

ways, significantly influencing the spread of disease. The high resolution of our data also shows a great deal of diversity of movement and interactions among healthcare workers within the same department and within the same job type. This is another important outcome of our approach discussed with more detail in section 2.3.

We are aware of several problems with using HCW contact networks as a proxy for patterns of actual healthcare worker contacts. These include the complete absence of patients and certain categories of healthcare workers such as janitors and transporters. Another problem is that certain healthcare worker behaviors that may introduce a systematic bias in the EMR login data. For example, typically healthcare workers visit patients in small groups during rounds and designate the junior-most member as the person in-charge of updating the EMR system. This may cause a relative absence of senior staff logins in the EMR login data, even though the senior staff may be moving around the hospital and interacting with patients and other healthcare workers as much as the junior staff.

We aim to address these problems in the future using a combination of new data gathering techniques (e.g, having HCWs and patients wear wireless “badges” that will record contacts) and further analysis of available data (e.g., patient admission and discharge data, out-patient load data, etc.). Recently we have made progress implementing the wireless “badge” approach at the UIHC to detect the proximity of individuals [31] and automate monitoring of HCW hand hygiene [96].