Chapter 28
Blockchain for Universal Health Coverage

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ABSTRACT

In this chapter the authors provide an overview of where Blockchain is being used in high resource settings and explore its potential use in emerging health systems for universal health coverage. There is opportunity to address issues in emerging health systems through adaptation and testing of Blockchain, especially in the management of patient records and data, financing, supply chain management, health workforce management, and surveillance processes. It also has complementary relevance for identity and financial inclusion, which are vital for improving the health of the poor in emerging economies. Reference is also made to the use of Blockchain for displaced people and humanitarian settings, which is the subject of Chapter 7 of this book. There remains, however, a need for more research and evaluation as these technologies are implemented and increased user participation in design to ensure that privacy and security issues are addressed. Furthermore, greater attention to local implementation and health sector applications in low resource settings is required.

INTRODUCTION

Blockchain is increasingly seen as a technology that has potential to contribute to global health equity and universal health coverage (Till et al, 2017). Universal health coverage is defined as *ensuring that all people have access to needed health services (including prevention, promotion, treatment, rehabilitation and palliation) of sufficient quality to be effective while also ensuring that the use of these services does not expose the user to financial hardship* (World Health Organisation, 2019).

A literature review of applications of Blockchain in health care (Mwashuma, 2018) concluded that Blockchain will be key in building a global health ecosystem that connects patients, clinicians, researchers, insurers and clinical laboratories. It further cited potential for Blockchain to improve patient data security, data sharing, interoperability, patient engagement, and big data analytics health information exchange, fight counterfeit drugs, and improve research processes and AI based diagnostics. Additionally, an article in the reputable British Medical Journal (Till et al, 2017) posits that Blockchain could remake global health financing and contribute to global health equity and universal health coverage. Blockchain is demonstrating its potential to re-architect many incumbent business models, removing friction and improving data sharing in a highly secure environment while leveraging existing IT infrastructure (Brodersen et al, 2016).

The basic features which underpin the technology help demonstrate why the approach may suit health sector transformation, especially. Firstly, Blockchain enables a distributed database, where each party on a Blockchain has access to the entire database and its complete history. No single party controls the data or the information and every party can verify the records of its transaction partners directly, without an intermediary. In this system, peer-to-peer transmission is supported, with communication occurring directly between peers as opposed to through a central node. Each node stores and forwards information to all other nodes (Iansiti & Lakhani, 2017). With health systems in emerging settings often decentralized, they face constant challenges both to centralize information (national reporting) and to share information across disparate nodes (sharing information on patient treatment at different health service sites). Distributed databases are, by design, intended to address these issues.

Secondly, Blockchain technology enables transparency with pseudonymity, where each transaction is visible to anyone with permissioned access to the system, but where users can choose to remain anonymous or provide proof of their identity to others. Once a transaction is entered in the database recording on the database is permanent, chronologically ordered, and available to all others on the network. Finally, transactions can be tied to computational logic and programmed. Blockchains offer properties of decentralization, transparency, and immutability that can potentially be leveraged to improve healthcare interoperability. Programmable Blockchains have generated interest as a potential solution to key challenges such as inefficient clinical report delivery and fragmented health records.

This chapter begins with a brief overview of how Blockchain is being used and developed in high resource health care systems, then explores the potential in emerging economies for health care and related areas, given that many determinants of good health are social - such as the conditions in which people are born, grow, live, work and age

Blockchain for health care fundamentally reaches towards Empowerment in the New World as represented in the B4SC model in Figure 1.

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