Strategies to support the COVID-19 response in LMICs

A virtual seminar series
Basics of Contact Tracing for COVID-19

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Contact Tracing for COVID-19
A Case of COVID-19 Requires Action

- Diagnosing a case of COVID-19 is important because we have to act

- Support the person who is infected
  - Ensure they have access to medical care and social services
    - Offer treatment
    - Limit their contact with other people

- Identify people they may have infected
  - Notify them about their exposure and offer social services
    - Offer treatment
    - Limit their contact with other people
If we can limit contact between people who are infected and others, we can limit opportunities for the virus to be transmitted.
Timeline of Infection: Infectious Period

**Person infected**

- **Incubation period**: (ranges from 2-14 days, but typically 5 days)
- **Infectious period**: Starts 2 days **PRIOR** to symptoms

- **Signs and symptoms**:
  - (mild illness, about 10 days)
  - (severe illness, 2 or more weeks)

- **Most infectious at day 1** of symptoms
- **Contagion lessens with time**
Timeline of Infection: Infected Contact

Person infected

Incubation period
(ranges from 2-14 days, but typically 5 days)

Signs and symptoms
(mild illness, about 10 days)
(severe illness, 2 or more weeks)

Infected Contact
(5 day incubation)
(10 days signs and symptoms)
Timeline of Infection: Window of Opportunity

**Person infected**

- **Incubation period**
  - (ranges from 2-14 days, but typically 5 days)

**Infected Contact**

- (5 day incubation)
  - (10 days signs and symptoms)

**Signs and symptoms**

- (mild illness, about 10 days)
  - (severe illness, 2 or more weeks)

**Window of Opportunity**

- (before they become infectious)
Reproductive number (R0)

- How many people will one infectious person infect, if everyone they have contact with is susceptible?
  - Reproductive number

- Good way to measure how fast a disease can spread

- The higher the reproductive number, the more people who will be infected
Isolation and Quarantine Can Have a Big Impact on Reducing Transmission

► Stopping one transmission chain can prevent many future cases

$R_0 = 2$
Isolation and Quarantine Can Have a Big Impact on Reducing Transmission

- Stopping one transmission chain can prevent many future cases

What happens if we stop each case from infecting just one person?
Definitions and Steps in Contact Tracing
Cases and Contacts

► Case
  ► Someone who has COVID-19
  ► Usually has a positive laboratory test

► Suspect or probable case
  ► Someone exposed to a case who develops symptoms, even if they have not had a test yet

► Contact
  ► Someone who had contact with a case while they were infectious
    ● During their illness
    ● 2 days before their illness began
  ► Three kinds of contact
    ● Physical contact
    ● Close contact: within 6 feet for 15+ minutes (10 or 30)
    ● Proximate contact: more than 6 feet but in the same room for an extended period
<table>
<thead>
<tr>
<th>Isolation</th>
<th>Quarantine</th>
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</thead>
<tbody>
<tr>
<td>Keeps sick people separate from healthy people</td>
<td>Restricts movement and contact of healthy people who have been exposed</td>
</tr>
<tr>
<td>Restricted to home or hotel</td>
<td>For 14 days since the last contact with the person who is infected</td>
</tr>
<tr>
<td>Separate space in hospital to limit contact</td>
<td></td>
</tr>
<tr>
<td>For duration of infectiousness</td>
<td></td>
</tr>
<tr>
<td>• 2 days before onset</td>
<td></td>
</tr>
<tr>
<td>• At least 10 days after onset of illness; symptoms must be improving <em>and</em> no fever within the past 3 days</td>
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</table>
Steps to investigate cases and trace their contacts

<table>
<thead>
<tr>
<th>Introduce</th>
<th>Inquire</th>
<th>Identify contacts</th>
<th>Isolate</th>
<th>Initiate contact tracing</th>
<th>Implement regular check ins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduce yourself to the case and get their basic information</td>
<td>Figure out the case’s likely infectious period</td>
<td>Ask the case about contacts during their infectious period</td>
<td>Provide isolation instructions to the case, identify challenges, and provide support</td>
<td>Call case’s contacts to inform about their exposure, ask about symptoms, and give quarantine instructions</td>
<td>Check in with the case and their contacts until their isolation or quarantine ends</td>
</tr>
</tbody>
</table>
What is Rapport and Why is it Needed?

• Rapport is a feeling of mutual understanding, trust, and agreeableness between people

• Callers will need rapport with cases and contacts to:
  • Successfully ask for and get accurate information
  • Effectively educate about SARS-CoV-2 and COVID-19
  • Persuasively ask for them to follow isolation and quarantine instructions

"How Do We Measure Rapport In Interviews?" by CREST Research is licensed under CC BY-NC-SA 2.0
Important Terms

► **Congregate housing settings**
  ► A shared living environment where each individual or family has private living quarters and shares common dining, recreational, and other facilities

► **High-risk subpopulation**
  ► A segment of the population that has characteristics that increase the risk of infection or severe disease
Factors that Increase Risk for Infection and Severe Disease

- Populations at increased risk:
  - Dense contact environment
  - Difficult to contact trace and identify exposures
  - Difficult to isolate or quarantine
  - Higher risk of infection and severe disease or death

Image source: Center for Teaching and Learning, Johns Hopkins Bloomberg School of Public Health.
Dense Contact Environment: Examples

- Large crowds of people

- Close contact interaction
  - Physical contact
  - Within 6 feet for prolonged periods of time

- Can lead to a “super-spreading” event—an unusually high reproductive number
Dense Contact Environment

- Large crowds of people
- Close contact interaction
  - Physical contact
  - Within 6 feet for prolonged periods of time
- Can lead to a “super-spreading” event—an unusually high reproductive number

Examples
- Conferences
- Mass transit
- Religious services
- Demonstrations
- Workplaces
- Bars
- Gyms
- Schools
- Sporting events
- Concerts
Difficult to Contact, Trace and Identify Exposures

- Close contacts may be unknown
- Recall of close contacts may not be reliable
- There may be too many contacts, and difficult to determine who is at highest risk for infection
Difficult to Contact Trace and Identify Exposures: Example

- Close contacts may be unknown
- Recall of close contacts may not be reliable
- There may be too many contacts, and difficult to determine who is at highest risk for infection

**Example: homeless shelter**
- May not recall all contacts
- Contacts may be spread out through multiple jurisdictions
- Difficulty locating or testing exposed homeless contacts
Difficult to Isolate or Quarantine

- Unable to distance from others
  - Design of house or facility
  - Developmental disabilities
  - Not enough resources
    - Masks, gloves, staff
  - Social pressures

- Unwilling to cooperate
Difficult to Isolate or Quarantine: Example

- Unable to distance from others
  - Design of house or facility
  - Developmental disabilities
  - Not enough resources
    - Masks, gloves, staff
  - Social pressures

- Unwilling to cooperate

Example: intermediate care facility

- A home with individuals with special needs
- Residents may be unable to cooperate
  - May not understand the concepts of hygiene and social distancing
  - Difficult to remove those who need care from infected people
  - Harder to maintain resources (masks, gowns) for effective infection prevention
Ethical Considerations
Privacy

• The right of a person to be free from intrusion or publicity concerning personal matters
   Everyone has the right to keep their personal life personal

• Examples of private information that may be discussed during contact tracing
  • Who lives in your house with you?
  • Who you spent time with in the past week?
  • Where have you gone in the past week?
  • How much time did you spend with people in your home and outside your home?

• A contact tracer can ask about private information only for the purposes of contact tracing

• A contact tracer can only use private information provided for contact tracing purposes
Confidentiality

- The right of an individual to have personal, identifiable **medical** information kept private and not to be released without his/her/their consent

  Your medical information cannot be shared with anyone else unless you agree to it
  (but your COVID-19 test results can be shared to protect public health)

- Examples of confidential information that will be discussed during case investigations and contact tracing
  - Other health conditions the case or contact may have
  - Results from the COVID-19 test

- A contact tracer can only learn about medical information relevant to contact tracing and can only use it for contact tracing purposes
Balance between public health goods and individual rights

• Contact tracing programs are a public good
  • Reduce risk for the public from COVID-19

• Must balance this good for society with rights of privacy, confidentiality and autonomy
Electronic Case Reporting

- When a patient gets a test for COVID-19, entered into an electronic system
- Central database where positive test results are reported from the lab
  - Varies by region

**Problem:** Can take time to gather data and information on cases for investigators

**Solution:** Automated, standardized reporting of positive tests to case investigators

**Added value:** Less time between diagnosis and call from public health team
Tracking Symptoms

• Important for cases
  • Worsening symptoms that require medical care
  • Know when they have recovered and can end isolation

• Important for contacts
  • Identify signs or symptoms and need for care
  • Possible access to testing

**Problem:** Daily calls to cases and contacts is time consuming for everyone

**Solution:**
1) applications where cases and contacts can directly enter symptoms into a database;
2) text messages to remind cases and contacts to report new or worsening symptoms

**Added value:** Less time required by team, less time from cases and contacts
Identifying contacts quickly

• Numerous difficulties
  • Cases may not remember all of their contacts
  • Cases may not want to talk about their contacts with the interviewer due to privacy concerns
  • Cases may not know the phone number or address of their contacts
  • Phone numbers for contacts may be incorrect

• Takes time to identify and get in touch with contacts

• A few possible supportive technologies
Phone-to-phone notification of contact

• Applications being developed
• Smartphone users can download an application that will communicate with other phones that have the app
  • Uses Bluetooth technology to communicate that you have been in ‘contact’
    • Within 6 feet for 15+ minutes, for example
• If you are diagnosed with COVID-19 you can enter this information in the app and the app notifies all of your contacts automatically

**Added value:** Contacts are notified of their exposure immediately and advised to quarantine; identity of the case and their contacts is kept confidential

**Added concerns:** Unclear how the data could be used by public health teams; effectiveness depends on the number of people using the app; not all contacts may truly have been exposed
Timeline of contact notification through the app
Timeline of contact notification through the app

- **Home**
  - Physical contact
  - Close

- **Train**
Timeline of contact notification through the app

[Diagram showing the timeline of contact notification through an app, with stages labeled 'Home', 'Train', and 'Work', and activities such as 'Physical contact' and 'Close'.]

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2
Timeline of contact notification through the app
Timeline of contact notification through the app

- Home
- Train
- Work
- Home

Physical contact Close
Physical contact Close

Fever
Timeline of contact notification through the app

- Home
- Train
- Work
- Home

Feaver

Close contacts quarantine for 14 days
Summary
Summary of Contact Tracing

► We can stop transmission of COVID-19 if we can identify cases and their contacts quickly and get them to limit their contact with other people

► Not an all or nothing strategy
  ► Even preventing some infections can have an impact on total cases

► Contact tracing is difficult work, people helping people

► Must gain trust of community and respect human rights