**Assignment 3**

**02/01/2023**

**1. Should users of social media, online applications and/or search engines be notified about the potential use of their personal data (even in aggregated form) for public health measures? Why/why not?**

With the evolution of technology and machine learning algorithms, there must be greater emphasis on data security and privacy. From a public health perspective, social media and search engine users should be notified about the potential use of their personal information and data for any measures. Users have the right to privacy and should know not only *who* is using their data but also *what* data is used and *how* it is used. Data usage is a sensitive issue, and improper usage of data without the consent of participants can raise questions about the boundaries surrounding the involvement of private entities and government agencies.

However, data about human behavior at a very granular level, which the tech startup is collecting, can be instrumental in providing insights for improving public health behavior. Stringent measures of notifying users about data usage come at the risk of non-participation in the app, and missing information can train either inaccurate models or amplify inherent biases in systems.

**2. What are some of the ethical risks of the proposed big data analytics or algorithms discussed in this case study, specifically focused on outbreak tracking? What might be done to mitigate the risks?**

As I mentioned, improper data collection can lead to failed algorithms that produce inaccurate predictions. This practice can lead to the waste of preventive resources directed toward the wrong locations. The algorithm also collects data based on an app that aims to help users reach health goals and improve their routine behavior. The users most likely represent a younger, urban population that is proactively health conscious. This database does not represent rural, disadvantaged populations who do not use the app or even have access to use the particular app. Training an algorithm from this database would introduce selection bias, and the outbreak tracking will be heavily biased despite being data-driven. Since the solutions provided by the app cater to a specific demographic, disparities against other vulnerable populations would be perpetuated. It is crucial to obtain user data with appropriate consent and somehow form a master dataset representative of populations before being used to train the algorithm.

Additionally, big data analytics come at the risk of data breaches. The tech startup must ensure that the security protocol for data storage is tight. Additionally, there should be regular audits to regulate and monitor the ethical usage of algorithms, data, and quality control in data security.

**3. What are some of the opportunities and ethical risks of for-profit companies collecting,**

**managing and/or analyzing the health data of large populations? Describe any potential actions or policies that could be taken that would allow the public health community to maximize the opportunities presented by these new technologies while minimizing some of the risks in order to advance public health.**

The most significant opportunity for for-profits that manage and analyze health data of large populations is the ability to access the most granular forms of data and produce robust and targeted results in improving public health outcomes. However, it is paramount to question how for-profits define success - improved health or financial profits. Many tech companies that involve data collection through user interaction make money from advertising on their platform. For-profits may profit by selling targeted ads based on the user's data. With enough incentive, there would be nothing that prevents for-profits from potentially selling direct data to governments or malicious organizations. Using this data for profitable purposes instead of exclusive public health outcomes can lead to policy violations and put individuals at risk.

For-profits must adhere to ethical practices through stringent regulatory policies and be transparent about the kind of data they would use, and for what purposes the data would be used. These actions would ensure that such companies keep public health outcomes as their primary goal, follow ethical data management and analysis practices, and allow users to hold them accountable for any potential data misuse.