

Contact Tracing Utilization to Decrease the Reproductive Number (R_0) of SARS-CoV-2 to Inhibit Transmission

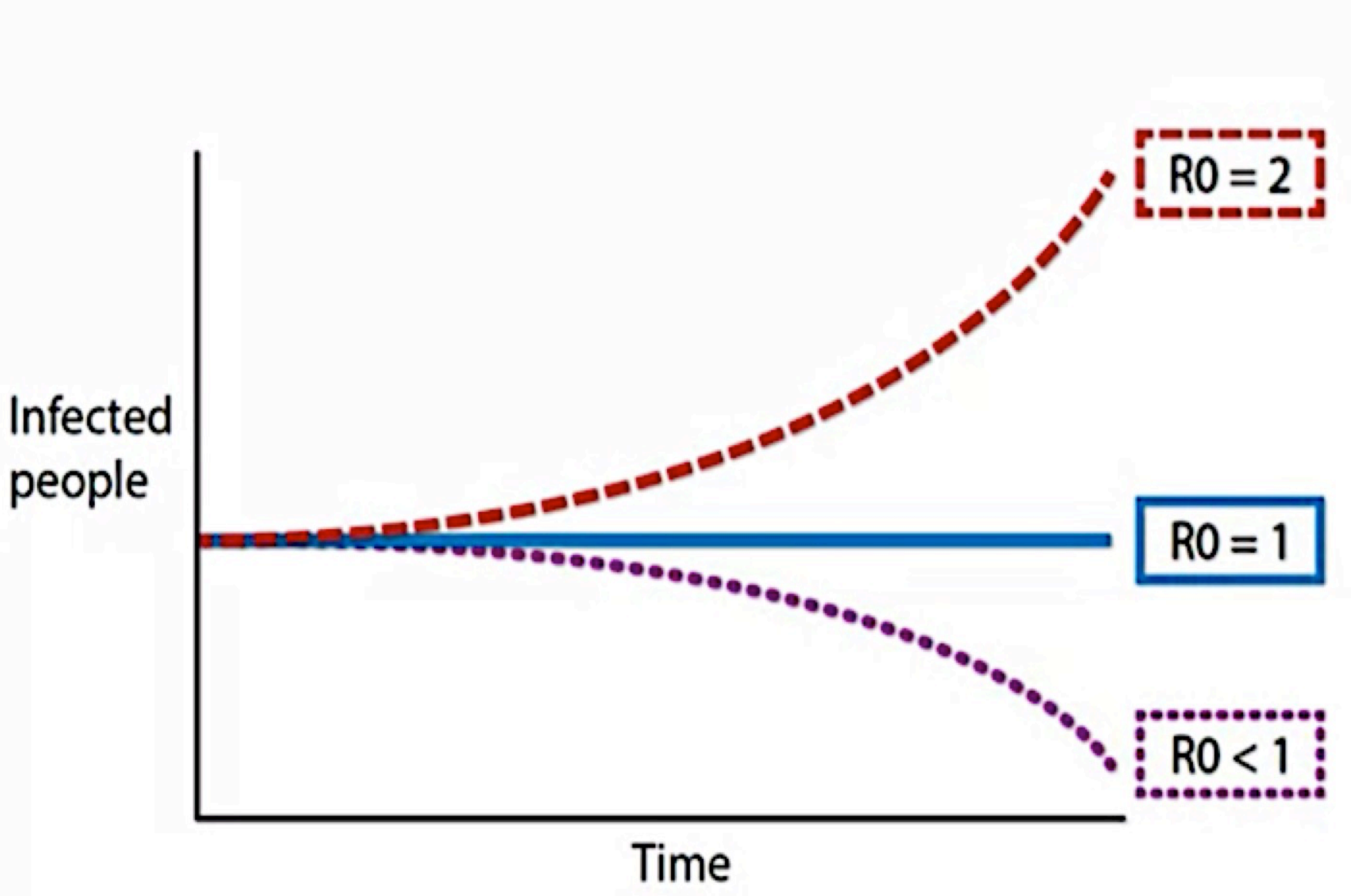
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Introduction

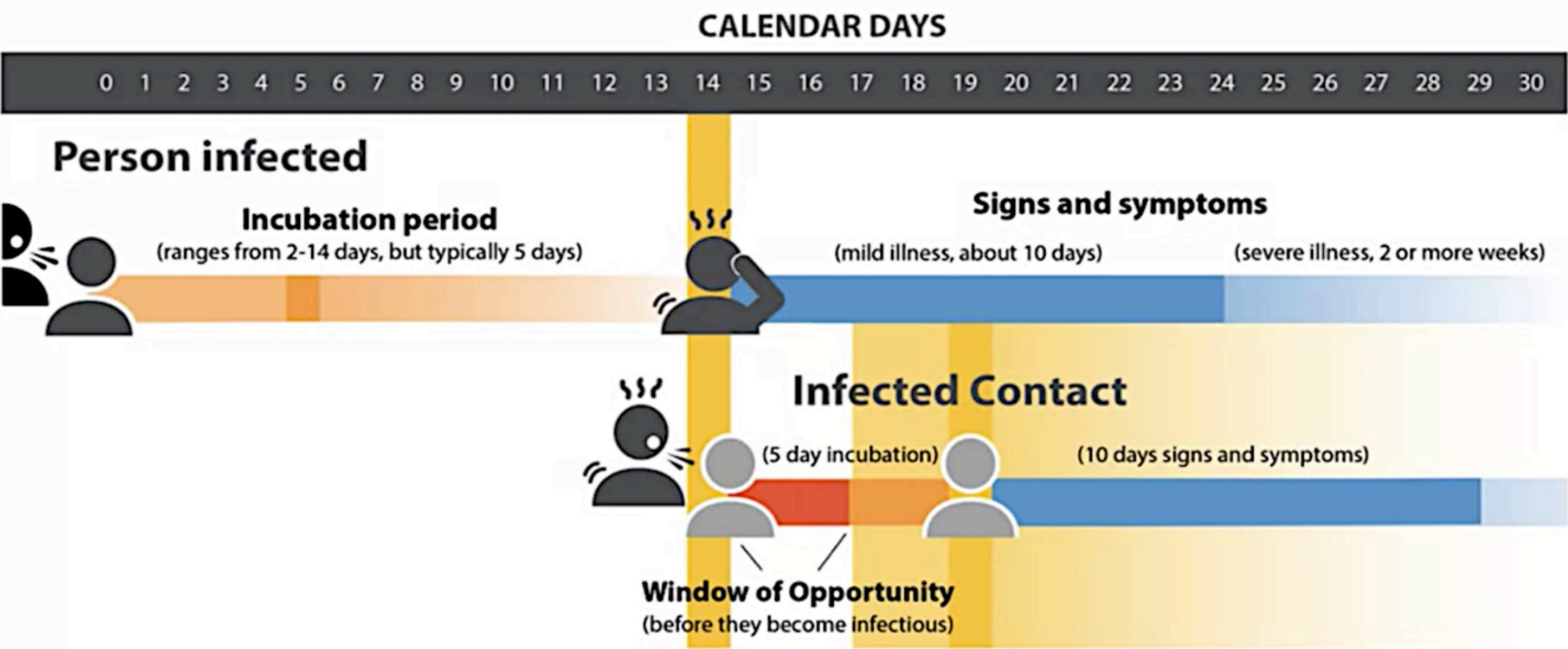
SARS-CoV-2 spread rapidly causing a pandemic, and with the onset of the pandemic, lockdown practices were implemented to hinder the spread of the virus. As populations attempt to return to a normal routine, COVID-19 testing has become a new norm. Since lockdown efforts are no longer being implemented, contact tracing is utilized to inhibit further spread. Contact tracing has been utilized to control viruses in the past such TB, HIV, and Ebola. Contact tracing in addition to testing can effectively decrease the R_0 of COVID-19, thus controlling its spread.

Reproductive Number (R_0)

The R_0 of a disease is the amount of people each infected individual will go on to infect, without any intervention in place. If a disease has a high R_0 , the more people are likely to get infected by an infectious person, and a R_0 of <1 supports a disease not successfully being transmitted from an infected person to a healthy one. The summary reproductive number for COVID-19 is 2.87 (95% CI, 2.39 – 3.44), meaning each infected person will go on to infect about 2.87 individuals. As cases and contacts isolate and quarantine after testing positive or being contact traced respectively, with the consideration of proper adherence to protocol, the R_0 for COVID-19 becomes <1 .



Timeline



Contact Tracing Considerations

In order for contact tracing to be effective, there are various considerations which must be present, which serve to enhance its accuracy. Amongst staffing of any organization, employees should be grouped into zones and pods, which separate the high risk employees from the low risk. Occupation responsibilities dictate which employee can be classified as high risk or low risk. In addition to implementation of testing cadences, high risk groups should have a more rigorous cadence than low risk groups. Increased testing enhances the accuracy of contact tracing. Isolation and quarantine need to be overseen for the public good and proper decrease of the R_0 .

General Procedure

1. Contact the case and verify that they are the correct person.
2. Inquire about presence of symptoms and onset of symptoms; very crucial step for determining the extent of contact tracing.
3. Identify who they may have had contact with 2 days prior to onset of symptoms, or obtaining a positive test result.
4. Provide instructions for proper isolation.
5. Reach out to contacts who have been traced, while maintaining confidentiality of the case, instruct to quarantine for 14 days. After 14 days contact has to test negative in order to terminate quarantine.
6. Implement regular check-ins with cases as well as contacts.

Results

Testing Event	Tested Positive	Contact Traced	Later (+) or symptomatic	% Accuracy of Contact Tracing
1 – (3/8/21) [Zone A]	4	14	11	78.6%
2 – (3/23/21) [Zone B]	1	5	4	80%
3 – (3/31/21) [Zone A]	3	7	5	71.4%
Total		26	20	76.9%

Testing Event	Reproductive Number (R_0)	Testing Event	(+) or symptomatic after contact tracing	Reproductive Number (R_0)	Possible Incidence w/o Contact Tracing
1	2.75	1	11	2.75	30.25
2	4	2	4	4	16
3	1.67	3	5	1.67	8.35
		Total	20		54.6

Discussion

Contact tracing relies on mass testing for proper results, and when conducted, it prevents mass outbreak as can be observed in the results. Time is of the essence when it comes to contact tracing. It is also in the best financial interest of any organization to implement preventive measures to protect the health of its workers, and in turn, its productivity. It is also important to recognize that HIPAA is still functional and the privacy and confidentiality of every person is to be adequately maintained.

Policy Proposal

1. On-Site Services Rendered to Clients
 - 1.1 Health Safety Team
 - 1.1.1 Health Safety Supervisor(s)
 - 1.1.2 Health Safety Assistant(s)
 - 1.1.3 EMT/LPN COVID-19 Tester(s)
 - 1.1.4 Disinfectant crew – outsourced to third party vendor
 - 1.2 Electronic Reporting Mobile Application
 - 1.3 COVID-19 testing services
 - 1.3.1 RT-PCR testing – Provided via testing services.
 - 1.3.2 Rapid Testing – Provided via testing services.
 - 1.3.3 Concierge Testing – RT-PCR test at requested location for client
 - 1.4 Personal Protective Equipment (PPE)
 - 1.5 Contact Tracing Guidelines
2. Off-Site Services Rendered to Clients
 - 2.1 Contagious Respiratory Illness Assessment (CRIA) team
 - 24/7 CRIA representatives available via telephone to all clients, offering services from illness screening to Medical Director Support
3. Safety Protocols
 - 3.1 CDC Guidelines followed
 - 3.2 Protocols tailored to fit the needs of the clients
 - 3.3 Repercussions of failing to adhere to protocols will be the responsibility of the client

Faculty Advisor

Dr. Daniel Ehlke