Changes in institutional psychiatric care and suicidal behaviour: a follow-up study of inpatient suicide attempters in Bærum, Norway

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Received: 26 June 2008 / Accepted: 30 January 2009 / Published online: 27 February 2009
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Abstract

Background During the past decades, extensive reformatory changes in institutional psychiatric care have been implemented in Norway.

Aims The objective of the present study was to investigate whether these changes have resulted in shortened length of psychiatric hospital stays for suicide attempters. Further, to examine if length of hospital stay and time period in which the patients received treatment were related to the risk of a repeated suicide attempt and/or committing suicide.

Methods All cases of suicide attempters hospitalised between 1984 and 2006 in the municipality of Bærum, a suburb outside Oslo, were examined. The period of observation was further subdivided in two time intervals on the basis of the deinstitutionalisation of psychiatric care, which started to plateau in 1996.

Results Among 1,574 patients consecutively admitted to the local general hospital after a suicide attempt, 330 were admitted to inpatient psychiatric care. Patients admitted in the period 1996–2006 had significantly shorter hospital stays than patients in the preceding period 1984–1995 (Log Rank P < 0.001). Neither the time period of treatment variable nor the length of hospital stay variable was significantly associated with the risk of a repeated suicide attempt or suicide.

Conclusions Psychiatric de-institutionalisation appears as not having affected suicide attempt repetition. It is possible that reduced length of hospital stay has been compensated by improved mental health care in general and extended outpatient services in particular.

Keywords Suicide · Suicide attempt repetition · Mental health services · Length of stay · De-institutionalisation

Introduction

Severe mental illness requiring hospitalisation and history of a previous suicide attempt are among the strongest known risk factors for suicide [5, 10, 12, 13, 15, 26, 29]. In a population-based nested case-control register study, Mortensen and co-workers [12] reported that almost 50% of the individuals who committed suicide had been or were, at the time of death, psychiatric inpatients. In an unselected cohort study, Ostamo and Lonqvist [13] reported that male suicide attempters had 55 times the risk of committing suicide when compared with the general male population, while female suicide attempters had 77 times the risk of committing suicide when compared with the general female population.

The risk of committing suicide after psychiatric hospitalisation has consistently been found to peak in the immediate post-discharge period [2, 4, 9, 19]. In another nested case-control study, Qin and Nordenstedt [20] reported that patients who had shorter than median length of
hospital treatment had an increased risk of committing suicide. The authors suggested that premature discharge and incomplete recovery might explain the observed additional suicide risk in the immediate post-discharge period. On the other hand, Ho [7], in a retrospective population-based cohort study, found no support for ‘the premature discharge hypothesis’: Individuals hospitalised for less than 15 days had significantly lower suicide rates than longer-stay patients. However, long-stay patients can also be prematurely discharged. Neither Qin and Nordentoft nor Ho studied the possible period effect of a trend towards shorter stays for both short- and long-stay patients.

The number of premature discharges may have increased in Norway due to the hospital beds reduction policy; fewer beds may make it difficult to balance the needs of admitted patients against those demanding access [6]. Shorter hospital stays and incomplete recovery might particularly be ill-fated for psychiatric hospitalised suicide attempters, given the known increase in suicide risk characterising this patient group.

In Norway, the process of de-institutionalisation began in the mid-1970s with a reorganisation of the psychiatric services based on the principles of decentralisation, entailing a shift from the traditional treatment of psychiatric patients in large state hospitals to treatment at the county and local community level [11]. The rationale was based on the assumption that decentralised and outpatient care would be more caring, integrative and therapeutically successful than the traditional state hospital care [22]. During the 1980s, the number of beds in adult psychiatric health care was reduced by approximately 35%, from 12,000 beds by the end of 1980 to 7,750 by the end of 1990 [28]. The downsizing continued throughout the 1990s, although at a slower pace. However, it was mainly beds in psychiatric nursing homes that were reduced during the 1990s, the reduction of beds in psychiatric hospitals flattened out by the mid-1990s. The capacity in various outpatient psychiatric services increased substantially throughout the 1990s, from 93 consultations per 1,000 inhabitants in 1990 to 156 in 2000 [24].

In a ministerial report dated 1996–1997, Norwegian health authorities expressed concern related to the mental health reform [22]. Although the aptness of closing psychiatric state hospitals was emphasised, it was also underlined that too few alternative services had been established in substitution of hospital facilities. The report concluded by stating that the present Norwegian mental health care system had deficiencies at several levels: (1) prevention efforts were not extensive; (2) community services and availability of psychiatric specialists were not adequate; (3) mean length of stay in psychiatric institutions was too short; and (4) discharges were often inadequately planned and the follow-up observation in general, was insufficient [22].

A plan for improvement in mental health prevention efforts and services was ratified by the Norwegian parliament in 1999, with targets to be fully reached by the end of 2008 [18]. During 2000–2006, the number of outpatient consultations doubled (from 156 to 314 per 1,000 inhabitants) and the total number of person-years in psychiatric wards increased from 14,147 to 16,533 [25]. However, the number of beds in adult psychiatric institutions continued to decrease, from 5,781 in the year 2000 to 4,990 in 2006 [25].

To the best of our knowledge, no studies have been published on how the extensive structural changes in the mental health services during the past 30 years have affected the vulnerable population of psychiatric hospitalised suicide attempters. Based on a sample of individuals hospitalised after a suicide attempt, the aims of the present study were: (1) to investigate if the length of psychiatric hospital stay had decreased in the mental health de-institutionalisation period 1996–2006 when compared with the preceding period 1984–1995; and (2) to examine if the length of hospital stay and the time period of treatment were related to the risk of repeating a suicide attempt and/or committing suicide.

Methods

Unselected cases were patients admitted to the general hospital of Bærum, Norway, between 1 January 1984 and 31 December 2006 after a suicide attempt. The municipality of Bærum is a suburb located on the outskirts of Oslo, the capital of Norway [23]. It is characterised by a higher population density, a higher income and education level for both men and women, and a lower unemployment rate than the national average. The mean population of Bærum above the age of 15 in the period 1984–1995 was 71,237 individuals (34,306 males and 36,931 females) and 80,044 individuals in the period 1996–2006 (38,341 males and 41,704 females). Eligible cases were all patients admitted to inpatient care at the local psychiatric hospital following medical treatment at the general hospital. The personal identifier, an eleven numbered code which comprises a person’s date of birth and a unique national identification number, was used to retrieve and merge individual data. On the basis of the reform that involved psychiatric de-institutionalisation starting with 1996, observations were separately performed on the period 1984–1995 and 1996–2006.

Data on the study cases were collected in three stages. First, data were consecutively collected from 1984 [3]. The definition of suicide attempt was assimilated to the one of ‘parasuicide’ used in the WHO/EURO Multicentre Study on Suicidal Behaviour: “An act with nonfatal outcome, in
which an individual deliberately initiates a non-habitual behaviour that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognised therapeutic dosage, and which is aimed at realising changes which the subject desired via the actual or expected physical consequences” [17]. Secondly, by linking the personal identifier of individuals to the medical record base of the local psychiatric hospital, information on length of hospital stay and psychiatric diagnoses according to ICD 9 and ICD 10 codes were obtained. Thirdly, information on mortality of all causes was collected by linking the personal identifier of suicide attempters to the computerised causes of death registry at Statistics Norway.

In order to perform the investigation, permission was sought and obtained from the Norwegian Data Inspectorate, The Regional Committee for Medical Research Ethics (REK), the Norwegian Directorate of Health and the Data Handling Treaty between the Hospital of Asker & Bærum and the Norwegian Institute of Public Health.

Statistical analyses

In case of suicide attempt repeaters, in order to avoid duplication of observations, only the first recorded suicide attempt leading to psychiatric admission in Bærum was included in the analysis. Length of inpatient psychiatric stay was measured in days from the date of admittance to the date of discharge. A Log Rank test was applied to decide statistically whether the length of stay in the two periods during (1984–1995) and after (1996–2006) the process of de-institutionalisation were significantly different, and Kaplan–Meier survival curves were used to illustrate the length of stay in the two periods.

Logistic regression analyses were applied to predict suicide attempt repetition. Assuming that it is not reasonable to attribute repeated suicide attempts which occur years after discharge to shortages at the hospital ward level, a repeated suicide attempt was defined as a new suicide attempt within twelve months after discharge from psychiatric hospitalisation. Data on suicide attempts in 2007 were added to the analyses in order to predict repetition for patients hospitalised in 2006. The explanatory variables applied were time period of admittance, length of hospital stay, sex, age, discharge diagnosis, marital status and employment status. The model-building strategies for regression analysis recommended by Hosmer and Lemeshow [8] were used.

Descriptive analyses and Kaplan–Meier survival curves, illustrating the time in days from discharge until death by suicide, in the two time periods were computed. Assuming that the last psychiatric hospital stay would be the most important stay in relation to suicide, only the last suicide attempt from each individual with multiple attempts leading to psychiatric hospitalisation was included in the analyses. Consequently, the last date of hospital admission determined the period categorisation. The last year of information from the death registry was 31 December 2003.

Results

By 31 December 2006, 1,574 individuals above the age of 15 had 2,320 suicide attempts. Of these 1,574 individuals, 949 were from the time period 1984–1996 and 625 from the time period 1996–2006. Among the 1,574 individuals, 330 were identified to have been admitted to inpatient psychiatric care after somatic treatment for their suicide attempt. Of these 330 individuals, 128 were from the time period 1984–1995 and 202 from the time period 1996–2006. Individuals admitted in the first period had significantly longer hospital stays than individuals admitted in the second period (Log Rank \(P < 0.001\), patient/days analysed from 0 and censored at 365 days) (Fig. 1). The length of hospital stay was also significantly different in the two periods both when patient/days were censored at 100 days (\(P < 0.001\)) and when patient/days were analysed from 100 to 365 days (\(P < 0.02\)), which means that length of stay was reduced for both short- and longer-stay patients in the second period. The median length of stay in the first period was 31 days (95% CI = 20.8–41.2), whereas the median stay in the second period was 19 days (95% CI = 14.5–23.5).

In the period 1984–1995, 23 (18%) individuals repeated a suicide attempt within 12 months after discharge, whereas 27 (13%) individuals repeated a suicide attempt in the period 1996–2006 (Table 1). Both the length of hospital treatment (adjusted OR = 0.99; 95% CI = 0.98–1.00) and the period in which the individuals received treatment (adjusted OR = 0.72; 95% CI = 0.28–1.83)
failed to predict suicide attempt repetition (Table 2). Sex, diagnoses and marital status were significantly associated with the odds of a suicide attempt repeat ($P < 0.05$): Being male reduced the odds of a repeat by 61%, whereas having a personality disorder and being divorced or separated increased the odds of a repeated attempt 3.47 and 4.22 times, respectively.

Data were analysed separately for men and women. For women, who constituted 80% of the cases (Table 1), results were very similar to those described above, except that the length of hospital stay variable became significant at the 10% probability level.

In the period 1984–2003, 257 individuals were discharged from inpatient psychiatric care after a suicide attempt. Among those individuals, 47 (18%) died during follow up—in 16 cases (6.2%) due to suicide. The most

| Table 1 Suicide attempt repetition by sex and hospitalisation period |
|-------------------|-------------------|------------------|------------------|
|                  | Men              | Women            | Total            |
|                  | $N$ Cases (%)    | $N$ Cases (%)    | $N$ Cases (%)    |
| 1984–1995        | 44 6 (13.6)      | 84 17 (20.2)     | 128 23 (18)      |
| 1996–2006        | 62 4 (6.5)       | 140 23 (16.4)    | 202 27 (13.4)    |
| Total            | 106 10 (9.4)     | 224 40 (17.9)    | 330 50 (15.1)    |

| Table 2 Logistic regression analysis predicting suicide attempt repetition |
|--------------------------|-----------------|-----------------|-----------------|
| Variable                 | Crude analysis  | Adjusted analysis I | Adjusted analysis II |
|                          | OR 95% CI       | OR 95% CI        | OR 95% CI        |
| Sex                      |                 |                 |                 |
| Female                   | 1.00            | 1.00            | 1.00            |
| Male                     | 0.48* 0.23–1.00 | 0.37 0.14–1.01  | 0.39* 0.16–0.95 |
| Age                      | 1.00 0.98–1.01  | 1.04 0.99–1.08  |                 |
| Period of treatment      |                 |                 |                 |
| 1984–1995                | 1.00            | 1.00            |                 |
| 1996–2006                | 0.70 0.38–1.29  | 0.72 0.28–1.83  |                 |
| Length of hospital stay  |                 |                 |                 |
| 1.00 0.93–1.00           | 0.99 0.98–1.00  |                 |                 |
| Diagnosis                | 1.00            | 1.00            |                 |
| Other diagnoses          | 1.00            | 1.00            |                 |
| Psychosis                | 1.79 0.61–5.27  | 1.72 0.38–7.72  | 1.56 0.47–5.18  |
| Mood disorders           | 1.18 0.43–3.26  | 0.59 0.17–2.01  | 0.99 0.34–2.87  |
| Personality disorders    | 3.72** 1.43–9.66| 4.15* 1.23–14.0| 3.47* 1.26–9.57 |
| Substance abuse          | 2.24 0.65–7.73  | 2.12 0.51–8.88  | 2.31 0.63–8.50  |
| Marital status           |                 |                 |                 |
| Married/cohabiting       | 1.00            | 1.00            | 1.00            |
| Single                   | 2.23 0.93–5.34  | 1.93 0.58–6.45  | 2.11 0.82–5.44  |
| Widow(er)                | 2.47 0.68–9.05  | 4.05 0.70–23.4  | 3.40 0.86–13.4  |
| Divorced/separated       | 4.20** 1.65–10.7| 2.87 0.90–9.13  | 4.22** 1.53–11.6|
| Employment               |                 |                 |                 |
| Employed                 | 1.00            | 1.00            | 1.00            |
| Unemployed/disabled      | 2.02 0.90–4.54  | 1.65 0.61–4.49  |                 |
| Student/pupil            | 1.77 0.55–5.74  | 2.46 0.53–11.4  |                 |
| Others                   | 0.44 0.15–1.34  | 0.31 0.07–1.50  |                 |

* $P < 0.05$; ** $P < 0.01$
frequent discharge diagnoses among the individuals who committed suicide were mood disorders (6/16) and personality disorders (4/16). Among the 116 patients discharged in the period 1984–1995, 11 (9.5%) committed suicide whereas 5 out of 141 (3.5%) patients committed suicide in the period 1996–2003 (RR = 2.71). As can be seen in Fig. 2, the time in days from discharge until death by suicide is relatively extensive: the median time from discharge until death was 635 days (95% CI = 0.00–1,549) in the period 1984–1995 and 829 days (95% CI = 0.00–2,373) in the period 1996–2003. Thus, it is not reasonable to infer that possible premature discharges or other shortages in the hospital treatment were important contributory factors in causing the suicides. If this was the case, one would have expected suicides to occur relatively soon after discharge.

Discussion

The objective of the present study was to examine if length of psychiatric hospital stays among suicide attempters had been reduced due to the hospital beds contraction policy. Another aim was to examine if length of stay and time period in which the patient received treatment were associated with the risk of future suicidal behaviour. Patients admitted in the period 1996–2006 had significantly shorter hospital stays than patients admitted in the preceding period 1984–1995. Despite the increased likelihood of incomplete recovery as a result of shortened hospital stay, data showed neither a significant association between length of stay and risk of future suicidal behaviour nor between period of treatment and subsequent suicidal behaviour. Further, the time in days from discharge until death by suicide was relatively extensive in both periods, which makes it unlikely that the suicides can be substantially attributed to shortcomings at the psychiatric hospital ward level.

However, more individuals were admitted to inpatient psychiatric treatment in the second period than the first. This finding could be interpreted as a negative consequence of the de-institutionalised services. It might be hypothesised that shortened length of hospital stays increases the pressure on outpatient services, which in turn may result in reduced treatment opportunities for the less mentally ill individuals. Eventually, this may lead to illness escalation, increased probability of suicide attempt and inpatient admittance. An alternative interpretation could be that the finding reflects a clinical practice change towards reduced threshold for admitting suicidal individuals. Pirkola and co-workers [16], studying the relation between de-institutionalisation and suicide risk in Finland, found a service trend towards more treated individuals in the de-institutionalised period. The same trend can be seen in Norwegian service statistics: The number of discharges increased by 67% in the time period 1990–2000 [28].

Due to the small number of cases eventually involved, the possibility of a type II error was examined. Thus, it could be hypothesised that increasing the length of hospital treatment may to a certain extent have a protective effect on suicide attempt repetition, at least for women. When women were analysed separately, data indicated that a 10 days increase in the length of hospital stay reduced the adjusted odds of repeating a suicide attempt by 10%. However, the argument also holds for the time period of treatment variable. The data indicated that individuals who received treatment in the period 1996–2006 when compared with the period 1984–1995 had a 28% decrease in the adjusted odds of making a suicide attempt repetition. Consequently, although the length of hospital stay has decreased significantly during the study period, and the fact that long hospital stays may have a protective impact on the risk of repeating a suicide attempt, data indicated that suicide attempters who received treatment in the period 1996–2006 did not have an increased risk of suicide attempt repetition. A reasonable interpretation may be that the extensive reduction in psychiatric beds has been compensated by improved mental health-care services in general and extended outpatient mental health services in particular. Both the number of outpatient consultations and the total number of person-years in psychiatric institutions increased substantially in the de-institutionalised period (1996–2006) [25]. Further, the use of unskilled personnel in mental health services decreased by the end of the 1990s [14]. In addition, the Norwegian parliament ratified a plan in 1994 which aimed at making the health services better equipped to reduce suicide [27].

The elevated risk of suicide that characterises the population of suicide attempters [13, 29] was also confirmed in the present study. Between 1984 and 2003, 18% of the suicide attempters hospitalised in a psychiatric ward died,
in one third of these cases due to suicide. Given that suicide did not occur in the immediate post-discharge period, it may be hypothesised that suicidal behaviour vulnerability continues beyond the point of clinical recovery, or that patients relapse after treatment has ended. Either way, it may be wise to continue the follow up of high risk patients far beyond clinical recovery, as suggested by Appleby and co-workers [1]. In addition, Hawton and co-workers [5] found a persistent risk of suicide following deliberate self-harm. Both studies’ results are in line with the findings of the present investigation, which underlines the need for a long-term follow-up.

In Finland, researchers have reported a reduced suicide risk among psychiatric inpatients in the post de-institutionalised period [16, 21]. In a nationwide register study, Pirkola and co-workers [16] found both an immediate and a 1 year post-discharge reduction in suicide risk among several diagnostic categories, which led the researchers to conclude that the downsizing of psychiatric hospitals had been a success. Although the results in the present study do not allow for a similar conclusion, it seems justifiable to say that the mental health reform in Norway has not worsened the prognosis of hospitalised suicide attempters.

However, in interpreting the results of our study, caution should be paid because of the small number of cases involved. Also, the categorisation pre- and post-de-institutionalisation is to some extent artificial. Moreover, it might be hypothesised that shortened length of hospital stay increases the pressure on outpatient services, which in turn may result in reduced treatment opportunities for the less mentally ill suicide attempters. Nevertheless, the focus of the present study was to examine if the length of hospital stay among suicide attempters had been reduced as a consequence of the psychiatric reform, and if such a reduction would influence the risk of future suicidal behaviour. In that respect, the timeframes chosen to represent the period prior and after the de-institutionalisation seem to be sensible, given that the process of downsizing hospital bed numbers began to flatten out by the mid-1990s.

Conclusions

The length of stay in psychiatric hospital of suicide attempters decreased significantly after the institutional reform in Norway. Even considering that reduced length of hospital stay might increase the likelihood of incomplete recovery, our data show that this was not significantly associated with the risk of subsequent suicidal behaviour. It is probable that the shortened length of stay was compensated by improved mental health care, particularly through the development of outpatient services.

Acknowledgments

This study was funded by the Research Council of Norway. The authors thank Professor Bjørgulf Claussen and Melanie Straiton for valuable comments on earlier versions of the manuscript.

Conflict of interest statement

None.

References

1. Appleby L, Dennehv JA, Thomas CS, Faragher EB, Lewis G (1999) Aftercare and clinical characteristics of people with mental illness who commit suicide: a case-control study. Lancet 353:1397–1400
2. Crawford MJ (2004) Suicide following discharge from in-patient psychiatric care. Adv Psychiatr Treat 10:434–438
3. Dieserud G, Loeb M, Ekeberg O (2000) Suicidal behavior in the municipality of Baerum, Norway: a 12-year prospective study of parasuicide and suicide. Suicide Life Threat Behav 30:61–73
4. Goldacre M, Seagroatt V, Hawton K (1993) Suicide after-discharge from psychiatric inpatient care. Lancet 342:283–286
5. Hawton K, Zahl D, Weatherall R (2003) Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. Br J Psychiatry 182:537–542
6. Heggestad T (2001) Operating conditions of psychiatric hospitals and early readmission—effects of high patient turnover. Acta Psychiatr Scand 103:196–202
7. Ho TP (2006) Duration of hospitalization and post discharge suicide. Suicide Life Threat Behav 36:682–686
8. Hosmer DW, Lemeshow S (2000) Applied logistic regression. Wiley, New York
9. Isometsa E, Henriksson M, Heikkinen M, Lonnqvist J (1993) Suicide after-discharge from psychiatric inpatient care. Lancet 342:1055–1056
10. Kan CK, Ho TP, Dong JYS, Dunn ELW (2007) Risk factors for suicide in the immediate post-discharge period. Soc Psychiatry Psychiatr Epidemiol 42:208–214
11. Lavik NJ (1987) Trends in the organization of mental-health services in Norway. Int J Ment Health 16:164–169
12. Mortensen PB, Agerbo E, Erikson T, Qin P, Westergaard-Nielsen N (2000) Psychiatric illness and risk factors for suicide in Denmark. Lancet 355:9–12
13. Ostamo A, Lonnqvist J (2001) Excess mortality of suicide attempters. Soc Psychiatry Psychiatr Epidemiol 36:29–35
14. Ottersen IH (2005) Syy är med opptappingsplenen for psykisk helse—hvordan står vi? (Seven years with the plan of act to improve mental health-what are the results?). Samfunnspolitikken 5, Statistics Norway, Oslo
15. Owens D, Horrocks J, House A (2002) Fatal and non-fatal repetition of self-harm. Systematic review. Br J Psychiatry 181:193–199
16. Pirkola S, Sohlman B, Heila H, Wålbeck K (2007) Reductions in postdischarge suicide after deinstitutionalization and decentralization: a nationwide register study in Finland. Psychiatr Serv 58:221–226
17. Platt S, BilleBrahe U, Kerkhof A, Schmidtke A, Bjarke T, Crepet P, Deleo D, Haring C, Lonnqvist J, Michel K, Philippe A, Wasserman D, Faria JS (1992) Parasuicide in Europe—the Who Euro Multicenter Study on Parasuicide.1. Introduction and preliminary-analysis for 1989. Acta Psychiatr Scand 85:97–104
18. Proposition to the Storting no.63 (1997–1998) Opptappingsplan for psykisk helse1999–2006 (Plan of act to improve mental health and psychiatric services). Ministry of Health and Care Services, Oslo
19. Qin P, Agerbo E, Mortensen PB (2003) Suicide risk in relation to socioeconomic, demographic, psychiatric, and familial factors: a national register-based study of all suicides in Denmark, 1981–1997. Am J Psychiatry 160:765–772

20. Qin P, Nordentoft M (2005) Suicide risk in relation to psychiatric hospitalization: evidence based on longitudinal registers. Arch Gen Psychiatry 62:427–432

21. Rantanen H, Koivisto AM, Salokangas RK, Helminen M, Oja H, Pirkola S, Wahlbeck K, Joukamaa M (2008) Five-year mortality of Finnish schizophrenia patients in the era of deinstitutionalization. Soc Psychiatry Psychiatr Epidemiol

22. Report no. 25 to the Storting (1996–1997) Åpenhet og helhet. Om psykiske lidelser og tjenestetilbudene (Psychiatric disorders and health services) Ministry of Health and Care Services, Oslo

23. Statistics Norway (2009) Municipal fact sheet. http://www.ssb.no/english/municipalities/0219. Accessed 12 Jan 2009

24. Statistics Norway (2008) Psychiatric institutions for adults. Beds, discharges, bed-days, out-patient consultations and day cases. http://statbank.ssb.no/statistikkbanken/Default_FR.asp?PXSid=0&nvl=true&PLanguage=1&tilside=selectvarval/define.asp&Tabellid=04511. Accessed 19 June 2008

25. Statistics Norway (2008) Specialist Health Service. Psychiatric health. http://www.ssb.no/speshelsepsyk_en/. Accessed 19 June 2008

26. Suominen K, Isometsa E, Suokas J, Haukka J, Achte K, Lonqvist J (2004) Completed suicide after a suicide attempt: a 37-year follow-up study. Am J Psychiatry 161:562–563

27. The national plan for suicide prevention 1994–1998 (1995) Norwegian Board of Health, Oslo

28. Vold B (2002) Psykiatrien på 1990-tallet: Mer aktiv behandling (Psychiatric services in the 90s: more integrative treatment). Helse og omsorgstjenester, Statistiske analyser 56, Statistics Norway, Oslo

29. Zihrl S, Zalar B (2006) Risk of suicide after attempted suicide in the population of Slovenia from 1970 to 1996. Eur Psychiatry 21:396–400