

Efficacy of Manual and Digital Contact tracing of COVID-19

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Abstract

Background: The unprecedented situation unfolded by the COVID-19 pandemic needs tools and measures of varying degrees. Contact tracing is one of them. Contact tracing has become buzz word these days. Along with non-pharmacological interventions (NPI) this is one of the major tools employed by the local health care authorities.

Summary: The contact tracing measure is major part of the response against COVID-19 pandemic. Methods of contact tracing and its efficient way to carry them out needs to be studied. The efficacy of the contact tracing mechanism needs strong backing of empirical data upon which research is ongoing. Further combining the manual and digital contact tracing is the option authorities needs to check out. Health care human resource crunch can be addressed by creating civilian vigilantes to inform the health authorities about the possible suspected case. In case of digital tracing the data minimization and anonymizing the data in which there is no name attached with the particular data can be used so that doubts about data privacy should get vanished. Balancing between controlling case fatality rate and infection rate with the help of proper and adequate resourceful data is the key to effectively control the spread along with easing of restriction and step towards normalization of lives.

Conclusion: More thorough study is needed with numerical data backing to establish the efficacy and the relation between controlling the case count and contact tracing.

Key Words :- Contact Tracing , Covid-19 , Infodemic, Primary Tracing, Secondary Tracing, High Risk

Introduction

The coronavirus disease 2019 shortly named as COVID-19 is wreaking havoc in all parts of the world. Started from the Hubei province of Wuhan in Peoples Republic OF China, the spread and reach of the virus has reached every nook and corner of the world. Nearly 1 million deaths and 32 million cases worldwide it effectively put pressure on already crumbling health infrastructure. Named after its shape of crown the coronavirus is hitting harder and like never before to all the humanity.⁽¹⁾ As vaccine is under trial and will need some more time and cannot be expected in near future, it is essential to innovate various methods to be employed in the containment of the deadly virus which has been employed and being rectified according to the feedback. Initially the ambiguity of whether this disease spread through human to human contact or not was there but later World Health Organization (WHO) clarified

that this can be transmitted from human to human. This triggered the need of identifying the persons carrying the load of coronavirus. First the authorities tried to treat them but later found out that before treatment the infected person might have contacted with other peoples steadily increasing the patients count. Then the need of contact tracing was really felt and authorities started to chalk out the plan to contain the spread of the deadly disease.⁽²⁾ The test, trace and treat model immensely helped in containing the cases during early period. Initially only family members were isolated and quarantined but on the course of the time other immediate contacts such as neighbors and house help also got isolated. This prove out to be a great strategy for containment as where resources are lacking and where there is low doctor to population ratio. Densely populated countries where health infrastructure is already burdened now experiencing the crushing effect of added pandemic. In such situation this strategy of policy making to contain the spread is

really helping to avoid the unfortunate scenario. As the test, trace, treat model evolves, testing eventually becomes an essential part in success of the contact tracing methodology. Proper rules and regulations and training should be undertaken by swab takers which are in turn health care professionals to properly take the swab which can correctly decide the infection level.⁽³⁾ Efficacy of the contact tracing is also under scanner as more study is needed to establish the correlation between number of cases and tools employed. Which should be employed and where is a crucial factor in containing the viral spread. Various methods according to the ground reality are being employed and rectified every day to get on the nerves of this unprecedented situation. The role of technology is also crucial in contact tracing in particular as the penetration of the network of the cellular phones with internet is ever increasing and on the level that was not seen before. Also, ethical dilemmas such as right to privacy should be given thought while formulating any guidelines on the digital contact tracing. This article unfolds some aspects involving the contact tracing strategy to effectively contain the viral spread.⁽⁴⁾

What is contact tracing?

Contact tracing has become buzz word these days. People who were in close contact of a person whose report is positive for contagious virus such as coronavirus and are at higher risk of becoming infected with the said infection and who has potential to further infect others are called close contacts of the infected person. Tracing and isolating such people if necessary are known as contact tracing. Contact tracing becomes extremely important in such scenario where spreading rate of contagious virus is high such as novel coronavirus.⁽⁵⁾ Contact tracing can be broadly divided into three basic steps. In which first one is contact identification. Once some people confirmed with such virus, such person is asked about his recent activities where the person possibly came in contact with another people. These contacts can be anyone from family members to hose keepers. Second steps are called as contact listing. All the persons listed by the above infected person should be listed as contacts. It can be further classified into high risk category and low risk category. As receiving early care is of utmost importance, these contacts should be identified and conveyed the necessary message and acquaint them of further procedure. The third and the last step in the

contact tracing procedure is called as contact follow up. Regular and in appropriate time the contacts should be checked and monitored by the health authorities for symptoms. Asymptomatic contacts can be kept at home with proper medical interventions. But even mild symptoms contact should be admitted to the hospital as soon as possible otherwise his health would worsen and risk of transmitting the virus is maximized which is low in the asymptomatic cases hence quarantined at home.⁽⁶⁾ Further contacts can be further divided into primary and secondary contact. Primary contacts are those who were within close proximity of six feet for at least two days prior of the confirmed positive report. These can also call as close contact. Secondary contacts are those contacts whose proximity with the confirmed positive patient were less than the primary contact. In case of lack of healthcare infrastructure and overwhelming scenario secondary contacts can be quarantined at home with appropriate care provided they are asymptomatic and having less comorbidities. While primary contacts should be monitored closely and hospitalized even if minor symptoms are shown. High risk contacts are those contacts whose age is above 50 years and having different comorbidities. Research showed that the virus affects more comorbid patients than healthy ones.⁽⁷⁾

Methods of contact tracing

World Health Organization has issued guidelines that must be adopted with necessary changes to effectively counter the viral spread. Depending on the epidemiological scenarios there are some case by case basis response level. For example, what should one do when there are zero cases, when there are sporadic cases here and there, when there is cluster outbreak and finally when there is community transmission where one does not know from where he or she got the infection? [WHO INTERIM] In first two scenarios where cases are zero or sporadic occurrences, health infrastructure can be strengthened and necessary medicines can be manufactured as lot and equipment's should be strengthened. In second and third scenario cluster outbreak, needs intensive contact tracing to avoid upgradation into community transmission. Finally, when community transmission takes place then it is extremely difficult to effectively employ the contact tracing strategy especially in the countries with huge population and population density. It is hard to completely defenestrate the virus at

one go but due diligence is essentially required. Contact tracing can reduce the further infection by up to 15 percent which is remarkable feat.⁽⁸⁾

Self-reporting is also an effective way to counter the disease spread. But that needs proper dissemination of information by authorized agencies. The preference level for isolation of the suspected patient whose report is under progress should also be decided by the authorities. The prime importance should be given to the health care professionals who are the frontline workers in this pandemic then according to the comorbidities and risk factor associated the next in line should be decided according to the ground condition. The Pandemic also parallel accompanied by Infodemic which is lot deadlier than previous. In some cases it even prevented from reporting the patient by creating a hoax.⁽¹⁾ As the person having the infection is not able to disclose its identity publicly which would have been a best option, due to attached taboo, the healthcare professionals manually trace the nearest past contact of the infected patients. People's participation is extremely necessary in this complicated task. The right information would eventually bring down the casualties due to late reporting of the cases.⁽⁹⁾

Testing Methods

It is also a crucial factor in deciding the success rate of the contact tracing strategy. There are various types of tests. The main and on which doctors and health care professional rely upon is RT-PCR (Reverse Transcript Polymerase Chain Reaction). But other tests are also done including rapidgen antibodies tests, truenat tests. The early one identifies the infected person the less is the chance of the person to infect others. RT-PCR test renders result in maximum one day which can be reduces by mass producing testing kits. Antibodies test needs additional confirmation of the RT-PCR test then and only then the patient is treated as infected person. Antibody test id mainly used in community outbreak to check the disease prevalence in the particular area. The nasal swab which is taken in RT-PCR testing is key in deciding the test result. Because the viral load can shift toward lungs via throat. And if the sample taken is only have swab of nostrils then it would falsely claim that the person is negative or sometimes the result is inconclusive. ⁽¹⁰⁾Therefore, proper training should be

done of the swab takers who are also health care workers and proper guidelines must be issued in this regard. As the pandemic is progressing and countries are easing up on travel restrictions more kiosk or booths can be set up to take random samples from the commuters as well as the people roaming to check the spread of the virus. Also, mandatory testing should be introduced gradually to justify the test, trace, and treat formula. Hesitancy among masses of getting infected while testing or swab taking procedure should be fought with right and authenticated information and myth busters. Testing results should be conveyed as soon as possible so that further procedure of quarantining or isolating whichever suits the situation should be carried out. The cooperation of the people is really essential in these protocol follow up.⁽⁷⁾

Efficiency of contact tracing

Contact tracing is the main response on which local health authorities can rely upon to control the spread. An average individual has on an average has 36 contacts and among all people around 9 percent of them have around 100 contacts.⁽¹¹⁾ To sharpen the contact tracing strategy maximum number of secondary contacts needs to be traced so that they are identified before they get infected and spreader. Longer time would eventually increase the case count day by day exponentially. All the contacts need to be monitored as not all the contacts are symptomatic and will render test negative. They possible can became infectious after some days. The efficacy of the contact tracing is also depending on the nature of primary and secondary contacts. The comorbidity plays a very vital role in case fatality rate (CFR). The more medical conditions one is suffering from more is the chance of one to be turn out a severe case. As more and more governments are turning towards easing up the social restrictions norms, their strategy focuses on reducing the case fatality rate (CFR) than reducing the number of infections. So, it would be disaster if more comorbid which are also known as high risk patients or contacts exposed to the virus. There is a need of correcting the definition and criteria of close contact and secondary contacts. Almost every government have their different perception of close contact. Contact tracing can go hand in hand with other non-pharmacological interventions (NPI) like physical distancing, wearing of masks, and sanitization on regular intervals to lessen the

burden of the health authorities. Apart from what is being discussed the major tool for the local health authorities is definitely the contact tracing strategy. It is efficient so far and its importance is increasing as the case count is surging on daily basis.^(12,13)

A case for digitally tracing the high-risk contact

Authorities are relying on the manual tracing of the contacts of the detected COVID-19 patients. As the exponentially of the pandemic is ever increasing it is necessary for the authorities to trace as soon as possible. Taking the help of the technologies will surely help as we experiencing technological revolution. The penetration of the internet connectivity will only help in tracing the contacts.⁽¹⁴⁾ In India the government has launched Arogya setu application which can be downloaded on the cellular phones of the peoples. It uses Bluetooth as well as location data to alert the folks about nearby positive cases so that it can secure itself from that particular area. Further it is also helpful in crowded places such as transport and various congregations where large gatherings are expected. Close circuit television camera's (CCTV) can be used with thermal gun to monitor the temperature and isolate the suspected patients. It is far rapid than the manual method where the chance of the infection of health care professional is also high. The confirmed positive report of a patient should automatically trigger the authorities to trace its digital contact in near past and alert them as they also can be potent infection spreader.⁽¹⁵⁾ These days cellular phones popularly known as mobile is the nearest possible thing of a person so further process becomes easy. The asymptomatic patients can be isolated under supervision in their respective homes as chances of early detection reduces the spreading capacity of a patient. There is a direct relation between population adopting digital contact tracing application and decrease in number of infections. Both are in direct proportion. Means as the download and usage count of the tracing application increases it further facilitates in identifying the contacts rapidly and quarantine or isolate them further to reduce their exposure to the masses. In country like India where there is already lack of manpower and infrastructure this methodology will immensely help in getting off some of the health professionals' burden. Even if it covers small number of our population it is very rapid and can further prevent the spread by identifying the risky contacts

rapidly. The pandemic already wreaking havoc and any possible and innovative solution should be tried to check its feasibility. But the efficiency of the application-based contact tracing increases with the large cross section of the population uses it. Otherwise it will render ineffective tool. Also users should use the application in a continuous manner then and only then it will show some intended results.⁽¹⁵⁾

But the other side of the coin also has strong point to make. As this pandemic unfolds the power wielding nature of the various governmental authorities, handing over information of citizens which they are hesitate to share is also a big concern. Too much information at the disposal of the authorities can crush the opposition's voice. WHO In its interim guidelines suggested for rational usage of the technology in digitally contact tracing. It suggested measures like data minimization, limited retention of data, independent oversight, and accountability to be in regular use while employing the digital tracing method.⁽¹⁵⁾ In addition, the non-state actors can unethically exploit the loopholes in the governmental data storage and possible leakage of the information such as whereabouts of the peoples is also detrimental to the overall wellbeing of the people. Further proper usage from the user's side is also necessary as selective usage will only create false sense of security.⁽⁴⁾

A wider and quick consultation with all the stake holders about the digital tracing and proper, unambiguous guidelines should be issued by the authorities. Anonymizing the data is one way out as it will not disclose the person's identity and will also serve the purpose of faster tracing. Using technology is the need of the hour but concerns of the people are also legitimate. Judicious and ethical usage is the only way out to conquer the unleashed dragon like COVID-19 pandemic.⁽¹⁶⁾

Conclusion

As there is rapid surge in COVID-19 cases worldwide, almost 32 million cases registered so far, various schemes are being chalked out and tested continuously. Contact tracing is one of the efficient and reliable method to counter the spread of the virus. Definition and criteria of the contact tracing needs periodic rectification. High risk patients or patients having co-morbidities should be

on top in priority list. Protocol on asymptomatic patient as they are undetected and possible spreaders should be monitored regularly. As far as manual tracing is concerned it can be supplemented with digital tracing which is more rapid and the fast. Government can try out hybrid model engaging both, manual as well as digital tracing, to make policies regarding the containment of COVID-19. As governments are turning towards lowering case fatality rate than lowering the number of infections a delicate balance should be established as most of the governments lack resources even after dedicating sizable amount of resources toward dealing with COVID-19 pandemic. Tracing should cover large spectrum of the population and the testing result delivery should be as fast as possible to avoid more spreading. Lack of human resource in health care system is road block in contact tracing like strategies. Self-reporting by people on their own after creating awareness could be effective. Efficacy of the scheme of contact tracing needs more empirical study to prove its profitability. It can act as guiding light in upcoming such unfortunate scenarios. Study on spreading capacity of seconae patients must be studied as it will also adds up to the containment of the pandemic. Infodemic is also parallelly spiraling upward as technology can be misused too. Hesitancy in testing by people because of fake messages world end up creating a whole new disaster. Case for digital tracing is strong as these unprecedented situations requires utmost solutions. Technical glitches are hindrance in employing the application-based tracing which can be removed by strengthening the back-end support system of the application. Although manual tracing is rendering more result the digital one is faster. Limited reach of the technology is a cause of concern in employing it. Proper guidelines regarding how to use the application should be popularize thorough various platforms so that the masses can use them with ease. But also, the ethical concerns of the users about privacy and data usage should be addressed so that we can effectively use the technological advancements.

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