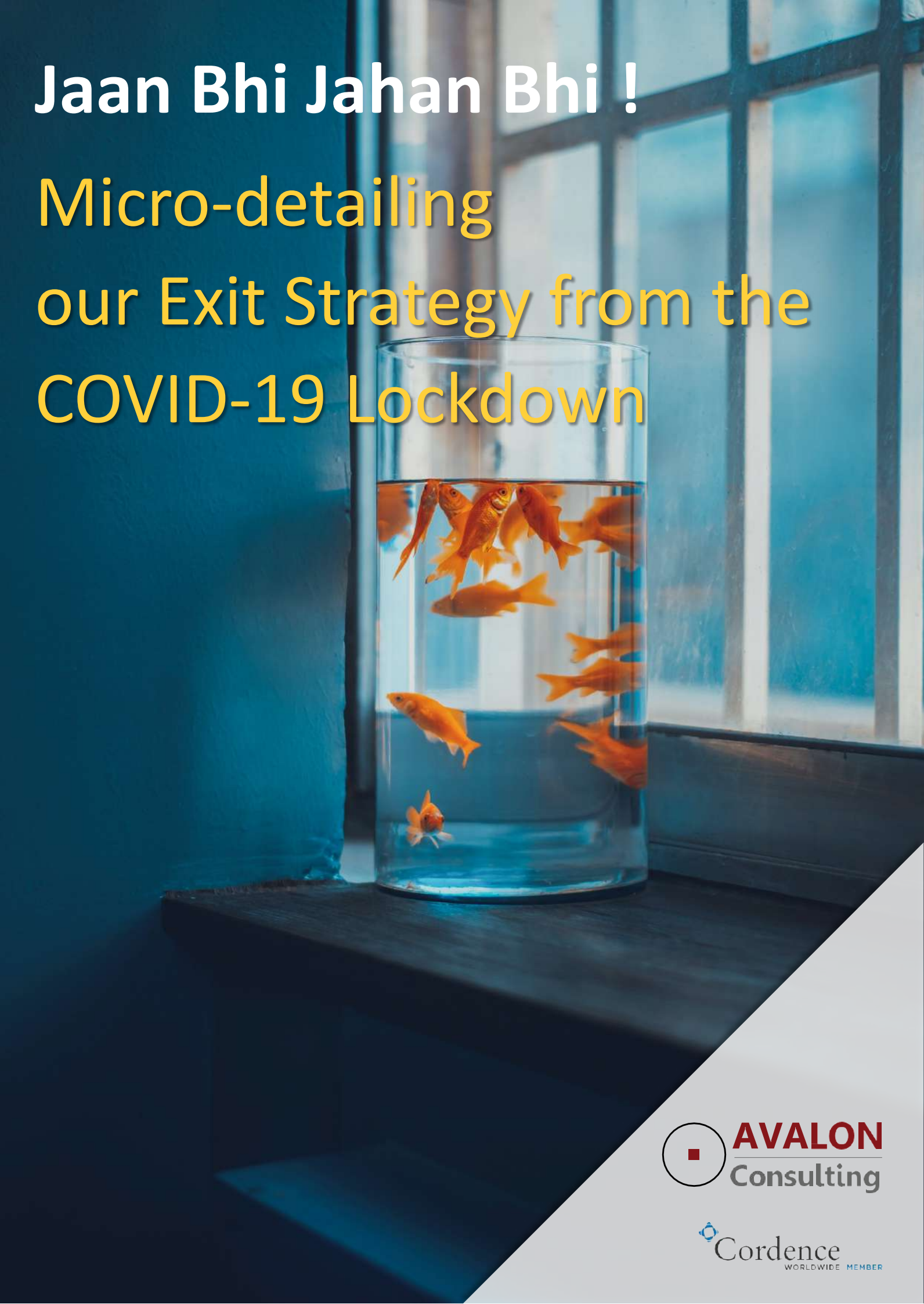
Jaan Bhi Jahan Bhi !

Micro-detailing our Exit Strategy from the COVID-19 Lockdown



AVALON Consulting

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Our Conundrum

As we complete a month of being under lockdown and with another 10 odd days to go for it to end, the issue uppermost in our minds is our exit strategy. The exit strategy needs to answer three important questions in our fight against COVID-19:

1. Which districts are more important to release from the lockdown to ease supply constraints and revive the economy?
2. Which districts need to continue to be under some form of a lockdown? What benchmarks do we use to decide if a district can lift the lockdown and move to social distancing?
3. How do we shape the narrative to internal and external stakeholders to convey the unique aspects of India's response to COVID-19?

In this research paper, we seek to provide answers to these questions.

Geographic Importance of Supply Clusters

Many entrepreneurs and industrialists are aware that Indian manufacturing across industry segments tends to be concentrated in some districts due to a combination of historical reasons (early investment by a 'mother' company, availability of skill sets, incentives, etc.). The level of concentration and the specific districts vary across industry segments – automotive clusters are in Manesar, Gummidipundi, Pune, etc. while Pharmaceuticals are in Hyderabad, Baddi, Ahmedabad, etc. and FMCG has a much more widespread manufacturing footprint. Besides, agriproduce like rice, wheat, pulses, condiments (all essential products) are grown across a wide cross section of districts and States with varying degrees of scale and importance.

In this research, we have **mapped the manufacturing locations** of units across **20+ key industry segments** spanning essential commodities and other important industry segments. The coverage includes **> 95% of the large, organised companies** (defined as revenues >Rs. 2,000 cr.) in the industry segments, besides many of the medium and small units in these segments. This has been supplemented with the fulfillment centres of key multi-commodity e-commerce players like Amazon, Flipkart, PayTM mall, Big Basket, etc. and quantum of agricultural production of the above commodities in each of the districts in India. Thus our database includes **>32,000 data points** of manufacturing locations across 20+ industry segments, production data of agriproduce and key fulfillment centres for e-commerce across the 720 districts of India. **Manufacturing locations** within this database spans **>24,000 units** spread across size as follows:

Figure 1: Manufacturing locations database summary

Size of Units	Number in our Sample	Industry Segments Covered
Large	1,758	Apparel, Auto and ancillaries, Consumer Electronics, Electrical Products (incl. wires and cables), Fertilisers, FMCG and their Chemical and other Ingredients, Food and Beverage (including Tea), Food Ingredients (Chemical and Natural Preservatives, other key Ingredients), Processed Food, Footwear, Paper and Plastic Packaging, Refining and Petroleum Products, Pharmaceuticals, Textiles
Medium	5,758	
Large	16,938	
Total	**24,454**	

Source: CMIE Database, Company Websites, Avalon Consulting Research and Analysis

We have subsequently classified each district as 'High' or 'Low' according to the extent of presence of an industry segment or e-commerce fulfillment centres in that district. The number of such 'High' districts across industry segments are as follows:

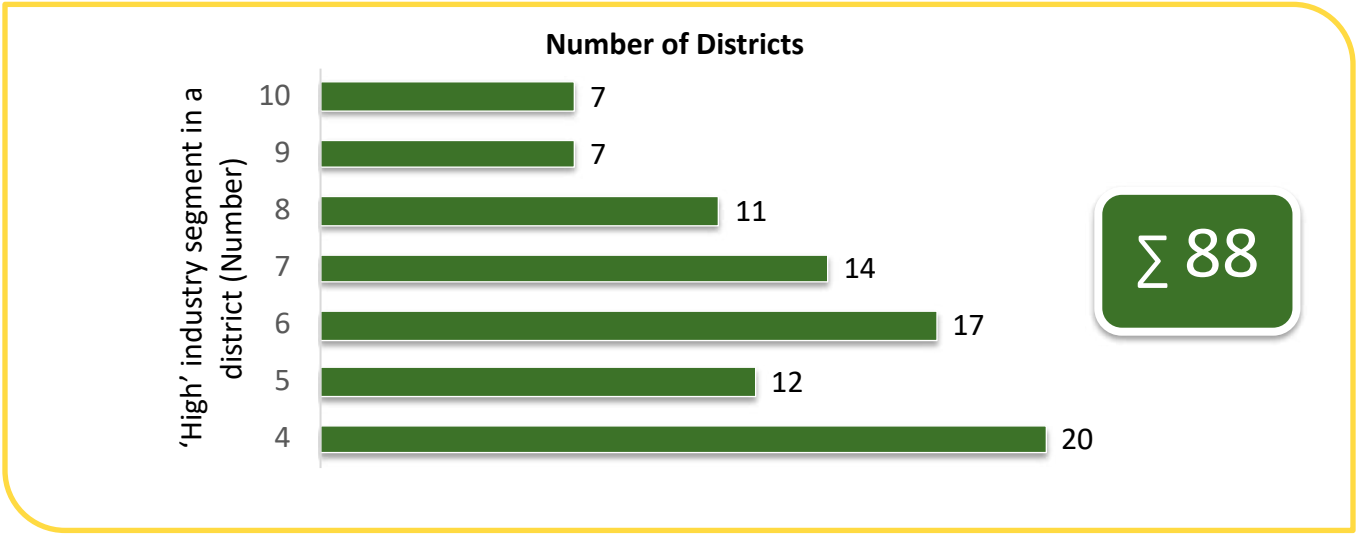
Figure 2: Manufacturing locations classification across segments in India	
Segments	**Number of Districts with High Presence**
Processed Food	124
Agri Commodities	120
FMCG + Ingredients	114
Dairy Products	89
Pharma (API + Formulations)	87
Textile / Apparel	76
Electronics	74
Auto and Ancilliaries	71
Packaging	52
Fertilizer and Pesticides	47
E-Commerce	33
Petroleum Products	24

Source: CMIE Database, Company Websites, Avalon Consulting Research and Analysis

For agriproduce, we have classified the top 30 districts in each region, in terms of cumulative quantum of production of the identified commodities, as 'High'. Thus, every district could have multiple 'High' classifications based on the size / presence of the industry segment and the quantum of agriproduce in that district.

The **intersection** of the **'High'** across **industry segments** and quantum of agriproduce presents some interesting insights. There are **88 districts** which have **4 or more 'High'** presence across industry segments and agriproduce.

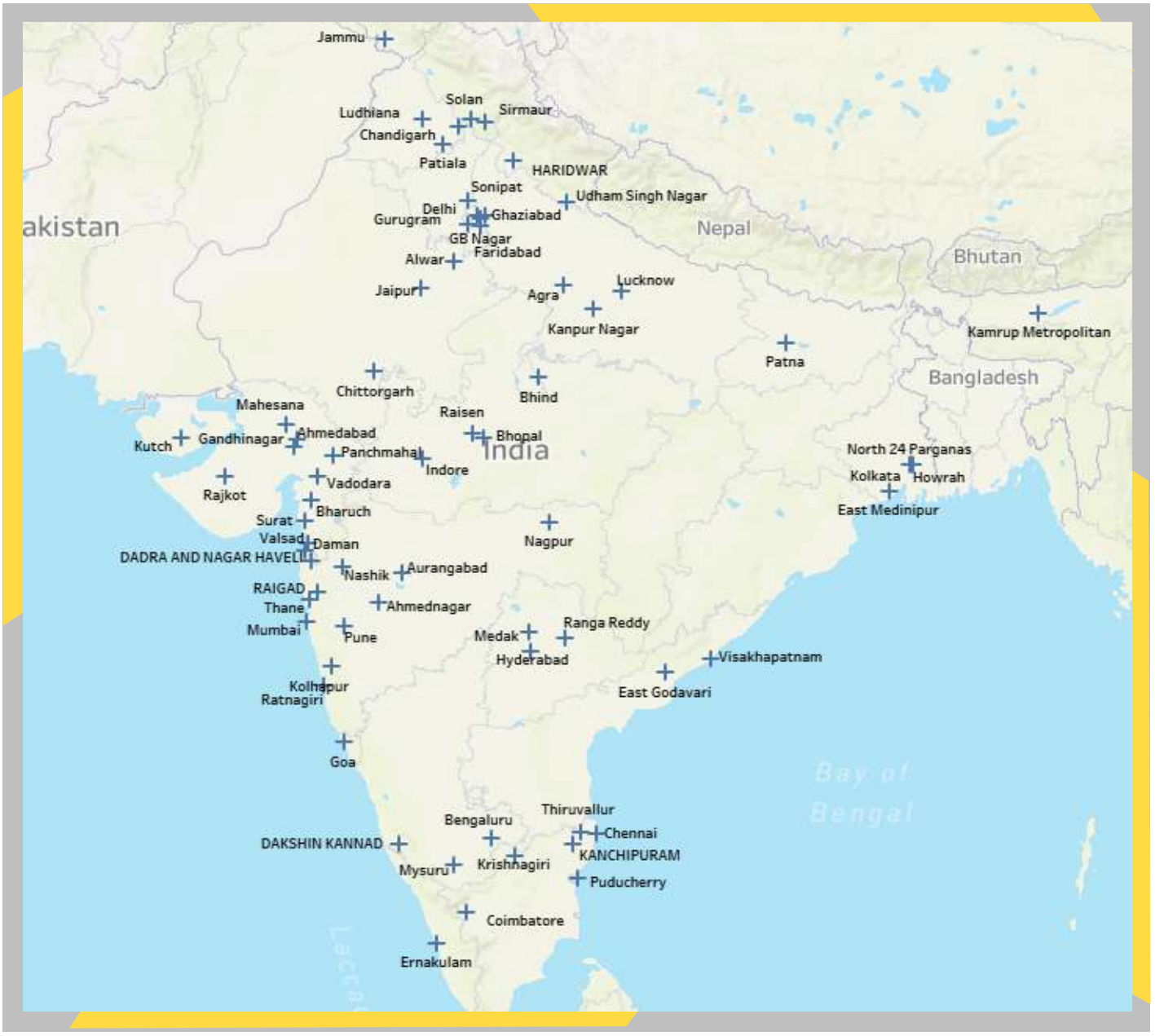
Figure 3: Distribution of districts with 'High' presence across segments in India



Source: CMIE Database, Company Websites, Avalon Consulting Research and Analysis

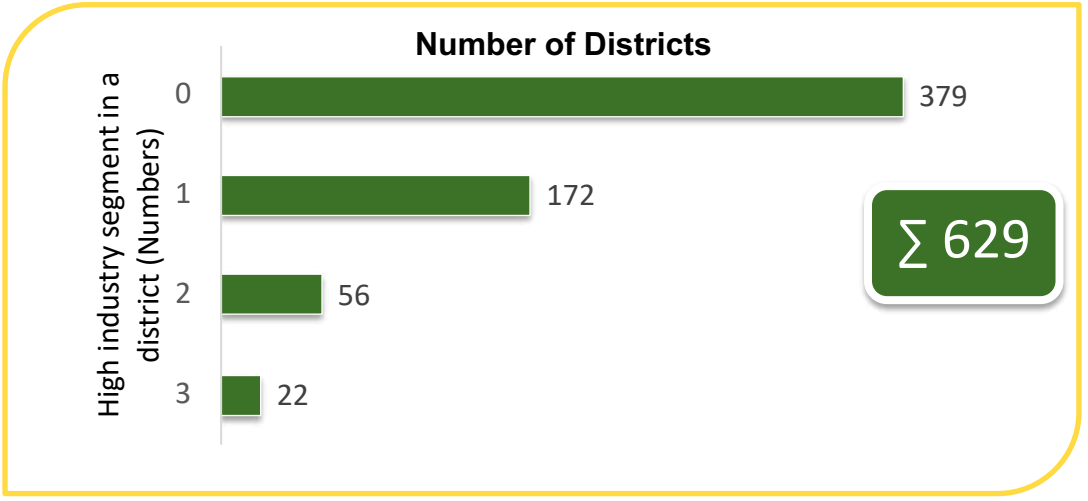
These 88 districts have a larger presence in the West and North and a weak presence in the East.

Figure 4: Distribution of 88 Districts with 4 or more 'High' presence in India



The **supply side economics** across the **rest of the country** is **very dispersed**. A large number (379) of the districts do not have a 'High' presence across any of the industry segments and are not in the top 30 agriproduce locations within the region. A further 172 have a 'High' presence in only one district. Thus, a total of **629 districts** do not have a huge impact on the supply side economics. Economic activity in these districts is still relevant but it **does not** have a **cascading impact** across other districts.

Figure 5: Distribution of districts with 'High' presence across segments in India



Thus, the **COVID-19 control measures** need to be **prioritised in the 88 districts** which have as **significant impact** on the **supply side economics.**

COVID-19 Modelling Across Districts

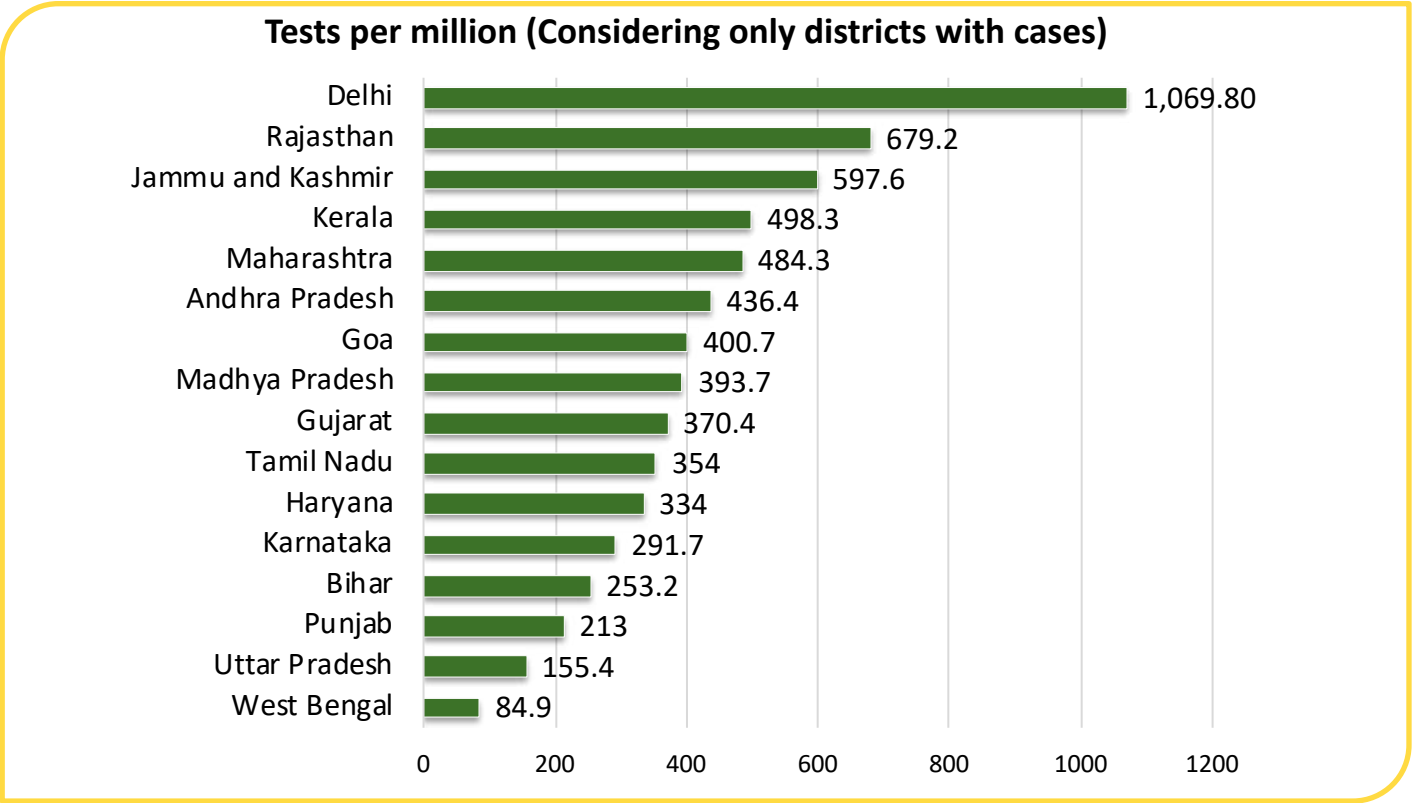
Rationale for the Model

It is now well acknowledged that **India's response** to COVID-19 has been among the **most severe across countries** without the commensurate support for the economy. The sustained and complete lockdown has had a **significant impact on slowing the progress of COVID-19** in the country. As of April 18th, 351 districts did not have a single case. Among the 366 districts which have seen COVID-19 cases, there has been a widely varying spread across districts even within a State. While in terms of **absolute numbers**, the obvious suspects – dense and highly populated urban centres – have the most cases, this **cannot be the only metric** to **judge the spread** in these locations. There is a need to take a more nuanced approach. More important, in order to take decisions on the nature of exit from the lockdown, there needs to be **appropriate benchmarks** and **forecasts of the cases** to take **sensible decisions** on **allowing economic and other activities** in the district. In this research paper, we have attempted to develop such a **model (Avalon Model)** and have used it to **classify districts as hotspots** based on their **current cases and future trajectory**, using **suitable benchmarks** which can be **considered nationally**. More important, the Avalon model can be **used to provide ongoing metrics to State and district administrations** for them to **manage the progression** by setting **appropriate targets** which can help them move to a **safe zone**.

We have used COVID-19 Tracker as our source for the Avalon model we have developed. While this is not an official source, it uses State Bulletins and official (CM, Health Ministry) handles to update numbers. The data is validated by a group of volunteers. We have observed that the data in this source has higher positives than MoHFW at some points in time. However, this is because this database is updated more frequently while MoHFW updates the data at a scheduled time.

It is a well accepted fact that the **more you test**, the **more cases** you are likely to find. **India** has **tested much lower** than many populous countries (we have conducted **346 tests per million** even after considering tests being done only in districts where we have found positive cases as of **April 16th**, **only Indonesia** at 128 tests per million **is lower than this** among 20+ countries. **Many countries** are at **10,000+ tests per million**! More on this later). In an ideal world, we would have **liked to use testing data** to make suitable adjustments to the number of cases across districts. However, this data is **not available / released at the district level** and only State level testing data is available which varies widely.

Figure 6: State wise COVID testing in India as of April 16th, 2020



Source: COVID 19 Tracker, Avalon Consulting Research and Analysis

Hence, we have worked with the actual reported cases across districts from the date when the cases were first reported, working under the assumption that **testing is low across locations** and hence, a level of **under representation** of the cases is **prevalent across locations**.

Our **COVID-19 model methodology** has **two critical elements** which help us **take decisions** regarding the **current and future state of the district** and provides ongoing metrics to manage the progression to the safe zone:

01 **Future four-week projections of COVID-19 at the district level**

02 **Benchmarks to classify the district as a hotspot – current and future**

Let us look at the methodology for each of these elements of the Avalon model.

Future 4-week projections of COVID-19 at the district level

The future projections of COVID-19 cases in a district is dependent on two factors:

01 The doubling rate at the last date of evaluation

02 The rate of change of the doubling rate at the last date of the evaluation

Avalon model have been built with **April 18th as the last date** for which we have considered the **doubling rate at a district level**. However, since the cases being reported fluctuate widely every day (based on factors like the number of tests done, efficacy of contact tracing, number of new incidents of 'super spreaders', etc.), we have considered a **weekly moving average** of the **doubling days**. A week is also considered to be the rough incubation time for the virus. So the doubling rate considered for each district in Avalon model is the weekly moving average doubling rate as of April 18th.

We have considered a **two-week window** for computing the **growth of the doubling rate**. A fortnight is considered to be the period of infection of the virus. Hence, we have computed the **moving average doubling rate as of April 4th** (two weeks prior to April 18th) and calculated **growth of the doubling rate** vis-à-vis April 18th. Districts which have seen a **flattening of the curve** will see an **increase in the doubling days** and hence a **positive growth** in the **doubling rate**. Conversely, a district where the **doubling days have decreased** on April 18th compared to April 4th will have a **negative growth in the doubling rate**. In some districts, COVID-19 cases have started later and an April 4th moving average doubling rate cannot be computed. In such cases, we have considered the earliest date from which data is available for computing the growth of doubling days.

Figure 7: Select District COVID 19 Analysis of Moving Average Doubling Rate Growth

Districts	Total Cases (#)	Earliest day/4th April Doubling Rate (Days)	18th April Doubling Rate (Days)	Doubling Rate Growth Rate (%)
Mumbai	2,512	3.1	7.3	137%
Chennai	240	2.8	17.5	516%
Delhi	1,893	2.2	8.5	286%
Chandigarh	23	6.0	25.4	324%
Bengaluru	100	19.7	15.4	-22%
Lucknow	160	21.7	3.0	-86%
Ranga Reddy	25	2.0	58.2	2829%
Patna	7	26.6	14.4	-46%
Agra	199	3.3	6.3	92%
Madurai	44	2.8	8.6	207%
Thiruvallur	47	1.9	10.0	431%
Kozhikode	20	31.5	11.3	-64%
Munger	17	5.7	5.5	-5%
Ahmedabad	861	5.0	3.8	-23%
Indore	841	2.6	4.4	69%
Hyderabad	448	5.1	7.5	47%
Palwal	34	1.7	30.5	1681%
Jalandhar	41	26.6	4.8	-82%

Source: COVID 19 Tracker, Company Websites, Avalon Consulting Research and Analysis

We have considered 3 scenarios for forecasting projected COVID-19 cases at each district:

Scenario-1	Scenario-2	Scenario-3
Due to the **continued lockdown from April 18th to May 3rd**, there will be a **further flattening of the curve**. Hence in this scenario, the **doubling growth rate** as of April 18th will **improve by 25%** every week into the future and has been considered for computing the number of COVID-19 cases 4 weeks from April 18th	In this scenario, the **April 18th doubling growth rate** is considered for the projected 4 weeks	In this scenario, with **increased testing in the coming weeks**, the April 18th **doubling growth rate declines by 25%** every week into the future and has been considered for computing the number of COVID-19 cases 4 weeks from April 18th

In arriving at the **future 4-week projections**, we have also **factored** in **recovered cases** by removing them from the future new cases to arrive at active cases. Thus, the **most recent ground level experience** of the **district / State administration**, both in terms of new cases and recovered cases, **determines its future projections of COVID-19 cases**. The Avalon model can be **updated daily / weekly** with the updated data on cases and used for **ongoing forecasts**.

Benchmarks to classify the district as a hotspot

One of the most **important factors** which influences the **spread of COVID-19** cases in a location is the **population density of the district**. The **higher the density** of the district, **greater** the **risk of the spread**. Besides, the absolute numbers in any location is influenced by the size of the population. Hence, the more **relevant metric** to **compare locations** of widely differing populations is **cases per million people**. These cases per million will vary across districts depending on the density cluster of the location. Thus, our approach to arriving at a benchmark is not based on the cases in the State or in India in absolute numbers but defining **benchmarks** in terms of **cases per million** for **each density cluster**.

We have classified **India** into **10 density clusters** based on the **population per sq. Km**. We have used the mean population per sq. Km for India and created these clusters by considering buckets of range from the mean – higher and lower than the mean. The number of districts with and without COVID-19 cases in each cluster varies depending on the spread across the country (and probably the extent of testing, which is not known).

Figure 8: Density Cluster Definition			
Density Cluster	**Range (Population per sq.km.)**	**Range (% of India mean)**	**Districts with COVID-19 cases (Nos.)**
DC_1	Less than or equal to 132	Less than of 15% of India mean	18
DC_2	Between 132 and 264	Between 15% and 30% of India mean	68
DC_3	Between 264 and 484	Between 30% and 55% of India mean	120
DC_4	Between 484 and 660	Between 50% and 75% of India mean	54
DC_5	Between 660 and 748	Between 75% and 85% if India mean	21
DC_6	Between 748 and 968	Between 85% and 110% of India mean	39
DC_7	Between 968 and 1,759	Between 100% and 200% of India mean	48
DC_8	Between 1,759 and 5,278	Between 200% and 600% of India mean	16
DC_9	Between 5,278 and 1,3195	Between 600% and 1,500% of India mean	2
DC_10	Greater than 13,195	Greater than 1,500% of India mean	3

Source : India Census 2011, Company Websites, Avalon Consulting Research and Analysis

The larger the population density, the smaller the number of districts in the cluster as these will be the big metro cities.

In order to define the benchmark of cases per million people for each density cluster, we adopted two approaches:

- **International benchmarks of cities in the same density clusters** from countries with much **higher testing per million people** (> 10,000 tests per million)
- **Average (mean)** of the **cases per million of the districts in the cluster in India**, with a threshold minimum number of cases (to ensure that the mean of the cluster is not very low due to a large number of districts with very few cases)

The **international benchmarks** are **higher** than the **mean** of the cases per million of the **districts considered in the cluster in India**. This may be due to the higher testing done in these countries resulting in a higher absolute number of cases and consequently higher cases per million people in these international benchmark cities.

Figure 9: Global COVID-19 City Wise Benchmark and Indian Density Cluster Mean Analysis								
Density Clusters	International (as of April 16th)					India (as of April 18th)		
	City	Country	City COVID-19 cases (#)	Cases per million population (#)	Test per million (in the respective country)	Districts in the cluster with COVID-19 Cases (Nos.)	Districts considered to compute the mean in the cluster in India (Nos.)	Mean cases per million population
DC_1	Townsville	Australia	24	124	14,962	18	7	33
DC_2	Norman	USA	5	41	10,374	68	35	20
DC_3	Gold Coast	Australia	190	321	14,962	120	60	14
DC_4	Paju	South Korea	50	116	10,460	54	34	21
DC_5	Gumi	South Korea	68	162	10,460	21	11	23
DC_6	Hwaseong	South Korea	46	71	10,460	39	25	36
DC_7	Naples	Italy	2227	421	19,928	48	32	12
DC_8	Incheon	South Korea	92	31	10,460	16	10	11
DC_9	Seongnam	South Korea	72	74	10,460	2	2	64
DC_10	Seoul	South Korea	628	63	10,460	3	3	46

Source: Country CDCs, WHO, Avalon Consulting Research and Analysis

We have considered the **Indian mean cases per million** as the **benchmark for the cluster**. Hence for **any district** to **not** be considered a **hotspot**, the **current** and the **projected** number of **cases per million** in the district needs to be **below** this **mean cases per million** of the **density cluster** of the district. Given the lower number of tests per district in India, the international benchmarks may not be appropriate for India. Besides, the mean cases per million of these international benchmarks in each of the density clusters is higher than the Indian mean cases per million, allowing an easier threshold for not being considered a hotspot.

Using the above benchmarks for each density cluster, districts have been classified as a **current hotspot** based on the **district's cases per million as of April 18th** – any district **above the district cluster mean** is considered a hotspot. Similarly, based on the **future number of cases per million in the district**, in different scenarios of the growth of the doubling rate, a district is classified as a **hotspot** if the cases per million is **above the mean cases per million of the cluster.**

Thus, the **benchmark defined** for Avalon model is **not determined by State boundaries** but **compares districts** in the **same density cluster across States**. Classification into a hotspot is thus determined by the **district's performance in controlling the spread of COVID-19 cases vis-à-vis a relevant peer set**. The Avalon model can be updated daily / weekly with the updated data on cases and used for ongoing forecasts, and districts can be classified as hotspots using the defined benchmarks.

Mapping the COVID-19 Avalon Model Outcome with Important Supply Clusters - Implications for our Exit from the Lockdown

We saw that 88 districts have a 'High' for 4 or more presence of industry segments and quantum of agriproduce. These districts need to prioritised in terms of control of COVID-19. How are we faring as of April 18th and the projections of COVID-19 cases across these districts?

Depending on the Scenario considered, between **55 to 56 of these 88 districts** will **not** be a **hotspot**. Only 14 of these are not hotspots because of no COVID-19 cases till April 18th. Thus, most of these districts have been **helped by the lockdown and / or have a done a good job in flattening the curve in these past 4 weeks**. Thus, the **focus needs to be** on these **55 to 56 districts in the next 10 days** to ensure that the **current trend as of April 18th continues / accelerates** so that they **continue to not be considered a hotspot** when we actually emerge from the lockdown on May 3rd. We also **mapped the regional representation** of these 55-56 districts **across industry segments** and **identified gaps** in **specific segments** which will need to be plugged, since we are considering only districts with 'High' presence in 4 or more segments. For this, we **identified other districts** which are **not hotspots** but have a **'High' presence** in **the specific industry segment** which is **under represented** in a **region**. This district will have 'High' presence in <4 industry segments. Thus, the **total number of districts** which we need to target to remain non-hotspot districts till May 3rd increases marginally in each scenario to **58-59 districts.**

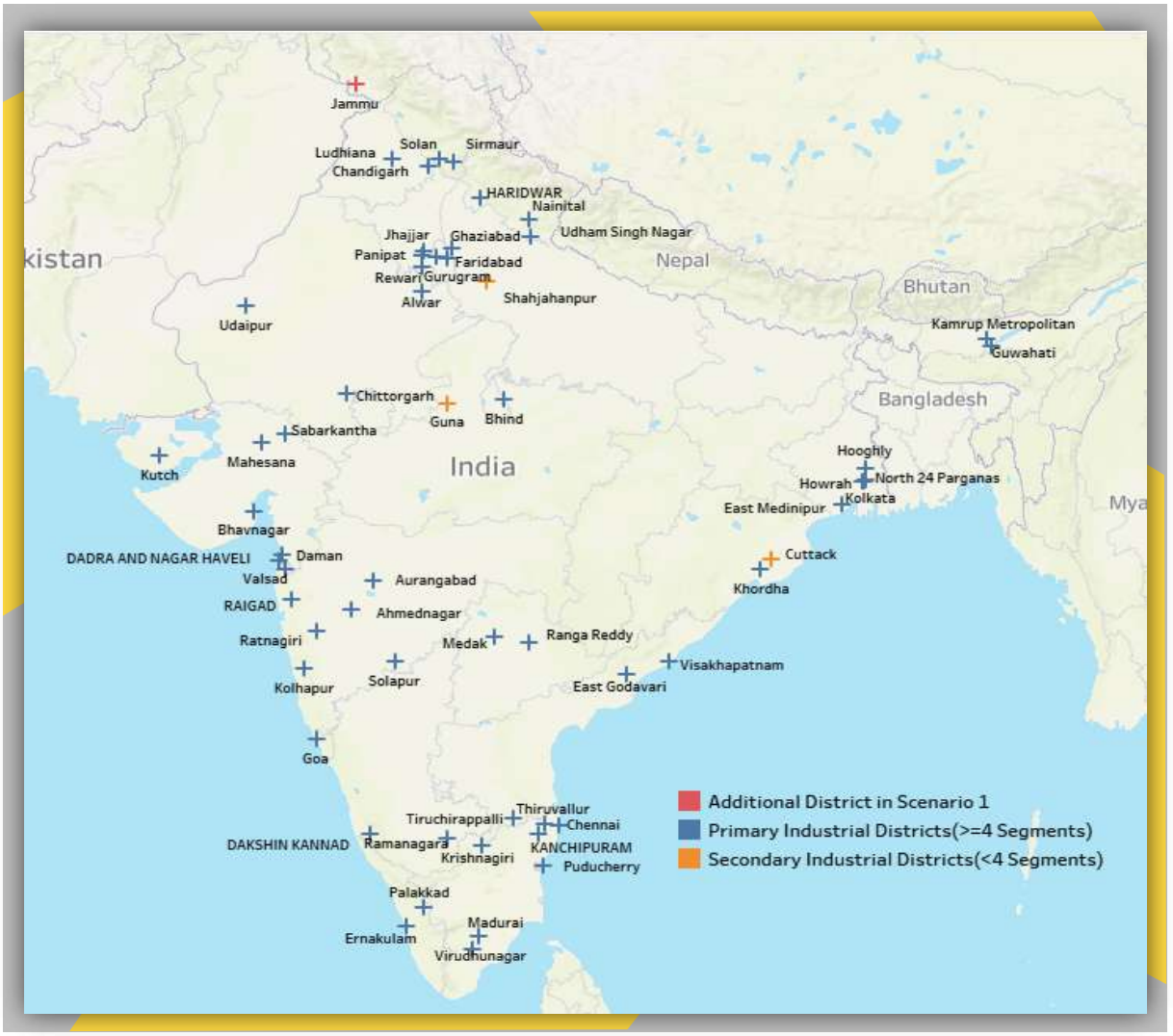
Figure 10: Summary of Manufacturing locations and Risk levels

Details	Scenario 1	Scenario 2	Scenario 3
Total number of districts	717	717	717
Overall Number of Districts with Low Risk	600	599	597
Number of Districts with High Economic Activity in No Segment	379	379	379
Number of Districts with High Economic Activity in at least 4 segments In India	88	88	88
Number of Districts with High Economic Activity in at least 4 Segments in COVID Analysis Scenarios	56	55	55
Share of Districts with Low Risk in Total Districts with High Economic Activity in at least 4 segments	64%	63%	63%
Number of Districts with High Economic Activity Required for Regional Representation	59	58	58
Number of Districts with High Economic Activity with No Cases	14	14	14
Share of No cases in district with high economic activity and low risk	24%	24%	24%

Source: Avalon Consulting Research and Analysis

Across the three scenarios, many districts are common with only one district (Jammu) turning into hotspots as we move from Scenario 1 to a more stringent forecast in Scenario 3

Figure 11: Top manufacturing districts with low COVID risk in India



Source: Avalon Consulting Research and Analysis

As a final step, we **compared the results of Avalon model** with the classification of **hotspots by the Government of India**. The MoHFW has already announced 3 criteria for classifying a district to be a hotspot:

01	**If the district contributes to the top 80% of the total All India cases, or**
02	**If the district contributes to the top 80% of the total State cases, or**
03	**If the doubling rate is < 4 days on Monday**

There are **~30 districts** which **Avalon model does not consider to be a hotspot** as of **April 18th and in the future**. But these districts have been **classified hotspots** in the **Government of India** classification. We present the data related to these districts and would urge a re-look at the classification criteria to ensure these priority districts emerge from the lockdown on May 3rd based on their efforts in flattening the curve which is amply supported by the data.

Figure 12: Districts not identified as a hotspot by the Avalon Model

Sr. No	District	Reason for hotspot classification on application of criteria set by Govt on 18th April	Absolute cases 18th April (#)	Cases per million 18th April (#)	Mean cases per million for the density cluster (#)	Moving average doubling rate 18th April (days)	Moving average doubling growth (%)	Week-4 projection case per million (#, Scenario 1)	Reason for not hotspot in Avalon Model
1	Udham Singh Nagar	Not meeting the criteria as per 18th April data	4	2	21	NA	NA	No Projection	The cases per million and total number of cases are less than 5 and doubling rate on exit day cannot be calculated as the numbers are too low
2	Udaipur		4	1	20	NA	NA		
3	Sirmaur		1	2		NA	NA		
4	East Medinipur		3	1	11	NA	NA		
5	Howrah		1	0	11	NA	NA		
6	North 24 Parganas	Contributing to more than 80% of cases at state level	4	0		NA	NA		
7	Kolhapur	Not meeting the criteria as per 18th April data	6	1	21	NA	NA		There are no new cases in the last 7 days and hence there is no doubling rate on April 18th. Hence the number of cases per million will reduce from April 18th and will continue to be below the cluster mean
8	Kolkata	Contributing to more than 80% of cases at state level	11	2	46	NA	NA		
9	Visakha-patnam		20	4	14	NA	NA		
10	Solan		9	15		NA	NA		
11	Gurugram		32	20	12	NA	NA		
12	Ernakulam		24	7		NA	NA		

Figure 12: Districts not identified as a hotspot by the Avalon Model (Cont..)

Sr. No	District	Reason for hotspot classification on application of criteria set by Govt on 18th April	Absolute cases 18th April (#)	Cases per million 18th April (#)	Mean cases per million for the density cluster (#)	Moving average doubling rate 18th April (days)	Moving average doubling growth (%)	Week-4 projection case per million (#, Scenario 1)	Reason for not hotspot in Avalon Model
13	Chandigarh	Contributing to more than 80% of cases at State level	23	21	64	25	324%	13	The future mean per million case is less than the cluster mean
14	Chennai		240	32	46	18	516%	25	
15	Khordha		46	20	36	42	1239%	12	
16	Aurangabad	Not meeting the criteria as per 18th Aprildata	24	9		21	370%	9	
17	Tiruchirappalli	Contributing to more than 80% of cases at State level	46	16	21	29	403%	12	
18	Jammu		26	16		15	63%	20	
19	East Godavari	Not meeting the criteria as per 18th April data	19	4		44	2056%	3	
20	Virudhunagar		17	8		11	451%	7	
21	Nainital	Contributing to more than 80% of cases at State level	9	9	20	41	37%	9	
22	Bhavnagar	Not meeting the criteria as per 18th April data	30	10	14	18	727%	10	
23	Ahmednagar		28	6		65	2241%	5	
24	DAKSHIN KANNAD	Contributing to more than 80% of cases at State level	13	6		61	573%	4	
25	Thiruvallur		47	12	12	10	431%	10	
26	Madurai		44	11		9	207%	10	
27	Ludhiana	Not meeting the criteria as per 18th April data	15	4		12	242%	4	
28	Faridabad	Contributing to more than 80% of cases at State level	33	18	11	38	1092%	10	
29	Ghaziabad		30	6		46	877%	6	
30	Ranga Reddy		25	9		58	2829%	7	

Finally, there needs to be a **greater focus** on the fight with COVID-19 in the **32 specific districts** which are part of our **priority supply cluster districts** and are **still classified as hotspots** as of **April 18th** data. As expected, many of these are the larger, densely populated, urban centres which also support significant economic activity. The **task ahead of them** is a **tough one** but the **targets for not being considered** a hotspot are also evident.

Figure 13: High Priority districts which will be hotspots as per Avalon Model (cases per million above the benchmark mean of the cluster)

District	Data as of 18th April		Target for not being a hotspot at end of 4 weeks	
	Total Cases (#)	# of Cases per million	Benchmark cases per million of the cluster	Target cases required (#)
Delhi	1,893	108	64	1,129
Mumbai	2,512	102	46	1,122
Thane	550	50		504
Indore	841	246	36	124
Hyderabad	448	124		131
Bhopal	197	80		90
S.A.S Nagar	57	55		37
Jaipur	519	74	21	147
Pune	509	52		208
Coimbatore	128	35		76
Guntur	125	24	14	73
Mysuru	80	26		45
Agra	199	43	12	56
GB Nagar	95	54		21
Kanpur	30	6		21
Gandhinagar	17	12	11	16
Ahmedabad	861	114	36	274
Vadodara	153	40	21	80
Surat	156	30	12	63
Lucknow	160	33	11	53

Source: Avalon Consulting COVID 19 Model and Analysis

There are a few others like Bangalore, Bharuch, Nagpur, Rajkot, etc. which have recently seen a spurt in cases and hence have **a negative growth** in **doubling days**, although their **mean cases per million** is **below** the **cluster mean**. These districts need to **increase their doubling rate** to be not considered a hotspot.

Figure 14: High Priority districts which will be hotspots as per Avalon Model (With shortening of doubling days)

District	Data as of 18th April			
	Total Cases (#)	# of Cases per million	Doubling rate on 18th April (in Days)	Doubling rate growth (%)
Bharuch	22	14	4.8	9%
Patiala	26	9	1.9	-50%
Sonipat	7	5	5.7	-18%
Nagpur	69	14	4.8	-57%
Raisen	8	6	2.3	-1%
Nashik	56	9	3.5	-73%
Rajkot	30	9	9.5	-56%
Dhar	10	4	2.1	-22%
Satara	10	3	9.5	-21%
Panchmahal	9	4	2.2	-68%
Bengaluru	100	10	15.4	-22%
Patna	7	1	14.4	-46%

Source: Avalon Consulting COVID 19 Model and Analysis

Thus, as we enter the last lap of our country-wide lockdown phase, set to end on May 3rd, a **sustainable strategy** to exit the lock down needs to **focus on certain key imperatives**:

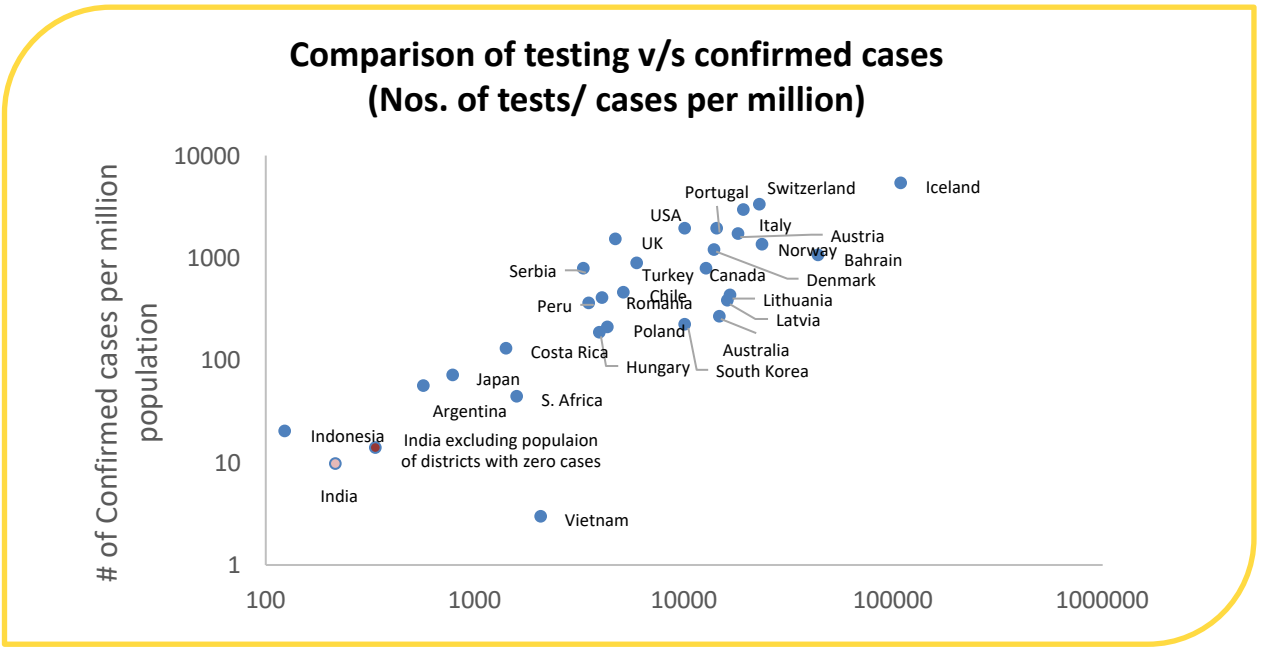
- **Sustain the control on COVID-19 cases** in the **56 supply clusters** which have a **high impact** on **multiple industry segments**
- **Focus attention** on the other **32 districts** which **are hotspots** as of April 18th and **important** from an **economic activity** standpoint – set **clear targets** for a **sustained release** of the **lockdown in these locations** as **early as possible**
- **Adopt** a **COVID-19 model** which **evaluates** the **performance of districts** in their fight against the virus in **a transparent manner** with **measures benchmarked against comparable clusters across India** (and not at a State level), which will not be subject to interpretation
- **Facilitate** the use of the **model** as an **on-going monitoring tool** within **States, districts and micro-clusters** which will bring in the **discipline of collating data** from the ground and will **mesh** with a **sustainable testing strategy**

Shaping the Narrative of India's response to COVID_19

There is **universal acknowledgment** that the **early lockdown** has **helped India flatten the curve** – we are **faring much better** than **many other countries** in the fight with the virus. However, we need to **shift the narrative away** from **counting the number of COVID-19 cases** and increases each day and hoping to bring it down to zero.

We had talked briefly about **testing in India vs. other countries**. As of April 16th, India has **among the lowest tests per million** among a bunch of major countries. The number of COVID-19 cases in some of the countries is **strongly co-related to the number of tests** being done as can be seen from the graph below

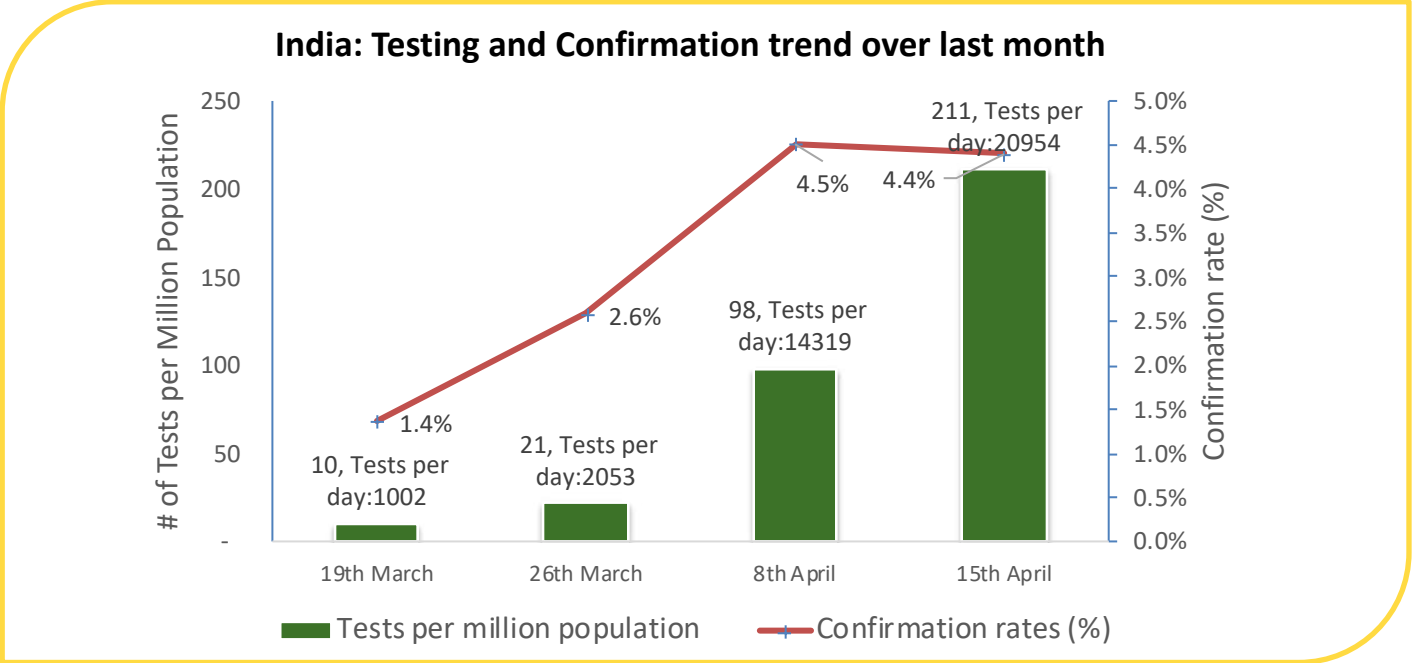
Figure 15: Global Testing v/s Confirmation analysis as of April 16th



Source: Country CDCs, Avalon Consulting Research and Analysis

This is also **true for India** – as she has **ramped up testing**, the **number of cases** in absolute numbers and as a % of tests **have increased**.

Figure 16: India Testing and Confirmation Trends

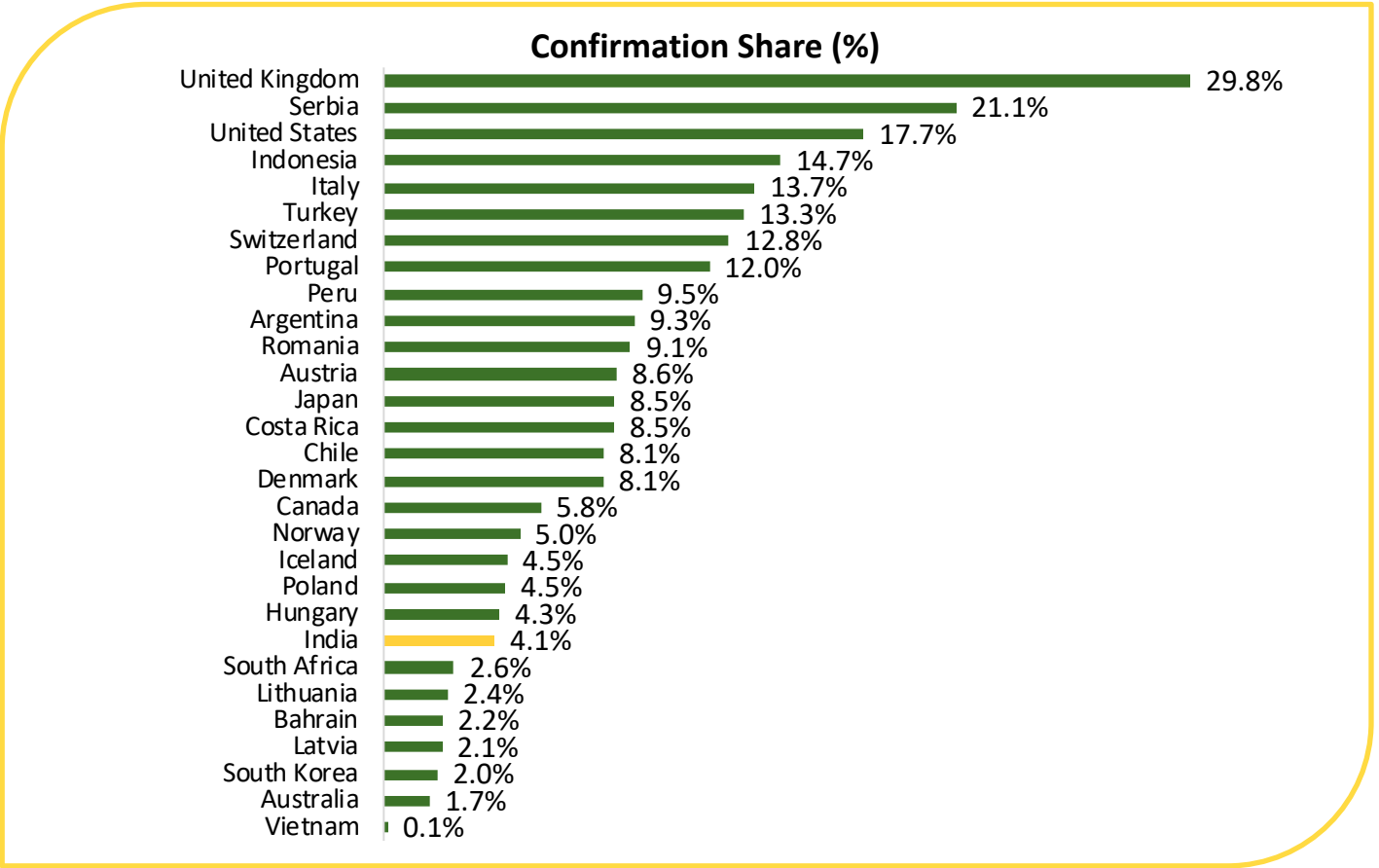


Source: India COVID Tracker, Avalon Consulting Research and Analysis

So as **we test more**, the **cases** are only **going to increase, not decrease**. It will not be surprising that **despite a flattening curve** and a **lengthening of doubling days**, the total number of **cases in India** is likely to **cross 100,000** by **end May or in June**. Thus, we need to acknowledge the fact that the COVID-19 cases in the country will continue to increase despite the best efforts of the people, district and State administrations and the Government of India.

While there is some truth in the criticism on the lower number of tests conducted in India being responsible for this, there is **another metric** on which **India is faring much better globally** – **number of confirmations per test**. Although this has increased in the last month, it seems to have stabilised around **4%** but it is **among the lowest** across multiple countries.

Figure 17: Confirmation share by Country



Source: Country CDCs, India COVID Tracker, Avalon Consulting Research and Analysis

We know our **testing strategy** focuses on **symptomatic individuals** or others **identified** through **contact tracing** and **quarantined** – we are **not testing communities** as yet. **Despite this, our test confirmations are among the lowest**. Assuming our test quality is not under question, it gives rise to questions:

- Can we **focus on the profile of patients** who have been tested and were found to be negative? What was the **rationale for testing them**? Did they have **sustained exposure to COVID-19 positive cases**?
- Do we have **better immunity** to the virus due to **higher levels of exposure** to the **flu virus** and possibly an **ability to withstand certain concentrations** of the virus?
- Is there a **weather dividend**?
- Etc.

Similarly, we have **nearly 4,000 cases** who have **recovered** from the virus. If we focus on their **recovery process**, we may be able to answer questions like:

- How **many** were **asymptomatic**? What is their **age profile**?
- How **many** developed **symptoms**? **What symptoms** were they?
- How many **required active intervention** and **ICU support**? How many **required ventilators**?

In the last one month, there have been **huge efforts** to **augment our supply side capacity** – train compartments, hostels, etc being converted to **isolation and treatment facilities**. **Not much** is known on the **extent of augmentation** across the country – information is anecdotal and does not inspire confidence.

Finally, we need to speak about the **deaths** – there was some information shared about the age profile of the dead and co-morbidities **–** this acknowledges that **most of the deaths** are of **older people (>60 years)** in line with **global trends**. While our **share of deaths** remains in line with many **global countries** at **2-3%,** are we **really tracking the true number of COVID-19 cases** in the country **given our low levels of tests per million**? There is a valid argument that we may also **not be tracking deaths correctly** as other countries have seen an increase in the total number of deaths compared to **normative trends** even after the official count of COVID-19 deaths. However, there are reports that the actual number of deaths in the last few weeks has dropped significantly compared to **our normative death trend of ~20-25000 per day** due to the lockdown**.** There is another interesting take put out by the fund house Marcellus, which using Bayes' Theorem of probability of an event concludes that the **risk** of us **dying from road accidents or from air pollution** in an Indian city is **at least 4 times higher** than the risk of us **dying from COVID-19**! There are **other estimates** which put the **potential deaths** in India from COVID-19 to be **as high as 8000+ per day without controls** in place. Given that **increased deaths** due to COVID-19 is the **key driver of our response**, can we get a **better assessment** of the risks based on the **data collected from our 4-week experience** so far? If we are **unlikely to see a big increase** on our **normative death rate**, do we **need to fear** this **virus and its spread**? Can we **isolate the susceptible population** and allow others to continue **life with social distancing**?

We are all bombarded everyday by the headline number of the COVID-19 cases and the increase over the previous day or week. We hear some officials stating that they will bring the number of cases down to zero in their district and then lift the lockdown! If we **remain obsessed** with the **number of COVID-19 cases** in India, we **cannot control the narrative**. We need to **shift this narrative.** We need to **collect and disseminate data** in an **organised manner** around the **reasons for one of the lowest global share of positive tests** in a **targeted testing environment**, **the details of the recovery process of our confirmed patients**, the **supply side augmentation of capacity** to help us get treated / isolated and the **true picture of the likely increase in our normative death rate** and shift the focus on the **susceptible population**. **Disseminating** this in an **organised manner** – making this the **focus of the official MoFHW briefings** and through other channels - will help us **reduce our fear of the virus**, the **speed of it's spread** and **portray the possible dividend and advantage that India has in its fight against COVID-19**. We need to **outline our strategy** to **focus on the high impact supply clusters** and **our robust methodology** to **monitor districts** at a **micro level** using an **analytical model** to **sustain measurable improvements**. Communicating these **positives** will have a **huge impact on our ability** to **weather the macro-economic implications** (rating downgrade, rupee depreciation, etc.) of **a fiscal program** to **support our people and industry**.

Sridhar Venkiteswaran,
CEO
April 24th, 2020

Our Values – The Avalon EDGE

E **ENTREPRENEURSHIP**

Enterprising ownership to transform ideas into pragmatic and profitable solutions

D **DEDICATION TO EXCELLENCE**

Commitment to premier quality and highest standards in everything we do

G **GREAT VALUE CREATION**

Focus on delivering maximum client impact through innovation and collaboration

E **ETHICAL APPROACH**

Respect, fairness and transparency in all our interactions

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