	$sparse_1$	$moderate_1$	$dense_1$
n (num. vertices)	6,875	6,875	6,875
m (num. edges)	82,199	174,739	332,766
$\langle k \rangle$ (mean degree)	23.91	50.83	96.8
k_{max} (max. degree)	321	635	1,115
σ (std. dev. degree dist.)	32.84	62.86	113.877
σ_{rand} (std. dev. degree dist. $G(n,p)$)	4.90	7.06	9.77
cc (clust. coeff.)	0.3109	0.3906	0.4379
cc_{rand} (clust. coeff. $G(n,p)$)	0.003516	0.007476	0.01414
c (num. components)	873	293	144
c_{rand} (num. components $G(n,p)$)	1	1	1
n_{giant} (num. vertices giant comp.)	5,838 (84.92%)	6,547 (95.23%)	6,702 (97.48%)
m_{giant} (num. edges giant comp.)	81,935 (99.68%)	174,687 (99.97%)	332,717 (99.98%)
$diam$ (diam. giant comp.)	11	13	12
$\langle \ell \rangle$ (ave. path len. giant comp.)	3.592	3.131	2.746

Figure 2.11: Basic structural features of a $sparse_1$ ($d = 1$, $t = 0$), $moderate_1$ ($d = 3$, $t = 15$), and $dense_1$ ($d = 5$, $t = 30$) instance of the HCW contact network are shown here. Note that the dense graph is only dense relative to the sparse graph; the average degree of even the dense graph is less than 1% of the graph size. For all three graphs we use time window $T = 001$, i.e., a 4-week time window starting at the second week of our EMR login data. For comparison, the corresponding statistics for Erdös-Renyi random graphs with same size (n) and same mean degree ($\langle k \rangle$) are also provided.

whose degree is no greater than the average vertex degree is 66.89% ($sparse_1$), 64.97% ($moderate_1$), and 64.00% ($dense_1$), pointing to a heavy tail in all of these cases. The plots in Figure 2.12 confirm this. Figure 2.12(a) shows the log-log plot of the degree distribution of the $moderate_1$ HCW contact network, indicating quite clearly that the distribution is heavy-tailed, covering close to three orders of magnitude and indicating a high level of heterogeneity among healthcare workers. This has important implications for infection control: if indeed a few people have lots of contacts, then it seems natural to try and target this group for vaccination.

We have also analyzed the degree distributions of the HCW contact networks with the aim of determining how well the popular heavy-tailed *power-law distribution* and *log-normal distribution* [74] fit the observed degree distributions. Figure 2.12