EMERGING ISSUES IN DIGITAL ID PART 5

PREDICTIVE USE CASE: USING DIGITAL ID FOR VACCINE DISTRIBUTION

A Use Case and Issue Brief
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BACKGROUND

As the world grapples with COVID-19, there are ongoing efforts to develop a COVID-19 vaccine. Until clinical trials are completed it is impossible to know what kind of vaccine will be effective. It is however projected that vaccines will initially be limited, and that some people will be vaccinated before others. Depending on the kind of vaccine that emerges, one dose or a combination of doses may be administered– a preliminary dose and after a certain period, a booster dose. It is also possible that additional doses will be needed to provide continued protection. For these reasons, national efforts to reach locals for vaccine administration and to keep track of vaccinations will be an important exercise, necessitating the maintenance of proper records and registries.

Additionally, in view of the great demand for a vaccine and the expectation that vaccines will be initially limited, equitable distribution is likely to be a concern. Although the COVID-19 pandemic is a universal problem, burdens of the pandemic are being experienced differently by different people, as some groups within societies are more vulnerable than others. Some groups are more susceptible to serious illness or death because of old age, poor access to health care or healthy food, or compromised immune systems. Health workers are also more likely to be exposed to the virus because of their line of work. For these reasons, it will be beneficial to have an efficient vaccination infrastructure that enables the equitable distribution of vaccines, built to meet the specific needs of every individual and region.

The use of Digital ID, including the use of biometrics, in conjunction with electronic information registries could promote the equitable administration of vaccines and the efficient and convenient tracking of vaccinations. After the administration of a dose, besides the usual vaccination data collected, biometrics can be registered. Collected data can be used to ensure that people are not left out, that individuals are not getting excessive or too few doses, or that a region is not cleared to resume normal activities until it has been immunized completely. However, with the use of Digital ID to aid the vaccination process, privacy concerns may arise out of the use or misuse of data.

JUSTIFICATION FOR THE USE CASE

The use of established Digital ID mechanisms in the distribution of the Covid-19 Vaccine has been proposed to be most effective for the following reasons:

1. Identification of individuals who have, or have not, received the vaccine
2. Identification of individuals who may have developed antibodies through information stored in the biometric system.
3. Easy and fast verification of prior health information.
4. Reliable record keeping and tracking for dosing and dose administration, and ensuring that each dose reaches the right person.
5. Mapping out vaccine coverage, aiding public health officials in decision making.
6. Tracking vaccine efficiency and efficacy.

DATA INVOLVED IN THE USE CASE

Data that is likely to be collected for this use case may include,

1. Biographical data (name, date of birth, gender, telephone number, address, etc.)
2. Biometric data (fingerprints, facial images, iris scans)
3. Health-related information (allergies, vaccination history, general health, etc.).

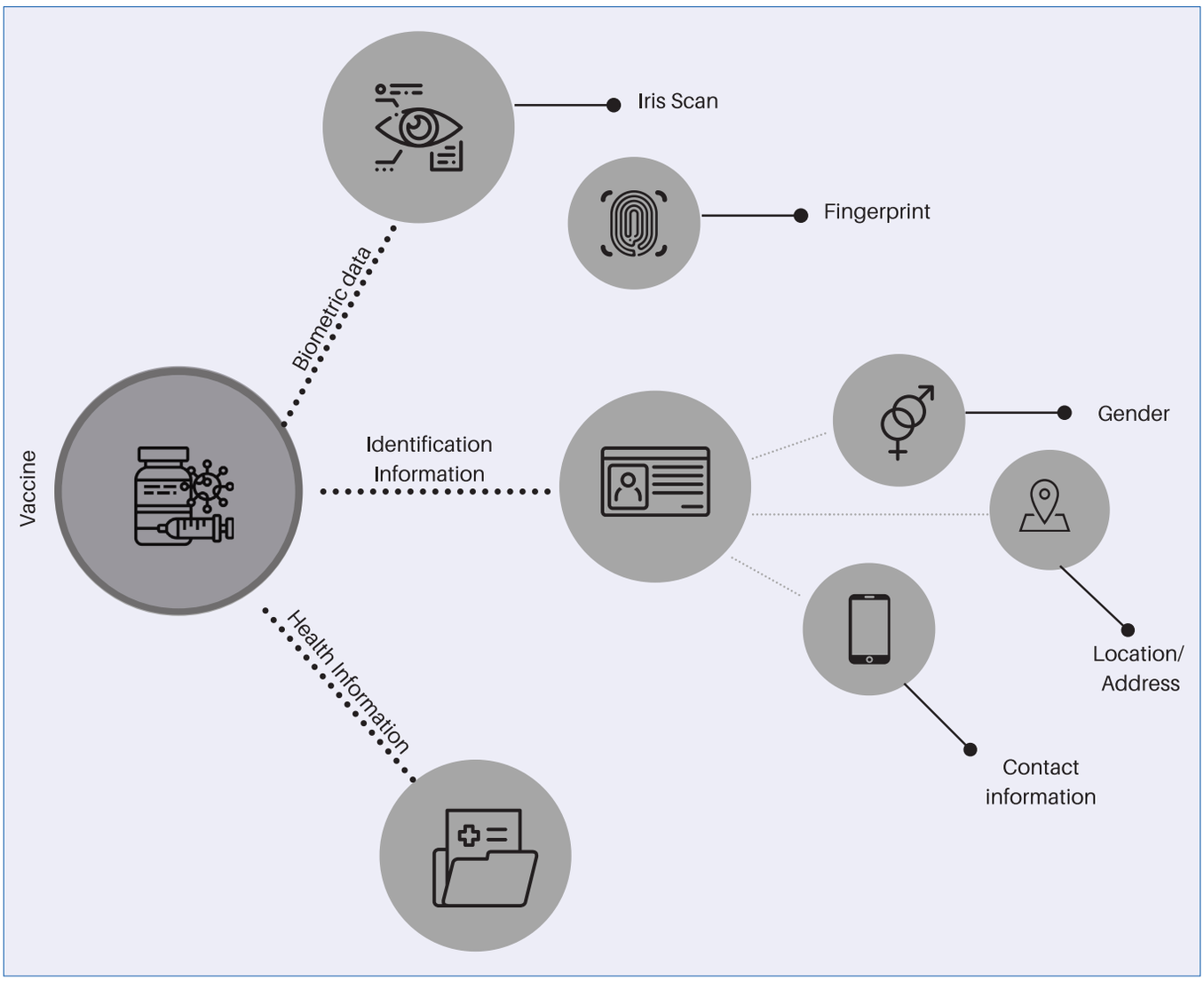

Fig. 1 Data Required

RISK INVOLVED IN THE USE CASE

1. Data leakage, especially of sensitive health information
2. Accidental duplication leading to multiple distribution of the vaccine
3. Risk of exclusion of members of vulnerable communities
4. Possible misuse of data by third parties
5. Stigmatization of those who have not received the vaccine
6. Data manipulation
7. Unnecessary and indiscriminate increase in government surveillance

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ANALYSIS

Covid-19 has prompted the re-evaluation of the Digital ID infrastructure as governments around the world turn to technology to help curb the continued spread of the virus. A wide range of interactions and activities have moved online as different sectors try to embrace new ways of continued operation. Consequently the move has prompted a shift in the digital ecosystem propelling the need to create a more stable digital ecosystem which has further strengthened the argument for Digital ID.

Numerous tests and trials are underway for the development of a vaccine. By the end of 2020, it is likely that none will have been approved for general use.[1] Nevertheless, as countries anticipate the release of an approved vaccine, the next stage will be to ensure that a sufficient percentage of the population is vaccinated. This will require the development of fair and equitable distribution infrastructure.[2]

Reports show that around 1 billion people in the world, particularly residents in developing countries, lack formal identities. This may present a challenge for governments trying to reach their entire population. Without the required identification it will be difficult to track persons who has received the vaccines and those who have not. With the likelihood that the initial supply of the covid-19 vaccine will be limited, it will be essential to verify that the dosages reach the right patients to avoid missed populations, accidental duplications, or corruption in the system.[3] The use of biometrics has been suggested to be the most efficient and effective way to manage the vaccine distribution. Biometric data (fingerprints and iris, for example) give a more distinctive identifier than names or date of birth, and are touted as a solution where existing ID systems do not cover the entire population.

The use of biometrics for vaccination is not a new idea: private companies and non-profit tech organizations like Simprints began preliminary work in Nepal, Bangladesh and Ethiopia for purposes of registering, tracking and recording maternal health and child immunization. Simprints developed a finger print reader that is used by health practitioners to administer child immunization and keep record and track child vaccination. The reader was first deployed in 2016 with a pilot study conducted in Dhaka, Bangladesh. The study found the biometric approach increased the number of women getting regular maternal health care by 38%. As a result, Simprints in collaboration with Japanese telecom NEC Crop and vaccine alliance GAVI, have launched a Campaign aimed at delivering standard immunizations to children across developing countries.[4] The collaboration aims at using biometric to increase immunization coverage in developing countries.[5]

This same technology can be modified for possible use in the distribution of a Covid vaccine. Although still at the inception stages, the technology shows promise as the non–profit tech explores the creation of a touchless system with face and palm scans in consideration of the non-contact rules to minimize spread of the virus.[6]

The use of biometrics is touted as a logical approach when the vaccine finally hits the market, considering that a number of countries, especially in Africa, are beginning or attempting to embrace Digital ID systems. Data protection enthusiast however warn against using biometrics-led technologies for hurried vaccine drives

without proper considerations of privacy and security measures. The entire process, if not well thought out, may jeopardize already existing privacy and security measures. As most governments' primary focus will be the quick distribution of the vaccine, they may overlook normal ethics-based limitations and procedures, increasing risk to personal data.

Balancing the issues of privacy/security with achieving the justifications mentioned above can be difficult. A system that collects one biometric datapoint (e.g., a fingerprint) without any other information or identity data would be ideal, from a data protection perspective, for ensuring that individuals do not receive duplicate doses. But that system would have difficulty ensuring widespread and equitable distribution of a vaccine. Similarly, linking a vaccine-distribution system to a national ID system would be better suited for ensuring equitable distribution, but also has a greatly increased risk of data misuse.

Some efforts are underway to address these issues. For example, IRespond is a non-profit tech organization providing biometric Digital ID to refugees and stateless persons to enable access to health care and other services. Their system relies on iris scanning technology and they have been trying to develop better methods of collecting minimal biometric data that could be linked to vaccine records. The system is, however, created for adult faces and would have to be modified to accommodate children.

Clearly, issues around privacy and security arise in respect of considering biometric–led vaccine drives. The Center for Global Development points out that the deployment and success of such a system will rely on the creator's ability to create public confidence in the system being full proof in terms of privacy. The development and widespread distribution of covid-19 vaccine will require effective interventions from governments throughout the world as it is not an initiative that can be undertaken in isolation. Digital ID systems in some countries remains a controversial issue due to lack of appropriate data protection policies and guidelines, exclusion of populations, and other issues. Appropriate policies and regulations will be need to ensure not only the fair and equitable distribution of the vaccine but also the protection of biometric data.

[1] Jonathan Corum, Sui-Lee Wee and Carl Zimmer, ' Coronavirus Vaccine Tracker.' (New York Times , October 2020) << https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html>>

[2] Thomas J. Bollyky, Lawrence O. Gostin, Margaret A. Hamburg. 'The Equitable Distribution of COVID-19 Therapeutics and Vaccines.' (Jama Network , May , 2020) https://jamanetwork.com/journals/jama/fullarticle/2765944

[3] Rebecca Weintraub, Prashant Yadav and Seth Berkley, 'A Covid -19 Vaccine will Need Equitable Global Distribution.' (Harvard Business Review , April 2020) https://hbr.org/2020/04/a-covid-19-vaccine-will-need-equitable-global-distribution>

[4] Samantha Subramanian, 'Biometric Tracking Can Ensure Billions Have Immunity against Covid-19.' https://www.bloomberg.com/features/2020-covid-vaccine-tracking-biometric/ (Bloomberg Business Week, August 2020)

[5] Chris Burt, 'NEC and Simprints join forces with Gavi to extend vaccination coverage with biometrics.' (Biometric Update ,June 2019) <https://www.biometricupdate.com/201906/nec-and-simprints-join-forces-with-gavi-to-extend-vaccination-coverage-with-biometrics>

[6] Frank Hersey, 'Biometrics and Digital ID in Africa this week: BIO-key, Yoti, Simprints, iiDENTIFii and Innovatrics.' (Biometric Update.Com , April 2020) <https://www.biometricupdate.com/202004/biometrics-and-digital-id-in-africa-this-week-bio-key-yoti-simprints-iidentifii-and-innovatrics>

[7] Samantha Subramanian 'Covid Vaccine: Biometric Tracking Can Ensure Immunity. It's Also a Privacy Risk.' <https://www.bloomberg.com/features/2020-covid-vaccine-tracking-biometric/ >(Bloomberg Business Week, August 2020).

[8] Samantha Subramanian, 'Biometric Tracking Can Ensure Billions Have Immunity against Covid-19.' <https://www.bloomberg.com/features/2020-covid-vaccine-tracking-biometric/ >(Bloomberg Business Week, August 2020).

GOOD ID PRINCIPLES

1. Adequate privacy and security measures
2. Ethical considerations (i.e. informed consent, voluntary participation, confidentiality, assessment of only relevant components)
3. Secure hardware and software in accordance with appropriate safeguards for protecting personal health information.
4. Data encryption
5. Disaster recovery measures
6. Anonymization of personal health data. Personal health data should not be linked to individual identity when it is non-essential
7. Controlled access to personal data
8. Access to information

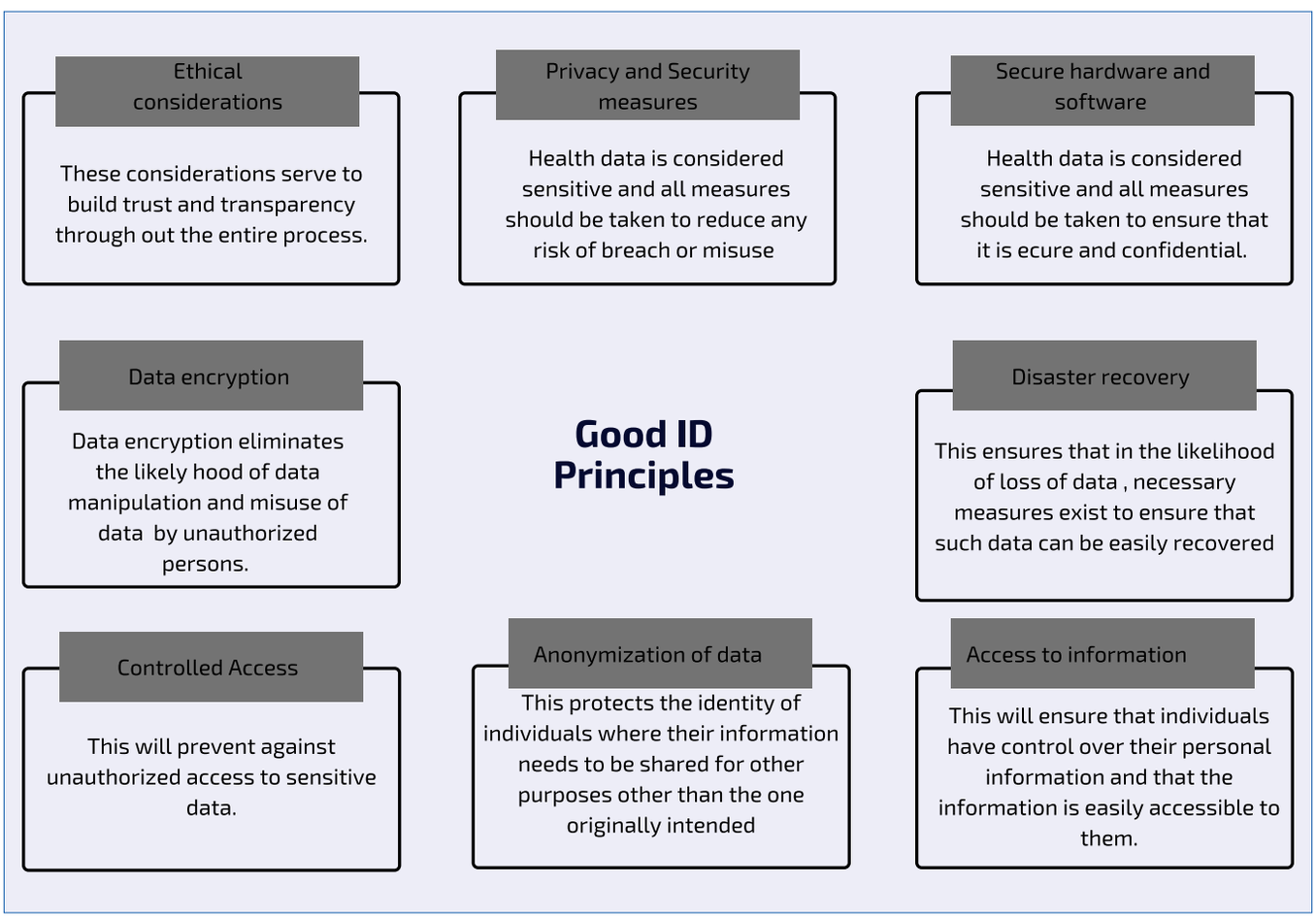

Fig. 2 Good ID Principles

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CONCLUSION

The use of Digital ID will potentially aid in the efficient and equitable vaccination of COVID-19. However, it presents certain risks of privacy violations which, in anticipation of a COVID-19 vaccine, need to be addressed to increase the public's confidence.

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ADDENDUM: CASE STUDY: TECH COMPANIES PROVIDING DIGITAL ID SOLUTIONS THAT COULD BE USED FOR VACCINE DISTRIBUTION.

The Covid-19 vaccine, once made available, will require wide distribution. Digital ID is more likely to play a crucial role in developing the distribution chain of this vaccine to all persons without leaving out those from the most vulnerable communities. The distribution chain needs to be developed in such a manner that eliminates risk to privacy, fraud, corruption, duplication, inaccurate data, and unintegrated databases. This case study explores how two non-profit tech companies, iRespond and Simprints, have used their digital identity solutions to aid access to medical healthcare, reflecting how these same solutions could be used in creating a fair and equitable distribution chain for the covid-19 vaccine. The case study also looks at the possible challenges associated with using the digital identity solutions these companies present.

IRespond developed a digital identity solution that primarily relies on iris biometrics. Other modalities, such as finger or face identification can be used instead, or in combination with the iris data. Their system design operates firstly through enrolment by consent, then assigning a unique identifier to a participant, which is critical to the enrolment step as it requires precision and repeatability. When a new participant is enrolled, an encrypted biometric template is created from their iris scan and a randomly assigned 12-digit number is drawn from a pool of 90 billion numbers. On subsequent visits, the identity of the participant is verified when their template is matched and the system returns the original 12-digit unique identifier. The system operator uses the pseudonymous identifier within their ecosystem to positively ID the participant.[9]

The biometric ID solution has been primarily used within the humanitarian sector and within countries with vulnerable populations for medical health care purposes and human rights protections. This identification system has been used in a pilot project in the Mae La Refugee camp in Thailand. Targeting a population of 40,000 people, the system was used to provide camp residents with medical records and enable access to health care. The system has also been used to identify and register communities in Kenya, Senegal, Sierra Leone, and Myanmar for HIV testing and treatment, securely and anonymously linking medical records automatically. No ID cards or personal identifiers are necessary, improving the tracking and treatment of HIV positive populations, while maintaining a certain level of data security.[10]

Simprints, another non-profit tech company, has built and deployed biometric identification solutions to secure health care and vaccine delivery. The Simprints digital ID system combines both face and finger print biometrics, or a combination of both, and their system integrates biometrics into existing mobile tools and workflows. Simprints have a presence in: Nigeria and Somalia, where they have used their tech for cash and aid distribution; the slums of Dhaka in Bangladesh, where they have aided access to maternal health; and Ethiopia, for combating Neglected Tropical Diseases (NTD) by creating tracking systems for treatment in vulnerable communities. In Kenya, Simprints has worked in partnership with Cohesu, a Kenyan NGO leading the fight against diseases that affect children and their families within the larger Western regions of Kenya.[11] They have used the Simprints biometrics system to treat the NTD known as Tunga,[12] which affects school going children

in the western region. Cohesu work with select schools to identify and treat children suffering from Tunga and malaria. They are also using the system to track, treat, and prevent diarrheal outbreaks among the 1,000 residents in the area.[13]

Digital ID systems programmed to use biometrics can reduce the challenge of inaccuracy, provided that the biometric systems are well administered. Photos for facial recognition, for example, must adhere to standardized parameters and must therefore be taken under controlled conditions.

Biometric information should remain a special category of data, since the unique nature of this data (iris, fingerprints, and face) cannot be easily replaced as one would replace an identification card or an assigned PIN. Exploring the questions arising around the use of biometrics (e.g., the differences between biometric systems, their use in a manner that protects privacy, and what constitutes a good biometric system), will determine the benefits or faults of using this digital ID solution. Consideration of these factors will be especially important in determining whether a fair and equitable distribution mechanism is possible for the administration of the Covid-19 vaccine.

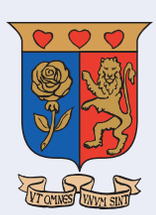
[9] 'iRespond.'< https://www.irespond.org/ >

[10] 'Health and Well-being of Women, Children and Adolescents on the Move: Knowledge Brief Series.' <https://www.who.int/pmnch/media/news/2019/PMNCH-knowledge-brief-1.pdf?ua=1>

[11] Simprints Projects.' <https://www.simprints.com/project/cohesu>

[12] *Tunga* are parasitic insects that burrow into the bare feet of their human hosts, making walking painful, keeping children out of school and adults out of work, and risking infection that, if left untreated, can lead to loss of limb and even death.

[13] 'Simprints Projects.' <https://www.simprints.com/project/cohesu>



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