Roll out of COVID-19 vaccination in India: A SWOT analysis

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Sources of Support: Nil

Short running title: SWOT analysis of COVID-19 vaccination program
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Abstract

Objective: To identify the strengths, weaknesses, opportunities, and threats (SWOT) in the rollout of COVID-19 vaccination campaign in India.

Methods: The internal and external attributes affecting the vaccination rollout identified by reviewing the scientific literature, government guidelines and press statements along with media reports were categorized into the SWOT matrix.

Results: The existing immunization program, indigenous vaccine production, setting up of NEGVAC, updated guidelines, and training followed by dry runs were identified as strengths. The weaknesses identified in the program were knowledge gap about vaccines, apprehensions, lack of temperature loggers and VVM, space constraints in health care set up, demand supply gap, and digital divide. The experience of conducting the general elections, intersectoral coordination forged during the pandemic response, Information Technology platform, and vaccine eagerness present opportunities to strengthen program. The emergence of virus variants, commercial interests, laxity in COVID appropriate behaviour, and receding wave of the pandemic can pose significant threats to the implementation of the vaccination campaign.

Conclusion: The study identified factors which can aid design effective measures and countermeasures for COVID-19 vaccination rollout. This SWOT analysis is relevant to Low and Middle Income countries planning to implement COVID vaccine in the near future.

Key words: COVID-19 vaccination, SWOT, pandemic
**Introduction**

Vaccines have been necessary public health tools in the fight against infectious diseases. Three potential vaccine candidates sought emergency use authorization against coronavirus disease (COVID-19) from the Government of India in the first week of December 2020, following which full-fledged preparation for vaccine rollout began in December 2020. This article attempts to identify the strengths, weaknesses, opportunities, and threats of this rollout experience. The points will be beneficial for other low and middle-income countries preparing for vaccine rollout. Moreover, this will also be a valuable guide for India in future vaccine rollout programs.

**Methods**

We reviewed the scientific literature, government guidelines and press statements, and media reports on the topic of COVID-19 vaccination in India to identify key internal attributes of the medical and existing health care system that can affect the vaccination rollout. We have documented our learning based on the experience of conducting the training program for COVID-19 in the South district of Delhi and our observations of the vaccination rollout at our institute. We categorized the points according to the SWOT matrix i.e. internal factors which facilitate (Strengths) or hinder (Weaknesses) the implementation of the vaccination and external factors that can help (Opportunities) or impede (Threats) the vaccine rollout, and describe a timeline for COVID-19 vaccine rollout in India. (Table 1).

**Results**

**Strengths**

1. **Existing Universal Immunization Program (UIP) in India**

   The COVID-19 vaccination drive will employ a workforce that is already trained and has on-field experience with routine immunization activities. Additional human resources, including pharmacists, staff nurses and lab-technicians, were trained as vaccinators. The vaccine
storage temperature requirement of 2°C to 8°C was compatible with routine immunization cold chain equipment. Cold chain space requirement was estimated at designated cold-chain points with functional Ice-Lined Refrigerators (ILR). The defective equipment was replaced and new equipment was provided wherever required. [1]

2. **NEGVC-A centralized decision-making body**

In India, the National Expert Group on Vaccine Administration for COVID-19 (NEGVC) discusses and takes key decisions on parameters for selecting appropriate COVID-19 vaccine, procurement mechanisms, community engagement with awareness generation, digital infrastructure for supply chain management, and tracking logistics and financial resources and strategy. [2]

3. **Formulating and updating operational guidelines**

Operational guidelines were released before vaccine rollout, which had the introductory background of the disease and potential vaccine candidates, criteria for prioritizing beneficiaries, detailed procedures for setting up and conducting a vaccination session, brief introduction to Co-WIN software, etc. As new information became available, these guidelines were updated and shared on the official website. [1]

4. **Training**

The government started cascade training sessions at different levels for doctors, vaccinators, cold chain handlers, and data-entry operators for the early launch of the vaccine. All of the training sessions concluded with questions and answers, and the chain of communication was completed by addressing the queries by publishing frequently asked questions (FAQs). [3]

5. **Social mobilization and advocacy**

Information, Education, and Communication (IEC) for the stakeholders and community was initiated through tailor-made modules for vaccinators, cold chain handlers, and other groups. Indicators for reporting of advocacy, communication, social mobilization were included in operational guidelines. [1]
6. **CO-WIN- Information Technology (IT) platform**

A new digitalized platform – CO-WIN, an acronym from winning over COVID, was developed. Logistic management, vaccine distribution, session site planning, and team allotment, beneficiary management, and AEFI (Adverse Events Following Immunization) reporting will be done online and in real-time through this platform ensuring timely and transparent reporting and monitoring. [4]

7. **Dry runs**

The dry run exercise aims to end-to-end testing of COVID-19 vaccination process and includes planning & preparations as per the operational guidelines. A nationwide dry run exercise was conducted on 2nd January 2021, with further dry runs at various session sites. [5]

8. **Indigenous production and public-private partnership**

Three of the potential vaccine candidates, namely Covishield, Covaxin, and Sputnik V, are produced indigenously, reducing transportation and procurement costs, and making the vaccine more affordable. Mission COVID Suraksha was launched to enable indigenous, accessible and affordable vaccine development in India. [6] The vaccines are being manufactured in collaboration with government and private sectors. They will be made available to the government at a subsidized price, thereby improving the whole program’s cost-efficiency.

9. **Strategy to prepare on multiple fronts**

Various stages of vaccine rollout were planned and implemented simultaneously. This included identifying and strengthening cold chain points, developing CO-WIN software to manage vaccination sessions, and identifying workforce identification, training, logistics management, and social mobilization. All potential candidate vaccines had some common characteristics – intramuscular, two doses 3-4 weeks apart, multi-dose vials, a liquid form, 2-
C cold chain space. [1] Hence, identifying a specific vaccine or its availability was not a pre-requisite for vaccine rollout.

Weaknesses

1. **Knowledge gap**

As the government was making decisions about vaccine rollout, the trials were still underway. The vaccine manufacturers were seeking emergency use authorization from the Government of India with limited data on efficacy. COVID-19 vaccines were reported to be effective against symptomatic infection, severe disease and resulting hospitalization with no evidence about efficacy against asymptomatic infection, which is crucial to interrupt the chain of transmission. As the trials' follow-up period was less than one year, no comment can be made on long term protection. The majority of vaccine trial participants were in the younger age groups and comparatively healthy, compromising the evidence of efficacy and safety of the vaccine in high-risk and vulnerable age groups of the elderly and people with co-morbidities.

2. **Temperature Loggers and vaccine vial monitors (VVM)**

There is an insufficiency of data-loggers for real-time temperature monitoring of vaccine cold-chain in the country. [7] This can result in problems in temperature monitoring, and temperature excursions can affect vaccine potency and safety. There is a possibility that no VVM will be present on the vaccine vial during the initial phases of vaccination. [1] It will be difficult for peripheral healthcare workers to recognize cumulative heat exposure and resulting vaccine damage.

3. **Space constraints**

An ideal session site requires at least three separate rooms with washroom, handwashing and drinking water facilities. [1] Space and infrastructure constraints in rural healthcare system of the country will pose challenges. [8]
4. **Non-COVID services**

The Indian government will bear the entire cost of COVID-19 vaccination. It will result in the diversion of funds from non-COVID-19 healthcare and other sectors to COVID-19 vaccination program. The implementation of these programs is bound to suffer eventually. A recent example is the nationwide polio immunization drive scheduled on 17\(^{th}\) January 2021 which was postponed considering the COVID-19 vaccine rollout.

5. **Insufficient team members**

A team of five members has been proposed for each session site to vaccinate 100 beneficiaries, [1] which seems insufficient. The long duration of sessions will also be exhausting for the team members, increasing the possibility of errors.

6. **Demand-supply gap**

Cold chain points in our country are distributed unevenly with respect to population size and there is wide disparity between urban and rural areas. India will require at least 60 million doses for the initial phase of the vaccination drive, considering immunizing 30 crore beneficiaries with a two-dose schedule vaccine. Whether the manufacturers will be able to meet this demand on short notice is questionable.

7. **No prior antibody testing/Reverse Transcriptase-Polymerase Chain Reaction (RT-PCR) testing**

RT-PCR testing is not required to get vaccinated. There is a possibility that asymptomatic or mild cases of COVID-19 can enter the vaccine session site, posing a risk of infection to others. Immunogenicity and safety profile of vaccine in infected individuals is not ascertained. Interference by antibodies from natural infection with vaccine action is not yet clear.

8. **Digital divide**

The registered beneficiaries will get the information about the vaccination session site and date on their registered mobile numbers through a text message. A previous study has
highlighted that there is a digital divide in India as people with access to technology may not be able to use all its features. [9]

Opportunities

1. Election experience

The COVID-19 vaccination sessions are planned on the lines of the election process. The experience gained from the latter one will prove to be an added advantage for the current immunization program.

2. Inter-sectoral coordination

About 21 ministries and departments are involved in the smooth rollout and conduct of the vaccination drive. [1] This inter-sectoral convergence is a significant opportunity which can be utilized for successful immunization program, and their role can be explored further.

3. Role of media

When political figures, celebrities, and influencers took COVID-19 vaccines, the media telecasted it live on their channels. It can help in alleviating the fears associated with vaccine amongst the Indian population.

4. Vaccine eagerness

Vaccine eagerness amongst people can be a driving force towards the success of this enormous vaccination drive. With politicians demanding the vaccine shot for themselves in the first phase, the citizens might get assurance of the vaccine’s safety and efficacy and get ready to get vaccinated if they are enlisted.

5. Central supply

The vaccine will be supplied to all the states by the central government and all the cost of phase one of vaccination will be taken care by the central government. This will help in better center and state coordination and more equitable distribution. States will be able to use their funds for other support activities and bearing the cost of vaccination in further phases, if required, in an efficient manner.
Threats

1. Apprehension
   Almost all potential candidate vaccines against COVID-19 have been developed in less than a year time. COVID-19 vaccines are new and will target adult population, which is different from the population covered during routine immunization. Few side-effects like allergic reactions, transverse myelitis were reported by the vaccine recipients in trial stage which were widely circulated through social and mass media channels adding to the vaccine hesitancy amongst the potential beneficiaries.

2. Virus Variants
   During mid-November and early December 2020, many countries across the globe started reporting emergence of cases due to variants of SARS CoV-2. There is uncertainty about the effectiveness of the vaccines against these new variants.

3. Compromising COVID-19 appropriate behaviors (CAB)
   The sense of protection induced by vaccines might lead to compromise in adherence to COVID-19 appropriate behavior. Intensive IEC with appropriate messages to ensure compliance with CAB should be implemented.

4. Receding infection wave
   Many states in India have witnessed decline in daily new cases during December 2020-January 2021 which can lead to decreased felt need for vaccine due to reduction in perceived danger, thereby increasing the vaccine hesitancy amongst the beneficiaries.

5. Corruption
   Vaccine eagerness can also be exploited by fake vaccine providers to trap individuals not included in the first phase of vaccination. Fake Co-Win app has already been reported, thereby misleading the beneficiaries.

6. Rumors and misinformation
As the nation gears up for largest vaccination drive in the history of immunization, there is a threat of concurrent circulation of myths and rumors like impotency caused by vaccine about potential vaccine candidates. These rumors and misinformation might become hurdle in the program’s success.

7. Other public health challenges
The co-existence of other public health challenges along with COVID-19 might jeopardize the efforts towards successful conduct of this vaccination program by diverting the resources. The recent example is bird flu outbreak in India.

Conclusion
As the country readies for the huge vaccination campaign being conducted for the first time in history of immunization, better prepared nation and vaccination machinery will be able to forecast the possible eventualities and manage them in a proficient manner. Addressing the weaknesses, checking the threats, identifying the opportunities and augmenting the foundation of strengths will aid in successful conduct of this program and generate the trust of citizens and the world in India’s capability to fight the pandemic. These experiences are relevant to Low- and Middle-Income countries which are planning to roll out COVID vaccine in the near future.

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Table 1. Timeline for COVID-19 vaccine roll out in India

| Activities            | Aug 2020 | Sep 2020 | Oct 2020 | Nov 2020            | Dec 2020                     | Jan 2021                        |
|-----------------------|----------|----------|----------|---------------------|-----------------------------|---------------------------------|
| Vaccines              |          |          |          |                     |                             |                                 |
| 3rd Phase clinical    |          |          |          |                     |                             |                                 |
| trial of COVISHIELD   |          |          |          |                     |                             |                                 |
| begins in India       |          |          |          |                     |                             |                                 |
| 3rd Phase clinical    |          |          |          |                     |                             |                                 |
| trial of COVAXIN      |          |          |          |                     |                             |                                 |
| begins in India       |          |          |          |                     |                             |                                 |
| Govt declares         |          |          |          |                     |                             |                                 |
| funding for Covid-19  |          |          |          |                     |                             |                                 |
| vaccine research      |          |          |          |                     |                             |                                 |
|                       |          |          |          | Application of      | Grant of                     |                                 |
|                       |          |          |          | emergency use        | permission                  |                                 |
| NEGVAC                | Constituted |        |          |                     |                             |                                 |
| Cold chain Assessment |          |          |          |                     |                             |                                 |
| Guidelines            |          |          |          |                     |                             |                                 |
| 1st set of operational|          |          |          |                     |                             |                                 |
| guidelines for vaccines|          |          |          |                     |                             |                                 |
| Guidelines for         |          |          |          |                     |                             |                                 |
| advocacy and social    |          |          |          |                     |                             |                                 |
| mobilization          |          |          |          |                     |                             |                                 |
| Training Cascade      |          |          |          |                     |                             |                                 |
| training from National, |          |          |          |                     |                             |                                 |
| state, district and   |          |          |          |                     |                             |                                 |
| block level           |          |          |          |                     |                             |                                 |
| CO-WIN App            |          |          |          |                     | Launches                     |                                 |
| Dry runs              |          |          |          |                     | Two national-level dry runs |                                 |
|                       |          |          |          |                     | First dry run in four states |                                 |

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