

# VACCINE SUPPLY: TRUSTING IN BLOCKCHAIN

As we wait for a COVID-19 vaccine, pharma is looking to blockchain technology to prepare for the major supply-chain obstacles to come.

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Among the many adverse effects of the COVID-19 pandemic, a shortage of drugs, protective equipment, and test kits, product delays, loss of employee productivity, and enforced plant closures have been among those exposing the weaknesses of the pharma supply chain. These challenges pose inevitable problems for the supply of COVID vaccines—when they eventually become available—especially as governments will need to expedite distribution of these treatments to billions of people worldwide. Indeed, the World Economic Forum (WEF) has reported that distributing the COVID-19 vaccine “will require one of the largest supply chain capacities for fighting pandemics ever built,” facilitating the distribution of between seven to 19 billion vaccine doses (the higher figure accounting for double doses where required and for loss of doses during storage and transit).

Traditional supply chains, however, are at the mercy of bottlenecks, quality control issues, theft, and counterfeiting. As the world clamors for the first COVID vaccines, such problems are likely to be amplified. To avoid these established supply-chain vulnerabilities, pharma is looking to blockchain and its transparent digital ledger technology, which records and logs transactions into “blocks” into a database across a network of computers with no centralized entry point. “Servers are set up over various different data centers and across different geographies,” explains VAI Chief Information Officer Kevin Beasley. “If any particular server becomes compromised or fails for whatever reason, the data still stored in multiple locations.” All users can see the transactions and the changes to the blockchain, and once data is entered it cannot be changed.

“You can go back and update records to say that the previous record was incorrect and log new information, but the original data is immutable,” Beasley told Pharm Exec. Blockchain, then, offers “a permanent audit trail.”

Pointing to a Harvard Business Review article stating that the supply chain for a COVID-19 vaccine “must be equitable,”<sup>2</sup> WEF adds that such equitability “can only be built on [an] openly verifiable, consensus-driven system having immutable integrity of data with no single source of control.” As vaccine access “will critically depend on an information system with the highest possible integrity,” WEF reports that blockchain technology will be essential for equitable COVID-19 vaccine distribution. While the organization accepts that, so far, blockchain has been mostly used in pilot experiments in retail and



transport logistics “to enable real-time tracking of shipments and shared access of data between consortium members, building trust,” it asserts that it is now time for these pilot-scheme learnings to be “utilized to enable a truly global ledger for the COVID-19 vaccine supply chain.”

For the vaccine manufacturers, blockchain allows for the accurate tracking of all aspects of the supply chain, from packaging and cold-chain transit to distribution strategies and storage. As Beasley says, many components go into a

vaccine, not just active or inactive viral components, and there can be questions about where they are sourced, how they were supplied, etc. With blockchain, manufacturers can track any component included in their vaccines. In July, San Francisco-based technology company Chronicled—the custodian of MediLedger, a decentralized network that connects trading partners without revealing private or competitively sensitive data—reported that MediLedger’s product verification solution will help fight counterfeits and fraud

in the medication used for the treatment of COVID-19 by enabling pharmacies and hospitals to authenticate high risk or suspect products. It works through a barcode scan that validates product data against the original manufacturer’s data.

“The whole purpose of blockchain is trust—you can actually trust in the data,” says Beasley. Blockchain-based supply chains would engender this trust in everyone “from manufacturers to doctors and the recipients of the vaccine.”

