

Pre-Registered Hypotheses

Passenger Density on Stockholm Subway Platforms With and Without Blue-Light Exposure: A Quasi-experimental Observational Study

Hypotheses

H1. At intervention platforms, passenger density in the exposure zone is expected to be lower during B-LED on periods compared to B-LED off periods. At control platforms, little to no change is expected in passenger density in the exposure zone over the same date and time windows, and any change will be substantially smaller than that observed at intervention platforms.

H2. At intervention platforms, passenger density in the adjacent zone is expected to be higher during B-LED on periods than during B-LED off periods. At control platforms, little to no change is expected in passenger density in the adjacent zone over the same date and time windows, and any change will be substantially smaller than that observed at intervention platforms.

H3. The magnitude of the B-LED effect (the reduction in the exposure zone and the increase in the adjacent zone) is expected to be smaller at higher levels of passenger inflow into the station, such that the relationship between inflow and effect magnitude is decreasing.

H4. Within a single B-LED on period, the magnitude of the B-LED effect on passenger density is expected to decrease over time, with the largest effect (reduction in the exposure zone, increase in the adjacent zone) at the beginning and the smallest at the end, following repeated exposure.

H5. Across the whole data collection period, the magnitude of the B-LED effect on passenger density is expected to decrease across successive exposure periods, with the largest effects in the early months of data collection and the smallest in the later months.

H6. At the outdoor exposure platform, the magnitude of the B-LED effects on passenger density is expected to be moderated by ambient outdoor light, effects being largest at low ambient light levels and approaching zero as ambient light increases.