



COVID-19









Guidance for Organizing Large Events and Gatherings

Updated Mar. 8, 2021

Print

Summary of Recent Changes

Updates as of March 7, 2021

- Added information for large event organizers
- Added updated information about ventilation
- Updated to ensure consistent language across sites
- Added links to information about attending smaller gatherings with family and friends

Key Points

- Avoid large events and gatherings, when possible.
- Consider the level of risk when deciding to host an event.
- Promote healthy behaviors and maintain healthy environments to reduce risk when large events and gatherings are held.
- Be prepared if someone gets sick during or after the event.

COVID-19 Cases are Extremely High. Avoid Events and Gatherings.

COVID-19 cases, hospitalizations, and deaths are extremely high across the United States. To decrease your chance of getting and spreading COVID-19, CDC recommends that you do not visit with people who do not live with you at this time. Attending events and gatherings increases your risk of getting and spreading COVID-19. Stay home to protect yourself and others from COVID-19.

Gatherings

CDC continues to recommend that large gatherings be avoided, particularly those in which physical (social) distancing cannot be maintained between people who live in different households. This guidance is intended for those who are planning a large event, such as sporting events, concerts, festivals, conferences, parades, or weddings. CDC also has resources for those attending large events and visiting with family and friends.

CDC offers the following guidance to help prevent the spread of COVID-19. Event planners should work with state and local health officials to implement this guidance, adjusting to meet the unique needs and circumstances of the local community. This guidance is meant to supplement—not replace—any state, local, territorial, or tribal health and safety laws, rules, and regulations with which gatherings must comply.

Risk Factors to Consider

Several factors can contribute to the likelihood of attendees getting and spreading COVID-19 at large events. In combination, the following factors will create higher or lower amounts of risk:

- Number of COVID-19 cases in your community—High or increasing levels of COVID-19 cases in the event location or the locations the attendees are coming from increase the risk of infection and spread among attendees. Relevant data can often be found on the local health department website or on CDC's COVID Data Tracker County View.
- **Exposure during travel**—Airports, airplanes, bus stations, buses, train stations, trains, public transport, gas stations, and rest stops are all places where physical distancing may be challenging and ventilation may be poor.
- Setting of the event—Indoor events, especially in places with poor ventilation, pose more risk than outdoor events.
- Length of the event—Events that last longer pose more risk than shorter events.

 Being within 6 feet of someone who has COVID-19 for a total of 15 minutes or more

(over a 24-hour period) greatly increases the risk of becoming infected and requires quarantine.

- Number and crowding of people at the event Events with more people
 increase the likelihood of being exposed. The size of the event should be determined
 based on whether attendees from different households can stay at least 6 feet (2
 arm lengths) Physical distancing at events can reduce transmission risk—for
 example, blocking off seats or modifying room layouts.
- Behavior of attendees during an event— Events where people engage in behaviors such as interacting with others from outside their own household, singing, shouting, not maintaining physical distancing, or not wearing masks consistently and correctly, can increase risk.

After reviewing this guidance, large event planners, operators, and administrators can use CDC's Events and Gatherings Readiness and Planning Tool [360 KB, 10 pages] to determine their level of readiness to implement mitigation and safety measures. Organizers should continue to assess, based on current conditions, whether to postpone or cancel large events and gatherings, or significantly reduce the number of attendees for events. If organizers are unable to put safety measures in place during large events and gatherings, they may choose instead to host a virtual event.

Promoting Healthy Behaviors that Reduce Spread

Event planners should consider implementing strategies to encourage behaviors that reduce the spread of COVID-19 among staff and attendees.

Stay Home when Appropriate

- Educate event staff and attendees about when they should stay home.
 - Advise event staff and attendees to stay home if they have tested positive for COVID-19, are waiting for COVID-19 test results, have COVID-19 symptoms, or if they have had close contact with a person who has tested positive for or who has symptoms of COVID-19.
 - Develop policies that strongly encourage event staff who are sick to stay at home without fear of reprisal, and ensure staff are aware of these policies.
 - Consider developing flexible refund policies for attendees for events that involve a participation fee. See additional information about Communication, Leave (Time off) Policies, Back-up Staffing, and more in sections below.
 - CDC criteria can help inform staff about when it is okay to end isolation or quarantine:
 - If they have been sick with COVID-19
 - If they tested positive for COVID-19 but had no symptoms
 - If they have recently had a close contact with a person with COVID-19
- CDC recommends conducting health checks such as temperature screening and other symptom checking of staff and attendees in a way that is safe and

respectful, and in accordance with any applicable privacy laws and regulations. It is important to keep in mind that temperature screening and screening of symptoms alone may not prevent someone from attending the event who has COVID-19.

Physical (Social) Distancing

- Adjust the size of an event based on the ability of attendees from different households to stay 6 feet (2 arm lengths) apart.
- Remind attendees upon arrival to stay at least 6 feet away from people who don't live with them.
- Discourage attendees and staff from greeting others with physical contact (for example, handshakes). Include this reminder on signs about physical distancing.
- Find additional information below about how to modify layouts and maintain healthy environments.

Masks

- Require that staff and attendees wear well-fitting masks that fit completely over their nose and mouth. Make a plan beforehand for how compliance will be monitored and ensured.
- Encourage attendees ahead of the event to bring and use masks at the event.
 Consider having masks on-hand to provide to staff and attendees who do not bring their own.
- Advise staff and attendees that masks should **not** be placed on babies or children younger than 2 years old, anyone who has trouble breathing, or anyone who is unconscious, incapacitated, or otherwise unable to remove the mask without assistance.
- The following categories of people are exempt from the requirement to wear a mask:
 - A child under the age of 2 years.
 - A person with a disability who cannot wear a mask, or cannot safely wear a mask, for reasons related to the disability.
 - A person for whom wearing a mask would create a risk to workplace health, safety, or job duty as determined by the workplace risk assessment
 .

Hand Hygiene and Respiratory Etiquette

- Require staff and attendees to wash their hands frequently (for example, before, during, and after taking tickets, or after touching garbage) with soap and water for at least 20 seconds and increase monitoring to ensure adherence.
- If soap and water are not readily available, staff and attendees can use hand sanitizer that contains at least 60% alcohol and rub their hands until dry.
- Encourage guests to avoid singing or shouting, especially indoors. If possible, keep music levels down so people don't have to shout or speak loudly to be heard.

Adequate Supplies

Ensure that you have adequate supplies to support healthy hygiene [290 KB, 2 pages] Supplies include soap, water, hand sanitizer containing at least 60% alcohol, a way to dry hands (e.g., paper towels, hand dryer), tissues, disinfectant wipes, masks (as feasible), and no-touch trash cans.

Signs and Messages

- Post signs in highly visible locations (for example, at entrances, in restrooms) that promote everyday protective measures and describe how to stop the spread ▶ [468 KB, 1 page] of germs by properly wearing a mask, physical distancing, and washing hands.
- Broadcast regular announcements on reducing the spread of COVID-19 on public address systems.
- Include messages (for example, videos) about behaviors that prevent spread of COVID-19 when communicating with staff, vendors, and attendees (such as on the invitation, on the event website, and through event social media accounts).
- Consider developing signs and messages in multiple languages and formats (for example, large print, braille, American Sign Language) for people who have limited vision or are blind or people who are deaf or hard of hearing.
 - Learn more about reaching people of diverse languages and cultures by visiting: Know Your Audience.
- Find freely available CDC print and digital resources about COVID-19 on CDC's communications resources main page.

Maintaining Healthy Environments

Event planners should consider implementing several strategies to maintain healthy environments.

Cleaning and Disinfection

- Develop a schedule for increased, routine cleaning.
- Clean and disinfect frequently touched surfaces within the venue before the
 event, at least daily, and as much as possible—for example, door handles, sink
 handles, grab bars, hand railings, and cash registers.
 - When choosing disinfectants, use products from EPA-approved disinfectants against COVID-19
 ☑ .
- Clean shared objects frequently, based on level of use—for example, payment terminals, tables, countertops, bars, and condiment holders.
- Consider closing areas such as drinking fountains that cannot be adequately cleaned during an event.
- Plan for and enact these cleaning routines when renting event space and ensure that other groups who may use your facilities follow these routines.
 Ensure safe and correct use and storage of cleaning and disinfection products

- to avoid harm to staff and other people. Always read and follow label instructions for each product, and store products securely away from children.
- Cleaning and disinfection products should not be used near children. Staff should ensure that there is adequate ventilation when using these products to prevent attendees or themselves from inhaling toxic vapors.
- Use disposable gloves when removing garbage bags or handling and disposing of trash.
 - After using disposable gloves, throw them out in a lined trash can.
 - Do not disinfect or reuse the gloves.
 - Wash hands after removing gloves.

Restrooms

- Consider limiting the number of people who occupy the restroom at one time to allow for physical distancing.
- Ensure that people standing in line can maintain a 6-foot distance from one another. It may be helpful to post signs or markers to help attendees maintain the appropriate physical distance of at least 6 feet.
- Ensure that open restrooms are:
 - Operational with functional toilets.
 - Cleaned and disinfected regularly, particularly high-touch surfaces such as faucets, toilets, stall doors, doorknobs, countertops, diaper changing tables, and light switches.
 - Clean and disinfect restrooms more often after times of heavy use with products from EPA List N: Disinfectants for Coronavirus (COVID-19) .
 - Ensure safe and correct application of disinfectants and keep products away from children.
 - Adequately stocked with supplies for handwashing, including soap and water or hand sanitizer with at least 60% alcohol (for staff and older children who can safely use hand sanitizer), a way to dry hands (e.g., paper towels, hand dryer), tissues, and no-touch trash cans.
 - If you are providing portable toilets, also provide portable handwashing stations and ensure that they remain stocked throughout the duration of the event. If possible, provide hand sanitizer stations that are touch-free.

Ventilation

- Ensure ventilation systems operate properly and increase circulation of outdoor air as much as possible, for example, by opening windows and doors. Do not open windows and doors if doing so poses a safety or health risk to staff or attendees (for example, risk of falling or triggering asthma symptoms).
- If portable ventilation equipment like fans are used, take steps to minimize air from them blowing from one person directly at another person to reduce the potential spread of any airborne or aerosolized viruses.

- If setting up outdoor seating under a pop-up, open air tent, ensure guests are still seated at least 6 feet apart. Enclosed 4-wall tents will have less air circulation than open air tents. If outdoor temperature or weather forces you to put up the tent sidewalls, consider leaving one or more sides open or rolling up the bottom 12 inches of each sidewall to enhance ventilation while still providing a wind break.
- For additional information on increasing ventilation, visit CDC guidance on Ventilation in Buildings or Guidance for Businesses and Employers.

Water Systems

To minimize the risk of Legionnaires' disease and other diseases associated with water, take steps to ensure that all water systems and features (for example, sink faucets, decorative fountains) are safe to use after a prolonged facility shutdown. Consider providing bottled water or encouraging staff and attendees to bring their own.

Modified Layouts

- Prioritize outdoor activities, such as drive-in concerts.
- Offer online attendance options in addition to in-person attendance to help reduce the number of in-person attendees.
- Limit in-person attendance or seating capacity to allow for physical distancing, or host smaller events in larger spaces.
- Use multiple entrances and exits and discourage crowded waiting areas.
- Change the seating layout or availability of seating so that people can remain at least 6 feet apart.
- If you are providing portable toilets, consider increasing the number provided and increase the spacing between them to reduce the likelihood of long lines in which it will be difficult to engage in physical distancing.
- Eliminate lines or queues. If that is not possible, encourage people to stay at least 6 feet apart by providing signs or other visual cues such as tape or chalk marks.

Physical Barriers and Guides

- Provide physical guides, such as tape on floors or sidewalks and signs on walls, to ensure that people remain at least 6 feet apart in lines and at other times (for example, guides for creating one-way routes).
- Establish pedestrian traffic flow plans to reduce bottlenecks and ensure the ability to maintain physical distancing at the event.
- Consider using multiple, single-direction entrances and exits and discourage crowded areas where it may be difficult to maintain appropriate distance.
 Utilize separate event entry and exit points if feasible.
- Consider making walkways one-way or clearly divided for bi-directional movement. Provide appropriate directional signs and markers, such as those that are freestanding or on the ground, to indicate the appropriate direction of pedestrian movement.

Install physical barriers, such as sneeze guards and partitions, in areas where it is difficult for people to remain at least 6 feet apart. Barriers can be useful at cash registers and other areas where maintaining a distance of 6 feet is difficult.

Communal Spaces

- Stagger use of shared indoor spaces such as dining halls, game rooms, and lounges as much as possible and clean and disinfect them between uses.
- Add physical barriers, such as plastic flexible screens, between bathroom sinks and beds, especially when they cannot be at least 6 feet apart.
- For more information on communal spaces in event housing (for example, laundry rooms, shared bathrooms, and recreation areas) follow CDC's guidance for Shared or Congregate Housing.

Food Service

- Currently, there is no evidence to suggest that handling food or eating is
 associated with directly spreading COVID-19. However, people sharing utensils
 and congregating around food service areas can pose a risk. Limit food or
 beverage service in areas in which people are more likely to congregate as that
 may encourage unmasked interactions.
- If the event includes food service, refer to CDC's COVID-19 considerations for restaurants and bars.
- Use touchless payment options as much as possible, if available.
- Ask customers and staff to exchange cash or card payments by placing them on a receipt tray or on the counter rather than by hand to avoid direct hand-tohand contact.
- Clean and disinfect frequently touched surfaces such as pens, counters, or hard surfaces between use and encourage patrons to use their own pens.
- Provide physical guides, such as tape on floors or sidewalks and signs on walls, to ensure that people remain at least 6 feet apart when waiting in line to order or pick up.
- If a cafeteria or group dining room is used, serve individually plated meals or grab-and-go options, and hold activities in separate areas.
- Use disposable food service items including utensils and dishes. If disposable items are not feasible or desirable, ensure that all non-disposable food service items are handled with gloves and washed with dish soap and hot water or in a dishwasher.
- People should wash their hands with soap and water for at least 20 seconds after removing their gloves or after directly handling used food service items.
- Avoid offering any self-serve food or drink options, such as buffets, salad bars, and drink stations. Consider having pre-packaged boxes or bags for each attendee.

Shared Objects

 Discourage people from sharing items that are difficult to clean, sanitize, or disinfect.

- Limit any sharing of food, tools, equipment, or supplies by staff members.
- Ensure adequate supplies to minimize sharing of high-touch materials to the
 extent possible; otherwise, limit use of supplies and equipment to one group of
 staff members or attendees at a time, and clean and disinfect them between
 use.

Maintaining Healthy Operations

Event organizers and staff may consider implementing several strategies to maintain healthy operations.

Regulatory Awareness

 Be aware of local or state regulatory agency policies related to group gatherings to determine if events can be held.

Protections for Event Staff and Attendees who are at Higher Risk of Severe Illness from COVID-19

- Offer options for staff at higher risk for severe illness (including older adults and people of any age with underlying medical conditions) that limit their exposure risk. For example, offer telework and modified job responsibilities for staff, such as setting up for the event rather than working at the registration desk.
- Replace in-person meetings with video- or tele-conference calls whenever possible.
- Offer options for attendees at higher risk for severe illness to limit their exposure risk (for example, virtual attendance).
- Consider limiting event attendance to staff and attendees who live in the local area (for example, community, city, town, or county) to reduce the risk of spreading the virus from areas with higher levels of COVID-19. If attendance is open to staff and guests from other communities, cities, town or counties, provide attendees with information about local COVID-19 levels so they can make an informed decision about participation. Encourage staff and attendees to check for any travel restrictions before traveling to the event.
- Put policies in place to protect the privacy of people at higher risk for severe illness regarding their underlying medical conditions.

· Limited, Staggered, or Rotated Shifts and Attendance Times

- Consider ways to significantly reduce the number of attendees.
- Use flexible worksites (for example, telework) and flexible work hours (for example, staggered shifts) to help establish policies and practices for physical distancing of 6 feet between staff and attendees.
- Stagger attendance times or offer expanded hours of operation with limited attendance at a given time to minimize the number of attendees at the venue.

Travel & Transit

Encourage attendees traveling from another location to follow CDC guidance

for Travel During the COVID-19 Pandemic.

- Make attendees traveling by air from a foreign country aware of CDC's requirement to show a negative COVID-19 test result or documentation of recovery from COVID-19 before boarding a flight to the United States.
- Encourage attendees to follow all state, territorial, tribal, and local requirements and recommendations related to travel.
- Encourage the use of transportation options that minimize close contact with others (for example, walking or biking, driving or riding by car—alone or with household members only). Consider offering the following support:
 - Ask all to visit CDC guidance on how to Protect Yourself When Using Transportation, including public transit.
 - Ensure all staff and attendees are aware of CDC's requirement for masks on public transportation traveling into, within, and out of the United States and in U.S. transportation hubs.
 - Allow staff to shift their hours so they can commute during less busy times.
 - Ask staff and attendees to wash their hands with soap and water for at least 20 seconds as soon as possible after their trip.
- If transport vehicles like buses are used by the event staff, drivers should practice all safety actions and protocols as indicated for other staff—for example, washing hands often, wearing masks, and maintaining physical distance of bus riders.
 - To clean and disinfect event buses, vans, or other vehicles see guidance for bus transit operators and drivers for hire, and adapt as needed.
- Reconfigure parking lots to limit congregation points and ensure proper separation of vehicles (for example, closing every other parking space).

Designated COVID-19 Point of Contact

 Designate an administrator or office to be responsible for responding to COVID-19 concerns. All staff and attendees should have information about who this person or office is and how to contact them.

Communication Systems

- Put systems in place to:
 - Encourage staff, attendees, and vendors to self-report to event officials or a COVID-19 point of contact if they:
 - Have symptoms of COVID-19
 - Have tested positive for COVID-19
 - Were exposed to someone with COVID-19 within the last 14 days.
 - Advise attendees and vendors prior to the event or gathering that they should not attend if they have tested positive for COVID-19, are waiting for COVID-19 test results, are showing COVID-19 symptoms, or if they have had close contact with a person who has tested positive for or who has symptoms of COVID-19.

- Communicate with vendors to ensure they are aware of COVID-19 safety protocols being followed at the event.
- Notify staff, attendees, and the public of cancellations and restrictions in place to limit people's exposure to COVID-19 (for example, limited hours of operation, or expanded hours with limited attendance at a given time).
- Identify and address potential language, cultural, and disability barriers
 associated with communicating COVID-19 information to event staff and
 attendees. Tailor information so that it is easily understood by various
 audiences and is available in alternative languages and accessible formats
 (for example, braille or larger print).
 - Learn more about how to communicate with people of diverse languages and cultures by visiting: Know Your Audience. You also can learn more about communicating to staff in a crisis at: Crisis Communications Plan

Leave (Time Off) Policies

- Implement flexible sick leave policies and practices that are not punitive and enable staff to stay home when they are sick, have been exposed to someone with COVID-19, are caring for someone who is sick, or who must stay home with children if schools or child care centers are closed.
- Examine and revise policies for leave, telework, and compensation as needed.
- Ensure that any relevant policies are communicated to staff.

· Back-Up Staffing Plan

- Cross-train staff and create a roster of trained back-up staff in the event of absenteeism.
- Develop policies for return-to-work and event facilities after a staff person has COVID-19. CDC's criteria to discontinue home isolation and quarantine can inform these policies.

Staff Training

- Train staff on all safety protocols. Consider using CDC's Guidance for Businesses and Employers as a guide.
- Conduct training virtually to ensure that physical distancing is maintained during training.
- If training needs to be done in person, maintain physical distancing. Virtual training is clearly better for infection control when feasible.

Recognize Signs and Symptoms

- If feasible, conduct daily health checks (for example, temperature screening and symptom checking) of staff and attendees safely and respectfully, and in accordance with any applicable privacy laws and regulations.
- Event administrators may consider using examples of screening methods in CDC's General Business FAQs as a guide.

Sharing Facilities

Encourage any organizations that share or use the same venue to also follow

this guidance and limit shared use, if possible.

Support Coping and Resilience

- Promote the ability of staff to eat healthy foods, exercise, get enough sleep, find time to unwind, and cope with stress.
- Encourage staff to talk with people they trust about their concerns and how they are feeling.
- Consider posting signs for the national distress hotline:
 - 1-800-985-5990, or text TalkWithUs to 66746;
 - The National Domestic Violence Hotline: 1-800-799-7233 and TTY 1-800-787-3224; and
 - The National Suicide Prevention Lifeline: 1-800-273-TALK (8255).

Lessons Learned After the Event

- Meet with the emergency operations coordinator or planning team for your venue to discuss and note lessons learned.
- Determine ways to improve planning and implementation processes if the event will happen again.
- Update your plans regularly according to the state and local situation and orders.

In Case Someone Gets Sick

Event planners should consider several strategies to implement in case someone gets sick.

Advise Sick People of Home Isolation Criteria

 Communicate to sick staff members that they should not return to work until they have met CDC's criteria to discontinue home isolation.

Isolate and Transport Those Who are Sick

- Immediately separate staff and attendees with COVID-19 symptoms (for example, fever, cough, shortness of breath) at the event. People who are sick should go home or to a healthcare facility, depending on how severe their symptoms are, and follow CDC guidance on how to isolate.
- People who have had close contact with a person who has symptoms should be separated, sent home, and advised to follow CDC's guidance (see "Notify Health Officials and Close Contacts" below). People who have been exposed to someone with known or suspected COVID-19 should follow CDC guidance on When to Quarantine.
- Work with venue administrators, local officials, and healthcare providers to identify an isolation area to separate anyone who has COVID-like symptoms.
 Event healthcare providers should use Standard and Transmission-Based Precautions when caring for sick people. See: What Healthcare Personnel Should Know About Caring for Patients with Confirmed or Possible COVID-19

Infection.

 Establish procedures for safely transporting anyone sick or identified as a close contact to their home or hotel room or to a healthcare facility. If you are calling an ambulance or bringing someone to the hospital, call first to alert them that the person may have COVID-19. Other transportation should be by private vehicle. Public transportation should not be used.

Clean and Disinfect

- Close off areas used by a sick person and do not use these areas until after cleaning and disinfecting them (for outdoor areas, this includes surfaces or shared objects in the area, if applicable).
- Wait at least 24 hours before cleaning and disinfecting. If 24 hours is not feasible, wait as long as possible. Ensure safe and correct use and storage of cleaning ☐ and disinfection products, including storing them securely away from children.

Notify Health Officials and Close Contacts

- In accordance with state and local laws and regulations, event planners should notify local health officials of any case of COVID-19.
- Advise those who have had close contact with a person diagnosed with COVID-19 to stay home and quarantine, self-monitor for symptoms, and follow CDC guidance if symptoms develop.
- Consider keeping a list of attendees and their contact information for potential future contact tracing needs.

What to do if anyone becomes sick after hosting or attending a gathering or event

- If a staff member or an attendee develops symptoms consistent with COVID-19, such as fever, cough, or shortness of breath, follow steps to prevent the spread of COVID-19 and the Public Health Recommendations for Community-Related Exposure.
 Collaboration with the local health department is important to facilitate case investigation and contact tracing for event attendees. Also, immediately contact and notify the people they were in close contact with, the event organizers, and the local health department.
- If a staff member or an attendee is waiting for COVID-19 test results, follow these important steps [223 KB, 2 pages] to help stop the spread of COVID-19.
- If you are a staff member or an attendee who has been diagnosed with COVID-19, a
 public health worker may contact you to check on your health and ask you who you
 have been in contact with and where you've spent your time. Your information will
 be confidential. Learn more about what to expect with contact tracing
 [1.8 MB, 2 pages].

Contact Tracing

Contact tracing is key to slowing the spread of COVID-19 and helps protect the community by:

- Letting people know they may have been exposed to COVID-19 and should monitor their health for signs and symptoms of COVID-19.
- Helping people who may have been exposed to COVID-19 get tested.
- Asking people to self-isolate if they have COVID-19 or develop symptoms of COVID-19 or to self-quarantine if they are a close contact.

Event organizers should collaborate with their local health department to facilitate case investigation and contact tracing for event attendees, as indicated. Learn more about contact tracing and what to expect at CDC's Contact Tracing website.

After reviewing the guidance listed on this page, event planners and administrators can use CDC's Events and Gatherings Readiness and Planning Tool [555 KB, 9 Pages] to protect staff, volunteers, and attendees.

Additional Resources
Latest COVID-19 Information
Cleaning and Disinfection
Guidance for Businesses and Employers
Guidance for Schools and Childcare Centers
Guidance for Park Administrators
Shared and Congregate Housing
COVID-19 Prevention
Handwashing Information
Masks
Physical Distancing
COVID-19 Frequently Asked Questions:
Persons at Higher Risk
Managing Stress and Coping
HIPAA and COVID-19 ☐
CDC communication resources
Community Mitigation
Transportation
Crisis Communications Plan 🖸
Restaurants and bars

Last Updated Mar. 8, 2021

Content source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases