Premature deaths among individuals with severe mental illness after discharge from long-term hospitalisation in Japan: a naturalistic observation during a 24-year period

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Background
Premature death in individuals with severe mental illness (SMI) in countries without nationally collected data, including Japan, is structurally underreported.

Aims
To elucidate excess mortality among individuals with SMI in Japan.

Method
We retrospectively investigated all deaths among users of a non-clinical community-based mental health service provider in suburban Tokyo from 1992 to 2015.

Results
During the study period, 45 individuals died among 254 qualified registrants. Deaths were by natural causes in 33 cases (73.3%). The mean years of life lost was 22.2 years and the overall standard mortality ratio (SMR) was 3.28 (95% CI 2.40–4.39). The cause-specific SMR was 5.09 (95% CI 2.33–9.66) for cardiovascular disease and 7.38 (95% CI 2.40–17.22) for suicide.

Conclusions
Although Japan leads the world in longevity, individuals with SMI suffer premature death and excess mortality due to physical conditions as well as suicide. Revealing this underreported disparity of life is the first step to improving physical care for individuals with SMI.

Declaration of interest
S.K. received personal fees from Pfizer and Dainippon-Sumitomo, outside the submitted work, and was a medical adviser to Sudachi-kai. Y.K. received grants from Japan Foundation for Neuroscience and Mental Health (JFNMH), during the conduct of the study, and personal fees from Dainippon-Sumitomo, outside the submitted work. K.K. received grants from Japan Society for the Promotion of Science (JSPS) and Japan Agency for Medical Research and Development (AMED), during the conduct of the study; personal fees from Daiichi-Sankyo, Otsuka, Meiji-Seika Pharma, Yoshitomi, Mochida and Fuji-Film RI Pharma; grants and personal fees from MSD, Astellas, Dainippon-Sumitomo and Eisai; and grants from Lily, Takeda and Tanabe-Mitsubishi, outside the submitted work.

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Premature deaths among individuals with severe mental illness (SMI) are extensively documented. However, most evidence originates from countries with an available large database or national registry. Little is known regarding this issue in countries without nationally collected data, including Japan. We aimed to elucidate excess mortality among individuals with SMI in Japan.

Method
We retrospectively investigated all deaths among users of a non-clinical community-based mental health service provider in suburban Tokyo from 1992 to 2015.

Results
During the study period, 45 individuals died among 254 qualified registrants. Deaths were by natural causes in 33 cases (73.3%). The mean years of life lost was 22.2 years and the overall standard mortality ratio (SMR) was 3.28 (95% CI 2.40–4.39). The cause-specific SMR was 5.09 (95% CI 2.33–9.66) for cardiovascular disease and 7.38 (95% CI 2.40–17.22) for suicide.

Conclusions
Although Japan leads the world in longevity, individuals with SMI suffer premature death and excess mortality due to physical conditions as well as suicide. Revealing this underreported disparity of life is the first step to improving physical care for individuals with SMI.
Results

During the study period, there were 254 qualified registrants (1983 person-years). Average age at entry was 50.0 years (s.d.=11.8). The living statuses of 180 registrants (1526 person-years) were confirmed at the end of 2015, whereas those who became untraceable were included until the time at which they left the service (457 person-years). Among these, 45 individuals (31 men and 14 women) died during the study period. All of the deceased had an SMI under treatment (schizophrenia 39, other psychotic disorder 1, bipolar disorder 3, depression 1 and other 1). Among the deceased, the cumulative length of the psychiatric hospital stay ranged from 1.1 to 47.8 years, with an average of 15.6 years (s.d.=12.0). The mean age at death was 63 years (men, 63.2 years; women, 62.6 years). The mean YLL was 22.2 years (men, 20.5 years; women, 26.0 years). The leading causes of death included cancer of any origin (10 (22.2%)), cardiovascular disease (9 (20.0%)) and suicide (5 (11.1%)). Natural causes were responsible for 33 (73.3%) of the deaths. Sudden death occurred in one-third of the deaths (15 (33.3%)). The death was unattended for 12 individuals (26.7%).

Among the deceased, 42 individuals (93%) had been living either independently or semi-independently; 39 (87%) had received social welfare or disability benefits (or both). Majority of the deceased (27 (60.0%)) had regularly visited non-psychiatric physicians for chronic conditions such as diabetes and hypertension. Twenty-two individuals (49%) were smokers at the time of death.

The overall SMR of the study group was 3.28 (95%CI 2.40–4.39). The gender-specific SMR was 2.85 (95%CI 1.93–4.04) for men and 4.98 (95%CI 2.72–8.35) for women. The cause-specific SMR was 1.94 (95%CI 0.93–3.57) for cancer, 5.09 (95%CI 2.33–9.66) for cardiovascular disease and 7.38 (95%CI 2.40–17.22) for suicide.

Detailed results are summarised in Table 1.

Discussion

We found that the individuals with SMI died approximately 20 years early relative to the general population, mostly from natural causes. The overall and gender-specific SMRs were significantly elevated, as well as those for cardiovascular disease and suicide. These results are consistent with the previous literature,7 and for the first time, they demonstrate the premature death of individuals with SMI in the world’s leading country for longevity.

Few reports exist regarding excess mortality in individuals with SMI in Japan, all of which are based on hospital records prior to the 1980s.10 The lack of publications after this era may be due to methodological limitations related to a difficulty in linking psychiatric patients with vital statistics in Japan. Moreover, the OECD Reviews of Health Care Quality8 pointed out that Japan is unable to report on any of the indicators collected under the OECD Health Care Quality Indicator collection for mental health. This lack of database infrastructure may itself reflect a structural neglect of this population.

This study has several limitations. First, this is a small, single-centre study, which may limit generalisation. Additionally, the average age of 50 years at entry suggests that the study group may reflect a survival group from earlier potential deaths, particularly from suicide. However, this study can be generalised to some extent, because such individuals illustrate a typical picture of a socially marginalised life course after discharge from long-term hospitalisation in a real-world setting. Although this study included incomplete data from those who became untraceable, it does provide some evidence on the mortality gap in the absence of alternative available data.

The strengths of this study include its ability to offer personal information that would not appear in large-scale population-based data. The fact that the majority of the deceased regularly visited physicians in addition to usual psychiatric visits may indicate that access to physical healthcare was apparently provided, but not in an integrative and effective way.9 In countries such as Japan, where physical and mental healthcare systems are dichotomised, multilevel actions under strong leadership are necessary to facilitate communication and improve physical care for individuals with SMI.10 Revealing this underreported disparity of life is the first step.

Table 1  Registrant characteristics and computed standard mortality ratios (SMRs)

| Cause of death       | Total n (%) | SMR (95% CI) |
|----------------------|-------------|--------------|
| Natural death        | 33 (73.3%)  | 3.28 (2.40–4.39) |
| Cancer               | 10 (22.2%)  | 1.94 (0.93–3.57) |
| Cardiovascular disease | 9 (20.0%) | 5.09 (2.33–9.66) |
| Other diseases       | 14 (31.1%)  | 1.94 (0.93–3.57) |
| Suicide              | 5 (11.1%)   | 7.38 (2.40–17.22) |
| Accident             | 2 (4.4%)    | –             |
| Unknown              | 5 (11.1%)   | –             |

| Accommodation after discharge       | Total n (%) | SMR (95% CI) |
|-------------------------------------|-------------|--------------|
| Independent living                  | 17 (37.8%)  | 2.85 (1.93–4.04) |
| Group home                          | 25 (55.6%)  | 4.98 (2.72–8.35) |
| Nursing home                        | 2 (4.4%)    | 1.94 (0.93–3.57) |
| Living with family                  | 1 (2.2%)    | 1.94 (0.93–3.57) |

| Marital status                      | Total n (%) | SMR (95% CI) |
|-------------------------------------|-------------|--------------|
| Never married                       | 22 (48.9%)  | 2.85 (1.93–4.04) |
| Married (including divorced)        | 13 (28.9%)  | 4.98 (2.72–8.35) |
| Unknown                             | 10 (22.2%)  | 1.94 (0.93–3.57) |

| Cigarette smoking                   | Total n (%) | SMR (95% CI) |
|-------------------------------------|-------------|--------------|
| Smoker                              | 22 (48.9%)  | 2.85 (1.93–4.04) |
| Non-smoker                          | 18 (40.0%)  | 4.98 (2.72–8.35) |
| Unknown                             | 5 (11.1%)   | 1.94 (0.93–3.57) |

| Medical treatment                   | Total n (%) | SMR (95% CI) |
|-------------------------------------|-------------|--------------|
| Regular psychiatric visits          | 45 (100.0%) | 2.85 (1.93–4.04) |
| Regular medical visits              | 27 (60.0%)  | 4.98 (2.72–8.35) |
| Unattended death                    | 12 (26.7%)  | 1.94 (0.93–3.57) |

95% CI, confidence interval; SMR, standard mortality ratio.
Premature deaths in severe mental illness after discharge from long-term hospitalisation

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