

Rate (95% CI) 18.1 17.8-18.3 5.3 5.1-5.4 11.2 11.0-11.4 33.2 32.9-33.4

Supplementary table 42. Multivariable Poisson regression analysis for 30-day readmission, in-hospital, 30-day and 1-year mortality rates with interaction term between time and ethnicity to determine statistical significance of trend differences by ethnicity

| | <u>30-days readmission</u> | | | <u>In-hospital mortality</u> | | | <u>30-days mortality</u> | | | <u>1-year mortality</u> | | |
|---------------|----------------------------|-------------|----------------|------------------------------|-------------|----------------|--------------------------|-------------|----------------|-------------------------|-------------|----------------|
| | <i>Rate ratio</i> | <i>CI</i> | <i>p</i> | <i>Rate ratio</i> | <i>CI</i> | <i>p</i> | <i>Rate ratio</i> | <i>CI</i> | <i>p</i> | <i>Rate ratio</i> | <i>CI</i> | <i>p</i> |
| (Intercept) | 0.16 | 0.15 – 0.17 | < 0.001 | 0.06 | 0.06 – 0.07 | < 0.001 | 0.11 | 0.10 – 0.12 | < 0.001 | 0.30 | 0.29 – 0.31 | < 0.001 |
| Time | 1.02 | 1.01 – 1.02 | < 0.001 | 0.93 | 0.91 – 0.94 | < 0.001 | 0.97 | 0.96 – 0.97 | < 0.001 | 1.00 | 0.99 – 1.00 | 0.231 |
| Time: Chinese | 1.00 | 0.98 – 1.01 | 0.578 | 1.01 | 0.99 – 1.04 | 0.349 | 1.00 | 0.99 – 1.02 | 0.858 | 1.00s | 0.99 – 1.01 | 0.738 |
| Time: Indian | 1.00 | 0.98 – 1.02 | 0.924 | 0.98 | 0.94 – 1.01 | 0.195 | 0.99 | 0.97 – 1.02 | 0.504 | 1.01 | 1.00 – 1.03 | 0.010 |
| Time: Others | 1.03 | 1.01 – 1.05 | 0.002 | 1.00 | 0.98 – 1.03 | 0.920 | 0.98 | 0.97 – 1.00 | 0.091 | 0.99 | 0.98 – 1.00 | 0.021 |
| Malay | <i>Reference</i> | | | | | | | | | | | |
| Chinese | 1.14 | 1.05 – 1.24 | 0.002 | 1.14 | 0.98 – 1.31 | 0.089 | 1.07 | 0.97 – 1.18 | 0.155 | 0.96 | 0.91 – 1.01 | 0.156 |

| | | | | | | | | | | | | |
|--------|------------------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|
| Indian | 1.11 | 1.01 – 1.23 | 0.038 | 0.93 | 0.75 – 1.14 | 0.474 | 0.83 | 0.73 – 0.96 | 0.010 | 0.80 | 0.74 – 0.86 | <0.001 |
| Others | 0.68 | 0.60 – 0.77 | <0.001 | 1.90 | 1.63 – 2.22 | <0.001 | 1.42 | 1.26 – 1.59 | <0.001 | 1.03 | 0.96 – 1.11 | 0.369 |
| Female | <i>Reference</i> | | | | | | | | | | | |
| Male | 1.16 | 1.13 – 1.19 | <0.001 | 1.02 | 0.97 – 1.08 | 0.429 | 1.11 | 1.07 – 1.15 | <0.001 | 1.17 | 1.15 – 1.19 | <0.001 |
| 60-<65 | <i>Reference</i> | | | | | | | | | | | |
| 20-<25 | 1.14 | 0.94 – 1.37 | 0.167 | 2.49 | 1.88 – 3.22 | <0.001 | 1.73 | 1.40 – 2.11 | <0.001 | 0.98 | 0.85 – 1.12 | 0.759 |
| 25-<30 | 1.01 | 0.86 – 1.17 | 0.918 | 2.62 | 2.12 – 3.21 | <0.001 | 1.75 | 1.48 – 2.04 | <0.001 | 0.99 | 0.89 – 1.10 | 0.884 |
| 30-<35 | 0.83 | 0.72 – 0.95 | 0.008 | 2.00 | 1.64 – 2.43 | <0.001 | 1.39 | 1.20 – 1.61 | <0.001 | 0.86 | 0.78 – 0.94 | 0.002 |
| 35-<40 | 0.98 | 0.88 – 1.08 | 0.654 | 1.25 | 1.01 – 1.53 | 0.034 | 1.09 | 0.95 – 1.25 | 0.224 | 0.83 | 0.76 – 0.89 | <0.001 |
| 40-<45 | 0.95 | 0.87 – 1.03 | 0.195 | 1.15 | 0.96 – 1.36 | 0.115 | 0.99 | 0.88 – 1.10 | 0.796 | 0.83 | 0.78 – 0.88 | <0.001 |
| 45-<50 | 0.94 | 0.88 – 1.01 | 0.078 | 0.88 | 0.75 – 1.02 | 0.089 | 0.84 | 0.76 – 0.93 | 0.001 | 0.82 | 0.78 – 0.87 | <0.001 |
| 50-<55 | 0.99 | 0.93 – 1.05 | 0.696 | 0.84 | 0.74 – 0.96 | 0.013 | 0.82 | 0.75 – 0.89 | <0.001 | 0.87 | 0.83 – 0.91 | <0.001 |
| 55-<60 | 0.98 | 0.93 – 1.03 | 0.463 | 0.93 | 0.83 – 1.05 | 0.253 | 0.90 | 0.83 – 0.97 | 0.005 | 0.93 | 0.90 – 0.96 | <0.001 |

| | | | | | | | | | | | | |
|--------------|---------|-------------|------------------|----------|-------------|------------------|----------|-------------|------------------|---------|-------------|------------------|
| 65-<70 | 0.97 | 0.92 – 1.02 | 0.215 | 1.07 | 0.96 – 1.20 | 0.220 | 1.08 | 1.01 – 1.15 | 0.033 | 1.05 | 1.01 – 1.09 | 0.006 |
| 70-<75 | 0.91 | 0.87 – 0.96 | 0.001 | 1.14 | 1.02 – 1.27 | 0.020 | 1.23 | 1.15 – 1.31 | <0.001 | 1.15 | 1.12 – 1.20 | <0.001 |
| 75-<80 | 0.86 | 0.81 – 0.91 | <0.001 | 1.25 | 1.12 – 1.40 | <0.001 | 1.34 | 1.25 – 1.44 | <0.001 | 1.24 | 1.19 – 1.28 | <0.001 |
| 80-<85 | 0.84 | 0.79 – 0.90 | <0.001 | 1.53 | 1.35 – 1.73 | <0.001 | 1.59 | 1.47 – 1.71 | <0.001 | 1.37 | 1.31 – 1.43 | <0.001 |
| 85+ | 0.75 | 0.68 – 0.81 | <0.001 | 1.84 | 1.61 – 2.10 | <0.001 | 1.94 | 1.79 – 2.11 | <0.001 | 1.59 | 1.52 – 1.66 | <0.001 |
| Observations | 999 | | | 1111 | | | 1111 | | | 1111 | | |
| Deviance | 894.324 | | | 1299.643 | | | 1114.947 | | | 890.756 | | |

Supplementary table 32. Poisson model for cardiovascular and non-cardiovascular death at one year after index HF admission

| <i>Predictors</i> | Cardiovascular death | | | Non-cardiovascular death | | |
|-------------------|-----------------------------|-------------|------------------|---------------------------------|-------------|------------------|
| | <i>Rate Ratio</i> | <i>CI</i> | <i>p</i> | <i>Rate Ratio</i> | <i>CI</i> | <i>p</i> |
| (Intercept) | 0.10 | 0.09 – 0.11 | <0.001 | 0.08 | 0.08 – 0.09 | <0.001 |
| Time | 0.98 | 0.97 – 0.99 | 0.001 | 1.02 | 1.01 – 1.03 | 0.003 |
| Female | <i>Reference</i> | | | | | |
| Male | 1.21 | 1.16 – 1.26 | <0.001 | 1.09 | 1.04 – 1.14 | 0.001 |
| Malay | <i>Reference</i> | | | | | |
| Chinese | 1.10 | 1.04 – 1.16 | 0.001 | 1.14 | 1.08 – 1.21 | <0.001 |
| Indian | 1.07 | 1.00 – 1.14 | 0.063 | 1.03 | 0.95 – 1.11 | 0.496 |
| Others | 1.12 | 1.04 – 1.20 | 0.002 | 1.17 | 1.08 – 1.26 | <0.001 |
| 60-<65 | <i>Reference</i> | | | | | |

| | | | | | | |
|--------|------|-------------|------------------|------|-------------|------------------|
| 20-<25 | 1.56 | 1.13 – 2.08 | 0.005 | 1.87 | 1.38 – 2.48 | <0.001 |
| 25-<30 | 1.59 | 1.30 – 1.93 | <0.001 | 1.72 | 1.37 – 2.13 | <0.001 |
| 30-<35 | 1.15 | 0.94 – 1.39 | 0.161 | 1.47 | 1.21 – 1.78 | <0.001 |
| 35-<40 | 1.14 | 0.97 – 1.34 | 0.109 | 1.20 | 1.00 – 1.43 | 0.049 |
| 40-<45 | 1.06 | 0.93 – 1.20 | 0.382 | 0.93 | 0.80 – 1.08 | 0.333 |
| 45-<50 | 0.92 | 0.82 – 1.02 | 0.110 | 0.83 | 0.74 – 0.94 | 0.003 |
| 50-<55 | 0.95 | 0.87 – 1.04 | 0.291 | 0.88 | 0.79 – 0.97 | 0.011 |
| 55-<60 | 1.00 | 0.92 – 1.08 | 0.905 | 0.93 | 0.85 – 1.02 | 0.146 |
| 65-<70 | 1.02 | 0.94 – 1.10 | 0.657 | 0.96 | 0.88 – 1.05 | 0.408 |
| 70-<75 | 1.10 | 1.01 – 1.18 | 0.020 | 0.98 | 0.90 – 1.07 | 0.672 |
| 75-<80 | 1.08 | 0.99 – 1.17 | 0.074 | 1.08 | 0.98 – 1.18 | 0.109 |
| 80-<85 | 1.07 | 0.97 – 1.18 | 0.162 | 1.12 | 1.01 – 1.24 | 0.032 |
| 85+ | 1.10 | 0.98 – 1.23 | 0.109 | 1.20 | 1.07 – 1.36 | 0.003 |

| | | |
|---------------------------|-------|-------|
| Observations | 686 | 678 |
| R ² Nagelkerke | 0.277 | 0.299 |

Supplementary table 43. Comparison on causes of death between 2007-2008 and 2012-2013

| Cause of death | <u>2007-2008</u> | | <u>2012-2013</u> | |
|--|------------------|----------------|------------------|----------------|
| | n | % [†] | n | % [†] |
| Cardiovascular | 2311 | 60% | 1955 | 53.5% |
| HF + cardiomyopathy | 956 | 24.8% | 722 | 19.8% |
| Other ischaemic heart diseases | 693 | 18.0% | 590 | 16.1% |
| Other diseases of the circulatory system | 263 | 6.8% | 189 | 5.2% |
| Acute myocardial infarction | 179 | 4.6% | 210 | 5.7% |
| Stroke | 146 | 3.8% | 171 | 4.7% |
| Valvular heart disease | 74 | 1.9% | 73 | 2.0% |
| Non-cardiovascular | 1541 | 40% | 1699 | 46.5% |
| Infection | 519 | 13.5% | 797 | 21.8% |
| Other‡ | 464 | 12.0% | 488 | 13.4% |
| Renal failure | 140 | 3.6% | 107 | 2.9% |
| Respiratory disease | 237 | 6.2% | 189 | 5.2% |
| Neoplasm | 108 | 2.8% | 87 | 2.4% |
| Diabetes mellitus and complications | 73 | 1.9% | 31 | 0.8% |
| Missing | 2679 | | 2254 | |

[†]Percentages were calculated based on all known causes of death

[‡] includes shock (not elsewhere classified), other diseases of digestive system, other disorders of urinary system, chronic nephritic syndrome, hepatic failure (NEC), hydro-electrolytic disorders, trauma and other causes

Supplementary table 54. Multivariable Poisson regression analysis for readmission and mortality rates using incident HF hospitalisation definition of no prior admission in the past 1 year

| Predictors | 30-days readmission | | | In-hospital mortality | | | 30-days mortality | | | 1-year mortality | | |
|-------------|-----------------------|-------------|--------|-----------------------|-------------|--------|-----------------------|-------------|--------|-----------------------|-------------|--------|
| | Incidence Rate Ratios | CI | p | Incidence Rate Ratios | CI | p | Incidence Rate Ratios | CI | p | Incidence Rate Ratios | CI | p |
| (Intercept) | 0.16 | 0.15 – 0.17 | <0.001 | 0.06 | 0.05 – 0.06 | <0.001 | 0.11 | 0.10 – 0.11 | <0.001 | 0.30 | 0.29 – 0.31 | <0.001 |
| Time | 1.02 | 1.01 – 1.03 | <0.001 | 0.93 | 0.92 – 0.93 | <0.001 | 0.96 | 0.96 – 0.97 | <0.001 | 1.00 | 0.99 – 1.00 | 0.102 |
| Female | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| Male | 1.16 | 1.13 – 1.20 | <0.001 | 1.02 | 0.96 – 1.08 | 0.486 | 1.11 | 1.07 – 1.15 | <0.001 | 1.17 | 1.15 – 1.19 | <0.001 |
| Malay | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| Chinese | 1.11 | 1.07 – 1.16 | <0.001 | 1.21 | 1.12 – 1.30 | <0.001 | 1.08 | 1.03 – 1.13 | 0.001 | 0.96 | 0.93 – 0.98 | <0.001 |
| Indian | 1.10 | 1.05 – 1.15 | <0.001 | 0.82 | 0.73 – 0.91 | <0.001 | 0.81 | 0.76 – 0.86 | <0.001 | 0.88 | 0.85 – 0.91 | <0.001 |
| Others | 0.82 | 0.78 – 0.87 | <0.001 | 1.92 | 1.78 – 2.07 | <0.001 | 1.30 | 1.23 – 1.37 | <0.001 | 0.96 | 0.93 – 0.99 | 0.007 |
| 60-<65 | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| 20-<25 | 1.13 | 0.92 – 1.36 | 0.228 | 2.54 | 1.92 – 3.28 | <0.001 | 1.73 | 1.40 – 2.11 | <0.001 | 0.98 | 0.85 – 1.12 | 0.770 |
| 25-<30 | 0.99 | 0.85 – 1.16 | 0.944 | 2.62 | 2.12 – 3.21 | <0.001 | 1.74 | 1.48 – 2.04 | <0.001 | 0.98 | 0.88 – 1.09 | 0.775 |
| 30-<35 | 0.83 | 0.72 – 0.96 | 0.012 | 2.03 | 1.66 – 2.46 | <0.001 | 1.39 | 1.20 – 1.60 | <0.001 | 0.86 | 0.78 – 0.94 | 0.002 |
| 35-<40 | 0.95 | 0.85 – 1.06 | 0.403 | 1.31 | 1.07 – 1.59 | 0.008 | 1.11 | 0.97 – 1.26 | 0.138 | 0.83 | 0.77 – 0.89 | <0.001 |
| 40-<45 | 0.94 | 0.86 – 1.02 | 0.148 | 1.17 | 0.98 – 1.38 | 0.071 | 0.99 | 0.88 – 1.10 | 0.840 | 0.83 | 0.78 – 0.88 | <0.001 |
| 45-<50 | 0.94 | 0.88 – 1.01 | 0.072 | 0.89 | 0.76 – 1.03 | 0.126 | 0.84 | 0.77 – 0.93 | <0.001 | 0.83 | 0.79 – 0.87 | <0.001 |

| | | | | | | | | | | | | |
|--------|------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|
| 50-<55 | 1.00 | 0.94 – 1.06 | 0.996 | 0.87 | 0.76 – 0.99 | 0.032 | 0.83 | 0.76 – 0.90 | <0.001 | 0.87 | 0.84 – 0.91 | <0.001 |
| 55-<60 | 0.99 | 0.93 – 1.04 | 0.592 | 0.96 | 0.85 – 1.08 | 0.485 | 0.91 | 0.84 – 0.98 | 0.010 | 0.94 | 0.90 – 0.97 | 0.001 |
| 65-<70 | 0.98 | 0.93 – 1.03 | 0.467 | 1.09 | 0.98 – 1.21 | 0.130 | 1.08 | 1.01 – 1.16 | 0.022 | 1.05 | 1.02 – 1.09 | 0.004 |
| 70-<75 | 0.92 | 0.87 – 0.97 | 0.003 | 1.15 | 1.03 – 1.28 | 0.013 | 1.22 | 1.14 – 1.30 | <0.001 | 1.15 | 1.11 – 1.19 | <0.001 |
| 75-<80 | 0.87 | 0.82 – 0.92 | <0.001 | 1.27 | 1.14 – 1.42 | <0.001 | 1.34 | 1.25 – 1.44 | <0.001 | 1.23 | 1.19 – 1.28 | <0.001 |
| 80-<85 | 0.86 | 0.80 – 0.92 | <0.001 | 1.54 | 1.36 – 1.73 | <0.001 | 1.58 | 1.46 – 1.70 | <0.001 | 1.36 | 1.31 – 1.42 | <0.001 |
| 85+ | 0.75 | 0.68 – 0.82 | <0.001 | 1.85 | 1.62 – 2.10 | <0.001 | 1.93 | 1.78 – 2.10 | <0.001 | 1.57 | 1.50 – 1.64 | <0.001 |

Supplementary table 65. Multivariable Poisson regression analysis for readmission and mortality rates using incident HF hospitalisation definition of no prior admission in the past 3 years

| <i>Predictors</i> | 30-days readmission | | | In-hospital mortality | | | 30-days mortality | | | 1-year mortality | | |
|-------------------|------------------------------|-------------|------------------|------------------------------|-------------|------------------|------------------------------|-------------|------------------|------------------------------|-------------|------------------|
| | <i>Incidence Rate Ratios</i> | <i>CI</i> | <i>p</i> | <i>Incidence Rate Ratios</i> | <i>CI</i> | <i>p</i> | <i>Incidence Rate Ratios</i> | <i>CI</i> | <i>p</i> | <i>Incidence Rate Ratios</i> | <i>CI</i> | <i>p</i> |
| (Intercept) | 0.16 | 0.15 – 0.17 | <0.001 | 0.06 | 0.05 – 0.07 | <0.001 | 0.11 | 0.10 – 0.12 | <0.001 | 0.29 | 0.28 – 0.30 | <0.001 |
| Time | 1.02 | 1.01 – 1.03 | <0.001 | 0.92 | 0.91 – 0.93 | <0.001 | 0.96 | 0.96 – 0.97 | <0.001 | 1.00 | 1.00 – 1.00 | 0.969 |
| Female | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| Male | 1.16 | 1.13 – 1.20 | <0.001 | 1.02 | 0.96 – 1.08 | 0.576 | 1.12 | 1.08 – 1.16 | <0.001 | 1.17 | 1.15 – 1.19 | <0.001 |

| | | | | | | | | | | | | |
|---------|------------------|-------------|----------------|------------------|-------------|----------------|------------------|-------------|----------------|------------------|-------------|----------------|
| Malay | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| Chinese | 1.11 | 1.07 – 1.15 | < 0.001 | 1.23 | 1.14 – 1.33 | < 0.001 | 1.10 | 1.04 – 1.15 | < 0.001 | 0.96 | 0.93 – 0.98 | 0.001 |
| Indian | 1.10 | 1.05 – 1.15 | < 0.001 | 0.80 | 0.71 – 0.90 | < 0.001 | 0.80 | 0.74 – 0.85 | < 0.001 | 0.86 | 0.83 – 0.89 | < 0.001 |
| Others | 0.81 | 0.77 – 0.86 | < 0.001 | 1.91 | 1.76 – 2.07 | < 0.001 | 1.28 | 1.21 – 1.36 | < 0.001 | 0.94 | 0.91 – 0.98 | 0.001 |
| 60-<65 | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | | <i>Reference</i> | | |
| 20-<25 | 1.16 | 0.95 – 1.40 | 0.143 | 2.50 | 1.85 – 3.28 | < 0.001 | 1.78 | 1.42 – 2.19 | < 0.001 | 1.01 | 0.87 – 1.16 | 0.914 |
| 25-<30 | 1.00 | 0.85 – 1.17 | 0.967 | 2.72 | 2.18 – 3.37 | < 0.001 | 1.83 | 1.55 – 2.16 | < 0.001 | 1.03 | 0.92 – 1.15 | 0.612 |
| 30-<35 | 0.84 | 0.73 – 0.97 | 0.020 | 2.01 | 1.63 – 2.47 | < 0.001 | 1.39 | 1.19 – 1.62 | < 0.001 | 0.87 | 0.78 – 0.95 | 0.004 |
| 35-<40 | 0.97 | 0.87 – 1.08 | 0.607 | 1.22 | 0.97 – 1.51 | 0.083 | 1.08 | 0.93 – 1.25 | 0.299 | 0.82 | 0.75 – 0.89 | < 0.001 |
| 40-<45 | 0.94 | 0.86 – 1.03 | 0.166 | 1.14 | 0.95 – 1.36 | 0.166 | 0.98 | 0.86 – 1.10 | 0.697 | 0.83 | 0.77 – 0.88 | < 0.001 |
| 45-<50 | 0.95 | 0.88 – 1.02 | 0.126 | 0.88 | 0.75 – 1.03 | 0.121 | 0.84 | 0.76 – 0.93 | 0.001 | 0.83 | 0.79 – 0.87 | < 0.001 |
| 50-<55 | 0.99 | 0.94 – 1.06 | 0.839 | 0.83 | 0.72 – 0.96 | 0.012 | 0.81 | 0.74 – 0.89 | < 0.001 | 0.87 | 0.83 – 0.91 | < 0.001 |

| | | | | | | | | | | | | |
|--------|------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|------|-------------|------------------|
| 55-<60 | 0.98 | 0.93 – 1.04 | 0.521 | 0.94 | 0.83 – 1.07 | 0.366 | 0.90 | 0.83 – 0.98 | 0.013 | 0.93 | 0.89 – 0.96 | <0.001 |
| 65-<70 | 0.97 | 0.92 – 1.02 | 0.237 | 1.09 | 0.97 – 1.22 | 0.161 | 1.08 | 1.00 – 1.16 | 0.042 | 1.05 | 1.01 – 1.09 | 0.017 |
| 70-<75 | 0.92 | 0.87 – 0.97 | 0.004 | 1.14 | 1.01 – 1.28 | 0.028 | 1.23 | 1.14 – 1.32 | <0.001 | 1.15 | 1.11 – 1.20 | <0.001 |
| 75-<80 | 0.87 | 0.82 – 0.93 | <0.001 | 1.23 | 1.09 – 1.39 | 0.001 | 1.32 | 1.22 – 1.42 | <0.001 | 1.24 | 1.19 – 1.29 | <0.001 |
| 80-<85 | 0.85 | 0.79 – 0.92 | <0.001 | 1.55 | 1.36 – 1.77 | <0.001 | 1.59 | 1.46 – 1.72 | <0.001 | 1.37 | 1.31 – 1.43 | <0.001 |
| 85+ | 0.75 | 0.68 – 0.82 | <0.001 | 1.83 | 1.58 – 2.11 | <0.001 | 1.93 | 1.76 – 2.11 | <0.001 | 1.59 | 1.51 – 1.67 | <0.001 |
