

Open Learning Forum

[Blockchain Applications in the Biomedical Domain: A Scoping Review](#)

Executive Summary written by GBBC

Introduction

Certain features of blockchain technology, such as security, immutability, and privacy, have led some proponents to believe it can improve a range of biomedical-related processes. This publication is a scoping review of academic papers: beginning with over 3647 papers, the researchers sorted them until they were left with 47 that directly address blockchain applications in the biomedical space. This broad-scope research of literature provides a useful barometer for determining the state and prevalence of research into biomedical blockchain applications.

Findings

The management of electronic health records, including medical records (from hospitals) and personal health records, is one of the most popular applications in this space. A number of papers have proposed a system that would allow patients to fully control their health records and “grant access to their medical record segments, either for continuity of care, second opinion, or medical research.” Further research has been conducted into creating a “unified personal health record” that would synthesize health records with data from medical sensors (wearables and embedded). The increasing prevalence of medical sensors has brought more attention to this issue as patients and companies look to secure extremely sensitive personal data. Only 42 percent of these papers have been simulated or tested in labs, though the researchers noted that there are ongoing pilot programs in this area, most notably in [Estonia](#) and the [United Kingdom](#).

Another popular application is supply chain management for drugs and medical devices, both to combat counterfeit and substandard drugs and to manage storage of legitimate drugs along the supply chain. These applications use a variety of sensors (temperature, location, etc.) to ensure that these products move through the supply chain without tampering or mismanagement.

Conclusion

The researchers conclude that while this is an “emerging field,” the amount of research being conducted on biomedical blockchain applications is increasing in volume and expanding in diversity. Early research was largely focused on health records, while new studies are focusing on “medical research, clinical trials, medicines supply chain, and medical insurance.” They suggest that future research should focus on wide-scale deployments to determine the limitations and benefits of the technology when it is used in the real world.