

Firefighter Sulforaphane Pilot Study *Results Summary*

August 12, 2026

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Fire Fighter Cancer Cohort Study



- ~9,000 participants across 33 states
- SFFD has >200 participants
- SFFD part of the:
 - FFCCS Women Firefighter Study, funded by FEMA; and the
 - FFCCS- affiliated Sulforaphane Study, funded by the San Francisco Firefighters Cancer Prevention Foundation



Women
Firefighter
Study



Sulforaphane
Study

What is Sulforaphane?



- Naturally occurring in broccoli, extracted from seeds and sprouts
- Known anti-oxidant and anti-inflammatory properties
- In other studies, sulforaphane helped the body to excrete some toxic chemicals faster (e.g. benzene)
- Supplementation with sulforaphane could have protective effects for firefighters



Study Goals

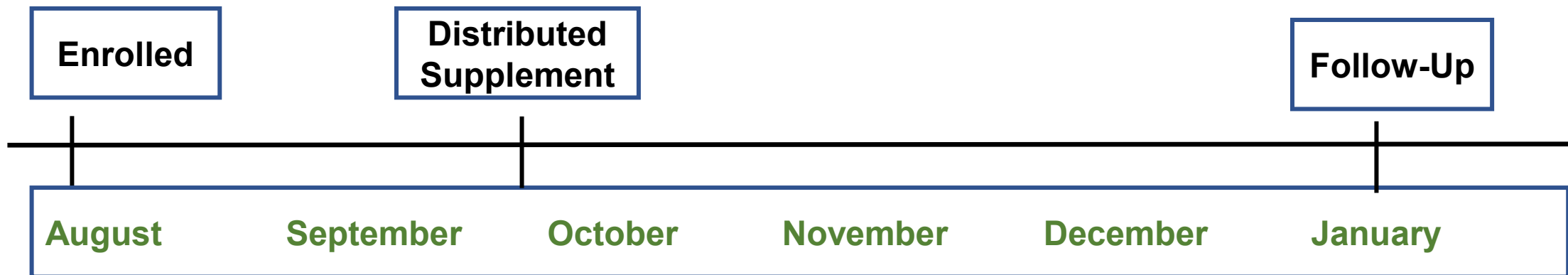


- The purpose of this study was to identify potential health effects of sulforaphane supplementation among firefighters
- The main objectives were to compare C-reactive protein (CRP), a marker of inflammation, and markers of biological age in samples collected at enrollment and follow-up among 48 firefighters that took the supplement and 37 that did not
- An exploratory objective was to assess whether blood metals changed over time in a subset of the treatment and non-treatment groups

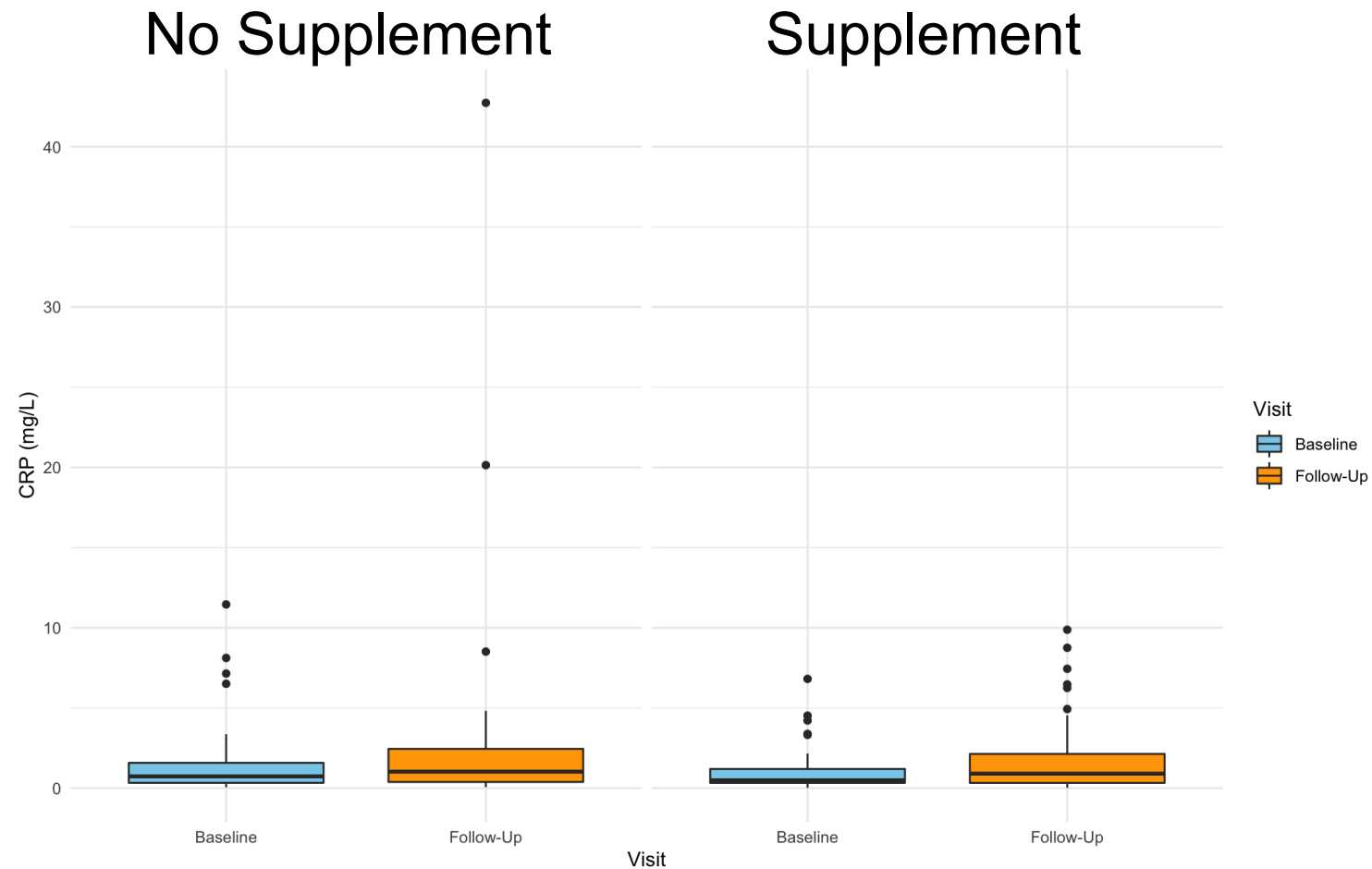
Study Methods



- 91 SFFD participants
- Supplements distributed at end of September, 2024
- Daily supplement consisted of 15 mg of sulforaphane x 3.5 months
- Follow-up visits occurred in January; 85 participants returned



Results: CRP



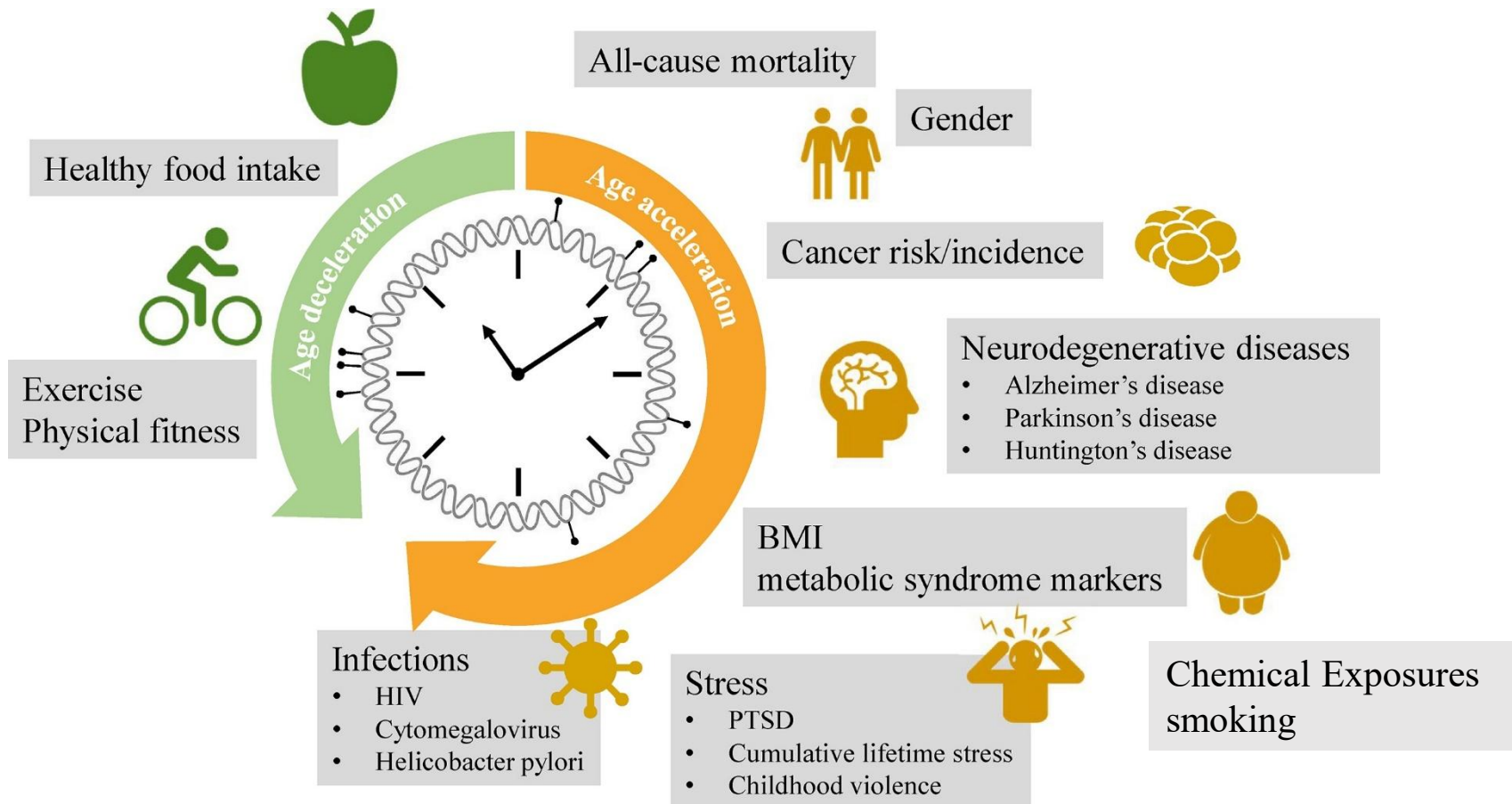
Take Home Points: CRP



- CRP was not different between the two groups at baseline
- CRP was consistently higher at the follow-up visit compared to baseline (~0.4 mg/L increase) in all participants
- When accounting for time, there was a small decrease in the supplement group, but it was not statistically significant
- **Overall:** CRP did not drastically change by supplement use



What is Epigenetic Age?



Epigenetic age:

-is estimated using epigenetic data from blood

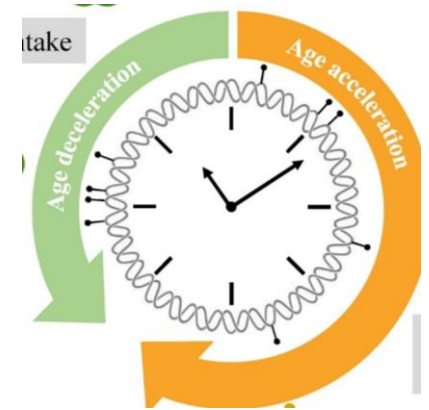
-Approximates the body's biological age

-Can improve with 'good' exposures and accelerate with 'bad' exposures

Results: Epigenetic Age



- We calculated epigenetic age using 16 different 'clocks'
- At baseline, no difference between groups
- In adjusted models, two clocks were significantly reduced in the supplement group over time:

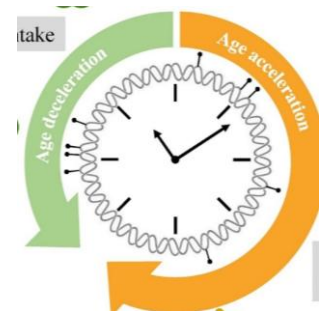


Clock	Estimate, supplement use (SE)	P-Value
GrimAgev1	-1.060 (0.525)	0.047
GrimAgev2	-1.508 (0.669)	0.027

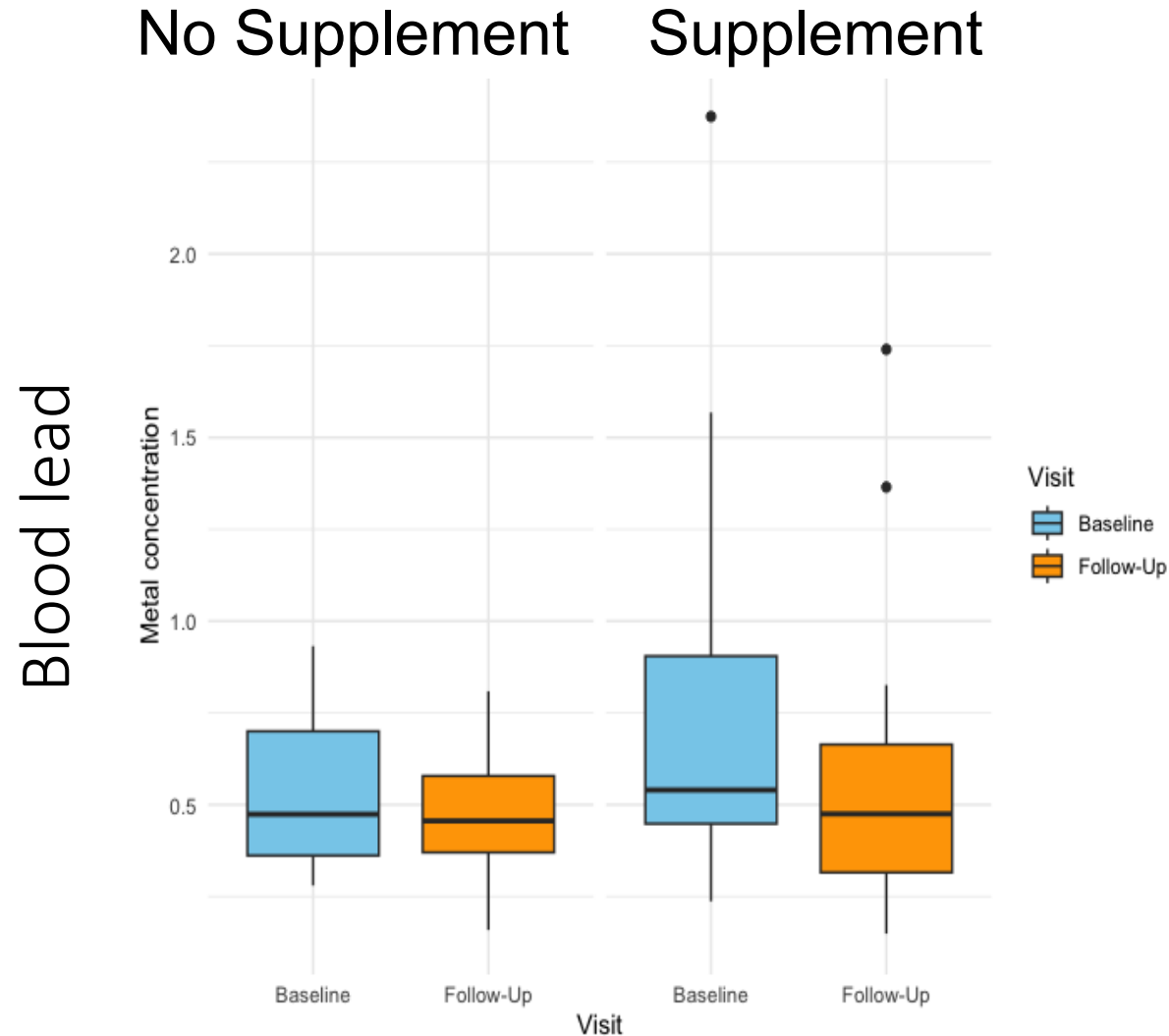
Take Home: Epigenetic Age



- Decreased epigenetic age (*indicates younger biological age*) was observed in the supplement group over time according to two versions of the GrimAge clock
- Accelerated GrimAge has been associated with mortality and morbidity for various diseases in other studies



Results: Metals in Blood



Take Home: Blood Lead



- Blood lead was significantly lower at follow-up in the supplement group but did not change in the no supplement group



Summary



- Daily sulforaphane supplementation for ~3.5 months:
 - Did not substantially change CRP levels
 - Was linked to reduced epigenetic/biological aging
 - Was linked to lower blood lead (Pb)
- Effects of longer-term sulforaphane use are not known

