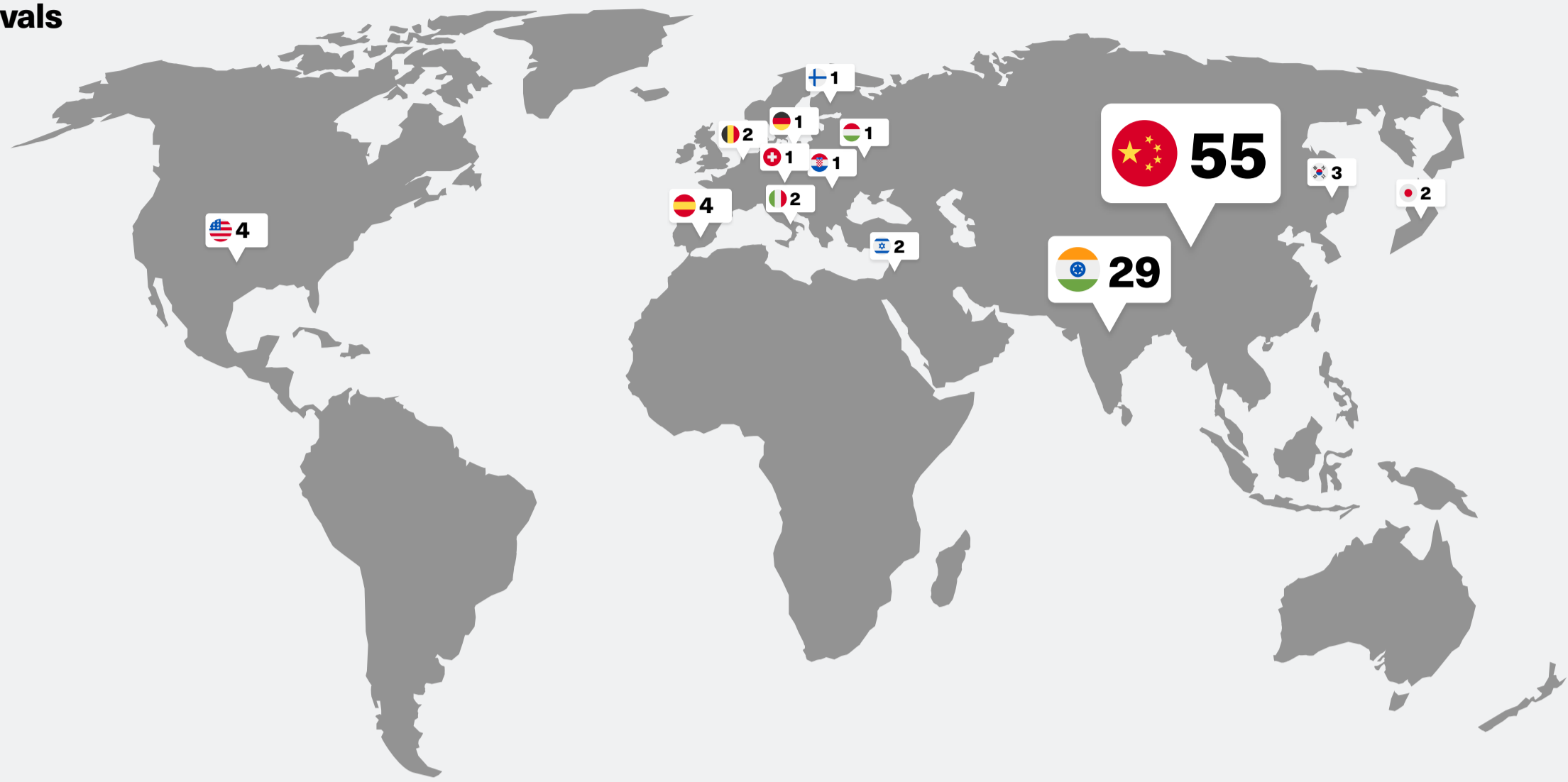


If existing drugs prove effective against CoViD-19 – how do we prevent shortages?

API producers with regulatory approvals



	Ritonavir	Lopinavir	Azithromycin	Hydroxychloroquine	Chloroquine	Losartan
Analyzed trade volume, tons 2019	20	60	1,440	100	180	980
Current API price, USD/kg unregulated regulated	706 759	456 520	138 111	128 174	27.9 29.6	210 124

API producers with regulatory approvals

CEP
 USDMF
 JDMF
 KDMF
 CN-REG

- Various drugs are under evaluation against CoViD-19 by regulatory authorities worldwide
- The medications that recently have received particular attention are mainly used against:
 - Malaria – Chloroquine/Hydroxychloroquine
 - HIV – Lopinavir & Ritonavir
 - High blood pressure – Losartan
 - Bacterial infections – Azithromycin
- If these prove effective in coronavirus trials, finished drug manufacturers would require larger amounts of these active ingredients (APIs) meet the increased demand
- Some API producers are already ramping up production, but it may not be enough to prevent supply chain disruptions and resulting drug shortages
- To help finished drug manufacturers evaluate all options for their supply chain – please find a worldwide overview of API producers with valid regulatory approvals below


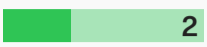



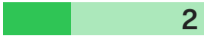



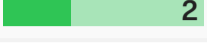



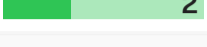



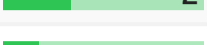



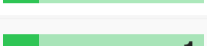





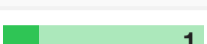







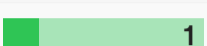




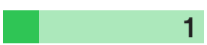




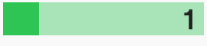




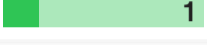




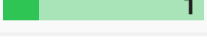



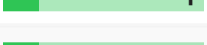



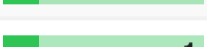



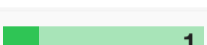



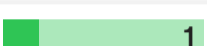



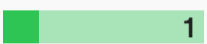



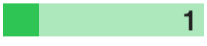



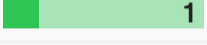



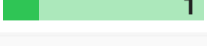



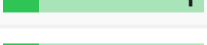



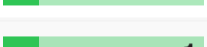


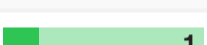


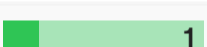


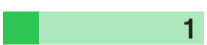


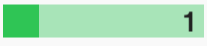


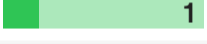


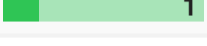


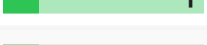


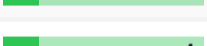


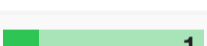


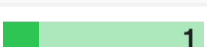


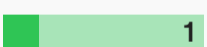





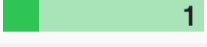


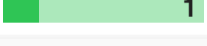


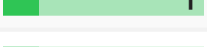


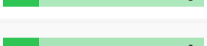


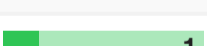


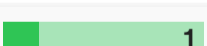


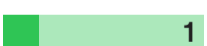


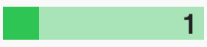


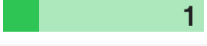


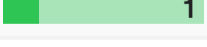


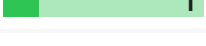












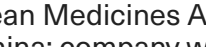




Locations	Company	APIs covered	Ritonavir	Lopinavir	Azithromycin	Hydroxychloroquine	Chloroquine	Losartan
1	India: Lupin Ltd.	4	USA	EU	USA, JDMF			USA
2	India: Aurobindo Pharma Ltd.	3	EU, USA	EU, USA				EU, USA, JDMF
3	India: Ipca Laboratories Ltd.	3				EU, USA	EU, USA	EU, USA, JDMF
4	India, Spain, USA: Mylan N.V.	3	EU, USA	EU, USA				EU, USA, JDMF
5	India: Hetero Drugs Ltd.	3	USA	USA				EU, USA, JDMF
6	India: Cipla Ltd.	3	USA	EU, USA				EU
7	India: Laurus Labs Ltd.	3	USA	USA		USA		
8	India, USA, Japan: Teva Pharmaceutical Industries Ltd.	2			EU, USA, JDMF, CN-REG			EU, USA, JDMF
9	India: Jubilant Life Sciences Ltd.	2			EU, USA			EU, USA, JDMF
10	India: Alembic Pharmaceuticals Ltd.	2			EU, USA			EU, USA
11	India: Cadila Healthcare Ltd.	2				USA		EU, USA, JDMF
12	China: Shanghai Acebright Pharmaceuticals Group Co., Ltd.	2	EU, USA	USA				
13	Germany, USA: AbbVie Inc.	2	EU					
14	China: Chongqing Kangle Pharmaceutical Co., Ltd.	2				USA		
15	India: Dr. Reddy's Laboratories Ltd.	2	USA					USA, JDMF

Sources: QYOBO platform; United States Food and Drug Administration (FDA); European Medicines Agency (EMA); Pharmaceuticals and Medical Devices Agency (PMDA), Japan; National Institute of Food and Drug Safety Evaluation (NIFDS), South Korea; National Medical Products Administration (NMPA), China; company websites and recent announcements by company representatives; international trade statistics.

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  USDMF
  JDMF
  KDMF
  CN-REG

Locations	Company	APIs covered	Ritonavir	Lopinavir	Azithromycin	Hydroxychloroquine	Chloroquine	Losartan
16	 AMRI Global	 2						
17	 Calyx Chemicals & Pharmaceuticals Ltd.	 2						
18	 Shanghai Pharmaceuticals Holding Co., Ltd.	 2						
19	 Sun Pharmaceutical Industries Ltd.	 2						
20	 Suven Life Sciences Ltd.	 2						
21	 Yichang HEC Changjiang Pharmaceutical Co., Ltd.	 1			   			
22	 Zhejiang Huahai Pharmaceutical Co., Ltd.	 1						   
23	   Sandoz AG	 1			  			
24	 Shanghai Shyndec Pharmaceutical Co., Ltd.	 1			  			
25	 Shijiazhuang Pharmaceutical Group Co., Ltd.	 1			  			
26	 Zhejiang Tianyu Pharmaceutical Co., Ltd.	 1						  
27	 Ercros S.A.	 1			 			
28	 Granules India Ltd.	 1						 
29	 Guobang Pharmachem Group Co., Ltd.	 1			 			
30	 Hanmi Fine Chemical Co., Ltd.	 1						 
31	 Micro Labs Ltd.	 1						 
32	 Ningxia Qiyuan Pharmaceutical Co., Ltd.	 1			 			
33	 Orion Corporation	 1				 		
34	 SCI Pharmtech Inc.	 1				 		
35	 Unichem Laboratories Ltd.	 1						 
36	 Vasudha Pharma Chem Ltd.	 1						 
37	 Beijing Taiyang Pharmaceutical Co., Ltd.	 1						
38	 Biozen Pharmaceuticals Co., Ltd.	 1						
39	 Chengdu Miracle Pharmaceutical Co., Ltd.	 1						
40	 China Meheco Group Co., Ltd.	 1						
41	 Chongqing Pharmaceutical (Group) Co., Ltd.	 1						
42	 Chongqing Southwest No.2 Pharmaceutical Factory Co., Ltd.	 1						
43	 Cinkate Corporation	 1						
44	 CR Double-Crane Pharmaceuticals Co., Ltd.	 1						
45	 Daito Corporation	 1						
46	 Dawnrays Pharmaceutical (Holdings) Ltd.	 1						
47	 Divi's Laboratories Ltd.	 1						
48	 Emcure Pharmaceuticals Ltd.	 1						
49	 Foshan Nanhai Beisha Pharmaceutical Co., Ltd.	 1						
50	 Fuan Pharmaceutical (Group) Co., Ltd.	 1						
51	 Furen Pharmaceutical Group Co., Ltd.	 1						
52	 Grand Pharma (China) Co., Ltd.	 1						
53	 Hainan Star Pharmaceutical Co., Ltd.	 1						
54	 Hebei Dongfeng Pharmaceutical Co., Ltd.	 1						
55	 Heilongjiang Wusuli River Pharmaceutical Co., Ltd.	 1						
56	 Henan Kangda Pharmaceutical Co., Ltd.	 1						
57	 Heze Fangming Pharmaceutical Co., Ltd.	 1						
58	 Huangshi Shixing Pharmaceutical Co., Ltd.	 1						
59	 Hunan Jiudian Pharmaceutical Co., Ltd.	 1						
60	 Hunan Xiang Yikang Pharmaceutical Co., Ltd.	 1						
61	  Insud Pharma	 1						
62	 Jiangsu Shenhua Pharmaceutical Co., Ltd.	 1						
63	 Jinghua Pharmaceutical Group Co., Ltd.	 1						
64	 Kolon Life Science, Inc.	 1						
65	 Kopran Research Laboratories Ltd.	 1						

Sources:




































































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Locations	Company	APIs covered	Ritonavir	Lopinavir	Azithromycin	Hydroxychloroquine	Chloroquine	Losartan
66	 Kyongbo Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
67	 Macleods Pharmaceuticals Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
68	 Mahima Life Sciences Pvt. Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
69	 Natco Pharma Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
70	 North China Pharmaceutical Hebei Huamin Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
71	 Olon Spa	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
72	 Orchid Pharma Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
73	 Pfizer Inc.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
74	 Qilu Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
75	 RAKS Pharma Private Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
76	 Sanofi S.A.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
77	 Shandong Duanxintang Dayu Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
78	 Shijiazhuang No. 4 Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
79	 Sichuan Jiangchuan Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
80	 Sterile India Pvt. Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
81	 Taishan Chemical Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
82	 Taro Pharmaceutical Industries Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
83	 Wanquan Wante Pharmaceutical (Xiamen) Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
84	 Wockhardt Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
85	 Xi'an Lijun Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
86	 Yangtze River Pharmaceutical Group Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
87	 Yonezawa Hamari Chemicals, Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
88	 Youcare Pharmaceutical Group Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
89	 Zhejiang Aotuo Kang Pharmaceutical Group Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
90	 Zhejiang Better Pharmaceuticals Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
91	 Zhejiang Golden Pharma Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
92	 Zhejiang Menovo Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
93	 Zhejiang New Harmony Union Corporation	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
94	 Zhejiang Nexchem Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1			 			
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97	 Zhejiang Zhenyuan Share Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						
98	 Zhuozhou Dongle Pharmaceutical Co., Ltd.	<div style="width: 100%; height: 10px; background-color: green;"></div> 1						

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