**Table 1a Supplemental:** Estimated Numbers and Types of Inpatient Bariatric Surgeries in the US: Overall 1993 to 2016 and Yearly from 1993 to 2004.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **1993 -2016** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** |
| **Primary inpatient bariatric surgery, N** | 1,903,273 | 8,631 | 8,257 | 7,657 | 8,634 | 11,014 | 13,364 | 22,604 | 30,680 | 55,546 | 67,788 | 108,184 | 118,297 |
| **Open gastric bypass, N (%)** | 475,419 (25) | 4,197 (48.6) | 4,975 (60.2) | 5,651 (73.8) | 6,523 (75.5) | 8,917 (81) | 10,655 (79.7) | 20,099 (88.9) | 26,607 (86.7) | 47,363 (85.2) | 61,510 (90.7) | 97,200 (89.8) | 94,842 (80.2) |
| **Laparoscopic gastric bypass, N (%)** | 701,483 (36.9) | 0  | 0  | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 13,221 (11.2) |
| **Open sleeve/VBG, N (%)** | 67,048 (3.5) | 4,228 (49.0) | 3,062 (37.1) | 1,707 (22.3) | 1,739 (20.1) | 1,740 (15.8) | 2,371 (17.7) | 1,990 (8.8) | 2,889 (9.4) | 6,280 (11.3) | 4,220 (6.2) | 9,115 (8.4) | 5,575 (4.7) |
| **Laparoscopic sleeve gastrectomy, N (%)** | 454,628 (23.9) | 0 | 0 | 0 | 0 | 0 | 0  | 0  | 0  | 0  | 0  | 0  | 476(0.4) |
| **Laparoscopic adjustable gastric band, N (%)** | 161,396 (8.5) | 0 | 0  | 0  | 0 | 0  | 0 | 0  | 0  | 0  | 0  | 0  | 1,545 (1.3) |
| **BPD-DS, N (%)** | 43,299 (2.3) | 205 (2.4) | 220 (2.7) | 299 (3.9) | 372 (4.3) | 357 (3.2) | 337 (2.5) | 515 (2.3) | 1,184 (3.9) | 1,903 (3.4) | 2,058 (3) | 1,869 (1.7) | 2,639 (2.2) |

VBG: Vertical banded gastroplasty. BPD-DS: Biliopancreatic diversion-duodenal switch

**Table 1b Supplemental**: Estimated Numbers and Types of Inpatient Bariatric Surgeries in the US: Yearly from 2005 to 2016.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Primary inpatient bariatric surgery, N** | 111,414 | 91,791 | 84,562 | 120,083 | 118,816 | 102,340 | 83,038 | 122,340 | 139,350 | 148,560 | 157,354 | 162,969 |
| **Open gastric bypass, N (%)** | 23,997 (21.5) | 16,338 (17.8) | 9,856 (11.7) | 9,303 (7.7) | 5,813 (4.9) | 6,898 (6.7) | 3,586 (4.3) | 3,330 (2.7) | 2,495 (1.8) | 2,020 (1.4) | 1,940 (1.2) | 1,305(0.8) |
| **Laparoscopic gastric bypass, N (%)** | 67,015 (60.1) | 57,128 (62.2) | 48,044 (56.8) | 70,250 (58.5) | 77,076 (64.9) | 66,391 (64.9) | 51,217 (61.7) | 59,055 (48.2) | 52,500 (37.7) | 48,390 (32.6) | 45,920 (29.2) | 45,275(27.8) |
| **Open sleeve/VBG, N (%)** | 394 (1.3) | 1,342 (1.5) | 2,387 (2.8) | 1,761 (1.5) | 1,730 (1.5) | 2,195 (2.1) | 1,925 (2.3) | 2,125 (1.7) | 1,975 (1.4) | 2,335 (1.6) | 1,880 (1.2) | 1,080(0.7) |
| **Laparoscopic sleeve gastrectomy, N (%)** | 3,432(3.1) | 1,719 (1.9) | 2,893 (3.4) | 2,062 (1.7) | 2,017 (1.7) | 1,36 0 (1.3) | 8,891 (10.7) | 47,620 (38.9) | 75,715 (54.3) | 91,190 (61.4) | 103,495 (65.8) | 113,754(69.8) |
| **Laparoscopic adjustable gastric band, N (%)** | 13,786 (12.3) | 13,292 (14.5) | 19,866 (23.5) | 34,681 (28.9) | 28,361(23.9) | 23,155 (22.6) | 14,035 (16.9) | 6,665 (5.4) | 3,26 5 (2.3) | 1,240 (0.8) | 905 (0.6) | 600(0.4) |
| **BPD-DS, N (%)** | 1,790 (1.6) | 1,972 (2.1) | 1,515 (1.8) | 2,024 (1.7) | 3,819 (3.2) | 2,343 (2.3) | 3,383 (4.1) | 3,545 (2.9) | 3,400 (2.4) | 3,385 (2.3) | 3,210 (2) | 955(0.6) |

VBG: Vertical banded gastroplasty. BPD-DS: Biliopancreatic diversion-duodenal switch

**Table 2a:** Characteristics of the Patient Population Receiving Bariatric Surgery in the US: Overall 1993 to 2016 and Yearly from 1993 to 2003.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Complete data  N (%)** |  **Variables** | **1993 -2016** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** |
| **Age (year)** | 1,903,273(100) | **Mean (SEM)** | 43.9 (0.1) | 38.9(0.5) | 39 (0.5) | 40.3 (0.5) | 39.7 (0.5) | 40.4 (0.5) | 39.8 (0.3) | 41.6 (0.3) | 40.9 (0.3) | 41 (0.2) | 41.6 (0.2) | 42.3 (0.2) |
| **Sex** | 1,898,903(99.8) | **Male, N (%)** | 381,747 (20.1) | 1,317(15.3) | 1,439(17.4) | 1,299(17) | 1,442(16.7) | 1,905(17.3) | 2,463(18.4) | 4,154(18.4) | 4,558(14.9) | 8,884(16) | 10,558(15.6) | 19,129(17.8) |
| **Female, N (%)** | 1,517,156(79.9) | 7,314(85) | 6,818(82.6) | 6,357(83) | 7,193(83) | 9,109 (82.7) | 10,900(81.6) | 18,442(81.6) | 26,102(85.1) | 46,662(84) | 57,231(84.4) | 88,312(82.2) |
| **Race** | 1,632,089(85.8) | **White, N (%)** | 1,157,730(70.9) | 6,048(86) | 5,436(82) | 5,129(81.1) | 5,343(78.1) | 7,057(82.4) | 8,551(81) | 14,108(84.5) | 17,245(77.9) | 29,471(80.5) | 40,869(80.5) | 64,604(77.8) |
| **Black, N (%)** | 232,482 (14.2) | 818(11.6) | 963(14.5) | 846(13.4) | 965 (14.1) | 1,023(12) | 1,241(11.8) | 1,400(8.4) | 2,992(13.5) | 3,555 (9.7) | 5,006(9.9) | 9,152 (11) |
| **Hispanic, N (%)** | 170,164 (10.4) | 95 (1.4) | 171(2.6) | 289(4.6) | 376(5.5) | 320(3.7) | 623(5.9) | 927(5.5) | 1,133(5.1) | 2,598(7.1) | 3,412(6.7) | 6,229(7.5) |
| **Other, N (%)** | 71,713(4.4) | 68(1) | 63(1) | 58(1) | 160(2.3) | 161(1.9) | 146(1.4) | 264(1.6) | 757(3.4) | 977(2.7) | 1,485(2.9) | 3,055(3.7) |
| **Insurance** | 1,896,557(99.6) | **Private, N (%)** | 1,340,693 (70.7) | 6,726 (78.1) | 5,957(72.4) | 5,499(71.8) | 6,088(70.5) | 7,423(67.6) | 10,042(75.5) | 16,946(76) | 24,633(80.4) | 45,782(83.3) | 55,934(82.6) | 88,687(82.1) |
| **Medicare, N (%)** | 230,340(12.2) | 435(5) | 648(7.9) | 868(11.3) | 967(11.2) | 1,275(11.6) | 1,199(9) | 1,993(8.9) | 2,072(6.8) | 3,214(5.8) | 4,154(6.1) | 7,308(6.8) |
| **Medicaid, N (%)** | 178,230 (9.4) | 700(8.1) | 877(10.7) | 735(9.6) | 886(10.3) | 962(8.8) | 933(7) | 1,486(6.7) | 2,151(7) | 2,676(4.9) | 3,356(5) | 5,618(5.2) |
| **Self-Pay, N (%)** | 83,359(4.4) | 248(2.9) | 172(2.1) | 233(3) | 319(3.7) | 783(7.1) | 698(5.2) | 1,451(6.5) | 1,111(3.6) | 1,828(3.3) | 2,417(3.6) | 3,296(3.0) |
| **Other, N (%)** | 63,936(3.4) | 499(5.8) | 576(7) | 317(4.1) | 370(4.3) | 529(4.8) | 420(3.2) | 408(1.8) | 654(2.1) | 1,493(2.7) | 1,861(2.8) | 3,064(2.8) |
| **Obesity-related Comorbidities** | 1,903,273(100)\* | **Hypertension, N (%)** | 1,005,779(52.9) | 2,422(28.1) | 2,413(29.2) | 2,599(34) | 3,160(36.6) | 3,875(35.2) | 4,836(36.2) | 9,030(40) | 11,664(38) | 21,070(37.9) | 30,235(44.6) | 50,591(46.8) |
| **Type-2 Diabetes, N (%)** | 555,725(29.2) | 877(10.2) | 1,007(12.2) | 1,109(14.5) | 1,349(15.6) | 1,696(15.4) | 1,993(14.9) | 4,082(18.1) | 5,648(18.4) | 10,418(18.8) | 14,739(21.7) | 26,740(24.7) |
| **Obstructive sleep apnea, N (%)** | 742,634(39) | 693(8) | 993(12) | 1,137(14.8) | 1,460(16.9) | 2,384(21.6) | 2,514(18.8) | 6,238(27.6) | 6,892(22.5) | 13,814(24.9) | 17,969(26.5) | 32,910(30.4) |

**Table 2b:** Characteristics of the Patient Population Receiving Bariatric Surgery in the US: Yearly from 2004 to 2016.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  **Variables** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Age (year)** | **Mean (SEM)** | 42.6 (0.2) | 42.9 (0.2) | 43.5 (0.2) | 43.8 (0.2) | 45(0.2) | 45.5 (0.3) | 44.9 (0.2) | 45.2 (0.3) | 44.9 (0.1) | 44.9 (0.1) | 45.2 (0.1) | 45(0.1) | 44.4 (0.1) |
| **Sex** | **Male, N (%)** | 20,533(17.5) | 20,315(18.4) | 17,956(19.6) | 16,846(20) | 24,903(20.8) | 26,365(22.2) | 21,561(21.1) | 18,694(22.5) | 26,975(22.1) | 30,345(21.8) | 32,910(22.1) | 34,041(21.6) | 33,155(20.4) |
| **Female, N (%)** | 96,982(82.5) | 89,952(81.6) | 73,575(80.4) | 67,321(80) | 94,852(79.2) | 92,223(77.8) | 80,576(78.9) | 64,263(77.5) | 95,350(78) | 109,000(78.2) | 115,650(77.9) | 123,298(78.4) | 129,674(79.6) |
| **Race** | **White, N (%)** | 72,435(78.4) | 63,962(75.9) | 53,147(74.9) | 44,739(71.7) | 77,903(74.3) | 70,068(70.9) | 65,548(70.5) | 52,141(69.8) | 76,850(66.1) | 87,925(66.5) | 93,035(65.9) | 96,187(64.3) | 99,929(63.9) |
| **Black, N (%)** | 1,094(11.8) | 9,093(10.8) | 8,658(12.2) | 7,925(12.7) | 12,906(12.3) | 12,747(12.9) | 15,576(16.8) | 11,011(14.7) | 17,905(15.4) | 21,270(16) | 23,160(16.4) | 25,626(17.1) | 27,740(17.7) |
| **Hispanic, N (%)** | 7,176(7.8) | 7,747(9.2) | 6,904(9.7) | 5,601(9) | 7,909(7.5) | 10,389(10.5) | 7,750(8.3) | 9,434(12.6) | 14,810(12.7) | 16,665(12.6) | 18,200(12.9) | 20,016(13.4) | 21,390(13.7) |
| **Other, N (%)** | 1,831(2) | 3,483(4.1) | 2,246(3.2) | 4,104(6.6) | 6,185(6.0) | 5,565(5.6) | 4,066(4.4) | 2,094(2.8) | 6,675(5.7) | 6,385(4.8) | 6,860(4.9) | 7,750(5.2) | 7,275(4.7) |
| **Insurance** | **Private, N (%)** | 92,251(78) | 84,497(76.1) | 65,544(72.2) | 61,120(72.8) | 88,936(74.2) | 82,943(69.9) | 69,385(67.8) | 51,614(62.3) | 81,870(67.7) | 93,585(67.3) | 96,900(65.4) | 97,552(62.1) | 100,779(62) |
| **Medicare, N (%)** | 9,113(7.7) | 9,224(8.3) | 7,931(8.7) | 6,988(8.3) | 13,013(10.9) | 18,489(15.6) | 15,389(15) | 14,808(17.9) | 17,550(14.5) | 21,885(15.7) | 24,110(16.3) | 24,641(15.7) | 23,065(14.2) |
| **Medicaid, N (%)** | 6,531(5.5) | 6,560(5.9) | 6,267(6.9) | 5,513(6.6) | 7,015(5.9) | 8,083(6.8) | 10,292(10.1) | 9,898(11.9) | 12,930(10.7) | 14,390(10.3) | 18,020(12.2) | 24,311(15.5) | 28,040(17.2) |
| **Self-Pay, N (%)** | 6,419(5.4) | 5,776(5.2) | 6,903(7.6) | 6,450(7.7) | 6,371(5.3) | 5,363(4.5) | 3,100(3) | 2,801(3.4) | 4,730(3.9) | 5,095(3.7) | 5,615(3.8) | 6,175(3.9) | 6,005(3.7) |
| **Other, N (%)** | 3,845(3.2) | 4,968(4.5) | 4,126(4.6) | 3,910(4.7) | 4,484(3.7) | 3,800(3.2) | 4,141(4) | 3,752(4.5) | 3,945(3.3) | 4,160(3) | 3,590(2.4) | 4,310(2.8) | 4,715(3) |
| **Obesity-related Comorbidities** | **Hypertension, N (%)** | 61,549(52) | 56,540(50.8) | 48,654(53) | 45,361 (53.6) | 67,556(56.3) | 70,832(59.6) | 60,014(58.6) | 48,722(58.7) | 70,375(57.5) | 78,460(56.3) | 83,795(56.4) | 85,712(54.5) | 86,314(53) |
| **Type 2 Diabetes, N (%)** | 32,605(27.6) | 31,210(28) | 27,177(29.6) | 25,419(30.1) | 39,861(33.2) | 41,789(35.2) | 34,620(33.8) | 28,925(34.8) | 40,415(33) | 44,190(31.7) | 46,945(31.6) | 46,836(29.8) | 46,075(28.3) |
| **Obstructive sleep apnea, N (%)** | 37,913(32) | 36,617(32.9) | 34,520(37.6) | 32,118(38) | 49,899(42) | 52,938(44.5) | 46,066(41.5) | 38,633(46.5) | 55,290(45.2) | 62,380(44.8) | 67,625(45.5) | 69,367(44.1) | 72,264(44.3) |

**Table 3a:** Characteristics of the Hospitals Where Inpatient Bariatric Surgery Was Performed in the US: Overall 1993 to 2016 and Yearly from 1993 to 2003.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Complete data  N (%)** |  **Variables** | **1993 -2016** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** |
| **Hospital location and teaching status** | 1,898,950(99.8) | **Urban teaching,** **N (%)** | 1,105,026(58.2) | 1,982(23) | 2,598(31.5) | 3,230(42.2) | 4,631(53.6) | 6,432(58.4) | 6,602(49.4) | 14,185(62.8) | 20,174(65.8) | 26,367(47.5) | 39,310(58) | 54,083(50) |
| **Urban nonteaching,** **N (%)** | 722,764(38) | 6,489(75.2) | 5,415(65.6) | 4,158(54.3) | 3,671(42.5) | 4,256(38.6) | 6,253(46.8) | 7,423(32.8) | 9,800(31.9) | 27,725(49.9) | 24,453(36.1) | 46,904(43.4) |
| **Rural,** **N (%)** | 71,159(3.8) | 160(1.9) | 243(3) | 269(3.5) | 332(3.9) | 326(3) | 505(3.8) | 997(4.4) | 706(2.3) | 1,455(2.6) | 4,024(5.9) | 7,196(6.7) |
| **Hospital size** | 1,898,950(99.8) | **Large hospital,** **N (%)** | 1,054,254(55.5) | 4,609(53.4) | 4,441(53.8) | 4,412(57.6) | 4,353(50.4) | 4,767(43.3) | 7,180(53.8) | 12,737(56.4) | 14,767(48.1) | 35,785(64.4) | 45,671(67.4) | 65,666(60.7) |
| **Medium hospital,** **N (%)** | 542,158(28.6) | 2,522(29.2) | 2,240(27.1) | 2,751(35.9) | 3,197(37) | 4,034(36.6) | 3,712(27.8) | 8,213(36.3) | 8,338(27.2) | 10,291(18.5) | 15,876(23.4) | 22,826(21.1) |
| **Small hospital,** **N (%)** | 302,537(15.9) | 1,500(17.4) | 1,576(19.1) | 494(6.5) | 1,085(12.6) | 2,213(20.1) | 2,466(18.5) | 1,655(7.3) | 7,575(24.7) | 9,470(17.1) | 6,241(9.2) | 19,691(18.2) |
| **Hospital region of the country** | 1,903,273(100) | **South,** **N (%)** | 633,946(33.3) | 3,238(37.5) | 3,502(42.4) | 3,696(48.3) | 3,338(38.6) | 3,248(29.5) | 3,815(28.6) | 6,726(29.8) | 11,500(37.5) | 14,488(26.1) | 19,339(28.5) | 38,762(35.8) |
| **Northeast,** **N (%)** | 493,305(25.9) | 691(8) | 668(8.1) | 1,414(18.5) | 2,057(23.8) | 3,290(29.9) | 2,723(20.4) | 3,307(14.6) | 9,455(30.8) | 12,811(23.1) | 20,039(29.6) | 27,835(25.7) |
| **West,** **N (%)** | 399,443(21) | 2,369(27.4) | 1,736(21) | 1,689(22.1) | 2,300(26.6) | 3,159(28.7) | 4,150(31.1) | 8,529(37.7) | 5,429(17.7) | 14,041(25.3) | 16,177(23.9) | 21,091(19.5) |
| **Midwest,** **N (%)** | 376,581(19.8) | 2,333(27) | 2,351(28.5) | 858(11.2) | 940(10.9) | 1,317(12) | 2,676(20) | 4,043(17.9) | 4,297(14) | 14,206(25.6) | 12,234(18.1) | 20,495(18.9) |

**Table 3b:** Characteristics of the Hospitals Where Inpatient Bariatric Surgery Was Performed in the US*:* Yearly from 2004 to 2016.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  **Variables** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Hospital location and teaching status** | **Urban teaching,** **N (%)** | 61,253(51.8) | 60,804(54.6) | 51,597(56.2) | 43,497(51.4) | 60,046(50.0) | 54,707(46.2) | 49,386(49.9) | 48,000(58.1) | 70,870(57.9) | 82,610(59.3) | 109,480 (73.7) | 115,068(73.1) | 118,114 (72.5) |
| **Urban nonteaching,** **N (%)** | 51,413(43.5) | 48,343(43.4) | 37,635(41) | 38,104(45.1) | 56,109(46.7) | 58,263(49.3) | 42,687(43.1) | 31,947(38.7) | 47,625(38.9) | 52,200(37.5) | 34,715(23.4) | 37,266(23.7) | 39,910(24.5) |
| **Rural,** **N (%)** | 5,631(4.8) | 2,268(2) | 2,559(2.8) | 2,961(3.5) | 3,928(3.3) | 5,316(4.5) | 6,930(7) | 2,639(3.2) | 3,845(3.1) | 4,540(3.3) | 4,365(2.9) | 5,020(3.2) | 4,945(3) |
| **Hospital size** | **Large hospital,** **N (%)** | 77,482(65.5) | 66,428(59.6) | 56,281(61.3) | 53,558(63.3) | 72,435(60.3) | 63,668(53.8) | 55,077(55.6) | 45,236(54.8) | 64,545(52.8) | 74,230(53.3) | 70,060(47.2) | 73,702(46.8) | 77,164(47.4) |
| **Medium hospital,** **N (%)** | 31,439(26.6) | 29,339(26.3) | 23,628(25.7) | 18,286(21.6) | 38,002(31.6) | 37,423(31.6) | 29,560(29.9) | 21,480(26) | 36,740(30) | 40,785(29.3) | 45,805(30.8) | 52,546(33.4) | 53,125(32.6) |
| **Small hospital,** **N (%)** | 9,376(7.9) | 15,647(14) | 11,881(12.9) | 12,718(15) | 9,646(8) | 17,196(14.5) | 14,367(14.5) | 15,869 (19.2) | 21,055(17.2) | 24,335(17.5) | 32,695(22) | 31,106(19.8) | 32,680(20.1) |
| **Hospital region of the country** | **South,** **N (%)** | 38,917(32.9) | 31,629(28.4) | 27,259(29.7) | 27,509(32.5) | 34,606(28.8) | 35,840(30.2) | 34,301(33.5) | 28,008(33.7) | 44,515(36.4) | 52,500(37.7) | 54,390(36.6) | 55,786(35.5) | 57,034(35) |
| **Northeast,** **N (%)** | 30,022(25.4) | 3,247(28.9) | 25,925(28.2) | 21,728(25.7) | 32,836(27.3) | 23,971(20.2) | 25,912(25.3) | 21,038 (25.3) | 30,360(24.8) | 36,395(26.1) | 39,700(26.7) | 43,201(27.4) | 45,790 (28.1) |
| **West,** **N (%)** | 24,976(21.1) | 28,632(25.7) | 22,221(24.2) | 18,103(21.4) | 32,678(27.2) | 25,080(21.1) | 15,795(15.4) | 16,302(19.6) | 24,015(19.6) | 24,745(17.8) | 27,155(18.3) | 29,026(18.4) | 30,045(18.4) |
| **Midwest,** **N (%)** | 24,381(20.6) | 19,005(17.1) | 16,386(17.9) | 17,222(20.4) | 19,974(16.6) | 33,925(28.6) | 26,332(25.7) | 17,690(21.3) | 23,450(19.2) | 25,710(18.4) | 27,315(18.4) | 29,341(18.6) | 30,100(18.5) |

**Table 4a.** Estimated Complications, Deaths, and Hospital Length of Stay during Admissions for Bariatric Surgery in the US: Overall 1993 to 2016 and Yearly from 1993 to 2004.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  **Variables** | **1993 -2016** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** | **1999** | **2000** | **2001** | **2002** | **2003** | **2004** |
| **Complications\*** | **Any complication****N (%)** | 91,404(4.8) | 783(9.1) | 822(10) | 795(10.4) | 878(10.2) | 1,227(11.1) | 1,560(11.7) | 2,250(10) | 2,706(8.9) | 5,327(9.6) | 5,684(8.4) | 7,566(7) | 6,770(5.8) |
| **Gastrointestinal** **N (%)** | 28,230(1.5) | 415(4.8) | 485(5.9) | 469(6.1) | 489(5.7) | 570(5.2) | 772(5.8) | 973(4.3) | 1,218(4) | 2,390 (4.3) | 2,783(4.1) | 2,311(2.1) | 1,824(1.5) |
| **Surgical****N (%)** | 22,126(1.1) | 197(2.3) | 184(2.2) | 203(2.7) | 214(2.5) | 242(2.2) | 363(2.7) | 683(3) | 668(2.2) | 1225(2.2) | 1239(1.8) | 1949(1.8) | 2100(1.8) |
| **Bleeding****N (%)** | 19,969(1) | 0 | 0 | 0 | 9(0.1) | 237(2.2) | 82(0.6) | 267(1.2) | 343(1.1) | 780(1.4) | 820(1.2) | 1,652(1.5) | 1,476(1.3) |
| **CV/thromboembolic** **N (%)** | 17,343(0.9) | 208(2.4) | 149(1.8) | 138(1.8) | 154(1.8) | 200(1.8) | 273(2) | 404(1.8) | 470(1.5) | 881(1.6) | 1,022(1.5) | 1,636(1.5) | 1,352(1.1) |
| **Infectious****N (%)** | 12,981(0.7) | 51(0.6) | 47(0.6) | 56(0.7) | 105(1.2) | 211(1.9) | 238(1.8) | 455(2) | 473(1.5) | 863(1.6) | 854(1.3) | 1,080(1) | 1,046(0.9) |
| **Other****N (%)** | 18,439(1) | 24(0.3) | 92 (1.1) | 99(1.3) | 108(1.3) | 198(1.8) | 238(1.8) | 308(1.4) | 525(1.7) | 964(1.7) | 1,026(1.5) | 1,571(1.5) | 1,136(1) |
| **Deaths\*****N (%)** | 2,966(0.2) | 52(0.6) | 22(0.3) | 46(0.6) | 64(0.7) | 61(0.6) | 131(1) | 151(0.7) | 158(0.5) | 231(0.4) | 224(0.3) | 230(0.2) | 231(0.2) |
| **Length of Stay (days)\*****N (SEM)** | 2.6(0.03) | 6.2(0.3) | 6.3(0.4) | 5.9(0.3) | 5.3(0.2) | 5.3(0.3) | 5.2(0.3) | 4.6(0.3) | 4.3(0.3) | 4(0.2) | 3.8(0.1) | 3.5(0.1) | 3.1(0.1) |

Abbreviations: CV, cardiovascular.

\*Complications, death, and length of stay data were available for 100% of the admissions.

**Table 4b.** Estimated Complications and Mortality Rates during Admissions for Bariatric Surgery in the US: Yearly from 2005 to 2016.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  **Variables** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Complications\*** | **Any complication****N (%)** | 6,344(5.7) | 5,422(5.9) | 4,719(5.6) | 5,220(4.4) | 5,969(5) | 5,168(5.1) | 3,939(4.7) | 3,955(3.2) | 4,230(3.0) | 4,165(2.8) | 3,575(2.3) | 2,330(1.4) |
| **Gastrointestinal****N (%)** | 1,756(1.6) | 1,624(1.8) | 1,496(1.8) | 1,759(1.5) | 2,158(1.9) | 1,912( 1.9) | 1,257(1.6) | 305( 0.3) | 285(0.2) | 325( 0.2) | 315(0.2) | 340( 0.2) |
| **Surgical complications****N (%)** | 1731(1.6) | 1532(1.7) | 1278(1.5) | 1186(1) | 1232(1) | 1092(1.1) | 793(1) | 875(0.1) | 855(0.6) | 765(0.5) | 790(0.5) | 730(0.5) |
| **Bleeding****N (%)** | 1,866(1.7) | 1,257(1.4) | 1,160(1.4) | 1,292(1.1) | 1,466(1.2) | 1,265(1.2) | 911(1.1) | 1,125(0.9) | 1,280(0.9) | 1,115(0.8) | 895(0.6) | 670(0.4) |
| **Cardiovascular/thromboembolic****N (%)** | 1,103(1) | 950(1) | 802(1) | 870(0.7) | 1,129(1) | 907(0.9) | 736(0.9) | 905(0.7) | 905(0.7) | 930(0.6) | 710(0.5) | 510(0.3) |
| **Infection/abscess complications****N (%)** | 760(0.7) | 654(0.7) | 590(0.7) | 616(0.5) | 588(0.5) | 572(0.6) | 644(0.8) | 780(0.6) | 730(0.5) | 615(0.4) | 635(0.4) | 320(0.2) |
| **Other complications****N (%)** | 1,095(1) | 947(1) | 890(1) | 1,087(0.9) | 1,181(1) | 927(0.9) | 944(1.1) | 1,045(0.9) | 927(1) | 1,610(1.1) | 1,075(0.7) | NA |
| **Deaths\*****N (%)** | 178(0.2) | 140(0.2) | 108(0.1) | 101(0.1) | 127(0.1) | 111(0.1) | 98(0.1) | 145(0.1) | 80(0.1) | 95(0.1) | 120(0.1) | 60(0.04) |
| **Length of Stay (days)\*****N (SEM)** | 2.7(0.1) | 2.6(0.1) | 2.4(0.1) | 2.2(0.1) | 2.2(0.1) | 2.2(0.1) | 2.4(0.1) | 2.3(0.03) | 2.2(0.03) | 2.1(0.04) | 2(0.1) | 1.9(0.1) |

\*Complications and mortality data were available for 100% of the admissions.

**Figure 3.** Estimated Number of Adults Possibly Eligible for Bariatric Surgery and Estimated Utilization of Surgery in the Eligible Population in the US from 1993 to 2016