# THE ANNUAL COST OF BIPOLAR DISORDER TO UK SOCIETY

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## INTRODUCTION

Bipolar disorder (BPD) is a common illness characterised by recurrent episodes of mania/hypomania and major depression. Two types of BPD are commonly recognised in clinical practice: bipolar I and II disorder [1]. The prevalence of BPD in the UK has been estimated to be 0.5% [2], which equates to approximately 297,000 people suffering from BPD in the UK annually. Moreover, BPD is often associated with other mental disorders, particularly alcoholism and substance abuse [3]. Against this background we estimated the annual costs of healthcare, those borne by other statutory agencies and the indirect annual costs attributable to BPD to determine the annual societal cost of this illness in the UK.

## METHODOLOGY

**Healthcare Resource Use**

- The DIN-link database contains information on 0.9 million live patients managed by approximately 360 GPs in 100 nationally distributed general practices (using AAH Meditel software). This database was interrogated to obtain the annual amount of primary care resource use attributable to managing BPD.
- Secondary care inpatient data were based on the IBM Hospital Episode Statistics database, which contains information compiled from the statutory returns from the 300 National Health Service (NHS) Trusts in England. The database was interrogated to obtain the annual number of hospital episodes attributable to BPD.
- Published sources and information obtained from interviews with ten consultant psychiatrists were used to estimate resource utilisation by BPD sufferers using NHS day hospitals [4], outpatient services [5], community mental healthcare teams (CMHT) [6] and Special Hospitals [7].

**Personal Social Service Resource Use and the Criminal Justice System**

Published sources and information obtained from telephone interviews with managers at seven non-NHS day care facilities were used to estimate resource utilisation by BPD sufferers using residential services [8], non-NHS day care facilities [9] and the criminal justice system [10].

**Resource Costs**

Unit resource costs [11-13] were applied to the resource use estimates to determine the annual direct cost attributable to BPD at 1999/2000 prices.

**Indirect Resource Use and Costs**

The estimated indirect cost arising from excess unemployment [14], absenteeism from work [15] and suicide [16] among BPD sufferers was estimated by applying the current annual average wage [17] to the estimated number of BPD sufferers absent from work as a result of morbidity and mortality. A 6% annual discount rate was applied to the indirect costs of unemployment arising from BPD sufferers who commit suicide in the study year and, therefore, who are absent from the workforce in subsequent years.

**Sensitivity Analysis**

Univariate sensitivity analyses tested the robustness of the study results to changes in resource use activity affecting healthcare, non-healthcare and indirect costs.

## DISCUSSION

- Cost of illness studies provide information about patterns of resource use associated with a particular disease. However, unlike cost effectiveness and cost utility studies, they are unable to directly inform decisions about the allocation of resources to fund a particular treatment.
- Treatment choices are particularly important in bipolar patients where compliance with conventional maintenance treatment is low [19]. Atypical antipsychotics show much promise as mood-stabilising agents in bipolar patients [20], with a lower risk of the extrapyramidal symptoms and tardive dyskinesia than is associated with typical antipsychotics [20], potentially leading to improved compliance.
- The cost of drugs used to treat BPD constitutes less than 2% of the total cost of GP-prescribing for all psychiatric conditions [21] and about 5%, 14% and 14% of general psychiatric inpatient, outpatient and general community team costs respectively [22]. Moreover, the estimated annual primary care drug cost of £8.5 million for BPD sufferers is small compared, for example, to the drug costs for schizophrenia for England in 1992/93 which were estimated to be about £32 million (£39 million at 1999/2000 prices) [23].

## RESULTS

**Healthcare Resource Use**

- There were 136,000 BPD sufferers registered with a GP during 1998, of whom 62% were female and 38% male. This corresponds to a mean of 4 BPD patients per GP and a mean 13 patients per general practice. The mean age of BPD sufferers in the DIN-link data set was 54 years, with 53% being between 31 and 60 years of age and 38% being >60 years of age (Figure 1).

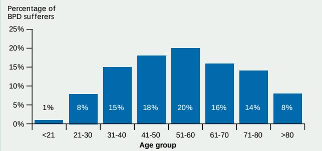


**Figure 1: Distribution of BPD sufferers by age group.**

- The total annual healthcare cost attributable to managing BPD was estimated to be £199 million (Table I).

| Resource use category | Annual amount of resource use | Annual cost of resource use (£ million) | Percentage of total cost |
|---|---|---|---|
| GP consultations | 315000 | 5.2 | 3% |
| GP-prescribed drugs | 1200000 | 8.5 | 4% |
| GP-initiated tests | 111000 | 1.2 | 1% |
| Hospital episodes | 12400 | 69.4 | 35% |
| Ambulance journeys | 3720 | 0.7 | 0% |
| Outpatient attendances | 277000 | 28.5 | 14% |
| Ward attendances | 5000 | 0.5 | 0% |
| Day hospital attendances | 459000 | 28.9 | 15% |
| CMHTs | 14% of all CMHT contact | 53.2 | 27% |
| Special Hospitals | 27 | 2.7 | 1% |
| Total cost | — | 198.7 | 100% |

**Table I: Annual NHS resource use and corresponding costs attributable to BPD.**

| Drug category | Annual number of prescriptions (000s) | | Annual cost of prescriptions (000s) | |
|---|---|---|---|---|
| Anti-Parkinsonians | 93 | (8%) | 236 | (3%) |
| Anxiolytics | 98 | (8%) | 103 | (1%) |
| Atypical antipsychotics | 16 | (1%) | 999 | (12%) |
| Carbamazepine | 58 | (5%) | 234 | (3%) |
| Hypnotics | 90 | (7%) | 285 | (3%) |
| Lithium | 239 | (20%) | 854 | (10%) |
| Non-SSRI antidepressants | 184 | (15%) | 1834 | (22%) |
| Sodium valproate | 32 | (3%) | 279 | (3%) |
| SSRI antidepressants | 128 | (11%) | 2385 | (28%) |
| Thyroxine | 6 | (<1%) | 7 | (<1%) |
| Typical antipsychotics | 268 | (22%) | 1249 | (15%) |
| Total | 1213 | (100%) | 8466 | (100%) |

**Table II: Annual number and corresponding cost of GP-prescribed drugs for BPD.** (Percentage of total is in parentheses).

- The mean annual cost of GP-prescribed items to manage BPD sufferers was £249 per GP and £809 per general practice. Table II illustrates the distribution of these prescriptions and corresponding costs.
- Eighty-six percent of hospital episodes were managed on mental illness wards, 10% on psychogeriatric wards, 1% on forensic psychiatry wards and 3% on other speciality wards. Moreover, 44% of admissions are due to patients experiencing hypomania or mania without psychotic symptoms (Figure 2). The mean length of stay was 5.5 weeks. Additionally, BPD accounted for 5% of the 258,462 annual episodes for mental health in the UK [18].

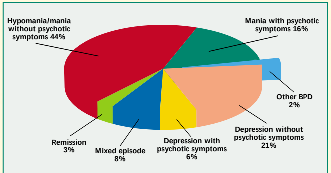


**Figure 2: Distribution of inpatient care for BPD sufferers by presenting symptoms.**

**Non-healthcare Resource Use and Indirect Costs**

- The total annual non-healthcare cost attributable to managing BPD was estimated to be £85.9 million and the total annual indirect cost attributable to BPD was estimated to be £1,770 million (Table III).

| Categories of non-healthcare resource use | Annual amount of resource use | Annual cost of resource use (£ million) | Percentage of total cost |
|---|---|---|---|
| Residential care places | 4822 | 67.8 | 79% |
| Day hospital attendances | 754000 | 18.1 | 21% |
| Total non-healthcare resource use | — | 85.9 | 100% |
| **Categories of lost productivity** | **Annual number** | **Annual indirect cost (£ million)** | **Percentage of total cost** |
| Excess unemployment | 76500 people | 1510 | 85% |
| Excess absenteeism from work | 1733400 days | 152 | 9% |
| Excess suicides | 640 suicides | 109 | 6% |
| Total indirect cost | — | 1770 | 100% |

**Table III: Annual cost of non-healthcare resource use and lost productivity attributable to BPD.**

- We were unable to find any evidence that the incidence of either imprisonment or people on remand was higher among those with BPD than the general population. Therefore, the analysis assumed that costs incurred by the criminal justice system attributable specifically to BPD is zero.
- We were unable to find any evidence that there was a higher unemployment rate among carers than the general population. Therefore, the analysis assumed that indirect costs specifically attributable to carers of BPD sufferer is zero.

**Total Annual Societal Cost of BPD**

- The total annual societal cost of managing 297,000 people with BPD was estimated to be £2,055 million (Figure 3).

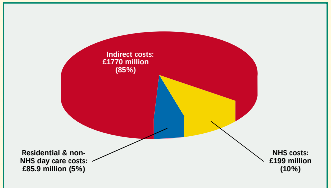


**Figure 3: Distribution of the total annual societal cost of BPD.**

- The total annual societal cost per BPD sufferer was estimated to be £6,919 (Figure 4).

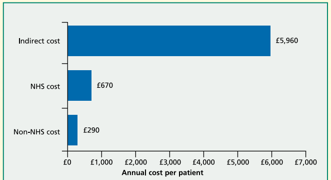


**Figure 4: Annual cost per BPD sufferer.**

**Sensitivity Analyses**

- The annual healthcare cost attributable to BPD is sensitive to changes in the number of hospital admissions and CMHT contacts. However, it is not sensitive to changes in the use of any other healthcare resource.
- The annual non-healthcare cost attributable to BPD is sensitive to changes in the number of residential places and the assumptions pertaining to the use of the criminal justice system by BPD sufferers. However, it is not sensitive to changes in the annual number of non-NHS day care attendances.
- The annual indirect cost attributable to BPD is sensitive to changes in the number of unemployed people. However, it is not sensitive to changes in the excess rate of absenteeism from work and annual number of suicides.

## CONCLUSION

BPD costs UK society £2.1 billion per year at 1999/2000 prices. Ten percent of this is due to NHS resource use and 5% to non-healthcare resource use. Indirect costs account for 85% of the total. Hospital admissions and CMHTs account for 35% and 27% respectively of the annual NHS cost of £199 million. Primary healthcare contributes just 8% to the annual NHS cost. Residential accommodation accounts for 79% of the annual non-healthcare cost of £85.9 million. Eighty-five percent of the indirect cost of £1,770 million is due to a higher unemployment rate among those with BPD compared to the general population.

## REFERENCES


1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington DC, 1994.
2. Bebbington P & Ramana R. The epidemiology of bipolar affective disorder. *Soc Psych Psychiatr Epidemiol*. 1995; 30: 279-92.
3. Regier DA, Farmer ME, Rae DS *et al*. Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. *JAMA*. 1990; 264(19): 2511-18.
4. Department of Health. NHS day care facilities, England, Financial Year 1998-99. London, 1999.
5. Department of Health. Outpatients and ward attenders, England, Financial Year 1998-99. London, 1999.
6. Onyett S, Heppleston T & Bushnell D. The organisation and operation of community mental health teams in England. A national survey. The Sainsbury Centre for Mental Health, London, 1995.
7. Department of Health. The Government Expenditure plans. 2000-2001.
8. Personal Correspondence from D. Chisholm at the Centre for the Economics of Mental Health. 24th August 1999.
9. Department of Health. Community care statistics 1997. Day and domiciliary personal social services for adults, England. *Statistical Bulletin* 1998/13.
10. The Government's annual report, 1999/00. The Stationery Office, 2000.
11. Netten A, Dennett J & Knight J. Unit costs of health and social care 1999. Personal Social Services Research Unit, University of Kent, Canterbury, 1999.
12. Monthly Index of Medical Specialities (MIMS). March 2000 edition. London: Haymarket.
13. Drug Tariff. May 2000. London: The Stationery Office, 1999.
14. Hill GR, Hardy P & Shepherd G. Perspectives on manic depression. A survey of The Manic Depression Fellowship. The Sainsbury Centre for Mental Health, London, 1996.
15. Lepine JP, Gastpar M, Mendlewicz J *et al*. Depression in the community: the first pan-European study DEPRES (Depression Research in European Society). *Int Clin Psychopharmacol*. 1997; 12(1): 19-29.
16. Sharma R & Markar HR. Mortality in affective disorder. *J Affect Dis*. 1994; 31: 91-96.
17. Annual abstract of statistics. Office for National Statistics, 2000.
18. Department of Health. Hospital Episode Statistics 1998-99. IBM, 2000.
19. Keck PE Jr, McElroy SL, Strakowski SM *et al*. Compliance with maintenance treatment in bipolar disorder. *Psychopharmacol Bull*. 1997; 33(1): 87-91.
20. Tohen M, Zarate CA Jr, Centorrino F *et al*. Risperidone in the treatment of mania. *J Clin Psych*. 1996; 57(6): 249-53.
21. Department of Health. Prescriptions dispensed in the community. Statistics for 1989 to 1999. England. *Statistics Bulletin* 2000/20.
22. Department of Health. Personal Social Services. Current expenditure in England: 1998-99. 2000.
23. Knapp M. Costs of schizophrenia. *Br J Psych*. 1997; 171: 509-18.


## ACKNOWLEDGEMENTS


The authors thank the following psychiatrists and managers of non-NHS day care centres for their contributions to the study: Dr I Akhter, Small Heath Mental Health Unit, Birmingham; Dr C Anderson, The Dukes Priory Hospital, Chelmsford; Dr T Bullock, Ealing Hospital, London; Dr C Gillespie, Newton Abbott Hospital, Torquay; Professor G Goodwin, Warneford Hospital, Oxford; Professor S Martin, Cherry Knowle Hospital, Sunderland; Dr J Meehan, South Kensington and Chelsea Mental Health Centre, London; Dr A Suri, Clatterbridge Hospital, The Wirral; Dr T Turner, Homerton Hospital, London; Professor A Young, The Royal Victoria Infirmary, Newcastle upon Tyne; Ms D Finch, Westminster AMH, London; Ms M Fisher, Castle Day Centre, Southwark, London; Ms M Naughton, Beech Croft Day Centre, Birmingham; Mr P Nevis, Islington MIND, London; Ms G Newlon, Carpentry Instructor, Pine Street Day Centre, Clerkenwell, London; Ms J Sahin, Delacey House, Leeds; Ms H Taylor, Homerton Drop In Centre, London.

The authors also thank Janssen-Cilag for their support of this study.