COVID-19 is an ongoing pandemic affecting many countries globally, including India. Coronavirus response includes disease control measures recommended by various agencies include surveillance, early detection (lab, clinical) and isolation (home/ hospital), contact tracing, healthcare infection prevention and control, appropriate clinical care, individual and community based social distancing interventions.

In India, the first case was reported on January 30 2020. The number of cases has increased to 147, as on 18th March 2020, including three deaths. The current surveillance strategy includes screening at the port-of-entry and testing among travellers from COVID-19 affected countries and their symptomatic contacts. The current strategy is suitable for the stage I and II of COVID-19 epidemic. To facilitate early detection of community transmission and implementation of non-clinical interventions, it is proposed to establish stimulated passive surveillance for Severe Acute Respiratory Illness (SARI) hospitalisations.

Objectives
1. Monitor trends of hospitalized severe acute respiratory illness cases to identify COVID-19 cases and clusters.
2. Identify areas where control measures including community-based interventions can be implemented to reduce transmission.

Methods for establishing Sentinel SARI surveillance

1. Case identification: SARI surveillance definition
   A case with
   • Age > 15 years AND
   • History of fever AND
   • At least one respiratory symptom (cough, shortness of breath) AND
   • Requires hospitalization

2. Sentinel Surveillance sites
   • Government or private hospitals which cater to majority of the hospitalizations for SARI in a given district or corporation. The hospitals may include district hospitals, govt or private medical colleges and large private hospitals
   • It is not mandatory to include all hospitals.
   • Priority can be given to the districts which reported confirmed COVID-19 cases.

3. Data collection
   3a. Data collection variables for each SARI case
   Data for the following variables can be collected on the paper or any electronic formats. This list can be maintained at the hospital.
   • Unique ID/ hospital ID
   • Date of hospitalization
   • Age
3b. Data collection variables for aggregate report
Retrospective data can be collected for previous 15 days to establish the baseline threshold for the hospital.

Subsequently, data can be collected on daily basis.
- Date of reporting
- Name of the hospital
- Number of daily new SARI admissions
- Number of SARI deaths among all the hospitalised SARI cases
- Total number of SARI cases tested for COVID - 19
- Total number of COVID-19 positive among SARI cases

4. Daily report and data flow
- A nodal person can be assigned at the hospital for collecting and sending daily reports. The daily report will be sent from the hospital to District Surveillance Unit through phone/WhatsApp/email etc. The data will be compiled by the district data manager and analysed by the District Surveillance Officer/District Epidemiologist. The summary report will be shared with State Surveillance Cell.
- If the hospital sends sample for COVID-19 testing, hospital should submit the case referral form to VRDL and retain a copy in the hospital. The test report should be informed to the district authorities after obtaining the result (Annexure I).

5. Data analysis:
- The data analysis template in MS excel is provided. The excel sheet provides threshold line based the average plus two standard deviation of number of SARI hospitalisations 15 days before the initiation of surveillance. The average should be computed based on the available data.
- Analysis will include time trends for hospitalizations and deaths due to SARI.
- Number of SARI cases tested for COVID-19 by hospital and by district
- Number of COVID-19 cases/clusters detected by hospital and by district

Public Health Action:
- If the district has 'at least one confirmed case of COVID-19 without history of international travel and with history of contact with an imported confirmed COVID-19 case', all the SARI cases may be tested for COVID-19
- In other districts, if the SARI case meets testing criteria OR SARI admissions exceed the threshold (Figure 1), laboratory testing may be done for COVID-19.
- If COVID-19 case is confirmed, initiate the epidemiological investigation and control measures involving district/state rapid response team (RRT) (Annexure II).
Severe Acute Respiratory Illness (SARI) Surveillance

Data collection flowchart

Nodal person from district hospital will collect the information on daily IP SARI case and SARI deaths

The nodal person shares the information to the District Surveillance unit (DSU)

The data manager of DSU will do data entry for each hospital included in SARI surveillance

Action alert will be prompted if the count of the hospitals cross the threshold

Data will be analysed by the District Surveillance officer / District Epidemiologist

Initiate epidemiological investigation

District Surveillance officer / District Epidemiologist can share the report to the State Surveillance unit
Eligibility criteria to test for COVID-19 among SARI patients

SARI hospitalization
A person with age > 15 years AND history of fever AND Cough &/or Shortness of breath AND requires hospitalization

Every SARI patient at admission**

With any of the following

- H/o international travel to places with ongoing transmission of COVID-19 within previous 14 days OR
- H/o contact with a confirmed case of COVID-19 within previous 14 days OR
- Any healthcare worker admitted with SARI OR
- Unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, even if another etiology has been identified that fully explains the clinical presentation OR
- H/o exposure to a healthcare facility where hospital-associated COVID-19 infections have been reported

Number of SARI admissions per day

Exceeds threshold (average plus two standard deviation of number of SARI hospitalizations during 15 days prior to initiating surveillance)

Does not exceed threshold

No testing

A. Test patients in the SARI cluster
If two or more patients,
- are from the same locality OR
- Jointly attended an event OR
- Met each other within 14 days of admission

B. Test patients with
- H/o international travel to places with ongoing transmission of COVID-19 within previous 14 days
- H/o contact with a known case of COVID-19 within previous 14 days
- Worsening of clinical condition (including those who were admitted prior)

C. If A and B are not satisfied
Test at least half of SARI patients admitted on that day when SARI admissions exceeded the threshold

*Local transmission – At least one confirmed case of COVID-19 without history of international travel AND with history of contact with an imported confirmed COVID-19 case

**Guidelines on Clinical Management of COVID-19 by MoHFW, GoI dated 17th Match 2020
### Annexure 1

**India Sentinel SARI Surveillance for COVID-19 Enhanced Response**

**PATIENT PROFORMA FOR COVID-19 TESTING**

<table>
<thead>
<tr>
<th>State:</th>
<th>District:</th>
<th>Name of Nodal Officer:</th>
<th>Mobile No.:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name:</th>
<th>Age/sex:</th>
<th>Mobile number:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Village:</th>
<th>Block:</th>
<th>Hospital:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ward/ICU:</th>
<th>Patient IP no.:</th>
<th>Date of hospital admission:</th>
</tr>
</thead>
</table>

### Clinical symptoms:

#### Date of onset of symptoms:

<table>
<thead>
<tr>
<th>Fever: Y/N</th>
<th>Chills: Y/N</th>
<th>Breathlessness: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Cough: Y/N</th>
<th>If yes, Productive /Dry</th>
<th>Sore throat: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Myalgia: Y/N</th>
<th>Headache: Y/N</th>
<th>Nausea: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Vomiting: Y/N</th>
<th>Diarrhea: Y/N</th>
<th>Abdominal pain: Y/N</th>
</tr>
</thead>
</table>

**Other symptoms, if any:**

### Clinical signs:

<table>
<thead>
<tr>
<th>Require oxygen: Y/N</th>
<th>Require ventilator: Y/N</th>
</tr>
</thead>
</table>

### Presence of any comorbidities in the patient:

<table>
<thead>
<tr>
<th>Hypertension: Y/N</th>
<th>Diabetes: Y/N</th>
<th>Kidney disease: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Liver disease: Y/N</th>
<th>Lung disease: Y/N</th>
<th>Heart disease: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Cancer: Y/N</th>
<th>Blood disorders: Y/N</th>
<th>Immunocompromised: Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pregnancy: Y/N</th>
<th>Others, if any:</th>
</tr>
</thead>
</table>

### History of possible exposure to COVID-19:

<table>
<thead>
<tr>
<th>Is the patient a health care worker? Y/N</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>H/o international travel in the previous 14 days: Y/N</th>
<th>If yes, which country?</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>H/o contact with any confirmed COVID-19 case: Y/N</th>
<th>If yes, date of contact:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Any other person in the same household has similar illness: Y/N</th>
</tr>
</thead>
</table>

### Provisional Diagnosis:

____________________________________________________________________________________

### Details of the sample:

<table>
<thead>
<tr>
<th>Type of sample: Nasopharyngeal swab/Oropharyngeal swab/Nasopharyngeal aspirate/BAL/Tracheal aspirate/Sputum/Serum</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date of sample collection:</th>
<th>Date of sample receipt:</th>
<th>Date of test result:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>COVID-19: Positive / Negative</th>
</tr>
</thead>
</table>

### Disease outcome:

<table>
<thead>
<tr>
<th>Discharged /Referred /Death</th>
<th>Date of outcome:</th>
</tr>
</thead>
</table>

### If death, reported cause of death:

____________________________________________________________________________________

**Note:** To fill the form in duplicate. One to be sent along with the sample and the other to be attached to the patient case sheet.
Epidemiological investigation of Hospital Based Severe Acute Respiratory Illness (SARI) Surveillance

When to initiate investigation?
Hospital is reporting an inpatient of SARI with one of the following conditions

- H/o international travel to places with ongoing transmission of COVID-19 within previous 14 days
- H/o contact with a known case of COVID-19 within previous 14 days
- Worsening of clinical condition (including those who were admitted prior)
- Suspect COVID-19 deaths

What to do?

1. Identification of COVID-19 cases / clusters:
   a. Test for COVID-19 – Follow the testing guidelines
2. Search for new cases in the geographical place
   a. Active search of cases may be done in the geographical
   b. Follow the guidelines for admission and isolation as per national guidelines
3. If there is a suspect COVID-19 death, verbal autopsy may be done and epidemiological investigation at the community level.
4. Contact tracing
   a. Listing of suspected contacts to be done
   b. Categorisation and follow up of contacts as per the national guidelines
5. Control measures
   a. Implementation of non-clinical interventions for stopping further spread