Table S1. Cause-specific hazard model for death and technique failure

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Death |  | Technique failure |
| Crude HR (95% CI) | Adjusted HR (95% CI) |  | Crude HR (95% CI) | Adjusted HR (95% CI) |
| **Center-level characteristics** |  |  |  |  |  |
|  | Number of patients initiating PD in the center per year |  |  |  |  |  |
|  |  | 1 | – 12 | Ref | Ref |  | Ref | Ref |
|  |  | 13 | – 25 | 1.02 (0.81–1.28) | 1.02 (0.87–1.19) |  | 0.99 (0.85–1.16) | 0.92 (0.79–1.08) |
|  |  | 26 | – 42 | 0.96 (0.78–1.18) | 1.11 (0.96–1.28) |  | 0.98 (0.82–1.18) | 0.91 (0.76–1.10) |
|  |  | 43 | – 107 | 0.87 (0.70–1.07) | 0.99 (0.85–1.17) |  | 0.86 (0.73–1.02) | 0.77 (0.61–0.98) |
|  | Hospital level |  |  |  |  |  |
|  |  | Medical center | Ref | Ref |  | Ref | Ref |
|  |  | Regional hospital | 1.36 (1.08–1.71) | 1.16 (0.98–1.38) |  | 1.04 (0.90–1.20) | 0.90 (0.74-1.09) |
|  |  | District hospital | 1.99 (1.10–3.59) | 1.42 (0.94–2.14) |  | 0.79 (0.44–1.44) | 0.59 (0.32 –1.08) |
|  | Hospital ownership |  |  |  |  |  |
|  |  | Private | Ref | Ref |  | Ref | Ref |
|  |  | Public | 0.86 (0.61–1.22) | 0.88 (0.73–1.07) |  | 1.05 (0.86–1.28) | 1.08 (0.90–1.30) |
|  | Urbanization |  |  |  |  |  |
|  |  | Urban | Ref | Ref |  | Ref | Ref |
|  |  | Suburban | 1.00 (0.88–1.14) | 0.99 (0.90–1.10) |  | 1.02 (0.92–1.14) | 0.97 (0.86–1.10) |
|  |  | Rural | 1.37 (1.09–1.74) | 1.21 (1.01–1.45) |  | 1.14 (0.97–1.33) | 1.06 (0.85–1.33) |
|  | Geographic area |  |  |  |  |  |
|  |  | North | Ref | Ref |  | Ref | Ref |
|  |  | Middle | 0.98 (0.77–1.24) | 0.91 (0.82–1.01) |  | 1.22 (1.03–1.43) | 1.20 (0.99–1.46) |
|  |  | South | 0.74 (0.58–0.93) | 0.78 (0.67–0.91) |  | 1.04 (0.90–1.21) | 1.03 (0.89–1.21) |
|  |  | East | 1.77 (1.33–2.37) | 1.31 (1.01–1.69) |  | 1.33 (1.07–1.64) | 1.16 (0.89–1.52) |
|  |  | Off-shore island | 0.41 (0.16–1.05) | 0.40 (0.18–0.90) |  | 0.94 (0.50–1.76) | 0.88 (0.47–1.66) |
| **Patient-level characteristics** |  |  |  |  |  |
|  | Gender |  |  |  |  |  |
|  |  | Female | Ref | Ref |  | Ref | Ref |
|  |  | Male | 1.10 (0.99–1.23) | 1.07 (0.97–1.18) |  | 1.31 (1.18–1.45) | 1.30 (1.18-1.43) |
|  | Age (per year) | 1.07 (1.07–1.08) | 1.07 (1.06–1.07) |  | 1.01 (1.01–1.01) | 1.01 (1.00–1.01) |
|  | Insurable monthly wage |  |  |  |  |  |
|  |  | Low-income people | Ref | Ref |  | Ref | Ref |
|  |  | Farmers and Fishermen | 1.24 (1.06–1.46) | 1.09 (0.95–1.25) |  | 1.00 (0.87–1.14) | 0.92 (0.79–1.07) |
|  |  | ≤20,000 NTD | 0.65 (0.54–0.79) | 1.00 (0.84–1.19) |  | 0.93 (0.80–1.08) | 0.94 (0.81–1.10) |
|  |  | 20,001–40,000 NTD | 0.67 (0.59–0.76) | 0.99 (0.85–1.16) |  | 0.88 (0.80–0.97) | 0.90 (0.82–0.99) |
|  |  | >40,000 NTD | 0.79 (0.68–0.93) | 0.91 (0.78–1.05) |  | 0.82 (0.74–0.92) | 0.82 (0.73–0.92) |
|  | CCI (per point) | 1.60 (1.52–1.67) | 1.39 (1.35–1.44) |  | 1.19 (1.15–1.23) | 1.16 (1.13–1.20) |
|  | Pre-PD nephrology care |  |  |  |  |  |
|  |  | No | Ref | Ref |  | Ref | Ref |
|  |  | Yes | 1.05 (0.94–1.17) | 0.84 (0.77–0.92) |  | 1.03 (0.93–1.13) | 1.00 (0.91–1.10) |
|  | CVC for initial dialysis |  |  |  |  |  |
|  |  | No | Ref | Ref |  | Ref | Ref |
|  |  | Yes | 0.95 (0.88–1.04) | 1.09 (1.01–1.19) |  | 1.00 (0.90–1.11) | 1.03 (0.94–1.14) |
| **Era** |  |  |  |  |  |
|  | 2001–2005 | Ref | Ref |  | Ref | Ref |
|  | 2006–2010 | 0.98 (0.85–1.14) | 0.80 (0.71–0.91) | 　 | 0.93 (0.82–1.05) | 0.91 (0.80–1.03) |

CCI, Charlson comorbidity index; CVC, central venous catheter; HD, hemodialysis; NTD, New Taiwan Dollar; 95% CI, 95% confidence interval

Table S2. Subdistribution hazard model for death and technique failure

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | Death |  | Technique failure |
| Crude HR (95% CI) | Adjusted HR (95% CI) |  | Crude HR (95% CI) | Adjusted HR (95% CI) |
| **Center-level characteristics** |  |  |  |  |  |
|  | Number of patients initiating PD in the center per year |  |  |  |  |  |
|  |  | 1 | – 12 | Ref | Ref |  | Ref | Ref |
|  |  | 13 | – 25 | 1.03 (0.91–1.17) | 1.05 (0.91–1.20) |  | 0.98 (0.86–1.12) | 0.90 (0.79–1.04) |
|  |  | 26 | – 42 | 0.98 (0.87–1.11) | 1.15 (0.99–1.32) |  | 1.00 (0.88–1.14) | 0.90 (0.78–1.03) |
|  |  | 43 | – 107 | 0.90 (0.80–1.02) | 1.08 (0.91–1.28) |  | 0.89 (0.79–1.01) | 0.77 (0.66–0.90) |
|  | Hospital level |  |  |  |  |  |
|  |  | Medical center | Ref | Ref |  | Ref | Ref |
|  |  | Regional hospital | 1.33 (1.23–1.44) | 1.17 (1.05–1.31) |  | 0.97 (0.89–1.06) | 0.88 (0.79–0.98) |
|  |  | District hospital | 2.03 (1.58–2.60) | 1.60 (1.23–2.09) |  | 0.67 (0.47–0.96) | 0.54 (0.35–0.83) |
|  | Hospital ownership |  |  |  |  |  |
|  |  | Private | Ref | Ref |  | Ref | Ref |
|  |  | Public | 0.86 (0.79–0.94) | 0.87 (0.79–0.96) |  | 1.07 (0.97–1.17) | 1.08 (0.98–1.19) |
|  | Urbanization |  |  |  |  |  |
|  |  | Urban | Ref | Ref |  | Ref | Ref |
|  |  | Suburban | 0.99 (0.91–1.08) | 1.01 (0.91–1.12) |  | 1.02 (0.93–1.13) | 0.98 (0.89–1.09) |
|  |  | Rural | 1.33 (1.16–1.52) | 1.21 (1.01–1.45) |  | 1.04 (0.89–1.20) | 1.01 (0.84–1.21) |
|  | Geographic area |  |  |  |  |  |
|  |  | North | Ref | Ref |  | Ref | Ref |
|  |  | Middle | 0.94 (0.84–1.05) | 0.86 (0.76–0.97) |  | 1.21 (1.08–1.35) | 1.21 (1.08–1.37) |
|  |  | South | 0.73 (0.66–0.81) | 0.76 (0.67–0.86) |  | 1.11 (1.00–1.23) | 1.09 (0.98–1.22) |
|  |  | East | 1.65 (1.33–2.04) | 1.28 (0.98–1.67) |  | 1.13 (0.86–1.50) | 1.08 (0.80–1.45) |
|  |  | Off-shore island | 0.41 (0.02–10.00) | 0.40 (0.07–2.29) |  | 1.05 (0.53–2.06) | 0.99 (0.48–2.05) |
| **Patient-level characteristics** |  |  |  |  |  |
|  | Gender |  |  |  |  |  |
|  |  | Female | Ref | Ref |  | Ref | Ref |
|  |  | Male | 1.05 (0.97–1.14) | 1.05 (0.97–1.14) |  | 1.28 (1.18–1.40) | 1.30 (1.19–1.41) |
|  | Age (per year) | 1.07 (1.06–1.07) | 1.06 (1.06–1.06) |  | 1.00 (0.99–1.00) | 0.99 (0.99–1.00) |
|  | Insurable monthly wage |  |  |  |  |  |
|  |  | Low-income people | Ref | Ref |  | Ref | Ref |
|  |  | Farmers and Fishermen | 1.24 (1.10–1.39) | 1.08 (0.94–1.25) |  | 0.93 (0.80–1.07) | 0.90 (0.78–1.04) |
|  |  | ≤20,000 NTD | 0.67 (0.58–0.77) | 1.03 (0.89–1.19) |  | 1.02 (0.89–1.17) | 0.97 (0.84–1.11) |
|  |  | 20,001–40,000 NTD | 0.68 (0.61–0.77) | 1.01 (0.89–1.15) |  | 0.96 (0.85–1.08) | 0.94 (0.83–1.06) |
|  |  | >40,000 NTD | 0.82 (0.73–0.92) | 0.92 (0.80–1.06) |  | 0.86 (0.75–0.99) | 0.85 (0.74–0.98) |
|  | CCI (per point) | 1.53 (1.48–1.59) | 1.33 (1.29–1.38) |  | 1.04 (1.00–1.07) | 1.05 (1.02–1.09) |
|  | Pre-PD nephrology care |  |  |  |  |  |
|  |  | No | Ref | Ref |  | Ref | Ref |
|  |  | Yes | 1.03 (0.94–1.12) | 0.82 (0.75–0.91) |  | 0.95 (0.86–1.05) | 1.05 (0.96–1.15) |
|  | CVC for initial dialysis |  |  |  |  |  |
|  |  | No | Ref | Ref |  | Ref | Ref |
|  |  | Yes | 0.95 (0.88–1.03) | 1.07 (0.98–1.17) |  | 1.01 (0.93–1.09) | 1.01 (0.93–1.10) |
| **Era** |  |  |  |  |  |
|  | 2001–2005 | Ref | Ref |  | Ref | Ref |
|  | 2006–2010 | 0.98 (0.91–1.06) | 0.78 (0.71–0.86) |  | 0.92 (0.85–1.01) | 0.93 (0.85–1.01) |

CCI, Charlson comorbidity index; CVC, central venous catheter; HD, hemodialysis; NTD, New Taiwan Dollar; 95% CI, 95% confidence interval

Table S3. Association between prevalent volume of centers (annual average monthly number of patients on PD in the center) and patient outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcomes** | **Adjusted cause-specific hazard ratio (95%)** | **P** |  | **Adjusted subdistribution hazard ratio (95%)** | **P** |
| 　 |
| **Technique failure** |  |  |  |  |  |
|  | Number of patients on PD in the center per month |  | 0.14a |  |  | 0.80a |
|  |  | 1 | – 46 | Ref |  |  | Ref |  |
|  |  | 47 | – 110 | 0.92 (0.78–1.08) | 0.30 |  | 0.96 (0.83–1.11) | 0.56 |
|  |  | 111 | – 181 | 0.88 (0.71–1.08) | 0.21 |  | 0.96 (0.83–1.12) | 0.64 |
|  |  | 182 | – 448 | 0.77 (0.61–0.98) | 0.03 |  | 0.91 (0.76–1.10) | 0.35 |
| **Death** |  |  |  |  |  |
|  | Number of patients on PD in the center per month |  | 0.54a |  |  | 0.38a |
|  |  | 1 | – 12 | Ref |  |  | Ref |  |
|  |  | 47 | – 25 | 0.96 (0.81–1.15) | 0.67 |  | 1.03 (0.89–1.19) | 0.68 |
|  |  | 111 | – 42 | 0.98 (0.82–1.17) | 0.80 |  | 1.13 (0.97–1.33) | 0.12 |
| 　 | 　 | 182 | – 448 | 0.88 (0.71–1.10) | 0.26 | 　 | 1.16 (0.96–1.39) | 0.13 |

All models were adjusted for gender, age, era of commencing peritoneal dialysis, insurable monthly wage, Charlson comorbidity index, predialysis nephrology care, central venous catheter for initial dialysis, hospital level, hospital ownership, urbanization degree and geographic region.

a Cumulative -value of overall groups significance

PD, peritoneal dialysis; 95% CI, 95% confidence interval

Table S4. The association between baseline center volume (number of patients starting PD in the treatment center in the 12 months before PD commencement) and patient outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcomes** | **Adjusted cause-specific hazard ratio (95%)** | **P** |  | **Adjusted subdistribution hazard ratio (95%)** | **P** |
| 　 |
| **Technique failure** |  |  |  |  |  |
|  | Number of patients starting PD in the past 12 months |  | 0.61a |  |  | 0.45a |
|  |  | 1 | – 12 | Ref |  |  | Ref |  |
|  |  | 13 | – 25 | 1.02 (0.89–1.17) | 0.81 |  | 1.03 (0.91–1.17) | 0.64 |
|  |  | 26 | – 42 | 0.93 (0.78–1.12) | 0.46 |  | 0.93 (0.82–1.06) | 0.29 |
|  |  | 43 | – 107 | 0.96 (0.79–1.17) | 0.69 |  | 0.97 (0.84–1.13) | 0.73 |
| **Death** |  |  |  |  |  |
|  | Number of patients starting PD in the past 12 months |  | 0.45a |  |  | 0.41a |
|  |  | 1 | – 12 | Ref |  |  | Ref |  |
|  |  | 13 | – 25 | 0.93 (0.81–1.08) | 0.34 |  | 0.95 (0.82–1.09) | 0.46 |
|  |  | 26 | – 42 | 1.02 (0.86–1.20) | 0.84 |  | 1.04 (0.90–1.20) | 0.61 |
| 　 | 　 | 43 | – 107 | 0.99 (0.85–1.15) | 0.89 | 　 | 1.07 (0.92–1.25) | 0.39 |

All models were adjusted for gender, age, era of commencing peritoneal dialysis, insurable monthly wage, Charlson comorbidity index, predialysis nephrology care, central venous catheter for initial dialysis, hospital level, hospital ownership, urbanization degree and geographic region.

a Cumulative -value of overall groups significance

PD, peritoneal dialysis; 95% CI, 95% confidence interval

Table S5. The association between center volume (number of patients starting PD in the center during the study period) and patient outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcomes** | **Adjusted cause-specific hazard ratio (95%)** | **P** |  | **Adjusted cause-specific hazard ratio (95%)** | **P** |
| 　 |
| **Technique failure** |  |  |  |  |  |
|  | Number of patients starting PD during the study period |  | 0.56a |  |  | 0.29a |
|  |  | 1 | – 177 | Ref |  |  | Ref |  |
|  |  | 178 | – 367 | 0.94 (0.77–1.14) | 0.50 |  | 0.91 (0.80–1.03) | 0.14 |
|  |  | 368 | – 603 | 0.97 (0.70–1.36) | 0.88 |  | 0.97 (0.80–1.16) | 0.70 |
|  |  | 604 | – 919 | 0.85 (0.63–1.14) | 0.28 |  | 0.87 (0.71–1.07) | 0.18 |
| **Death** |  |  |  |  |  |
|  | Number of patients starting PD during the study period |  | 0.31a |  |  | 0.08a |
|  |  | 1 | – 177 | Ref |  |  | Ref |  |
|  |  | 178 | – 367 | 1.12 (0.91–1.39) | 0.28 |  | 1.16 (1.02–1.32) | 0.02 |
|  |  | 368 | – 603 | 1.08 (0.82–1.41) | 0.58 |  | 1.07 (0.86–1.33) | 0.52 |
| 　 | 　 | 604 | – 919 | 0.97 (0.74–1.26) | 0.80 | 　 | 1.05 (0.84–1.31) | 0.68 |

All models were adjusted for gender, age, era of commencing peritoneal dialysis, insurable monthly wage, Charlson comorbidity index, predialysis nephrology care, central venous catheter for initial dialysis, hospital level, hospital ownership, urbanization degree and geographic region.

a Cumulative -value of overall groups significance

PD, peritoneal dialysis; 95% CI, 95% confidence interval

Table S6. The association between change of center volume and outcomes of patients and patient outcomes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Outcomes** | **Adjusted cause-specific hazard ratio (95%)** | **P** |  | **Adjusted subdistribution hazard ratio (95%)** | **P** |
| 　 |
| **Technique failure** |  |  |  |  |  |
|  | Annual change of number of patients initiating PD |  | 0.61a |  |  | 0.27a |
|  |  | Change < 25% | Ref |  |  | Ref |  |
|  |  | Increasing ≧ 25% | 1.04 (0.92–1.18) | 0.52 |  | 1.06 (0.94–1.19) | 0.36 |
|  |  | Decreasing ≧ 25% | 1.08 (0.96–1.22) | 0.18 |  | 1.09 (0.98–1.21) | 0.11 |
| **Death** |  |  |  |  |  |
|  | Annual change of number of patients initiating PD |  | 0.66a |  |  | 0.13a |
|  |  | Change < 25% | Ref |  |  | Ref |  |
|  |  | Increasing ≧ 25% | 1.00 (0.89–1.13) | 0.98 |  | 1.02 (0.90–1.14) | 0.79 |
| 　 | 　 | Decreasing ≧ 25% | 0.93 (0.82–1.06) | 0.29 | 　 | 0.91 (0.81–1.02) | 0.09 |

All models were adjusted for gender, age, era of commencing peritoneal dialysis, insurable monthly wage, Charlson comorbidity index, predialysis nephrology care, central venous catheter for initial dialysis, hospital level, hospital ownership, urbanization degree and geographic region.

a Cumulative -value of overall groups significance

PD, peritoneal dialysis; 95% CI, 95% confidence interval

Figure S1. Trend in number of patients on peritoneal dialysis and number of centers providing peritoneal dialysis from 2001 to 2012

