

COVID-19 STRESSES SUPPLY CHAINS

Anna Nagurney's book, 'Networks Against Time: Supply Chain Analytics for Perishable Products', co-authored with M. Yu, A.H. Masoumi, and L.S. Nagurney, and published by Springer in 2013, analyses the impacts of a variety of supply chain disruptions. In March, the day after the World Health Organization declared the COVID-19 pandemic, her article, 'How coronavirus is upsetting the blood supply chain', was published in *The Conversation* (see <http://bit.ly/Nagurney>). It was subsequently updated and published as 'The COVID-19 pandemic and the stressed supply chain', in Coronavirus Chronicles in *Analytics* magazine (see <http://bit.ly/Nagurney2>).



Supply chains have been especially stressed during the COVID-19 pandemic. The USA blood supply chain is stressed for numerous reasons, including fewer collection sites for donations due to closures of universities, and fear of coronavirus striking donors and those who labour in blood services. Food supply chains have also been negatively impacted by the pandemic, from meat and dairy to fresh produce supply chains. Many meat processing plants have had workers contract COVID-19, resulting in closures, subsequent sanitisation of facilities and redesign for physical/social distancing. Some dairy farmers have resorted to throwing out milk, and potato farmers their potatoes, because the supply chains are broken. Even freight service providers and warehouse employees have taken ill, further disrupting the supply chain networks. The cost is great to farmers and society as prices rise and children go hungry with increasing food insecurity. Many in the O.R./analytics community are making intense efforts to combat stresses in supply chains.