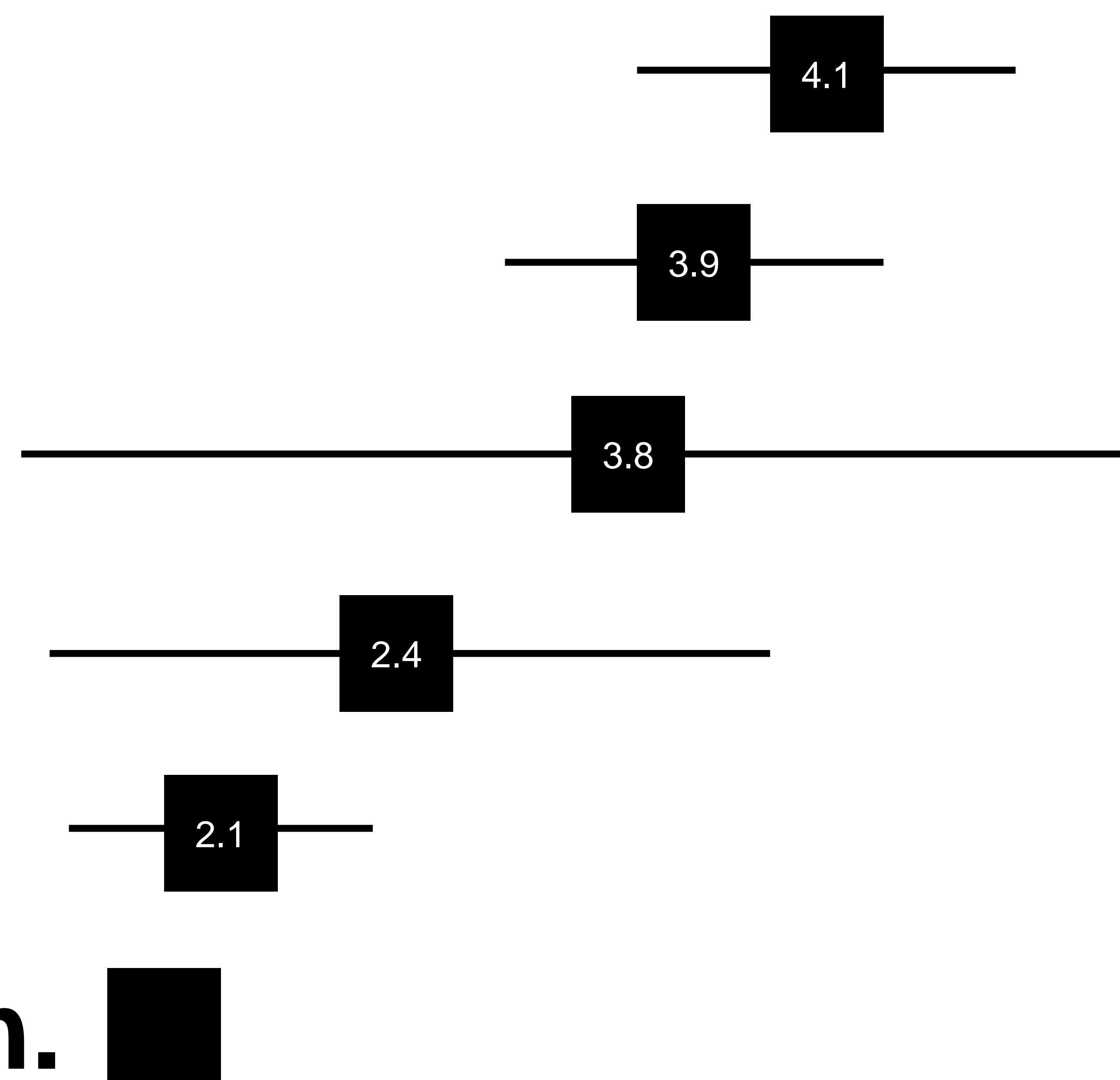


Across 73 studies of 19 million donations, **blood donors** who felt faint were often\* **younger, inexperienced, smaller, hypotensive, female, and fearful of donation.**



0.5 | 1 | Odds ratio (OR) | 2 | 4

\*Random-effects-pooled unadjusted odds ratios (ORs) and 95% confidence intervals (CIs) compared binary categories for sex and new donor status and lowest and highest exposure categories for age, total blood volume, and systolic blood pressure (with similar associations seen for diastolic blood pressure). All characteristics displayed curvilinear associations in dose-response analyses. The OR for donation fears was approximated from 12 narratively synthesised studies. Limited evidence was found for associations with race, heart rate, haemoglobin, and donation site type. High heterogeneity ( $I^2 > 90\%$ ) was observed across all risk factors, and no clear evidence for small study effects or subgroup differences was found.

### Background

- Blood donation is generally safe, but 1-7% of whole blood donors suffer vasovagal reactions (VVRs; feeling faint or fainting), which can cause injury and discourage return
- Diverse risk factors for these reactions have been identified, but the magnitude, consistency, and validity of their associations with VVRs have not been systematically evaluated

### Methods

- We searched databases from inception to February 2024 for English-language studies of risk factors for whole-blood-donation-related VVRs, returning 7358 records of which 417 full texts were assessed for eligibility
- We extracted study and participant characteristics, risk factor and VVR assessment methods, and ratio measures and 95% confidence intervals
- We examined heterogeneity and small study effects and conducted subgroup analyses by outcome severity, donor experience, and study context and quality

### Interpretation

- Our world-first quantitative synthesis identified demographic, donation-specific, biomarker, and psychologic risk factors for donation-related VVRs with and without loss of consciousness
- We attributed heterogeneous estimates to differences in donor characteristics, outcome operationalisation, and donation procedures
- Future VVR aetiology research should mutually adjust for risk factors to inform the development and targeting of prevention strategies

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### Figure 1 (left)

Gauze tape used during the first author's first donation