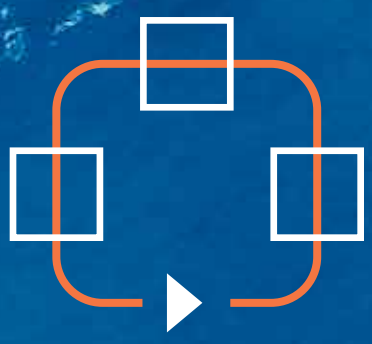




# The global medicines supply chain has grown more complex

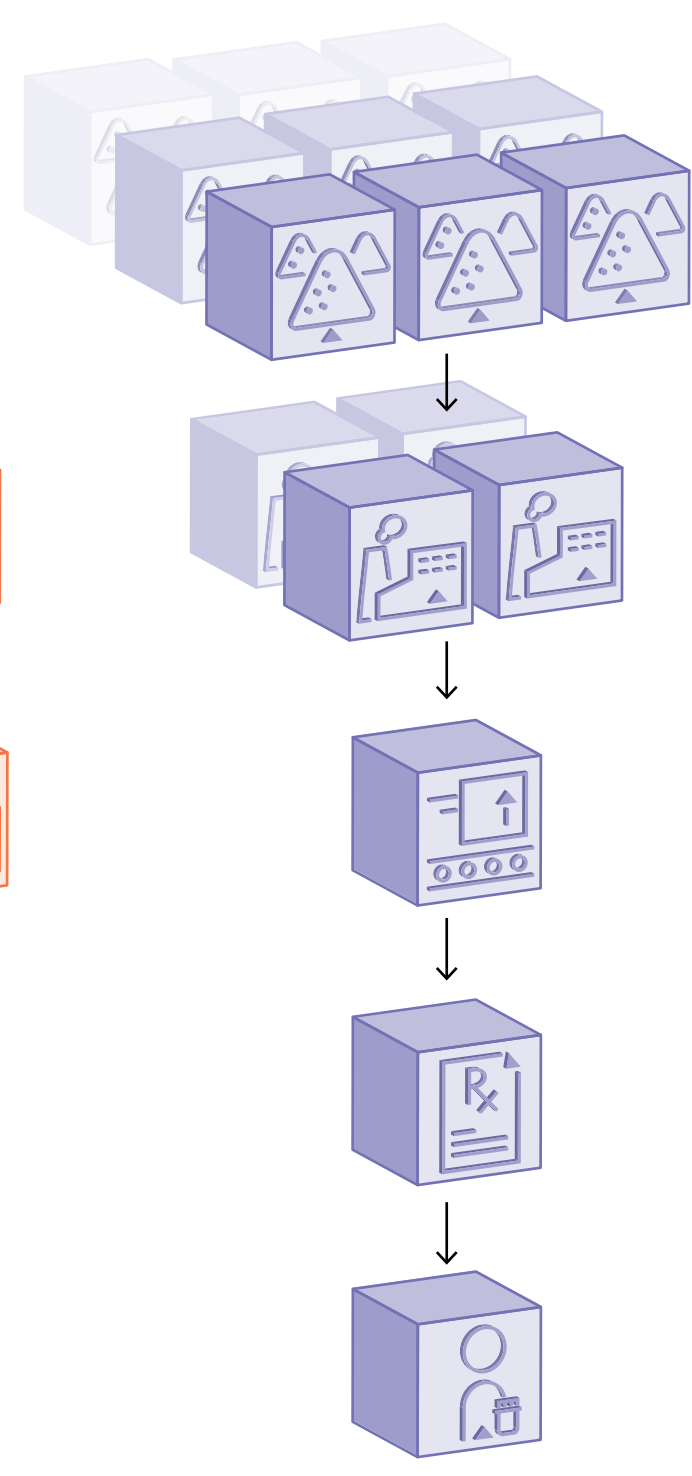
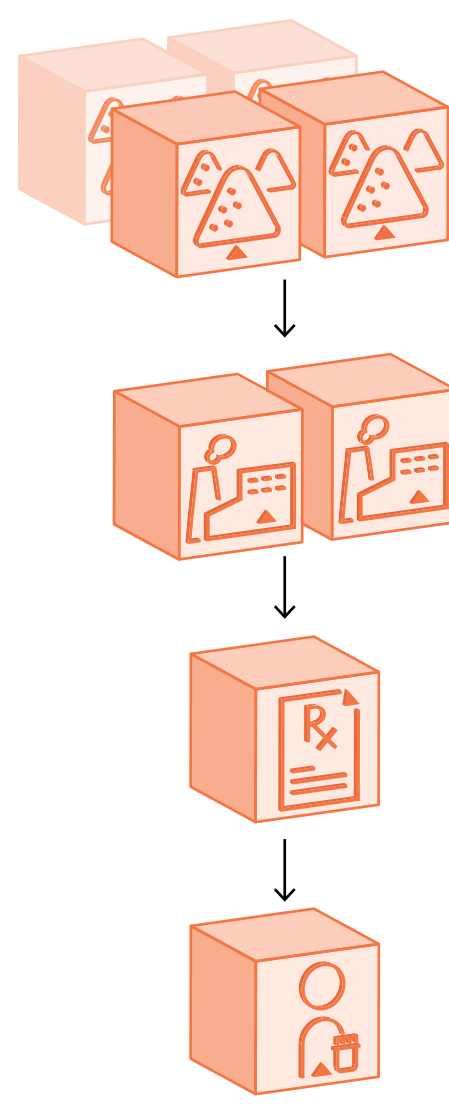
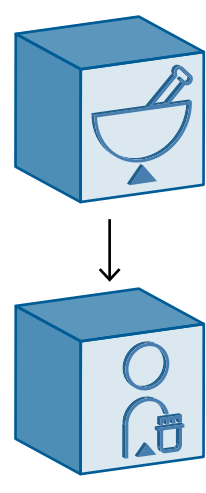


The COVID-19 pandemic is raising concerns about vulnerabilities in the supply chain and where our medicines are made. Changes are needed to make the medicines supply chain more resilient to withstand disruptions. There won't be a single or simple solution.

How medicines reach patients has evolved over the past 200 years and there are now more stops along the supply chain and many more participants around the world.

## Supply Chain Legend

	= Patient		= Distributors & wholesalers
	= Apothecary		= Pharmaceutical manufacturers
	= Pharmacy		= Ingredient suppliers



1820s-1860s

1870s-1950s

1960s-1970s

1980s-2020s

### Botanicals and herbal medicines

Local apothecaries with knowledge of botanicals, prepare remedies for patients.

### Rise of manufacturing

Analytical chemistry and pharmacology along with advances in automation give rise to large-scale manufacturing.

### Global expansion

Pharmaceutical companies continue expanding manufacturing plants to other countries to increase their markets and reduce operating costs. As a result medicines are produced and packaged at a greater distance.

### Growth, distribution, consolidation

Rise of generics in the early 80s extends the supply chain as more companies manufacture medicines outside the U.S. Today, many intermediaries play a role in medicine's production, distribution, and delivery.

