



**The Biomedical Engineering Society of The University of Texas at
Austin**

2017 Case Competition



Objective

Design and present a solution to improve the response to a widespread, viral pandemic originating in a major city while keeping in mind administration policies at local, state and national levels. Construct your solution with regards to controlling the spread of the pandemic as well as relevant policy. Keep in mind the economic, social, and ethical issues that may arise as a result of your solution. Consider a feasible solution that can be efficiently and effectively implemented, and be sure to include how it will be financially sustainable during its effective time period. Also, discuss why your idea is a step up from previous solutions to this problem. Be prepared to refute potential arguments against your solution.

Assume the virus currently relies on transmission through bodily fluids and has an $R_0 > 2$.

Things to consider

- Your solution may be a physical object or something intangible (e.g. a new policy).
- Research previous solutions or attempts to solve the problem.
- Make your solution creative
- Is the impact of your solution immediate or long-standing?
- Who benefits and who does not benefit from your idea?
- Think of ethical dilemmas that could arise and how to circumvent them.
- Can your solution be adapted to unanticipated situations (what if the virus mutates and can spread through other vectors?)
- Keep in mind that your solution does not need to solely center on a cure.
- For instance, how could the quarantine system improve? How would you inform and educate people about the situation without causing panic?



Background

From the Black Death of the Middle Ages to the Spanish Influenza outbreak of 1918 to the recent Ebola outbreak, epidemics have caused millions of casualties. In the past, epidemics could take years to spread beyond local borders, but the unprecedented interaction caused by globalization has changed this. Modern-day epidemics can spread more quickly and widely than before through multiple vectors, becoming classified as pandemics when they leave national borders. Flight patterns and aviation hubs are more relevant than geographical distance in predicting the spread of a pandemic, and global mobility models show that an outbreak in a major city is unlikely to be contained or quarantined. Viral mutation makes it possible for these viruses to spread widely before they are identified and makes it difficult for vaccines to be developed to control transmission. When the disease spreads internationally, the problem is complicated by international policies. Recent international response to pandemics including Influenza A in 2009, SARS in 2002, and Zika in 2016 have exposed multiple shortcomings in the current strategies implemented by the World Health Organization. These inefficiencies include poor public awareness, administrative concerns about liability, a lack of procedures to deal with high patient traffic, inability to bypass national regulatory requirements for imported vaccines, and limited national and local capacities to administer vaccines at a large scale. For example, the recent Ebola outbreak demonstrated how local hospitals can get overwhelmed by an influx of patients, leading to public panic and loss of quarantine. A multi-pronged approach that addresses policy and treatment at local, national, and international levels is required.



Summary

A successful presentation will include an innovative solution to the problem at hand, thorough research of the solution, a plan to implement the solution that includes a thorough understanding of the risks and rewards, potential pitfalls, opportunities for further development, relevant financial information such as business development, marketing, funding and expenses, etc., and the long-term impact of the proposed solution in an organized and aesthetically-pleasing presentation.

Competition Day

The competition will be held on November 11, 2017 at 9 am. Teams will be notified of their presentation times beforehand. Each team will have 15 minutes for their presentation: 10 minutes to present their solution and 5 minutes to answer questions from the judges. Dress code for presenters is Business Professional.

The 1st place team will be awarded \$700. The 2nd place team will be awarded \$300. The 3rd place team will be awarded \$200.

Judging Criteria

Idea:

- Novel
- Creative
- Practical

Implementation:

- Net Positive Impact
- Minimal Ethical and Cultural Effects
- Economic and Technical Feasibility

Proposal:

- Business Plan for Implementation
- Relevant Financial Information
- Long-term Effects

Quality of Presentation:

- Neat and Organized
- Smooth Transitions
- Contains all necessary information

If you have any questions, please contact:

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