

COVID-19 Case and Contact Investigation in an Office Workspace

Matthew T. Hall, MC USN*; Han Q. Bui, MC USN*; John Rowe, MC USA (Ret.)*; Tai A. Do, MC USN*

ABSTRACT

This investigation report describes a case of COVID-19 in a combined military and civilian office workspace and the contact investigation and mitigation efforts that followed. This office space included an embedded public health officer who was able to conduct the contact investigation and advise on the outbreak response. Over a 3-day period, the index case unintentionally exposed 150 coworkers to SARS-CoV-2 through participation in carpools, conferences, and small meetings. Of these exposures 37 were considered medium risk at the time and 113 were considered low risk. A total of 5 contacts reported COVID-like-symptoms at the time of the investigation and another 5 developed symptoms during the 14-day quarantine period and all were directed to self-isolate. None of the contacts required hospitalization and all the symptomatic contacts tested negative for SARS-CoV-2. With the advice and aid of the embedded public health officer, the office authorized telework, conducted thorough cleaning of spaces, distributed informative messaging, conducted virtual question-and-answer forums, and evaluated outbreak policies. This report demonstrates that the close integration of public health and office management can lead to rapid identification of those at risk of infection and implementation of mitigation and control efforts to stop the spread of disease.

INTRODUCTION

In late 2019 a novel Coronavirus (SARS-CoV-2, COVID-19) outbreak began in Wuhan, China and by January 21, 2020 the first case was in the United States.¹ Cases in the United States were imported from outbreak areas until February 26, 2020 when the first suspected community acquired infection was documented in the United States.² In the event of isolated outbreaks, case contact investigations are useful in identifying those at increased risk of infection and placing them in quarantine in an effort to halt the spread of the disease. Often these investigations also include recommendations regarding cleaning of areas and precautions to other office workers. Commonly, contact investigations are conducted by local public health agencies that are independent of, and not physically associated with, the index case or office location.

As a result of the rapidly evolving nature of the COVID-19 outbreak and eventual pandemic, COVID-19 definitions, as per the Centers for Disease Control and Prevention (CDC), have changed since the first cases appeared.^{3,4} Currently cases can be diagnosed clinically but initially, cases were only defined as having a documented positive CDC laboratory COVID-19 polymerase chain reaction test.⁵ At the time of the investigation, individuals who recently traveled from Wuhan, China were considered high risk. Additionally, individuals were considered to be at high risk if they were “living in the same household as, being an intimate partner of, or providing care in a nonhealthcare setting (such as a home) of a person

with symptomatic laboratory confirmed COVID-19 infection without using recommended precautions for home care and home isolation.”⁶ A close contact, at that time was unclearly defined as having been within 6 feet (2 m) of a person for a “prolonged” period of time.⁴ There was also insufficient data to define “prolonged” exposure. Although current recommendations vary on the length of time of exposure from 10 minutes or more to 30 minutes or more, at the time of this investigation the CDC’s guidance that any period beyond a brief interaction (1–2 minutes) was considered prolonged.⁷ Medium risk of infection included travel from areas in China outside of Hubei Province or Iran or another country with sustained or widespread transmission. Additionally, medium risk included close contact with a laboratory-confirmed case, to include being seated within 6 feet of a symptomatic infected person on an aircraft, or living in a household as noted in the “high risk” group but while using precautions.⁶ Low-risk exposures were individuals who had been in the same indoor environment (e.g. classroom) as a person with symptomatic laboratory-confirmed COVID-19 for a prolonged period of time but not meeting the definition of close contact.⁶ The CDC recommended that low-risk persons be instructed to undergo 14 days of self-observation and social distancing beginning the last day of exposure.⁶ The U.S. military, at that time, was directing individuals with other than low-risk exposure to remain in their homes while they practiced social distancing and active monitoring by the appropriate medical authority; this period was called Restriction of Movement. Functionally, Restriction of Movement is similar to quarantine in that the person is prevented from close interaction with others to include family members, friends, and coworkers.

This report describes a contact investigation of a COVID-19 patient who worked in a busy office space. This investigation occurred at the headquarters for U.S. Navy Medicine, the Bureau of Medicine and Surgery in Falls Church, Virginia. It is unique in that public health officers

*Bureau of Medicine and Surgery, M44, Public Health & Safety, 7700 Arlington Blvd, Falls Church, VA 22042–5113

The views expressed in this article reflect the results of research conducted by the author and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, nor the U.S. Government.
doi:10.1093/milmed/usaa194

Published by Oxford University Press on behalf of the Association of Military Surgeons of the United States 2020. This work is written by (a) US Government employee(s) and is in the public domain in the US.

(PHO) were imbedded within the office space and readily available to rapidly respond to the confirmed case. From this position they were able to rapidly conduct the preliminary contact investigation, oversee the quarantine and isolation of patients, direct the cleaning of workspaces, and monitor the health and outcomes of the close contacts who worked in the same offices before the local public health authorities were able to notify the employer through conventional means.

FINDINGS

On March 9, 2020, an employee at the Bureau of Medicine and Surgery headquarters office building notified the respective supervisor that the employee had received a positive COVID-19 test result (index case). The supervisor in turn notified the command's PHO (coauthor T.A.D.) of a positive COVID-19 case within the directorate. The notification occurred at the end of the workday, so most of the employees had either left the workspace or were leaving. The PHO recommended that all workspaces where the index case frequented be secured until the spaces were cleaned. In addition, common areas such as lounges, bathrooms, water fountains, and printing rooms were also recommended to be secured for cleaning. Although the CDC recommended workspaces be secured for at least 24 hours prior to cleaning, it took 72 hours to identify appropriate cleaning resources and clean the workspace.⁸ The office transitioned to an administrative leave and tentative telework policy although a large portion of the workspace was secured for cleaning. The office administrators used the next 72 hours to re-evaluate policies and implement a much wider telework strategy. Additionally, with the assistance of the PHO, the office management distributed informative messaging, held question-and-answer virtual meetings, and evaluated infection control policies.

In addition to addressing the workspace where the index case worked, the office leadership directed the PHO to initiate a contact investigation within its workspace. The PHO called the index case, described the situation, and asked permission to begin the preliminary contact investigation. The index case was at that time in isolation and undergoing treatment at a local hospital. The index case denied any travel within the past several months, had not interacted with any sick persons or with anyone from locations where COVID-19 outbreaks were being reported. The index case reported experiencing a dry cough, felt feverish, and had fatigue during the week prior to the diagnosis. During the 3 days following the initial onset of symptoms, the index case attended work, participated in carpools, and was present at several meetings with associates where close contact occurred as well as attended a large conference of nurses with international attendees. The PHO consulted with the local health department who conducted the contact investigation outside of the workplace.

The index case reported 2 group meetings and 2 individual meetings that qualified as close interactions during the 3-day period. Using the meeting invitation and attendance

lists, the PHO was able to identify individuals who were potentially exposed at the group meetings. Additionally, the index case reported using a carpool for all 3 days prior to hospitalization where 3 to 5 people were exposed during an hour commute to and from work daily. The van pool was operated by the local county; consequently the contact investigation of the van pool was conducted by the local public health authorities. The internal contact investigation found a total of 150 close contacts, 44 of whom were from within the workplace (Fig. 1). Of the 44 contacts, 37 had medium-risk exposures and 7 had low-risk exposures. The PHO notified each of these individuals about their exposures and asked if they had symptoms of COVID-19 based on the CDC's symptom criteria which, at that time, included "subjective or measured fever, cough, or difficulty breathing."⁶ Two of the medium-risk individuals reported having either cough, fever, or shortness of breath and were considered persons under investigation (PUI). The PUIs were determined to be in a nonacute condition, directed to remain at home in isolation, and instructed to contact their primary care provider to schedule an evaluation for COVID-19. Asymptomatic medium-risk contacts were directed to remain at home under quarantine conditions for 14 days after the last day of exposure, self-monitor for COVID-19 symptoms with daily telephonic follow-up by designated public health personnel from the office workplace, and contact their health care provider if any symptoms develop. In addition to the medium-risk contacts, there was a total of 113 low-risk contacts identified. Seven of the 113 low risk contacts were individuals within the workplace and worked within the same department as the index case. Of these 7 low-risk contacts, 2 individuals were symptomatic and were also considered PUIs. The other 106 low-risk contacts were individuals who attended the nursing conference and did not work at the same workplace as the index case. A mass email with confirmed receipt was sent out to all the nursing conference attendees to notify them of their low-risk exposure with instructions to self-observe their health for 14 days. Of these low-risk contacts outside of the workplace, only 1 reported COVID-19-like symptoms. This individual also tested negative for COVID-19. Asymptomatic medium-risk contacts were directed to remain at home under quarantine conditions for 14 days after the last day of exposure, self-monitor for COVID-19 symptoms with daily follow-up by public health personnel at the office, and contact their health care provider if any symptoms develop. There were an additional 7 contacts who were exposed to the 4 PUIs (2 medium-risk contacts and 2 low-risk contacts) and, because of the unknown infectious threat at the time and as a precautionary measure, were advised to stay home from work pending results of the PUI's COVID-19 tests. These 7 contacts were all allowed to return to work upon receipt of negative COVID-19 test results for the 4 PUIs.

After the initial contact investigation, an additional 6 individuals from the workplace developed COVID-19-like

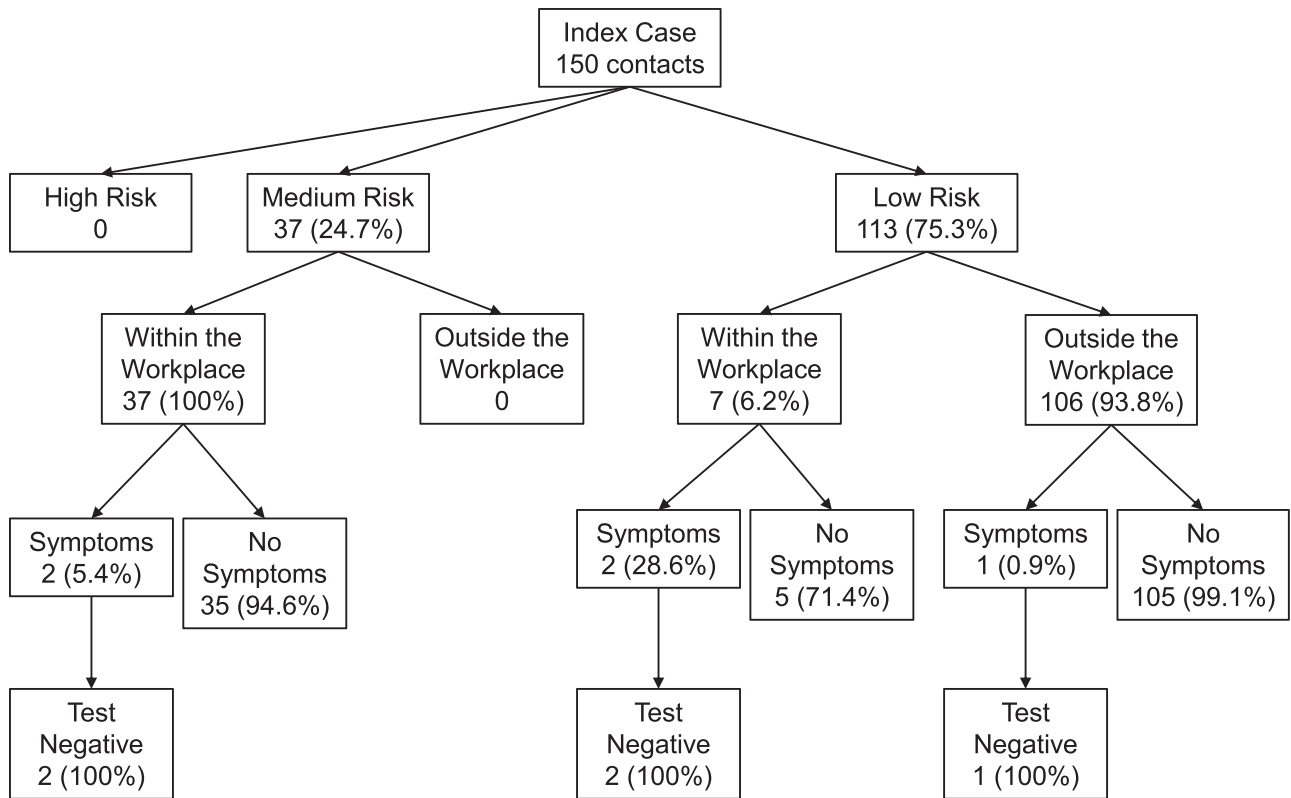


FIGURE 1. Initial COVID-19 contact investigation findings. The index case interacted with 150 people and those interactions were classified as high, medium, or low risk. Each risk group was described by the location where the exposure occurred: within the workplace or outside the workplace. Lastly, contacts were described by whether or not symptoms were reported and the results of the test taken to diagnose COVID-19.

symptoms during the 14-day quarantine. In total, 10 individuals from the workplace developed COVID-19-like symptoms but did not require hospitalization and were directed to remain isolated while awaiting a laboratory test. All 10 symptomatic patients tested negative for COVID-19 on the CDC approved polymerase chain reaction assays. One of these individuals tested positive for a non-SARS-CoV-2 coronavirus. No other information is available on the infectious cause of the other patient’s symptoms. No additional patients developed symptoms and/or tested positive for COVID-19. Of note, none of the coworkers who were exposed during the carpool developed symptoms and despite the close contact were believed to not have been infected. Near the end of the quarantine period, the COVID-19 pandemic progressed to include widespread community transmission in most of the United States.⁹ At that time, the office spaces transitioned to an “essential personnel only” work force policy which directed all other members to work from home.

Rapid employer notification by public health or the employee is vital to an effective outbreak response at the workplace to limit the spread of disease. Office spaces provide an opportunity for rapid disease transmission because of the close proximity of coworkers, frequency of meetings with close quarters exposure to others, high traffic shared common spaces, and open work areas. Ideally, structural changes would be made to modify the office-related factors that increase the risk of disease transmission, but these are costly and unlikely to be feasible for most businesses. Separately, employers should work with public health personnel to create plans for contact tracing and infection control within their work environment and develop a close relationship with PHOs who can provide advice and facilitate outbreak responses. This investigation demonstrated that, in the event of an outbreak, rapid and coordinated responses between public health experts and the office management authorities may be effective in controlling the occupational spread of an infectious outbreak.

CONCLUSION

This investigation revealed that office workplaces are areas of opportunity for transmission of infections, but that quick reaction and identification of at-risk individuals with quarantine and isolation as indicated, can limit the spread of infection.

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