

COVID-19

Considerations for the implementation and management of contact tracing for coronavirus disease 2019 (COVID-19) in the Region of the Americas

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1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared the outbreak of coronavirus disease (COVID-19) a pandemic. As the pandemic continues to evolve, countries and territories are implementing actions to reduce the rate of SARS-CoV-2 virus transmission in areas where COVID-19 virus is already circulating, while stepping up efforts to provide optimized care to infected patients.

Public health measures to control the spread and/or mitigate the impact of COVID-19 include isolation of cases, contact tracing of individuals who have been exposed to a confirmed or probable COVID-19 case,¹ and quarantine. Notwithstanding its feasibility depending on the transmissions scenario experienced, contact tracing is intended to allow for the early detection of cases among individuals who have been exposed to SARS-CoV-2 virus and supporting the control of transmission. Contact tracing has been used extensively as a primary means for control of infectious diseases with low prevalence (i.e. TB, HIV, sexually transmitted infections, vaccine-preventable diseases such as measles, Ebola Virus Disease, SARS, influenza A/H5N1) and is intricately connected to case finding and investigation. WHO recommends that contacts of laboratory-confirmed COVID-19 cases be quarantined for 14 days from the last time they were exposed to the index patient.² Figure 1 explains the concept of contact tracing in response to COVID-19.

2. Purpose of the document

This document is intended to complement the interim guidance by WHO on Contact tracing in the context of COVID-19.³ It aims at providing guidance and operational recommendations for implementing contact tracing for COVID-19 in the Americas. The document incorporates current WHO recommendations, considering recommendations from other international agencies and public health institutions. It will be updated as current knowledge on COVID-19 evolves.

3. Target audience

The target audiences of this document are national health authorities, public health professionals, and other officials involved in developing and implementing policies and standard operating procedures on contact tracing operations in the Americas.

¹ World Health Organization. Global surveillance for COVID-19 caused by human infection with COVID-19 virus: interim guidance, available at: <https://www.who.int/publications-detail/global-surveillance-for-covid-19-caused-by-human-infection-with-covid-19-virus-interim-guidance> [accessed on 18 May 2020]

² World Health Organization. Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19). Available at: [https://www.who.int/publications-detail/considerations-for-quarantine-of-individuals-in-the-context-of-containment-for-coronavirus-disease-\(covid-19\)](https://www.who.int/publications-detail/considerations-for-quarantine-of-individuals-in-the-context-of-containment-for-coronavirus-disease-(covid-19)) [accessed on 18 May 2020]

³ World Health Organization. Contact tracing in the context of COVID-19: interim guidance, available at: <https://www.who.int/publications-detail/contact-tracing-in-the-context-of-covid-19> [accessed on 18 May 2020]

4. Ethical duty to conduct and support rigorous CoVID-19 contact tracing⁴

As part of the multifaceted response to the COVID-19 pandemic, health authorities have the ethical obligation to conduct rigorous contact tracing and to act without delay based on information obtained. Public health authorities should further ensure that:

- Data are managed responsibly: The privacy of individuals and the confidentiality of their personal information should be protected. Public health teams must thus disclose the minimum amount of information required to achieve the objectives of contact tracing. For example, contacts should be only told that they have been exposed to the infection, but not informed of the person who was the source of the exposure. Public health practitioners have the duty to warn individuals of their exposure.
- Risks are minimized: Contact tracing can entail risks of stigmatization and discrimination, along with economic loss and psychological distress. Contact tracing conducted in the context of other diseases, such as Ebola Virus Disease or TB, has shown that it may discourage contacts from seeking medical treatment for fear of loss of confidentiality and subsequent stigma, discrimination or abuse. Officials involved in contact tracing operations must exercise caution to minimize these risks through: community engagement (e.g. involving and educating community leaders on COVID-19 and the community's role in the response), public communication and psychosocial support to overcome the fear associated with COVID-19; a carefully designed risk communication strategy. Information about the evolution of the pandemic must be communicated with extreme care to the public to further minimize these risks.
- The population is informed: The public must be informed about ongoing contact tracing efforts, their essential role to control the spread of COVID-19 and protect the health of the population, and the commitment to conduct contact tracing ethically. It is the health authority's duty to provide this information in a way that is understandable for the public, which in turn is necessary to advance the trust in the public health authority and the cooperation with the measures required by the response to COVID-19 that are necessary for a successful response.

⁴ Developed on the basis of: Pan American Health Organization. Ethics guidance on issues raised by the novel coronavirus disease (COVID-19) pandemic. Washington DC: PAHO; 2020. Available from: <https://www.paho.org/en/documents/ethics-guidance-issues-raised-novel-coronavirus-disease-covid-19-pandemic>. World Health Organization. Guidelines on ethical issues in public health surveillance. Geneva: WHO; 2016. Available from: <https://apps.who.int/iris/bitstream/handle/10665/255721/9789241512657-eng.pdf?sequence=1>. World Health Organization. Guidance for managing ethical issues in infectious disease outbreaks. Geneva: WHO; 2016. Available from: <https://apps.who.int/iris/bitstream/handle/10665/250580/9789241549837-eng.pdf?sequence=1&isAllowed=y>

- Data are promptly shared: It is imperative that all parties involved in COVID-19 surveillance share data in a timely fashion. Considering the urgency and global dimension of the COVID-19 pandemic, timely data sharing of the highest possible quality is critical to inform decision-making capable of protecting the health of the public effectively.⁵

The population has the ethical duty to cooperate with contact tracing efforts. The population must always be treated respectfully, which entails explaining the importance of their contribution to these efforts, providing the information about the data that will be collected and how it will be used, and reassuring people that their privacy and the confidentiality of their information will be protected, and that this information will only be used for public health purposes.

5. Definitions

Contact tracing requires the application of definitions for what defines a confirmed or probable COVID-19 case and a contact.

COVID-19 case⁶

Probable case

A. A suspect case for whom testing for the COVID-19 virus is inconclusive.¹

OR

B. A suspect case for whom testing could not be performed for any reason.

Confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

Contact^{7,8}

A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:

1. Face-to-face contact with a probable or confirmed case within 1 meter and for more than 15 minutes;
2. Direct physical contact with a probable or confirmed case;

⁵ World Health Organization. WHO guidelines on ethical issues in public health surveillance, available from: <https://apps.who.int/iris/bitstream/handle/10665/255721/9789241512657-eng.pdf?sequence=1> [accessed on 18 May 2020]

⁶ World Health Organization. Global surveillance for COVID-19 caused by human infection with COVID-19 virus: interim guidance, available at: <https://www.who.int/publications-detail/global-surveillance-for-covid-19-caused-by-human-infection-with-covid-19-virus-interim-guidance> [accessed on 18 May 2020]

⁷ Ditto as per footnote 6

⁸ WHO. Considerations in the investigation of cases and clusters of COVID-19 Interim guidance 13 March 2020; available at: <https://www.who.int/publications-detail/considerations-in-the-investigation-of-cases-and-clusters-of-covid-19>

3. Direct care for a patient with probable or confirmed COVID-19 disease without using proper personal protective equipment; 2OR
4. Other situations as indicated by local risk assessments.

Note: for confirmed asymptomatic cases, the period of contact is measured as the 2 days before through the 14 days after the date on which the sample was taken which led to confirmation.

Quarantine of persons⁹

The quarantine of persons is the restriction of activities and/or separation of persons who are not ill, but who may be exposed to an infectious agent or disease, with the objective of monitoring symptoms and early detection of cases. Quarantine is different from isolation, which is the separation of ill or infected persons from others, to prevent the spread of infection or contamination. Quarantine can be conducted in a medical facility or other setting established by public health authorities for that purpose (hotels, dormitories etc.) or in the contact's home (*home quarantine*).

Monitoring of COVID-19 contacts

The daily act of establishing communication with contacts and follow up on presence or absence of symptoms of fever, feeling feverish, cough, or breathing difficulty.

- Communication can be done face to face, via phone calls, text messages, app or email at least once a day.
- High risk contacts, such as health care workers, can be contacted twice daily, and/or can conduct self-monitoring and report temperature and presence/absence of symptoms twice a day.

Self-monitoring: Contacts can monitor themselves for fever by taking their temperature twice a day and remain alert for cough or difficulty breathing. If they develop symptoms (feel feverish or develop measured fever, cough, or difficulty breathing) during the self-monitoring period, they should self-isolate, and seek advice by telephone from their local health department to determine whether medical evaluation is needed.

Closed contact monitoring

The monitoring of a contact is considered closed if he/she did not develop symptoms by the end of the quarantine period or if all necessary actions were taken and completed for symptomatic contacts. After the quarantine period, the person should continue to implement the public health measures recommended for the general population.

⁹ World Health Organization. Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19), available at: [https://www.who.int/publications-detail/considerations-for-quarantine-of-individuals-in-the-context-of-containment-for-coronavirus-disease-\(covid-19\)](https://www.who.int/publications-detail/considerations-for-quarantine-of-individuals-in-the-context-of-containment-for-coronavirus-disease-(covid-19)) [accessed on 18 May 2020]

6. Purpose of contact tracing within an outbreak of COVID-19

Within the COVID-19 response, contact tracing is part of a package of measures in place to control the outbreak. The goals of contact tracing are:

For the individual:

- To alert contacts to the possibility of infection and offer information and counseling;
- To offer diagnosis, counseling and treatment to contacts who develop symptoms, especially those at higher risk of developing complications such as older adults and individuals with underlying medical conditions.

For the community:

- To interrupt ongoing transmission through prompt quarantine, and reduce the spread of an infection;
- To identify novel areas at high-risk of infection and implement preventive measures;
- To identify areas for enhanced environmental measures for disinfection.

For public health decision makers:

- To better characterize COVID-19 situation, guide the development of public health recommendations, and ensure the timely deployment of response countermeasures.

Any missed or lost to follow-up contact can be detrimental to accomplishing these goals.

The objective of contact tracing is to identify and monitor all social, familial, work and healthcare workers contacts who have had contact with a confirmed case (*cf. 5 Definitions*). Contacts should self-quarantine for 14 days following their last exposure to the COVID-19 case. At the end of the quarantine period and depending of laboratory resources, respiratory samples from quarantined persons should be sent for laboratory testing. Prioritization for testing asymptomatic contacts should be given to health care workers, people who are at risk of developing severe disease and household contacts (For more information see ¹⁰).

Member States may consider contact tracing of a suspected case depending on the epidemiological situation including the extent of local transmission, and human and financial resources available. Figure 2 highlights the role of contact tracing in different epidemiological scenarios of COVID-19.

¹⁰ World Health Organization. Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19). 19 March 2020

Figure 1. Overview of contact tracing for COVID-19

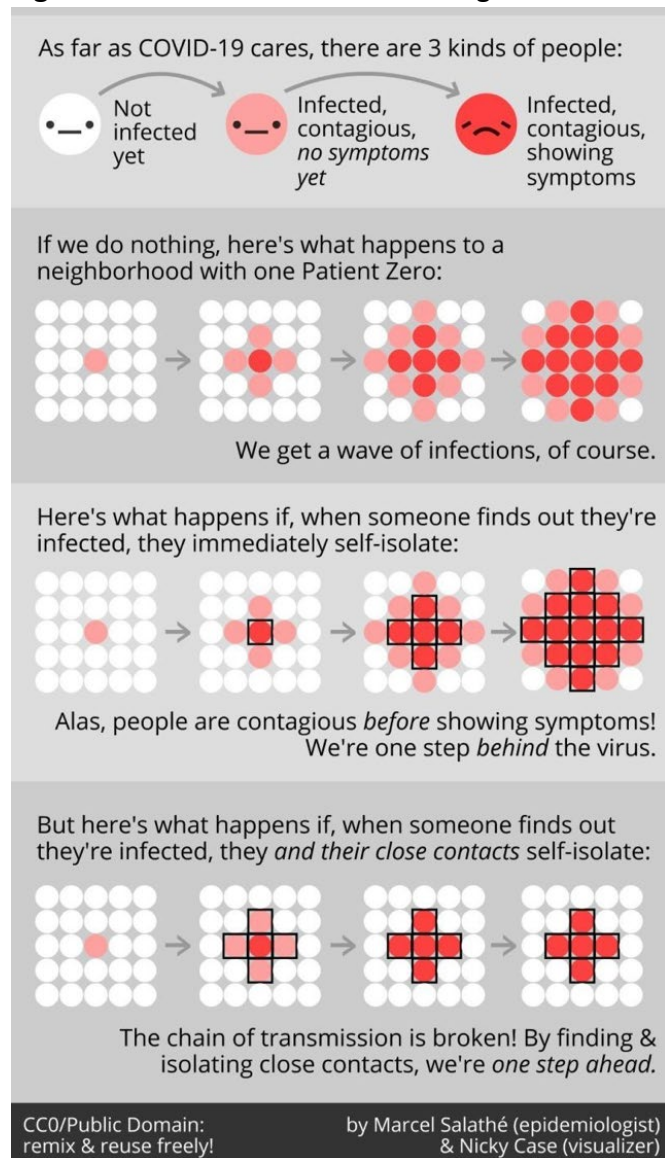


Figure 2. Epidemiological scenarios defined by WHO for preparedness, readiness and action

- **No COVID-19 cases:** the focus should be on ensuring that a well-trained contact tracing workforce is available and ready to respond.
- **Sporadic COVID-19 cases or small clusters:** contact tracing is crucial to rapidly interrupt transmission and prevent the expansion of clusters.
- Settings with **sustained community transmission:** contact tracing efforts complement physical distancing measures to reduce the transmission intensity and limit disease spread ('flatten the curve'). However, when COVID-19 incidence and the number of cases increase to a point where traditional contact tracing is no longer feasible, health authorities may choose to focus closed settings that concentrate high-risk populations such as hospitals and care homes, prioritize vulnerable contacts, and maintain strong contact tracing capacity in geographical areas with smaller COVID-19 clusters.
- During the **decreasing phase** of the epidemic, and particularly when lockdown measures or physical distancing measures are being relaxed, contact tracing becomes critical again to maintain low levels of transmission and rapidly interrupt new transmission chains.

Source: Adapted from WHO Contact tracing guidelines for COVID-19. Draft v3. 27 April 2020.

7. Contact tracing and management in the response to COVID-19

7.1. Planning and Preparation for Contact Tracing

A preparation phase is essential to set up coordination teams and deploy the necessary funding, infrastructure, materials and human resources, so contact tracing can be conducted effectively and in a timely fashion. The Ministry of Health of the Member States should start disseminating messages to the community regarding contact tracing, so people understand and know what to expect in case they are identified as a contact and know what resources are available to them. Contact tracing and associated steps such as quarantine and isolation should not be used punitively or associated with security measures, immigration status, or other non-public health concerns. Thus, WHO recommends against using security services for contact tracing and for a voluntary participation of cases and contacts.

The national response team coordinates contact tracing activities across the country with regional, and local teams coordinating the contact tracing activities at regional/local level. The national/regional staff may also act as surge teams in case the local efforts need support or strengthening. Contact tracing requires coordination across several local or regional public health jurisdictions. Contact tracing in Latin America and the Caribbean has usually been undertaken by public health officials, epidemiologists, and hospital teams; however, depending on the extent of the outbreak and the available resources, contact tracing teams may also involve adequately trained health care providers, community volunteers, or civil society members. These teams must

speak the language of the interviewees and be familiar with the social and cultural milieu in which they operate.

The availability of resources and the extent to which preparatory activities are needed will vary from country to country. Member States must obtain the necessary equipment, tools and infrastructure, and train the appropriate personnel, before the start of contact tracing, home quarantine and monitoring. Examples of resources required include:

- Staff training: staff at national and local levels need to be trained on the contact tracing activities and procedures (i.e phone interviewing, data collection, follow-up and reporting);
- Set-up of call centers with a toll-free number: a call center with staff for contact tracing activities and available to contacts if they become symptomatic;
- Use or development of new technologies, such as a mobile phone application to facilitate contact tracing and /or a tool-free twice daily Short Message Service (SMS) to inquire about a contacts health);
- Stocking and pre-positioning PPE at the national (central stockpile) and regional/local levels, frequency of restocking, and minimal stock directives to avoid stock-outs (see https://www.who.int/docs/default-source/coronaviruse/covid-19-sprp-unct-guidelines.pdf?sfvrsn=81ff43d8_4), if face-to-face contact tracing is performed.
- Validated protocols, templates and questionnaires (paper or electronic) for data collection (during phone interviews, for example).
- Set-up of a national database to collect, collate and analyze all data obtained.
- Laboratory resources (human and materials) for sample taken at the place the contact is quarantine and in case developed symptomatology.

7.2. Steps in Contact Tracing

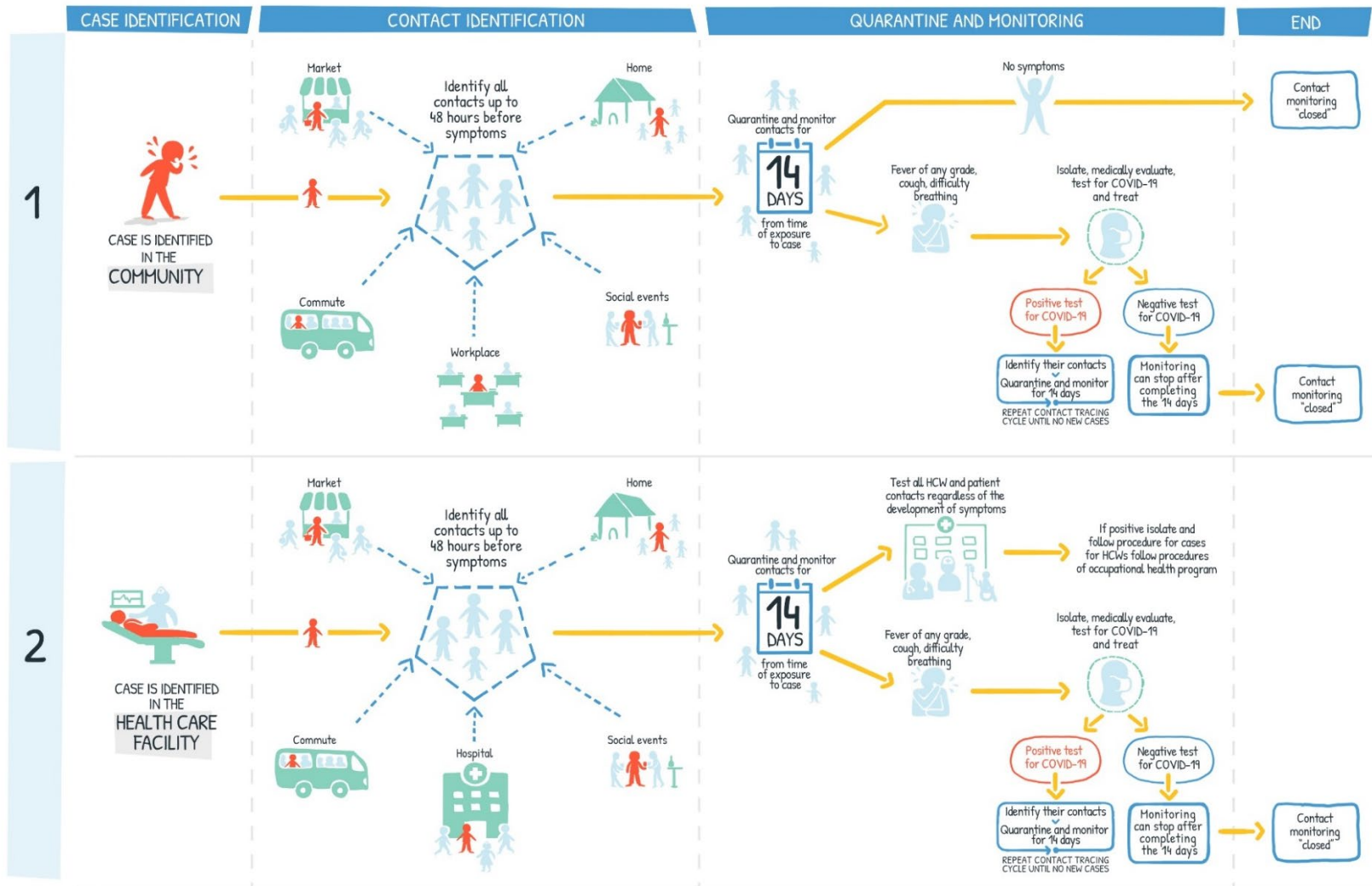
Figure 3. summarizes the steps in contact tracing and management in response to COVID-19.

Case investigation and contact identification

- Immediately after a patient meets the definition of a confirmed COVID-19 case, isolated the case and rapid response team systematically identifies all individuals that may have been in contact with him/her as early as 48 hours before he/she developed symptoms. This is done by administering probing questions to the case, to delineate all the activities he/she performed and identifying those involved in the activities. No aspect of the case's daily activities should be missed. This process may also involve going to locations visited by the case to identify potential exposed individuals that the case did not know (i.e., restaurant, hotel, conference, market, etc.). In the event of a deceased case, parties that were involved in all situations surrounding him/her in the hours and days before death could be interviewed. Additional information is gathered from people with geographic proximity to the case, including family and neighbors. In order to ensure a complete and accurate list of contacts, several interviews of the case may need to be performed over time. The case should also be provided with an easy modality by which to reach the tracers in the event they recall more contacts.

Figure 3. Contact tracing in the community and healthcare settings

CONTACT TRACING in the community (1) and in health care settings (2)



Visual story design: Trilce Garcia Cosovalente

Source: Adapted from WHO's "Considerations in the investigation of cases and clusters of COVID-19 Interim guidance", March 2020.

- Countries may wish to use digital applications and new technology to help identify geographical locations attended by COVID-19 cases. Information can be provided to the community to aid in locating and identifying people that could be contacts.
- Each contact identified by the investigation team is reported on a “contact listing form” that collects information about contacts’ interaction with or relation to the case, date of last contact, type of contact, contacts’ residential location and contact information (annex 1).
- Each contact identified and listed should first be contacted over the phone or in person to confirm their exposure and decide whether they meet the contact definition and thus require monitoring. Once exposure is verified, monitoring is initiated.
- Once a potential contact has been confirmed as a COVID-19 contact, the individual should be notified that he/she must be quarantined, and the monitoring procedure should be explained. The contact, as well as household members or caregivers where applicable, should be educated regarding the signs and symptoms of COVID-19 and protective measures. They should be given the contact information for the tracing team, and local public health office to alert if any symptoms develop, and instructions on when and where to seek care, the most appropriate mode of transportation, when and where to enter the designated health care facility, and what infection control precautions should be followed including:
 - While traveling to seek care, the ill person should wear a medical mask.
 - Avoid public transportation to the health care facility, if possible; call an ambulance or transport the ill person with a private vehicle and open the windows of the vehicle if possible.
 - The symptomatic contact should be advised to always perform respiratory hygiene and hand hygiene; stand or sit as far away from others as possible (1 meter or more), when in transit and when in the health care facility.
 - Any surfaces that become soiled with respiratory secretions and other body fluids during transport should be cleaned with soap or detergent and disinfected with regular household product containing a diluted bleach at 0.5%.

Quarantine of contacts

- **All COVID-19 contacts, as per definition above, should be quarantined for 14 days.** For additional information please see: World Health Organization. Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19).

Monitoring of contacts

- Monitoring should be carried out for all contacts. Each individual should be contacted at least once a day (depending on risk assessment) via phone calls, text messages, email, app, or face-to-face, and asked about symptoms of fever (*measured or feeling feverish*) or cough or other respiratory symptoms, for 14 days following the last exposure to a confirmed case of COVID-

19. Even if a contact receives only one call per day, he/she should report records of symptoms for the morning and evening. It should be stressed that considering that the elderly, immunocompromised or those taking anti-pyretic analgesia may not present with fever, reporting other symptoms will be crucial. Special attention should be given to the monitoring of subpopulations that cannot shelter in place or are locally considered vulnerable populations such as the homeless, migrants/displaced, and indigenous populations.

- All COVID-19 contacts should have a contact tracing form completed to collect relevant demographic, epidemiological and exposure data as shown in table 1 and annex 2. This information will be collected on the first day of follow-up. If a contact develops symptoms, action should be taken to ensure his/her isolation, and the contact tracing staff will notify the appointed health officer medical evaluation, testing and treatment. If by the end of the monitoring period the contact has not developed symptoms, the contact monitoring is considered “closed”. The contact should be advised to continue to implement the public health measures for COVID-19 recommended for the general population. If the contact is exposed to a new COVID-19 confirmed case (e.g., a person in the family tests positive), the 14-day count starts again.

Table 1. Example of information to collect in COVID-19 contact tracing forms.

Type of information	Recommended minimum data
Contact identification (entered once)	<ul style="list-style-type: none"> • Contact ID • Name (first, last) • Address (and geolocation, where possible) • Phone number and/or other contact details
Demographic information (entered once)	<ul style="list-style-type: none"> • Age • Sex/Gender • Occupation (to identify HCWs)
Type of contact (entered once)	<ul style="list-style-type: none"> • Type of contact (household, community, health facility, other) • Date of last contact with the COVID-19 case
Daily follow-up of signs and symptoms (daily entry fields)	<ul style="list-style-type: none"> • Fever (mention if perceived or measured, and whether reported or observed) • Other signs and symptoms: sore throat, cough, shortness of breath or difficulty breathing, muscle pain, loss of smell (anosmia) or taste, or diarrhoea
Absence or loss to follow-up	<ul style="list-style-type: none"> • Reasons for non-reporting of daily signs and symptoms (contacts are unavailable, relocated, lost to follow-up) • Address (if known) of where the contact has relocated.
Actions taken if symptomatic (entered once)	<ul style="list-style-type: none"> • Referral criteria (based on clinical severity and presence of vulnerability factors) • Contact’s location (self-isolation at home, other self-isolation facility, hospital) • Whether a sample has been taken, and date of collection

Source: Adapted from WHO Contact tracing guidelines for COVID-19. Draft v3. 27 April 2020.

7.3. Contact Tracing Indicators and Analysis

Questionnaires

When a contact is identified, the contact tracing staff will administer the initial questionnaire to collect information on the person's demographic information (i.e., name, sex, age), contact information (i.e., address of residence, phone number), profession (i.e., whether or not the contact is a HCW) and relationship to the COVID-19 case (i.e., relationship to the case, date of last contact) (See Annex 1).

Once the 14 days of contact tracing start, the staff will administer a daily questionnaire to each contact under monitoring to record any signs or symptoms of disease. The questionnaire administration can occur in person or remotely, according to the Member State's guidelines. For each contact, the staff will record the presence or absence of any of the signs or symptoms associated with COVID-19:

- Fever ($\geq 38^{\circ}\text{C}$ or feeling feverish),
- Dry cough,
- Shortness of breath or difficulty breathing,
- Others: sore throat, cough, muscle pain, loss of smell (anosmia) or taste, or diarrhea.

This information will be collected on each of the 14 days for each contact under monitoring (annex 2).

If the contact is not available for monitoring at the appointed time, the staff will contact the person again at the end of the day. If the contact still is not available, he/she will be marked as "not seen". If a contact is not seen for three or more days, he/she will be classified as "lost to monitoring".

Indicators for monitoring and performance

At the end of each day of monitoring, the staff sums the information and calculate the following indicators. See Annex 3 for an example of this indicator reporting form:

- Number of contacts scheduled to be followed today
 - o Equal to the total number of contacts that a staff member must contact and monitor on a given day. All contacts are recorded on the staff's daily contact list.
- Number of contacts seen today
 - o Equal to the number of contacts who provided the required information to the staff member on a given day. If the contact provides the information before midnight on a given day, he/she is classified as "seen"
- Number of contacts not seen today
 - o Equal to the number of contacts who did not provide the required information to the staff member on a given day. If the contact did not provide the information before midnight on a given day, he/she is classified as "not seen"
- Number of contacts lost to follow up (i.e., not seen for 3+ consecutive days)

- Equal to the number of contacts who did not provide the required information to the staff member for three or more consecutive days. If the contact is not available for two days but provides information on the third day, he/she is classified as “not seen” for the first two days but is not considered to be “lost to monitoring”.
- Number of contacts who developed symptoms
 - Equal to the number of contacts who develop one or more symptoms during the 14-day monitoring period. This number should be equal to the number of referrals that the staff makes to the appointed public health officer for further medical evaluation and testing.

Note: The sum of contacts “seen” and contacts “not seen” should be equal to the total number of contacts to be monitored.

Indicators to assess contact tracing efforts

Monitoring of contact tracing efforts is essential to understand if it is successful in reducing disease transmission in the community. At the end of each reporting period, the contact tracing staff will calculate the following indicators to assess its understanding of the COVID-19 transmission chains. Specifically:

IMPACT INDICATOR

- **Percentage of COVID-19 cases who originated from the contact list**
 - Equal to the number of new COVID-19 cases who were known contacts divided by the number of new COVID-19 cases, in a given time period.
 - The higher this proportion, the more confidence public health officers have that they have identified the complete transmission chain and can interrupt it quickly by recommending home quarantine to contacts. It is an indicator of the quality of the contact tracing.

COMPLETENESS OF CASE INVESTIGATION AND CONTACT TRACING

- **Percentage of cases with contacts identified**
 - Equal to the number of COVID-19 cases with contacts identified, divided by the total number of cases, in a given time period.
 - Provides information on the coverage of contact tracing among cases.
- **Percentage of contacts that were interviewed out of contacts reported**
 - Equal to the number of contacts that were interviewed among all contacts identified, in a given time period.

COMPLETENESS OF MONITORING

- **Percentage of contacts that are followed up daily**
 - Equal to the number of contacts that are contacted daily for symptoms reporting and follow-up divided by the number of all contacts to be followed-up (meeting the definition of contact), in a given time period.

- **Percentage of contacts that are lost to follow up**
 - o Equal to the number of contacts that had initiated follow up but did not complete the entire follow up period divided by the number of contacts that initiated follow up, in a given time period.

TIMELINESS OF QUARANTINE

- **Percentage of contacts that are quarantined within 24 hours of confirming their exposure.**
 - o Equal to the number of contacts for whom exposure was confirmed and who were quarantined within 24 hours divided by the total number of contacts with confirmed exposure.

ADDITIONAL INDICATORS

- **Percentage of contacts that become confirmed cases**
 - o Equal to the number of identified contacts that were confirmed as COVID-19 cases divided by the total number of identified contacts.
 - o A measure of the frequency of new cases of COVID-19 infection that occur among contacts within the incubation period (range) following exposure to a primary confirmed case, in relation to the total number of exposed contacts. The denominator should be restricted to susceptible contacts when these can be determined.
- **Percentage of contacts that develop clinical symptoms compatible with COVID-19**
 - o Equal to the number of contacts that developed symptoms suggestive of COVID-19 divided by all contacts.
 - o In the absence of testing, it can be a measure of person-to-person spread.
- **Time from exposure to symptom onset**
 - o Equal to the number of days between the contact's exposure to a case and the presentation of one or more symptoms in the contact.
 - o This indicator helps refine our understanding of the length of time between a contact's exposure and his/her symptom onset, and can influence policy concerning the length of time to consider when identifying contacts – to include the days when the case was asymptomatic but already infectious.
- **Time from symptom onset of case to symptom onset of contact**
 - o Equal to the number of days between the presentation of symptoms in a confirmed COVID-19 case and the presentation of symptoms in a known contact of the case
 - o This indicator helps refine our understanding of the speed of infection between cases and contacts, and can influence policy regarding public health measures for mitigation and suppression of the infection.
- **Time from symptom onset of contact to case confirmation**
 - o Equal to the number of days between the presentation of symptoms in a confirmed COVID-19 case and the presentation of symptoms in a known contact of the case
 - o This indicator helps refine our understanding of the speed of infection between cases and contacts, and can influence policy regarding public health measures for mitigation and suppression of the infection.

- **Number of contacts per case**
 - o Equal to the average number of contacts that originate from each case.
 - o This indicator can help understand how well contacts are being identified, and resources needed and guide planning public health measures.
- **Mapping and network analysis**
 - o Information on the location of the cases during the infectious period, as well as of the contacts during the exposure period, can support the visualization of transmission chains in the community. The identification of highly infected neighborhoods and their contiguous areas can mobilize heightened containment and prevention measures to limit the spread of the disease to other areas.

Additionally, Member States may wish to conduct studies to assess the epidemiology and clinical characteristics of cases and contacts in different settings. Applying the [First Few X \(FFX\) cases and contact investigation protocol for 2019-novel coronavirus \(2019-nCoV\) infection](#) may be useful to further the understanding of this virus and associated disease. This study centers on identification and follow-up of cases and their close contacts in the general population, or restricted to close settings (like households, health-care settings, schools). It can provide information on transmission dynamics, severity and clinical spectrum, through estimates of the clinical presentation of COVID-19 infection and course of associated disease; the secondary infection rate and secondary clinical attack rate of COVID-19 infection among close contacts; the serial interval of COVID-19 infection; the symptomatic proportion of COVID-19 cases (through contact tracing and laboratory testing); identification of possible routes of transmission and secondarily, the basic reproduction number (R0) of COVID-19, the incubation period of COVID-19, the preliminary COVID-19 infection and disease-severity ratios (e.g. case-hospitalization and case-fatality ratios).

Contact tracing database

The effective management of information from contacts can be achieved using appropriate software, designed to manage cases and their corresponding contacts. To streamline management of contacts during infectious disease outbreaks, the World Health Organization developed the Go.Data software. Go.Data is a tool to support outbreak response activities in terms of case and contact data collection, analysis and production of related reports.

Regardless of whether the Member States choose to use Go.Data, a contact tracing database must include the following elements:

- Registration of cases and their relative information (demographics, location, date of symptom onset)
- Registration of contacts and their relative information
- Monitoring communication with each contact for symptom follow-up, to be collected daily during the 14-day monitoring period

Also, the data must be aggregated in a way to allow for the development of the following information products:

- Predefined summary and detailed reports

- Summary case and contact mapping
- Visualization of chains of transmission

Finally, the database should be available in different formats to allow for further analysis.

8. Use of technologies for contact tracing

Successful contact tracing does not necessarily require electronic tools, but the use of information technology can render the process more efficient, especially when outbreaks are extensive, and resources are limited. There have been numerous reports of tools developed around the world to facilitate contact tracing, including government-driven initiatives. A common example are mobile applications for Bluetooth-enabled smartphones that can be downloaded on a voluntary basis to identify people who have been in close proximity to a case. They work by exchanging short-distance Bluetooth signals between phones, thus detecting proximity to other application users. This mapping of contacts allows to detect and sometimes alert potential contacts of COVID-19 cases. In some instances, data are encrypted so that users cannot be identified, and some application provide the option to users who eventually test positive for COVID-19 to send their location to public health officials. Mobile applications were also developed to facilitate the self-reporting of symptoms by contacts. WHO is currently undertaking a comprehensive review of the usefulness and potential privacy concerns of information technology tools for contact tracing in order to determine how they can best support the work of trained contact tracing staff.

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Annex 1. Example of a COVID-19 contact list form

CONTACT LIST FORM

Contact list form filled in by:

Case name _____ Case ID if assigned _____
 Case neighbourhood/village _____ Chief or Community Leader _____
 District/town _____ Province/region _____

CONTACT SURNAME	FIRST NAME	RELATIONSHIP TO CASE	AGE (YEARS)	SEX	VILLAGE OR NEIGHBOURHOOD	DISTRICT OR TOWN	TYPE OF CONTACT*	DATE OF LAST CONTACT	LAST DATE FOR FOLLOW-UP	ASSIGNED CONTACT ID	DATE OF FIRST VISIT	CONTACT OUTCOME

* Options include household member, health-care worker, co-worker, neighbour or other (list).

Source: WHO Protocol to INVESTIGATE non-seasonal influenza and other emerging acute respiratory diseases, 2018.

Annex 2. Example of a contact monitoring form

CONTACT MONITORING FORM													
Name of monitoring staff: Contact phone of monitoring staff:													
CONTACT ID	SURNAME	FIRST NAME	AGE	SEX	DATE OF LAST CONTACT WITH CASE	DATE OF LAST MONITORING VISIT TO CONTACT	FINDINGS ON DAILY FOLLOW-UP*						
							1	2	3	4	5	6	7

* Days of follow-up will depend on the event and can be extended to any number of days.
 Tick "0" if the contact has not developed disease symptoms
 Tick "X" if the contact has developed symptoms or has died

Source: WHO Protocol to INVESTIGATE non-seasonal influenza and other emerging acute respiratory diseases, 2018.

Annex 3. Example of a field indicator reporting form

REPORTING FORM FOR THE FIELD TEAMS

Variable	Date:
Team name	
Team members	
Towns assigned No. of towns No. of households Name of towns	
Towns visited No. of towns No. of households Name of towns	
Total cases under follow-up	
Total contacts under follow up	
Contacts who have completed 14 days follow up today	
Total cases followed-up today	
Total contacts followed-up today	
Contacts who developed symptoms	
Details of community alerts responded to	
Remarks/other issues:	

Source: Adapted from the 2014 Ebola outbreak reporting form in Nigeria.

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