Indoor Air Quality (IAQ) is an important issue since exposure to common indoor pollutants can cause a wide range of adverse health effects. Within the last 15 years technological advances have allowed for the mass production of affordable, consumer-grade sensors designed to measure atmospheric particles and gases. These sensors provide an opportunity to monitor multiple locations across a wide range of participants. Our work uses data from consumer-grade IAQ sensors combined with health metrics to understand the relationship between IAQ and sleep quality. First, we create, calibrate, and deploy 30 IAQ monitors – the Building Environment and Occupancy (BEVO) Beacon – that consist of multiple sensors wired to a single microcomputer. Participants are provided Fitbit Inspire HR devices and asked to download a smartphone app that provides GPS data and sends scheduled Ecological Momentary Assessments (EMAs) directly to them. Sleep data are gathered by Fitbit and four questions included on morning EMAs. Our results indicate significant decreases in both objective and subjective sleep quality during nights with poor ventilation and elevated CO, CO2, and temperature. Sleep quality improved slightly at elevated particulate matter and volatile organic compound concentrations, indicating the need to continue exploring the relationship between IAQ and sleep.