

Prognostic Factors of Physical Function Decline in the PREPARE Study

Grace L. Kulik (nee Ditzenberger)¹, Triin Umbleja², Todd T. Brown³, Heather J. Ribaudo², Steven K. Grinspoon⁴, Jennifer A. Schrack⁵, Markella V. Zanni⁴, Judith A. Aberg⁶, Carl J. Fichtenbaum⁷, Carlos D. Malvestutto⁸, Sarah M. Chu⁴, Judith S. Currier⁹, Pamela S. Douglas¹⁰, Gerald S. Bloomfield¹¹, Kristine M. Erlandson¹

¹University of Colorado Anschutz Medical Campus, Aurora, CO, USA; ²Harvard TH Chan School of Public Health, Boston, MA, USA; ³Johns Hopkins University School of Medicine, Baltimore, MD, USA; ⁴Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA; ⁵Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA; ⁶Icahn School of Medicine at Mount Sinai, New York, USA; ⁷University of Cincinnati College of Medicine, Cincinnati, OH, USA; ⁸Ohio State University Medical Center, Columbus, OH, USA; ⁹David Geffen School of Medicine, University of California, Los Angeles, CA, USA; ¹⁰Duke University Research Institute, Duke University School of Medicine, NC, USA ¹¹Duke Global Health Institute and Duke Clinical Research Institute, Duke University, NC, USA



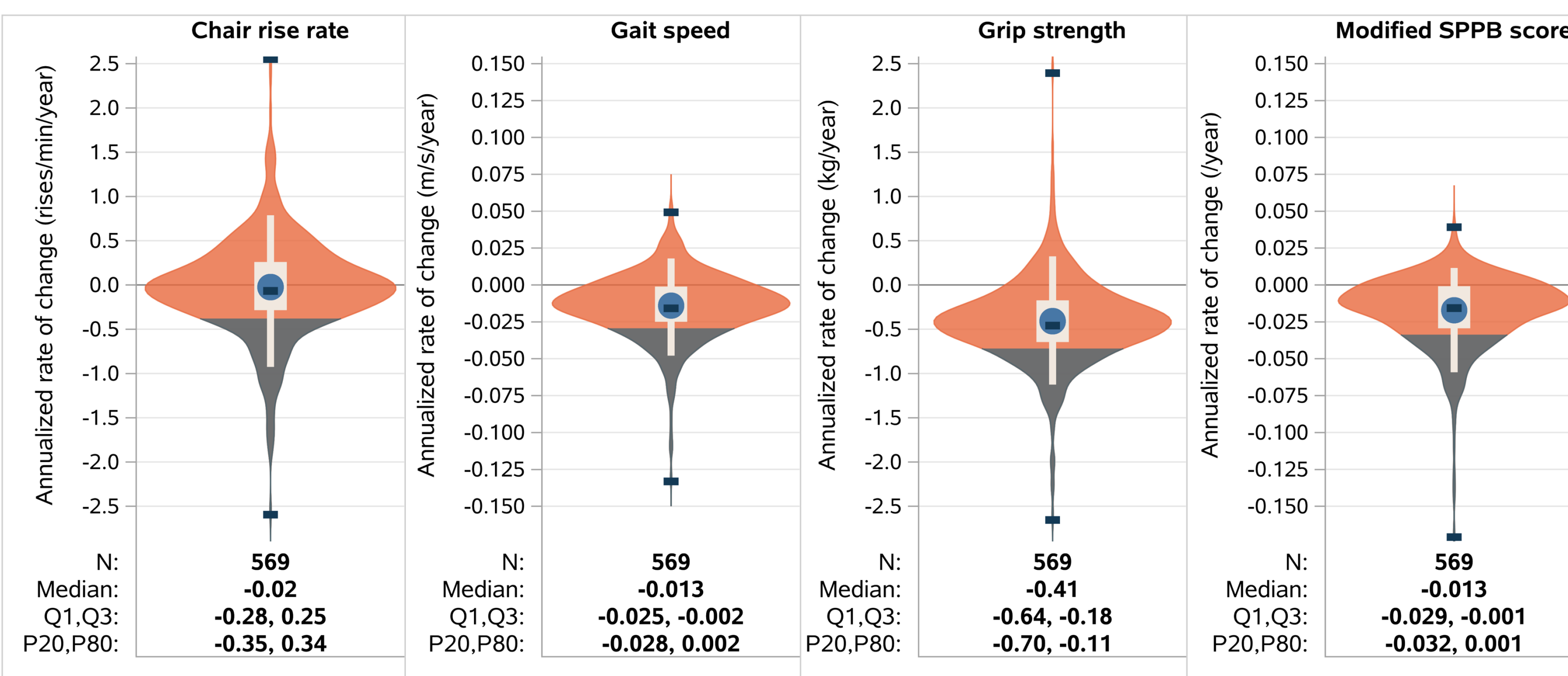
BACKGROUND

- People with HIV (PWH) appear to have an accelerated decline of physical function compared to populations without HIV, which may contribute to increased morbidity and all-cause mortality.
- The Pitavastatin to REduce Physical Function Impairment and FRailty in HIV (PREPARE) substudy of REPRIEVE found small declines in physical function over 5 years.
- However, there was substantial individual variability, with some participants experiencing considerable declines in physical function.
- The purpose of this pre-specified exploratory analysis was to identify participants at a greater risk for physical function decline.

METHODS

- PREPARE conducted physical function assessments annually for up to 5 years. Physical function assessments included chair rise rate (based on 10x chair stands), gait speed (based on 4-meter walk), the modified Short Performance Physical Battery (mSPPB, composite of the latter two plus balancing time), and grip strength.
- Participant-specific annualized rates of change in these physical function assessments were estimated from linear mixed effect models (Figure 1).
- Physical function decline was defined as an annualized rate of change below the 20th percentile (P20) of the study population in at least one of the four measures.
- Associations between baseline factors and physical function decline were evaluated with log-binomial regression models.

Figure 1: Participant-specific Annualized Rates of Change in Physical Function



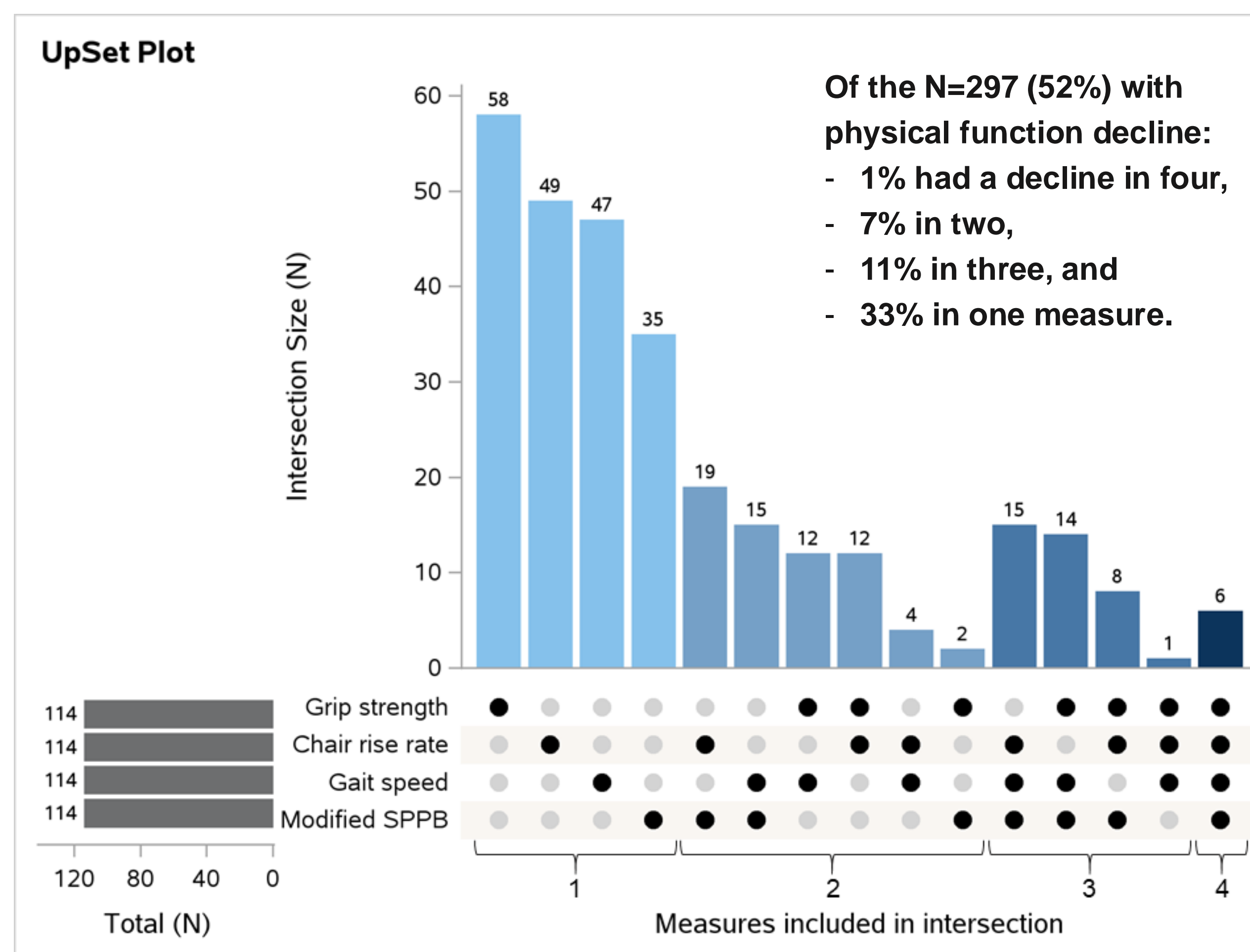
Violin plots showing estimated probability density function, mean (circle), median, min and max (dashes), Q1-Q3 (box) and P5-P95 (whiskers); density below P20 is shown in gray.

People with HIV with history of depression treatment, high BMI, or levels of inflammation and those showing early signs of functional impairment were at greatest risk for physical function decline. These individuals may benefit from early interventions to preserve physical function with aging.

RESULTS

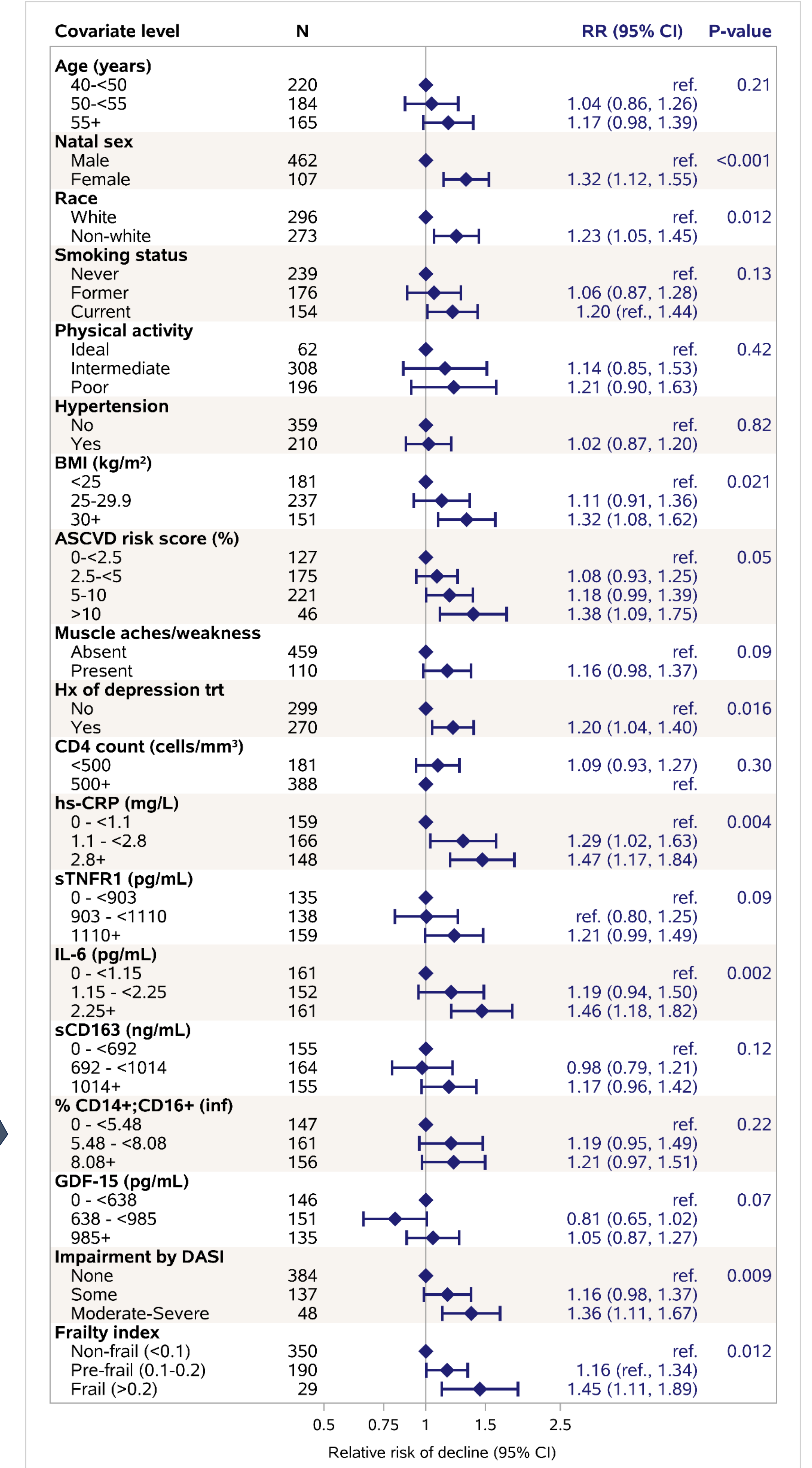
- Of 569 participants (81% male, 52% white), the median age was 51 (Q1-Q3: 47-55) years.
- There was a greater risk physical function decline among females, non-whites, and a trend of higher risk with increasing age (Figure 3).
- The sex difference was attenuated in models adjusted for BMI, history of depression treatment, and inflammatory markers, which were higher/more prevalent among females (RR: 1.16, 95%CI: 0.98-1.38 in females vs. males, when adjusted for hs-CRP).

Figure 2: Details on Participants Classified as Having Physical Function Decline



UpSet plot visualizing overlap in those below P20 in chair rise rate, gait speed, grip strength or mSPPB. Left: bar chart showing the total N with decline according to each measure (N=114 by definition). Right: bar chart showing the N for each intersection of the 4 measures (from light blue for 1 to dark blue for all 4 measures); the measures represented in an intersection are shown with black circles in the legend below the chart, those not included are in gray.

Figure 3: Associations between Baseline Factors and Physical Function Decline



CONCLUSIONS

- Identification of these risk factors of physical function decline, particularly modifiable factors such as BMI, can help clinicians provide early intervention strategies to prevent physical function decline.