

**Widespread SARS-CoV-2 Transmission Among Attendees at a Large Motorcycle Rally and their Contacts, 30 US Jurisdictions, August–September, 2020**

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## **Abstract**

The 2020 Sturgis Motorcycle rally resulted in widespread transmission of SARS-CoV-2 across the United States. At least 649 COVID-19 cases were identified, including secondary and tertiary spread to close contacts. To limit transmission, persons attending events should wear masks and practice physical distancing. Persons with a known exposure should quarantine and obtain COVID-19 testing.

**Keywords:** SARS-CoV2; COVID-19; Sturgis; mass gathering; transmission

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## **Introduction**

Large gatherings such as weddings, sporting competitions and church events can result in significant SARS-CoV-2 transmission [1-4]. A major event, the Sturgis Motorcycle Rally (Sturgis Rally), was held in Meade County, South Dakota, August 7–16, 2020, with approximately 462,000 persons\* attending a variety of outdoor and indoor activities. Local news media reported COVID-19 cases identified in Sturgis during the rally and among attendees shortly after the event. Here we present a national count of reported COVID-19 cases indicating geographic spread from those returning from the rally.

## **Methods**

To summarize the number of COVID-19 cases associated with attendance at the Sturgis Rally and describe the geographic spread of cases across the United States (US), the Centers for Disease Control and Prevention (CDC) requested information on laboratory or clinically diagnosed COVID-19 cases<sup>†</sup> detected after travel to Sturgis/Meade County, South Dakota (SD), August 1–30, or attendance at the Sturgis Rally, August 7–16, from 54 health departments (50 states and Washington, DC, New York City, Chicago and Los Angeles County). Information on risk factors and travel in the previous two weeks was collected by health department staff via phone interviews with infected persons. Several states modified the definition of a Sturgis Rally-associated case to include cases who reported any travel to SD during August due to some individuals' reluctance to disclose attendance at the Sturgis Rally. Data requested included total numbers of confirmed and probable cases of COVID-19 in index (primary) patients and close contacts<sup>^</sup> (secondary/tertiary), and demographic characteristics and clinical outcomes for primary cases. Secondary cases were defined as laboratory or clinically diagnosed infections

among persons who were close contacts of a person who attended the Sturgis Rally or traveled to SD, August 1–30. Tertiary cases were infections in close contacts of persons with secondary infections. Epidemiologic data were summarized across participating jurisdictions.

This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy. †

## Results

Of 54 jurisdictions, 39 (72%) provided data. Nine jurisdictions reported no cases, 30 reported one or more Sturgis-associated<sup>#</sup> COVID-19 cases (Figure 1). Of 649 reported cases, 463 (71%) laboratory-confirmed or probable primary cases were reported by 30 jurisdictions from across the country with most laboratory-confirmed cases diagnosed within two weeks of the Sturgis Rally. An additional 186 (29%) secondary and tertiary cases were reported by 17 jurisdictions. Among the 463 primary cases, 17 (3.7%) persons were hospitalized and one died (Table 1). South Dakota and five bordering states (Minnesota, Montana, North Dakota, Nebraska, Wyoming) reported 56% of all cases. Among the primary cases, 276 (60%) were male, 388 (84%) were white, and 25 (5%) were Hispanic. Just over half of all cases were 40–59 years old; 72 (16%) were 60 years or older. Most patients (86%) were symptomatic at the time of COVID-19 testing or case investigation (Table 1).

## Public Health Response

In South Dakota, several public health mitigation activities were implemented before, during, and after the event. During the event, the SD Department of Health (DOH) issued four public health alerts (<https://doh.sd.gov/news/recent-releases.aspx>) to inform the

public about new COVID-19 cases identified in local bars and a tattoo parlor in Sturgis and to advise on testing. Testing capacity in Meade and surrounding counties was increased in anticipation of the event through the placement of additional diagnostic equipment to conduct testing using SARS-CoV-2 real-time reverse transcription polymerase chain reaction assay (RT-PCR) to identify cases before they returned to other regions of the state. In Sturgis, the SD DOH also coordinated with a large health system to support testing for city residents. From August 1 to September 15, the 14-day testing volume among Meade County residents increased 199% and the 14-day PCR test positivity increased, from 5% to 8%, indicating the event's impact on SARS-CoV-2 transmission in Meade County for both workers and county residents. Through media briefings and health department websites, the bordering states of North Dakota and Minnesota encouraged residents who attended or worked at the event to obtain COVID-19 testing.

## **Discussion**

Attendance at the Sturgis Rally led to widespread SARS-CoV-2 transmission to 463 people in 30 jurisdictions, with 17 jurisdictions reporting subsequent transmission to 186 household and workplace contacts. In Minnesota, epidemiologic investigations identified secondary and tertiary transmission from attendees who traveled to Sturgis and traced Rally-associated cases across one-third of its counties [5].

While the number of cases identified is sizable—140 cases per 100,000 attendees—it is likely that the true national impact of the Sturgis event is underestimated because attendees with asymptomatic or mild illness may not have been tested for SARS-CoV-2, attendees may not have reported attending the Sturgis rally and because of variability in

health department resources to identify and interview all COVID-19 cases, identify sources of infection, and conduct contact tracing and detailed outbreak investigations.

Widespread transmission of SARS-CoV-2 has been documented among people attending gatherings such as birthday parties, church events, and weddings [1-3], resulting in secondary spread in the community and workplaces far from the place of the original exposure. At those gatherings, most attendees were local residents. In contrast, Sturgis Rally attendees came from 61% of all counties in the US, including hotspot areas, according to an analysis of anonymous cell phone data, indicating the potential for widespread infection [6]. A recent analysis of an international business conference in Boston demonstrated how a single event, which brought together attendees from across the US and Europe, led to the national transmission of the outbreak strain [7]. CDC recommendations highlight the increased risk of COVID-19 transmission at in-person events when attendees travel from outside the local area and where it is difficult for individuals to physically distance [8].

COVID-19 risk mitigation strategies were difficult to enforce at the Sturgis Rally. South Dakota had implemented few restrictions on business operations during the COVID-19 pandemic and there were no state, county, or city mask mandates in effect at the time of the Rally. Multiple news outlets noted the absence of physical distancing and face mask use during the 10-day Sturgis Rally [9].

There are at least three limitations to this report. First, given the volume of COVID-19 cases, health departments could not interview all cases and may have missed travel or event exposures linking cases to the Sturgis Rally. Second, among case interviews completed, participation in the Sturgis Rally and identification of contacts may have been underestimated. According to several state health departments, some attendees were

reluctant to report names of contacts and detailed travel history. Third, not all health departments submitted data for this national analysis.

## **Conclusion**

These findings highlight the risk of COVID-19 transmission associated with a mass gathering event that resulted in preventable illness, hospitalizations, and at least one reported death across multiple jurisdictions. The Sturgis Rally had many characteristics of a superspreading event: large crowds, high intensity of contact between people, potential for highly infectious individuals traveling from hotspots, and events in poorly ventilated indoor environments. Although specimens were not available for whole genome sequencing to identify this as a super-spreading event, the event resulted in secondary transmission of COVID-19 to those who did not attend the event, particularly within South Dakota and bordering states. Such mass events can result in the resurgence of COVID-19 in counties and states even after epidemic control has been achieved through local risk mitigation activities. Recent modeling suggests that interventions such as postponing voluntary, mass events may be the most viable option to maintain epidemic control [10].

If postponement is not an option, public messaging should signal the risks and inform those who choose to attend gatherings about COVID-19 mitigation strategies to protect themselves during and after the event, including symptom monitoring and quarantine\*\* and to protect their household members and community when they return home. To limit transmission, persons attending events should wear masks and practice physical distancing. In the absence of state or local restrictions on gatherings, health departments may consider direct outreach to businesses and business associations whose workers and

patrons will be at risk during the event to implement mitigation strategies (e.g., operating at reduced capacity, risk communication tailored to the event). Additional strategies include offering mass COVID-19 testing to attendees during and after the event to identify cases as soon as possible, ideally before travel back home if residing in another state.

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## Notes

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Department of Health Services; <sup>31</sup>Wyoming Department of Health

### **Disclaimer**

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC.

### **Potential conflicts of interest**

A.K. reports grant funding from CDC and CDC ELC. All other authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

### **Footnotes**

\*Sturgis Motorcycle Rally Traffic Counts 2011-2020. South Dakota Dept of Transportation. August 2020.

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<sup>^</sup><https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/contact-tracing.html>

<sup>†</sup> Council of State and Territorial Epidemiologists. Technical guidance interim-20-ID-01: Standardized surveillance case definition and national notification for 2019 novel coronavirus disease.

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<sup>††</sup> 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. \*\*241(d); 5 U.S.C. \*\*552a; 44 U.S.C. \*\*3501 et seq.

<sup>#</sup> traveled to Sturgis/Meade County, SD or attended Sturgis Rally events

<sup>\*\*</sup><https://www.cdc.gov/coronavirus/2019-ncov/if-you-are-sick/quarantine.html>

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**TABLE 1. Demographic characteristics and symptoms of primary COVID-19 cases associated with the Sturgis Motorcycle Rally, 30 jurisdictions, August–September, 2020**

<b>Characteristic</b>	<b>No. (%)</b>
<b>Total</b>	463
<b>Sex</b>	
Male	276 (59.6)
Female	187 (40.4)
<b>Age group (yrs)</b>	
<20	7 (1.5)
20-39	149 (32.2)
40-59	235 (50.8)
≥60	72 (15.6)
<b>Race</b>	
White	388 (83.8)
Black	3 (0.6)
Asian	1 (0.2)
American Indian/Pacific Islander	24 (5.2)
Other <sup>a</sup>	9 (1.9)
Unknown	38 (8.2)
<b>Ethnicity</b>	
Non-Hispanic	406 (87.7)
Hispanic	25 (5.4)
Unknown	32 (6.9)

<b>Clinical</b>	
Hospitalized	17 (3.7)
Died	1 (<0.1)
Symptomatic <sup>b</sup>	
Yes	399 (86.2)
No	42 (9.1)
Unknown	22 (4.8)

<sup>a</sup>Includes persons reporting more than one race

<sup>b</sup>Symptoms reported at time of SARS-CoV-2 testing or at time of case interview. Symptoms included: cough, shortness of breath, difficult breathing, fever, chills, myalgia, headache, sore throat, or loss of taste or smell. Council of State and Territorial Epidemiologists. Technical guidance interim-20-ID-01: Standardized surveillance case definition and national notification for 2019 novel coronavirus disease.

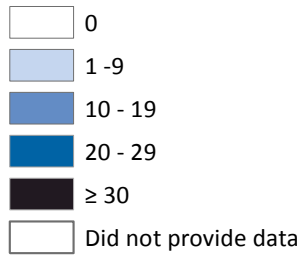
[https://cdn.ymaws.com/www.cste.org/resource/resmgr/2020ps/interim-20-id-01\\_covid-19.pdf](https://cdn.ymaws.com/www.cste.org/resource/resmgr/2020ps/interim-20-id-01_covid-19.pdf)

**Figure Title**

Figure 1. US Map of COVID-19 cases associated with the Sturgis Rally --South Dakota, August-September 2020

Figure legend

**Primary Case Count**



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