1. How does temp influence movement?
2. What was the role of temperature in relation to how well people stuck to shelter in place guidelines?

Question 1: How does temp influence movement?

What is the typical mobility response to temperature increase

Hypothesis: Mobility increases with heat until a certain threshold (Matthews et al., 2001; [Bocker et al., 2016](https://www.sciencedirect.com/science/article/pii/S001393512031505X?casa_token=xL-laofq6qcAAAAA:7kfFNG7PA5-kgpi3w2o7gm2aL6XIYiFQunxZTGHK3ZHKamy_uMPiLDaM9VeHEriDpMsjzxuwVVk" \l "bib3); [Liu et al., 2014](https://www.sciencedirect.com/science/article/pii/S001393512031505X?casa_token=xL-laofq6qcAAAAA:7kfFNG7PA5-kgpi3w2o7gm2aL6XIYiFQunxZTGHK3ZHKamy_uMPiLDaM9VeHEriDpMsjzxuwVVk" \l "bib17)), then people shelter more to avoid extreme heat. (Barreca et al 2016: AC responsible for almost all of the decline in heat mortality so staying indoors is necessary. Their threshold for dangerous temp is 90 degrees)

* Summary stats
* This is based on Jan 2019-Feb 2020 daily “shelter” data (which is just a measure of how many devices left their home census block group).
* Run fixed effect model (by county or by census block?)
  + Binned for every (10?) degrees
  + IV: temperature; PM
  + FE: location, time trends, state/county specific linear time trends
* Results: understanding how % change in temp creates % change in movement (there are going to be regional differences in this pattern, so for now we’ll just do the west coast)

Question 2: 2020 was different, and aimed to decrease mobility. Did it work?

Hypothesis: warmer weather still saw an increase in mobility, but SIP regulated the % change in movement.

* Summary stats on 2020 mobility
* Fixed effect on just Apr-Sept 2020 & run t-tests to compare w/ <2020 years
  + (are there any caveats to t-tests with fixed effects?)

Question 3: What difference do we see across socio-economic backgrounds?

Hypothesis: lower socio-economic status means patterns that look more like a typical year (ppl that are essential and service workers)

* PM 2.5 + Temp

Question 4 (optional?): If there are differences in how temp affected SIP adherence based on socio-economic indicators, did we see any significant difference in COVID mortality?

* Stratify the different counties based on the indicators
* Run ANOVA on the different groups to establish difference