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Comparing Motor Vehicle Collision (MVC) Injury Incidence Between Pregnant and Non-Pregnant Female Vehicle Occupants.

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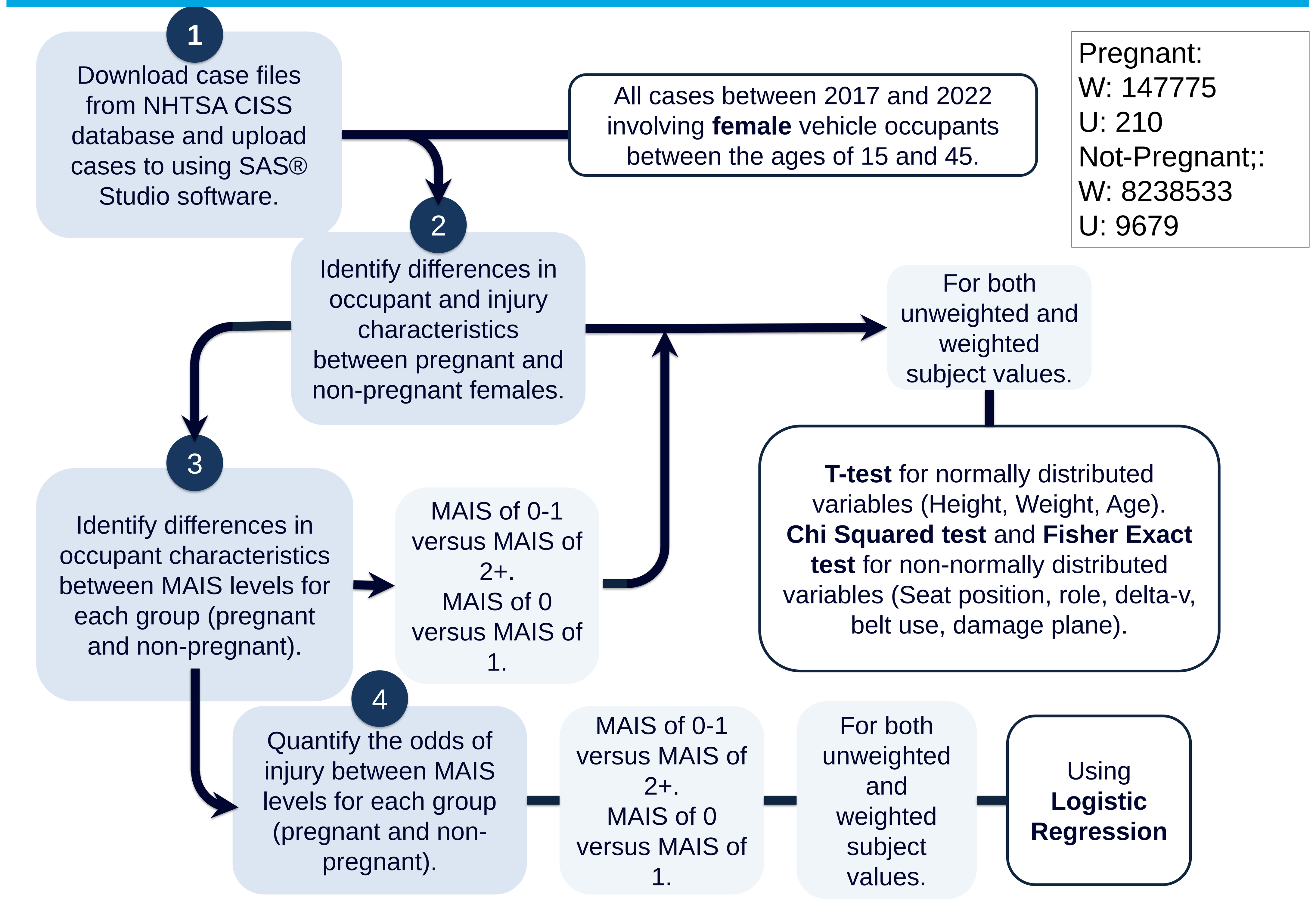
Background

- Motor vehicle collisions (MVCs) are the **leading cause of blunt abdominal trauma** during pregnancy in Canada and the US [1].
- Near the end of pregnancy, a large proportion of the uterus lies below the midline of the lap belt [2]. If loaded, the blunt forces from the belt could cause injuries such as **placental abruption** (a traumatic shearing of the placenta from the uterine wall), which is associated with high rates of morbidity for both the mother and the fetus.
- Because the anthropometry of pregnant individuals differs from the general population, it is important to understand how those differences influence injury risk.
- The goal of this study was to identify if **pregnant occupants were at a higher risk of injury** than non-pregnant female occupants as well as what factors influence the risk of injury for both populations.
- We hypothesized that, for *the same conditions,* vehicle occupants who are pregnant would have a higher risk of injury than their non-pregnant counterparts; among those involved in MVCs.

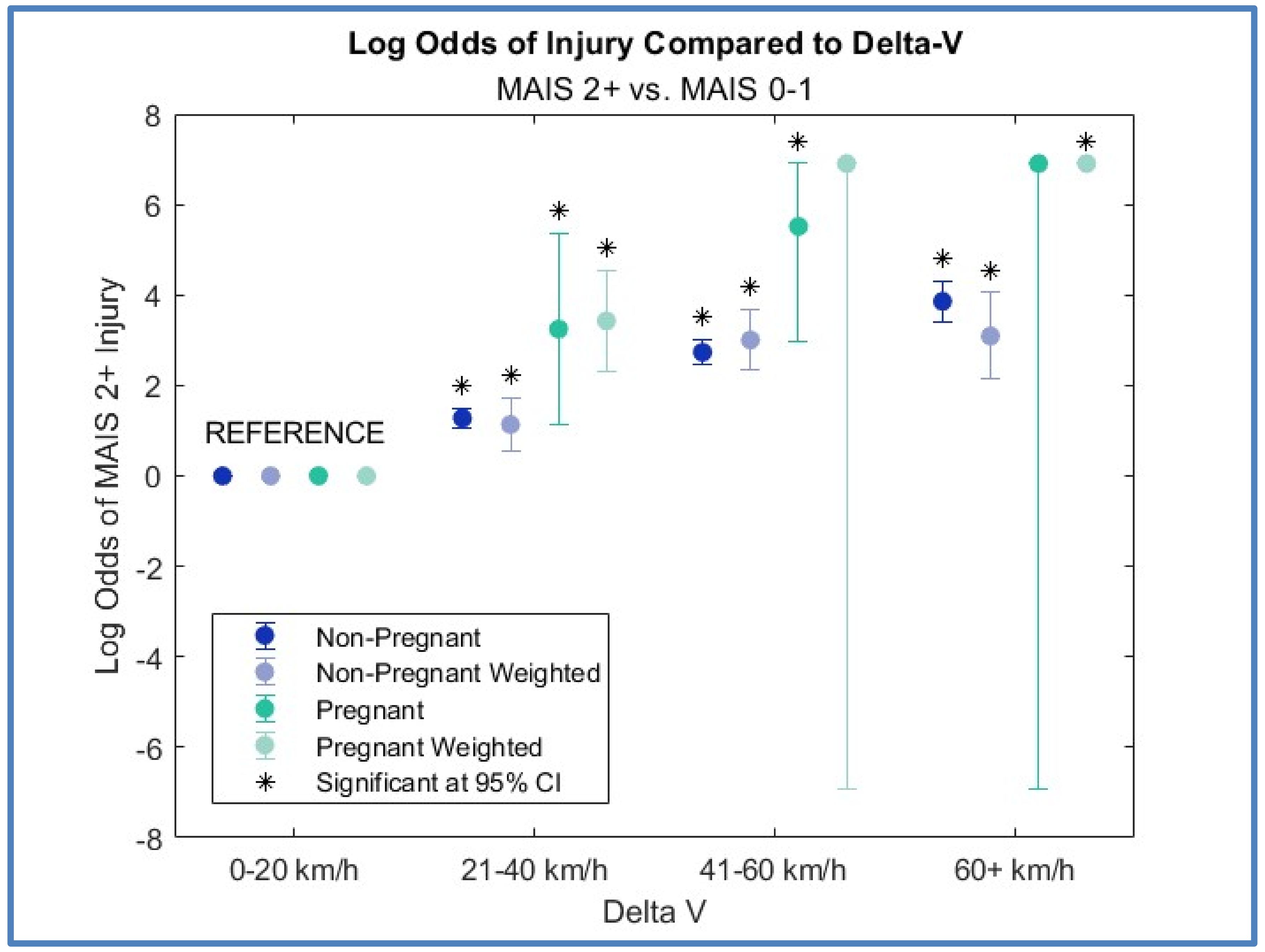
Methods



Results

Injury Risk

For the same Delta-V, pregnant occupants had **a higher odds of MAIS 2+ injury** for both the weighted and un-weighted analysis.



W – Weighted Values. **U** – Unweighted Values. ***** - Significant at P < 0.05. ** - Not including Unknown values.

Other Results of interest:

- Both groups (Pregnant and non-pregnant females) were equally likely to be reported the driver of the vehicle. (**W**)
- **89%** of pregnant female occupants and **87%** of non-pregnant female occupants were reported to be properly wearing three-point seat belts . (**W,****)
- Pregnant occupants were 15% more likely than non-pregnant female occupants to have a Delta-V of less than 21 km/h. (**W,*,****)
- Pregnant female occupants were **significantly more likely to have mild injuries** (AIS 1) than non-pregnant female occupants and equally likely to have moderate or worse injuries (AIS 2+). (**W,*,****)
- Pregnant female occupants had higher percentage of AIS 1 abdominal injuries and a lower percentage of AIS 2+ head and thoracic injuries than non-pregnant females. (**W,***)

Discussion

The results of this study agree with previous analyses of pregnant occupants conducted using NHTSA's NASS database [3-4]. Both this study and previous NASS studies found that non-pregnant females were significantly more likely to have AIS 2+ injuries to the head and thorax and no significant difference in likelihood of AIS 2+ abdominal injuries between the groups [3]. The specific injury characteristics from this study suggested that most of the pregnant females that sustained AIS 2+ abdominal and pelvic injuries were belted, and the injuries were often caused by the lap belt. The relationship between lap belt trauma and abdominal injuries for pregnant occupants is well documented and similarly found in the 2000-15 NASS analyses [4].

While seatbelts greatly reduced the risk of injury for all occupants, more research needs to be done to improve their protection for pregnant occupants. The results of this study highlight the **lack of changes in pregnant occupant safety from 2000-present** and signify a need for increased research in this area. This study was limited by the small number of pregnant occupants with AIS 2+ injuries compared to the non-pregnant population (N = 28 vs. N = 1167 (**U**)).

References

1. Brown H L, Obstet. Gynecol 114, 147-160, 2009.
2. Klinich K D, et al, International Congress & Exposition, SAE International, 1999.
3. Koh S., et al, Healthcare 11,9. 2021.
4. Manoogian S, Accident Analysis and Prevention 74, 69-76. 2015.

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