# Supplemental material

Table S1. Characteristics of all groups

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Characteristics** | **G1**  **(N=26,312)**  n(%) | | **G2**  **(N=1,316)**  n(%) | **G3**  **(N=25,600)**  n(%) | | | **G4**  **(N=26,630)**  n(%) | ***P*** | |
| *Gender* |  | |  |  | | |  |  | |
| Male | 16,500(62.71) | | 797(60.56) | 14,517(56.71) | | | 16,016(60.14) | <.001 | |
| female | 9,812(37.29) | | 519(39.44) | 11,083(43.29) | | | 10,614(39.86) |  | |
| *Age\** | 66.86(12.8) | | 74.13(10.5) | 75.24(12.2) | | | 70.46(16.06) | <.001 | |
| *Age group (years)* |  | |  |  | | |  |  | |
| 20< | 20(0.08) | | - | 7(0.03) | | | 474(1.78) | <.001 | |
| 20–29 | 85(0.32) | | - | 60(0.23) | | | 254(0.95) |  | |
| 30–39 | 466(1.77) | | 7(0.53) | 186(0.73) | | | 465(1.75) |  | |
| 40–49 | 1,915(7.28) | | 26(1.98) | 669(2.61) | | | 1,141(4.28) |  | |
| 50–59 | 5,038(19.15) | | 97(7.37) | 2,141(8.36) | | | 2,778(10.43) |  | |
| 60–69 | 6,966(26.47) | | 242(18.39) | 3,923(15.32) | | | 5,243(19.69) |  | |
| 70–79 | 7,291(27.71) | | 490(37.23) | 7,713(30.13) | | | 7,926(29.76) |  | |
| ≥80 | 4,531(17.22) | | 454(34.50) | 10,901(42.58) | | | 8,349(31.35) |  | |
| *Patient status* |  | |  |  | | |  |  | |
| Terminal | 16,835(63.98) | | - | - | | | - |  | |
| End-of-life | 9,477(36.02) | | - | - | | | - |  | |
| *Diagnosis* |  | |  |  | | |  |  | |
| Neoplasm | 22,724(86.36) | | 862(65.50) | 11,924(46.58) | | | 10,953(41.13) | <.001 | |
| Respiratory | 1,714(6.51) | | 162(12.31) | 5,131(20.04) | | | 5,184(19.47) |  | |
| Cardiovascular | 530(2.01) | | 130(9.88) | 3,246(12.68) | | | 4,493(16.87) |  | |
| Gastrointestinal | 514(1.95) | | 30(2.28) | 1,352(5.28) | | | 1,693(6.36) |  | |
| Genitourinary | 205(0.78) | | 35(2.66) | 1,201(4.69) | | | 1,118(4.20) |  | |
| Infectious | 173(0.66) | | 27(2.05) | 878(3.43) | | | 774(2.91) |  | |
| Others | 452(1.73) | | 70(5.32) | 1868(7.30) | | | 2,415(9.06) |  | |
| *Type of medical institution\*\** |  | |  |  | | |  |  | |
| Tertiary hospital | 14,652(55.69) | | 676(51.37) | 16,311(63.71) | | | 17,670(66.35) | <.001 | |
| General hospital | 10,519(39.98) | | 561(42.63) | 8,311(32.46) | | | 8,564(32.16) |  | |
| Others | 1,141(4.34) | | 79(6.00) | 978(3.83) | | | 396(1.49) |  | |
| *Region* |  | |  |  | | |  |  | |
| Seoul | 9,793(37.22) | | 479(36.40) | 8,637(33.74) | | | 9,670(36.31) | <.001 | |
| Gyeong-gi | 4,920(18.70) | | 349(26.52) | 4,083(15.95) | | | 4,477(16.81) |  | |
| Incheon | 2,018(7.67) | | 110(8.36) | 1,780(6.95) | | | 2,016(7.57) |  | |
| Busan | 1,839(6.99) | | 58(4.41) | 1,030(4.02) | | | 1,319(4.95) |  | |
| Dae-gu | 1,702(6.47) | | 46(3.50) | 2,569(10.03) | | | 1,194(4.48) |  | |
| Gyeong-nam | 1,570(5.97) | | 42(3.19) | 1,168(4.56) | | | 1,688(6.34) |  | |
| Jeon-nam | 1,031(3.92) | | 10(0.76) | 662(2.59) | | | 343(1.29) |  | |
| Others | 3,439(13.06) | | 222(16.86) | 5,672(22.16) | | | 5,923(22.25) |  | |
| *AD status* |  | |  |  | | |  |  | |
| Yes | 211(0.80) | | 1,315(99.92) | 56(0.22) | | | 33(0.12) | <.001 | |
| No | 26.101(99.20) | | 1(0.08) | 25,545(99.78) | | | 26,597(99.88) |  | |
| *Status to use hospice* |  | |  |  | | |  |  | |
| Yes | 3,212(12.21) | | 192(14.59) | 608(2.37) | | | 271(1.02) | <.001 | |
| *Subject of specialist* |  | |  |  | | |  |  | |
| Internal medicine | | 18,802(71.46) | 877(66.64) | | 20,033(78.25) | 19,006(71.37) | | | <.001 | |
| Family medicine | | 2,676(10.17) | 114(8.66) | | 737(2.88) | 313(1.18) | | |  | |
| Surgery | | 840(3.19) | 40(3.04) | | 810(3.16) | 1,311(4.92) | | |  | |
| Obstetrics/gynecology | | 646(2.46) | 9(0.68) | | 137(0.54) | 163(0.61) | | |  | |
| Emergency medicine | | 480(1.82) | 66(5.02) | | 980(3.83) | 1,277(4.80) | | |  | |
| Genito-urology | | 166(0.63) | 9(0.68) | | 99(0.39) | 119(0.45) | | |  | |
| Cardiovascular surgery | | 161(0.61) | 6(0.46) | | 307(1.20) | 341(1.28) | | |  | |
| Neurosurgery | | 74(0.28) | 31(2.36) | | 831(3.25) | 1,793(6.73) | | |  | |
| Neurology | | 73(0.28) | 42(3.19) | | 763(2.98) | 1,075(4.04) | | |  | |
| Others | | 312(1.19) | 21(1.60) | | 225(0.87) | 722(2.70) | | |  | |
| No response | | 2,082(7.91) | 101(7.67) | | 678(2.65) | 510(1.92) | | |  | |
| *Content of forgoing LST* |  | |  |  | | |  |  | |
| CPR | 25,733(97.80) | | 1,265(96.12) | 24,967(97.52) | | | 25,938(97.40) | .0001 | |
| Ventilator | 25,484(96.85) | | 1,196(90.88) | 21,339(83.35) | | | 19,417(72.91) | <.001 | |
| Hemodialysis | 23,845(90.62) | | 1,155(87.77) | 20,689(80.81) | | | 19,929(74.84) | <.001 | |
| Chemotherapy | 19,613(74.54) | | 1,001(76.06) | 14,571(56.92) | | | 13,177(49.48) | <.001 | |
| ECMO | 11,253(42.77) | | 758(57.60) | 9,138(35.69) | | | 8,393(31.52) | <.001 | |
| Transfusion | 5,680(21.59) | | 392(29.79) | 4,453(17.39) | | | 4,095(15.38) | <.001 | |
| Inotropic drugs | 7,958(30.24) | | 542(41.19) | 5,929(23.16) | | | 5,500(20.65) | <.001 | |
| Others | 483(1.84) | | 43(3.27) | 536(2.09) | | | 505(1.90) | .0008 | |
| \* expressed as mean(standard deviation); \*\* Medical institutions are clinics, hospital (more than 30 beds), general hospital (more than 100 beds), and tertiary hospitals (a general hospital providing highly specialized medical services for treating serious diseases satisfying the legal requirements and designated by Minister of Health and Welfare). AD: Advance Directive; LST: life-sustaining treatment; CPR: cardiopulmonary resuscitation; ECMO: extracorporeal membrane oxygenation. | | | | | | | | | |

Table S2. Results of logistic regression analysis between the self-determined and family-determined groups

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parameter** | **Multivariable model** | | | | |
| **Adj. OR** | **95% CI** | | |  |
| *Gender* |  |  |  |  | |
| Male | 1.467 | (0.983 | - | 2.188) | |
| Female | 1.000 [Reference] | | | | |
| *Age group (years)* |  |  |  |  | |
| 20 < | 4.618 | (0.434 | - | 49.128) | |
| 20–29 | 1.066 | (0.651 | - | 1.747) | |
| 30–39 | 2.439 | (0.265 | - | 22.451) | |
| 40–49 | 5.685 | (2.076 | - | 15.566) | |
| 50–59 | 1.679 | (0.844 | - | 3.339) | |
| 60–69 | 1.791 | (0.996 | - | 3.220) | |
| 70–79 | 0.939 | (0.577 | - | 1.526) | |
| ≥80 | 1.000 [Reference] | | | | |
| *Diagnosis* |  |  |  |  | |
| Neoplasm | 1.000 [Reference] | | | | |
| Respiratory | 0.568 | (0.318 | - | 1.016) | |
| Cardiovascular | 0.246 | (0.118 | - | 0.513) | |
| Gastrointestinal | 0.552 | (0.478 | - | 0.807) | |
| Genitourinary | 0.419 | (0.103 | - | 1.696) | |
| Others | 0.356 | (0.189 | - | 0.670) | |
| *Type of medical institution* |  |  |  |  | |
| Tertiary hospital | 1.000 [Reference] | | | | |
| General hospital | 2.223 | (0.203 | - | 24.361) | |
| Hospital | 0.021 | (0.005 | - | 0.090) | |
| Long-term care hospital | 1.148 | (0.351 | - | 3.760) | |
| Clinic | 1.112 | (0.680 | - | 1.818) | |
| *Status to use hospice* |  |  |  |  | |
| Yes | 1.000 [Reference] | | | | |
| No | 0.736 | (0.294 | - | 1.839) | |
| No response | 0.317 | (0.091 | - | 1.107) | |
| *Region* |  |  |  |  | |
| Seoul | 1.000 [Reference] | | | | |
| Busan | 1.48 | (0.728 | - | 3.008) | |
| Dae-gu | 1.849 | (0.808 | - | 4.231) | |
| Incheon | 1.277 | (0.756 | - | 2.155) | |
| Gwang-ju | 0.082 | (0.027 | - | 0.244) | |
| Dae-jeon | 1.102 | (0.532 | - | 2.279) | |
| Ulsan | 1.934 | (1.126 | - | 3.322) | |
| Gyeong-gi | 2.471 | (1.304 | - | 4.683) | |
| Gangwon | 1.306 | (0.324 | - | 5.266) | |
| Chung-buk | 1.597 | (1.006 | - | 2.536) | |
| Chung-nam | 0.485 | (0.181 | - | 1.301) | |
| Jeon-buk | 2.404 | (0.711 | - | 8.127) | |
| Jeon-nam | 2.366 | (0.187 | - | 29.881) | |
| Gyeong-buk | 0.084 | (0.015 | - | 0.478) | |
| Gyeong-nam | 1.415 | (0.448 | - | 4.475) | |
| Je-ju | 1.987 | (1.222 | - | 3.233) | |
| *AD status* |  |  |  |  | |
| Yes | 117.476 | (60.838 | - | 226.841) | |
| No | 1.000 [Reference] | | | | |
| *Subject of specialist* |  |  |  |  | |
| Internal medicine | 1.000 [Reference] | | | | |
| Family medicine | 3.46 | (1.195 | - | 10.017) | |
| Surgery | 0.916 | (0.287 | - | 2.918) | |
| Emergency medicine | 0.88 | (0.477 | - | 1.622) | |
| Neurosurgery | 0.5 | (0.115 | - | 2.176) | |
| Neurology | 1.311 | (0.428 | - | 4.012) | |
| Others | 2.266 | (0.768 | - | 6.692) | |
| *Contents of forgoing LST* |  |  |  |  | |
| CPR |  | | | | |
| Yes | 0.873 | (0.157 | - | 4.842) | |
| No | 1.000 [Reference] | | | | |
| Ventilator |  | | | | |
| Yes | 5.3 | (2.961 | - | 9.487) | |
| No | 1.000 [Reference] | | | | |
| Hemodialysis |  | | | | |
| Yes | 2.12 | (1.247 | - | 3.605) | |
| No | 1.000 [Reference] | | | | |
| Chemotherapy |  | | | | |
| Yes | 0.897 | (0.571 | - | 1.408) | |
| No | 1.000 [Reference] | | | | |
| ECMO |  | | | | |
| Yes | 0.532 | (0.273 | - | 1.036) | |
| No | 1.000 [Reference] | | | | |
| Transfusion |  | | | | |
| Yes | 0.563 | (0.310 | - | 1.021) | |
| No | 1.000 [Reference] | | | | |
| Inotropic drugs |  | | | | |
| Yes | 0.827 | (0.459 | - | 1.489) | |
| No | 1.000 [Reference] | | | | |
| Others |  | | | | |
| Yes | 5.26 | (0.631 | - | 43.880) | |
| No | 1.000 [Reference] | | | | |
| Adj. OR: adjusted odds ratio; CI: confidence interval; AD: Advance Directive; LST: life-sustaining treatment; CPR: cardiopulmonary resuscitation; ECMO: extracorporeal membrane oxygenation. | | | | | |