Key Points from Day 1 (Thursday, January 17) [DRAFT]

Effectively responding to outbreaks and preventing pandemics in the future will require collecting high-resolution data mobility and human interaction in real-time.

a. Hyperlocal information can improve and appropriately target outbreak responses.
b. Crucial to estimate overdispersion in the distribution of secondary cases produced by infected individuals: epidemics sustained by superspreading events are fragile and prone to extinction.
c. Avoid unintended consequences in which policies aimed at curbing transmission may actually increase it.

We must grapple with an inherent trade-off between statistical accuracy and privacy preservation.

a. The outputs from each analysis conducted on a data set spend a "privacy budget".
b. Accumulating even seemingly benign data, such as aggregate statistics, creates privacy concerns. Privacy harms add up with each query we make into the data.
c. Domain experts must specify which research questions are most important (i.e., justify higher spending of the privacy budget) and relay this information to those implementing privacy-preserving algorithms.

Key Points Re: MAPPING@Brown

1. Given the sensitive data we hope to collect on location and proximity, we must consider both the magnitude of the potential benefit as well as *who* stands to benefit, in making an assertion as to when collecting such data is justified.

2. What data should we *not* collect for any reason? Some data may reveal information not at all pertinent to our research aims (e.g., nighttime resting temperature predicts pregnancy).

3. Granting agencies such as NSF and NIH require clearly described user profiles whenever individuals will be tracked during a study.

Breakout 1 Output:
Key Data for MAPPS to Focus On

Data Type	Variables
Geographic	• GPS coordinates • Travel distances • Phone brightness (to indicate inside/outside location) • Geocircles, and once someone enters the geocircle, it sends a signal back that the device has entered this location
Environmental	• Phone brightness (to indicate inside/outside location) • Room occupancy • Within room density • Prevalence of pathogen mitigation activities (UV lights, air filters, air exchange) • Outside weather • Strength of wifi connection • Temperature • CO2 monitor • Interior layout data of SPH and other Brown buildings (Only select variables important for Phase 3)
Relational	• Contact characteristics (with person and place): type, duration, frequency • Room occupancy over time (affects distances between people) • Within room density (affect distances between people) • Understanding from where and to where people are going; type of activities occurring in each room • Place a beacon in a given location that acts as an additional person contact (this can reduce the need for geospatial data) • Battery life (i.e., if battery is dead this is a way to tell whether we are missing relational data) (Only select variables, or estimates of these variables, might be required for Phase 3)
Personal	• Demographics (should be collected for all invited participants, i.e., those who enroll and those who decline to participate in the study) • Biometric data (temp, heart rate, oximeter, skin sweating) • Personality intake • Co-occurring conditions; respiratory conditions; vaccination status • Lifestyle • Health literacy • Occupation; year of school (e.g., freshman) • Type of activities being engaged in (work and leisure) • Individual behaviors: masked vs. unmasked • Phone brightness (to indicate inside/outside location) • Is someone currently sick? (biometrics/self-report) (Demographic data more important for Phase 2 than for Phase 1)