International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 04 Issue: 05 | May -2020 ISSN: 2582-3930

Response to COVID-19: Improvements and findings in community screening methods along with COVID hotspot identification techniques.

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Abstract

Coronavirus, a pandemic like never before is claiming thousands of precious lives each day, with spread rate of 2.5 times of normal flu, COVID-19 is highly infectious and has no proven cure or vaccine as of now, seeing how dangerous it is and to contain its spread countries like India have introduced complete lockdown in their respective jurisdiction.

In these lockdowns, only essential services have the permission to operate, like grocery stores or medical shops. Rest everything has been ordered to closed. People are told/ordered to stay at home, where they are only allowed to move out of their homes only to purchase essential items.

Many thoughare taking advantage of this and are moving out of their homes in the name of essential purchase, also the lockdown has created panic among the general population and they are hoarding items. Context of all this is that people in large numbers and everyone at the community level will go to these essential stores.

This indicating the only way to tap community level figures are these grocery shops, medical stores etc. Testing kits are not widely available and hence wide community-level testsis not very much possible in a country like India, an average non Antibody test costs about 5000 Indian rupees(source ICMR) and as of now, there are only 70 national labs and 50 private labs authorized to carry out tests. Even with more testing, it is highly unlikely we are about to monitor whole communities. As of March, we are able to conduct only 18tests per million in India, compared to South Korea where over 5000 tests has been carried out per million. Such high number of tests helped them to figure out hotspots of coronavirus, the area where you are most vulnerable to get in touch of this deadly respiratory infectious disease. Areas like these were quarantined and people were isolated. All these along with other measures helped Korea to Flatten the spread curve heavily, from reporting hundreds of cases a day they were down to only 30-40 cases per day all in a matter of a few weeks.

In London, similar community tracking is in process, the mobile application has been launched by their state authorities where you know GPS location of each corona patient in your locality so that you could avoid going there. These are the some of the essential steps that every nation is trying to duplicate to contain the spread.

But in a country like India with 1.3billion residents, such community tracking to contain the virus is very tough. So it is important to find new and cunning ways to obtain a similar result, it is highly important to identify vulnerablelocalities throughout the nation and isolate them, it would

help reduce migration and travel and will help contain the virus from spreading to other parts. But this process of identifying vital hotspots is only possible if we are able to track whole communities, with just 1-2 reported cases of COVID-19 in an area and that too at not constant frequencies is not enough to make judgements,and false creation or identification of tensed locations could create unnecessary panic among the general population. And it's highly important for the government to create a formula and a mechanism to effectively monitor communities and find a way for containment.

This paper is about the ideation of a system that would assist government solve this issue, and for proper identification we will have to use shops of necessity as the tracking centers and the data obtained from these centers must be uploaded on a common national portal and the data can then be used and analyzed accordingly with input of information like no. of foreign nationals or the confirmed cases of COVID, etc.

Problem background

"We have a simple message for all countries: test, test, test." Words of Dr Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization, speaking at a virtual press conference where he expressed concern over the action some nations have taken on detecting and containing the COVID-19 virus.

COVID-19 is a highly infectious respiratory virus, with an infection rate of sometimes over 2.5 per person, you can easily get the virus if proper precautions are not taken. Some of the ways you may get it is by touching a surface that might have COVID infected droplets of a person's cough. Then this infected virus gets stuck on your hands and when by chance you put your hand in your mouth or nose, you'll get infected from the same.

The dangerous thing about coronavirus is its variable mortality rate,The CFR(Case fatality rate) for COVID-19 in Italy is among the highest in the world and was 7.2% as of March, 2020. By comparison, the CFR in China was 2.3% as of February 11, 2020. There are potentially several reasons for these differences. Data from countries like China and other Asian nations showed a mortality rate of less than 3% with deaths mostly residing in people over the age of 65-70 and had medical histories like prevalence of ischemic heart disease, diabetes, active cancer. But data from western nations are pointing towards a much higher mortality rate. Example of Italy where deaths from coronavirus are standing tall at 10500(as per current status) that's over 10% of all infected cases. The elderly population share is

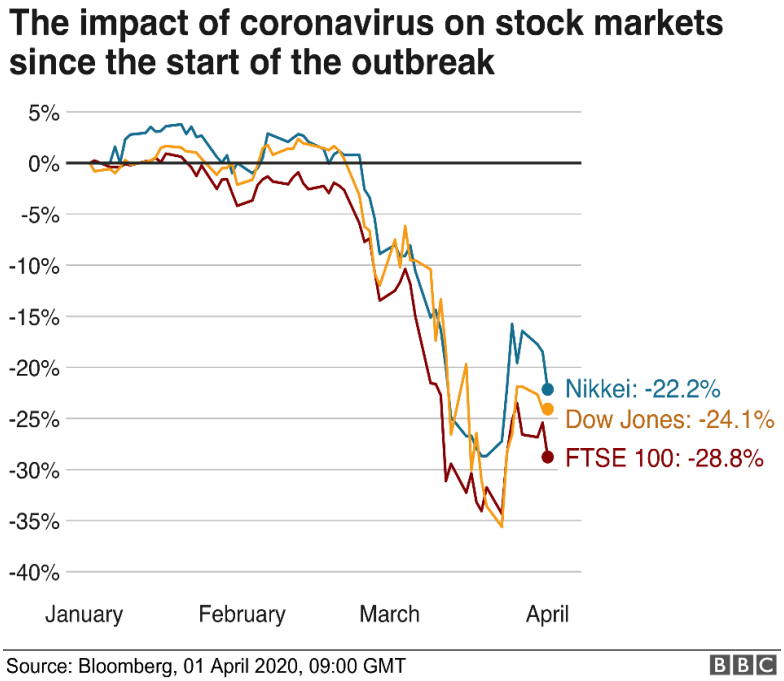
23% in Italy but that's so the case with other Asian nations like japan(where mortality rate is much less). The interesting fact is China standards don't allow a person to be declared confirmed of COVID-19 until they start showing symptoms, even though they have been tested positive, reducing mortality rate further down. In countries like Italy and Spain coronavirus have been proven deadly for the young population too. People even without having any medical history are having respiratory issues like breathlessness requiring the support of medical instrument ventilator.

COVID-19 patient doesn't show symptoms suddenly after getting infected, they may have an incubation period of up to 14 days, they may not even get tracked in temperature screening due to the same, they are potential carriers of the novel virus even they may think they are fit and there is no need to be in quarantine, they may go to grocery shops thinking the same, resulting in infecting others. The effective way to prevent this is the compulsory quarantine of more than 14 days for everyone. Everyone.

Cost of cure

As discussed above the only tested and viable cure for the COVID-19 is prevention. And to prevent this from spreading, only limited ways we have all revolves around hygiene and social distancing, but it's important to realise that social distancing and lockdowns too comes at a cost, isolating whole states and even nations are a huge burden to society leading to jobs losses, unemployment, revenue loss etc such repercussions common to be seen.

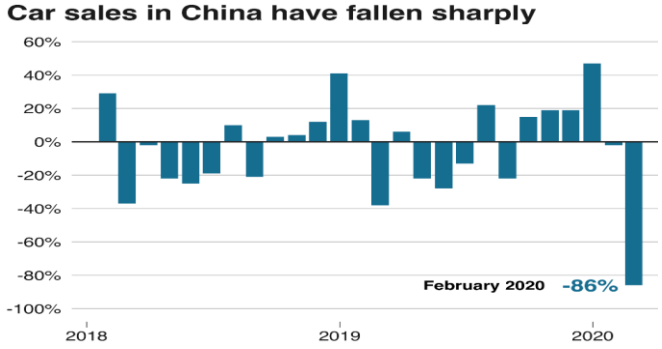
Global markets in the months of February and March only have lost more than a quarter of their capitalization. With airline stocks worst hit among them. With over 100 countries having travel restrictions and more than 1/3rs of global population under some sort of compulsory lockdown, air traffic is reduced to a level that airline companies have started going bankrupt(recent example of Air Deccan seizing their operations), losing more than 60% of their market value, example of United airlines stock that is trading at 23dollars as of now, was over 70dollars a share a couple of months back.

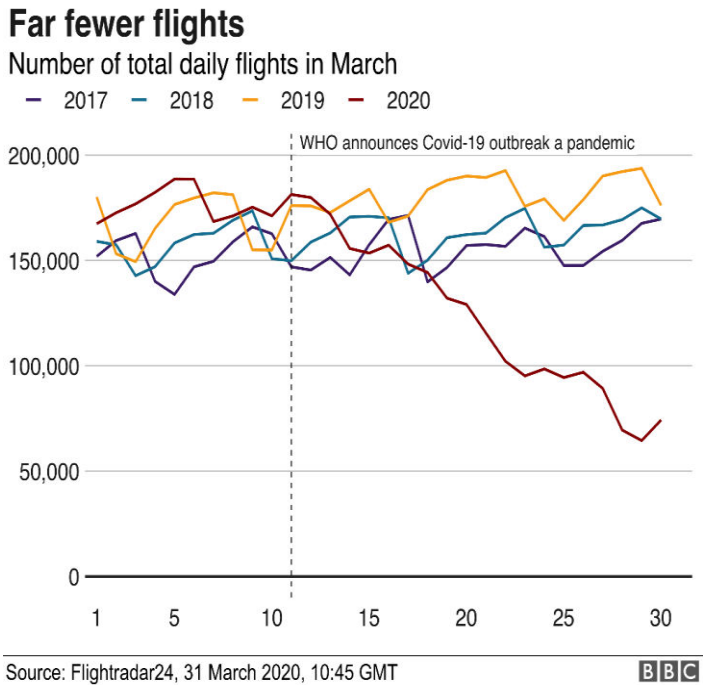


Source: Bloomberg and BBC

Unemployment rates are at an all-time high with over 10million people filing for unemployment benefits alone in the US, the worst-hit among them is migrant labours, with millions of them stuck without food and shelter, as there are travel restrictions and they can not move.

Source: BBC and China Automotive regulatory body





Source: Bloomberg and BBC

An example of car sales in China, the worst-hit ever recorded in their automotive market. And this is not just the case with them it's with every other nation out there on the planet. To prevent this economic, financial mayhem government have tabled relief packages highest ever given, the US giving 2trillion dollar stimulus to their economy, Britain over 330billion dollar, India over 1,75,000 crore rupees

TQT

Test, Quarantine, Treat- Mantra to win this fight against corona, testing coronavirus is not an easy process it costs thousands of rupees for a single test and results take hours to come, though using antibody test methods results can be achieved quickly and several firms, start-ups are working on the same. Still seeing economic and technical constraints testing even a tenth of the population is a distant dream, leaving countries with huge populations like India. But it is important to test so to quarantine the suspects and then the confirmed cases.

The next important stage in fighting COVID-19 is social distancing by self-isolation or quarantining yourself. Isolation is a must step for those who are infected or are in more vulnerable areas. Since it's not possible to detect and test every coronavirus suspect, government all over the globe have issued lockdown notices meaning you have to compulsory stay at home and can only go out for essential services. This is a necessary step to flatten the infection spread curve and ensure more people are safe indoors as they are not contracting any infected person.

Findings

- **Community Screening**

Testing communities may be a distant possibility but screening them isn't. One way for countries like India especially to contain the virus is to screen whole communities. And record the data obtained, using it for further actions and analysis like hotspot identification.

Through community screening, governments will be able to identify very early on areas and localities that are more vulnerable to coronavirus. Identifying most affected or prone to the virus communities/localities, government can declare them COVID hotspot and instead of imposing lockdowns in the whole of state, they can be specific to those areas. While other not so vulnerable localities, restrictions can be eased, discussed above the Huge economic, humane, financial impact of the restrictions it's important to identify and segregate safe zones and danger zones so that at least some people can be given relief and some economic activity can be started again.

But due to the viral nature of novel coronavirus, communities and whole populations have been ordered to stay home at any given case, In India, e-commerce shopping to anything non-essential is closed. From manufacturing to selling you cannot carry out such activity if you are not provided with an essential service licence by the authorities. Essential services for which people are allowed to

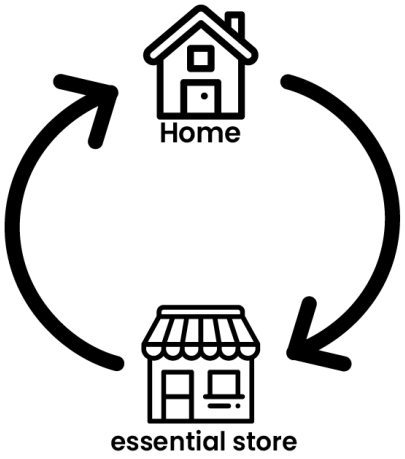
move out of their homes is related to food/groceries and medics only. Hence in the entire period of social distancing and lockdown, in a good proportion of cases if lockdown is followed by the general population. Only areas where a person(individual or representing a family) will only go to essential shops, grocery stores, supermarket, Kirana store or a chemist gathering essential items for himself/herself or the family. Frequency of visiting the store would vary a lot on various factors, persons individual characteristics, type of store, local restrictions, the distance at which it is located, family size etc.

Persona of situation

In any case representative from every family would visit these shops regularly, and that leads us to our current scenario, where the visitor to the store will be told to maintain social distancing, soon his existing groceries will run out and to fulfil the demand gap he will either contact home delivery services(available to only a tiny population; states have banned delivery services seeing increase chances of transmission by or to the delivery person and the goods) or will simply decide what he needs to purchase and from where and will go out using his own transport or through a walk to the nearby store, there at the store he will ensure proper hygiene and distancing, he'll make the purchase and will move back.

The person moving out may be of any gender and any age! And maybe alone or representing a family, since essential requirements are equal for all and they all equally prone to catching the coronavirus infection, and if they are representing a family it can be considered that minimal social practising is being maintained inside in between the family members, so the person representing them may be the indication of corona status of the whole of family/people living with him/her.

Current scenario



Screening points

These shops and stores are the only places where people everywhere will go, as they need to ensure they have the necessary goods with them, another place is either closed down by the government or they are not allowed to visit. Whether it is the local Kirana store or the chemist store, they are the only points that will witness representative of

every family around the nation at least once only in the initial week of lockdown and so it will continue.

It is recommended that these stores and shops to be used as screening points of the communities and localities.At a specific shop, people in general, only from nearby areas will come to make the purchase, thus giving a huge opportunity to the authorities to screen, map and track whole of communities by screening people visiting these stores, the data then can further be processed and nationalised to make conclusions.

These stores are 24*7 monitored by police and concerned departments and are given special licence to operate during this pandemic, hence it is easy for the government to ensure that they are complying with policies and strategies government is forming, expecting to adhere.

How to screen

Several pieces of research have been carried out in this domain on how to screen the suspects of coronavirus with maximum efficiency and accuracy.Still, screening is the method that doesn't guarantee detection of patients, it only provides you early detection ofmany corona suspects. But in tracking communities with high vulnerability screening of suspects is immensely necessary and governments and medical association around the globe all seem to agree on this. As a result, countries that have evolved an effective way of screening and ensured that it is seriously carried out at airports or any other place, have suffered less or late from the effects of the pandemic.

Example of japan that started screening of all international patients from early January, as of now only have around 1000 confirmed cases, as most of the suspects were detected very early and were quarantined accordingly.

Screening people when they will visit essential shops have many potential benefits. This includes getting broad community data, as few high suspects case can alarm government at an early stage that there might be chances of community transmission at a specific location/locality and government can take actions accordingly, it will help governments in identifying COVID-19 hotspots and put special restrictions at these hotspots to stop the spread. The data will be regularly updated in this case as a people will be visiting the essential shops regularly to meet the demand, hence the situation of a community is monitored real-time. Another benefit is this doesn't work on the principle of sampling as with compulsory screening of everyone visiting the stores will ensure that each individual(alone or

representing a group of people) is screened and data is processed.

There are several methods on how to screen COVID-19 patients and theses are constantly evolving as there is no perfect solution, but whatever method we are using to screen, some factors are important to consider, like we need to ensure that proper guidelines of hygiene and social distancing are followed considering real-time situations, we need to ensure touchless contacts and make sure that our screening method doesn't promote the same, it also needs to be economically and technologically feasible.

Suggesting a 3-step screening process that can be followed in such case of community tracking at necessity/essential shops/stores.

- Thermal scanning

The most popular and effective way, even advocated by the WHO to screen out suspects is to do the thermal/body temperature scan, since COVID-19 is a viral infectious disease it causes human body temperature to rise, resulting in fever, any mild change in our body temperature will indicate towards a possibility of a infectious virus, COVID-19 in this case.The normal body temperature of a human body is 98.6degree F, any change will eventually warn us.

- Gathering required Information from the individual/respondent

Screening doesn't end at thermal scanning only, certain important information like travel history, mild symptoms, age, proximity to an essential service employee must be extracted from the individual/visitor to the store. This basic info is very important for more meaningful and accurate detection of suspect cases, the government has introduced many apps, asking questions on different parameters and then telling you whether you should get a COVID test or not. But these apps are on the individual level and their data isn't used further for tracking, also low usage of these apps and at irregular intervals among populations is another indication towards unreliable data we may get from them especially at community level.

- Noting the behaviour of the respondent

The third step that authorities don't focus much on is also very vital,for complete screening of suspects. This step requires attendees at the stores to follow some basic observational tasks of noticing certain habits of the individuals and grading the same on different parameters, currently we are only focusing on self-diagnosis and that many times results in skipping of vital information or symptoms from which we may not be very familiar.

Requirements

It Is required that all this screening process is made compulsory for visitors at such places of essential items(helping to collect broad data, nationwide) and we should not ask visitors/respondents to diagnose themselves, rather allocate a special attendee to carry out all the screening taking responses of respondents, It is necessary because with this the equipment used will come in contact to that attendee only not to different individuals reducing the risk of transmission of virus.

To make shops understand and adhere to the screening process, it is important to educate them about the same and provide them with required product and software support, since all the data collected from this is required to be processed further to identify COVID hotspots and to tell consumers about their current health situation, a specific app is required to be developed, that will contain questions for step 2 and 3 of screening, and space where data recorded from step 1 from thermal scanning need to be uploaded.Once done the app will send all this to the government portal where it will be processed and analysed further. Phones with this application installed is to be provided to every essential store in a must, they can use their existing smartphones and give it to the attendee carrying out the screening process or if they don't have one, the government can provide so, a basic smartphone starts at 6000rupees or around 100dollars.

Next equipment which the government has to provide to these essential stores is the temperature measuring gun, the temperature gun is a must-have accessory to be used by the stores to measure human body temperature, which in fact is step 1 of the screening process, later this information is needed to be uploaded on the app provided, alongside with other step activities. Governments and authorities have to ensure that the hygiene and distancing norms at these places in general is maintained, while they are doing the screening process, like providing them with masks.

This activity is required to be carried out all of the essential stores licenced by the government throughout the nation for more inclusive, accurate and practical data. The steps of screening have been designed in a way that it won't take more than a minute per person and also will ensure that the person/respondent itself is not getting in close contact with the attendee or the equipment, as all of the stages will be carried by the shopkeeper attendee only, even at the step 2 where questions will be asked to respondents verbally by designated attendee only.

In summary, People going to shopshaving compulsory screening of them, data real-time is uploaded on the government portal and the visitor/consumer/respondent can carry on with the purchase afterwards.

Step 2 and step 3 of the screening process

After the thermal scanning is done, the attendee doing the screening process at the store would be presented with a questionnaire that he has to read out to the consumer/respondent and he/she has to answer the same, the questionnaire would be simple/short and would contain questions that matter to detect suspects of the COVID-19.

Suggested Questions that need to be presented to the attendee in the app, which he needs to ask verbally for responses could be as follows,

Step 2

1. Name/Aadhaar number(optional; India specific)
   Measure of identification, using aadhaar may increase total process time hence kept optional, also because the data or the testingwill be somewhat generic and regularly repeated for real-time situation/analysis.

2. Age group
   important factor! Researches have shown how much variations aftereffects of COVID-19 can have based on your age, old people have a weaker immune system comparatively and hence there are more chances they will show critical or dangerous symptoms after they get the virus.

3. Body temperature
   Measured from step 1 of screening process by the attendee of the respondent needs to be mentioned here, one of the most important step to consider in screening process.

4. Travel history
   Across the globe, in the initial stage, Coronavirus have expanded and transmitted through travellers from an infected region only. In India as of now, the majority of the cases are those who have a travel history or have come in contact with one. Hence, it is important to ask if the patient at least knows that he has a person with a travel history to affected regions living in his close proximity.

5. Self-diagnosed symptoms
   Visitors/respondentstelling about any respiratory symptom or similar related to

COVID-19 they are facing.If yes,exactly what type and from how many days. This information is also very vital.

6. Exposure to vulnerable
   Respondents telling about how much they are exposed to the environment/surrounding or the people they think have more chances of contracting covid_19, people working in healthcare systems are for example have comparatively more chances to get infected since they have to treat related patients.

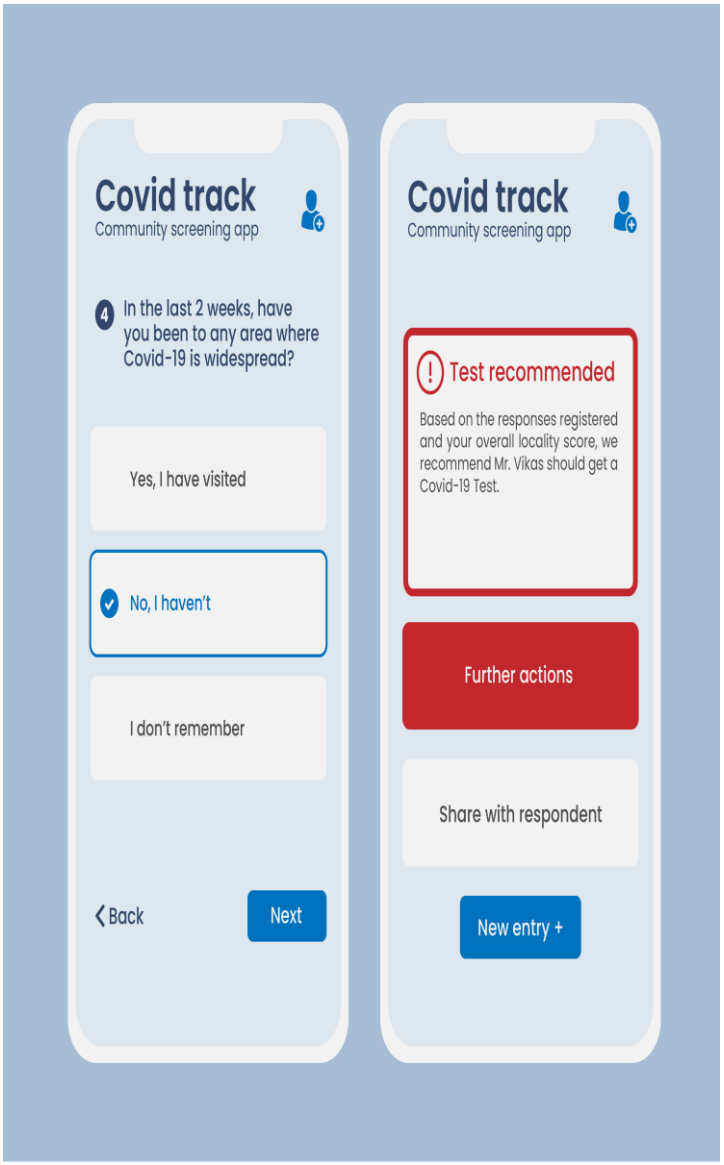
Step 3

1. the first question would be about whether the person is looking fit and healthy(important to note that unfit here is classified only if there are visible signs of infectious disease symptoms), the attendee has to look, judge and then grade, he has to see the behaviour of the subject observing things like, are they coughing? Or not etc.

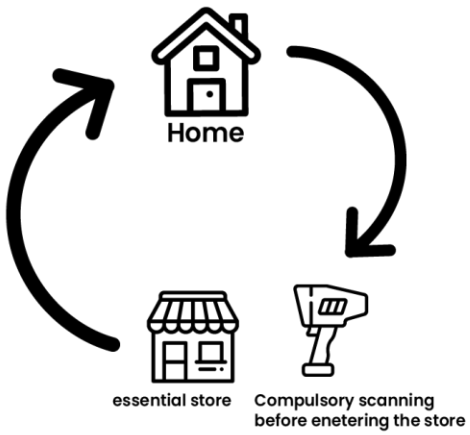
2. Is proper distancing norms or hygiene being maintained by the respondent, example of whether the person is wearing protective masks, gloves or is taking care of himself. This also needs to be judged and graded by the attendee.

These important questions would be presented in the screening app and all the required answers will be submitted via it. Answers of step 2 questions will be provided by the respondent to the attendee while the answers of step 3 questions are something that attendee has to judge himself and feed.

Suggested App design (design rights reserved.)



Division of suspect and danger levels through marking system Answers/responses to these questions must be marked based on the importance they hold in the screening process depending on considerations like what matters the most or what factors that are most likely to decide the fate or widely seen in a suspect. These points from individual answers are then needed to be combined with other factors giving an overall score of the same.



This overall score can be used to classify different levels of danger from No risk to immediate test and isolation, results to be provided or told to the customer/respondent if they pass on a certain danger level like mild risk and also it is required (automated) that all the data would be shared with the government real-time for further processing and analysis. Based on the score obtained people can be told what next steps they need to take. (e.g. they should try to isolate themselves even from their family members or they should get a COVID test done)

The updated scenario for the visitor only had a simple step added in the form of a screening test which is mandatory for them to do when they'll visit any essential item store. The attendee at the store would measure their temperature and ask them some basic questions. After that, they are good to go and continue with their purchase.

- **Identification of hotspot**

Concerned authorities know that to stop coronavirus from spreading nationwide/further, they must identify COVID hotspots, or areas that have high vulnerability for the same, this identification can be on any basis, the most common is how many confirmed cases of coronavirus are there. Chances of declaring an area COVID-19 hotspot is directly proportional to the number of cases there, this is a narrow outlook as places that might be affected from the disease with people having symptoms may not be declared a Corona hotspot because of lack of testing there. Hotspot identification shouldbe broad and inclusive and should not be limited only to the current norms.

With better classification techniques and formulating meaning algorithms that consider whole of situation from different aspects is necessary for accurate identification of these areas/zones, with the above community screening techniques this could just be the step in the right direction.

Accurate identification of these areas is very important so that it can be ensured that people from less affected localities don't come into contact with them, with people maintain caution and distance. The government could also introduce special restrictions for the identified hotspot and contain the virus there only from spreading. There are several methods or ways for such identification adopted by different governments around the globe but the common fault among them is the narrow outlook by not focusing on inclusive and wide community tracking and screening, in the case COVID-19 when you cannot test every suspect, it is very difficult to classify results based on a limited sample and thus it becomes utmost import to include every citizen of the nation in the screening/testing process, helping in more meaningful identification, and this paper simply suggests the same and how one-way government could do so.

Another problem that is required to be addressed is the current identification of hotspot borders, a couple of cases in town and governments tend do declare whole towns as COVID hotspot, then wasting a lot of resources as the economic burden is to be faced by everyone even if their locality is not exposed to the virus, also increasing difficulties for authorities to precisely identify the area where the spread is more. With the suggested community tracking, it will be very helpful in identifying exact localities that might have been affected with the spread and that too real-time, resulting in timely and more accurate action.

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Working scenario and resources

The current suggested community tracking method along with a suggested format if used together, we could achieve data that will be more helpful in accurately identifying vulnerable localities(hotspot), this identification of hotspot is possible if in synchronisation used with data of community screening. For this, it is important to design and develop a system of different stages that will work in harmony for current classification and identification of vulnerable areas,

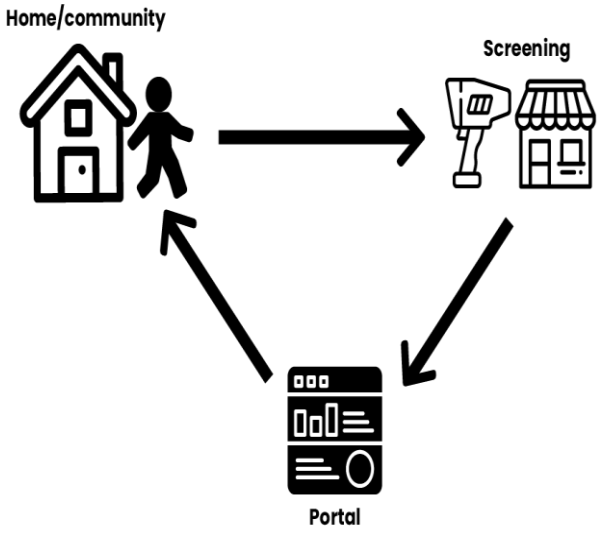
The first stage of this would be the community tracking via community screening and the App that will be used to obtain all the data that we have

discussed earlier, this data must then be processed initially and this processed data will further be sent to another portal for further analysis.

The second stage would require the development of the special portal, this portal which will be maintained by the government should be easily accessible to the general public, in this portal all the data from stage 1 will be analysed and some further calculations and analysis will be done(suggested afterwards) using other vital information like number of confirmed cases in tge area, number of people quarantined, population per sq. mile etc.Which in together will give us a suggestion on localities that might be vulnerable and probable COVID hotspot. This data and analysis will be publicly available and open for suggestion and since many of the information sourced is from outside(through government portals and websitese.g. ICMR) that are updated real-time, this portal should have a similar domino effect.

Suggested layout and features of the public portal on COVID hotspot is shown below, there needs to be a inclusive map and easy interface so that everyone can comprehend details, this comprehension through the portal would allow both governments to take accordingly actions and people to be more cautious as they are now aware where they should not try to go.

Much like AQI(air quality index) index and Map, this web accessed portal could be classified as CHT(COVID hotspot tracking) portal, where it is important not only real-time location-specific data is analysed and showed but also an index is developed which will classify different stages of danger levels in your locality, based on the overall score the specific locality it could be classified vulnerable.



Classification of levels

Level 1 (colour coded) – you are in a safe zone to level 5(colour coded) where there is extremely dangerous situation and the area has been declared a COVID hotspot, while levels in between indicating different stages of danger, to classify this differentiation in levels of danger the government could/should use some of the suggested factors, I have listed 10 factors and the importance of each of them.

It is suggested that the localities are divided or borders are identified based on 4-5 essential shops or 1.0sq meter whichever is lower, this is necessary to judge data more accurately and more specific, reducing risks of relative comprehensions and also since community data is provided to us from every registered/licenced shop differently. Though there will be situations when many factors you are considering to declare an area hotspot or to judge it's current vulnerability level, data available from these factors is not segregated or available at such breakdown level, in that case, the points or the threat level from the data should be equally divided through different localities falling under the realm of the area/district of which the data/information is available.

Factors (locality/area wise) to consider

1. The number of confirmed COVID cases per 1000 residents.

   Will be single-handedly the most important factor in deciding whether an area should be declared COVID hotspot or not, with more case percentage, the danger level increases in direct proportions.

2. Data/score obtained from community tracking.

   like the suggestion for using point-based marking system for each response during community tracking, it is important that those marks are collectively combined and the average of them is taken out as an overall score of that grocery shop, those scores about by each grocery shop will be used here for analysis. E.g., if a store X 70 people were tested in a day, with individual scores ranging from 20 to 50 out of 100, in that case, we will take an average of all these, supposedly the average is 37, then 37 would be the score of that essential/grocery store, and this will be updated and refreshed real-time or at short intervals. These scores obtained by stores would classify which danger level they are standing at now.

3. No. of people with Travel history

Discussed above in the community screening section also,Coronavirus has been introduced to nations from people who travelled to infected regions. In countries like India where we have still not entered full-blown community transmission stage and most of the cases are of the people who either have travelled abroad or who came into direct contact of them, hence it becomes important to take travel history of populations living the zone into account while making judgements. Data from this shown be accessed from concerned authorities like foreign ministry.

4. Timeline of confirmed cases

   is important for states to track and maintain a proper record of when, where and how many cases have been identified of COVID-19, town x that witnessed 100 cases in the first-week march has different vulnerability level then week 4 of march where for example the same town witnessed only 10 odd cases.

5. Distance from nearest COVID-19 hotspot

   Proximity to existing hotspot always increases the chances of risk as people tend to travel in nearby areas, increasing the risk of spread.

6. Is there any bus, train terminal, hospital etc. inside the region/area

   It is an important factor to consider which many times gets neglected, especially if the area has a hospital treating COVID patients or related, the risk of transmission increases substantially as a single mistake could spread the virus from the infectious person getting treatment there, a similar example we have seen in Delhi, where some areas have been kept under vision after a doctor at the local Mohalla clinic there, were tested positive. Also, any other place of mass gathering like bus terminal increases the chances of transmission because these are the places from where everyone round the city comes.

7. Population density

   An important aspect to consider, researches have shown coronavirus doesn't spread after 3.5ft (distance) hence it becomes important to consider living conditions and population density, places like Dharavi slums(8,60,000+ people per sq. Mile) that lacks space and people are forced to cramp up in small rooms, places like these have more chance of community spread than places where people live in

bungalows and have low population density.

8. Data from government self-diagnosis app; Arogya setu

   Over a million people have downloaded the setu app, also the government has launched other similarapps for self-diagnosis, any data accessed from these would only help in increasing the credibility and accuracy of the existing system.

9. GPS location of current confirmed cases(residing in isolation at their homes or at isolation centre)

   The thing becomes important many times, as on the map you could see where exactly the current confirmed cases are residing so that you can ensure your safety by carrying outdistancing practices. This data has been made public by the Indian government and can be accessed from the same.

10. Cases of pneumonia in the region

    Because many times, Cases of COVID are treated/considered as cases of normal existing pneumonia, one reason could be because of not testing every suspect with symptom.

Every factor holds different value in calculating and judging the overall situation/score of a specific locality and deciding which danger level they are, this list of factors is just a suggestion it is constantly evolving and modified. Each factor in itself also has different variations, these factors should also be graded and marked accordingly, depending on the variations among them, then these scores from all of the considered factors and variables are collected and a combined score is generated, based on that, level of danger is decided.

Sample marking table of any one factor

Population density	Marking accordingly
0-250	10
250-2500	20
2500- 25000	30
25000-250000	50
250000+	80

Portal Design

Portal design employees a very vital role in communicating information in the form you want, It should have an inclusive design, understood by everyone, serving its purpose, inspiration can be drawn from current portal design showing data of Air Quality, the portal design should increase awareness and should show relevant information only, we should refrain from an overload of data,

the colour scheme used in the representation of data also matters, like using red for danger. These small psychological and visual details create a much better experience serving its purpose with increased efficiency.

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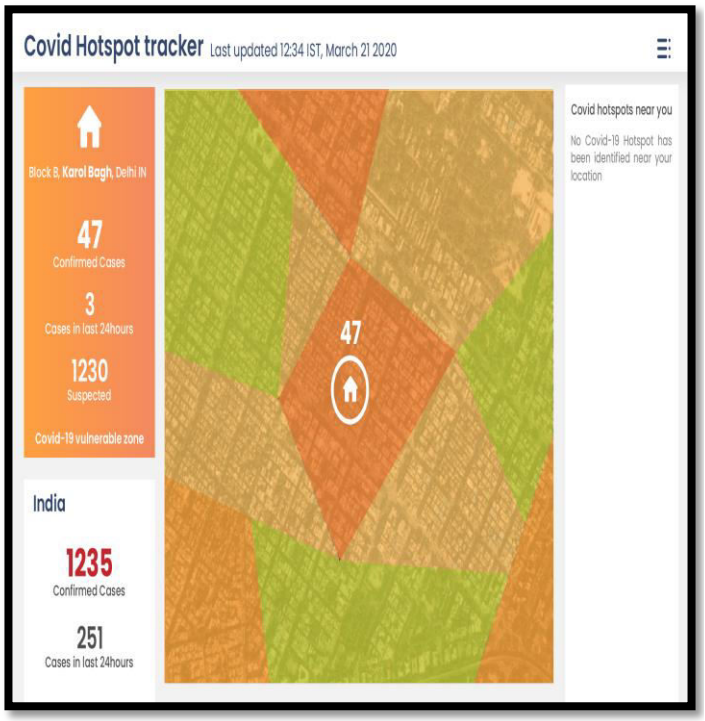

Conclusion

In summarised form, this paper is about the suggestion of how we could improve our existing community tracking methods by improved and broad way of screening and how we could use essential stores as these screening points from where we could gather locality specific community data of nearly every citizen or representative of a group/family together resulting in more accurate and effective data of communities, this also ensures that real-time analysis of data and could warn citizens if they are in danger zones, could tell them if they require an urgent test or not. The second part is the continuation of the first one only where the issue of COVID hotspot identification has been discussed, factors and ways to correctly and accurately identifying the high-risk areas, along with the classification of risk levels of other localities have been suggested. Suggested factors to consider in analysis and from where to source data and how to process it(like how to use information gathered from the first part of community tracking). Once we can classify localities from low risk to hotspot, way in the portal have also been suggested where we discussed how and what data needs to be presented, warning and helping not only the citizens of the nation but also the governments helping them take actions more effectively and efficiently. This research has especially been carried to assist the government and the people in these difficult times and hopes it does the same.

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