**SUPPLEMENTAL MATERIALS**

**FIGURE TITLES**

Figure S1. U.S. States and Regions Represented in LEADR

Figure S2. OMOP CDM v4 Data Model used in LEADR

**TABLES**

Table S1. Demographic Distribution, Disease Prevalence, and T2DM Incident Cases for Selected Cohort Encounter Requirements.

| **Total** | **2 Encounters** | | **3 Encounters** | | **4 Encounters** | | **5 Encounters** | | **6 Encounters** | | **7 Encounters** | | **8 Encounters** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| 1,526,245 | 100% | 1,473,339 | 100% | 1,411,864 | 100% | 1,349,890 | 100% | 1,289,689 | 100% | 1,230,409 | 100% | 1,173,674 | 100% |
| **Age (years)** | | | | | | | | | | | | | | |
| 18-29 | 294,156 | 19% | 279,111 | 19% | 261,859 | 19% | 244,268 | 18% | 228,012 | 18% | 212,737 | 17% | 198,239 | 17% |
| 30-49 | 543,550 | 36% | 523,845 | 36% | 500,394 | 35% | 476,594 | 35% | 453,299 | 35% | 430,544 | 35% | 408,909 | 35% |
| 50-69 | 520,342 | 34% | 506,516 | 34% | 490,423 | 35% | 474,384 | 35% | 458,285 | 36% | 441,694 | 36% | 425,675 | 36% |
| 70+ | 168,197 | 11% | 163,867 | 11% | 159,188 | 11% | 154,644 | 11% | 150,093 | 12% | 145,434 | 12% | 140,851 | 12% |
| **Race/Ethnicity** | | | | | | | | | | | | | | |
| Non-Hispanic white | 1,058,598 | 69% | 1,026,825 | 70% | 989,750 | 70% | 950,838 | 70% | 912,044 | 71% | 872,559 | 71% | 834,169 | 71% |
| Non-Hispanic black | 126,442 | 8% | 124,027 | 8% | 119,989 | 8% | 115,555 | 9% | 110,896 | 9% | 106,343 | 9% | 101,991 | 9% |
| Hispanic | 143,951 | 9% | 140,319 | 10% | 135,401 | 10% | 130,167 | 10% | 125,072 | 10% | 119,957 | 10% | 114,945 | 10% |
| Other/ Multi-racial | 13,370 | 1% | 12,699 | 1% | 11,928 | 1% | 11,111 | 1% | 10,322 | 1% | 9,602 | 1% | 8,944 | 1% |
| American Indian/ Alaska Native | 5,647 | <1% | 5,429 | <1% | 5,210 | <1% | 4,942 | <1% | 4,694 | <1% | 4,465 | <1% | 4,267 | <1% |
| Asian | 23,635 | 2% | 23,201 | 2% | 22,541 | 2% | 21,716 | 2% | 20,895 | 2% | 20,033 | 2% | 19,176 | 2% |
| Missing | 154,602 | 10% | 140,839 | 10% | 127,045 | 9% | 115,561 | 9% | 105,766 | 8% | 97,450 | 8% | 90,182 | 8% |
| **Region** | | | | | | | | | | | | | | |
| Northeast | 496,467 | 33% | 492,965 | 33% | 486,585 | 34% | 476,936 | 35% | 465,472 | 36% | 452,346 | 37% | 438,926 | 37% |
| South | 259,543 | 17% | 256,551 | 17% | 249,319 | 18% | 240,387 | 18% | 230,347 | 18% | 219,692 | 18% | 208,630 | 18% |
| West | 191,590 | 13% | 184,528 | 13% | 176,196 | 12% | 167,959 | 12% | 160,156 | 12% | 152,800 | 12% | 145,661 | 12% |
| Rocky | 578,645 | 38% | 539,295 | 37% | 499,764 | 35% | 464,608 | 34% | 433,714 | 34% | 405,571 | 33% | 380,457 | 32% |
| **Body Mass Index (BMI)\*** | | | | | | | | | | | | | | |
| Underweight | 29,548 | 2% | 29,182 | 2% | 28,635 | 2% | 28,025 | 2% | 27,330 | 2% | 26,510 | 2% | 25,749 | 2% |
| Normal | 321,365 | 21% | 315,706 | 21% | 307,461 | 22% | 297,561 | 22% | 287,065 | 22% | 276,096 | 22% | 264,920 | 23% |
| Overweight | 318,339 | 21% | 312,448 | 21% | 304,275 | 22% | 294,696 | 22% | 284,401 | 22% | 273,598 | 22% | 262,609 | 22% |
| Obesity I | 170,733 | 11% | 167,723 | 11% | 163,346 | 12% | 158,431 | 12% | 153,067 | 12% | 147,560 | 12% | 141,963 | 12% |
| Obesity II | 72,764 | 5% | 71,524 | 5% | 69,760 | 5% | 67,632 | 5% | 65,330 | 5% | 62,999 | 5% | 60,685 | 5% |
| Obesity III | 50,701 | 3% | 49,911 | 3% | 48,702 | 3% | 47,327 | 4% | 45,782 | 4% | 44,221 | 4% | 42,701 | 4% |
| Missinga | 562,795 | 37% | 526,845 | 36% | 489,685 | 35% | 456,218 | 34% | 426,714 | 33% | 399,425 | 32% | 375,047 | 32% |

Table S1. Demographic Distribution, Disease Prevalence, and T2DM Incident Cases for Selected Cohort Encounter Requirements (continued)

| **Total** | **2 Encounters** | | **3 Encounters** | | **4 Encounters** | | **5 Encounters** | | **6 Encounters** | | **7 Encounters** | | **8 Encounters** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** | **N** | **%** |
| 1,526,245 | 100% | 1,473,339 | 100% | 1,411,864 | 100% | 1,349,890 | 100% | 1,289,689 | 100% | 1,230,409 | 100% | 1,173,674 | 100% |
| **Hypertension** | | | | | | | | | | | | | | |
| Yes | 348,703 | 23% | 347,255 | 24% | 344,711 | 24% | 341,090 | 25% | 336,486 | 26% | 330,819 | 27% | 324,328 | 28% |
| No | 911,009 | 60% | 875,725 | 59% | 836,739 | 59% | 796,175 | 59% | 755,573 | 59% | 715,034 | 58% | 675,584 | 58% |
| Missinga | 266,533 | 17% | 250,359 | 17% | 230,414 | 16% | 212,625 | 16% | 197,630 | 15% | 184,556 | 15% | 173,762 | 15% |
| **Elevated Lipids** | | | | | | | | | | | | | | |
| Yes | 600,551 | 39% | 595,521 | 40% | 588,606 | 42% | 579,743 | 43% | 569,299 | 44% | 557,427 | 45% | 544,431 | 46% |
| No | 158,591 | 10% | 157,963 | 11% | 156,354 | 11% | 153,852 | 11% | 150,533 | 12% | 146,617 | 12% | 142,300 | 12% |
| Missinga | 767,103 | 50% | 719,855 | 49% | 666,904 | 47% | 616,295 | 46% | 569,857 | 44% | 526,365 | 43% | 486,943 | 41% |
| **Cardiovascular disease (CVD)**b | | | | | | | | | | | | | | |
| Yes | 149,122 | 10% | 148,057 | 10% | 146,562 | 10% | 144,583 | 11% | 142,297 | 11% | 139,664 | 11% | 136,960 | 12% |
| No | 1,377,123 | 90% | 1,325,282 | 90% | 1,265,302 | 90% | 1,205,307 | 89% | 1,147,392 | 89% | 1,090,745 | 89% | 1,036,714 | 88% |
| **T2DM, incident cases** | | | | | | | | | | | | | | |
| Yes | 83,905 | 5% | 83,607 | 6% | 82,922 | 6% | 81,923 | 6% | 80,674 | 6% | 79,229 | 6% | 77,692 | 7% |
| No | 639,846 | 42% | 628,720 | 43% | 615,342 | 44% | 601,490 | 45% | 586,945 | 46% | 571,692 | 46% | 555,954 | 47% |
| Missinga | 802,494 | 53% | 761,012 | 52% | 713,600 | 51% | 666,477 | 49% | 622,070 | 48% | 579,488 | 47% | 540,028 | 46% |

T2DM=type 2 diabetes.

\*Underweight, <18.5 kg/m2; Normal, 18.5 ≤ BMI < 25 kg/m2; Overweight, 25 ≤ BMI < 30 kg/m2; Obesity I, 30 ≤ BMI < 35; Obesity II, 35 ≤ BMI < 40 kg/m2; Obesity III, ≥ 40 kg/m2

aDefined as having no record of a specific diagnosis or a specific medication to treat that condition, or no related lab results/body measurements

bDefined as having a diagnosis for any of the following: chronic ischemic heart disease, coronary arteriosclerosis, angina pectoris, myocardial infarction, congestive heart failure, diastolic heart failure, chronic systolic heart failure, cerebral artery occlusion, transient cerebral ischemia, cerebral infarction, cerebral artery occlusion, atherosclerosis of arteries of the extremities; peripheral vascular disease, abdominal aortic aneurysm without rupture, and aortic aneurysm.

Table S2. Identification of Incident Type 2 Diabetes Mellitus Cases.

|  |  |  |
| --- | --- | --- |
| Identification Method | N | % |
| 1) Diagnosis record | 39,133 | 47 |
| 2) Metformin drug prescription | 1,152 | 1 |
| 3) Other anti-diabetic drug prescriptions | 15,974 | 19 |
| 4) HbA1c value above threshold | 4,157 | 5 |
| 5) FBG value above threshold | 18,344 | 22 |
| 6) Two Random Glucose value ≥ 200 | 1,629 | 2 |
| 7) One Random Glucose value ≥ 250 | 2,335 | 3 |
| 8) One Random Glucose value ≥ 200 & one diabetes diagnosis | 198 | <1 |
| Total Incident Cases | 82,922 | 100 |

FBG=fasting blood glucose; HbA1c=hemoglobin A1c.