethical approach, the focus is on the consequences of the action. This

analysis can be challenging especially when considering all the potential second and third-order effects.⁴⁰ For this case study, we will be asking two primary questions to analyze each COA: “What gives the biggest bang for the buck?” and “Who wins and who loses?”

“Bang for the buck” in this case study centers on the number of lives saved and containment of the Ebola outbreak.

The first question when analyzing COAs from a consequences-based approach is, “What gives the biggest bang for the buck?”

In this case study, it is important to consider this question from the perspective of the Liberian government. They are primarily concerned with the containment of this Ebola crisis to protect the health and welfare of its citizens and ensure the survival of the country. “Bang for the buck” in this case study centers on the number of lives saved and containment of the Ebola outbreak.

COA 1, which prioritizes healthcare workers to receive ZMapp, potentially results in lives saved of healthcare workers. These healthcare workers can further aid in the management of the Ebola crisis and save additional lives. Given that the focus of the Liberian government is the health and welfare of its citizens, this COA potentially provides more than just three lives saved from the initial ZMapp doses.

COA 2, a lottery for determining who receives ZMapp, will most likely save the lives of only the individuals selected to receive ZMapp. When considering “bang for the buck,” those chosen from the lottery will most likely not be healthcare workers. Therefore, the assumption is that number of lives saved will most likely be only the three individuals that receive ZMapp, and that those individuals who receive ZMapp will not directly aid in the containment of the Ebola outbreak.

The second question when analyzing COAs from a consequences-based approach is “Who wins and who loses?” From the perspective of the Liberian government, the focus on who wins and who loses centers around the containment of this Ebola crisis and the protection of the health and welfare of Liberian citizens to ensure the survival of the country. To “win” lives need to be saved, and the Ebola crisis needs to be contained.

From the perspective of the Liberian government, the focus on who wins and who loses centers around the containment of this Ebola crisis and the protection of the health and welfare of Liberian citizens...

At first glance, it appears that with COA 1 it is just the healthcare workers receiving ZMapp who win, and all others not prioritized for treatment lose. However, if the healthcare workers survive because of their treatment and continue to provide care to other Ebola patients, then those that receive care are “secondary” winners. With COA 1, it is likely that there will be more “winners” than just the three workers. Providing care to patients will help contribute to the containment of Ebola. Both the secondary winners and contributions to the containment of the Ebola outbreak translates to a win for the Liberian government due to the focus on the health and welfare of its citizens and containment of the Ebola outbreak. However, the Liberian government may lose trust with its citizens if perception of fair treatment with ZMapp is lacking.

COA 2, a lottery for determining who receives ZMapp, reveals a different set of winners and losers. The three individuals who receive ZMapp are winners; however, it is unlikely that there will be any “secondary” winners as in COA 1. Arguably another winner

with COA 2 is the Liberian government. COA 2, which does not prioritize any individuals, may help in maintaining the people’s trust by proving that the government fairly considered all its citizens for treatment.

Based on the analysis above, COA 1 better aligns with a consequences-based ethical approach. Prioritization of healthcare workers provides the biggest “bang for the buck” by having the potential to result in more lives saved than just those with the three initial ZMapp doses. COA 1 also leads to more individuals who “win” when looking at “secondary winners.” Following a consequences-based approach, it appears that COA 1 is more ethically sound. However, there is still one other ethical approach to take into consideration when deciding between these two COAs.

Virtues-based approach

When looking at each COA through the lens of a virtues-based approach, the focus is on what a virtuous person would do.⁴¹ For a virtues-based ethical approach the two questions typically considered are “What would my grandmother think?” and “What if my actions showed up as the lead story in the news?” These questions are more fitting for an individualized approach, so for this case study we will be using a broader question to analyze each COA: “What if the decision appears as the lead story in the news?”

The question of “What if the decision appears as the lead story in the news?” is important for the Liberian government to consider.

It is important that the decision made is one that the Liberian people and global community regards as virtuous.

COA 1, which prioritizes healthcare workers, would most likely appear as the lead story in the news as not a virtuous decision. We can say this with relative certainty because when two American healthcare workers were prioritized to receive ZMapp, it was portrayed as an unethical

decision. The reason it was viewed as unethical is because it appeared to prioritize individuals based on their status as healthcare workers over equally deserving Liberians impacted by Ebola.⁴² However, a better characterization of this would be that it was not an ethical decision from a virtues-based, ethical decision-making lens. Prioritizing individuals based on any criteria, be it social status, financial status, or job status went against our commonly-held and accepted set of virtues.

COA 2, a lottery to determine who receives ZMapp, may be regarded as the more virtuous choice. It does not prioritize individuals based on any criteria and affords everyone an equal chance. COA 2 would most likely be portrayed in a positive manner as a sound ethical decision if it were to be the lead story in the news. Treating all humans as equal aligns with the global societies espoused set of virtues.

Based on the analysis above, COA 2 better aligns with a virtues-based ethical approach. By not prioritizing any individual based on job or status, this COA best adheres to the principle of “do unto others as you would have them do unto you.” Following a virtues-based approach, it appears that COA 2 is more ethically sound.

Application of the Ethical Triangle: Step four

The fourth step is to revisit all potential COAs again and see if an alternative COA has presented itself. The reason for revisiting COAs again is that during step three, another solution outside of the two selected COAs may have presented itself. In this case study, only one additional COA presented itself.

During the application of a principles-based ethical approach, one principle of distributive justice “to each according to free-market exchange” revealed another COA not previously considered. This COA would be allocation of ZMapp based on an individual’s ability to pay. In other words, true supply and demand principles,

where ZMapp would go to the highest bidder. However, because this capitalistic approach would not be considered an ethical COA among the global community, it was not considered further in this case study.

Prioritizing individuals based on any criteria, be it social status, financial status, or job status went against our commonly-held and accepted set of virtues.

Application of the Ethical Triangle: Step Five

The fifth step is to make a choice based on the analysis conducted in steps one through four. When making a choice, it is important that the context of the organizational climate and culture as well as the professional values of the organization are taken into consideration. In this case study, the Liberian government values the health and welfare of all citizens above other interests. From a principles-based approach, both COAs appear to be on equal ethical footing. From a consequences-based approach, COA 1 was a clear choice. From a virtues-based approach, COA 2 was a clear choice. Given that the Liberian government must consider all citizens, and a virtues-based approach tends to be more individualistic, more weight was given to the consequences and principles-based ethical approaches when making a final decision in this case study. Based on the ethical analysis above, COA 1, prioritizing health care workers to receive ZMapp, is the COA that should be chosen.

Application of the Ethical Triangle: Step Six

The sixth and final step is implementation of the choice.⁴³ After working through the previous five steps, the decision for allocation

of experimental treatment has been examined from multiple ethical angles and is well reasoned. Three healthcare workers with Ebola, who meet the necessary clinical parameters, should be given ZMapp. In this case study, this is exactly what the Liberian government chose to do.⁴⁴

Military Application

As evidenced by the collaboration involved in the development of the drug ZMapp, the U.S. military is often involved in the research and development of experimental therapies. However, with regards to the distribution of experimental therapies, military leaders are more likely to function as advisors when allocation decisions are made or implementers of allocation decisions. Although the decision for how to allocate experimental treatment will more than likely continue to fall to the state, for military leaders to effectively implement the treatment allocation decisions, it is crucial that there is an understanding of the ethical reasoning process used to make these decisions.

Conclusion

In the event of another epidemic or pandemic without a curative therapy available, the need to use experimental treatments could occur again. Given the ethical implications that arise with allocation of these experimental treatments with scarce availability, we recommend the deciding authority apply the Ethical Triangle to assist in determining the allocation of experimental drugs. Application of the Ethical Triangle will lead to a well-reasoned ethical approach to a situation that has shades of gray or two “right” answers. Additionally, when implementing the decision, it allows the decision-making authority to better articulate and maintain transparency with the community regarding the ethical reasoning that led to the decision that was made. The Ethical Triangle is a useful tool in ensuring that the allocation of a limited supply of experimental drugs during an epidemic or pandemic is ethically sound. **IAJ**

NOTES

1 Centers for Disease Control and Prevention (CDC), “Ebola Virus Disease Distribution Map,” April 14, 2016, <<https://www.cdc.gov/vhf/ebola/outbreaks/history/distribution-map.html>>, accessed on May 8, 2017.

2 WHO Ebola Response Team, “Ebola Virus Disease in West Africa—The First 9 Months of the Epidemic and Forward Projections,” *The New England Journal of Medicine*, Vol. 371, September 23, 2014, pp. 1481–1495.

3 “Statement on the 1st Meeting of the IHR Emergency Committee on the 2014 Ebola Outbreak in West Africa,” The World Health Organization (WHO), August 8, 2014, <<http://who.int/mediacentre/news/statements/2014/ebola-20140808/in/>>, accessed on May 17, 2016.

4 CDC, “2014 Ebola Outbreak in West Africa-Case Counts,” April 13, 2016, <<https://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>>, accessed on May 15, 2017.

5 Scott Dowell et al., “Transmission of Ebola Hemorrhagic Fever: A Study of Risk Factors in Family Members, Kikwit, Democratic Republic of the Congo, 1995,” *The Journal of Infectious Diseases*, Vol. 179, No. 1, February 1, 1999, <https://academic.oup.com/jid/article/179/Supplement_1/S87/882673/Transmission-of-Ebola-Hemorrhagic-Fever-A-Study-of->, accessed on May 17, 2017, pp. 87–91.

- 6 CDC, “Signs and Symptoms,” November 2, 2014, <<https://www.cdc.gov/vhf/ebola/symptoms/index.html>>, accessed on May 17, 2017.
- 7 CDC, “Prevention,” July 22, 2015, <<https://www.cdc.gov/vhf/ebola/prevention/index.html>>, accessed on May 8, 2017.
- 8 Joe Stephens, “Where Profits and Lives Hang in the Balance,” *The Washington Post*, December 17, 2010, <<http://www.washingtonpost.com/wpdyn/content/article/2008/10/01/AR2008100100973.html?sid=ST2008100101390>>, accessed on May 8, 2017.
- 9 Ibid.
- 10 “Pfizer: Nigeria Drug Trial Victims get Compensation,” BBC News, August 11, 2011, <<http://www.bbc.com/news/world-africa-14493277>>, accessed on May 9, 2017.
- 11 WHO, “Ebola: Experimental Therapies and Rumored Remedies,” August 15, 2014, <<http://www.who.int/media/centre/news/ebola/15-august-2014/en/>>, accessed on May 8, 2017.
- 12 WHO, “Ethical Considerations for the Use of Unregistered Interventions of the Ebola Viral Disease,” August 11, 2014, p. 1, <http://apps.who.int/iris/bitstream/10665/130997/1/WHO_HIS_KER_GHE_14.1_eng.pdf?ua=1>, accessed on May 9, 2017.
- 13 Ibid., p. 2.
- 14 Katie Martinez, et al., “The Ethics of Allocating Experimental Treatment for the Ebola Virus: Applying the Army-Baylor 7-Step Method for Organizational Decision Making,” poster presentation at AMSUS Society of Federal Health Professionals annual meeting, December 1, 2015; Lawrence Gostin, “Ethical Allocation of Drugs and Vaccines in the West African Ebola Epidemic,” *The Milbank Quarterly*, Vol. 92, No. 4, December 2014, pp. 662–666, <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4266171/>>, accessed on May 25, 2017.
- 15 Mapp Biopharmaceutical, “ZMapp Frequently Asked Questions,” <<http://mappbio.com/zmapp-faq/>>, accessed on May 9, 2017.
- 16 Marilyn Marchione, “US Government Had a Role in Experimental Ebola Treatment Given to 2 American Aid Workers,” *U.S. News and World Report*, August 5, 2014, <<https://www.usnews.com/news/us/articles/2014/08/04/son-mothers-ebola-should-spark-push-for-cure>>, accessed on May 9, 2017.
- 17 Katherine Furman, “The International Response to the Ebola Outbreak Has Excluded Africans and Their Interests,” Africa at LSE, August 20, 2014, <<http://eprints.lse.ac.uk/75396/1/Africa%20at%20LSE%20%E2%80%93%20The%20international%20response%20to%20the%20Ebola%20outbreak%20has%20excluded%20Africans%20and%20their%20interests.pdf>>, accessed on May 10, 2017.
- 18 Jack D. Kem. “Ethical Decision Making: Using the ‘Ethical Triangle,’” Command and General Staff College, Fort Leavenworth, KS, August 2016, p. 3.
- 19 Ibid., p. 5.
- 20 Ibid.
- 21 Ibid., pp. 5–6.
- 22 “Plato’s Ethics: An Overview,” *Stanford Encyclopedia of Philosophy*, July 18, 2013, <<https://plato.stanford.edu/entries/plato-ethics/>>, accessed on May 9, 2017.

- 23 Kem, p. 6.
- 24 Ibid.
- 25 Ibid.
- 26 Department of the Army, Army Doctrine Reference Publication 6-22 (ADRP 6-22) with change 1, *Army Leadership*, Government Printing Office, Washington, DC, 2012, para 3-38.
- 27 Rushworth M. Kidder, *How Good People Make Tough Choices*, William Morrow and Company, Inc., New York, 1995.
- 28 CDC, “Community Knowledge, Attitudes, and Practices Regarding Ebola Virus Disease— Liberia,” July 10, 2015, <<https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6426a2.htm>>, accessed on May 15, 2017.
- 29 Kem, p. 6.
- 30 Ibid., p. 8.
- 31 Ibid., p. 5.
- 32 Christian Gericke et al., “Ethical Issues in Funding Orphan Drug Research and Development,” *Journal of Medical Ethics*, Vol. 31, No. 3, 2005, <<http://jme.bmj.com/content/medethics/31/3/164.full.pdf>>, pp. 164–168.
- 33 Tom Beauchamp and James Childress, *Principles of Biomedical Ethics*, Oxford University Press, Oxford, 2001, p. 225.
- 34 Ibid., p. 228.
- 35 Ibid.
- 36 Bernard Weiner, “From Each According to His Abilities: The Role of Effort in a Moral Society,” *Human Development*, Vol. 16, No. 1-2, 1973, pp. 53–60.
- 37 Paul Gregory and Robert Stuart, *Comparing Economic Systems in the Twenty-First Century*, Houghton Mifflin, Boston, August 2003, p. 118.
- 38 Phillip O’Hara, *Encyclopedia of Political Economy*, Vol. 2, Routledge, England, September 2003, p. 1135.
- 39 Beauchamp and Childress, p. 227.
- 40 Kem, pp. 5–6.
- 41 Ibid., p. 6.
- 42 Lisa Chedekel, “Battling Ebola: The Ethical Issues,” Boston University Today, August 13, 2014, <<http://www.bu.edu/today/2014/battling-ebola-the-ethical-issues/>>, accessed on May 15, 2017.
- 43 Kem, p. 7.
- 44 “Liberia Gives 3 Doctors Experimental ZMapp Ebola Treatment,” NBC News, August 17, 2014, <<http://www.nbcnews.com/news/world/liberia-gives-3-doctors-experimental-zmapp-ebola-treatment-n182466>>, accessed on May 10, 2017.