# Timeline of capacity constraint unfolding

March - April 2020		May – December 2020				1H 2021		2H 2021
Country lock-downs in EU impacted ongoing operations and capacity expansion projects		Normalized productions and restarted capacity expansion projects		Country lock initiated. Sinitiated. Sinitiated. Sinitiated.	c-downs re- te absenteeism			
bruary/March: Impact of OVID seen on logistics			Balance of 2020: Suppliers and Tier 2 raw material suppliers of single-use technology components and assemblies reacted quickly to respond to demand increases by changing production schedules and improving productivity.					
	April: Demand increases noted due to Warp Speed & BARDA initiatives				Production capacity expansion	n projects expand capacity		
		Identified alternative components						
	March/April: capacity constraints driven by COVID illness at manufacturers			Conduct studies to increase useful life of existing componentry				
	Rebalanced inven	tory between	sites				Capacity co	onstraint relieved by 4Q21
	April: Biologics and non-COVID related products' orders and deliveries began to be impacted			Reconfigure operations to reduce the number of components used				

Identified and qualified new suppliers for constrained materials

## Capacity constraints driven by COVID-19

### Consumables used in manufacture of Biologics and Vaccines

#### **Stabilize**

- ✓ Completed assessment of 32 suppliers
- ✓ Ensured safety stock levels @ >8 weeks for raw material components
- ✓ Ensured employee safety measures in place

#### Recover

- ✓ Maintain safety stock levels
- ✓ Increase staffing to ensure capacity investments fully realize output
- ✓ Transition to 24/7 operations
- ✓ Increase raw material stock and sterilization capacity

# **Increase Capacity**

- ✓ Secure additional capacity (65% increase required)
  - Increase physical footprint and add equipment
  - Added suppliers
- ✓ Build a global capacity plan
- ✓ Leverage external partners and new manufacturing technologies, e.g. automation