Using technology to mitigate the impact of pandemics

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***Abstract*—Using computer simulations to predict and mitigate the impact of pandemics**

Subject:

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A. Introduction

The purpose of this document is to lay out a proposal to increase funding for research on the spread of viral diseases, and strategies to mitigate negative effects using technology. This proposal outlines a few different research efforts that may be feasible for the following:

- Bridging the gap of resources many communities have found themselves in.
- Provide a space for volunteers to do meaningful work to combat COVID-19.

It is paramount that we have the best minds on the planet working on solutions to combat this pandemic.

B. Problem Statement

We are currently living through the worst pandemic in the past century. This pandemic is created by coronavirus, which causes the COVID-19 condition in humans.1 As of the time of this writing, there have been nearly 1 million cases of COVID-19, with patient zero having been suspected to have contracted the virus in December 2020. As a direct result of the unprecedented srpead of this new disease, nearly 50,000 people have perished. Because of this, America as well as most other countries have issued a social distancing policy to try to "flatten the curve", and most states have now mandated a shelter in place policy to reduce the spread of this pandemic. Not only has the economy suffered, but also our healthcare systems across the country are quickly becoming overburdened**???**, short-staffed, and under supplied. What's more epidemiolgists are quickly becoming less able to react to the ever growing demand on their time as policy makers request their input on new ordinances.

C. Stakeholder Interests

My target audience for this would two-fold:

1. Firstly, policy makers - These are the people who should have an accurate view of the situation their constituents are facing on a daily basis, and interested in gaining an factual understanding of how policy actions or lack thereof will affect those they represent.
2. Secondly, volunteers - With many people in their homes and not a lot to do, many people want to do what they can to improve the lives of others around them, but may not know what needs their attention. Many technology professionals are more than willing to put their years experience towards a project bigger than themselves so that we can combat this global threat effectively.

D. Research Plan

Find ways to crowd source solutions to some of these problems.

These problems include:

- Creating a unified platform for volunteers to connect with others who need their efforts in this time of crisis.
- Creating a platform to allow for exchange of nessecary medical equipment/protective equipment for medical staff and other responders directly affected by this pandemic.
  - I have/I need platform - Medical administrators could post on such a platform saying they are looking for example 10,000 masks, and other facilities/clinics or private companies in other industries could help fill that need and gift them the resources.
  - Mutual Aid fund - In addition to medical professionals, many other people are affected by this pandemic. There are many vulnerable populations that could use help. The elderly, immunocompromised and otherwise suceptible populations require extra care, and they need to take extra precautions before venturing out, or if possible others could go out on their behalf and leave goods at their doorstep.
- Create standard for both "flattening the curve", as well as "raising the bar", referring to increasing the capacity of our existing healthcare system.
- Creating more accurate models that public health professionals can use to model the spread of the

pandemic and it's externalities with different policy initiatives.
- A mobile app that will allow citizens to track their symptoms, or lack thereof. This app would then recommend a course of action for the person, according to guidelines set by public health professionals.

E. Qualifications

Although I'm not a microbiologist, or an epidemiologist, I do understand technology, and how technology has the tremendous ability to multiply efforts to reach orders of magnitude more people than ever before. I have experience in Software Engineering, DevOps, and product management. Additionally, I've always been interested public health, policy making and the intersection of these two worlds. This research report will allow me to increase my knowledge of these fields with technology, a field I'm very famialar with. I feel that this is an incredibly important time for us as a society to have this kind of infrastructure I've written about in place.

F. Conclusion

If approved, I will begin a feasibility analysis of different algorithms that can be used to address the questions presented in this document. In the end, my end goal is to create a list of resources, or technologies I reccomend using to efficiently and effectively combat the issues presented by the current ongoing pandemic.

G. References

1. [WHO(https://www.who.int/emergencies/diseases/novel-coronavirus-2019)
2.