

**eTable 1.** Prefecture-level characteristics

| Prefecture | Population, n | Recipients of public assistance per 1,000 population, n | Treated patients with mental disorders per 1,000 population, n | Visits for psychiatric nursing care at home per 100,000 population, n | Psychiatric beds per 100,000 population, n | Average length of stay in psychiatric beds, days |
|------------|---------------|---|--|---|--|--|
| Japan      | 127,094,745   | 16.7  | 30.9   | 102.3   | 263.3                                      | 269.9  |
| Hokkaido   | 5,381,733     | 30.9  | 31.8   | 283.6   | 376.0                                      | 261.0  |
| Aomori     | 1,308,265     | 23.0  | 36.7   | 166.3   | 344.4                                      | 233.8  |
| Iwate      | 1,279,594     | 10.8  | 25.0   | 106.4   | 343.7                                      | 262.5  |
| Miyagi     | 2,333,899     | 11.9  | 39.0   | 74.3  | 265.9                                      | 288.7  |
| Akita      | 1,023,119     | 14.8  | 31.3   | 51.7  | 401.3                                      | 269.2  |
| Yamagata   | 1,123,891     | 6.6   | 37.4   | 89.7  | 321.7                                      | 234.1  |
| Fukushima  | 1,914,039     | 8.6   | 35.0   | 88.9  | 336.3                                      | 314.7  |
| Ibaraki    | 2,916,976     | 8.9   | 35.0   | 46.4  | 253.0                                      | 321.8  |
| Tochigi    | 1,974,255     | 10.7  | 21.3   | 108.4   | 257.1                                      | 348.9  |
| Gunma      | 1,973,115     | 7.4   | 27.9   | 69.6  | 258.2                                      | 322.5  |
| Saitama    | 7,266,534     | 13.1  | 22.3   | 48.2  | 195.5                                      | 271.6  |
| Chiba      | 6,222,666     | 13.1  | 21.1   | 49.0  | 203.7                                      | 312.3  |
| Tokyo      | 13,515,271    | 21.5  | 40.3   | 57.6  | 164.5                                      | 193.1  |
| Kanagawa   | 9,126,214     | 17.0  | 27.9   | 63.4  | 152.1                                      | 229.3  |
| Niigata    | 2,304,264     | 9.0   | 25.2   | 74.1  | 290.3                                      | 325.3  |
| Toyama     | 1,066,328     | 3.2   | 20.6   | 152.5   | 301.9                                      | 292.9  |
| Ishikawa   | 1,154,008     | 6.4   | 24.3   | 113.4   | 329.3                                      | 274.2  |
| Fukui      | 786,740       | 5.1   | 20.3   | 88.7  | 293.6                                      | 243.9  |
| Yamanashi  | 834,930       | 8.0   | 34.7   | 109.2   | 280.1                                      | 254.2  |
| Nagano     | 2,098,804     | 5.3   | 41.5   | 53.4  | 231.0                                      | 222.1  |
| Gifu       | 2,031,903     | 5.8   | 33.5   | 74.9  | 199.3                                      | 256.6  |
| Shizuoka   | 3,700,305     | 8.1   | 28.9   | 57.9  | 183.1                                      | 266.9  |
| Aichi      | 7,483,128     | 10.4  | 29.8   | 76.2  | 169.9                                      | 250.0  |
| Mie        | 1,815,865     | 9.4   | 25.9   | 123.3   | 261.6                                      | 310.5  |
| Shiga      | 1,412,916     | 8.1   | 26.2   | 35.7  | 167.7                                      | 251.3  |
| Kyoto      | 2,610,353     | 23.1  | 29.5   | 88.8  | 241.5                                      | 255.0  |
| Osaka      | 8,839,469     | 33.3  | 31.7   | 81.4  | 214.2                                      | 228.9  |
| Hyogo      | 5,534,800     | 19.2  | 24.2   | 43.9  | 211.1                                      | 264.2  |
| Nara       | 1,364,316     | 15.0  | 24.9   | 55.9  | 213.1                                      | 251.4  |
| Wakayama   | 963,579       | 15.6  | 29.1   | 221.1   | 220.0                                      | 306.8  |
| Tottori    | 573,441       | 13.1  | 40.1   | 209.8   | 338.8                                      | 273.4  |
| Shimane    | 694,352       | 8.7   | 41.8   | 132.1   | 332.6                                      | 244.6  |
| Okayama    | 1,921,525     | 13.3  | 42.2   | 62.4  | 287.9                                      | 227.2  |
| Hiroshima  | 2,843,990     | 16.4  | 30.2   | 210.0   | 316.2                                      | 289.9  |
| Yamaguchi  | 1,404,729     | 11.6  | 27.1   | 288.4   | 425.3                                      | 395.3  |
| Tokushima  | 755,733       | 18.9  | 49.0   | 162.6   | 512.8                                      | 355.2  |
| Kagawa     | 976,263       | 11.3  | 42.0   | 110.4   | 352.6                                      | 312.1  |
| Ehime      | 1,385,262     | 15.9  | 51.3   | 192.2   | 346.7                                      | 313.4  |
| Kochi      | 728,276       | 27.8  | 41.2   | 81.8  | 503.1                                      | 231.2  |
| Fukuoka    | 5,101,556     | 25.4  | 27.2   | 139.9   | 417.8                                      | 296.4  |
| Saga       | 832,832       | 9.5   | 30.0   | 254.7   | 510.0                                      | 298.0  |
| Nagasaki   | 1,377,187     | 21.9  | 37.8   | 146.2   | 578.0                                      | 354.3  |
| Kumamoto   | 1,786,170     | 14.9  | 32.5   | 165.8   | 500.1                                      | 268.9  |
| Oita       | 1,166,338     | 17.2  | 35.2   | 173.3   | 452.3                                      | 415.2  |
| Miyazaki   | 1,104,069     | 16.3  | 28.1   | 366.8   | 532.6                                      | 335.2  |
| Kagoshima  | 1,648,177     | 19.3  | 32.8   | 270.3   | 590.3                                      | 361.1  |
| Okinawa    | 1,433,566     | 24.5  | 24.4   | 225.0   | 376.1                                      | 253.5  |

(eTable 1 continues)

(eTable 1 continued)

| Prefecture | Beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years, n | Depopulated municipalities, % | Population living alone, % | Unemployment rate, % |
|------------|---|-------------------------------|----------------------------|----------------------|
| Japan      | 15.5  | 46.4                          | 14.5                       | 3.1                  |
| Hokkaido   | 15.0  | 83.2                          | 16.9                       | 3.6                  |
| Aomori     | 14.1  | 70.0                          | 11.7                       | 4.0                  |
| Iwate      | 17.9  | 66.7                          | 11.6                       | 2.4                  |
| Miyagi     | 15.0  | 25.7                          | 13.9                       | 3.2                  |
| Akita      | 19.5  | 84.0                          | 10.6                       | 3.2                  |
| Yamagata   | 21.8  | 60.0                          | 8.9                        | 2.4                  |
| Fukushima  | 18.2  | 49.2                          | 11.7                       | 2.6                  |
| Ibaraki    | 18.0  | 9.1                           | 10.9                       | 2.9                  |
| Tochigi    | 14.1  | 12.0                          | 11.1                       | 2.7                  |
| Gunma      | 17.2  | 40.0                          | 11.2                       | 2.5                  |
| Saitama    | 15.9  | 6.3                           | 12.4                       | 3.1                  |
| Chiba      | 13.5  | 11.1                          | 13.5                       | 2.9                  |
| Tokyo      | 14.1  | 15.4                          | 23.4                       | 3.2                  |
| Kanagawa   | 15.2  | 0.0                           | 15.4                       | 3.1                  |
| Niigata    | 20.6  | 46.7                          | 10.1                       | 2.8                  |
| Toyama     | 16.6  | 20.0                          | 9.6                        | 2.3                  |
| Ishikawa   | 19.4  | 47.4                          | 12.4                       | 2.3                  |
| Fukui      | 19.3  | 35.3                          | 9.4                        | 1.9                  |
| Yamanashi  | 15.1  | 55.6                          | 11.7                       | 2.6                  |
| Nagano     | 17.7  | 48.1                          | 10.7                       | 2.5                  |
| Gifu       | 17.0  | 33.3                          | 9.5                        | 2.4                  |
| Shizuoka   | 16.3  | 22.9                          | 11.0                       | 2.5                  |
| Aichi      | 12.0  | 9.3                           | 13.7                       | 2.4                  |
| Mie        | 17.0  | 31.0                          | 11.6                       | 2.0                  |
| Shiga      | 15.2  | 10.5                          | 10.8                       | 2.5                  |
| Kyoto      | 15.4  | 34.6                          | 16.9                       | 3.1                  |
| Osaka      | 13.1  | 2.3                           | 16.6                       | 4.0                  |
| Hyogo      | 14.8  | 22.0                          | 13.7                       | 3.4                  |
| Nara       | 17.0  | 38.5                          | 10.0                       | 3.2                  |
| Wakayama   | 18.0  | 60.0                          | 11.9                       | 2.0                  |
| Tottori    | 17.9  | 63.2                          | 11.1                       | 2.4                  |
| Shimane    | 21.4  | 100.0                         | 11.5                       | 1.7                  |
| Okayama    | 17.6  | 74.1                          | 12.9                       | 2.7                  |
| Hiroshima  | 14.1  | 69.6                          | 14.7                       | 2.7                  |
| Yamaguchi  | 14.1  | 63.2                          | 14.2                       | 2.4                  |
| Tokushima  | 15.2  | 54.2                          | 13.0                       | 2.7                  |
| Kagawa     | 16.9  | 47.1                          | 12.9                       | 2.6                  |
| Ehime      | 14.7  | 85.0                          | 14.3                       | 2.6                  |
| Kochi      | 17.2  | 82.4                          | 15.9                       | 3.3                  |
| Fukuoka    | 15.3  | 35.0                          | 16.1                       | 3.5                  |
| Saga       | 14.9  | 45.0                          | 9.7                        | 2.1                  |
| Nagasaki   | 15.3  | 61.9                          | 12.9                       | 2.8                  |
| Kumamoto   | 14.4  | 60.0                          | 12.2                       | 3.2                  |
| Oita       | 13.7  | 88.9                          | 13.8                       | 2.6                  |
| Miyazaki   | 16.9  | 65.4                          | 13.4                       | 2.3                  |
| Kagoshima  | 19.7  | 95.3                          | 15.6                       | 2.8                  |
| Okinawa    | 15.8  | 43.9                          | 12.6                       | 4.4                  |

**eTable 2.** Characteristics of study population

| Characteristic  | Survey year |                              |            |                              |            |                              |
|---|-------------|------------------------------|------------|------------------------------|------------|------------------------------|
|   | 2016        |                              | 2015       |                              | 2014       |                              |
|   | (n=46,559)  |                              | (n=48,022) |                              | (n=49,022) |                              |
|   | n           | %                            | n          | %                            | n          | %                            |
| Type of hospital  |             |                              |            |                              |            |                              |
| General hospital  | 1,061       | 2.3                          | 1,122      | 2.3                          | 1,051      | 2.1                          |
| Other   | 45,498      | 97.7                         | 46,900     | 97.7                         | 47,971     | 97.9                         |
| Type of hospital fee  |             |                              |            |                              |            |                              |
| Fee-for-service plan (patient-to-nurse-ratio)                                 |             |                              |            |                              |            |                              |
| Psychiatric unit (10:1)   | 85          | 0.2                          | 84         | 0.2                          | 114        | 0.2                          |
| Psychiatric unit (13:1)   | 518         | 1.1                          | 571        | 1.2                          | 394        | 0.8                          |
| Psychiatric unit (15:1)   | 22,012      | 47.3                         | 22,498     | 46.8                         | 23,085     | 47.1                         |
| Psychiatric unit (18:1)   | 1,029       | 2.2                          | 1,210      | 2.5                          | 1,534      | 3.1                          |
| Psychiatric unit (20:1)   | 296         | 0.6                          | 340        | 0.7                          | 466        | 1.0                          |
| Specialized psychiatric unit  | 308         | 0.7                          | 393        | 0.8                          | 360        | 0.7                          |
| Fee-for-service plan in advanced treatment hospitals (patient-to-nurse-ratio) |             |                              |            |                              |            |                              |
| Psychiatric unit (7:1)  | 14          | 0.0                          | 17         | 0.0                          | 11         | 0.0                          |
| Psychiatric unit (10:1)   | 53          | 0.1                          | 39         | 0.1                          | 39         | 0.1                          |
| Psychiatric unit (13:1)   | 83          | 0.2                          | 78         | 0.2                          | 78         | 0.2                          |
| Psychiatric unit (15:1)   | 23          | 0.0                          | 36         | 0.1                          | 31         | 0.1                          |
| Per-diem payment plan   |             |                              |            |                              |            |                              |
| Psychiatric emergency unit  | 1,213       | 2.6                          | 1,127      | 2.3                          | 970        | 2.0                          |
| Psychiatric acute care unit   | 2,186       | 4.7                          | 2,239      | 4.7                          | 2,091      | 4.3                          |
| Psychiatric emergency and physical complication unit                          | 34          | 0.1                          | 40         | 0.1                          | 18         | 0.0                          |
| Child and adolescent psychiatric unit   | 58          | 0.1                          | 43         | 0.1                          | 38         | 0.1                          |
| Chronic psychiatric care unit   | 15,850      | 34.0                         | 16,442     | 34.2                         | 16,887     | 34.4                         |
| Dementia care unit  | 2,797       | 6.0                          | 2,865      | 6.0                          | 2,906      | 5.9                          |
| Sex   |             |                              |            |                              |            |                              |
| Men   | 25,858      | 55.5                         | 26,752     | 55.7                         | 27,484     | 56.1                         |
| Women   | 20,701      | 44.5                         | 21,270     | 44.3                         | 21,538     | 43.9                         |
| Age, years  |             |                              |            |                              |            |                              |
| 0–19  | 168         | 0.4                          | 142        | 0.3                          | 153        | 0.3                          |
| 20–39   | 3,083       | 6.6                          | 3,306      | 6.9                          | 3,465      | 7.1                          |
| 40–64   | 21,111      | 45.3                         | 22,128     | 46.1                         | 22,917     | 46.7                         |
| 65–74   | 13,457      | 28.9                         | 13,755     | 28.6                         | 13,668     | 27.9                         |
| ≥75   | 8,740       | 18.8                         | 8,691      | 18.1                         | 8,819      | 18.0                         |
| Primary diagnosis for mental disorders (ICD-10 codes) <sup>a</sup>            |             |                              |            |                              |            |                              |
| Alcohol use disorder (F10)  | 3,571       | 7.7                          | 3,703      | 7.7                          | 3,807      | 7.8                          |
| Drug use disorders (F11–F16, F18–F19)   | 511         | 1.1                          | 517        | 1.1                          | 488        | 1.0                          |
| Schizophrenia (F2)  | 28,956      | 62.2                         | 29,916     | 62.3                         | 30,719     | 62.7                         |
| Unipolar depressive disorders (F32–F33, F341)                                 | 1,771       | 3.8                          | 1,835      | 3.8                          | 1,829      | 3.7                          |
| Bipolar affective disorders (F30–F31)   | 1,555       | 3.3                          | 1,639      | 3.4                          | 1,571      | 3.2                          |
| Anxiety disorders (F40–F44)   | 675         | 1.5                          | 670        | 1.4                          | 650        | 1.3                          |
| Eating disorders (F50)  | 43          | 0.1                          | 51         | 0.1                          | 43         | 0.1                          |
| Pervasive and developmental disorders (F840, F845)                            | 43          | 0.1                          | 46         | 0.1                          | 25         | 0.1                          |
| Childhood behavioral disorders (F7, F90–F92)                                  | 472         | 1.0                          | 415        | 0.9                          | 365        | 0.7                          |
| Other mental disorders  | 2,225       | 4.8                          | 2,157      | 4.5                          | 2,289      | 4.7                          |
| Primary diagnosis of dementia (ICD-10 codes: F00–F03, G30–G31)                | 4,422       | 9.5                          | 4,507      | 9.4                          | 4,578      | 9.3                          |
| Length of hospital stay   |             |                              |            |                              |            |                              |
| <3 months   | 7,385       | 15.9                         | 7,602      | 15.8                         | 7,423      | 15.1                         |
| ≥3 months to <1 year  | 7,340       | 15.8                         | 7,274      | 15.1                         | 7,382      | 15.1                         |
| ≥1 year to <5 years   | 11,737      | 25.2                         | 12,188     | 25.4                         | 12,379     | 25.3                         |
| ≥5 years  | 20,097      | 43.2                         | 20,958     | 43.6                         | 21,838     | 44.5                         |
| Total medical cost per month, median yen (interquartile range)                |             | 372,250<br>(339,640–398,900) |            | 369,680<br>(337,540–395,300) |            | 369,680<br>(336,622–396,200) |

<sup>a</sup>Diagnostic codes were based on the Global Burden of Disease Study 2010.

**eTable 3.** Age- and sex-standardized number of psychiatric admissions by prefecture and survey year, using direct and indirect methods

| Prefecture | Direct method, number of admissions per 100,000 population |      |      | Indirect method, standardized claim ratio (95% CrI) |                    |                    |
|------------|--|------|------|---|--------------------|--------------------|
|            | 2016   | 2015 | 2014 | 2016  | 2015               | 2014               |
| Japan      | 36.6   | 37.8 | 38.6 | reference   | reference          | reference          |
| Hokkaido   | 66.0   | 67.6 | 70.2 | 1.77 (1.72, 1.83)*                                  | 1.76 (1.71, 1.82)* | 1.79 (1.74, 1.85)* |
| Aomori     | 41.7   | 45.3 | 41.4 | 1.13 (1.04, 1.22)*                                  | 1.17 (1.09, 1.27)* | 1.06 (0.97, 1.14)  |
| Iwate      | 28.5   | 31.4 | 30.0 | 0.76 (0.69, 0.84)*                                  | 0.80 (0.72, 0.88)* | 0.76 (0.68, 0.83)* |
| Miyagi     | 23.3   | 24.6 | 24.4 | 0.63 (0.58, 0.68)*                                  | 0.64 (0.59, 0.70)* | 0.62 (0.57, 0.68)* |
| Akita      | 41.3   | 39.3 | 41.2 | 1.10 (1.00, 1.20)*                                  | 1.02 (0.93, 1.12)  | 1.05 (0.96, 1.15)  |
| Yamagata   | 17.9   | 17.8 | 17.0 | 0.48 (0.42, 0.54)*                                  | 0.47 (0.41, 0.53)* | 0.44 (0.38, 0.50)* |
| Fukushima  | 23.8   | 23.4 | 25.8 | 0.64 (0.59, 0.70)*                                  | 0.61 (0.56, 0.67)* | 0.65 (0.60, 0.71)* |
| Ibaraki    | 29.1   | 29.1 | 30.9 | 0.79 (0.74, 0.84)*                                  | 0.76 (0.71, 0.82)* | 0.80 (0.75, 0.85)* |
| Tochigi    | 35.6   | 36.7 | 36.7 | 0.96 (0.89, 1.03)                                   | 0.96 (0.89, 1.03)  | 0.94 (0.88, 1.01)  |
| Gunma      | 15.6   | 15.8 | 18.2 | 0.42 (0.38, 0.47)*                                  | 0.41 (0.37, 0.46)* | 0.47 (0.42, 0.52)* |
| Saitama    | 24.3   | 25.2 | 25.5 | 0.66 (0.62, 0.69)*                                  | 0.67 (0.63, 0.70)* | 0.66 (0.63, 0.69)* |
| Chiba      | 26.3   | 28.5 | 28.0 | 0.71 (0.68, 0.75)*                                  | 0.75 (0.71, 0.78)* | 0.72 (0.68, 0.75)* |
| Tokyo      | 47.8   | 49.9 | 49.9 | 1.27 (1.24, 1.30)*                                  | 1.28 (1.25, 1.31)* | 1.26 (1.22, 1.29)* |
| Kanagawa   | 28.9   | 29.0 | 28.5 | 0.78 (0.75, 0.81)*                                  | 0.76 (0.73, 0.79)* | 0.73 (0.70, 0.76)* |
| Niigata    | 22.4   | 23.1 | 24.1 | 0.60 (0.55, 0.65)*                                  | 0.60 (0.55, 0.65)* | 0.61 (0.56, 0.66)* |
| Toyama     | 15.6   | 14.5 | 15.9 | 0.42 (0.36, 0.49)*                                  | 0.38 (0.32, 0.44)* | 0.41 (0.35, 0.47)* |
| Ishikawa   | 24.4   | 24.4 | 26.8 | 0.66 (0.59, 0.74)*                                  | 0.64 (0.57, 0.72)* | 0.69 (0.62, 0.77)* |
| Fukui      | 12.8   | 13.9 | 17.5 | 0.35 (0.29, 0.42)*                                  | 0.37 (0.30, 0.44)* | 0.46 (0.39, 0.54)* |
| Yamanashi  | 17.7   | 21.5 | 18.9 | 0.48 (0.41, 0.56)*                                  | 0.56 (0.49, 0.65)* | 0.49 (0.42, 0.57)* |
| Nagano     | 12.0   | 12.0 | 12.9 | 0.32 (0.28, 0.36)*                                  | 0.31 (0.27, 0.35)* | 0.32 (0.29, 0.36)* |
| Gifu       | 12.0   | 12.7 | 13.7 | 0.33 (0.29, 0.37)*                                  | 0.33 (0.30, 0.38)* | 0.35 (0.31, 0.40)* |
| Shizuoka   | 15.2   | 15.6 | 16.9 | 0.41 (0.38, 0.44)*                                  | 0.41 (0.37, 0.44)* | 0.43 (0.40, 0.47)* |
| Aichi      | 24.9   | 25.6 | 26.0 | 0.68 (0.65, 0.71)*                                  | 0.68 (0.65, 0.71)* | 0.67 (0.64, 0.70)* |
| Mie        | 26.4   | 27.8 | 29.6 | 0.71 (0.65, 0.78)*                                  | 0.73 (0.67, 0.79)* | 0.76 (0.70, 0.82)* |
| Shiga      | 14.5   | 16.1 | 16.1 | 0.39 (0.34, 0.45)*                                  | 0.42 (0.37, 0.48)* | 0.41 (0.36, 0.47)* |
| Kyoto      | 34.3   | 37.4 | 38.0 | 0.93 (0.87, 1.00)*                                  | 0.98 (0.92, 1.05)  | 0.98 (0.92, 1.04)  |
| Osaka      | 46.8   | 48.8 | 50.2 | 1.26 (1.22, 1.30)*                                  | 1.28 (1.24, 1.31)* | 1.29 (1.25, 1.33)* |
| Hyogo      | 33.6   | 35.1 | 33.9 | 0.90 (0.86, 0.95)*                                  | 0.92 (0.88, 0.96)* | 0.87 (0.83, 0.91)* |
| Nara       | 29.0   | 29.2 | 32.2 | 0.78 (0.70, 0.85)*                                  | 0.76 (0.69, 0.84)* | 0.82 (0.75, 0.90)* |
| Wakayama   | 27.1   | 26.6 | 27.2 | 0.73 (0.64, 0.82)*                                  | 0.70 (0.62, 0.78)* | 0.70 (0.62, 0.78)* |
| Tottori    | 24.1   | 24.5 | 28.4 | 0.64 (0.54, 0.74)*                                  | 0.64 (0.54, 0.75)* | 0.72 (0.61, 0.83)* |
| Shimane    | 18.8   | 20.5 | 23.6 | 0.52 (0.44, 0.61)*                                  | 0.54 (0.45, 0.63)* | 0.60 (0.51, 0.69)* |
| Okayama    | 28.5   | 30.0 | 29.6 | 0.77 (0.71, 0.84)*                                  | 0.79 (0.72, 0.85)* | 0.76 (0.70, 0.82)* |
| Hiroshima  | 32.1   | 32.5 | 35.4 | 0.87 (0.81, 0.92)*                                  | 0.85 (0.79, 0.90)* | 0.91 (0.85, 0.96)* |
| Yamaguchi  | 38.7   | 37.9 | 38.2 | 1.04 (0.95, 1.12)                                   | 0.99 (0.91, 1.07)  | 0.98 (0.90, 1.06)  |
| Tokushima  | 71.6   | 71.4 | 74.7 | 1.93 (1.78, 2.09)*                                  | 1.86 (1.71, 2.02)* | 1.91 (1.76, 2.07)* |
| Kagawa     | 40.3   | 39.6 | 40.6 | 1.08 (0.98, 1.19)                                   | 1.03 (0.93, 1.13)  | 1.03 (0.94, 1.14)  |
| Ehime      | 36.6   | 39.3 | 39.6 | 0.97 (0.89, 1.06)                                   | 1.01 (0.93, 1.09)  | 1.00 (0.92, 1.09)  |
| Kochi      | 71.8   | 76.5 | 77.1 | 1.92 (1.76, 2.08)*                                  | 1.99 (1.84, 2.16)* | 1.96 (1.81, 2.12)* |
| Fukuoka    | 76.0   | 78.3 | 80.6 | 2.04 (1.98, 2.11)*                                  | 2.04 (1.98, 2.11)* | 2.06 (1.99, 2.12)* |
| Saga       | 45.5   | 46.5 | 48.6 | 1.23 (1.11, 1.35)*                                  | 1.21 (1.09, 1.33)* | 1.24 (1.12, 1.37)* |
| Nagasaki   | 83.3   | 84.6 | 87.6 | 2.24 (2.12, 2.37)*                                  | 2.21 (2.09, 2.34)* | 2.24 (2.11, 2.36)* |
| Kumamoto   | 50.4   | 46.9 | 47.2 | 1.36 (1.27, 1.45)*                                  | 1.24 (1.15, 1.32)* | 1.21 (1.13, 1.30)* |
| Oita       | 72.7   | 74.1 | 76.2 | 1.97 (1.84, 2.10)*                                  | 1.95 (1.82, 2.08)* | 1.95 (1.83, 2.08)* |
| Miyazaki   | 56.6   | 62.4 | 61.8 | 1.53 (1.42, 1.65)*                                  | 1.63 (1.51, 1.75)* | 1.58 (1.47, 1.70)* |
| Kagoshima  | 80.2   | 85.3 | 91.8 | 2.15 (2.03, 2.26)*                                  | 2.24 (2.12, 2.35)* | 2.34 (2.22, 2.46)* |
| Okinawa    | 78.4   | 72.0 | 73.8 | 2.17 (2.04, 2.31)*                                  | 1.94 (1.82, 2.07)* | 1.94 (1.82, 2.07)* |

CrI, credible interval.

\*Indicates a statistically significant difference from Japan's national mean

**eTable 4.** Age- and sex-standardized total medical costs of psychiatric admissions by prefecture and survey year using direct and indirect methods

| Prefecture | Direct method, costs per month per 100,000 population (Japanese yen) |            |            | Indirect method, multiplicative effect (95% CI) |                    |                    |
|------------|--|------------|------------|---|--------------------|--------------------|
|            | 2016   | 2015       | 2014       | 2016  | 2015               | 2014               |
| Japan      | 13,781,489   | 14,078,804 | 14,226,207 | reference                                       | reference          | reference          |
| Hokkaido   | 25,026,870   | 25,418,300 | 26,184,110 | 2.12 (2.02, 2.23)*                              | 2.12 (2.02, 2.23)* | 2.13 (2.02, 2.25)* |
| Aomori     | 14,940,300   | 16,352,640 | 14,357,170 | 1.28 (1.19, 1.37)*                              | 1.36 (1.25, 1.48)* | 1.17 (1.09, 1.26)* |
| Iwate      | 10,561,730   | 11,063,640 | 10,530,570 | 0.88 (0.77, 1.01)                               | 0.90 (0.78, 1.03)  | 0.85 (0.77, 0.94)* |
| Miyagi     | 8,780,533  | 9,116,270  | 9,011,531  | 0.74 (0.69, 0.81)*                              | 0.76 (0.69, 0.84)* | 0.73 (0.65, 0.82)* |
| Akita      | 14,642,890   | 13,715,980 | 14,174,880 | 1.24 (1.13, 1.36)*                              | 1.14 (1.03, 1.26)* | 1.16 (1.07, 1.26)* |
| Yamagata   | 7,595,429  | 6,788,425  | 6,242,322  | 0.64 (0.53, 0.77)*                              | 0.56 (0.47, 0.68)* | 0.51 (0.44, 0.60)* |
| Fukushima  | 8,733,251  | 8,479,678  | 9,198,535  | 0.74 (0.67, 0.81)*                              | 0.70 (0.63, 0.78)* | 0.74 (0.67, 0.82)* |
| Ibaraki    | 9,885,284  | 9,733,355  | 10,312,850 | 0.84 (0.78, 0.91)*                              | 0.82 (0.75, 0.89)* | 0.84 (0.78, 0.91)* |
| Tochigi    | 12,835,370   | 13,017,090 | 13,013,320 | 1.09 (1.02, 1.16)*                              | 1.09 (1.00, 1.19)* | 1.06 (0.98, 1.16)  |
| Gunma      | 5,777,945  | 5,841,379  | 6,491,284  | 0.49 (0.43, 0.56)*                              | 0.49 (0.44, 0.54)* | 0.53 (0.48, 0.59)* |
| Saitama    | 9,191,140  | 9,509,933  | 9,588,116  | 0.78 (0.73, 0.83)*                              | 0.80 (0.74, 0.87)* | 0.78 (0.72, 0.85)* |
| Chiba      | 9,806,037  | 10,587,760 | 10,198,460 | 0.83 (0.78, 0.89)*                              | 0.88 (0.84, 0.93)* | 0.83 (0.79, 0.87)* |
| Tokyo      | 18,333,600   | 19,024,080 | 18,858,240 | 1.53 (1.43, 1.64)*                              | 1.56 (1.45, 1.68)* | 1.51 (1.41, 1.62)* |
| Kanagawa   | 10,855,230   | 10,675,710 | 10,470,610 | 0.93 (0.87, 0.98)*                              | 0.89 (0.85, 0.94)* | 0.85 (0.81, 0.90)* |
| Niigata    | 7,950,355  | 8,316,223  | 8,560,402  | 0.67 (0.61, 0.73)*                              | 0.69 (0.63, 0.74)* | 0.69 (0.63, 0.76)* |
| Toyama     | 5,729,391  | 5,178,156  | 5,645,694  | 0.49 (0.41, 0.58)*                              | 0.43 (0.36, 0.51)* | 0.46 (0.38, 0.54)* |
| Ishikawa   | 9,450,332  | 9,366,522  | 10,064,310 | 0.80 (0.70, 0.93)*                              | 0.78 (0.66, 0.93)* | 0.82 (0.72, 0.94)* |
| Fukui      | 4,250,780  | 4,827,967  | 5,934,504  | 0.36 (0.30, 0.44)*                              | 0.40 (0.33, 0.48)* | 0.49 (0.41, 0.59)* |
| Yamanashi  | 6,643,804  | 7,882,143  | 6,504,432  | 0.56 (0.49, 0.65)*                              | 0.66 (0.59, 0.73)* | 0.53 (0.46, 0.62)* |
| Nagano     | 4,598,932  | 4,260,866  | 4,594,430  | 0.38 (0.32, 0.46)*                              | 0.35 (0.29, 0.41)* | 0.36 (0.30, 0.44)* |
| Gifu       | 4,294,193  | 4,626,641  | 4,791,732  | 0.36 (0.33, 0.41)*                              | 0.39 (0.34, 0.44)* | 0.39 (0.34, 0.45)* |
| Shizuoka   | 5,719,913  | 5,843,555  | 6,224,670  | 0.48 (0.44, 0.53)*                              | 0.49 (0.45, 0.53)* | 0.51 (0.47, 0.55)* |
| Aichi      | 9,259,240  | 9,600,954  | 9,555,090  | 0.79 (0.71, 0.88)*                              | 0.81 (0.74, 0.88)* | 0.79 (0.70, 0.89)* |
| Mie        | 9,842,139  | 10,430,300 | 11,290,540 | 0.83 (0.77, 0.91)*                              | 0.87 (0.80, 0.95)* | 0.92 (0.86, 0.98)* |
| Shiga      | 5,425,304  | 5,954,347  | 6,066,896  | 0.46 (0.40, 0.53)*                              | 0.49 (0.43, 0.57)* | 0.49 (0.41, 0.58)* |
| Kyoto      | 12,716,310   | 13,581,530 | 13,422,710 | 1.09 (0.97, 1.22)                               | 1.14 (1.02, 1.26)* | 1.10 (0.99, 1.23)  |
| Osaka      | 18,206,500   | 18,621,470 | 18,810,710 | 1.55 (1.47, 1.63)*                              | 1.55 (1.47, 1.64)* | 1.54 (1.46, 1.61)* |
| Hyogo      | 12,876,300   | 13,399,500 | 12,741,540 | 1.09 (1.04, 1.15)*                              | 1.12 (1.05, 1.19)* | 1.04 (0.97, 1.11)  |
| Nara       | 11,321,660   | 11,030,790 | 12,265,050 | 0.95 (0.84, 1.08)                               | 0.92 (0.82, 1.03)  | 0.99 (0.88, 1.12)  |
| Wakayama   | 9,244,243  | 9,536,979  | 9,601,252  | 0.78 (0.70, 0.87)*                              | 0.79 (0.73, 0.87)* | 0.78 (0.72, 0.85)* |
| Tottori    | 9,505,344  | 9,112,663  | 10,146,560 | 0.78 (0.68, 0.91)*                              | 0.76 (0.65, 0.89)* | 0.82 (0.72, 0.94)* |
| Shimane    | 7,141,159  | 7,612,556  | 8,682,998  | 0.61 (0.50, 0.75)*                              | 0.63 (0.57, 0.71)* | 0.70 (0.61, 0.81)* |
| Okayama    | 10,834,120   | 11,621,320 | 11,529,500 | 0.92 (0.86, 0.99)*                              | 0.97 (0.89, 1.07)  | 0.94 (0.86, 1.04)  |
| Hiroshima  | 12,084,230   | 12,273,230 | 13,155,720 | 1.02 (0.96, 1.09)                               | 1.02 (0.94, 1.10)  | 1.07 (0.99, 1.16)  |
| Yamaguchi  | 14,536,480   | 13,733,930 | 13,875,750 | 1.23 (1.10, 1.37)*                              | 1.14 (1.02, 1.28)* | 1.13 (0.98, 1.30)  |
| Tokushima  | 26,489,400   | 25,566,740 | 27,041,960 | 2.27 (2.05, 2.51)*                              | 2.14 (1.94, 2.37)* | 2.22 (2.04, 2.42)* |
| Kagawa     | 15,374,730   | 14,282,600 | 14,359,430 | 1.30 (1.18, 1.43)*                              | 1.19 (1.08, 1.30)* | 1.17 (1.07, 1.27)* |
| Ehime      | 13,512,280   | 14,117,880 | 14,385,580 | 1.13 (1.01, 1.26)*                              | 1.16 (1.04, 1.28)* | 1.16 (1.06, 1.26)* |
| Kochi      | 27,558,900   | 28,877,330 | 28,463,940 | 2.33 (2.16, 2.51)*                              | 2.42 (2.22, 2.64)* | 2.32 (2.10, 2.55)* |
| Fukuoka    | 29,058,610   | 29,877,200 | 30,523,310 | 2.46 (2.34, 2.59)*                              | 2.49 (2.36, 2.63)* | 2.48 (2.36, 2.61)* |
| Saga       | 17,212,680   | 17,074,090 | 17,991,570 | 1.46 (1.33, 1.61)*                              | 1.42 (1.27, 1.58)* | 1.46 (1.29, 1.66)* |
| Nagasaki   | 30,332,570   | 30,272,430 | 31,828,840 | 2.58 (2.39, 2.78)*                              | 2.54 (2.31, 2.80)* | 2.60 (2.41, 2.80)* |
| Kumamoto   | 17,164,300   | 16,547,570 | 17,239,500 | 1.46 (1.35, 1.59)*                              | 1.40 (1.30, 1.50)* | 1.41 (1.29, 1.54)* |
| Oita       | 26,983,440   | 27,651,520 | 28,010,720 | 2.31 (2.12, 2.52)*                              | 2.33 (2.12, 2.56)* | 2.29 (2.12, 2.47)* |
| Miyazaki   | 21,021,750   | 23,301,660 | 22,440,030 | 1.80 (1.66, 1.96)*                              | 1.94 (1.78, 2.12)* | 1.83 (1.70, 1.98)* |
| Kagoshima  | 28,567,940   | 29,979,610 | 32,054,940 | 2.42 (2.26, 2.59)*                              | 2.52 (2.35, 2.71)* | 2.61 (2.46, 2.78)* |
| Okinawa    | 30,987,080   | 27,729,810 | 27,763,180 | 2.70 (2.46, 2.96)*                              | 2.40 (2.13, 2.70)* | 2.34 (2.10, 2.60)* |

\*Indicates a statistically significant difference from Japan's national mean  
CI, confidence interval

**eTable 5.** Correlations matrix and variance inflation factor

| Independent variable  | Pearson correlation coefficient |       |       |      |       |       |       |      |   | Tolerance | VIF  |
|---|---------------------------------|-------|-------|------|-------|-------|-------|------|---|-----------|------|
|   | 1                               | 2     | 3     | 4    | 5     | 6     | 7     | 8    | 9 |           |      |
| 1. Number of recipients of public assistance per 1,000 population   | —                               |       |       |      |       |       |       |      |   | 0.17      | 5.75 |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.17                            | —     |       |      |       |       |       |      |   | 0.61      | 1.63 |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.27                            | 0.06  | —     |      |       |       |       |      |   | 0.39      | 2.54 |
| 4. Number of psychiatric beds per 100, 000 population   | 0.28                            | 0.28  | 0.66  | —    |       |       |       |      |   | 0.31      | 3.27 |
| 5. Average length of stay in psychiatric beds, days   | -0.09                           | -0.05 | 0.45  | 0.50 | —     |       |       |      |   | 0.56      | 1.78 |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.41                           | 0.05  | -0.08 | 0.12 | -0.08 | —     |       |      |   | 0.51      | 1.98 |
| 7. Percentage of depopulated municipalities   | 0.16                            | 0.47  | 0.53  | 0.68 | 0.22  | 0.36  | —     |      |   | 0.31      | 3.24 |
| 8. Percentage of population living alone  | 0.71                            | 0.22  | 0.12  | 0.03 | -0.10 | -0.46 | -0.02 | —    |   | 0.38      | 2.60 |
| 9. Unemployment rate  | 0.75                            | -0.01 | -0.08 | 0.01 | -0.26 | -0.40 | -0.14 | 0.44 | — | 0.29      | 3.44 |

VIF, variance inflation factor.

**eTable 6.** Potential determinants of the number of psychiatric admissions per 100,000 population by survey year

| Independent variable  | 2016 (Overall R <sup>2</sup> =0.91) |                          |                  | 2015 (Overall R <sup>2</sup> =0.92) |                         |                  | 2014 (Overall R <sup>2</sup> =0.92) |                           |                  |
|---|-------------------------------------|--------------------------|------------------|-------------------------------------|-------------------------|------------------|-------------------------------------|---------------------------|------------------|
|   | r                                   | B (95% CI)               | R <sup>2 a</sup> | r                                   | B (95% CI)              | R <sup>2 a</sup> | r                                   | B (95% CI)                | R <sup>2 a</sup> |
| Intercept   | —                                   | -55.30 (-97.43, -13.16)* | —                | —                                   | -49.90 (-90.02, -9.78)* | —                | —                                   | -57.84 (-100.24, -15.44)* | —                |
| 1. Number of recipients of public assistance per 1,000 population   | 0.76                                | 1.33 (0.64, 2.03)*       | 0.23             | 0.77                                | 1.49 (0.83, 2.15)*      | 0.24             | 0.75                                | 1.61 (0.91, 2.30)*        | 0.24             |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.21                                | -0.02 (-0.37, 0.33)      | 0.01             | 0.22                                | -0.05 (-0.38, 0.29)     | 0.01             | 0.22                                | -0.04 (-0.40, 0.31)       | 0.01             |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.50                                | -0.02 (-0.06, 0.03)      | 0.07             | 0.50                                | -0.02 (-0.06, 0.02)     | 0.07             | 0.51                                | -0.02 (-0.06, 0.02)       | 0.07             |
| 4. Number of psychiatric beds per 100, 000 population   | 0.73                                | 0.11 (0.08, 0.15)*       | 0.28             | 0.73                                | 0.12 (0.09, 0.15)*      | 0.27             | 0.74                                | 0.12 (0.09, 0.15)*        | 0.28             |
| 5. Average length of stay in psychiatric beds, days   | 0.34                                | 0.07 (0.01, 0.12)*       | 0.06             | 0.34                                | 0.06 (0.01, 0.12)*      | 0.06             | 0.36                                | 0.08 (0.02, 0.13)*        | 0.07             |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.26                               | 0.05 (-1.24, 1.35)       | 0.02             | -0.26                               | -0.01 (-1.25, 1.22)     | 0.03             | -0.23                               | 0.39 (-0.91, 1.70)        | 0.02             |
| 7. Percentage of depopulated municipalities   | 0.37                                | -0.10 (-0.24, 0.04)      | 0.05             | 0.38                                | -0.09 (-0.22, 0.04)     | 0.05             | 0.39                                | -0.11 (-0.24, 0.03)       | 0.05             |
| 8. Percentage of population living alone  | 0.50                                | 1.07 (-0.19, 2.32)       | 0.09             | 0.52                                | 1.27 (0.07, 2.46)*      | 0.10             | 0.51                                | 1.30 (0.04, 2.56)*        | 0.10             |
| 9. Unemployment rate  | 0.49                                | 3.60 (-3.20, 10.39)      | 0.10             | 0.47                                | 1.12 (-5.35, 7.59)      | 0.09             | 0.44                                | 0.08 (-6.76, 6.92)        | 0.08             |

CI, confidence interval.

\*  $P < 0.05$

<sup>a</sup>R<sup>2</sup> indicates a decomposition of overall R<sup>2</sup> in the multiple regression model. The sum of R<sup>2</sup> for all independent variables is equal to the overall R<sup>2</sup> in the model.

**eTable 7.** Potential determinants of the total cost of psychiatric admissions per 100,000 population by survey year

| Independent variable  | 2016 (Overall R <sup>2</sup> =0.90) |  |                  | 2015 (Overall R <sup>2</sup> =0.91) |  |                  | 2014 (Overall R <sup>2</sup> =0.91) |  |                  |
|---|-------------------------------------|--|------------------|-------------------------------------|--|------------------|-------------------------------------|--|------------------|
|   | r                                   | B (95% CI)                             | R <sup>2 a</sup> | r                                   | B (95% CI)                             | R <sup>2 a</sup> | r                                   | B (95% CI)                             | R <sup>2 a</sup> |
| Intercept   | —                                   | -20,680,553 (-37,437,806, -3,923,300)* | —                | —                                   | -17,041,780 (-32,608,027, -1,475,532)* | —                | —                                   | -19,068,202 (-35,352,617, -2,783,787)* | —                |
| 1. Number of recipients of public assistance per 1,000 population   | 0.77                                | 507,868 (231,489, 784,247)*            | 0.24             | 0.78                                | 561,664 (304,928, 818,400)*            | 0.25             | 0.76                                | 603,151 (334,570, 871,732)*            | 0.24             |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.21                                | -1,981 (-141,487, 137,525)             | 0.01             | 0.21                                | -29,710 (-159,301, 99,881)             | 0.01             | 0.21                                | -24,658 (-160,228, 110,912)            | 0.01             |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.49                                | -3,631 (-20,165, 12,904)               | 0.07             | 0.50                                | -6,858 (-22,217, 8,501)                | 0.07             | 0.50                                | -78,97 (-23,964, 8,171)                | 0.07             |
| 4. Number of psychiatric beds per 100,000 population  | 0.71                                | 41,785 (29,114, 54,456)*               | 0.26             | 0.71                                | 41,521 (29,751, 53,291)*               | 0.26             | 0.73                                | 43,624 (31,310, 55,937)*               | 0.27             |
| 5. Average length of stay in psychiatric beds, days   | 0.31                                | 21,348 (-1,547, 44,243)                | 0.05             | 0.31                                | 20,014 (-1,254, 41,282)                | 0.05             | 0.34                                | 24,010 (1,761, 46,260)*                | 0.06             |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.27                               | 52,177 (-463,164, 567,517)             | 0.03             | -0.28                               | -19,272 (-497,985, 459,441)            | 0.03             | -0.25                               | 93,451 (-407,348, 594,249)             | 0.02             |
| 7. Percentage of depopulated municipalities   | 0.36                                | -41,026 (-95,582, 13,530)              | 0.04             | 0.37                                | -30,735 (-81,413, 19,943)              | 0.05             | 0.38                                | -39,740 (-92,757, 13,276)              | 0.05             |
| 8. Percentage of population living alone  | 0.51                                | 403,291 (-94,870, 901,452)             | 0.09             | 0.54                                | 491,283 (28,529, 954,038)*             | 0.11             | 0.52                                | 489,211 (5,106, 973,315)*              | 0.10             |
| 9. Unemployment rate  | 0.50                                | 1,480,578 (-1,221,334, 4,182,490)      | 0.11             | 0.49                                | 435,652 (-2,074,224, 2,945,528)        | 0.10             | 0.45                                | -115,046 (-2,740,718, 2,510,626)       | 0.08             |

CI, confidence interval.

\*  $P < 0.05$

a R<sup>2</sup> indicates a decomposition of overall R<sup>2</sup> in the multiple regression model. The sum of R<sup>2</sup> for all independent variables is equal to the overall R<sup>2</sup> in the model.



**eTable 8.** Age- and sex-standardized number of new long-stay psychiatric patients by prefecture and survey year, using direct and indirect methods

| Prefecture | Direct method, no. of admissions per 100,000 population |      |      | Indirect method, standardized claim ratio (95% CrI) |                    |                    |
|------------|---|------|------|---|--------------------|--------------------|
|            | 2016  | 2015 | 2014 | 2016  | 2015               | 2014               |
| Japan      | 9.2   | 9.6  | 9.7  | reference   | reference          | reference          |
| Hokkaido   | 17.1  | 16.8 | 16.5 | 1.83 (1.71, 1.94)*                                  | 1.73 (1.63, 1.85)* | 1.68 (1.57, 1.79)* |
| Aomori     | 11.0  | 11.8 | 10.7 | 1.17 (1.00, 1.36)                                   | 1.21 (1.03, 1.40)* | 1.07 (0.90, 1.24)  |
| Iwate      | 7.7   | 7.9  | 8.0  | 0.83 (0.68, 0.99)*                                  | 0.80 (0.66, 0.96)* | 0.80 (0.66, 0.95)* |
| Miyagi     | 7.6   | 7.9  | 8.4  | 0.81 (0.69, 0.93)*                                  | 0.81 (0.70, 0.94)* | 0.85 (0.74, 0.98)* |
| Akita      | 9.7   | 9.0  | 8.9  | 0.99 (0.82, 1.19)                                   | 0.91 (0.75, 1.10)  | 0.90 (0.73, 1.08)  |
| Yamagata   | 5.2   | 4.9  | 4.1  | 0.57 (0.44, 0.71)*                                  | 0.52 (0.40, 0.66)* | 0.43 (0.32, 0.55)* |
| Fukushima  | 6.4   | 6.7  | 7.3  | 0.69 (0.58, 0.81)*                                  | 0.69 (0.58, 0.81)* | 0.74 (0.62, 0.86)* |
| Ibaraki    | 6.9   | 6.9  | 7.2  | 0.74 (0.64, 0.84)*                                  | 0.71 (0.62, 0.81)* | 0.73 (0.64, 0.83)* |
| Tochigi    | 7.7   | 9.6  | 9.7  | 0.82 (0.70, 0.96)*                                  | 0.99 (0.85, 1.13)  | 0.98 (0.85, 1.13)  |
| Gunma      | 3.5   | 3.5  | 4.3  | 0.39 (0.30, 0.48)*                                  | 0.37 (0.29, 0.46)* | 0.44 (0.35, 0.54)* |
| Saitama    | 5.7   | 5.9  | 6.0  | 0.61 (0.56, 0.67)*                                  | 0.61 (0.56, 0.67)* | 0.61 (0.56, 0.67)* |
| Chiba      | 6.2   | 6.3  | 6.3  | 0.67 (0.60, 0.74)*                                  | 0.65 (0.59, 0.72)* | 0.65 (0.59, 0.71)* |
| Tokyo      | 13.0  | 13.7 | 13.7 | 1.36 (1.29, 1.43)*                                  | 1.37 (1.30, 1.44)* | 1.35 (1.29, 1.42)* |
| Kanagawa   | 8.4   | 8.3  | 8.0  | 0.90 (0.83, 0.96)*                                  | 0.85 (0.79, 0.91)* | 0.81 (0.76, 0.88)* |
| Niigata    | 6.0   | 6.0  | 6.4  | 0.64 (0.54, 0.74)*                                  | 0.61 (0.51, 0.71)* | 0.64 (0.54, 0.74)* |
| Toyama     | 3.4   | 3.5  | 3.5  | 0.38 (0.27, 0.50)*                                  | 0.37 (0.27, 0.49)* | 0.38 (0.27, 0.50)* |
| Ishikawa   | 6.4   | 5.6  | 5.3  | 0.68 (0.54, 0.85)*                                  | 0.59 (0.46, 0.74)* | 0.56 (0.43, 0.70)* |
| Fukui      | 3.5   | 3.1  | 3.7  | 0.40 (0.27, 0.56)*                                  | 0.34 (0.22, 0.48)* | 0.41 (0.28, 0.56)* |
| Yamanashi  | 2.9   | 3.6  | 2.8  | 0.33 (0.22, 0.46)*                                  | 0.39 (0.27, 0.53)* | 0.31 (0.21, 0.44)* |
| Nagano     | 3.3   | 3.6  | 4.3  | 0.36 (0.28, 0.44)*                                  | 0.36 (0.29, 0.45)* | 0.42 (0.34, 0.51)* |
| Gifu       | 2.4   | 2.6  | 2.9  | 0.27 (0.21, 0.35)*                                  | 0.27 (0.21, 0.35)* | 0.30 (0.23, 0.38)* |
| Shizuoka   | 3.9   | 4.0  | 4.5  | 0.42 (0.36, 0.49)*                                  | 0.42 (0.36, 0.49)* | 0.46 (0.39, 0.53)* |
| Aichi      | 6.1   | 6.8  | 6.9  | 0.66 (0.60, 0.72)*                                  | 0.71 (0.65, 0.78)* | 0.71 (0.65, 0.78)* |
| Mie        | 5.6   | 6.8  | 6.8  | 0.60 (0.49, 0.72)*                                  | 0.70 (0.59, 0.83)* | 0.69 (0.58, 0.82)* |
| Shiga      | 2.8   | 3.9  | 4.2  | 0.32 (0.23, 0.42)*                                  | 0.42 (0.32, 0.54)* | 0.44 (0.34, 0.56)* |
| Kyoto      | 7.6   | 7.4  | 8.7  | 0.83 (0.72, 0.95)*                                  | 0.78 (0.67, 0.89)* | 0.90 (0.78, 1.02)  |
| Osaka      | 11.3  | 12.8 | 12.7 | 1.21 (1.13, 1.28)*                                  | 1.32 (1.25, 1.40)* | 1.29 (1.21, 1.37)* |
| Hyogo      | 8.3   | 8.6  | 8.3  | 0.89 (0.81, 0.97)*                                  | 0.88 (0.81, 0.96)* | 0.84 (0.77, 0.92)* |
| Nara       | 6.8   | 7.1  | 7.5  | 0.72 (0.58, 0.87)*                                  | 0.73 (0.59, 0.88)* | 0.76 (0.62, 0.91)* |
| Wakayama   | 6.2   | 5.5  | 5.9  | 0.67 (0.51, 0.84)*                                  | 0.56 (0.43, 0.72)* | 0.60 (0.46, 0.76)* |
| Tottori    | 6.5   | 8.8  | 7.9  | 0.70 (0.50, 0.93)*                                  | 0.91 (0.69, 1.16)  | 0.80 (0.59, 1.03)  |
| Shimane    | 6.1   | 6.0  | 6.7  | 0.67 (0.49, 0.87)*                                  | 0.65 (0.48, 0.84)* | 0.70 (0.53, 0.90)* |
| Okayama    | 7.5   | 7.8  | 7.5  | 0.80 (0.68, 0.94)*                                  | 0.80 (0.68, 0.93)* | 0.76 (0.64, 0.89)* |
| Hiroshima  | 7.9   | 8.4  | 10.0 | 0.85 (0.74, 0.96)*                                  | 0.87 (0.76, 0.98)* | 1.01 (0.89, 1.13)  |
| Yamaguchi  | 11.3  | 10.8 | 11.4 | 1.20 (1.02, 1.38)*                                  | 1.11 (0.95, 1.29)  | 1.16 (0.99, 1.33)  |
| Tokushima  | 16.3  | 15.5 | 15.8 | 1.68 (1.41, 1.98)*                                  | 1.54 (1.28, 1.82)* | 1.55 (1.29, 1.83)* |
| Kagawa     | 8.6   | 7.7  | 7.8  | 0.92 (0.74, 1.12)                                   | 0.81 (0.65, 1.00)  | 0.80 (0.64, 0.99)* |
| Ehime      | 10.0  | 10.8 | 10.9 | 1.04 (0.88, 1.22)                                   | 1.07 (0.91, 1.25)  | 1.10 (0.93, 1.27)  |
| Kochi      | 20.6  | 21.4 | 20.8 | 2.18 (1.86, 2.52)*                                  | 2.15 (1.84, 2.49)* | 2.07 (1.77, 2.39)* |
| Fukuoka    | 19.8  | 20.9 | 21.4 | 2.11 (1.98, 2.24)*                                  | 2.14 (2.01, 2.27)* | 2.15 (2.02, 2.28)* |
| Saga       | 12.0  | 12.6 | 13.9 | 1.28 (1.04, 1.54)*                                  | 1.29 (1.06, 1.54)* | 1.37 (1.14, 1.63)* |
| Nagasaki   | 19.2  | 19.9 | 18.8 | 2.04 (1.81, 2.28)*                                  | 2.03 (1.80, 2.27)* | 1.86 (1.65, 2.09)* |
| Kumamoto   | 11.6  | 11.2 | 10.6 | 1.23 (1.07, 1.40)*                                  | 1.16 (1.00, 1.32)* | 1.08 (0.94, 1.24)  |
| Oita       | 15.9  | 14.9 | 15.6 | 1.69 (1.46, 1.93)*                                  | 1.54 (1.32, 1.77)* | 1.58 (1.36, 1.80)* |
| Miyazaki   | 14.7  | 13.5 | 14.0 | 1.56 (1.33, 1.80)*                                  | 1.40 (1.19, 1.62)* | 1.43 (1.22, 1.66)* |
| Kagoshima  | 18.3  | 20.4 | 22.4 | 1.94 (1.73, 2.16)*                                  | 2.08 (1.87, 2.30)* | 2.25 (2.03, 2.48)* |
| Okinawa    | 19.3  | 18.3 | 19.6 | 2.05 (1.80, 2.31)*                                  | 1.90 (1.67, 2.15)* | 1.99 (1.76, 2.24)* |

CrI, credible interval.

\*Indicates a statistically significant difference from Japan's national mean

**eTable 9.** Potential determinants of the number of new long-stay psychiatric patients per 100,000 population by survey year

| Independent variable  | 2016 (Overall R <sup>2</sup> =0.92) |                         |                             | 2015 (Overall R <sup>2</sup> =0.91) |                         |                             | 2014 (Overall R <sup>2</sup> =0.89) |                         |                             |
|---|-------------------------------------|-------------------------|-----------------------------|-------------------------------------|-------------------------|-----------------------------|-------------------------------------|-------------------------|-----------------------------|
|   | r                                   | B (95% CI)              | R <sup>2</sup> <sup>a</sup> | r                                   | B (95% CI)              | R <sup>2</sup> <sup>a</sup> | r                                   | B (95% CI)              | R <sup>2</sup> <sup>a</sup> |
| Intercept   | —                                   | -14.95 (-24.99, -4.91)* | —                           | —                                   | -12.81 (-23.50, -2.11)* | —                           | —                                   | -15.70 (-27.45, -3.96)* | —                           |
| 1. Number of recipients of public assistance per 1,000 population   | 0.78                                | 0.29 (0.12, 0.45)*      | 0.24                        | 0.79                                | 0.33 (0.15, 0.50)*      | 0.25                        | 0.77                                | 0.30 (0.10, 0.49)*      | 0.23                        |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.24                                | 0.00 (-0.08, 0.09)      | 0.01                        | 0.24                                | 0.01 (-0.08, 0.10)      | 0.02                        | 0.21                                | -0.00 (-0.10, 0.09)     | 0.01                        |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.51                                | -0.00 (-0.01, 0.01)     | 0.07                        | 0.49                                | -0.00 (-0.01, 0.01)     | 0.07                        | 0.51                                | 0.00 (-0.01, 0.01)      | 0.08                        |
| 4. Number of psychiatric beds per 100, 000 population   | 0.72                                | 0.03 (0.02, 0.04)*      | 0.27                        | 0.70                                | 0.03 (0.02, 0.04)*      | 0.26                        | 0.70                                | 0.03 (0.02, 0.04)*      | 0.25                        |
| 5. Average length of stay in psychiatric beds, days   | 0.27                                | 0.01 (-0.01, 0.02)      | 0.04                        | 0.25                                | 0.01 (-0.01, 0.02)      | 0.03                        | 0.28                                | 0.01 (-0.01, 0.03)      | 0.04                        |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.24                               | 0.11 (-0.20, 0.42)      | 0.02                        | -0.26                               | 0.07 (-0.26, 0.39)      | 0.02                        | -0.25                               | 0.14 (-0.22, 0.50)      | 0.02                        |
| 7. Percentage of depopulated municipalities   | 0.39                                | -0.03 (-0.06, 0.01)     | 0.05                        | 0.36                                | -0.03 (-0.07, 0.00)     | 0.04                        | 0.36                                | -0.03 (-0.07, 0.01)     | 0.04                        |
| 8. Percentage of population living alone  | 0.54                                | 0.40 (0.10, 0.70)*      | 0.11                        | 0.55                                | 0.38 (0.06, 0.69)*      | 0.11                        | 0.56                                | 0.48 (0.13, 0.83)*      | 0.12                        |
| 9. Unemployment rate  | 0.50                                | 1.09 (-0.53, 2.71)      | 0.10                        | 0.51                                | 0.74 (-0.98, 2.47)      | 0.10                        | 0.48                                | 0.88 (-1.01, 2.77)      | 0.10                        |

CI, confidence interval.

\*  $P < 0.05$

<sup>a</sup>R<sup>2</sup> indicates a decomposition of overall R<sup>2</sup> in the multiple regression model. The sum of R<sup>2</sup> for all independent variables is equal to the overall R<sup>2</sup> in the model.

**eTable 10.** Age- and sex-standardized number of old long-stay psychiatric patients by prefecture and survey year, using direct and indirect methods

| Prefecture | Direct method, no. of admissions per 100,000 population |      |      | Indirect method, standardized claim ratio (95% CrI) |                    |                    |
|------------|---|------|------|---|--------------------|--------------------|
|            | 2016  | 2015 | 2014 | 2016  | 2015               | 2014               |
| Japan      | 15.8  | 16.5 | 17.2 | reference   | reference          | reference          |
| Hokkaido   | 24.8  | 26.2 | 27.8 | 1.55 (1.47, 1.63)*                                  | 1.56 (1.49, 1.65)* | 1.59 (1.51, 1.67)* |
| Aomori     | 13.3  | 14.3 | 14.5 | 0.83 (0.71, 0.95)*                                  | 0.85 (0.74, 0.97)* | 0.83 (0.72, 0.94)* |
| Iwate      | 11.2  | 11.9 | 12.1 | 0.69 (0.59, 0.81)*                                  | 0.70 (0.60, 0.81)* | 0.68 (0.58, 0.79)* |
| Miyagi     | 8.9   | 8.9  | 9.6  | 0.56 (0.49, 0.64)*                                  | 0.53 (0.46, 0.61)* | 0.55 (0.48, 0.63)* |
| Akita      | 18.6  | 19.0 | 20.5 | 1.15 (1.00, 1.30)*                                  | 1.13 (0.99, 1.28)  | 1.16 (1.02, 1.31)* |
| Yamagata   | 4.5   | 4.8  | 5.3  | 0.29 (0.22, 0.37)*                                  | 0.29 (0.22, 0.37)* | 0.31 (0.24, 0.39)* |
| Fukushima  | 12.0  | 11.8 | 13.0 | 0.74 (0.65, 0.84)*                                  | 0.70 (0.61, 0.79)* | 0.73 (0.64, 0.82)* |
| Ibaraki    | 16.3  | 16.5 | 17.8 | 1.03 (0.94, 1.12)                                   | 1.00 (0.91, 1.09)  | 1.03 (0.94, 1.12)  |
| Tochigi    | 20.5  | 20.5 | 20.8 | 1.28 (1.16, 1.41)*                                  | 1.23 (1.12, 1.35)* | 1.20 (1.09, 1.32)* |
| Gunma      | 7.3   | 7.6  | 8.4  | 0.46 (0.39, 0.54)*                                  | 0.46 (0.39, 0.53)* | 0.49 (0.42, 0.56)* |
| Saitama    | 10.6  | 10.9 | 11.1 | 0.67 (0.62, 0.72)*                                  | 0.66 (0.61, 0.71)* | 0.65 (0.60, 0.69)* |
| Chiba      | 13.3  | 15.2 | 15.3 | 0.83 (0.77, 0.89)*                                  | 0.91 (0.85, 0.97)* | 0.88 (0.82, 0.94)* |
| Tokyo      | 19.5  | 20.5 | 20.9 | 1.20 (1.15, 1.25)*                                  | 1.21 (1.16, 1.26)* | 1.18 (1.14, 1.23)* |
| Kanagawa   | 9.6   | 10.0 | 10.5 | 0.60 (0.56, 0.64)*                                  | 0.60 (0.56, 0.64)* | 0.60 (0.56, 0.64)* |
| Niigata    | 10.0  | 10.4 | 10.8 | 0.62 (0.55, 0.70)*                                  | 0.62 (0.54, 0.70)* | 0.62 (0.55, 0.70)* |
| Toyama     | 8.7   | 8.1  | 9.0  | 0.54 (0.44, 0.65)*                                  | 0.48 (0.39, 0.59)* | 0.51 (0.42, 0.62)* |
| Ishikawa   | 11.5  | 11.8 | 13.5 | 0.72 (0.60, 0.84)*                                  | 0.71 (0.60, 0.83)* | 0.78 (0.67, 0.91)* |
| Fukui      | 5.8   | 7.4  | 7.9  | 0.38 (0.28, 0.49)*                                  | 0.45 (0.35, 0.57)* | 0.47 (0.36, 0.59)* |
| Yamanashi  | 8.3   | 9.6  | 9.9  | 0.53 (0.42, 0.66)*                                  | 0.59 (0.47, 0.72)* | 0.58 (0.47, 0.71)* |
| Nagano     | 3.7   | 3.3  | 3.5  | 0.24 (0.19, 0.29)*                                  | 0.21 (0.16, 0.25)* | 0.21 (0.16, 0.26)* |
| Gifu       | 5.6   | 5.8  | 6.0  | 0.35 (0.29, 0.42)*                                  | 0.35 (0.29, 0.42)* | 0.35 (0.29, 0.42)* |
| Shizuoka   | 5.9   | 6.5  | 7.0  | 0.37 (0.33, 0.42)*                                  | 0.39 (0.34, 0.44)* | 0.40 (0.36, 0.45)* |
| Aichi      | 11.3  | 11.5 | 11.9 | 0.71 (0.66, 0.76)*                                  | 0.70 (0.65, 0.75)* | 0.70 (0.65, 0.74)* |
| Mie        | 12.3  | 14.2 | 14.7 | 0.77 (0.67, 0.87)*                                  | 0.85 (0.75, 0.96)* | 0.85 (0.75, 0.95)* |
| Shiga      | 6.5   | 7.2  | 7.1  | 0.41 (0.33, 0.50)*                                  | 0.43 (0.35, 0.52)* | 0.41 (0.33, 0.49)* |
| Kyoto      | 13.6  | 15.3 | 15.9 | 0.86 (0.77, 0.95)*                                  | 0.92 (0.84, 1.02)  | 0.92 (0.84, 1.01)  |
| Osaka      | 19.8  | 20.4 | 21.0 | 1.23 (1.18, 1.29)*                                  | 1.21 (1.16, 1.27)* | 1.21 (1.15, 1.26)* |
| Hyogo      | 13.3  | 14.1 | 14.4 | 0.83 (0.78, 0.90)*                                  | 0.84 (0.78, 0.90)* | 0.83 (0.77, 0.89)* |
| Nara       | 12.6  | 13.0 | 13.6 | 0.79 (0.68, 0.91)*                                  | 0.78 (0.68, 0.90)* | 0.79 (0.68, 0.90)* |
| Wakayama   | 13.2  | 13.1 | 13.9 | 0.83 (0.70, 0.97)*                                  | 0.79 (0.66, 0.92)* | 0.80 (0.68, 0.94)* |
| Tottori    | 8.4   | 7.0  | 8.3  | 0.52 (0.39, 0.67)*                                  | 0.43 (0.32, 0.57)* | 0.49 (0.37, 0.63)* |
| Shimane    | 7.3   | 7.4  | 8.8  | 0.47 (0.36, 0.60)*                                  | 0.45 (0.34, 0.57)* | 0.51 (0.39, 0.63)* |
| Okayama    | 10.2  | 11.2 | 12.2 | 0.64 (0.56, 0.74)*                                  | 0.68 (0.60, 0.78)* | 0.71 (0.63, 0.81)* |
| Hiroshima  | 14.6  | 14.4 | 15.3 | 0.91 (0.82, 1.00)*                                  | 0.86 (0.78, 0.94)* | 0.88 (0.80, 0.97)* |
| Yamaguchi  | 16.0  | 15.6 | 15.3 | 0.99 (0.87, 1.12)                                   | 0.94 (0.82, 1.06)  | 0.88 (0.77, 1.00)* |
| Tokushima  | 39.9  | 41.8 | 46.2 | 2.46 (2.20, 2.74)*                                  | 2.49 (2.23, 2.76)* | 2.61 (2.36, 2.88)* |
| Kagawa     | 19.1  | 19.4 | 20.5 | 1.19 (1.03, 1.36)*                                  | 1.14 (0.98, 1.30)  | 1.16 (1.01, 1.32)* |
| Ehime      | 13.7  | 13.8 | 14.5 | 0.85 (0.73, 0.97)*                                  | 0.82 (0.71, 0.94)* | 0.83 (0.72, 0.95)* |
| Kochi      | 26.4  | 28.5 | 29.1 | 1.62 (1.41, 1.85)*                                  | 1.69 (1.48, 1.91)* | 1.66 (1.45, 1.87)* |
| Fukuoka    | 37.1  | 38.4 | 39.9 | 2.31 (2.20, 2.42)*                                  | 2.29 (2.19, 2.40)* | 2.28 (2.19, 2.39)* |
| Saga       | 20.9  | 21.7 | 22.7 | 1.28 (1.10, 1.48)*                                  | 1.29 (1.11, 1.48)* | 1.30 (1.12, 1.48)* |
| Nagasaki   | 44.5  | 44.7 | 46.7 | 2.77 (2.56, 2.98)*                                  | 2.66 (2.46, 2.87)* | 2.68 (2.48, 2.88)* |
| Kumamoto   | 20.0  | 20.9 | 22.0 | 1.25 (1.13, 1.38)*                                  | 1.26 (1.14, 1.39)* | 1.27 (1.15, 1.40)* |
| Oita       | 39.5  | 42.0 | 43.1 | 2.46 (2.25, 2.69)*                                  | 2.50 (2.29, 2.72)* | 2.46 (2.25, 2.67)* |
| Miyazaki   | 24.2  | 27.7 | 29.5 | 1.52 (1.35, 1.70)*                                  | 1.65 (1.48, 1.84)* | 1.69 (1.52, 1.87)* |
| Kagoshima  | 39.7  | 41.9 | 43.3 | 2.47 (2.29, 2.66)*                                  | 2.51 (2.33, 2.69)* | 2.49 (2.32, 2.67)* |
| Okinawa    | 25.9  | 24.3 | 25.1 | 1.69 (1.51, 1.88)*                                  | 1.53 (1.37, 1.71)* | 1.50 (1.34, 1.67)* |

CrI, credible interval.

\*Indicates a statistically significant difference from Japan's national mean

**eTable 11.** Potential determinants of the number of old long-stay psychiatric patients per 100,000 population

| Independent variable  | 2016 (Overall R <sup>2</sup> =0.88) |                         |                  | 2015 (Overall R <sup>2</sup> =0.88) |                       |                  | 2014 (Overall R <sup>2</sup> =0.88) |                         |                  |
|---|-------------------------------------|-------------------------|------------------|-------------------------------------|-----------------------|------------------|-------------------------------------|-------------------------|------------------|
|   | r                                   | B (95% CI)              | R <sup>2 a</sup> | r                                   | B (95% CI)            | R <sup>2 a</sup> | r                                   | B (95% CI)              | R <sup>2 a</sup> |
| Intercept   | —                                   | -27.87 (-52.38, -3.36)* | —                | —                                   | -24.78 (-49.92, 0.36) | —                | —                                   | -27.72 (-54.34, -1.10)* | —                |
| 1. Number of recipients of public assistance per 1,000 population   | 0.62                                | 0.78 (0.38, 1.19)*      | 0.17             | 0.62                                | 0.85 (0.44, 1.27)*    | 0.17             | 0.61                                | 0.90 (0.46, 1.34)*      | 0.17             |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.19                                | 0.01 (-0.19, 0.22)      | 0.01             | 0.18                                | -0.03 (-0.24, 0.18)   | 0.01             | 0.20                                | 0.01 (-0.21, 0.24)      | 0.01             |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.44                                | -0.03 (-0.05, -0.01)*   | 0.06             | 0.44                                | -0.04 (-0.06, -0.01)* | 0.06             | 0.44                                | -0.04 (-0.06, -0.01)*   | 0.06             |
| 4. Number of psychiatric beds per 100, 000 population   | 0.73                                | 0.06 (0.04, 0.08)*      | 0.30             | 0.73                                | 0.06 (0.05, 0.08)*    | 0.30             | 0.74                                | 0.07 (0.05, 0.09)*      | 0.31             |
| 5. Average length of stay in psychiatric beds, days   | 0.52                                | 0.08 (0.04, 0.11)*      | 0.17             | 0.52                                | 0.08 (0.04, 0.11)*    | 0.16             | 0.52                                | 0.08 (0.04, 0.12)*      | 0.16             |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.25                               | -0.08 (-0.83, 0.68)     | 0.02             | -0.25                               | -0.14 (-0.91, 0.63)   | 0.02             | -0.23                               | -0.03 (-0.85, 0.79)     | 0.02             |
| 7. Percentage of depopulated municipalities   | 0.31                                | -0.08 (-0.16, 0.00)     | 0.04             | 0.32                                | -0.08 (-0.16, 0.01)   | 0.04             | 0.33                                | -0.09 (-0.18, -0.00)*   | 0.04             |
| 8. Percentage of population living alone  | 0.41                                | 0.41 (-0.32, 1.14)      | 0.06             | 0.42                                | 0.50 (-0.25, 1.24)    | 0.07             | 0.41                                | 0.46 (-0.33, 1.25)      | 0.07             |
| 9. Unemployment rate  | 0.32                                | -1.84 (-5.79, 2.11)     | 0.05             | 0.30                                | -2.91 (-6.96, 1.15)   | 0.05             | 0.29                                | -3.20 (-7.49, 1.09)     | 0.04             |

CI, confidence interval.

\*  $P < 0.05$ a R<sup>2</sup> indicates a decomposition of overall R<sup>2</sup> in the multiple regression model. The sum of R<sup>2</sup> for all independent variables is equal to the overall R<sup>2</sup> in the model.

**eTable 12.** Age- and sex-standardized number of dementia-related psychiatric admissions by prefecture and survey year, using direct and indirect methods

| Prefecture | Direct method, number of admissions per 100,000 population |      |      | Indirect method, standardized claim ratio (95% CrI) |                    |                    |
|------------|--|------|------|---|--------------------|--------------------|
|            | 2016   | 2015 | 2014 | 2016  | 2015               | 2014               |
| Japan      | 3.5  | 3.5  | 3.6  | reference   | reference          | reference          |
| Hokkaido   | 6.5  | 6.4  | 6.2  | 1.83 (1.66, 2.02)*                                  | 1.78 (1.60, 1.96)* | 1.71 (1.54, 1.88)* |
| Aomori     | 5.9  | 5.2  | 5.1  | 1.66 (1.33, 2.01)*                                  | 1.41 (1.12, 1.74)* | 1.39 (1.10, 1.71)* |
| Iwate      | 1.5  | 1.5  | 1.8  | 0.45 (0.29, 0.64)*                                  | 0.41 (0.26, 0.59)* | 0.49 (0.33, 0.69)* |
| Miyagi     | 3.0  | 3.4  | 3.6  | 0.84 (0.66, 1.05)                                   | 0.96 (0.76, 1.18)  | 0.99 (0.79, 1.21)  |
| Akita      | 3.5  | 2.9  | 2.7  | 0.97 (0.71, 1.26)                                   | 0.79 (0.57, 1.05)  | 0.72 (0.51, 0.97)* |
| Yamagata   | 1.5  | 1.0  | 1.1  | 0.44 (0.27, 0.64)*                                  | 0.32 (0.18, 0.49)* | 0.33 (0.19, 0.50)* |
| Fukushima  | 2.2  | 2.1  | 2.4  | 0.63 (0.47, 0.82)*                                  | 0.58 (0.43, 0.76)* | 0.68 (0.51, 0.87)* |
| Ibaraki    | 0.9  | 1.0  | 1.2  | 0.26 (0.17, 0.37)*                                  | 0.29 (0.19, 0.40)* | 0.35 (0.25, 0.48)* |
| Tochigi    | 1.3  | 1.3  | 1.1  | 0.39 (0.26, 0.55)*                                  | 0.38 (0.25, 0.54)* | 0.34 (0.22, 0.48)* |
| Gunma      | 1.2  | 1.1  | 1.3  | 0.37 (0.24, 0.52)*                                  | 0.34 (0.22, 0.48)* | 0.38 (0.26, 0.53)* |
| Saitama    | 2.0  | 2.2  | 2.0  | 0.55 (0.46, 0.65)*                                  | 0.62 (0.53, 0.73)* | 0.54 (0.45, 0.64)* |
| Chiba      | 1.9  | 2.0  | 2.3  | 0.54 (0.44, 0.64)*                                  | 0.56 (0.47, 0.67)* | 0.63 (0.52, 0.74)* |
| Tokyo      | 5.0  | 5.6  | 5.1  | 1.41 (1.30, 1.53)*                                  | 1.57 (1.45, 1.70)* | 1.41 (1.30, 1.53)* |
| Kanagawa   | 3.0  | 2.5  | 2.2  | 0.87 (0.77, 0.99)*                                  | 0.69 (0.60, 0.79)* | 0.62 (0.53, 0.71)* |
| Niigata    | 2.1  | 1.7  | 1.8  | 0.58 (0.44, 0.74)*                                  | 0.48 (0.35, 0.63)* | 0.48 (0.36, 0.63)* |
| Toyama     | 0.7  | 0.5  | 0.8  | 0.23 (0.11, 0.38)*                                  | 0.18 (0.08, 0.32)* | 0.26 (0.14, 0.43)* |
| Ishikawa   | 2.0  | 2.4  | 3.5  | 0.57 (0.37, 0.82)*                                  | 0.68 (0.46, 0.94)* | 0.95 (0.69, 1.26)  |
| Fukui      | 1.2  | 1.2  | 1.8  | 0.37 (0.19, 0.61)*                                  | 0.37 (0.19, 0.60)* | 0.51 (0.30, 0.78)* |
| Yamanashi  | 0.8  | 1.8  | 1.1  | 0.30 (0.14, 0.51)*                                  | 0.52 (0.31, 0.79)* | 0.35 (0.18, 0.57)* |
| Nagano     | 0.3  | 0.0  | 0.4  | 0.09 (0.04, 0.17)*                                  | 0.04 (0.01, 0.09)* | 0.12 (0.06, 0.21)* |
| Gifu       | 1.0  | 0.7  | 1.2  | 0.31 (0.20, 0.45)*                                  | 0.23 (0.14, 0.35)* | 0.35 (0.24, 0.50)* |
| Shizuoka   | 0.7  | 0.8  | 0.8  | 0.20 (0.13, 0.28)*                                  | 0.22 (0.15, 0.31)* | 0.23 (0.16, 0.32)* |
| Aichi      | 1.8  | 1.8  | 1.9  | 0.52 (0.43, 0.62)*                                  | 0.51 (0.42, 0.61)* | 0.53 (0.44, 0.62)* |
| Mie        | 1.8  | 2.3  | 2.2  | 0.52 (0.37, 0.71)*                                  | 0.64 (0.47, 0.85)* | 0.61 (0.44, 0.80)* |
| Shiga      | 2.7  | 2.8  | 2.1  | 0.77 (0.54, 1.04)                                   | 0.78 (0.55, 1.05)  | 0.60 (0.41, 0.84)* |
| Kyoto      | 4.7  | 5.6  | 6.8  | 1.34 (1.12, 1.59)*                                  | 1.53 (1.29, 1.79)* | 1.86 (1.60, 2.14)* |
| Osaka      | 5.1  | 5.2  | 5.4  | 1.44 (1.30, 1.58)*                                  | 1.46 (1.32, 1.60)* | 1.49 (1.36, 1.63)* |
| Hyogo      | 4.0  | 4.0  | 3.6  | 1.13 (0.99, 1.29)                                   | 1.13 (0.98, 1.28)  | 0.98 (0.85, 1.12)  |
| Nara       | 3.7  | 3.6  | 4.0  | 1.05 (0.79, 1.34)                                   | 0.99 (0.74, 1.28)  | 1.09 (0.83, 1.38)  |
| Wakayama   | 0.9  | 1.3  | 0.7  | 0.29 (0.15, 0.48)*                                  | 0.38 (0.22, 0.59)* | 0.24 (0.12, 0.40)* |
| Tottori    | 2.6  | 3.0  | 3.3  | 0.71 (0.42, 1.07)                                   | 0.85 (0.53, 1.23)  | 0.91 (0.59, 1.31)  |
| Shimane    | 2.2  | 2.3  | 3.0  | 0.64 (0.39, 0.93)*                                  | 0.66 (0.41, 0.95)* | 0.79 (0.52, 1.12)  |
| Okayama    | 3.6  | 3.7  | 3.6  | 1.01 (0.79, 1.25)                                   | 1.02 (0.80, 1.26)  | 0.98 (0.77, 1.21)  |
| Hiroshima  | 2.5  | 2.6  | 3.1  | 0.70 (0.55, 0.87)*                                  | 0.72 (0.56, 0.89)* | 0.84 (0.68, 1.03)  |
| Yamaguchi  | 3.5  | 3.8  | 3.7  | 0.97 (0.74, 1.23)                                   | 1.03 (0.80, 1.30)  | 1.02 (0.79, 1.28)  |
| Tokushima  | 5.5  | 6.1  | 5.1  | 1.46 (1.08, 1.89)*                                  | 1.57 (1.18, 2.02)* | 1.33 (0.97, 1.73)  |
| Kagawa     | 2.3  | 2.2  | 2.5  | 0.64 (0.42, 0.91)*                                  | 0.64 (0.42, 0.90)* | 0.70 (0.47, 0.97)* |
| Ehime      | 3.2  | 3.3  | 3.6  | 0.89 (0.67, 1.15)                                   | 0.89 (0.67, 1.15)  | 0.96 (0.73, 1.23)  |
| Kochi      | 6.3  | 7.5  | 5.7  | 1.74 (1.33, 2.21)*                                  | 2.02 (1.58, 2.51)* | 1.57 (1.19, 2.01)* |
| Fukuoka    | 8.8  | 9.1  | 9.8  | 2.48 (2.25, 2.72)*                                  | 2.51 (2.28, 2.75)* | 2.66 (2.43, 2.91)* |
| Saga       | 3.2  | 3.3  | 3.4  | 0.92 (0.62, 1.27)                                   | 0.93 (0.64, 1.28)  | 0.97 (0.68, 1.32)  |
| Nagasaki   | 4.7  | 4.5  | 5.2  | 1.32 (1.04, 1.63)*                                  | 1.24 (0.97, 1.54)  | 1.39 (1.11, 1.70)* |
| Kumamoto   | 5.2  | 4.6  | 4.2  | 1.46 (1.20, 1.75)*                                  | 1.33 (1.08, 1.60)* | 1.18 (0.95, 1.43)  |
| Oita       | 6.8  | 6.5  | 6.0  | 1.92 (1.56, 2.33)*                                  | 1.81 (1.46, 2.19)* | 1.65 (1.32, 2.01)* |
| Miyazaki   | 6.3  | 6.4  | 6.2  | 1.74 (1.38, 2.14)*                                  | 1.79 (1.43, 2.19)* | 1.72 (1.37, 2.11)* |
| Kagoshima  | 7.0  | 6.9  | 7.6  | 1.98 (1.66, 2.32)*                                  | 1.94 (1.63, 2.27)* | 2.09 (1.77, 2.43)* |
| Okinawa    | 9.8  | 7.6  | 9.9  | 2.73 (2.25, 3.25)*                                  | 2.08 (1.67, 2.53)* | 2.65 (2.19, 3.16)* |

CrI, credible interval.

\*Indicates a statistically significant difference from Japan's national mean

**eTable 13.** Potential determinants of the number of dementia-related psychiatric admissions per 100,000 population

| Independent variable  | 2016 (Overall R <sup>2</sup> =0.83) |                        |                             | 2015 (Overall R <sup>2</sup> =0.84) |                      |                             | 2014 (Overall R <sup>2</sup> =0.79) |                        |                             |
|---|-------------------------------------|------------------------|-----------------------------|-------------------------------------|----------------------|-----------------------------|-------------------------------------|------------------------|-----------------------------|
|   | r                                   | B (95% CI)             | R <sup>2</sup> <sup>a</sup> | r                                   | B (95% CI)           | R <sup>2</sup> <sup>a</sup> | r                                   | B (95% CI)             | R <sup>2</sup> <sup>a</sup> |
| Intercept   | —                                   | -6.90 (-13.25, -0.54)* | —                           | —                                   | -5.36 (-11.38, 0.65) | —                           | —                                   | -8.08 (-15.29, -0.87)* | —                           |
| 1. Number of recipients of public assistance per 1,000 population   | 0.81                                | 0.08 (-0.02, 0.19)     | 0.25                        | 0.83                                | 0.11 (0.02, 0.21)*   | 0.26                        | 0.78                                | 0.08 (-0.04, 0.20)     | 0.23                        |
| 2. Number of treated patients with mental disorders per 1,000 population                                  | 0.14                                | -0.02 (-0.08, 0.03)    | 0.01                        | 0.18                                | -0.02 (-0.07, 0.03)  | 0.01                        | 0.12                                | -0.03 (-0.09, 0.03)    | 0.01                        |
| 3. Number of patients receiving home visits for psychiatric nursing care per 100,000 population           | 0.44                                | 0.00 (-0.00, 0.01)     | 0.07                        | 0.43                                | 0.00 (-0.00, 0.01)   | 0.05                        | 0.45                                | 0.00 (-0.00, 0.01)     | 0.07                        |
| 4. Number of psychiatric beds per 100, 000 population   | 0.56                                | 0.01 (0.00, 0.01)*     | 0.15                        | 0.55                                | 0.01 (0.00, 0.01)*   | 0.15                        | 0.53                                | 0.01 (0.00, 0.01)*     | 0.13                        |
| 5. Average length of stay in psychiatric beds, days   | 0.10                                | -0.00 (-0.01, 0.01)    | 0.01                        | 0.10                                | -0.00 (-0.01, 0.01)  | 0.01                        | 0.10                                | -0.00 (-0.01, 0.01)    | 0.01                        |
| 6. Number of beds in institutions covered by long-term care insurance per 1,000 population aged ≥65 years | -0.27                               | 0.04 (-0.16, 0.23)     | 0.02                        | -0.30                               | 0.01 (-0.17, 0.20)   | 0.03                        | -0.24                               | 0.11 (-0.11, 0.34)     | 0.02                        |
| 7. Percentage of depopulated municipalities   | 0.31                                | 0.00 (-0.02, 0.02)     | 0.04                        | 0.31                                | -0.00 (-0.02, 0.02)  | 0.03                        | 0.29                                | -0.00 (-0.03, 0.02)    | 0.03                        |
| 8. Percentage of population living alone  | 0.54                                | 0.16 (-0.03, 0.35)     | 0.10                        | 0.63                                | 0.23 (0.05, 0.41)*   | 0.15                        | 0.57                                | 0.25 (0.04, 0.47)*     | 0.13                        |
| 9. Unemployment rate  | 0.65                                | 1.59 (0.57, 2.62)*     | 0.20                        | 0.59                                | 0.73 (-0.24, 1.70)   | 0.14                        | 0.60                                | 1.31 (0.15, 2.47)*     | 0.16                        |

CI, confidence interval.

\*  $P < 0.05$ <sup>a</sup> R<sup>2</sup> indicates a decomposition of overall R<sup>2</sup> in the multiple regression model. The sum of R<sup>2</sup> for all independent variables is equal to the overall R<sup>2</sup> in the model.

**eTable 14.** Differences in psychiatric admission data between the FSMA and the 630 survey

| Prefecture | Direct method, number of admissions per 100,000 population in the 630 survey |               |               |          | Differences in psychiatric admissions covered by public assistance per 100,000 population between the actual and expected number of admissions |               |               |          |
|------------|--|---------------|---------------|----------|--|---------------|---------------|----------|
|            | Total  | New long-stay | Old long-stay | Dementia | Total  | New long-stay | Old long-stay | Dementia |
| Japan      | 224.1  | 65.4          | 76.8          | 52.0     | —  | —             | —             | —        |
| Hokkaido   | 296.3  | 86.7          | 96.0          | 76.6     | 24.9   | 7.0           | 8.3           | 2.3      |
| Aomori     | 272.9  | 76.9          | 78.7          | 74.4     | 4.3  | 2.1           | 0.3           | 1.8      |
| Iwate      | 271.1  | 73.7          | 99.5          | 40.4     | -8.6   | -0.8          | -6.0          | -0.7     |
| Miyagi     | 230.2  | 75.1          | 70.7          | 71.5     | -7.5   | -1.1          | -2.4          | -1.0     |
| Akita      | 309.0  | 87.7          | 103.2         | 81.7     | -1.8   | -0.5          | 0.6           | -1.0     |
| Yamagata   | 266.2  | 78.5          | 72.9          | 69.0     | -18.5  | -4.0          | -7.3          | -2.3     |
| Fukushima  | 254.3  | 79.3          | 93.7          | 44.2     | -10.7  | -2.8          | -4.0          | -0.3     |
| Ibaraki    | 208.0  | 54.5          | 90.3          | 31.0     | 1.9  | 0.7           | 1.0           | -0.9     |
| Tochigi    | 224.8  | 63.2          | 98.9          | 34.0     | 5.7  | 0.4           | 3.4           | -0.6     |
| Gunma      | 232.7  | 63.7          | 95.2          | 35.1     | -15.6  | -3.8          | -9.0          | -0.8     |
| Saitama    | 185.6  | 56.1          | 57.3          | 65.1     | 0.5  | -0.7          | 2.0           | -1.6     |
| Chiba      | 154.5  | 44.4          | 63.4          | 28.9     | 7.4  | 1.2           | 3.5           | 0.2      |
| Tokyo      | 160.9  | 45.1          | 44.9          | 33.4     | 27.9   | 7.9           | 13.5          | 3.1      |
| Kanagawa   | 116.4  | 33.1          | 31.9          | 27.7     | 15.9   | 4.7           | 6.3           | 1.4      |
| Niigata    | 239.6  | 66.0          | 93.1          | 50.8     | -9.8   | -1.6          | -5.9          | -0.8     |
| Toyama     | 261.5  | 78.6          | 96.3          | 51.8     | -20.0  | -5.7          | -7.9          | -2.2     |
| Ishikawa   | 289.9  | 87.5          | 95.5          | 74.4     | -15.6  | -3.8          | -4.9          | -2.1     |
| Fukui      | 247.8  | 66.5          | 81.7          | 69.9     | -20.7  | -4.2          | -7.8          | -2.7     |
| Yamanashi  | 225.7  | 57.7          | 88.1          | 30.9     | -12.3  | -3.8          | -6.6          | -0.9     |
| Nagano     | 186.1  | 52.5          | 58.6          | 27.0     | -11.9  | -2.7          | -5.1          | -1.3     |
| Gifu       | 165.6  | 39.7          | 64.4          | 22.6     | -8.6   | -2.0          | -4.4          | -0.3     |
| Shizuoka   | 152.4  | 39.1          | 56.7          | 23.2     | -3.4   | -0.5          | -2.5          | -0.7     |
| Aichi      | 155.6  | 41.1          | 58.8          | 21.4     | 5.8  | 1.4           | 2.4           | 0.5      |
| Mie        | 226.1  | 65.7          | 86.5          | 45.0     | -3.7   | -2.0          | -2.3          | -0.7     |
| Shiga      | 152.0  | 45.1          | 50.2          | 42.5     | -4.0   | -2.3          | -0.6          | 0.3      |
| Kyoto      | 155.2  | 49.7          | 49.0          | 60.4     | 15.3   | 2.0           | 6.7           | 1.4      |
| Osaka      | 193.6  | 55.4          | 60.2          | 45.6     | 21.8   | 4.9           | 10.6          | 2.5      |
| Hyogo      | 188.2  | 53.6          | 64.0          | 41.2     | 9.4  | 2.2           | 3.4           | 1.7      |
| Nara       | 176.4  | 48.8          | 54.4          | 43.4     | 6.7  | 1.2           | 4.6           | 1.3      |
| Wakayama   | 168.9  | 45.0          | 73.1          | 10.3     | 6.0  | 1.1           | 1.4           | 0.2      |
| Tottori    | 270.4  | 85.3          | 82.2          | 73.7     | -12.9  | -3.4          | -5.3          | -1.4     |
| Shimane    | 271.4  | 78.6          | 82.1          | 48.9     | -18.4  | -3.0          | -6.4          | -0.5     |
| Okayama    | 230.9  | 71.4          | 65.1          | 66.8     | -2.4   | -0.8          | 0.0           | -0.1     |
| Hiroshima  | 276.6  | 84.3          | 92.9          | 63.9     | -5.9   | -1.9          | -1.3          | -1.1     |
| Yamaguchi  | 356.8  | 117.4         | 120.5         | 94.1     | -11.8  | -2.5          | -5.5          | -1.6     |
| Tokushima  | 405.2  | 107.3         | 197.5         | 44.6     | 13.5   | 3.8           | 2.7           | 3.0      |
| Kagawa     | 293.2  | 89.3          | 107.7         | 56.0     | -0.3   | -1.8          | 0.2           | -0.8     |
| Ehime      | 274.8  | 77.2          | 101.3         | 54.3     | -1.1   | 1.1           | -3.9          | 0.2      |
| Kochi      | 368.8  | 114.5         | 112.6         | 88.6     | 19.3   | 7.1           | 6.5           | 1.5      |
| Fukuoka    | 378.9  | 119.9         | 128.5         | 103.7    | 22.0   | 5.8           | 14.0          | 3.1      |
| Saga       | 451.2  | 150.0         | 137.9         | 117.6    | -19.8  | -5.6          | -4.2          | -3.1     |
| Nagasaki   | 473.8  | 140.5         | 184.3         | 93.4     | 14.4   | 2.7           | 9.9           | -0.4     |
| Kumamoto   | 431.4  | 123.9         | 154.3         | 107.1    | -11.8  | -3.0          | -8.4          | -0.7     |
| Oita       | 392.9  | 114.9         | 153.7         | 92.9     | 16.5   | 2.4           | 11.2          | 1.7      |
| Miyazaki   | 454.1  | 134.9         | 169.1         | 117.5    | -9.1   | -1.2          | -7.3          | -0.1     |
| Kagoshima  | 508.9  | 148.1         | 199.3         | 119.8    | 5.8  | 0.9           | 2.1           | 0.5      |
| Okinawa    | 402.1  | 123.2         | 120.5         | 99.5     | 20.8   | 4.8           | 4.4           | 4.4      |