

CEPI COVID-19



Manufacturing Survey Results Analysis



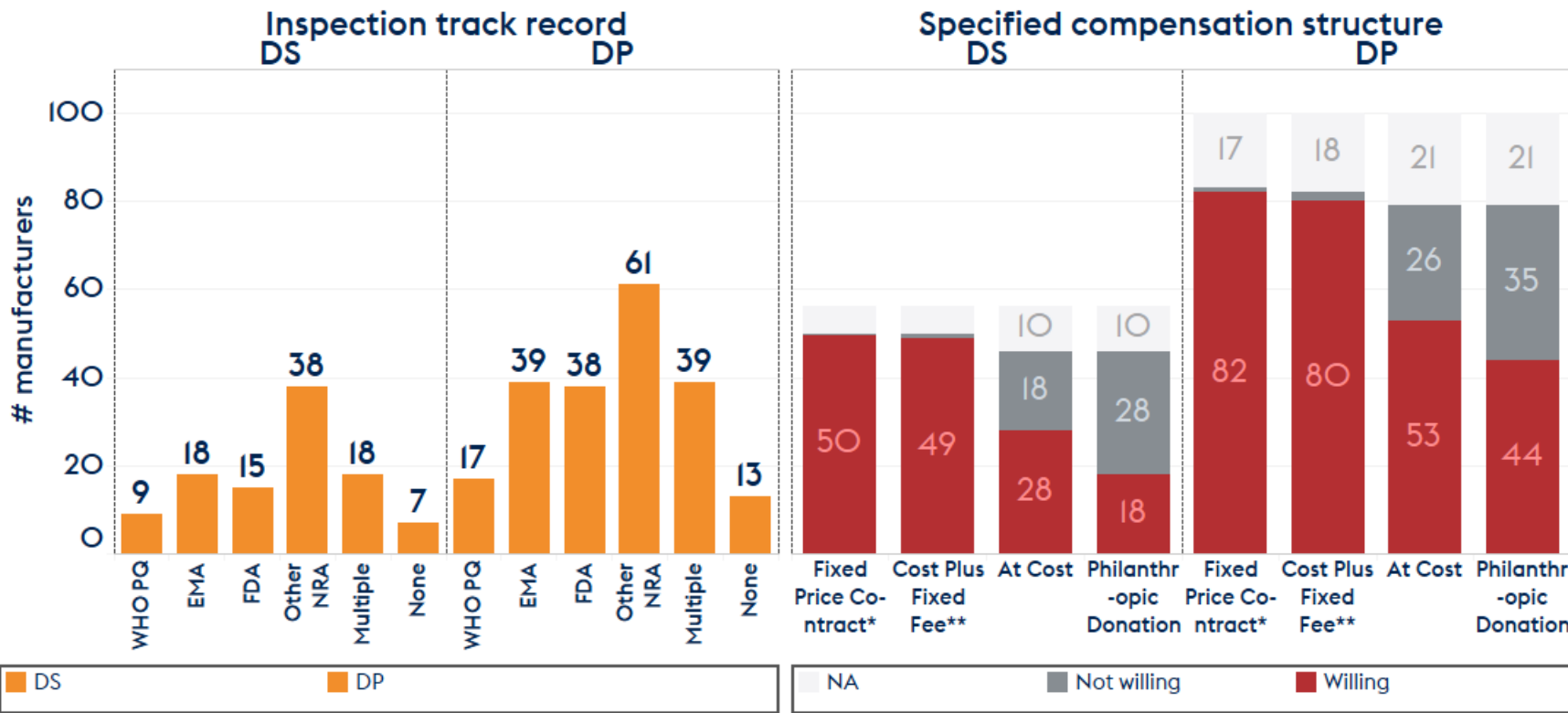
29 June 2020

Manufacturing Survey Results Analysis

Summary:

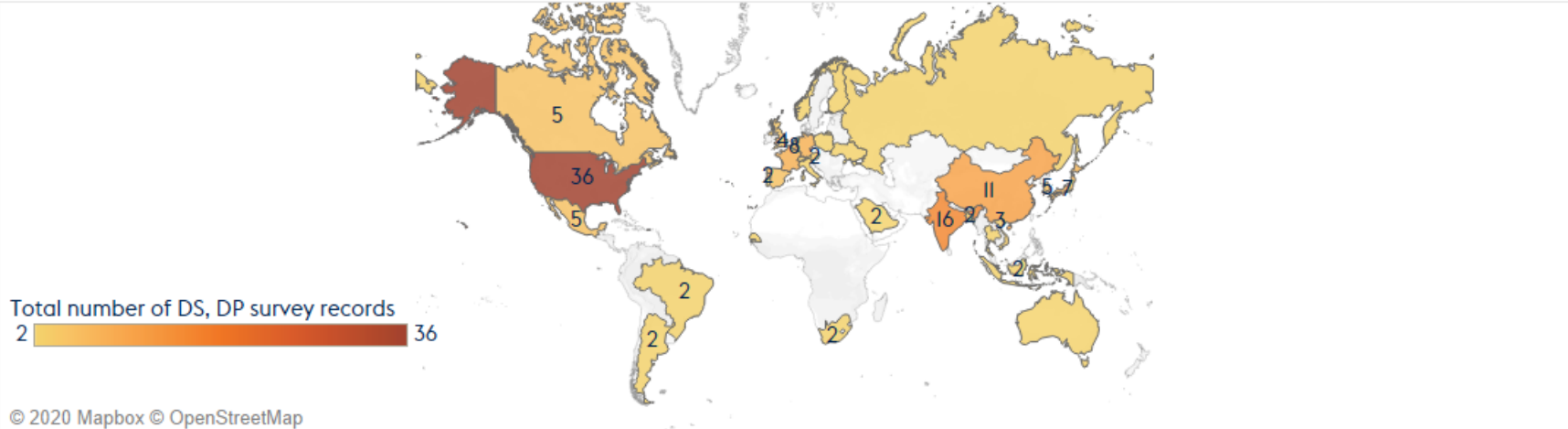
- The following analysis represents a snap shot in time and may have changed dramatically since the data was collected
- 113 manufacturers responded to the survey. 56 Drug Substance (DS) and 100 Drug Product (DP) manufacturers responded to the survey. 43 survey responders are both DS, DP
- Responders indicated available capacity Q42020 through EOY2021 and potential compensation structure
- Data was scrubbed to remove errors and inconsistencies in manufacturer submissions

Global Drug Substance and Drug Product Landscape



- Summary:**
- Experienced regulatory inspection records for responders
 - Various compensation structures offered but unvalidated until actual contract is negotiated

Landscape - Geographic Allocation of DS/DP manufacturers

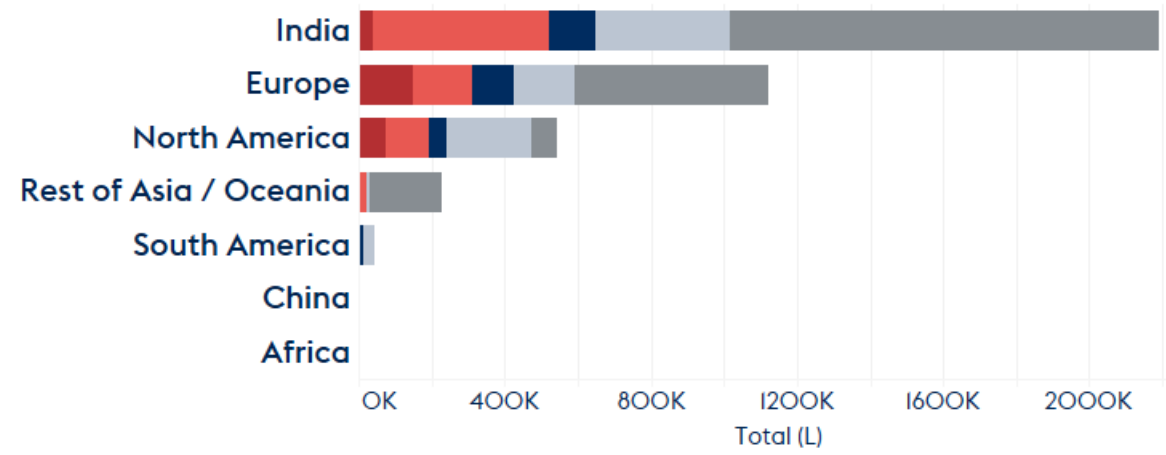


- The number presented in the map reflects the quantity of DS and DP manufacturers and their location. This does not take into account how many facilities each manufacturer operates

Notes:
 *Fixed price contract = fixed payment amount, regardless of incurred expenses
 **Cost plus fixed fee = payment of allowed expenses plus pre-determined fee that was agreed upon at the time of contract signature

Global Drug Substance Landscape – Available Capacity

Volume Summary per Region (exclude RNA)



Capacity in manufacturing vaccines based on

- microbial or yeast expression systems
- recombinant protein from suspension cells
- recombinant protein from insect cells
- viruses
- DNA

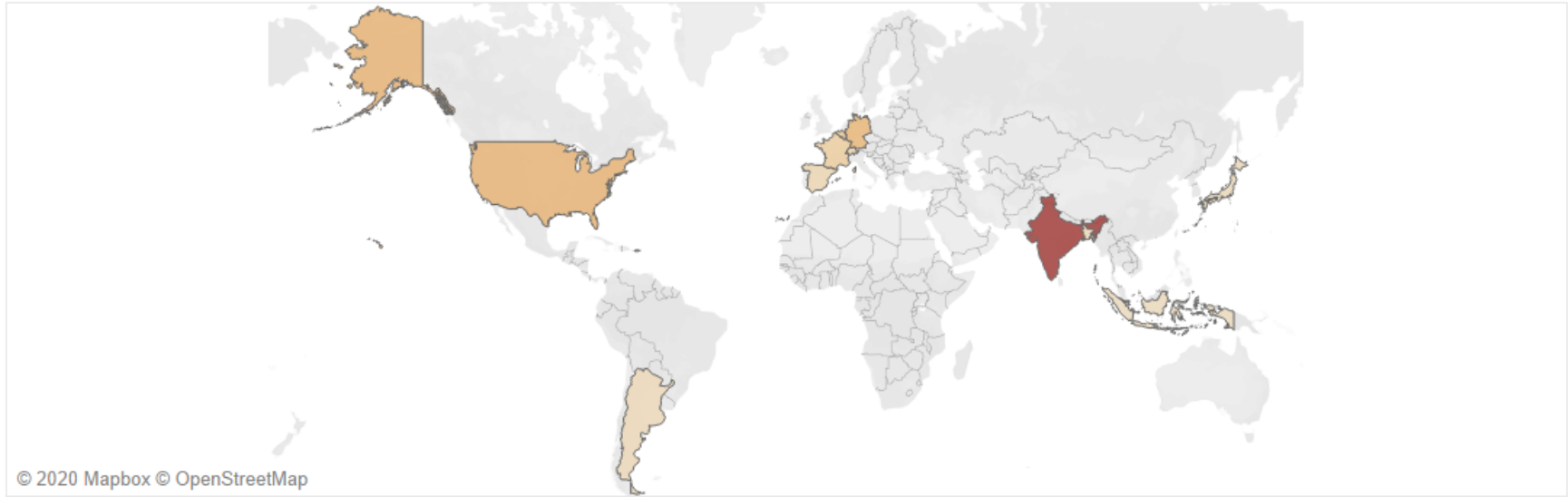
Summary:

- Analysis is based on liters or grams of production
- Number of doses will depend on actual dose proven in clinical trials
- Substantial DS capacity (L) is available with concentration in certain countries/regions

Volume Summary (RNA)

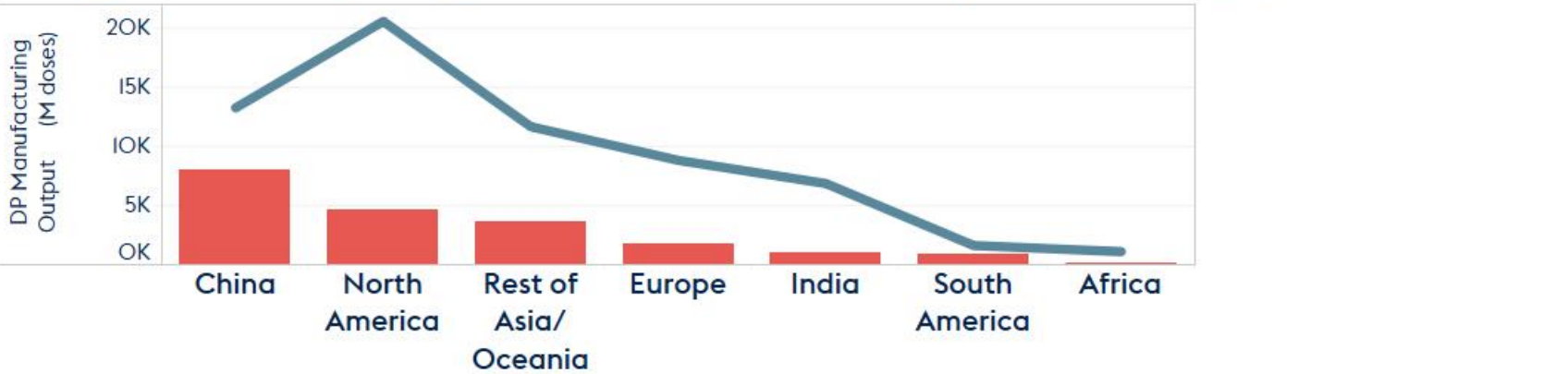
Europe	Belgium	72.0 g
	Portugal	82.0 g
North America	USA	72.0 g

Drug Substance Volume Estimate by Country (Exclude RNA)



Global Drug Product Landscape – Available Capacity

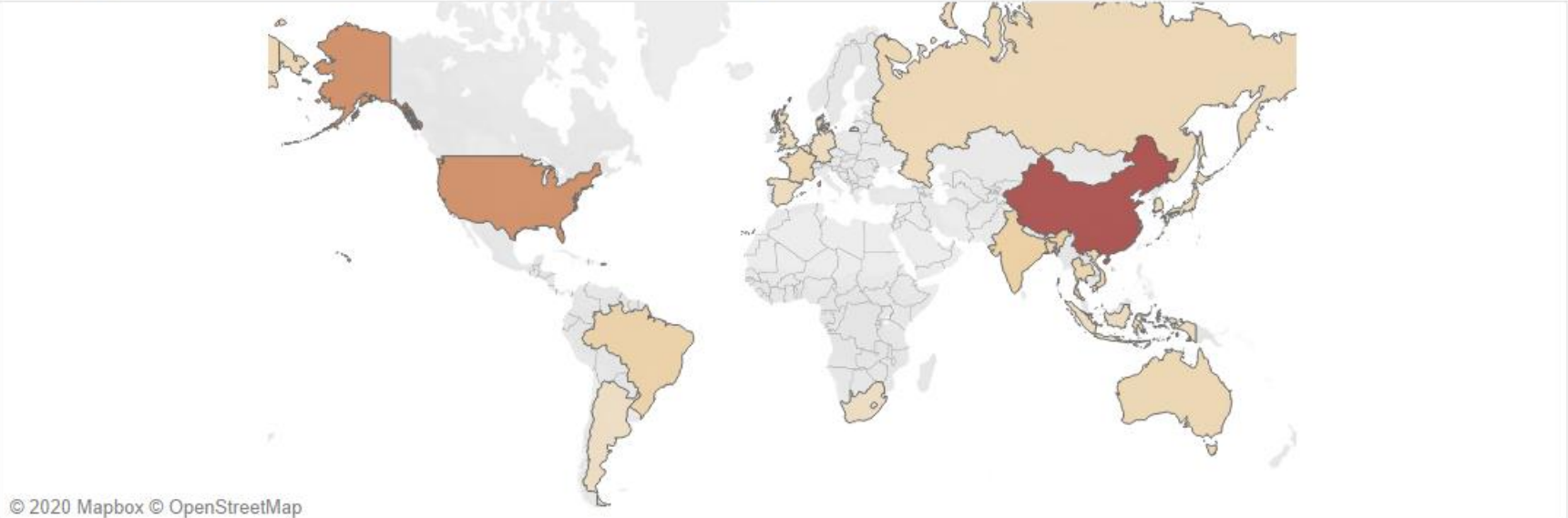
Drug Product by Region - Base Case and upside



Summary:

- Analysis is based on responder data but the Base Case takes into account most recent manufacturing discussions and publicly announced deals that have reduced capacity
- Meaningful DP capacity (doses) is available in distributed geographies

Drug Product Estimate by Country - Base Case



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 Base Case DP Manufacturing Output (M doses)
 100 8,038

Global Drug Substance Landscape – Available Capacity Data

	Sum of DNA (L)	Sum of RNA (g)	Sum of Recombinant protein from insect cells (L)	Sum of Viruses (L)	Sum of Subunit Vaccine from CHO cells (L)	Sum of Microbial / Yeast (L)
Europe	150900	154	114000	160500	168000	526230
France			57000	9000	57000	67500
Germany	50400.00				69000	382500
Spain	24000.00		27000		27000	
UK						
Belgium	76500.00	72	30000	30000	15000	76230
Poland						
Portugal		82				
Italy						
Switzerland				121500		
India	40707.00		126000	480000	369500	1174700
India	40707.00		126000	480000	369500	1174700
North America	73200	72	48000	120000	232200	69600
USA	73200.00	72	48000	120000	232200	69600
Canada						
Rest of Asia / Oceania	3000			18000	10500	195300
Bangladesh						67500
Saudi Arabia						
South Korea						
Vietnam						123000
Indonesia					7500	300
Japan	3000.00			18000	3000	4500
South America			15000		30000	
Argentina			15000		30000	
Brazil						
Africa						
South Africa						
China						
China						
Grand Total	267807	226	303000	778500	810200	1965830

Global Drug Product Landscape – Available Capacity Data

Region	Country	Base Case DP Manufacturing Output (doses in millions)	Upside DP Manufacturing Output (doses in millions)
Europe		1735.80	8836.30
	Austria	0.00	125.00
	Belgium	168.00	1168.00
	Bulgaria	0.00	0.00
	Denmark	100.00	350.00
	Finland	0.00	75.50
	France	628.00	1753.00
	Germany	215.00	1340.00
	Ireland	0.00	250.00
	Italy	0.00	500.00
	Luxemburg	0.00	125.00
	Netherlands	0.00	625.00
	Poland		
	Spain	274.80	274.80
	Switzerland	0.00	1500.00
	UK	350.00	750.00
North America		4576.75	20610.00
	Canada	0.00	1125.00
	USA	4576.75	19485.00
	Mexico	0.00	125.00
South America		876.60	1626.60
	Argentina	120.60	370.60
	Brazil	756.00	1131.00
India	India	946.88	6874.38
China	China	8037.50	13284.05
Rest of Asia/Oceania		3603.70	11686.80
	Bangladesh	523.90	523.90
	Indonesia	250.00	250.00
	Israel	0.00	250.00
	Iran	0.00	125.00
	Japan	350.00	850.00
	Malaysia	0.00	375.00
	New Zealand	0.00	250.00
	Pakistan	0.00	125.00
	Russia	453.75	953.75
	Saudi Arabia	0.00	375.00
	Sri Lanka	0.00	250.00
	South Korea	250.00	1201.60
	Taiwan	0.00	750.00
	Thailand	641.00	2269.10
	Turkey	0.00	250.00
	Vietnam	624.65	2128.05
	Australia	510.40	760.40
Africa		125.00	1106.80
	South Africa	125.00	856.80
	Senegal	0.00	250.00
	TOTAL	19902.23	64024.93

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