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A cautionary tale for measuring the effect of the 10/17 Las Vegas shooting and the 01/18 Hawaii false missile alert

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Male are born usually in excess of females, with a natural sex ratio at birth (SRB) of approximately 105 males born for every 100 females. Previous literature indicates that environmental factors such as pandemics, economic depressions and conflict influence SRB [1,2]. A recent study by Grech sought to ascertain whether the Las Vegas shooting and the Hawaii false missile alert influenced the natural SBR [3]. The author concludes that (1) there were no significant changes in the SBR resulting from these events and that (2) not all acute events may result a visible/significant reduction in SRB.

I posit that the limitations outlined by the author are responsible for this finding and that the conclusions of the paper should be evaluated with caution. These limitations are: (1) The population was no sufficiently large in order to detect a change in SRB or that (2) the events were not sufficiently momentous to affect the population and produce a change in the SRB. Alternatively, the author suggests that these populations are somehow hardier and more resistant to such influences.

We must concede that it is possible that these events did not cause a sufficiently long environmental disruption to affect SRB. Nevertheless, it is important to pay attention to the study design elements that may be influencing the conclusions. Was the population sufficiently large? This question is difficult to assess with birth records for two main reasons: (1) location at the time of the event and (2) level of analysis. Does the population of Nevada captures those who were exposed to this tragic event? The shooting occurred during the Route 91 Harvest Music Festival, which is attended by both local residents and tourists. The importance of the tourists for this section of Nevada is such that studies have been conducted to study the impact of this event in tourist perceptions of the security of the area [4]. It is possible that a fraction of the population exposed to this event left Nevada after this tragic event. Thus, any conception that occurred during the days after the shooting may not be captured in the state of Nevada. Performing such a study would require a registry of those who attended the event. The analyses would then be done on any births registered to the attendees during 2018. Given that such register does not exists, the assessment of changes in SRB due to this event are limited.

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Second, the author obtains information from the CDC Natality WONDER for Nevada. In 2017, the population of Las Vegas was 635,628 people, representing 21.28% of the population of the State of Nevada [5]. Thus, analyzing SRB for the whole state includes population that were not directly exposed to the event. In Figure 1, I explore differences in SRB for Clark County (Las Vegas) and Washoe County (Reno) in Nevada for 2016–2019. Both areas have unique patterns in SRB, and any conclusion derived from the examination of birth records should consider that data can be aggregated/disaggregated in different arrangements, and that this can influence the conclusions [6].

The critiques outlined above also apply to the case of the Hawaii false missile alert. We must recognize that Hawaii is a tourist destination. Thus, it is possible that a fraction of the population exposed to the distress caused by this alert will have returned home after at the conclusion of their visit to Hawaii. Thus, an analysis of the Hawaii birth records may not be capturing the totality of the population exposed to the false alert.

In conclusion, the study design and data limitations make it difficult to assess whether these events had an effect, or whether they were sufficiently large to generate an effect. Because of this, it is impossible to assess whether these populations are somehow hardier or more resistant to similar events.

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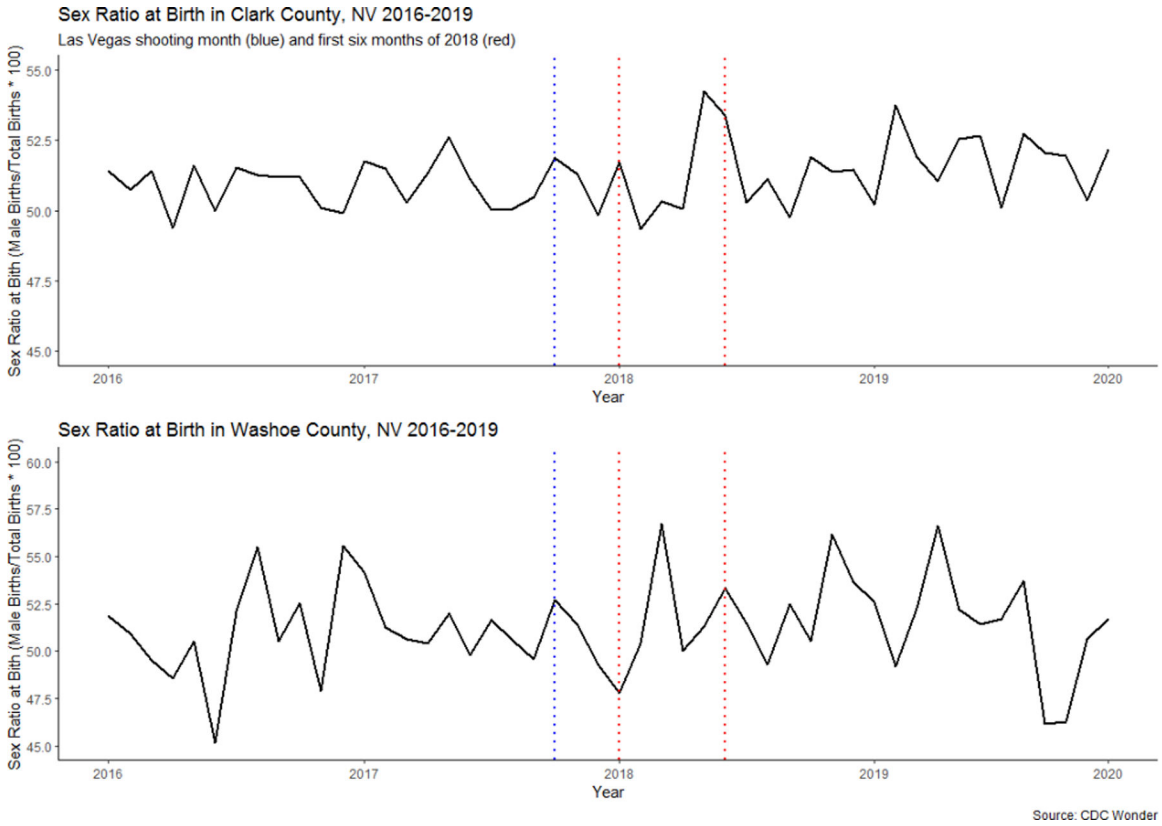

Figure 1.

Sex Ratio at Birth for Clark County and Washoe County in Nevada for 2016–2019. Highlighting the month of the shooting (in blue) and the first six months of 2018 (in red).