networks for the UIHC. These contact networks serve as realistic proxies for patterns of actual HCW contacts and provide some of the most detailed views, as yet, of contacts among hospital-based HCWs. Analysis of these contact networks reveals that despite spatial and job-related constraints on HCW movement and interactions, there is a surprising structural similarity between the HCW contact networks we generate and social networks that arise in other settings (e.g., movie or scientific collaborations, on-line friendships, etc. [4, 9, 58, 109]).

1.3 Random Graph Models for Contact Networks

Contact network structure plays a key role in how disease will spread on a network [69, 84, 109]. With the exponential growth in the size of networks being studied – compare the karate club graph of Zachary [111] in 1977 with 34 vertices and 78 edges to the web graph studied by Broder [19] in 2000 with 200 million vertices and over 1.5 billion edges – it is no long possible to visually analyze structure. Modeling networks as random graphs is a way to focus on the important structure aspects while abstracting away the unimportant features. In addition, random graph models can be used to predict properties of the class of networks represented by the model. Thus, finding random graph models that *accurately* model real-life instances of social networks are essential to the success of contact network epidemiology.

One of the major fallouts from the work by Watts and Strogatz [109] was realization that real-world social networks have distinct structural differences from the Erdös-Rényi random graphs. Thus, a lot of recent work has focused on the