

conclude that physicians should be prioritized for vaccination. Most recently Polgreen et al. [98] use contact networks gathered from observational data to show the importance of contact structure for informing vaccination interventions.

One of the problems of research in contact network epidemiology is the lack of reliable data from which to infer contact networks that are epidemiologically relevant. There is now considerable research on the structure of online social networks (see for example [4, 73, 56, 17]), but such online social networks are not always epidemiologically relevant and may be structurally very different from networks of HCWs induced by spatiotemporal proximity. The contact networks used by Meyers et al. [70], Ueno and Masada [105], and Polgreen et al. [98] are relatively small and constructed on the basis of limited data, taking a rather coarse view of time and the hospital space in which interactions take place. As a result, these approaches result in contact networks that are either highly structured (e.g., consisting of a clique for each ward or unit) or drawn at random from simple probability distributions. Neither of these types of networks seem representative of the complexity of interactions that occur in real hospital settings.

In Chapter 2, we present a comprehensive approach to constructing *HCW contact networks* in a large hospital setting via the use of electronic medical records (EMR). We apply this approach at the University of Iowa Hospitals and Clinics (UIHC), a 3.2 million square foot facility with 700 beds and about 8,000 HCWs. Using a data set of over 19.8 million EMR logins spanning more than 21 months (Sept 1, 2006 through June 21, 2008), we construct 9,000 different HCW contact