

## In Reply: Unexpected Decrease in Shunt Surgeries Performed During the Shelter-in-Place Period of the COVID-19 Pandemic

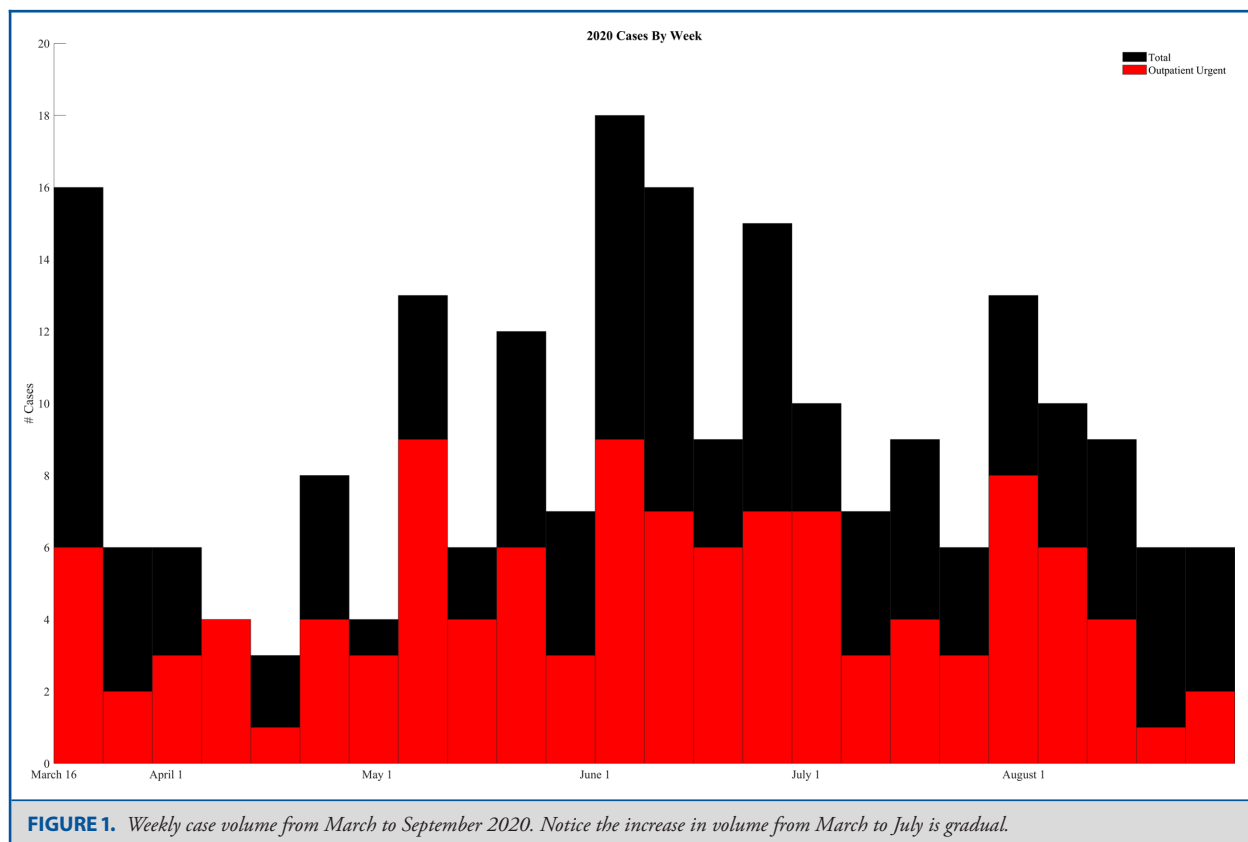
To the Editor:

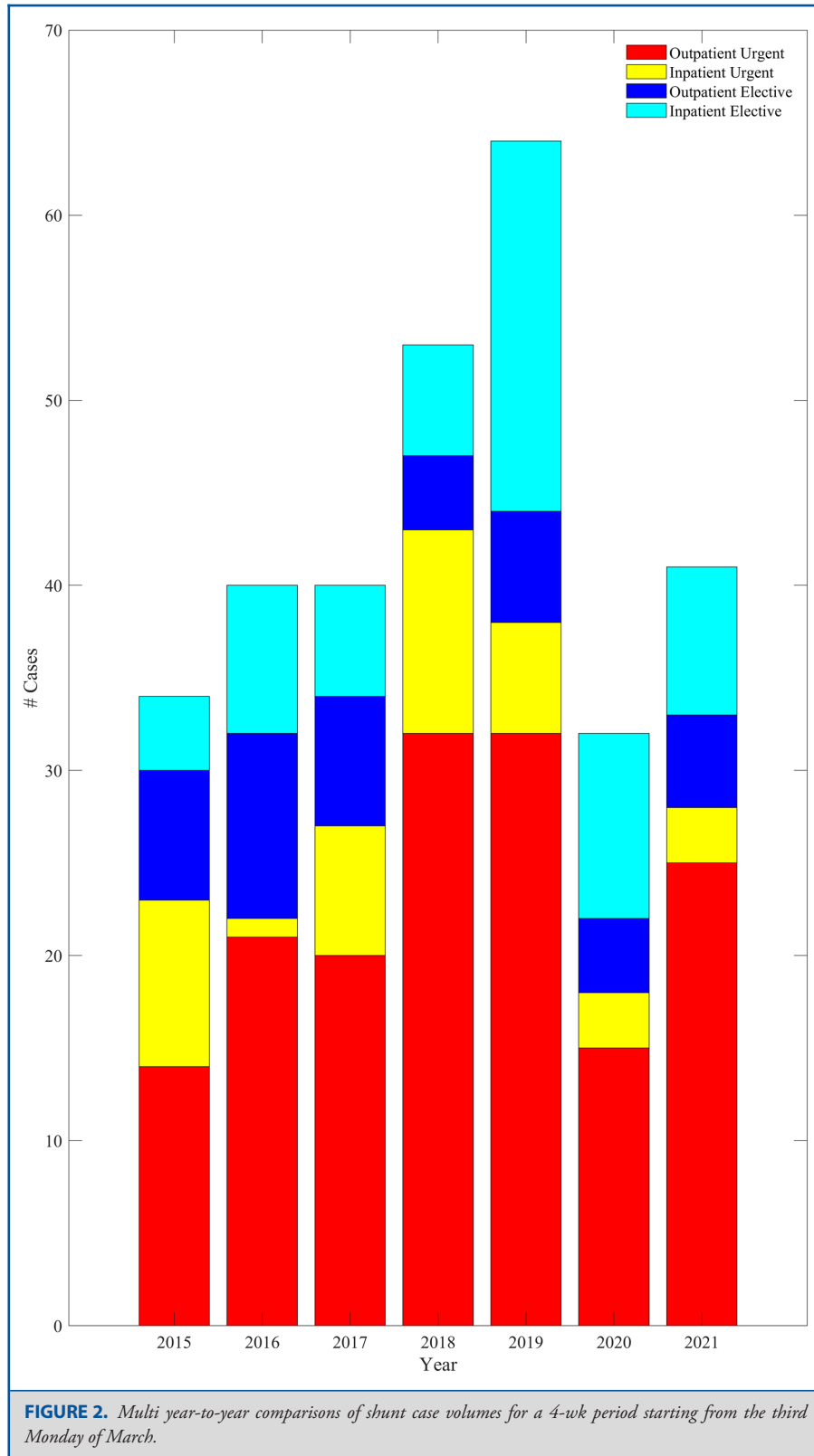
We would like to thank the authors<sup>1</sup> for their interest in our work<sup>2</sup> regarding the unexpected decrease in the number of shunt-related procedures performed at our institution during the beginning of the COVID-19 pandemic. We agree that one would expect the rate of shunt malfunction should remain steady and independent of the pandemic. That was the case in the author's own institution (pediatric population, Birmingham, UK). However, data from Sahoo et al<sup>3</sup> (adult hydrocephalus, India) and our own (pediatrics, USA) showed an unexpected decrease. This perhaps points to differences in behavioral, environmental, and nonmechanical causes for presentation.

As noted in our original manuscript and suggested by the authors,<sup>1</sup> exploring the weeks to months immediately following

the study period, as well as subsequent years, would better characterize our observations. To that end, we first explored the number of shunt surgeries over the 6-mo period starting March of 2020 (Figure 1). After the nidus in March, we did not see a sharp increase in the number of urgent shunt revisions being performed. Instead, we see a steady increase in the number of shunt revisions back to our institutional baseline over months, with some week-to-week variation. In Georgia, the lifting of restrictions was a gradual process that started on April 27, 2020, where the governor began lifting restrictions on certain businesses (gyms, bowling alleys, body art studios), but all restrictions were not lifted until May 3, 2021. Next, we examined the equivalent study period (28-d period starting from the third Monday of March) during 2021 for year-to-year comparisons (Figure 2). Statistical analyses indicate that the number of surgeries in 2021 is equivalent to the 2015-2019 population, and the results from 2020 remain a statistical anomaly.

As the authors aptly indicate, the evaluation of shunt malfunction can be challenging, and complex, interplaying





factors can have profound influence, and make retrospective evaluation difficult. Care must be taken in drawing definitive conclusions from these data. Despite this, it appears that the decrease in shunt surgeries during the shelter-in-place period of the COVID-19 pandemic was not simply due to delays in presentation, as these “missing” shunts were not suddenly made up in the subsequent weeks and months of 2020. Instead, the steady increase in rate back to our baseline supports the hypothesis that environmental factors and perception of the dangers of presenting to an emergency room during the pandemic may have a significant influence on presentation. There appears to be a correlation between the easing of restrictions, comfort with presenting to hospitals for emergency care, and the rate of shunt surgeries at our institution. Whether this is truly a causal relationship is difficult to determine, but the implication is that environmental factors may play a greater role in presentation than previously understood, and that a significant proportion of shunt surgeries may be driven by patient and family behavior rather than neurological necessity.

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### Disclosures

The authors have no personal, financial, or institutional interest in any of the drugs, materials, or devices described in this article.

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## REFERENCES

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2. Laxpati N, Bray DP, Wheelus J, et al. Unexpected decrease in shunt surgeries performed during the shelter-in-place period of the COVID-19 pandemic. *Oper Neurosurg*. 2021;20(5):469-476.
3. Sahoo SK, Dhandapani S, Singh A, et al. COVID-19: changing patterns among neurosurgical patients from North India, efficacy of repeat testing, and inpatient prevalence. *Neurosurg Focus*. 2020;49(6):1-8.

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