COVID-19 in India: Predictions, Projections and Preparations

As per prediction made by scientists from the University of Minnesota- coronavirus pandemic is likely to last between 18 and 24 months. As per report the new coronavirus has a longer incubation period than the flu, meaning it takes longer for symptoms to appear after a person has been infected. Report also points out that Covid-19 has displayed a higher rate of asymptomatic transmission, as well as a higher R0 (R naught) rating than influenza. A higher R0 means more people will need to get infected and become immune before the pandemic can end and It likely won't be halted until 60% to 70% of the population is immune.

AS per Dr V. Ravi, the head of Neurovirology at the National Institute of Mental Health and Neurosciences - 50% of people will be infected by the end of year 2020 in India. As per his estimation- around 90% of those infected are going to asymptomatic and are unlikely to transmit the virus, which leaves less than 10% who need hospitalisation and even fewer would require ventilator. These are conservative projections but looking to the size of population in India number of available hospital bed and criticle care equipment (specifically ventilator) may undergo extreme stress.

Advance projections or predictions forms basis for getting "ready" by planning, mobalising and commissioing mitigation measures (health resources in case of COVID-19). In this paper - an attempt is made to estimate probable number of hospital beds and ventilators which may be required based on the certain assumption drawn in line with various national and global predictions. These assumptions are - (1) 50 % of population will get infected (2) 90% of infected population will be asumptomatic and will need no hospital admission (3) 5% of infected population (half of the projected 10%) will need hospital admission (4) 2% of hospitalised will need ventilators uport.

Based on above assuptions - Table given below projects estimated need for hospital beds and ventilators for ten most COVID-19 affected states i.e. Maharashtra: 2.8 million and 56 thousand; Tamil Nadu: 1.8 million and 36 thousand; Delhi:0.4 million and 8.5 thousand;Gujarat:1.5 million and 30 thousand; Rajasthan: 1.7 million and 34 thousand; MP: 1.8 million and 36 thousand; UP: 5 million and 100 thousand; West Bengal:2.3 million and 46 thousand; Bihar:2.6 million and 52 thousand respectively.

S.N.	State	Population	Assumption1: 50% population would get COVID-19 +ve	Assumption3: 5% would need Hospital Admission = Nos of Hospital Beds	Assumption4: 2% of hospitalised would need ventilator = Nos of Ventilators Required
1	Maharashtra	112,374,333	56187167	2809358	56187
2	Tamil Nadu	72,147,030	36073515	1803676	36074
3	Delhi	16,787,941	8393971	419699	8394
4	Gujarat	60,439,692	30219846	1510992	30220
5	Rajasthan	68,548,437	34274219	1713711	34274
6	Madhya Pradesh	72,626,809	36313405	1815670	36313
7	Uttar Pradesh	199,812,341	99906171	4995309	99906
8	West Bengal	91,276,115	45638058	2281903	45638
9	Bihar	104,099,452	52049726	2602486	52050
10	Andhra Pradesh	84,580,777	42290389	2114519	42290
	Total			22067323	441346

Estimated projections suggest that COVID-19 will stress bed capacity and equipment in hospitals across the affected states in India by end of 2020. The stress on health care system may dilute to some extent if we spread hospital admission over a period of time, say 10-15 days for the numbers estimated and loopback resources freed (beds and ventilators) owing to recoveries and discharged patients. But this will make calculation complex due to element of "extreme uncertainity" in predicting or assuming "number of patients appearing for admission on a given day and number of patients would get disscharged on a given day".

I have not considered other health resources required for COVID-19 management - including oxygen and skilled human resources but the magnitude of these resources would also commensurate proportionally with number of general and critical care beds in hospital.

These are estimation and may have error and figures may go up or down. But I expect planners and decision makers to look at these and recalculate, if required with more precision and get “Ready”.

I am particularly worried about India where millions of migrants are on move to their native villages and many of them are silent carrier of this urban virus. COVID-19 is travelling from urban towns to rural villages with migrants and very soon it will travel reverse direction i.e. rural to urban as with very little or no job opportunities in villages many of them will travel back to urban area. This will form a vicious circle which, perhaps will end when majority of population gets infected and / or immunised !

Preventive and protective health measures and their Governance mechanism must reach villages before migrants reach there.

Absent hospital emergency preparedness plans for handling Pandemics is another big challenge for health system and Government both in India. State Governments are working strenuously for mobilising health resources (number of beds and ventilators etc...) but in absence of “singly window coordination mechanism” their efforts are not bringing desired results. Patients are made to run from one hospital to another in absence of “integrated current operating picture” of hospital resources and vacancies.

Preparing a detailed plan and its implimentation may not be practicable in the middle of crisis but it is always possible to revise approch for attanedance of pandemic dynamically based on evolving situation. With the experience acquired so far, health department in state must urgently establish a “single window access and Decision Support COVID decision and support system” in each town. All COVID ambulances (private / public / 108) must report to and controlled by the “COVID single window DSS” and citizens be advised to call a single number.

With the knowledge of “current operating picture” at “single window” – ambulance deployed for picking a patient will go with name hospital admission tacket ie. Name of the hospital, bed number etc. Looking to group of hospital with different management participating in COVID operation – it is extremely important that there is “single point of convergence” for matching “demand and supply”. Patient, who is already in pain and trouble, should not worry about where to go as ambulance carrying him has all his/her hospital resources reserved. “COVID Single Window” in each town will work as Decision Support System (DSS) with each partner hospital updating their resources in real time. Single Window DSS will have authority to issue hospital admission.

I remember having conceived, planned and commissioned (2012) a “decision support system application” for managing Hospital Fire in one of the State in India. Basic objective was to acquire a real time transparency between “burn beds” and other burn related medical resources available in each member hospital so as informed decision can be taken for transferring burn patients. COVID-19 single window DSS should have similar capabilities.

It looks that “Higher risk tolerance” of India society has, in some way, entered silently into mitigation planning process. Most of “preparedness related short comings” are connected with “threshold level of risk acceptance” considered into planning process. This needs a “reset”.

With huge and diversified poplation and other constraints, COVID-19 is a tough challenge for India adminstration. Fast approching monsoon (June-July-Aug) season would add more vulnerbilities to society already under stress. Government, both at National and State level must act now and prepare for worst case senerio considering – rise in COVID-19 cases and rise in flood water in many parts of the country.

Lockdown across the Nation was a good opportunity to clean stromwater drainage system in major cities where flooding is a chronic issues. Still there is time for Municipal corporation to wakeup and act to clear all drainages for allowing smooth passage to flood water. Adminstration has to think and plan pro-active considering worst scenerios and “cascading effects” of one disaster on another.