PRICING THE COVID-19 VACCINE: A MATHEMATICAL APPROACH

Banafsheh Behzad, Information Systems Department, College of Business, California State University, Long Beach, 1250 Bellflower Blvd., Long Beach, CA 90840, banafsheh.behzad@csulb.edu

ABSTRACT

The United Nations emphasized the importance of providing COVID-19 vaccines as "a global public good", which is accessible and affordable world-wide. Pricing the COVID-19 vaccines is a controversial topic. We use optimization and game theoretic approaches to model the COVID-19 U.S. vaccine market as a duopoly with two manufacturers Pfizer-BioNTech and Moderna. The results suggest that even in the context of very high production and distribution costs, the government can negotiate prices with the manufacturers to keep public sector prices as low as possible while meeting demand and ensuring each manufacturer earns a target profit.

Keywords: COVID-19, Vaccine Pricing, Optimization, Game Theory