

Introduction

Perioperative stroke is a life-threatening complication that increases the risk of post-operative cognitive dysfunction may lead to a loss of independence after surgery. The majority of perioperative strokes are related to embolic and thrombotic events. Only a minority of strokes are related to hypotension induced hypoperfusion. Advanced age is a key risk factor for perioperative thrombotic stroke, but the mechanism of age-associated thrombotic risk is not completely understood. Platelet reactivity may predispose to thrombotic risk and platelet size is correlated with greater platelet reactivity. Mean platelet volume is measured as part of routine pre-operative laboratory assessment and an increased mean platelet volume may indicated increased platelet reactivity. Based on this previous work we hypothesized that a higher mean platelet volume would be associated with a higher incidence of stroke.

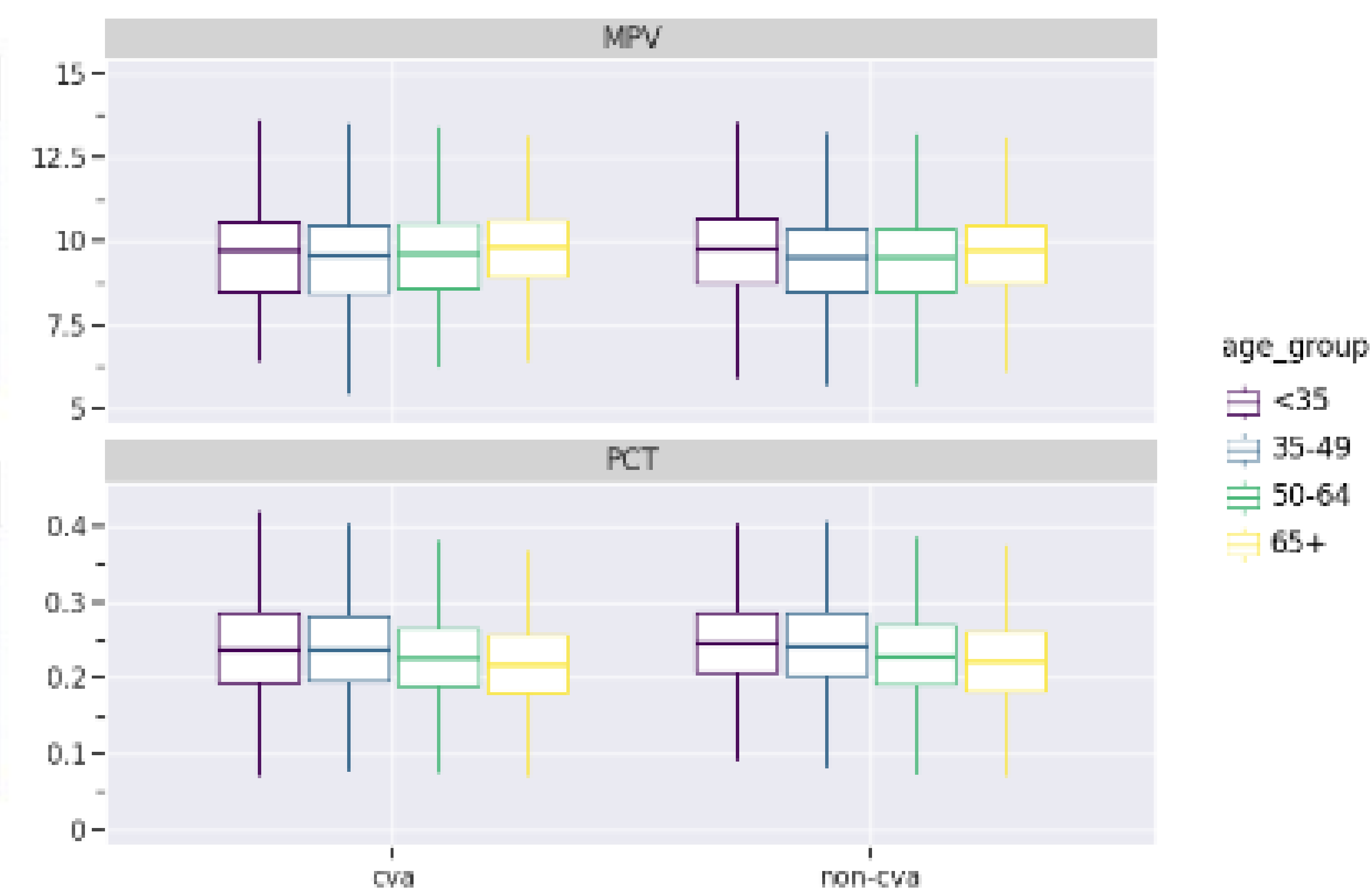
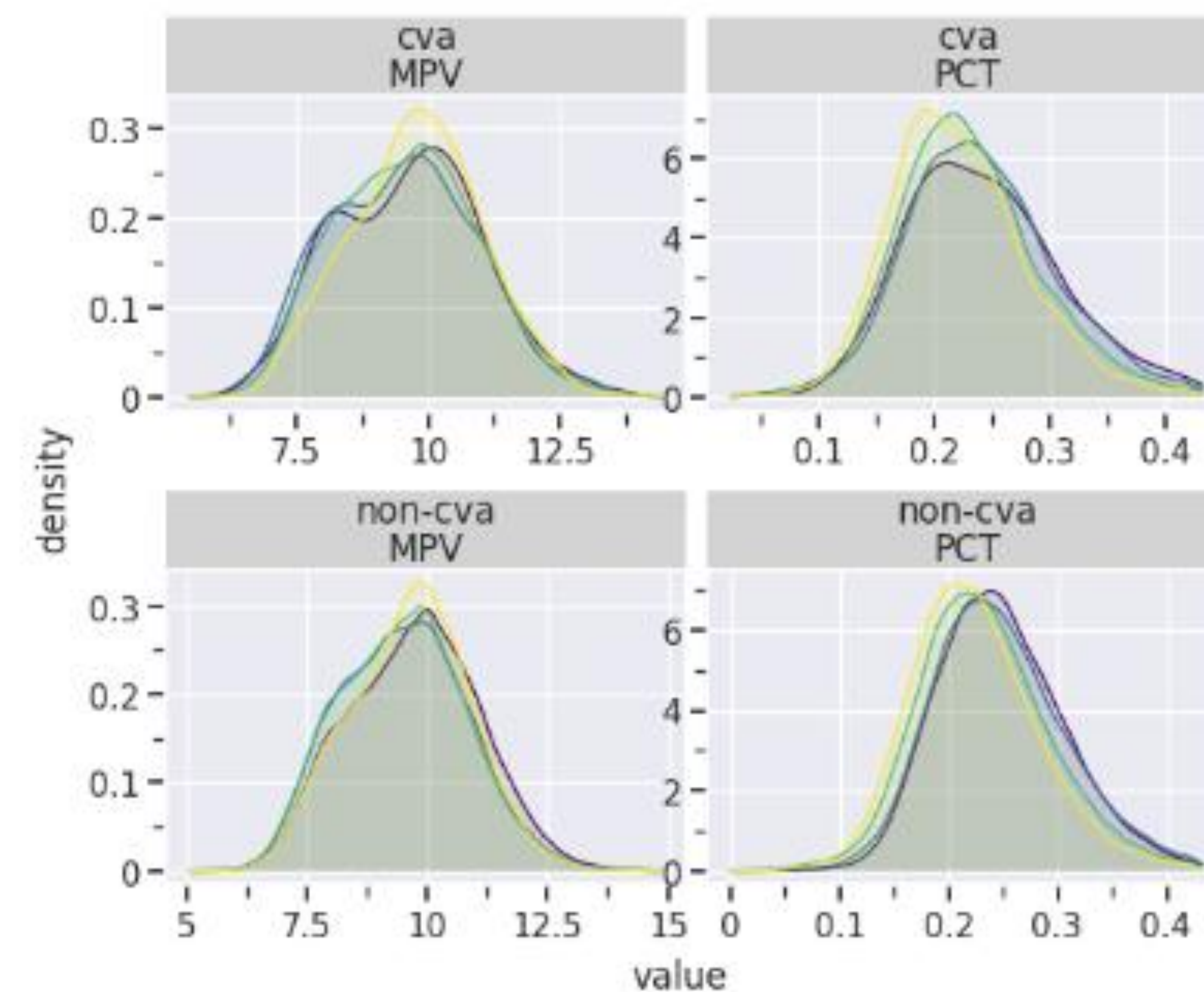
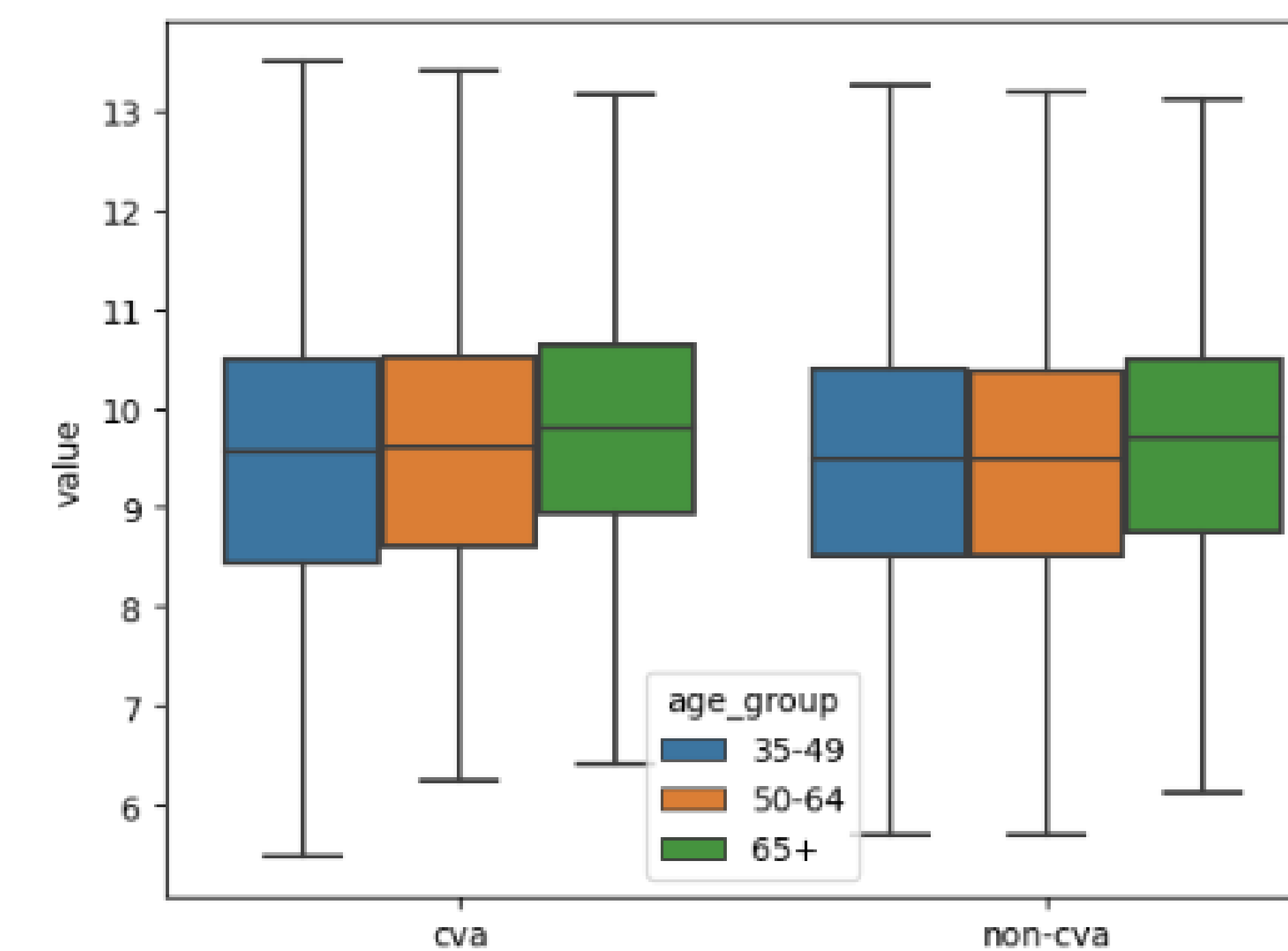
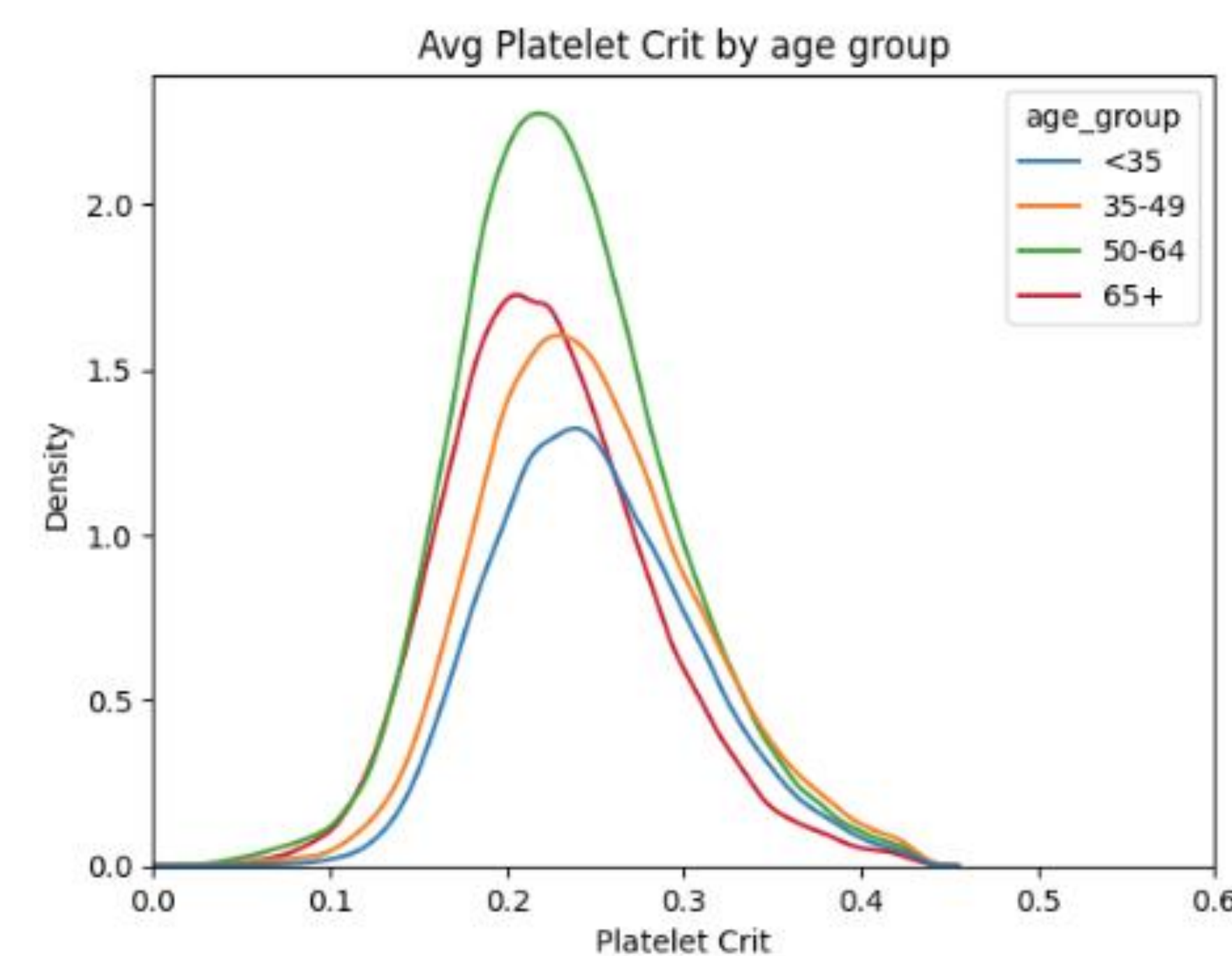
Methods

We compared the mean platelet volume and plateletcrit between subjects with and without a history of stroke within the National Institutes of Health All of Us prospective observational cohort (N = 660,395).

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group    age_group
cva      <35          1565
         35-49       5681
         50-64      13303
         65+        11665
non-cva  <35      124334
         35-49    156968
         50-64    204475
         65+     142404
Name: variable, dtype: int64
```

Results

Mean platelet volume increased and plateletcrit decreased with increasing age. Subjects with a history of stroke (n = 32,214) had a greater increase in mean platelet volume compared to controls (n = 628,181).



Conclusions

Perioperative stroke is a devastating complication after surgery and the key risk factors of age and procedure are non-modifiable. In a large prospective cohort we observed that mean platelet volume was associated with a history of stroke in a representative sample of the general population with the National Institutes of Health All of Us cohort. Mean platelet volume is associated with increased platelet reactivity and was increased in older adults in the cohort we studied. Therefore, anti-platelet therapy may be a viable prophylactic strategy for preventing stroke in older adults with an elevated mean platelet volume if future prospective randomized controlled trials demonstrate benefit.

References

- Selim M. Perioperative stroke. New England journal of medicine. 2007 Feb 15;356(7):706-13.
- Bath P, Algert C, Chapman N, Neal B. Association of mean platelet volume with risk of stroke among 3134 individuals with history of cerebrovascular disease. Stroke. 2004 Mar 1;35(3):622-6.
- All of Us Research Program Investigators. The "All of Us" research program. New England Journal of Medicine. 2019 Aug 15;381(7):668-76.