

**Table 1: Variation in Receipt of High Dose Influenza Vaccine By Age Strata in 2016-17 Across Region of the United States**

| <b>Region</b>    | <b>Agegroup</b> | <b># Clinics</b> | <b># patients</b> | <b>Quadrivalent n</b> | <b>Highdose n</b> | <b>% Quadrivalent</b> | <b>%High Dose</b> |
|------------------|-----------------|------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|
| <b>Northeast</b> | <65 years       | 53               | 1193              | 402                   | 791               | 34                    | 66                |
| <b>Northeast</b> | >=65 years      | 53               | 1098              | 180                   | 918               | 16                    | 84                |
| <b>South</b>     | <65 years       | 109              | 2583              | 1492                  | 1091              | 58                    | 42                |
| <b>South</b>     | >=65 years      | 108              | 1816              | 707                   | 1109              | 39                    | 61                |
| <b>West</b>      | <65 years       | 36               | 854               | 274                   | 580               | 32                    | 68                |
| <b>West</b>      | >=65 years      | 37               | 574               | 143                   | 431               | 25                    | 75                |
| <b>Midwest</b>   | <65 years       | 35               | 659               | 259                   | 400               | 39                    | 61                |
| <b>Midwest</b>   | >=65 years      | 34               | 537               | 157                   | 380               | 29                    | 71                |

**Table 2: Events by Vaccine Type Stratified by Age in Y2015-2016**

|                                                                                                                                                                       | Age<65 years         |                          |                      |          | Age≥65 years         |                          |                      |          |                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------------------|----------|----------------------|--------------------------|----------------------|----------|-------------------------------------|
|                                                                                                                                                                       | Standard<br>(n=1750) | Quadrivalent<br>(n=3511) | High dose<br>(n=294) | <i>p</i> | Standard<br>(n=1307) | Quadrivalent<br>(n=2430) | High dose<br>(n=511) | <i>p</i> | <i>p</i><br>interaction<br>with age |
| <b>First Hospitalization</b>                                                                                                                                          |                      |                          |                      |          |                      |                          |                      |          |                                     |
| Total events                                                                                                                                                          | 787                  | 1547                     | 137                  |          | 661                  | 1196                     | 226                  |          |                                     |
| Total months                                                                                                                                                          | 9,940                | 20,925                   | 1,603                |          | 7,126                | 13,456                   | 2,852                |          |                                     |
| Per 100-pt-                                                                                                                                                           | 7.92                 | 7.39                     | 8.55                 |          | 9.28                 | 8.89                     | 7.92                 |          |                                     |
| Unadjusted HR                                                                                                                                                         | Reference            | 0.95 (0.85, 1.06)        | 1.07 (0.84, 1.36)    | 0.25     | Reference            | 0.97 (0.87, 1.08)        | 0.85 (0.71, 1.01)    | 0.12     | 0.59                                |
| Adjusted* HR                                                                                                                                                          | Reference            | 0.94 (0.84, 1.05)        | 1.09 (0.87, 1.38)    | 0.14     | Reference            | 0.96 (0.87, 1.07)        | 0.86 (0.73, 1.03)    | 0.19     | 0.46                                |
| <b>Death</b>                                                                                                                                                          |                      |                          |                      |          |                      |                          |                      |          |                                     |
| Total events                                                                                                                                                          | 109                  | 214                      | 19                   |          | 199                  | 376                      | 77                   |          |                                     |
| Total months                                                                                                                                                          | 13,579               | 27,876                   | 2,154                |          | 9,885                | 18,373                   | 3,696                |          |                                     |
| Per 100-pt-                                                                                                                                                           | 0.80                 | 0.77                     | 0.88                 |          | 2.01                 | 2.05                     | 2.08                 |          |                                     |
| Unadjusted HR                                                                                                                                                         | Reference            | 0.95 (0.76, 1.20)        | 1.10 (0.67, 1.78)    | 0.80     | Reference            | 1.02 (0.85, 1.22)        | 1.03 (0.79, 1.36)    | 0.96     | 0.89                                |
| Adjusted* HR                                                                                                                                                          | Reference            | 0.91 (0.72, 1.15)        | 1.06 (0.65, 1.74)    | 0.64     | Reference            | 1.01 (0.85, 1.20)        | 1.03 (0.78, 1.35)    | 0.98     | 0.96                                |
| <b>First Hospitalization or Death</b>                                                                                                                                 |                      |                          |                      |          |                      |                          |                      |          |                                     |
| Total events                                                                                                                                                          | 822                  | 1610                     | 140                  |          | 717                  | 1297                     | 245                  |          |                                     |
| Total months                                                                                                                                                          | 9,940                | 20,925                   | 1,603                |          | 7,126                | 13,456                   | 2,852                |          |                                     |
| Per 100-pt-                                                                                                                                                           | 8.27                 | 7.69                     | 8.73                 |          | 10.06                | 9.64                     | 8.59                 |          |                                     |
| Unadjusted HR                                                                                                                                                         | Reference            | 0.94 (0.85, 1.05)        | 1.04 (0.83, 1.31)    | 0.25     | Reference            | 0.97 (0.87, 1.07)        | 0.85 (0.72, 1.00)    | 0.10     | 0.55                                |
| Adjusted* HR                                                                                                                                                          | Reference            | 0.93 (0.84, 1.03)        | 1.06 (0.85, 1.33)    | 0.14     | Reference            | 0.96 (0.87, 1.06)        | 0.86 (0.74, 1.02)    | 0.16     | 0.41                                |
| ^Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, 95% CI=95% Confidence Intervals |                      |                          |                      |          |                      |                          |                      |          |                                     |

**Table 3: Number of Hospitalizations By Vaccine Type in 2015-16**

|                                                                                                                                                                                                | Age<65 years         |                          |                      |          | Age≥65 years         |                          |                      |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------------------|----------|----------------------|--------------------------|----------------------|----------|
|                                                                                                                                                                                                | Standard<br>(n=1750) | Quadrivalent<br>(n=3511) | High dose<br>(n=294) | <i>p</i> | Standard<br>(n=1307) | Quadrivalent<br>(n=2430) | High dose<br>(n=511) | <i>p</i> |
| <b>All hospitalizations</b>                                                                                                                                                                    |                      |                          |                      |          |                      |                          |                      |          |
| Unadjusted IRR                                                                                                                                                                                 | Reference            | 0.94 (0.82, 1.07)        | 1.05 (0.78, 1.39)    | 0.51     | Reference            | 1.01 (0.89, 1.16)        | 0.93 (0.76, 1.15)    | 0.71     |
| Adjusted* IRR (95%CI)                                                                                                                                                                          | Reference            | 0.92 (0.82, 1.04)        | 1.07 (0.82, 1.38)    | 0.26     | Reference            | 0.99 (0.87, 1.13)        | 0.94 (0.76, 1.15)    | 0.82     |
| Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, IRR=Incidence Rate Ratio, 95% CI=95% Confidence Intervals |                      |                          |                      |          |                      |                          |                      |          |

**Table 4: Number of Hospitalizations By Vaccine Type in 2016-17**

|                                                                                                                                                                                                | Age<65 years             |                       |          | Age≥65 years             |                       |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|----------|--------------------------|-----------------------|----------|
|                                                                                                                                                                                                | Quadrivalent<br>(n=2427) | High dose<br>(n=2862) | <i>p</i> | Quadrivalent<br>(n=1187) | High dose<br>(n=2838) | <i>p</i> |
| <b>All hospitalizations</b>                                                                                                                                                                    |                          |                       |          |                          |                       |          |
| Unadjusted IRR (95%CI)                                                                                                                                                                         | Reference                | 0.97 (0.85, 1.11)     | 0.64     | Reference                | 0.88 (0.78, 0.99)     | 0.04     |
| Adjusted* IRR (95%CI)                                                                                                                                                                          | Reference                | 0.98 (0.87, 1.10)     | 0.71     | Reference                | 0.90 (0.80, 1.01)     | 0.07     |
| Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, IRR=Incidence Rate Ratio, 95% CI=95% Confidence Intervals |                          |                       |          |                          |                       |          |

| <b>Table 5: Events by Vaccine Type in Y2015-2016 in the Complete Case# Study Population</b>                                                                                                                                                  |                      |                          |                      |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------------------|----------|
|                                                                                                                                                                                                                                              | Standard<br>(n=2835) | Quadrivalent<br>(n=5648) | High dose<br>(n=720) | <i>p</i> |
| <b>First hospitalization</b>                                                                                                                                                                                                                 |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 1347                 | 2605                     | 325                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 0.97 (0.88, 1.06)        | 0.98 (0.84, 1.15)    | 0.55     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 0.95 (0.87, 1.04)        | 0.95 (0.81, 1.11)    | 0.38     |
| <b>Death</b>                                                                                                                                                                                                                                 |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 278                  | 561                      | 80                   |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 1.01 (0.86, 1.18)        | 1.21 (0.92, 1.60)    | 0.26     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 1.00 (0.86, 1.16)        | 1.01 (0.78, 1.30)    | 0.99     |
| <b>First hospitalization or death</b>                                                                                                                                                                                                        |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 1422                 | 2760                     | 344                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 0.97 (0.88, 1.05)        | 0.97 (0.83, 1.13)    | 0.54     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 0.95 (0.88, 1.04)        | 0.93 (0.80, 1.08)    | 0.30     |
| ^Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, 95% CI=95% Confidence Intervals<br>#Complete Case Analysis excludes patients with missing data (n=640) |                      |                          |                      |          |

| <b>Table 6: Events by Vaccine Type in Y2016-2017 in Complete Case Study Population<sup>#</sup></b>                                                                                                                                             |                          |                       |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|----------|
|                                                                                                                                                                                                                                                | Quadrivalent<br>(n=3335) | High dose<br>(n=5193) | <i>p</i> |
| <b>First hospitalization</b>                                                                                                                                                                                                                   |                          |                       |          |
| Total events                                                                                                                                                                                                                                   | 1602                     | 2349                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                          | Reference                | 0.93 (0.86, 1.00)     | 0.05     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                           | Reference                | 0.91 (0.84, 0.98)     | 0.02     |
| <b>Death</b>                                                                                                                                                                                                                                   |                          |                       |          |
| Total events                                                                                                                                                                                                                                   | 297                      | 542                   |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                          | Reference                | 1.23 (1.06, 1.44)     | 0.01     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                           | Reference                | 1.06 (0.91, 1.22)     | 0.46     |
| <b>First hospitalization or death</b>                                                                                                                                                                                                          |                          |                       |          |
| Total events                                                                                                                                                                                                                                   | 1679                     | 2505                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                          | Reference                | 0.95 (0.88, 1.02)     | 0.15     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                           | Reference                | 0.92 (0.86, 0.99)     | 0.03     |
| Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, 95% CI=95% Confidence Intervals<br><sup>#</sup> Complete Case excludes patients with missing data (n=786) |                          |                       |          |

| <b>Table 7: Events by Vaccine Type Stratified by Age in Y2015-2016 in the Complete Case Study Population</b>                                                                                                                                 |                      |                          |                      |          |                      |                          |                      |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------------------|----------|----------------------|--------------------------|----------------------|----------|
|                                                                                                                                                                                                                                              | Age<65 years         |                          |                      |          | Age≥65 years         |                          |                      |          |
|                                                                                                                                                                                                                                              | Standard<br>(n=1623) | Quadrivalent<br>(n=3359) | High dose<br>(n=273) | <i>p</i> | Standard<br>(n=1212) | Quadrivalent<br>(n=2289) | High dose<br>(n=447) | <i>p</i> |
| <b>First hospitalization</b>                                                                                                                                                                                                                 |                      |                          |                      |          |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 734                  | 1466                     | 128                  |          | 613                  | 1139                     | 197                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 0.95 (0.85, 1.06)        | 1.08 (0.85, 1.38)    | 0.23     | Reference            | 0.98 (0.88, 1.10)        | 0.84 (0.70, 1.01)    | 0.11     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 0.94 (0.84, 1.05)        | 1.11 (0.88, 1.39)    | 0.14     | Reference            | 0.97 (0.87, 1.09)        | 0.85 (0.71, 1.02)    | 0.17     |
| <b>Death</b>                                                                                                                                                                                                                                 |                      |                          |                      |          |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 102                  | 208                      | 17                   |          | 176                  | 353                      | 63                   |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 0.97 (0.77, 1.23)        | 1.06 (0.63, 1.76)    | 0.94     | Reference            | 1.06 (0.88, 1.28)        | 1.01 (0.75, 1.36)    | 0.76     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 0.93 (0.73, 1.18)        | 0.99 (0.59, 1.67)    | 0.82     | Reference            | 1.05 (0.87, 1.26)        | 1.02 (0.75, 1.37)    | 0.87     |
| <b>First hospitalization or death</b>                                                                                                                                                                                                        |                      |                          |                      |          |                      |                          |                      |          |
| Total events                                                                                                                                                                                                                                 | 766                  | 1527                     | 131                  |          | 656                  | 1233                     | 213                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                        | Reference            | 0.94 (0.85, 1.05)        | 1.06 (0.84, 1.33)    | 0.24     | Reference            | 0.99 (0.89, 1.10)        | 0.85 (0.72, 1.01)    | 0.10     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                         | Reference            | 0.93 (0.84, 1.03)        | 1.08 (0.86, 1.34)    | 0.14     | Reference            | 0.98 (0.89, 1.09)        | 0.86 (0.73, 1.02)    | 0.16     |
| ^Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, 95% CI=95% Confidence Intervals<br>*Complete Case Analysis excludes patients with missing data (n=640) |                      |                          |                      |          |                      |                          |                      |          |

| <b>Table 8: Events by Vaccine Type Stratified by Age in Y2016-2017 in the Complete Case Study Population<sup>#</sup></b>                                                                                                                                             |                          |                       |          |                          |                       |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|----------|--------------------------|-----------------------|----------|
|                                                                                                                                                                                                                                                                      | <b>Age&lt;65 years</b>   |                       |          | <b>Age≥65 years</b>      |                       |          |
|                                                                                                                                                                                                                                                                      | Quadrivalent<br>(n=2236) | High dose<br>(n=2602) | <i>p</i> | Quadrivalent<br>(n=1099) | High dose<br>(n=2591) | <i>p</i> |
| <b>First hospitalization</b>                                                                                                                                                                                                                                         |                          |                       |          |                          |                       |          |
| Total events                                                                                                                                                                                                                                                         | 1028                     | 1126                  |          | 574                      | 1223                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                                                | Reference                | 0.92 (0.82, 1.02)     | 0.12     | Reference                | 0.87 (0.79, 0.97)     | 0.01     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                                                 | Reference                | 0.92 (0.83, 1.02)     | 0.13     | Reference                | 0.88 (0.79, 0.98)     | 0.02     |
| <b>Death</b>                                                                                                                                                                                                                                                         |                          |                       |          |                          |                       |          |
| Total events                                                                                                                                                                                                                                                         | 143                      | 161                   |          | 154                      | 381                   |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                                                | Reference                | 0.97 (0.76, 1.24)     | 0.81     | Reference                | 1.07 (0.88, 1.29)     | 0.50     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                                                 | Reference                | 0.97 (0.77, 1.23)     | 0.82     | Reference                | 1.09 (0.90, 1.32)     | 0.35     |
| <b>First hospitalization or death</b>                                                                                                                                                                                                                                |                          |                       |          |                          |                       |          |
| Total events                                                                                                                                                                                                                                                         | 1066                     | 1177                  |          | 613                      | 1328                  |          |
| Unadjusted HR (95%CI)                                                                                                                                                                                                                                                | Reference                | 0.92 (0.83, 1.03)     | 0.14     | Reference                | 0.89 (0.80, 0.98)     | 0.02     |
| Adjusted* HR (95%CI)                                                                                                                                                                                                                                                 | Reference                | 0.93 (0.84, 1.03)     | 0.16     | Reference                | 0.90 (0.81, 0.99)     | 0.04     |
| <sup>^</sup> Adjusted for age, race, cause ESRD, ESRD vintage, PD vs. HD, serum albumin, ESCO, hospitalized in past 2 months.<br>HR=Hazard Ratio, 95% CI=95% Confidence Intervals<br><sup>#</sup> Complete Case Analysis excludes patients with missing data (n=786) |                          |                       |          |                          |                       |          |