Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.
**eFigure 1.** A Snapshot of Patient Contact Networks Constructed for the DASON Data for January 2017

Each node is a patient, and each edge represents a contact between the two corresponding patients in that hospital during that month. One hospital is omitted due to a very sparse connectivity over the chosen month.
eFigure 2. Mixing Matrices by Age Measured by the Number of Pairwise Contacts for Each of 24 Community Hospitals in the DASON Network.

Brighter areas of color represent denser numbers of patient-to-patient connections based on occupation in the same unit. Each hospital is represented on its own scale.
**eFigure 3.** Histograms Depicting the Distributions of the Patient Ages Included in the DASON Data Set For October 2015 to November 2017
eFigure 4. Patient Age Distributions Compared With Patient Length of Stay Distributions

Patient groups with particularly long lengths of stay contribute disproportionately to the mixing matrix as compared to looking at the age distributions alone.
eFigure 5. Ratio of Contacts in Which the Neither, 1, or Both Contacts Were Receiving Antibiotics

Here, the top two barcharts show a comparative scenario in a Medical Ward and a Medical Critical Care from the same hospital. While medical care has a higher ratio on one of the patients on antibiotics, the critical care is apparently higher in the ratio for both of the patients on antibiotics. The barchart from Postpartum Ward shows the ratio where almost half of the contacts were between patients who were not on any antibiotic and for the remaining half is distributed amongst the other two categories. And the last is drawn from the Emergency Department which shows most of the contacts occurred in this unit were between patients who were not exposed to any antibiotic until that point.
**eTable 1. Hospital-Wide Network Statistics From a Snapshot of Patient Contact Networks Constructed From the DASON Data for January 2017**

| Hospital ID | Nodes | Edges | Diameter | Mean Degree | Mean Betweenness | Mean Closeness | Modularity | Density |
|-------------|-------|-------|----------|-------------|-----------------|----------------|------------|---------|
| 1           | 6576  | 670913| 6        | 204.049     | 5356.133        | 0.385          | 0.764      | 0.016   |
| 2           | 5389  | 401977| 5        | 149.184     | 4982.137        | 0.354          | 0.801      | 0.014   |
| 3           | 7269  | 894488| 13       | 246.110     | 7631.447        | 0.320          | 0.821      | 0.017   |
| 4           | 7657  | 874364| 7        | 228.383     | 6689.637        | 0.370          | 0.668      | 0.015   |
| 5           | 1122  | 26168 | 5        | 46.645      | 760.520         | 0.408          | 0.666      | 0.021   |
| 6           | 729   | 17407 | 15       | 47.887      | 800.048         | 0.302          | 0.631      | 0.033   |
| 7           | 1177  | 31604 | 10       | 53.748      | 935.178         | 0.380          | 0.698      | 0.023   |
| 8           | 1074  | 34933 | 17       | 65.113      | 1379.834        | 0.312          | 0.559      | 0.030   |
| 9           | 5882  | 602574| 8        | 204.887     | 5191.893        | 0.355          | 0.762      | 0.017   |
| 10          | 3539  | 246644| 7        | 139.386     | 2902.438        | 0.369          | 0.641      | 0.020   |
| 11          | 6255  | 620917| 8        | 198.535     | 6415.586        | 0.334          | 0.781      | 0.016   |
| 12          | 7598  | 1094890| 6       | 288.205     | 6895.834        | 0.359          | 0.761      | 0.019   |
| 13          | 1573  | 62816 | 12       | 79.969      | 1007.687        | 0.375          | 0.595      | 0.025   |
| 14          | 7309  | 919447| 6        | 251.593     | 5072.496        | 0.395          | 0.668      | 0.017   |
| 15          | 5810  | 710865| 16       | 244.704     | 3575.345        | 0.462          | 0.684      | 0.021   |
| 16          | 642   | 10271 | 16       | 32.047      | 160.092         | 0.386          | 0.736      | 0.025   |
| 17          | 8810  | 1578582| 6      | 358.361     | 7630.618        | 0.358          | 0.769      | 0.020   |
| 18          | 5837  | 607447| 8        | 208.137     | 5458.206        | 0.347          | 0.796      | 0.018   |
| 19          | 2841  | 145634| 7        | 102.523     | 3054.066        | 0.319          | 0.802      | 0.018   |
| 20          | 3979  | 311686| 9        | 156.665     | 4190.498        | 0.319          | 0.799      | 0.020   |
| 22          | 723   | 25099 | 9        | 69.430      | 460.033         | 0.424          | 0.519      | 0.048   |
| 23          | 1418  | 37640 | 6        | 53.089      | 1625.326        | 0.318          | 0.834      | 0.019   |
| 24          | 10957 | 1645446| 10      | 300.346     | 8521.860        | 0.392          | 0.673      | 0.014   |
eTable 2. Hospitalwide Distribution of Single vs Multiple Unit Nodes and Edges From a Snapshot of Patient Contact Networks Constructed From the DASON Data for January 2017

| Hospital ID | Nodes | Edges | Single Unit Nodes (%) | Multi-Unit Nodes (%) | Single Unit Edges (%) | Multi-Unit Edges (%) |
|-------------|-------|-------|------------------------|----------------------|----------------------|----------------------|
| 1           | 6576  | 670913| 5222 (79.4)            | 1354 (20.6)          | 375799 (56.0)        | 295114 (44.0)        |
| 2           | 5389  | 401977| 4254 (78.9)            | 1135 (21.1)          | 222959 (55.5)        | 179018 (44.5)        |
| 3           | 7269  | 894488| 6392 (87.9)            | 877 (12.1)           | 649383 (72.6)        | 245105 (27.4)        |
| 4           | 7657  | 874364| 4955 (64.7)            | 2702 (35.3)          | 300864 (34.4)        | 573500 (65.6)        |
| 5           | 1122  | 26168 | 901 (80.3)             | 221 (19.7)           | 11909 (45.5)         | 14259 (54.5)         |
| 6           | 729   | 17407 | 606 (83.1)             | 123 (16.9)           | 12529 (72.0)         | 4878 (28.0)          |
| 7           | 1177  | 31604 | 997 (84.7)             | 180 (15.3)           | 17658 (55.9)         | 13946 (44.1)         |
| 8           | 1074  | 34933 | 376 (35.0)             | 698 (65.0)           | 2324 (6.7)           | 32609 (93.3)         |
| 9           | 5882  | 602574| 4393 (74.7)            | 1489 (25.3)          | 282160 (46.8)        | 320414 (53.2)        |
| 10          | 3539  | 246644| 1434 (40.5)            | 2105 (59.5)          | 21117 (8.6)          | 225527 (91.4)        |
| 11          | 6255  | 620917| 4808 (76.9)            | 1447 (23.1)          | 351592 (56.6)        | 269325 (43.4)        |
| 12          | 7598  | 1094890| 6392 (84.1)           | 1206 (15.9)          | 684951 (62.6)        | 409939 (37.4)        |
| 13          | 1573  | 62816 | 1211 (77.0)            | 362 (23.0)           | 35555 (56.6)         | 27261 (43.4)         |
| 14          | 7309  | 919447| 5486 (75.1)            | 1823 (24.9)          | 344566 (37.5)        | 574881 (62.5)        |
| 15          | 5810  | 710865| 4396 (75.7)            | 1414 (24.3)          | 375720 (52.9)        | 335145 (47.1)        |
| 16          | 642   | 10271 | 642 (100)              | 0 (0)                | 10271 (100)          | 0 (0)                |
| 17          | 8810  | 1578582| 7406 (84.1)          | 1404 (15.9)          | 1023232 (64.8)       | 555350 (35.2)        |
| 18          | 5837  | 607447| 4843 (83.0)            | 994 (17.0)           | 412821 (68.0)        | 194626 (32.0)        |
| 19          | 2841  | 145634| 2492 (87.7)            | 349 (12.3)           | 103399 (71.0)        | 42235 (29.0)         |
| 20          | 3979  | 311686| 3360 (84.4)            | 619 (15.6)           | 206008 (66.1)        | 105678 (33.9)        |
| 22          | 723   | 25099 | 606 (83.8)             | 117 (16.2)           | 12745 (50.8)         | 12354 (49.2)         |
| 23          | 1418  | 37640 | 1333 (94.0)            | 85 (6.0)             | 31504 (83.7)         | 6136 (16.3)          |
| 24          | 10957 | 1645446| 7403 (67.6)           | 3554 (32.4)          | 652800 (39.7)        | 992646 (60.3)        |
**eTable 3.** Distribution of Patients in a Neonatal Critical Care Unit (Hospital 24) Based on Their Exposure to Narrow- and/or Extended-Spectrum Antibiotics

|                        | Narrow-spectrum exposed | Narrow-spectrum unexposed |
|------------------------|-------------------------|---------------------------|
| Extended-spectrum exposed | 1,230                   | 9                         |
| Extended-spectrum unexposed | 44                     | 2                         |

**eTable 4.** Distribution of Patients in an Emergency Department (Hospital 15) Based on Their Exposure to Broad- and/or Extended-Spectrum Antibiotics

|                        | Took broad-spectrum | Did not take broad-spectrum |
|------------------------|---------------------|----------------------------|
| Took extended-spectrum | 2,445               | 6,499                      |
| Did not take extended-spectrum | 4,856           | 833                        |

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