**Supplemental Table 1. Comparison of patient baseline characteristics after multiple imputation and propensity score weighting**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Baseline characteristics** | **Total**  **(N=6385)** | **ATD**  **(N=4784)** | **RAI**  **(N=1274)** | **Surgery**  **(N=327)** | **ASMD** | **P-value** |
| **Patient demographics** |  |  |  |  |  |  |
| Age (year), Mean ± SE | 45.64±0.52 | 45.36±0.28 | 44.99±0.67 | 46.88±1.59 | 0.124 | 0.540 |
| Age group |  |  |  |  | 0.174 | 0.501 |
| 18-<30 | 17.31% | 19.16% | 18.24% | 13.55% |  |  |
| 30-<50 | 44.34% | 43.43% | 44.75% | 45.04% |  |  |
| 50-<70 | 29.58% | 27.80% | 28.90% | 32.91% |  |  |
| ≥70 | 8.77% | 9.62% | 8.11% | 8.50% |  |  |
| Sex |  |  |  |  | 0.020 | 0.891 |
| Female | 72.63% | 72.08% | 72.93% | 72.96% |  |  |
| Male | 27.37% | 27.92% | 27.07% | 27.04% |  |  |
|  |  |  |  |  |  |  |
| **Clinical parameters** |  |  |  |  |  |  |
| Laboratory result, Mean ± SE |  |  |  |  |  |  |
| Serum TSH, mIU/l | 1.74±0.18 | 2.19±0.34 | 1.25±0.30 | 1.76±0.32 | 0.100 | 0.104 |
| SBP, mmHg | 128.67±0.75 | 129.18±0.40 | 129.41±0.87 | 126.97±2.16 | 0.133 | 0.494 |
| DBP, mmHg | 73.72±0.63 | 73.75±0.33 | 73.79±0.67 | 73.59±1.68 | 0.017 | 0.991 |
| TC/ HDL-C ratio | 3.40±0.05 | 3.38±0.02 | 3.38±0.10 | 3.47±0.09 | 0.079 | 0.681 |
| Triglyceride, mmol/l | 1.16±0.04 | 1.12±0.02 | 1.19±0.08 | 1.15±0.11 | 0.090 | 0.759 |
| Fasting glucose, mmol/l | 5.64±0.08 | 5.59±0.03 | 5.68±0.14 | 5.64±0.22 | 0.056 | 0.730 |
| eGFR mL/min/1.73m2 |  |  |  |  | 0.065 | 0.131 |
| ≥60 | 97.97% | 97.49% | 98.42% | 98.03% |  |  |
| <60 | 2.03% | 2.51% | 1.58% | 1.97% |  |  |
|  |  |  |  |  |  |  |
| **Disease status** |  |  |  |  |  |  |
| Duration of GD (months),  Mean ± SE | 0.67±0.27 | 0.48±0.10 | 0.43±0.87 | 1.25±0.97 | 0.141 | 0.665 |
| Comorbidities |  |  |  |  |  |  |
| Coronary heart disease | 2.45% | 2.46% | 2.28% | 2.66% | 0.024 | 0.936 |
| Heart failure | 5.51% | 5.40% | 5.33% | 5.88% | 0.024 | 0.974 |
| Stroke | 2.32% | 2.65% | 1.80% | 2.56% | 0.058 | 0.205 |
| Atrial fibrillation | 9.29% | 9.42% | 9.04% | 9.46% | 0.014 | 0.913 |
| Psychological disease | 5.35% | 5.90% | 6.26% | 3.40% | 0.134 | 0.235 |
| Diabetes mellitus | 6.16% | 6.28% | 6.78% | 5.15% | 0.069 | 0.756 |
| Hypertension | 10.63% | 11.12% | 10.54% | 10.08% | 0.034 | 0.843 |
| CCI†, Mean ± SE | 1.59±0.07 | 1.55±0.03 | 1.51±0.07 | 1.76±0.24 | 0.137 | 0.583 |
| CCI† |  |  |  |  | 0.136 | 0.571 |
| 1 | 59.88% | 60.68% | 61.73% | 56.33% |  |  |
| 2 | 15.10% | 15.68% | 14.78% | 14.76% |  |  |
| 3 | 9.77% | 8.61% | 9.07% | 12.31% |  |  |
| 4 or above | 15.24% | 15.04% | 14.43% | 16.60% |  |  |
|  |  |  |  |  |  |  |
| **Other medications** |  |  |  |  |  |  |
| Beta-blocker | 65.18% | 66.17% | 66.19% | 62.48% | 0.077 | 0.672 |
| Calcium-channel blocker | 14.43% | 13.70% | 14.49% | 15.34% | 0.047 | 0.794 |
| Corticosteroids | 12.71% | 12.65% | 12.83% | 12.64% | 0.006 | 0.988 |

Abbreviations: ASMD = absolute standardized mean difference; SE = standard error; TSH=thyroid-stimulating hormone; SBP = systolic blood pressure; DBP = diastolic blood pressure; HDL-C = high density lipoprotein - cholesterol; TC = total cholesterol; CCI= Charlson Comorbidity Index; ATD = Anti-thyroid drugs; RAI= Radioactive Iodine.

\*: Imbalance covariate if pairwise ASMD >= 0.2, or significant difference (p<0.05) between groups by univariate linear regression, binary logistic or multinomial logistic regression

† The calculation of Charlson comorbidity Index does not include Acquired Immune Deficiency Syndrome (AIDS).

**Supplemental Table 2. The incidence of all-cause mortality, cardiovascular disease, atrial fibrillation, psychological disease, diabetes and hypertension by first-line treatment groups**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Event** | **Unweighted** | | | | | | **Weighted** | |
| **Cumulative incidence** | | **Incidence rate  (Cases/ 1000 person-years)** | | **Person-years** | **Median follow-up periods (Months)** | **Incidence rate**  **(Cases/ 1000 person-years)** | |
| **Cases with event** | **Rate** | **Estimate** | **95% CI\*** | **Estimate** | **95% CI\*** |
| ***Total (N=6385)*** | |  |  |  |  |  |  |  |
| All-cause mortality | 567 | 8.88% | 11.944 | (10.981, 12.969) | 47,470 | 90 | 10.029 | (9.665, 10.403) |
| CVD | 561 | 9.67% | 12.476 | (11.465, 13.552) | 44,967 | 83 | 9.505 | (9.144, 9.877) |
| AF | 340 | 5.95% | 7.422 | (6.654, 8.254) | 45,811 | 86 | 5.416 | (5.146, 5.697) |
| Psychological disease | 715 | 11.91% | 16.214 | (15.047, 17.448) | 44,097 | 81 | 13.526 | (13.089, 13.974) |
| Diabetes | 371 | 6.24% | 8.133 | (7.326, 9.004) | 45,617 | 85 | 6.914 | (6.608, 7.231) |
| Hypertension | 790 | 14.00% | 18.031 | (16.796, 19.334) | 43,813 | 80 | 17.374 | (16.875, 17.884) |
| ***ATD (N=4784)*** | |  |  |  |  |  |  |  |
| All-cause mortality | 415 | 8.67% | 11.472 | (10.395, 12.631) | 36,175 | 92 | 12.465 | (12.000, 12.943) |
| CVD | 446 | 10.09% | 13.044 | (11.861, 14.312) | 34,193 | 85 | 13.805 | (13.302, 14.323) |
| AF | 293 | 6.67% | 8.433 | (7.495, 9.456) | 34,744 | 88 | 9.136 | (8.730, 9.555) |
| Psychological disease | 566 | 12.62% | 16.880 | (15.518, 18.330) | 33,530 | 82 | 17.542 | (16.968, 18.131) |
| Diabetes | 280 | 6.24% | 8.062 | (7.145, 9.064) | 34,731 | 87 | 8.294 | (7.908, 8.694) |
| Hypertension | 586 | 13.74% | 17.491 | (16.104, 18.967) | 33,502 | 82 | 17.960 | (17.379, 18.555) |
| ***RAI (N=1274)*** | |  |  |  |  |  |  |  |
| All-cause mortality | 147 | 11.54% | 16.691 | (14.102, 19.618) | 8,807 | 82 | 10.650 | (9.832, 11.518) |
| CVD | 109 | 10.19% | 13.112 | (10.766, 15.817) | 8,313 | 75 | 10.016 | (9.207, 10.877) |
| AF | 45 | 4.47% | 5.242 | (3.824, 7.015) | 8,584 | 80 | 4.950 | (4.390, 5.562) |
| Psychological disease | 124 | 10.30% | 15.127 | (12.582, 18.036) | 8,197 | 73 | 15.452 | (14.425, 16.532) |
| Diabetes | 85 | 7.42% | 10.090 | (8.060, 12.477) | 8,424 | 76 | 8.608 | (7.859, 9.408) |
| Hypertension | 175 | 16.37% | 21.897 | (18.773, 25.392) | 7,992 | 71 | 21.603 | (20.373, 22.887) |
| ***Surgery (N=327)*** | |  |  |  |  |  |  |  |
| All-cause mortality | 5 | 1.53% | 0.568 | (0.653, 4.690) | 2,488 | 94 | 5.533 | (4.360, 6.926) |
| CVD | 6 | 1.90% | 0.722 | (0.894, 5.304) | 2,462 | 93 | 2.787 | (1.972, 3.825) |
| AF | 2 | 0.63% | 0.233 | (0.098, 2.910) | 2,483 | 94 | 0.802 | (0.400, 1.435) |
| Psychological disease | 25 | 7.99% | 3.050 | (6.824, 15.565) | 2,371 | 87 | 5.243 | (4.087, 6.624) |
| Diabetes | 6 | 1.90% | 0.712 | (0.894, 5.304) | 2,462 | 93 | 2.503 | (1.733, 3.498) |
| Hypertension | 29 | 9.45% | 3.629 | (8.375, 17.960) | 2,319 | 83 | 10.608 | (8.912, 12.533) |

Abbreviations: ATD = Anti-thyroid drugs; RAI= Radioactive Iodine; CI= Confidence Interval; CVD = cardiovascular diseases; AF = atrial fibrillation.

\* 95% CI of incidence rates were constructed by Poisson distribution

**Supplemental Table 3. List of diagnosis and procedure codes**

|  |  |  |
| --- | --- | --- |
| **Description** | **ICPC-2 code** | **ICD-9-CM code** |
| **Disease Diagnosis** |  |  |
| Graves’ disease | NA | 242.00, 242.01 |
| Acute myocardial infarction | K75 | 410.00-410.92 |
| Other ischemic heart disease | K74; K76 | 414.10-414.12; 414.19; 414.2-414.4; 414.8; 414.911.0; 411.1; 411.81; 411.89; 412; 413.0;413.1;413.9; 414.00-414.07 |
| Congestive heart failure | K77 | 428.0-428.9 |
| Stroke | K89; K90; K91 | 430; 431; 432.0-432.9; 433.00-433.91; 434.00-434.91;435.0-435.9; 436;437.0-437.9; 438.0-438.9 |
| Atrial fibrillation | K78 | 427.31 |
| Peripheral vascular disease | K92 | 250.60-250.63, 440.20-440.29, 997.2, 997.60-997.69 |
| Diabetes mellitus | T89, T90, W85 | 250.00-250.93 |
| Hypertension | K86, K87 | 401.0-401.9 |
| Psychological condition | P01-P06, P28, P29, P74-P99 | 291.1, 292-319 |
| Pregnancy | NA | 630.0–679.0, V22.0, V22.1, V22.2, V23.0-V23.9 |
| Thyroid cancer | NA | 193 |
| Liver disease | D97 | 570-573.9 |
| Peptic ulcer disease | D85, D86 | 531.0-534.91 |
| Amputation | L81 | 997.2, 997.60-997.69 |
| Dementia | P70 | 290.0-290.9 |
| Chronic lung disease | R79, R95 | 490-496 |
| Musculoskeletal and chronic orthopaedic disorders | L72-L81, L88-L90, L95, L96 | 710-739.99 |
| Peptic ulcer disease | D85, D86 | 531.0-534.91 |
| Liver disease | D97 | 570-573.9 |
| Moderate to severe chronic kidney disease | NA | 585.1-585.9, 586 |
| Hemiplegia | N99 | 342.00-342.92 |
| Leukemia | B73 | 204.00-208.92 |
| Malignant lymphoma | B72 | 202.00-202.08, 202.70-202.78, 202.80-202.88 |
| Solid tumor | A79, B72-B74, D74-D77, F74, H75, K72, L71, N74, R84-R85, S77, T71, U75-U77, W72, X75-X77, Y77-Y78 | 140.0-149.9, 150.0-159.9, 160.0-165.9, 170.0-176.9, 179-189.9, 190.0-199.2, 200.00-209.79 |
| **Procedure** |  |  |
| Partial thyroidectomy | NA | 06.2, 06.31-06.39 |
| Complete thyroidectomy | NA | 06.4 |
| Radioactive iodine | NA | 92.01 |

Abbreviations: NA = not available. ICPC-2 = International Classification of Primary Care, Second edition; ICD-9-CM = International Classification of Diseases, Ninth Revision

**Supplemental Table 4. Unit cost of healthcare services, procedures and thyroid drugs**

|  |  |  |
| --- | --- | --- |
| Items | Cost (HK$)† | Cost (US$) |
| **Healthcare services**‡ |  |  |
| Clinic visit |  |  |
| General outpatient clinic | 445 per visit | 57 per visit |
| Specialist outpatient clinic | 1,190 per visit | 153 per visit |
| Accident and emergency | 1,230 per visit | 158 per visit |
| Allied health professionals  (including speech therapy) | 550 per visit | 71 per visit |
| Hospitalization |  |  |
| General ward | 5,100 per day | 654 per day |
| Intensive care unit | 24,400 per day | 3,128 per day |
| Cardiac care unit | 24,400 per day | 3,128 per day |
| High dependency unit | 13,650 per day | 1,750 per day |
| **Procedures**§ |  |  |
| Total thyroidectomy | 55,000 | 7,051 |
| Partial thyroidectomy | 39,825 | 5,106 |
| RAI | 15,835 | 2,030 |
| Laryngeal examination of vocal cords | 901 | 115 |
| Injection laryngoplasty under local  anesthesia (office based) | 3,869 | 496 |
| **Thyroid drugs¶** |  |  |
| anti-thyroid drugs |  |  |
| Methimazole | 0.52/tablet | 0.067/tablet |
| Propylthiouracil | 0.83/tablet | 0.106/tablet |
| Carbimazole | 0.45/tablet | 0.058/tablet |
| Other drugs |  |  |
| Levothyroxine and Thyroxine(50/100μg) | 0127 or 0.144/tablet | 0.016 or 0.018/tablet |
| Calcium Carbonate (1000mg) | 1.039/tablet | 0.133/tablet |

Note:

† At a fixed exchange rate of 1 US= 7.80HK

‡ Data source: 2017 Hong Kong SAR Government Gazette and Hospital Authority Ordinance (chapter 113): Public charges – non-eligible persons.

§ Data source: 2017 Hong Kong SAR Government Gazette and Hospital Authority Ordinance (chapter 113): Private charges (midpoint value) Charge for operations; Lang BH, Wong CK, Tsang RK, Wong KP, Wong BY. Evaluating the cost-effectiveness of laryngeal examination after elective total thyroidectomy. Ann Surg Oncol. 2014;21(11):3548-3556.

**¶** Data source: Hong Kong SAR Hospital Authority; Keller JL, Lanou A, Barnard ND. The consumer cost of calcium from food and supplements. J Am Diet Assoc. 2002;102(11):1669-1671.

**Supplemental Table 5. Baseline characteristics of graves’ disease patients receiving ATD, RAI or Surgery before multiple imputation and propensity score weighting**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Baseline characteristics** | **Total**  **(N=6385)** | **ATD**  **(N=4784)** | **RAI**  **(N=1274)** | **Surgery**  **(N=327)** | **P-value** |
| Age (year), Mean ± SE | 45.34±16.34 | 44.60±16.62 | 49.24±15.53 | 41.02±12.30 | <0.001\* |
| Age group, n (%) |  |  |  |  | <0.001\* |
| 18-<30 | 1,202 (18.83%) | 990 (20.69%) | 149 (11.70%) | 63 (19.27%) |  |
| 30-<50 | 2,788 (43.66%) | 2,094 (43.77%) | 506 (39.72%) | 188 (57.49%) |  |
| 50-<70 | 1,809 (28.33%) | 1,262 (26.38%) | 478 (37.52%) | 69 (21.10%) |  |
| ≥70 | 586 (9.18%) | 438 (9.16%) | 141 (11.07%) | 7 (2.14%) |  |
| Gender, n (%) |  |  |  |  | <0.001\* |
| Female | 4,604 (72.11%) | 3,551 (74.23%) | 796 (62.48%) | 257 (78.59%) |  |
| Male | 1,781 (27.89%) | 1,233 (25.77%) | 478 (37.52%) | 70 (21.41%) |  |
|  |  |  |  |  |  |
| **Clinical parameter** |  |  |  |  |  |
| Laboratory result, Mean ± SE |  |  |  |  |  |
| TSH, mIU/l | 1.23±6.75 | 0.76±5.09 | 2.14±9.45 | 4.07±11.38 | <0.001\* |
| SBP, mmHg | 131.24±19.60 | 131.00±20.16 | 132.65±18.05 | 128.49±16.88 | 0.097 |
| DBP, mmHg | 73.57±12.10 | 73.13±12.29 | 74.84±11.43 | 74.62±11.69 | 0.017\* |
| TC/ HDL-C ratio | 3.45±1.30 | 3.42±1.30 | 3.51±1.33 | 3.51±1.06 | 0.317 |
| Triglyceride, mmol/l | 1.16±0.76 | 1.14±0.69 | 1.21±0.92 | 1.19±0.77 | 0.172 |
| Fasting glucose, mmol/l | 5.88±2.19 | 5.92±2.32 | 5.82±1.84 | 5.58±1.74 | 0.249 |
| eGFR mL/min/1.73m2 |  |  |  |  | 0.032\* |
| ≥60 | 5,329 (97.62%) | 3,879 (97.71%) | 1,127 (96.82%) | 323 (99.38%) |  |
| <60 | 130 (2.38%) | 91 (2.29%) | 37 (3.18%) | 2 (0.62%) |  |
|  |  |  |  |  |  |
| **Disease status** |  |  |  |  |  |
| Duration of GD (months),  Mean ± SE | 0.53±5.38 | 0.34±4.19 | 1.23±8.51 | 0.48±4.92 | <0.001\* |
| Comorbidities, n (%) |  |  |  |  |  |
| Diabetes mellitus | 437 (6.84%) | 298 (6.23%) | 128 (10.05%) | 11 (3.36%) | <0.001\* |
| Hypertension | 743 (11.64%) | 518 (10.83%) | 205 (16.09%) | 20 (6.12%) | <0.001\* |
| Coronary heart disease | 156 (2.44%) | 110 (2.30%) | 44 (3.45%) | 2 (0.61%) | 0.009\* |
| Heart failure | 360 (5.64%) | 201 (4.20%) | 150 (11.77%) | 9 (2.75%) | <0.001\* |
| Stroke | 156 (2.44%) | 112 (2.34%) | 43 (3.38%) | 1 (0.31%) | 0.012\* |
| Atrial fibrillation | 667 (10.45%) | 388 (8.11%) | 267 (20.96%) | 12 (3.67%) | <0.001\* |
| Psychological disease | 383 (6.00%) | 299 (6.25%) | 70 (5.49%) | 14 (4.28%) | 0.247 |
| CCI, Mean ± SE | 1.58±1.82 | 1.45±1.76 | 2.19±2.03 | 0.94±1.26 | <0.001\* |
| CCI n (%) |  |  |  |  | <0.001\* |
| 1 | 3,830 (59.98%) | 3,013 (62.98%) | 572 (44.90%) | 245 (74.92%) |  |
| 2 | 997 (15.61%) | 728 (15.22%) | 217 (17.03%) | 52 (15.90%) |  |
| 3 | 564 (8.83%) | 380 (7.94%) | 168 (13.19%) | 16 (4.89%) |  |
| 4 or above | 994 (15.57%) | 663 (13.86%) | 317 (24.88%) | 14 (4.28%) |  |
|  |  |  |  |  |  |
| **Treatment morbidity** |  |  |  |  |  |
| Use of other drugs |  |  |  |  |  |
| Beta-blocker, n (%) | 4,254 (66.62%) | 3,088 (64.55%) | 980 (76.92%) | 186 (56.88%) | <0.001\* |
| Calcium\_chanel, n (%) | 904 (14.16%) | 607 (12.69%) | 269 (21.11%) | 28 (8.56%) | <0.001\* |
| Corticosteroids n (%) | 829 (12.98%) | 433 (9.05%) | 345 (27.08%) | 51 (15.60%) | <0.001\* |

Abbreviations: SE = standard error; TSH=thyroid-stimulating hormone; SBP = systolic blood pressure; DBP = diastolic blood pressure; HDL-C = high density lipoprotein - cholesterol; TC = total cholesterol; CCI= Charlson Comorbidity Index; ATD = anti-thyroid drugs; RAI= radioactive Iodine.

\*: significant difference (p<0.05) between groups by univariate linear regression binary logistic or multinomial logistic regression.

**Supplemental Table 6. Sensitivity analyses of all-cause mortality, cardiovascular disease, atrial fibrillation, psychological disease, diabetes and hypertension by groups of ATD, RAI and Surgery**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **RAI vs ATD** | | | **Surgery vs ATD** | | | **Surgery vs RAI** | | |
| **Event** | **HR** | **95%CI** | **P-value** | **HR** | **95%CI** | **P-value** | **HR** | **95%CI** | **P-value** |
| ***Sensitivity analysis - Complete case*** | | | | | | | | | |
| All-cause mortality | 0.663 | (0.59,0.74) | <0.001\* | NA | NA | NA | NA | NA | NA |
| CVD | 0.561 | (0.49,0.64) | <0.001\* | 0.185 | (0.14,0.25) | <0.001\* | 0.388 | (0.31,0.49) | <0.001\* |
| AF | 0.314 | (0.26,0.39) | <0.001\* | NA | NA | NA | NA | NA | NA |
| Psychological disease | 0.88 | (0.78,0.99) | 0.029\* | 0.143 | (0.11,0.20) | <0.001\* | 0.084 | (0.06,0.12) | <0.001\* |
| Diabetes | 1.887 | (1.58,2.25) | <0.001\* | 0.961 | (0.69,1.35) | 0.819 | 0.436 | (0.32,0.60) | <0.001\* |
| Hypertension | 0.949 | (0.83,1.09) | 0.462 | 0.525 | (0.43,0.65) | <0.001\* | 0.473 | (0.38,0.59) | <0.001\* |
| ***Sensitivity analysis - Competing risk*** | | | | | | | | | |
| CVD | 0.798 | (0.682,0.933) | 0.006\* | 0.224 | (0.168,0.298) | <0.001\* | 0.055 | (0.206,0.450) | <0.001\* |
| AF | 0.637 | (0.526,0.770) | <0.001\* | 0.109 | (0.061,0.198) | <0.001\* | 0.080 | (0.150,0.495) | <0.001\* |
| Psychological disease | 0.906 | (0.812,1.011) | 0.079 | 0.291 | (0.241,0.351) | <0.001\* | 0.030 | (0.262,0.382) | <0.001\* |
| Diabetes | 1.097 | (0.927,1.299) | 0.277 | 0.359 | (0.269,0.479) | <0.001\* | 0.039 | (0.212,0.367) | <0.001\* |
| Hypertension | 1.295 | (1.159,1.447) | <0.001\* | 0.679 | (0.387,1.190) | 0.137 | 0.211 | (0.189,1.552) | 0.185 |

Abbreviations: ATD = anti-thyroid drugs; RAI= radioactive Iodine; HR= hazard ratio; CI= confidence Interval; CVD = cardiovascular diseases; AF = atrial fibrillation.

\* Significant at 0.05 level by multivariable Cox proportional hazard regression and competing risk regression. NA: not available.

**Supplemental Table 7. Subgroup analysis of hazard ratios of all-cause mortality, cardiovascular disease, atrial fibrillation, psychological disease, diabetes and hypertension by age, sex，CCI and TSH**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Event** | **RAI vs ATD** | | | **Surgery vs ATD** | | | **Surgery vs RAI** | | |
| **HR** | **95%CI** | **P-value** | **HR** | **95%CI** | **P-value** | **HR** | **95%CI** | **P-value** |
| ***age < 60*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 1.125 | (1.028,1.23) | 0.010\* | 0.563 | (0.474,0.669) | <0.001\* | 0.611 | (0.535,0.698) | <0.001\* |
| Cardiovascular disease | 0.716 | (0.663,0.773) | <0.001\* | 0.327 | (0.291,0.367) | <0.001\* | 0.475 | (0.42,0.538) | <0.001\* |
| Atrial fibrillation | 0.387 | (0.346,0.433) | <0.001\* | 0.061 | (0.046,0.082) | <0.001\* | 0.245 | (0.181,0.332) | <0.001\* |
| Psychological disease | 1.004 | (0.952,1.06) | 0.873 | 0.394 | (0.363,0.428) | <0.001\* | 0.371 | (0.342,0.402) | <0.001\* |
| Diabetes | 1.147 | (1.064,1.236) | <0.001\* | 0.512 | (0.456,0.575) | <0.001\* | 0.463 | (0.414,0.519) | <0.001\* |
| Hypertension | 1.231 | (1.171,1.295) | <0.001\* | 0.782 | (0.725,0.844) | <0.001\* | 0.750 | (0.7,0.804) | <0.001\* |
| ***age >= 60*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 0.729 | (0.68,0.782) | <0.001\* | 0.197 | (0.176,0.221) | <0.001\* | 0.236 | (0.206,0.269) | <0.001\* |
| Cardiovascular disease | 0.856 | (0.786,0.932) | <0.001\* | 0.094 | (0.075,0.117) | <0.001\* | 0.118 | (0.095,0.146) | <0.001\* |
| Atrial fibrillation | 1.066 | (0.961,1.182) | 0.228 | 0.182 | (0.144,0.231) | <0.001\* | 0.206 | (0.162,0.262) | <0.001\* |
| Psychological disease | 0.544 | (0.486,0.609) | <0.001\* | NA | NA | NA | NA | NA | NA |
| Diabetes | 0.856 | (0.747,0.981) | 0.025\* | NA | NA | NA | NA | NA | NA |
| Hypertension | 1.281 | (1.178,1.393) | <0.001\* | 0.381 | (0.334,0.435) | <0.001\* | 0.245 | (0.216,0.279) | <0.001\* |
| ***Male*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 0.632 | (0.572,0.699) | <0.001\* | 0.357 | (0.302,0.422) | <0.001\* | 0.242 | (0.203,0.29) | <0.001\* |
| Cardiovascular disease | 0.543 | (0.488,0.605) | <0.001\* | 0.011 | (0.006,0.021) | <0.001\* | 0.192 | (0.15,0.246) | <0.001\* |
| Atrial fibrillation | 0.296 | (0.252,0.348) | <0.001\* | 0.126 | (0.093,0.171) | <0.001\* | 0.330 | (0.235,0.465) | <0.001\* |
| Psychological disease | 0.842 | (0.755,0.939) | 0.002\* | 0.112 | (0.086,0.147) | <0.001\* | 0.145 | (0.112,0.189) | <0.001\* |
| Diabetes | 1.461 | (1.315,1.623) | <0.001\* | 0.101 | (0.072,0.141) | <0.001\* | 0.062 | (0.046,0.083) | <0.001\* |
| Hypertension | 1.478 | (1.369,1.597) | <0.001\* | 0.520 | (0.458,0.589) | <0.001\* | 0.416 | (0.371,0.467) | <0.001\* |
| ***Female*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 1.121 | (1.051,1.196) | 0.001\* | 0.266 | (0.23,0.307) | <0.001\* | 0.392 | (0.347,0.443) | <0.001\* |
| Cardiovascular disease | 0.920 | (0.862,0.983) | 0.013\* | 0.293 | (0.26,0.329) | <0.001\* | 0.351 | (0.312,0.395) | <0.001\* |
| Atrial fibrillation | 0.868 | (0.795,0.948) | 0.002\* | 0.114 | (0.091,0.143) | <0.001\* | 0.247 | (0.196,0.312) | <0.001\* |
| Psychological disease | 0.907 | (0.862,0.955) | <0.001\* | 0.319 | (0.294,0.347) | <0.001\* | 0.347 | (0.32,0.377) | <0.001\* |
| Diabetes | 0.911 | (0.84,0.988) | 0.025\* | 0.443 | (0.392,0.5) | <0.001\* | 0.436 | (0.387,0.491) | <0.001\* |
| Hypertension | 1.164 | (1.105,1.225) | <0.001\* | 0.766 | (0.709,0.828) | <0.001\* | 0.702 | (0.653,0.754) | <0.001\* |
| ***CCI <4*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 1.106 | (1.018,1.203) | 0.017\* | 0.382 | (0.32,0.457) | <0.001\* | 0.574 | (0.501,0.659) | <0.001\* |
| Cardiovascular disease | 0.833 | (0.781,0.889) | <0.001\* | 0.218 | (0.195,0.244) | <0.001\* | 0.317 | (0.282,0.357) | <0.001\* |
| Atrial fibrillation | 0.508 | (0.464,0.557) | <0.001\* | 0.038 | (0.028,0.051) | <0.001\* | 0.154 | (0.115,0.207) | <0.001\* |
| Psychological disease | 0.993 | (0.943,1.047) | 0.807 | 0.372 | (0.343,0.404) | <0.001\* | 0.361 | (0.333,0.391) | <0.001\* |
| Diabetes | 1.104 | (1.03,1.184) | 0.005\* | 0.309 | (0.271,0.353) | <0.001\* | 0.204 | (0.18,0.231) | <0.001\* |
| Hypertension | 1.285 | (1.227,1.346) | <0.001\* | 0.801 | (0.749,0.857) | <0.001\* | 0.655 | (0.615,0.696) | <0.001\* |
| ***CCI >= 4*** |  |  |  |  |  |  |  |  |  |
| All-cause mortality | 0.838 | (0.78,0.9) | <0.001\* | 0.241 | (0.213,0.272) | <0.001\* | 0.242 | (0.212,0.276) | <0.001\* |
| Cardiovascular disease | 0.580 | (0.517,0.651) | <0.001\* | 0.244 | (0.19,0.312) | <0.001\* | 0.484 | (0.38,0.618) | <0.001\* |
| Atrial fibrillation | 1.000 | (0.873,1.145) | 0.997 | 0.504 | (0.385,0.66) | <0.001\* | 0.451 | (0.346,0.587) | <0.001\* |
| Psychological disease | 0.633 | (0.563,0.712) | <0.001\* | NA | NA | NA | NA | NA | NA |
| Diabetes | 1.074 | (0.907,1.272) | 0.409 | 0.258 | (0.196,0.34) | <0.001\* | 0.589 | (0.43,0.806) | 0.001\* |
| Hypertension | 0.972 | (0.868,1.089) | 0.622 | NA | NA | NA | NA | NA | NA |
| ***Low TSH (<0.5***mIU/l***)*** | |  |  |  |  |  |  |  |  |
| All-cause mortality | 0.668 | (0.597,0.748) | <0.001\* | 0.196 | (0.152,0.253) | <0.001\* | 0.937 | (0.708,1.24) | 0.648 |
| Cardiovascular disease | 0.697 | (0.626,0.776) | <0.001\* | 0.551 | (0.463,0.655) | <0.001\* | 0.528 | (0.437,0.636) | <0.001\* |
| Atrial fibrillation | 0.537 | (0.473,0.608) | <0.001\* | 0.375 | (0.295,0.476) | <0.001\* | 0.762 | (0.574,1.011) | 0.060 |
| Psychological disease | 0.675 | (0.617,0.738) | <0.001\* | 0.124 | (0.099,0.155) | <0.001\* | 0.188 | (0.15,0.236) | <0.001\* |
| Diabetes | 1.152 | (1.028,1.292) | 0.015\* | 1.311 | (1.086,1.582) | 0.005\* | 1.072 | (0.884,1.3) | 0.479 |
| Hypertension | 1.153 | (1.059,1.255) | 0.001\* | 0.163 | (0.122,0.218) | <0.001\* | 0.065 | (0.049,0.087) | <0.001\* |
| ***Normal TSH (0.5~5***mIU/l***)*** | |  |  |  |  |  |  |  |  |
| All-cause mortality | 1.159 | (1.044,1.287) | 0.006\* | 0.443 | (0.346,0.567) | <0.001\* | 0.486 | (0.405,0.582) | <0.001\* |
| Cardiovascular disease | 0.879 | (0.796,0.971) | 0.011\* | 0.224 | (0.189,0.266) | <0.001\* | 0.307 | (0.256,0.368) | <0.001\* |
| Atrial fibrillation | 1.293 | (1.094,1.527) | 0.003\* | 0.174 | (0.129,0.236) | <0.001\* | 0.118 | (0.084,0.166) | <0.001\* |
| Psychological disease | 1.124 | (1.022,1.235) | 0.016\* | 0.145 | (0.12,0.174) | <0.001\* | 0.117 | (0.097,0.14) | <0.001\* |
| Diabetes | 0.825 | (0.723,0.942) | 0.004\* | 0.224 | (0.189,0.267) | <0.001\* | 0.309 | (0.256,0.373) | <0.001\* |
| Hypertension | 0.854 | (0.782,0.934) | 0.001\* | 0.937 | (0.851,1.032) | 0.188 | 1.109 | (0.996,1.235) | 0.059 |
| ***High TSH (>=5***mIU/l***)*** | |  |  |  |  |  |  |  |  |
| All-cause mortality | 1.045 | (0.963,1.134) | 0.291 | 0.159 | (0.137,0.183) | <0.001\* | 0.133 | (0.114,0.154) | <0.001\* |
| Cardiovascular disease | 0.843 | (0.772,0.92) | <0.001\* | 0.055 | (0.043,0.071) | <0.001\* | 0.191 | (0.154,0.236) | <0.001\* |
| Atrial fibrillation | 0.543 | (0.484,0.61) | <0.001\* | NA | NA | NA | NA | NA | NA |
| Psychological disease | 0.959 | (0.892,1.031) | 0.259 | 0.535 | (0.481,0.594) | <0.001\* | 0.527 | (0.477,0.584) | <0.001\* |
| Diabetes | 1.114 | (1.008,1.232) | 0.034\* | 0.107 | (0.079,0.146) | <0.001\* | 0.056 | (0.041,0.075) | <0.001\* |
| Hypertension | 1.654 | (1.547,1.767) | <0.001\* | 0.804 | (0.724,0.893) | <0.001\* | 0.467 | (0.425,0.513) | <0.001\* |

Abbreviations: ATD = anti-thyroid drugs; RAI= radioactive Iodine; HR= hazard ratio; CI= confidence Interval; TSH = thyroid-stimulating hormone; CCI = Charlson Comorbidity Index.

\* Significant at 0.05 level by multivariable Cox proportional hazard regression. NA: not available.

**Supplemental Table 8. E-values and adjusted hazard ratios of observed baseline covariates for outcomes of all-cause mortality, cardiovascular disease, atrial fibrillation, psychological disease, diabetes and hypertension**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **All-cause Mortality** | | | **Cardiovascular disease** | | | **Atrial fibrillation** | | | **Psychological disease** | | | **Diabetes** | | | **Hypertension** | | |
| ***RAI vs ATD*** |  |  |  |  |  |  |  |  | |  |  |  |  |  | |  |  |  |
| HR | 0.94 | (0.89,1.00) |  | 0.78 | (0.74,0.82) |  | 0.65 | (0.60,0.70) | | 0.92 | (0.87,0.96) |  | 1.11 | (1.04,1.18) | | 1.24 | (1.19,1.29) |  |
| E-value | 1.31 |  |  | 1.89 |  |  | 2.45 |  |  | 1.41 |  |  | 1.45 |  |  | 1.31 |  |  |
| E-value CI | 1.08 |  |  | 1.73 |  |  | 2.22 |  |  | 1.26 |  |  | 1.24 |  |  | 1.08 |  |  |
| ***Surgery vs ATD*** |  |  |  |  |  |  |  |  | |  |  |  |  |  | |  |  |  |
| HR | 0.36 | (0.33,0.39) |  | 0.23 | (0.20,0.25) |  | 0.11 | (0.10,0.14) | | 0.29 | (0.27,0.32) |  | 0.30 | (0.27,0.34) | | 0.66 | (0.62,0.70) |  |
| E-value | 4.97 |  |  | 8.32 |  |  | 17.09 |  |  | 6.28 |  |  | 6.05 |  |  | 4.97 |  |  |
| E-value CI | 4.53 |  |  | 7.48 |  |  | 14.21 |  |  | 5.78 |  |  | 5.37 |  |  | 4.53 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Baseline |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| age | 1.05 | (1.05,1.06) | <0.001 | 1.10 | (1.09,1.10) | <0.001 | 1.08 | (1.07,1.08) | <0.001 | 1.01 | (1.01,1.02) | <0.001 | 1.04 | (1.04,1.05) | <0.001 | 1.09 | (1.08,1.09) | <0.001 |
| Male | 1.26 | (1.19,1.33) | <0.001 | 1.10 | (1.04,1.16) | 0.001 | 1.38 | (1.28,1.48) | <0.001 | 0.56 | (0.53,0.59) | <0.001 | 1.43 | (1.34,1.52) | <0.001 | 1.15 | (1.10,1.20) | <0.001 |
| TSH | 1.01 | (1.00,1.01) | <0.001 | 1.00 | (1.00,1.00) | 0.377 | 1.00 | (0.99,1.00) | 0.163 | 1.00 | (1.00,1.00) | 0.963 | 1.01 | (1.01,1.01) | <0.001 | 1.01 | (1.00,1.01) | <0.001 |
| SBP | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | 0.068 | 1.01 | (1.01,1.01) | <0.001 | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | 0.344 | 1.00 | (1.00,1.01) | <0.001 |
| DBP | 1.00 | (1.00,1.00) | 0.492 | 1.00 | (1.00,1.00) | 0.158 | 0.99 | (0.99,1.00) | <0.001 | 1.00 | (1.00,1.00) | 0.154 | 1.01 | (1.01,1.01) | <0.001 | 1.01 | (1.01,1.01) | <0.001 |
| TC/HDL-C ratio | 1.01 | (0.99,1.03) | 0.452 | 1.04 | (1.03,1.06) | <0.001 | 1.00 | (0.97,1.03) | 0.875 | 1.03 | (1.01,1.05) | 0.004 | 1.07 | (1.05,1.09) | <0.001 | 1.06 | (1.05,1.08) | <0.001 |
| Triglyceride | 0.99 | (0.96,1.02) | 0.601 | 0.96 | (0.93,0.99) | 0.003 | 1.01 | (0.97,1.05) | 0.659 | 1.01 | (0.98,1.03) | 0.585 | 0.98 | (0.95,1.01) | 0.243 | 1.14 | (1.12,1.16) | <0.001 |
| FPG | 1.00 | (0.99,1.01) | 0.807 | 1.02 | (1.01,1.04) | <0.001 | 1.05 | (1.04,1.07) | <0.001 | 0.95 | (0.94,0.97) | <0.001 | 1.07 | (1.06,1.08) | <0.001 | 1.02 | (1.01,1.03) | <0.001 |
| eGFR | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | <0.001 | 1.00 | (1.00,1.00) | 0.363 |
| Carbimazole | 0.84 | (0.77,0.90) | <0.001 | 0.89 | (0.83,0.97) | 0.006 | 0.76 | (0.69,0.85) | <0.001 | 0.84 | (0.78,0.90) | <0.001 | 0.65 | (0.60,0.71) | <0.001 | 0.97 | (0.92,1.03) | 0.335 |
| Propylthiouracil | 0.68 | (0.62,0.75) | <0.001 | 1.48 | (1.37,1.61) | <0.001 | 1.23 | (1.10,1.38) | <0.001 | 0.96 | (0.90,1.03) | 0.234 | 0.78 | (0.71,0.86) | <0.001 | 0.89 | (0.84,0.94) | <0.001 |
| Duration of GD | 1.00 | (1.00,1.00) | 0.525 | 0.97 | (0.95,0.98) | <0.001 | 0.90 | (0.87,0.92) | <0.001 | 0.98 | (0.97,0.98) | <0.001 | 0.93 | (0.91,0.95) | <0.001 | 0.99 | (0.99,1.00) | 0.001 |
| CCI† | 1.40 | (1.37,1.42) | <0.001 | 0.65 | (0.63,0.67) | <0.001 | 0.78 | (0.75,0.81) | <0.001 | 0.95 | (0.93,0.98) | 0.001 | 0.92 | (0.89,0.95) | <0.001 | 0.62 | (0.61,0.64) | <0.001 |

Abbreviations: ATD = anti-thyroid drugs; RAI= radioactive Iodine; TSH = thyroid-stimulating hormone; FT4 = free thyroxine; SBP = systolic blood pressure; DBP = diastolic blood pressure; FPG = fasting plasma glucose; HDL-C = high density lipoprotein - cholesterol; TC = total cholesterol; eGFR = estimated glomerular filtration rate; CCI = Charlson Comorbidity Index; HR = hazard ratio; CI = confident interval. † The calculation of Charlson Comorbidity Index does not include Acquired Immune Deficiency Syndrome (AIDS)

**Supplemental Figure 1. Kaplan-Meier curves of coronary heart disease, heart failure and stroke by groups of ATD, RAI and thyroidectomy**

|  |  |
| --- | --- |
| a | b |
| c |  |



Abbreviations: ATD = anti-thyroid drugs; RAI= radioactive Iodine.

**Supplemental Figure 2. 10-years change in thyroid-stimulating hormone (a), free thyroxine (b), serum creatinine (c), and estimated glomerular filtration rate (d) by groups of ATD, RAI and Surgery**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ATD N | 4374 | 3466 | 3773 | 3501 | 3192 | 2872 | 2531 | 2319 | 1972 | 1713 | 1393 | | RAI N | 1235 | 1034 | 1013 | 893 | 795 | 715 | 638 | 561 | 488 | 428 | 341 | | surgery N | 325 | 285 | 282 | 238 | 221 | 212 | 187 | 177 | 148 | 135 | 115 | | P-value | 0.104 | <0.001\* | <0.001\* | 0.010\* | 0.055 | 0.067 | 0.071 | 0.024\* | 0.885 | 0.663 | 0.009\* |   a | |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ATD N | 4533 | 3850 | 3727 | 3216 | 2816 | 2457 | 2079 | 1827 | 1575 | 1295 | 1047 | | RAI N | 1236 | 998 | 872 | 741 | 621 | 539 | 488 | 404 | 352 | 309 | 234 | | surgery N | 325 | 250 | 234 | 194 | 169 | 173 | 142 | 130 | 109 | 93 | 74 | | P-value | <0.001\* | 0.905 | 0.087 | 0.323 | <0.001\* | 0.200 | 0.001\* | 0.016\* | 0.041\* | 0.127 | <0.001\* |   b |
| |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ATD N | 3970 | 2419 | 2618 | 2507 | 2316 | 2079 | 1859 | 1694 | 1459 | 1296 | 1079 | | RAI N | 1164 | 696 | 706 | 667 | 581 | 527 | 474 | 425 | 373 | 338 | 270 | | surgery N | 325 | 117 | 114 | 104 | 107 | 97 | 91 | 81 | 76 | 65 | 60 | | P-value | 0.003\* | 0.186 | 0.086 | 0.270 | 0.033\* | 0.655 | 0.525 | 0.080 | 0.927 | 0.813 | 0.934 |   c | |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | ATD N | 3970 | 2419 | 2618 | 2507 | 2316 | 2079 | 1859 | 1694 | 1459 | 1296 | 1079 | | RAI N | 1164 | 696 | 706 | 667 | 581 | 527 | 474 | 425 | 373 | 338 | 270 | | surgery N | 325 | 117 | 114 | 104 | 107 | 97 | 91 | 81 | 76 | 65 | 60 | | P-value | 0.034\* | 0.029\* | <0.001\* | <0.001\* | <0.001\* | 0.013\* | <0.001\* | 0.141 | 0.519 | 0.059 | 0.082 |   d |

Abbreviations: TSH=thyroid-stimulating hormone; FT4=free thyroxine; eGFR= estimated glomerular filtration rate; ATD = anti-thyroid drugs; RAI= radioactive Iodine. \* Significant at 0.05 level by univariate linear regression.

**Supplemental Figure 3. Frequency of health utilization by groups of ATD, RAI and thyroidectomy as first-line treatments in the index year and subsequent nine years**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | <0.001\* | 0.105 | 0.028\* | 0.044\* | 0.463 | 0.404 | 0.521 | 0.791 | 0.946 | 0.443 |   a | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | <0.001\* | <0.001\* | <0.001\* | <0.001\* | <0.001\* | 0.006\* | 0.002\* | 0.070 | 0.011\* | 0.104 |   b |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | <0.001\* | 0.004\* | 0.004\* | 0.008\* | 0.029\* | 0.116 | 0.167 | 0.905 | 0.129 | 0.560 |   c | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | <0.001\* | <0.001\* | <0.001\* | <0.001\* | 0.001\* | 0.002\* | 0.003\* | 0.014\* | 0.003\* | 0.006\* |   d |
| |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | 0.055 | 0.525 | 0.862 | 0.783 | 0.852 | 0.275 | 0.393 | 0.815 | 0.727 | 0.443 |   e | |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | P-value | <0.001\* | <0.001\* | <0.001\* | <0.001\* | 0.001\* | 0.002\* | 0.003\* | 0.014\* | 0.003\* | 0.006\* |   f |

Abbreviations: GOPC = general outpatient clinic; SOPC = specialist outpatient clinic; A&E = accident & emergency department; A&H =allied health professionals visit; ICU = intensive care unit; CCU = cardiac care unit; HDU = high dependency unit; ATD = anti-thyroid drugs; RAI= radioactive Iodine.