**Supplemental Material**

**Internet Appendices to**

**The Inefficient Effects of Non-Clinical Factors on Health Care Costs**

Internet Appendix A

We segment our sample based on hospital size and identify a sub-sample of only Emergency Department encounters. We perform our main tests of first digit and second digit distributions. We group hospital size by number of beds in the following categories: 6-99, 100-199, 200-299, 300-499, and 500+, with the expectation of inefficiencies increasing with hospital size. We find that the smallest hospitals have the most inefficiencies.

When examining emergency department (ED) visits alone, we remove the smallest and largest price buckets due to limited observations. We find that there is still a significant deviation from the Benford distribution, but the encounter expenses follow more closely than with our total hospital sample.

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| **Table 1A: Distribution of First-Digits by Hospital Size**  Using the Health Facts EMR data, we partition the observed encounters into four buckets based on hospital size. Our hospital size buckets are made as follows: bucket one contains hospitals with 6 to 99 beds, bucket two 100 to 199 beds, bucket three 200-299 beds, bucket four 300-499 beds, and bucket 5 is hospitals with 500 beds and more. We report the frequency of each digit (1 through 9) occurring as the first digit as a frequency as well as a percent of the total in the bucket. Mean absolute deviations (MAD) are presented with 1 for indicating close conformity, 2 acceptable conformity, 3 marginally acceptable conformity, and 4 non-conformity. | | | | | | | | | | | | |
|  | |  | 6-99 Beds | |  | 100-199 Beds | | | | | | |
| Digit | | Expected Percent | Frequency | Percent |  |  | | Frequency | | | Percent | |
| 1 | | 30.1 | 2,112,587 | 37.13 |  |  | | 2,178,365 | | | 35.78 | |
| 2 | | 17.61 | 1,178,100 | 20.7 |  |  | | 1,186,984 | | | 19.5 | |
| 3 | | 12.49 | 700,961 | 12.32 |  |  | | 748,788 | | | 12.3 | |
| 4 | | 9.69 | 529,783 | 9.31 |  |  | | 562,072 | | | 9.23 | |
| 5 | | 7.92 | 364,741 | 6.41 |  |  | | 425,158 | | | 6.98 | |
| 6 | | 6.70 | 274,453 | 4.82 |  |  | | 326,232 | | | 5.36 | |
| 7 | | 5.80 | 222,524 | 3.91 |  |  | | 257,654 | | | 4.23 | |
| 8 | | 5.11 | 168,955 | 2.97 |  |  | | 218,481 | | | 3.59 | |
| 9 | | 4.58 | 138,212 | 2.43 |  |  | | 184,463 | | | 3.03 | |
| MAD | | | 0.0234 |  |  | |  | | | 0.0174 |  |  |
|  | | | 200-299 Beds | |  |  | | | 300-499 Beds | | | |
| Digit | Expected Percent | | Frequency | Percent |  |  | | | Frequency | | Percent | |
| 1 | 30.1 | | 3,879,555 | 32.71 |  |  | | | 4,378,560 | | 34.51 | |
| 2 | 17.61 | | 2,202,472 | 18.57 |  |  | | | 2,586,687 | | 20.39 | |
| 3 | 12.49 | | 1,518,192 | 12.8 |  |  | | | 1,663,440 | | 13.11 | |
| 4 | 9.69 | | 1,155,435 | 9.74 |  |  | | | 1,200,303 | | 9.46 | |
| 5 | 7.92 | | 901,801 | 7.6 |  |  | | | 871,467 | | 6.87 | |
| 6 | 6.70 | | 723,932 | 6.1 |  |  | | | 668,532 | | 5.27 | |
| 7 | 5.80 | | 617,263 | 5.21 |  |  | | | 538,285 | | 4.24 | |
| 8 | 5.11 | | 480,134 | 4.05 |  |  | | | 417,917 | | 3.29 | |
| 9 | 4.58 | | 379,890 | 3.2 |  |  | | | 361,735 | | 2.85 | |
| MAD | | | 0.00893 |  |  |  | | | 0.0184 | |  | |

MAD group 5 0.174

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| **Table 2A: Distribution of Second-Digits by Hospital Size**  Using the Health Facts EMR data, we partition the observed encounters into four buckets based on hospital size. Our hospital size buckets are made as follows: bucket one contains hospitals with 6 to 99 beds, bucket two 100 to 199 beds, bucket three 200-299 beds, bucket four 300-499 beds, and bucket 5 is hospitals with 500 beds and more. We report the frequency of each digit (0 through 9) occurring as the first digit as a frequency as well as a percent of the total in the bucket. Mean absolute deviations (MAD) are presented with 1 for indicating close conformity, 2 acceptable conformity, 3 marginally acceptable conformity, and 4 non-conformity. | | | | | | | | | | | | |
|  | |  | 6-99 | |  | 100-199 | | | | |  | |
| Digit | | Expected Percent | Frequency | Percent |  |  | | Frequency | | | Percent |  |
| 0 | | 11.96 | 684,635 | 12.03 |  |  | | 719,680 | | | 11.82 |  |
| 1 | | 11.39 | 665,430 | 11.69 |  |  | | 706,031 | | | 11.6 |  |
| 2 | | 10.90 | 689,178 | 12.11 |  |  | | 726,708 | | | 11.94 |  |
| 3 | | 10.43 | 592,902 | 10.42 |  |  | | 646,860 | | | 10.62 |  |
| 4 | | 10.03 | 610,881 | 10.74 |  |  | | 606,219 | | | 9.96 |  |
| 5 | | 9.67 | 573,766 | 10.08 |  |  | | 610,343 | | | 10.03 |  |
| 6 | | 9.34 | 478,704 | 8.41 |  |  | | 554,882 | | | 9.11 |  |
| 7 | | 9.03 | 483,986 | 8.51 |  |  | | 544,289 | | | 8.94 |  |
| 8 | | 8.76 | 458,928 | 8.07 |  |  | | 498,945 | | | 8.2 |  |
| 9 | | 8.50 | 451,906 | 7.94 |  |  | | 474,240 | | | 7.79 |  |
| MAD | | | 0.0052 | |  | |  | | | 0.042 |  |  |
|  | | | 200-299 | |  |  | | | 300-499 | | | |
| Digit | Expected Percent | | Frequency | Percent |  |  | | | Frequency | | Percent |  |
| 0 | 11.96 | | 1,461,150 | 12.32 |  |  | | | 152,5961 | | 12.03 |  |
| 1 | 11.39 | | 1,402,921 | 11.83 |  |  | | | 1,446,353 | | 11.4 |  |
| 2 | 10.90 | | 1,299,265 | 10.96 |  |  | | | 1,421,913 | | 11.21 |  |
| 3 | 10.43 | | 1,280,751 | 10.8 |  |  | | | 1,392,534 | | 10.98 |  |
| 4 | 10.03 | | 1,155,923 | 9.75 |  |  | | | 1,317,320 | | 10.38 |  |
| 5 | 9.67 | | 1,167,255 | 9.84 |  |  | | | 1,201,689 | | 9.47 |  |
| 6 | 9.34 | | 1,047,669 | 8.83 |  |  | | | 1,214,781 | | 9.58 |  |
| 7 | 9.03 | | 1,043,999 | 8.8 |  |  | | | 1,105,449 | | 8.71 |  |
| 8 | 8.76 | | 986,289 | 8.32 |  |  | | | 1,047,146 | | 8.25 |  |
| 9 | 8.50 | | 1,013,452 | 8.55 |  |  | | | 1,013,780 | | 7.99 |  |
| MAD | | | 0.0031 |  |  |  | | | 0.0031 | |  |  |

\*\* MAD group 5 is 0.0042

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| **Table 3A: Mean Absolute Deviations for Emergency Department Visits**  Using the Health Facts EMR data, we partition the observed Emergency Department encounters into two buckets based on total charges (we omit the smallest and largest buckets as defined in our main manuscript due to few observations). The first bucket includes total charges of at least $1,000 and less than$10,000. The second bucket includes all charges of at least $10,000 and less than $100,000. We report the frequency of each digit (1 through 9) occurring as the first digit as a frequency as well as a percent of the total in the bucket. Mean absolute deviations (MAD) are presented with 1 for indicating close conformity, 2 acceptable conformity, 3 marginally acceptable conformity, and 4 non-conformity. | | |
|  | $1,000-$9,999 | $10,000-$99,999 | |
| First digits MAD | 0.0484 | 0.0624 | |
| Second digits MAD | 0.0093 | 0.0234 | |