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Stay-at-home orders and firearms in the United States during the COVID-19 pandemic

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\textbf{A B S T R A C T}

Firearms are a leading cause of death and injury in the United States, and this trend has continued during the COVID-19 pandemic. We sought to identify whether states designated gun retailers as essential businesses in their stay-at-home orders and characterize other references that could affect firearm acquisition during the COVID-19 pandemic. In this cross-sectional policy review, we assessed stay-at-home orders issued in March or April 2020. Orders were reviewed in their entirety, and any reference to firearms, firearm retailers, shooting ranges, or other relevant elements was documented. Forty-three states and the District of Columbia issued stay-at-home orders. Most considered federal firearm licensees to be among essential businesses or made provisions for them to remain open during widespread business closures. Others referenced the US Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency (CISA) advisory memorandum on essential critical infrastructure workers which named workers supporting firearm manufacturing and retail among essential workers. Therefore, stay-at-home orders issued in most states included provisions for firearms retailers to remain open, at least in some capacity. Only four states and the District of Columbia did not include federal firearms licensees among essential businesses or include provisions for them to be open. Meanwhile, an all-time high in firearm background checks indicates firearm sales have markedly increased. Given the associations between firearm access and injury risk, the effects of continued firearm access facilitated by these orders should be the focus of future research.

\textbf{1. Introduction}

Severe acute respiratory syndrome coronavirus 2, the cause of coronavirus disease 2019 (COVID-19), has created a global ongoing public health emergency. In response, the governors of all 50 states in the United States (US) declared states of emergency. In an effort to stop the spread of the virus, nearly all state governors issued stay-at-home orders that advised or required residents to shelter in place.\textsuperscript{(Gostin and Wiley, 2020)} These orders contained provisions that allowed individuals to engage in essential activities and obtain necessary supplies. The orders also identified certain businesses as essential – those that were allowed to remain open while the order was in place. On March 28, 2020, the US Department of Homeland Security’s Cybersecurity and Infrastructure Security Agency (CISA) published its advisory memorandum on essential critical infrastructure workers, naming “workers supporting the operation of firearm, or ammunition product manufacturers, retailers, importers, distributors, and shooting ranges” among essential workers.\textsuperscript{(Guidance on the Essential Critical Infrastructure Workforce: Ensuring Community and National Resilience in COVID-19 Response, 2020)} With nearly 200,000 lives lost to COVID-19 and the many effects of grief, isolation, and economic loss, the full toll of the pandemic will take years to fully understand.\textsuperscript{(The Johns Hopkins Coronavirus Resource Center, 2020)} Prior to and during the pandemic, firearms are a major cause of morbidity and mortality in the United States. In 2018, there were nearly 40,000 firearm-related deaths, of which over 24,000 were suicides.\textsuperscript{(Centers for Disease Control and Prevention, 2020)} As of September 10, there have already been more than 29,000 gun-related deaths in 2020, and the number of mass shootings has already greatly exceeded the year-end totals for the past six years.\textsuperscript{(Gun Violence Archive, 2020)} Research has consistently shown that firearm availability increases risk of homicide and suicide by more than two times, after controlling for other household level risk factors.\textsuperscript{(Miller et al., 2007; Anglemyer et al., 2014)} Prior to the pandemic, civilians in US owned more than 393 million guns, approximately 120 per 100 residents.\textsuperscript{(Karp, 2018)} and the early months of the pandemic saw record
levels of guns sales. (National Instant Criminal Background Check System Firearm Checks, 2020) Given this context, we sought to identify whether states designated gun retailers as essential businesses in their stay-at-home orders and how the orders could affect acquisition of firearms during the COVID-19 pandemic.

2. Methods

In this cross-sectional policy review, we assessed stay-at-home executive orders issued in March and April 2020. We obtained orders through state government websites. Two coders (TJ and ERG or SEBN) independently reviewed stay-at-home orders in their entirety and documented reference to firearms, firearm retailers, shooting ranges, background checks, firearm licensure, personal safety, or constitutional rights. We also recorded supremacy or preemption clauses when present. When firearms were not explicitly discussed, we documented reference to CISA guidelines on essential critical infrastructure. We reviewed available guidance documents (e.g., frequently asked questions) which are published by state and local governments to clarify aspects of the orders and address stakeholders’ questions thereby improving interpretation of the orders. A subgroup of the authors convened for a virtual meeting (KH, TJ, ERG, SEBN, AM) to reconcile differences through discussion and review of the orders and guidance documents until there was consensus. The citations for all orders are included in the Supplemental Materials. Ethical approval was not required by the Johns Hopkins Bloomberg School of Public Health for this non-human subject policy review.

3. Results

3.1. Federal firearm licensees as essential or nonessential businesses

As shown in Table 1, 43 states and the District of Columbia issued stay-at-home orders between March 18 and April 20, 2020. Of those, 26 orders were issued before the March 28 CISA guidance (15 of which included federal firearm licensees as essential) and 18 were issued on or after March 28.

Twenty-three (52%) states referenced firearms in their initial orders, regardless of when they were issued. Nineteen of those states considered federal firearms licensees (FFLs) to be among essential businesses. Georgia, Missouri, and South Carolina did not include FFLs among essential businesses but did include provisions that nothing in the order could be construed as limiting an individual’s right to purchase firearms. Other states included FFLs among nonessential businesses that could remain in operation with social distancing requirements. For example, Pennsylvania included this in its executive order; whereas Oregon did so in a referenced guidance document.

Of the twenty-one orders that did not mention firearms specifically, ten referenced the CISA guidelines for the definition of essential critical infrastructure workers. Only four states (Alaska, New Mexico, New York, and Washington) and the District of Columbia did not include FFLs among essential businesses or include provisions for them to be open. Several states (Oregon, Vermont, Virginia, and North Carolina) that neither explicitly mentioned FFLs nor deferred to CISA guidelines did make provisions to allow many nonessential businesses to remain open with social distancing measures in place should the respective business owners choose to do so.

3.2. Shooting ranges as essential activities

Only one state (Idaho) named shooting ranges among essential businesses, and three others (Delaware, Minnesota, and New York) allowed them to remain open with certain social distancing measures in place. Five states (Mississippi, Montana, New Hampshire, Ohio, and Virginia) specified that shooting ranges were to remain closed.

3.3. Constitutional protections and other considerations

Two states (Arizona and Kansas) stated that one’s Constitutionally protected rights would not be infringed upon by these stay-at-home orders. Two states commented on issues related to licensing or permitting: Connecticut extended expiry dates for existing permits to carry and purchase but did not allow new permits to be issued, and Georgia allowed for extended renewal periods for carry licenses.

Ten jurisdictions (AK, DE, DC, GA, ME, MD, MN, NY, NC, WA) included language indicating that all businesses selling products necessary to maintain the safety of personal residences were considered essential; the application of this statement to FFLs is unclear.

3.4. Preemption or supremacy clauses

Of the 44 stay-at-home orders reviewed, 27 included preemption or supremacy clauses. Thirteen preempted any local order in conflict, whereas 14 preempted any less-stringent orders enacted by local governments.

4. Discussion

In this review of stay-at-home orders issued during the COVID-19 pandemic, we found that most orders included some provision that allowed for continued access to firearms while sheltering in place. Even before the federal guidance on determination of essential infrastructure was revised to include FFLs, most states had already included them as such. These findings highlight the importance some states placed on protecting the right to acquire firearms.

Media reporting has revealed early evidence of an all-time high in firearm background checks, indicating a surge in gun sales. (National Instant Criminal Background Check System Firearm Checks, 2020; Nass, 2020) Many of the public health consequences of the COVID-19 pandemic will take years to evaluate. Early research shows increased psychological stress among US adults and among health care workers during the COVID-19 pandemic. (McGinty et al., 2020; Lai et al., 2020) Some researchers and government agencies predict higher rates of suicide, intimate partner violence, and child abuse during the COVID-19 pandemic. (Mannix et al., 2020; Roesch et al., 2020; Intimate Partner Violence and Child Abuse Considerations During COVID-19, 2020) With gun sales reaching all-time highs in March and June 2020, more individuals in the US could have access to firearms, placing individuals at risk of firearm-related violence and suicide. (Nass, 2020; Schleimer et al., 2020) Furthermore, the surge in sales was in large part due to first-time firearm purchases. (National Instant Criminal Background Check System Firearm Checks, 2020) With shooting ranges and in-person training being unavailable or severely limited, this also raises concern for an increase in unintentional injury and unsafe firearm storage. The relationships among burden of COVID-19 disease, access to firearms and safety training while stay-at-home orders were in place, rates of firearm sales, and firearm-related deaths and injuries will be important areas of future study.

Of note, Missouri and Nevada had enacted prior statutes to ensure that firearm sales would not be disrupted during states of emergency. (Mo. Rev. Stat, 2007; Nev. Rev. Stat., 2007) For example, under Section 44.101 of the Missouri Revised Statutes, “[t]he state … shall not prohibit … or restrict the lawful possession, transfer, sale, transportation, storage, display, or use of firearms or ammunition during an emergency.” (Mo. Rev. Stat, 2007) Thus, the state had already taken steps to ensure that firearm sales would not be disrupted during states of emergency. However, we considered these additional policies as beyond the scope of this review of stay-at-home orders. Future research on this topic should further consider additional policies that could impact acquisition of firearms beyond stay-at-home orders and associated guidance.

Our findings must be interpreted in the context of other limitations.
First, a number of states issued revisions to their stay-at-home orders. We attempted to review and include all modifications, but we may have missed changes related to firearms. Second, although many local jurisdictions issued their own orders, we made comparisons at the state level (with the exception of the District of Columbia) for this review. However, because of preemption laws limiting firearm regulation in 45 states, the ability of municipalities to enact more or less restrictive stay-at-home orders likely would not have affected our analysis as those orders may not have been able to meaningfully regulate firearms in a way that conflicted with state orders or state law. (Center GL, 2020)

Third, we did not distinguish between advisory and mandatory stay-at-home orders. However, the governor of Nebraska stated that his directive was not a stay-at-home order, so it was not included. Finally, it is also possible that some state orders that lacked explicit mentions of firearms still intended to cover FFLs through inclusion of businesses that sell products necessary to maintain the safety of personal residences as essential. Because this language did not explicitly mention firearms and was present in both state orders that specifically mentioned firearms and those that did not, we did not consider this language to apply to firearm-related businesses which could have led to misclassification error.

5. Conclusion
The stay-at-home orders issued in most states included provisions for firearms retailers to remain open at least in some capacity. Meanwhile, firearm sales have markedly increased. Given the associations between firearm access and injury risk, the effects of continued

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Table 1
Summary of Stay-at-Home (SAH) orders and references to firearms.

| State | State SAH order or advisory | Date | Mention of firearms in the SAH order | Reference to CISA | Firearm stores essential | Firearm stores nonessential but can be open | Social distancing (SD) requirements for firearm sales | Preemption clause |
|-------|-------------------------------|------|--------------------------------------|------------------|------------------------|--------------------------------------------|------------------------------------------------|------------------|
| AL    | Yes                           | 4/3/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | Any in conflict   |
| AK    | Yes                           | 3/27/20 | No                                   | No               | Any less stringent     |                                            |                                            | Any in conflict   |
| AZ    | Yes                           | 3/30/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | Any in conflict   |
| AR    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| CA    | Yes                           | 3/19/20 | No                                   | Yes              | Any in conflict        |                                            |                                            |                  |
| CO    | Yes                           | 3/25/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| CT    | Yes                           | 3/20/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| DE    | Yes                           | 3/22/20 | No                                   | Yes              | Any in conflict        |                                            |                                            |                  |
| DC    | Yes                           | 3/30/20 | No                                   | No               | Any less stringent     |                                            |                                            |                  |
| FL    | Yes                           | 4/1/20  | Yes                                  | Yes              | Any in conflict        |                                            |                                            |                  |
| GA    | Yes                           | 4/2/20  | No                                   | Yes              | Any in conflict        |                                            |                                            |                  |
| HI    | Yes                           | 3/23/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| ID    | Yes                           | 3/25/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| IL    | Yes                           | 3/20/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| IN    | Yes                           | 3/23/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            |                  |
| IA    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| KS    | Yes                           | 3/28/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | Any in conflict   |
| KY    | Yes advisory                  | 3/25/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | None             |
| LA    | Yes                           | 3/22/20 | No                                   | Yes              | Any less stringent     |                                            |                                            | None             |
| ME    | Yes                           | 3/31/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | None             |
| MD    | Yes                           | 3/30/20 | No                                   | Yes              | Any less stringent     |                                            |                                            | None             |
| MA    | Yes advisory                  | 3/23/20 | No                                   | Yes              | Any less stringent     |                                            |                                            | None             |
| MI    | Yes                           | 4/1/20  | No                                   | Yes              | Any less stringent     |                                            |                                            | None             |
| MN    | Yes                           | 3/25/20 | No                                   | Yes              | Any less stringent     |                                            |                                            | None             |
| MS    | Yes                           | 4/1/20  | Yes                                  | Yes              | Any less stringent     |                                            |                                            | None             |
| MO    | Yes                           | 4/3/20  | Yes                                  | Yes              | Any less stringent     |                                            |                                            | None             |
| MT    | Yes                           | 3/26/20 | Yes                                  | Yes              | Any less stringent     |                                            |                                            | None             |
| NE    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| NV    | Yes                           | 3/31/20 | No                                   | In previous EO   | In previous EO         |                                            |                                            | Any in conflict   |
| NH    | Yes                           | 3/26/20 | Yes                                  | Yes – media reports | Yes               |                                            |                                            | Any in conflict   |
| NJ    | Yes                           | 3/21/20 | No                                   | No               | Any less stringent     |                                            |                                            | Any in conflict   |
| NM    | Yes                           | 3/24/20 | No                                   | No               | Any in conflict        |                                            |                                            |                  |
| NY    | Yes                           | 3/18/20 | No                                   | No               | Any in conflict        |                                            |                                            |                  |
| NC    | Yes                           | 3/27/20 | No                                   | Yes              | Any less stringent     |                                            |                                            |                  |
| ND    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| OH    | Yes                           | 3/22/20 | Yes                                  | Yes              | Any in conflict        |                                            |                                            |                  |
| OK    | Yes                           | 4/20/20 | No                                   | No               | Any in conflict        |                                            |                                            |                  |
| OR    | Yes                           | 3/23/20 | No                                   | No               | Any in conflict        |                                            |                                            |                  |
| PA    | Yes                           | 4/1/20  | Yes                                  | Yes with SD      | Yes                  |                                            |                                            |                  |
| RI    | Yes                           | 3/28/20 | Yes                                  | Yes              | Any in conflict        |                                            |                                            |                  |
| SC    | Yes                           | 4/6/20  | No                                   | Yes              | Any in conflict        |                                            |                                            |                  |
| SD    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| TN    | Yes                           | 3/30/20 | No                                   | Yes              | Any less stringent     |                                            |                                            |                  |
| TX    | Yes                           | 3/31/20 | No                                   | Yes              | Any in conflict        |                                            |                                            |                  |
| UT    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
| VT    | Yes                           | 3/24/20 | No                                   | No               | Yes with SD            |                                            |                                            | Any in conflict   |
| VA    | Yes                           | 3/23/20 | No                                   | No               | Yes with SD            |                                            |                                            | None             |
| WA    | Yes                           | 3/23/20 | No                                   | No               | Any in conflict        |                                            |                                            | None             |
| WV    | Yes                           | 3/23/20 | Yes                                  | Yes              | Any in conflict        |                                            |                                            |                  |
| WI    | Yes                           | 3/24/20 | Yes                                  | Yes              | Any in conflict        |                                            |                                            |                  |
| WY    | No                            |        |                                      |                  |                        |                                            |                                            |                  |
firearm access facilitated by these orders should be the focus of future research.

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Declaration of Competing Interest

The authors have no conflicts of interest to disclose. Dr. Hoops’ time was supported by the NIH T32 training program (NIH 5T32GM075774–13).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ypmed.2020.106281.

References

Anglemyer, A., Horvath, T., Rutherford, G., 2014. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. Ann. Intern. Med. 160 (2), 101–110.

Center GL, 2020. Preemption of Local Laws. https://lawcenter.giffords.org/gun-laws/policy-areas/other-laws-policies/preemption-of-local-laws/#state Accessed June 16, 2020.

Centers for Disease Control and Prevention, 2020. Web-based Injury Statistics Query and Reporting System (WISQARS). http://www.cdc.gov/injury/wisqars/index.html.

Gostin, L.O., Wiley, L.F., 2020. Governmental public health powers during the COVID-19 pandemic: stay-at-home orders, business closures, and travel restrictions. JAMA. 323 (21), 2137–2138.

Guidance on the Essential Critical Infrastructure Workforce: Ensuring Community and National Resilience in COVID-19 Response. Department of Homeland Security, Cybersecurity and Infrastructure Security Agency, Washington, DC. https://www.cisa.gov/sites/default/files/publications/CISA_Guidance_on_the_Essential_Critical_Infrastructure_Workforce_Version_2.0_1.pdf.

Gun Violence Archive, 2020. https://www.gunviolencearchive.org/

Intimate Partner Violence and Child Abuse Considerations During COVID-19. Substance Abuse and Mental Health Services Administration, Washington, DC. https://www.samhsa.gov/sites/default/files/social-distancing-domestic-violence.pdf.

Karp, A., 2018. Estimating global civilian-held firearms numbers. Small Arms Survey. http://www.smallarmssurvey.org/fileadmin/docs/T-Briefing-Papers/SAS-8P-Civilian-Firearms-Numbers.pdf.

Lai, J., Ma, S., Wang, Y., et al., 2020. Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. JAMA Neurol. 173 (3), 228–229.

McCarthy, Baker, V., United States District Court for the District of Massachusetts, 2020. https://www.courtlistener.com/recap/gov.uscourts.mad.220718/gov.uscourts.mad.220718.34.0.pdf.

McGinty, E.E., Presskreischer, R., Han, H., Barry, C.L., 2020. Psychological distress and loneliness reported by US adults in 2018 and April 2020. JAMA. https://doi.org/10.1001/jama.2020.9740.

Miller, M., Lippmann, S.J., Azrael, D., Hemenway, D., 2007. Household firearm ownership and rates of suicide across the 50 United States. J. Trauma 62 (4), 1029–1034.

Mo. Rev. Stat 410.101.

Napolelllo, A., 2020. Gun shops are now considered essential businesses in N.J., Gov. Murphy says. NJ.Com. https://www.nj.com/coronavirus/2020/03/gun-shops-are-now-considered-essential-businesses-in-nj-gov-murphy-says.html.

Nass, D., 2020. Gun background checks surged to new high in June. The Trace. https://www.thetrace.org/2020/07/gun-background-checks-june-record/.

National Instant Criminal Background Check System Firearm Checks, 2020. Washington, DC: Federal Bureau of Investigations. https://www.fbi.gov/file-repository/nics_firearm_checks__month_year_by_state_type.pdf/view.

Nev. Rev. Stat 414.155.

Roesch, E., Amin, A., Gupta, J., Garcia-Moreno, C., 2020. Violence against women during covid-19 pandemic restrictions. BMJ. 369, m1712.

Schleimer, J.P., McCort, C.D., Peer, V.A., et al., 2020. Firearm purchasing and firearm violence in the first months of the coronavirus pandemic in the United States. medRxiv. https://doi.org/10.1101/2020.07.02.20145508.

The Johns Hopkins Coronavirus Resource Center, 2020. https://coronavirus.jhu.edu.

The Johns Hopkins Coronavirus Resource Center, 2020. https://coronavirus.jhu.edu.