**Supplemental Material**

Tables intended for publication as an online data supplement

**Supplemental Table 1: Codes Used to Identify Atrial Fibrillation or Flutter and Comorbidities, Nationwide Emergency Department Sample, National (Nationwide) Inpatient Sample and National Vital Statistics System, 2006-2014**

|  |  |  |
| --- | --- | --- |
| Outcome | ICD9-CM or CCS\* codes for NIS and NEDS | ICD 10 for NVSS |
| Atrial fibrillation/flutter | 4273 | I48 |
| Atrial flutter | 42732 | - |
| Chronic kidney disease (CKD) | CCS=158 | N18, Y84.1 |
| Dementia or Alzheimer’s | CCS=653 | F01, F03, F04, F05, F07, F09, G30, G31, R54 |
| Diabetes | CCS in (49,50) | E10-E14, R73.0, R73.9, R81, R82.4, Y42.3 |
| HF/VHD/cardiomyopathy | CCS=96, ICD 9 in (428, 425) | I05-I08, I34-I38, I42, I09.1, I09.8, I50, I11.0, I13.0, I13.2, R00.8, R01.0, R01.1, R01.2 |
| Hypertension | CCS in (98,99) | I10, I11.0, I11.9, I12, I13, I15.0, I15.9, I67.4 |
| Ischemic heart disease | CCS in (100, 101) | I20, I21, I22, I24, I25 |
| Stroke | CCS=109 | I60-I64, I69 |

\*CCS = AHRQ Clinical Classification Software

**Supplemental Table 2: Trends in Primary Atrial Fibrillation Events, Nationwide Emergency Department Sample, National (Nationwide) Inpatient Sample and National Vital Statistics System, 2006-2014**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **AF as Principal Diagnosis** | | | | | | | |
| **Emergency Department Visits** | | **Hospitalizations** | | **Deaths** | | **Total Events**  **(mutually exclusive)** | |
| **N** | **Rate per 100,000** | **N** | **Rate per 100,000** | **N** | **Rate per 100,000** | **N** | **Rate per 100,000** |
| **2006\*** | 434322 | 197.6 | 413282 | 188.2 | 11435 | 5.0 | 546049 | 248.6 |
| Men18-44 years | 24763 | 43.3 | 16901 | 29.6 | 16 | 0.0 | 27220 | 47.6 |
| Men 45-64 years | 76286 | 210.1 | 74349 | 204.8 | 262 | 0.7 | 99605 | 274.4 |
| Men 65-74 years | 50466 | 577.2 | 51492 | 589.0 | 471 | 5.4 | 66347 | 758.9 |
| Men 75+ years | 61414 | 876.2 | 63643 | 908.0 | 3257 | 46.5 | 80020 | 1141.6 |
| Women 18-44 years | 6987 | 12.6 | 5230 | 9.4 | 5 | 0.0 | 8082 | 14.5 |
| Women 45-64 years | 45121 | 118.2 | 39592 | 103.7 | 161 | 0.4 | 54412 | 142.5 |
| Women 65-74 years | 52022 | 507.9 | 48877 | 477.2 | 470 | 4.6 | 64492 | 629.7 |
| Women 75+ years | 117264 | 1043.1 | 113199 | 1007.0 | 6793 | 60.4 | 145871 | 1297.6 |
| **2007\*** | 451688 | 201.8 | 406453 | 181.8 | 14489 | 6.3 | 539635 | 241.3 |
| Men18-44 years | 24446 | 42.7 | 16845 | 29.4 | 16 | 0.0 | 26197 | 45.7 |
| Men 45-64 years | 80242 | 215.9 | 73198 | 196.9 | 285 | 0.8 | 98655 | 265.4 |
| Men 65-74 years | 51749 | 576.5 | 51052 | 568.8 | 613 | 6.8 | 64818 | 722.1 |
| Men 75+ years | 64952 | 909.1 | 61202 | 856.6 | 4067 | 56.9 | 79069 | 1106.7 |
| Women 18-44 years | 7101 | 12.8 | 4905 | 8.8 | 12 | 0.0 | 7755 | 14.0 |
| Women 45-64 years | 46092 | 118.0 | 39668 | 101.5 | 182 | 0.5 | 54376 | 139.2 |
| Women 65-74 years | 53558 | 511.5 | 48455 | 462.8 | 581 | 5.5 | 63781 | 609.1 |
| Women 75+ years | 123548 | 1090.1 | 111128 | 980.5 | 8733 | 77.1 | 144983 | 1279.2 |
| **2008\*** | 490566 | 215.1 | 460326 | 202.0 | 15383 | 6.6 | 610932 | 268.1 |
| Men18-44 years | 24998 | 43.5 | 17305 | 30.1 | 20 | 0.0 | 27969 | 48.6 |
| Men 45-64 years | 87626 | 231.5 | 82743 | 218.6 | 331 | 0.9 | 112459 | 297.1 |
| Men 65-74 years | 57068 | 610.4 | 59833 | 640.0 | 641 | 6.9 | 76625 | 819.6 |
| Men 75+ years | 70366 | 968.1 | 68927 | 948.3 | 4312 | 59.3 | 88065 | 1211.6 |
| Women 18-44 years | 7284 | 13.1 | 5049 | 9.1 | 6 | 0.0 | 7904 | 14.2 |
| Women 45-64 years | 49354 | 124.1 | 42731 | 107.4 | 200 | 0.5 | 59293 | 149.1 |
| Women 65-74 years | 58620 | 540.1 | 55511 | 511.4 | 558 | 5.1 | 72799 | 670.7 |
| Women 75+ years | 135251 | 1185.2 | 128227 | 1123.7 | 9315 | 81.6 | 165817 | 1453.1 |
| **2009\*** | 512127 | 220.8 | 472527 | 203.8 | 15432 | 6.5 | 626765 | 270.4 |
| Men18-44 years | 24292 | 42.1 | 17538 | 30.4 | 22 | 0.0 | 27461 | 47.6 |
| Men 45-64 years | 92627 | 240.2 | 85094 | 220.7 | 369 | 1.0 | 115059 | 298.4 |
| Men 65-74 years | 60198 | 622.1 | 62091 | 641.7 | 704 | 7.3 | 79633 | 822.9 |
| Men 75+ years | 72408 | 981.0 | 70018 | 948.6 | 4362 | 59.1 | 90638 | 1227.9 |
| Women 18-44 years | 7254 | 13.0 | 5300 | 9.5 | 8 | 0.0 | 8132 | 14.6 |
| Women 45-64 years | 52495 | 129.5 | 45642 | 112.6 | 200 | 0.5 | 62676 | 154.7 |
| Women 65-74 years | 62024 | 554.1 | 57470 | 513.4 | 640 | 5.7 | 75621 | 675.5 |
| Women 75+ years | 140830 | 1227.7 | 129375 | 1127.8 | 9127 | 79.6 | 167545 | 1460.5 |
| **2010\*** | 531921 | 225.5 | 460373 | 195.2 | 16453 | 6.8 | 618215 | 262.2 |
| Men18-44 years | 25836 | 44.7 | 16348 | 28.3 | 15 | 0.0 | 26984 | 46.7 |
| Men 45-64 years | 97434 | 248.3 | 84693 | 215.9 | 401 | 1.0 | 114816 | 292.6 |
| Men 65-74 years | 64480 | 647.6 | 60343 | 606.1 | 718 | 7.2 | 78739 | 790.8 |
| Men 75+ years | 74139 | 984.6 | 67648 | 898.4 | 4739 | 62.9 | 87965 | 1168.2 |
| Women 18-44 years | 7597 | 13.6 | 5251 | 9.4 | 5 | 0.0 | 8165 | 14.7 |
| Women 45-64 years | 53881 | 130.8 | 44049 | 106.9 | 221 | 0.5 | 61495 | 149.2 |
| Women 65-74 years | 63574 | 554.0 | 55987 | 487.9 | 670 | 5.8 | 74233 | 646.8 |
| Women 75+ years | 144980 | 1252.5 | 126055 | 1089.0 | 9684 | 83.7 | 165818 | 1432.5 |
| **2011\*** | 558734 | 233.3 | 495754 | 207.0 | 17729 | 7.4 | 670705 | 280.0 |
| Men18-44 years | 25679 | 44.9 | 16773 | 29.3 | 26 | 0.0 | 27641 | 48.4 |
| Men 45-64 years | 102476 | 253.7 | 89670 | 222.0 | 428 | 1.1 | 123776 | 306.5 |
| Men 65-74 years | 68197 | 650.8 | 64907 | 619.4 | 791 | 7.5 | 85375 | 814.8 |
| Men 75+ years | 78030 | 1046.4 | 71499 | 958.9 | 5041 | 67.6 | 93903 | 1259.3 |
| Women 18-44 years | 7303 | 13.0 | 5312 | 9.4 | 5 | 0.0 | 8385 | 14.9 |
| Women 45-64 years | 58407 | 137.7 | 47473 | 111.9 | 264 | 0.6 | 67649 | 159.5 |
| Women 65-74 years | 68251 | 568.3 | 61774 | 514.4 | 722 | 6.0 | 82131 | 683.9 |
| Women 75+ years | 150390 | 1316.4 | 138345 | 1210.9 | 10452 | 91.5 | 181844 | 1591.7 |
| **2012\*** | 572484 | 233.9 | 494685 | 201.8 | 19488 | 8.0 | 688885 | 281.3 |
| Men18-44 years | 25354 | 44.0 | 16130 | 28.0 | 27 | 0.0 | 27401 | 47.6 |
| Men 45-64 years | 105885 | 262.0 | 91035 | 225.3 | 502 | 1.2 | 127745 | 316.1 |
| Men 65-74 years | 71240 | 635.4 | 68290 | 609.1 | 880 | 7.8 | 91311 | 814.5 |
| Men 75+ years | 81065 | 1064.9 | 72540 | 952.9 | 5750 | 75.5 | 98883 | 1298.9 |
| Women 18-44 years | 7497 | 13.2 | 5180 | 9.2 | 14 | 0.0 | 8415 | 14.9 |
| Women 45-64 years | 59065 | 139.1 | 47085 | 110.9 | 273 | 0.6 | 68103 | 160.4 |
| Women 65-74 years | 69778 | 545.7 | 61525 | 481.2 | 757 | 5.9 | 84621 | 661.8 |
| Women 75+ years | 152600 | 1323.2 | 132900 | 1152.3 | 11285 | 97.8 | 182407 | 1581.6 |
| **2013\*** | 587904 | 235.2 | 477935 | 190.9 | 20737 | 8.4 | 684168 | 273.5 |
| Men18-44 years | 24640 | 42.5 | 15240 | 26.3 | 33 | 0.1 | 26548 | 45.8 |
| Men 45-64 years | 107502 | 265.3 | 87085 | 214.9 | 540 | 1.3 | 125205 | 309.0 |
| Men 65-74 years | 76677 | 649.9 | 67235 | 569.9 | 1061 | 9.0 | 93847 | 795.5 |
| Men 75+ years | 84455 | 1082.4 | 70005 | 897.2 | 6028 | 77.3 | 98684 | 1264.8 |
| Women 18-44 years | 7510 | 13.2 | 4755 | 8.4 | 8 | 0.01 | 8108 | 14.3 |
| Women 45-64 years | 57327 | 134.7 | 45035 | 105.8 | 322 | 0.8 | 66198 | 155.5 |
| Women 65-74 years | 73583 | 548.3 | 60450 | 450.5 | 907 | 6.8 | 85962 | 640.6 |
| Women 75+ years | 156210 | 1336.8 | 128130 | 1096.5 | 11838 | 101.3 | 179617 | 1537.2 |
| **2014\*** | 599790 | 235.2 | 453060 | 177.3 | 21712 | 8.6 | 684470 | 268.2 |
| Men18-44 years | 25808 | 44.3 | 14245 | 24.5 | 33 | 0.1 | 27229 | 46.7 |
| Men 45-64 years | 112052 | 275.0 | 82540 | 202.6 | 613 | 1.5 | 125221 | 307.3 |
| Men 65-74 years | 78554 | 636.1 | 63015 | 510.3 | 1148 | 9.3 | 92795 | 751.4 |
| Men 75+ years | 84305 | 1053.5 | 66880 | 835.8 | 6487 | 81.1 | 98784 | 1234.4 |
| Women 18-44 years | 7926 | 13.8 | 4730 | 8.3 | 15 | 0.0 | 8469 | 14.8 |
| Women 45-64 years | 59038 | 138.0 | 42420 | 99.1 | 322 | 0.8 | 66602 | 155.6 |
| Women 65-74 years | 75856 | 539.9 | 57080 | 406.3 | 916 | 6.5 | 85914 | 611.5 |
| Women 75+ years | 156251 | 1319.4 | 122150 | 1031.4 | 12178 | 102.8 | 179457 | 1515.3 |

\* Standardized by age to the 2010 U.S. Census Population distribution among adults aged ≥18 years; The crude age-sex specific rates were reported for sub group estimates.

**Supplemental Table 3: Trends in Secondary Atrial Fibrillation Events, Nationwide Emergency Department Sample, National (Nationwide) Inpatient Sample and National Vital Statistics System, 2006-2014**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **AF as Secondary Diagnosis** | | | | | | | |
| **Emergency Department Visits** | | **Hospitalizations** | | **Deaths** | | **Total Events**  **(mutually exclusive)** | |
| **N** | **Rate per 100,000** | **N** | **Rate per 100,000** | **N** | **Rate per 100,000** | **N** | **Rate per 100,000** |
| **2006\*** | 2715733 | 1216.6 | 2921379 | 1312.1 | 78530 | 34.6 | 3280843 | 1473.4 |
| Men18-44 years | 31648 | 55.4 | 24545 | 43.0 | 141 | 0.2 | 36096 | 63.2 |
| Men 45-64 years | 216330 | 595.9 | 243133 | 669.7 | 2380 | 6.6 | 278429 | 766.9 |
| Men 65-74 years | 286185 | 3273.5 | 347261 | 3972.1 | 4860 | 55.6 | 380526 | 4352.6 |
| Men 75+ years | 754085 | 10758.5 | 815608 | 11636.2 | 26058 | 371.8 | 890669 | 12707.1 |
| Women 18-44 years | 16198 | 29.2 | 13290 | 23.9 | 53 | 0.1 | 20326 | 36.6 |
| Women 45-64 years | 130186 | 341.0 | 140850 | 368.9 | 1221 | 3.2 | 164957 | 432.1 |
| Women 65-74 years | 237732 | 2321.1 | 271693 | 2652.7 | 3641 | 35.5 | 305931 | 2986.9 |
| Women 75+ years | 1043369 | 9281.5 | 1065000 | 9473.9 | 40176 | 357.4 | 1203909 | 10709.6 |
| **2007\*** | 2797553 | 1233.3 | 2898110 | 1280.7 | 79099 | 34.4 | 3314325 | 1464.5 |
| Men18-44 years | 31564 | 55.1 | 23915 | 41.7 | 149 | 0.3 | 36082 | 63.0 |
| Men 45-64 years | 230333 | 619.7 | 249039 | 670.1 | 2509 | 6.8 | 291562 | 784.5 |
| Men 65-74 years | 293471 | 3269.5 | 348197 | 3879.2 | 4969 | 55.4 | 386813 | 4309.4 |
| Men 75+ years | 770304 | 10782.1 | 808016 | 11310.0 | 26708 | 373.8 | 896742 | 12551.9 |
| Women 18-44 years | 17204 | 31.0 | 13319 | 24.0 | 47 | 0.1 | 20204 | 36.3 |
| Women 45-64 years | 137442 | 351.8 | 140754 | 360.3 | 1302 | 3.3 | 169407 | 433.6 |
| Women 65-74 years | 241782 | 2309.0 | 265203 | 2532.7 | 3688 | 35.2 | 302793 | 2891.7 |
| Women 75+ years | 1075452 | 9488.6 | 1049665 | 9261.1 | 39727 | 350.5 | 1210722 | 10682.1 |
| **2008\*** | 2931719 | 1270.4 | 2915490 | 1265.4 | 83898 | 35.9 | 3460086 | 1501.8 |
| Men18-44 years | 34116 | 59.3 | 23958 | 41.6 | 132 | 0.2 | 38304 | 66.6 |
| Men 45-64 years | 241228 | 637.4 | 249178 | 658.4 | 2616 | 6.9 | 301400 | 796.4 |
| Men 65-74 years | 308490 | 3299.7 | 351120 | 3755.6 | 5493 | 58.8 | 403953 | 4320.7 |
| Men 75+ years | 816620 | 11234.8 | 813340 | 11189.7 | 28440 | 391.3 | 939470 | 12924.9 |
| Women 18-44 years | 18604 | 33.4 | 12790 | 23.0 | 59 | 0.1 | 21531 | 38.7 |
| Women 45-64 years | 142715 | 358.8 | 138770 | 348.9 | 1401 | 3.5 | 174817 | 439.5 |
| Women 65-74 years | 254640 | 2346.1 | 265320 | 2444.5 | 3818 | 35.2 | 316527 | 2916.3 |
| Women 75+ years | 1115305 | 9773.8 | 1061012 | 9298.0 | 41939 | 367.5 | 1264083 | 11077.6 |
| **2009\*** | 3058629 | 1306.1 | 3043592 | 1301.4 | 84757 | 35.9 | 3652318 | 1561.7 |
| Men18-44 years | 36719 | 63.7 | 25865 | 44.8 | 160 | 0.3 | 41609 | 72.1 |
| Men 45-64 years | 262675 | 681.2 | 274309 | 711.3 | 2911 | 7.5 | 335595 | 870.3 |
| Men 65-74 years | 326204 | 3371.1 | 378153 | 3907.9 | 5615 | 58.0 | 436240 | 4508.2 |
| Men 75+ years | 836689 | 11335.2 | 843600 | 11428.8 | 28801 | 390.2 | 982315 | 13308.1 |
| Women 18-44 years | 20087 | 36.1 | 14316 | 25.7 | 59 | 0.1 | 23922 | 43.0 |
| Women 45-64 years | 154407 | 381.1 | 153250 | 378.2 | 1397 | 3.4 | 192695 | 475.5 |
| Women 65-74 years | 270694 | 2418.1 | 281830 | 2517.6 | 4013 | 35.8 | 339509 | 3032.9 |
| Women 75+ years | 1151153 | 10035.0 | 1072268 | 9347.3 | 41801 | 364.4 | 1300432 | 11336.3 |
| **2010\*** | 3240435 | 1362.0 | 3066391 | 1289.7 | 90877 | 37.9 | 3768566 | 1585.2 |
| Men18-44 years | 40149 | 69.4 | 26079 | 45.1 | 137 | 0.2 | 44966 | 77.7 |
| Men 45-64 years | 291740 | 743.6 | 285668 | 728.1 | 3098 | 7.9 | 358402 | 913.5 |
| Men 65-74 years | 352181 | 3537.3 | 376714 | 3783.7 | 6076 | 61.0 | 443567 | 4455.1 |
| Men 75+ years | 876851 | 11644.7 | 846475 | 11241.3 | 31267 | 415.2 | 1004441 | 13339.2 |
| Women 18-44 years | 22424 | 40.3 | 15023 | 27.0 | 53 | 0.1 | 26745 | 48.0 |
| Women 45-64 years | 172625 | 418.9 | 157700 | 382.7 | 1497 | 3.6 | 207186 | 502.8 |
| Women 65-74 years | 287790 | 2507.7 | 282433 | 2461.0 | 4213 | 36.7 | 346930 | 3023.0 |
| Women 75+ years | 1196676 | 10338.0 | 1076300 | 9298.1 | 44536 | 384.7 | 1336328 | 11544.4 |
| **2011\*** | 3542525 | 1479.6 | 3404302 | 1421.3 | 98515 | 41.2 | 4249535 | 1774.5 |
| Men18-44 years | 43081 | 75.4 | 28622 | 50.1 | 168 | 0.3 | 49851 | 87.2 |
| Men 45-64 years | 320394 | 793.3 | 312968 | 774.9 | 3442 | 8.5 | 402646 | 997.0 |
| Men 65-74 years | 388332 | 3705.9 | 420322 | 4011.2 | 6676 | 63.7 | 503213 | 4802.3 |
| Men 75+ years | 966256 | 12958.3 | 941957 | 12632.4 | 33786 | 453.1 | 1136733 | 15244.5 |
| Women 18-44 years | 26133 | 46.4 | 15772 | 28.0 | 63 | 0.1 | 30143 | 53.5 |
| Women 45-64 years | 191080 | 450.4 | 178249 | 420.2 | 1651 | 3.9 | 237213 | 559.1 |
| Women 65-74 years | 315719 | 2628.9 | 316778 | 2637.7 | 4647 | 38.7 | 394830 | 3287.6 |
| Women 75+ years | 1291529 | 11304.7 | 1189634 | 10412.8 | 48082 | 420.9 | 1494907 | 13084.9 |
| **2012\*** | 3579658 | 1462.9 | 3379780 | 1379.0 | 103543 | 42.5 | 4342423 | 1773.0 |
| Men18-44 years | 45170 | 78.5 | 27930 | 48.5 | 156 | 0.3 | 50797 | 88.2 |
| Men 45-64 years | 341562 | 845.3 | 320280 | 792.6 | 3706 | 9.2 | 423288 | 1047.5 |
| Men 65-74 years | 403889 | 3602.6 | 434615 | 3876.7 | 7460 | 66.5 | 530382 | 4730.9 |
| Men 75+ years | 960803 | 12621.2 | 930930 | 12228.8 | 35950 | 472.2 | 1153558 | 15153.3 |
| Women 18-44 years | 28522 | 50.4 | 15760 | 27.8 | 66 | 0.1 | 32351 | 57.2 |
| Women 45-64 years | 199041 | 468.9 | 177770 | 418.8 | 1806 | 4.3 | 247069 | 582.1 |
| Women 65-74 years | 324190 | 2535.3 | 323385 | 2529.0 | 5051 | 39.5 | 412712 | 3227.6 |
| Women 75+ years | 1276482 | 11068.0 | 1149110 | 9963.6 | 49348 | 427.9 | 1492267 | 12939.1 |
| **2013\*** | 3887764 | 1554.6 | 3443418 | 1373.9 | 111169 | 44.7 | 4533720 | 1810.9 |
| Men18-44 years | 47788 | 82.5 | 28775 | 49.7 | 178 | 0.3 | 53137 | 91.7 |
| Men 45-64 years | 368810 | 910.1 | 333635 | 823.3 | 4125 | 10.2 | 450397 | 1111.4 |
| Men 65-74 years | 456251 | 3867.3 | 457635 | 3879.0 | 8326 | 70.6 | 571037 | 4840.3 |
| Men 75+ years | 1051901 | 13481.9 | 948359 | 12154.9 | 38564 | 494.3 | 1202534 | 15412.6 |
| Women 18-44 years | 30800 | 54.2 | 16585 | 29.2 | 75 | 0.1 | 35379 | 62.2 |
| Women 45-64 years | 215644 | 506.7 | 182870 | 429.7 | 1961 | 4.6 | 259276 | 609.2 |
| Women 65-74 years | 359045 | 2675.6 | 335105 | 2497.2 | 5583 | 41.6 | 438950 | 3271.1 |
| Women 75+ years | 1357525 | 11617.7 | 1140454 | 9760.0 | 52357 | 448.1 | 1523011 | 13033.9 |
| **2014\*** | 3952915 | 1547.2 | 3523726 | 1375.2 | 115719 | 45.5 | 4695997 | 1835.4 |
| Men18-44 years | 50426 | 86.6 | 30310 | 52.0 | 204 | 0.4 | 56693 | 97.3 |
| Men 45-64 years | 395289 | 970.1 | 353130 | 866.6 | 4386 | 10.8 | 482358 | 1183.8 |
| Men 65-74 years | 478219 | 3872.5 | 480500 | 3891.0 | 9107 | 73.7 | 609762 | 4937.7 |
| Men 75+ years | 1056563 | 13203.3 | 966755 | 12081.0 | 40570 | 507.0 | 1242712 | 15529.5 |
| Women 18-44 years | 34052 | 59.5 | 18060 | 31.6 | 83 | 0.1 | 38656 | 67.5 |
| Women 45-64 years | 225117 | 526.1 | 190470 | 445.1 | 2148 | 5.0 | 273874 | 640.0 |
| Women 65-74 years | 369648 | 2631.1 | 346715 | 2467.9 | 5930 | 42.2 | 457865 | 3259.0 |
| Women 75+ years | 1343601 | 11345.4 | 1137786 | 9607.5 | 53291 | 450.0 | 1534077 | 12953.8 |

\* Standardized by age to the 2010 U.S. Census Population distribution among adults aged ≥18 years; The crude age-sex specific rates were reported for sub group estimates.