Optimising COVID Vaccination Rollouts with Deep Learning

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Argument: Such technologies should not be used in the first place given its nature

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Ethics Framework use: Ethics of Care

Initially, it seems that the existence of a vaccine rollouts algorithm is more preferable to having none at all, the algorithm is also said to be optimized so that many people receive it while minimizing the waste of precious vaccines. However, it is still hypothetically or theoretically, that success in the lab or plan does not always guarantee the same in real-life scenarios. Using the Ethics of Care framework, it is vital to identify the vulnerable, helpless group of people or just individuals that might get hurt most, and be left out when the “pandora box” is opened or such an algorithm was put into action. Clearly, not every person is in the same condition as each other, so to force everyone to submit to the effect of the algorithm, to enter an environment, where only certain individuals can thrive and benefit, would be unethical. As such, there is an example worth considering: “forcing a dog, a fish, a bird into a lake (i.e.: aquatic environment), and expect them all to survive, to grow in it”. Thus, it would be radical and outrageous to assume that nobody will get hurt or become vulnerable. When certain groups of people are highly prioritized, while, on the other hand, other groups are put to low priority, such technology should not be used nor put into practice at all.

For the matter of fairness, the algorithm or system “utilizes highly-sensitive data to make its decisions - including hospital records and estimated lifespan/quality of life from insurance providers”. It is important to realize that not everybody has a hospital record, or other necessary proofs to assist them in getting higher rank and be prioritized, in order to be selected by the algorithm, in the first place. Furthermore, this is highly true for immigrants, because their country of origin might not even have a health record system, or scattered and poorly managed (Glaser, 2020), or problems in translation that could result in different vaccine decision outcomes for them. Infamously and especially, illegal immigrants would be the most likely to be left out of the sphere of consideration, due to an even thinner chance of having a hospital record. Ethically, should they be left out to be vulnerable, with the already hardship in daily life and the conditions getting worse due to the pandemic? Aside from that, higher-income people are likely to have a better chance to access better healthcare services, thus, making their hospital records likely to be better, more detailed (Khullar, et al., 2018). On top of that, as each region has a different average income, the ethnicities/races that live there (e.g.: Caucasian, Black, Asian neighborhood), religions, or even political preferences than others (Leslie, et al., 2021). Which is safe to assume that, and, to make matters worse, people from certain regions would likely have a better chance at getting vaccinated early than the others because of those bias and discriminated factors (Landy, et al., 2018). Hence, the data which the algorithm is based on to make the decisions will not only be highly biased, but also miss a lot of important information to make a decent and fair judgment.

Due to the biases of information, the accessibility and equity of the vaccine distributed system from certain vulnerable groups of people is a huge threat and issue. As it would be likely that the more vulnerable the group of people, are likely to receive the vaccine at the latest, last of the list, or do they even get the chance to get vaccinated at all, under such dire circumstances that were mentioned? This seems to be paradoxical, because low-income people or immigrants (both legal and illegal), are those that have a high probability to work in the basic laboring sector. Thus, they are much more exposed both physically and directly, because they are likely to work in crowded places or have to travel to work. This means logically and ethically, they should

be getting vaccinated first, since they have a higher level of exposure, yet, the odds are completely against them. Because for certain criteria such as age, under some circumstances, for example, the healthcare workers have the highest chance of exposure and infection, should not be discriminated against with their age (Guo & Hao, 2020). As such, a globally optimized algorithm might leave out some special local cases, as the example of a health care worker. Yet, ironically, the health care workers are only a small portion compared to other occupations, they are proved to be most important during the pandemic era. And, by making them vulnerable, the algorithm is putting the whole society in danger, by denying their accessibility to vaccinations.

While the biases in data were already worst enough, because of the participation and contribution to the Artificial Intelligence (AI), Computer Science (CS) field, has been in fact, dominated by white Caucasian male (Manyika, et al., 2019). Which could potentially result in violation of human rights for people from different races. Due to the differences in core value, culture, and finance, the algorithm could make discriminating decisions against certain races. As estimated lifespan is also one factor that is used by the algorithm, but according to a CDC report (Minino, 2011), it shows that the Black ethnic has the lowest life expectancy compared to the others, whereas the Hispanic ethnic has the highest. So, should a person of Black ethnic be given the vaccine last just because he/she would not likely to live longer than another race or a person from Hispanic ethnic get vaccinated first because he/she is likely to live the longest compared to the others? As these are the statistics and numbers which the algorithm used to make decisions, it is frightfully clear that these numbers are highly racial “skewed”, and an average statistical number of any group should not be assumed and “branded” to every individual in that group. Hence, had the algorithm been put into action, violation of human rights to certain ethnic communities is most likely to happen, discriminating and depriving the rights to access the vaccine.

Another critical point is the privacy of the data, given the fact that the system is said to “utilizes highly-sensitive data to make its decisions”. First, it is not clear how much data in quantity and type would be needed for the algorithm to take action. Then, company X, the author, and owner of the algorithm has not yet made it clear how the

data would be protected, during the pandemic and even after that. Given that health care data is among one of the most “precious” types of data, and the notorious hack recently in 2018 at Singapore (BBC News, 2018), with even His Excellency the Prime Minister Lee Hsien Loong was also “specifically and repeatedly targeted”, has raised a huge alarm in this matter. Aside from that, from those given data, what “consequence” can be “figured” out from it (Kalkhof, 2020) and what can company X does with it, is also a buggy and uncertain question that has not been answered. For example, assume that a person with a hereditary disease (e.g.: cancer, diabetes), should that person’s offspring next generations be discriminated against (Medline Plus, 2020), or use that information against them, or leakage of that information. Ethically, it never should happen, yet if the data were to be granted and used, the risks would be increased and there is no guarantee that it would be decently protected. This should be conducted in the best interest of the user as possible, the most important stakeholder, because the damage in case such an event happens would be tremendous and might be “unfixable” (Duke, 2018). This led to another matter that is the accountability of the algorithm or the system as a whole. Who will be responsible, in case such an unfortunate event happens? Or when the algorithm was working successfully, yet the effect it brings harm certain people or groups of people. How could an “algorithm” be responsible, or should the developer, tester, or computer scientists invent the core algorithms be held responsible? Although during the pandemic era, the pandemic itself takes the central role of every attention, it is definitely not everything, and other important factors should not be overlooked nor “cheaply sold out” because of it.

“Not everything that can be counted counts and not everything that counts can be counted” – Albert Einstein. While the algorithm used different numbers and criteria to make its decisions, it is not clear that if those factors are enough, are there any unknown, have not thought of yet. Thus, it raises serious doubt, if the algorithm is really making useful and beneficial decisions or not. Which means everyone, including the vulnerable people, would have the algorithm act in their best interests, despite certain factors being missing or unworthy factors being placed inside the system? Therefore, trust is another critical issue that the system failed to support.

In conclusion, despite the initial benefits that the algorithm and the system might bring if it was to be put into action, too many critical and alarming factors have been raised, with more risks, more unanswered questions. But most importantly, to put the vulnerable people and communities into “last in the list” or “blacklist”, because of racial bias, age bias, job bias, etc., is completely outrageous, vice, unethical. Hence, under such circumstances, such algorithms and technologies should not be used.

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