# Lifetime Prevalence of Bipolar I and II Disorders in the United States

Robert M.A. Hirschfeld MD[1], Joseph R. Calabrese MD[2], Evelyn Weissman PhD[3], Michael Reed PhD[3], Marilyn Davies PhD[3], Mark Frye MD[1], Paul E. Keck MD[4], Lydia Lewis[5], Susan McElroy PhD[2], James P. McNulty[6], Karen Wagner MD[7]
[1]University of Texas Medical Branch, Galveston, TX, [2]Case Western Reserve University, Cleveland, OH, [3]Columbia University, New York, NY, [4]Medtronic Associates Inc, Chapel Hill, NC
[5]University of California at Los Angeles, Los Angeles, CA, [6]University of Cincinnati, Cincinnati, OH, [7]National Depressive and Manic Depressive Association, National Alliance for the Mentally Ill

## ABSTRACT

**Objective:** To determine the prevalence and sociodemographic profile of Bipolar I and II Disorders in the United States (US).

**Methods:** The Mood Disorder Questionnaire (MDQ), a validated screening instrument for Bipolar I and II Disorders, was mailed to a nationally representative sample of 127,800 adults (18+ years) from the National Family Opinion panel. A sub-sample of panelists who did not respond to the written survey was re-surveyed by telephone. Post-survey weighting was used to balance the sample for age, gender, region, market size, and household size to reflect national demography. A positive MDQ case was defined as seven or more symptoms/behaviors, co-occurrence of two or more symptoms/behaviors, and moderate or severe symptom-related impairment.

**Results:** A 67% response rate was obtained (85,358 usable surveys). The weighted prevalence of MDQ positive screens was 3.4%. Non-responders had a weighted MDQ positive screen rate of 4.6% ($p<0.05$). Adjusting for non-response bias, the overall prevalence of MDQ positive screens was 3.7%, which represents an estimate of the lifetime prevalence rate of Bipolar I and II Disorders. The prevalence was 3.8% for men and 3.0% for women. Prevalence was highest among respondents aged 18 – 24 years (9.3%) and lowest among those 65 years of age or older (<1%). The Southeast region of the US had the highest prevalence rate (5%), while New England had the lowest (2%). Prevalence was highest in rural areas (4%) and small cities (4%). Prevalence was also highest among those with an income < $20,00 (6%) and lowest among those earning >$85,000 (2%). Only 19.8% of respondents who screened MDQ positive reported having received a diagnosis of bipolar disorder from a healthcare professional, while 31.2% of respondents who screened positive reported a diagnosis of unipolar depression from a healthcare professional.

**Conclusions:** The estimated prevalence of Bipolar I and II Disorders is substantially higher than that reported. Only one in five respondents screened positive for Bipolar I and II had been diagnosed with bipolar disorder. Nearly one-third of the positive screens reported a diagnosis of unipolar depression. These finding suggest that Bipolar I and II Disorders are under-diagnosed and potentially misdiagnosed. Prevalence is highest among young adults, those with lower incomes, and those living in rural or small cities.

## INTRODUCTION

Bipolar I Disorder has been the focus of most mood disorder research. The lifetime prevalence of DSM-III Bipolar Disorder I is approximately 1%.[1] In the United States, the lifetime prevalence rates for Bipolar I Disorder were previously reported to be 0.8%[2] and 1.6%.[3] However, bipolar disorder encompasses a much broader range of illness than Bipolar I Disorder. Many authorities have suggested that milder forms of bipolar disorder occur more frequently than Bipolar I Disorder. Lifetime prevalence rates for Bipolar I and II have been reported to range from 3.0% to 6.5%.[4,5,6] However, these studies were small and used varying definitions.[4] No prospective large scale epidemiological study has examined the prevalence of Bipolar I and II in adults using DSM-IV criteria. The goal of the present study was to estimate the lifetime prevalence of DSM-IV Bipolar I and II Disorders in the general US population.

## METHODS

Subjects were sampled from a list of nationwide households maintained by the National Family Opinion (NFO), a market research firm with a panel of >600,000 continental US households. Households were selected using a balancing system that provided a sample with demographic characteristics matched to the 2000 US Census.

The *Mood Disorder Questionnaire (MDQ)* was mailed to 127,800 people who were selected on the basis of geographical region, market size, household size, income, and age of head of household. A total of 99,809 questionnaires were returned, of which 85,358 (66.8%) were usable.

A telephone survey of 4,766 mail-survey non-returners was conducted to examine a potential bias among those panelists who did not return mailed questionnaires. 3,404 interviews were completed for a completion rate of 71%.

## MEASURES

The MDQ is a validated self-report instrument that screens for a lifetime history of Bipolar I and II Disorders. Thirteen yes/no items ask about mood, self-confidence, energy, sociability, sex, loquaciousness, distractability, and other behaviors. Two questions query symptom co-occurrence and functional impairment (no, mild, moderate, severe).

A positive MDQ case was defined as 7 positive symptom items, the co-occurrence of symptoms, and moderate or severe functional impairment.

Validation of the MDQ in psychiatric outpatients indicated 0.73 sensitivity and 0.90 specificity against a SCID research interview.

Logistic regression was used to examine the relationship of demographics to Bipolar I and II. Weighted lifetime prevalence screen rates were calculated to correct biases in the returns toward older, female respondents. Chi-square tests were used to compare prevalence rates between returners and non- returners.

## RESULTS

**Population Demographic Characteristics***

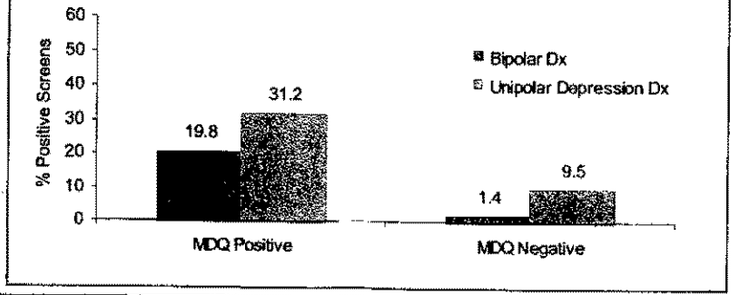
| | | | |
|---|---|---|---|
| **Gender** | | **Age** | |
| Male | 48% | 18 - 24 | 13% |
| Female | 52% | 25 - 34 | 19% |
| | | 35 - 44 | 22% |
| **Ethnicity** | | 45 - 54 | 18% |
| Black | 6% | 55 - 64 | 12% |
| White | 88% | > 65 | 16% |
| Asian/Pacific | 1% | | |
| American Indian | 1% | | |
| Other | 1% | | |
| Unknown | 3% | | |
| **Region** | | **Urban vs. Rural** | |
| New England | 5% | <100,000 | 20% |
| Mid Atlantic | 14% | 100,00 - 499,999 | 15% |
| E. No. Central | 16% | 500,000 - 2,000,000 | 21% |
| W. No. Central | 7% | >2,000,000 | 44% |
| So. Atlantic | 18% | | |
| E. So. Central | 7% | | |
| W. So. Central | 11% | | |
| Mountain | 6% | | |
| Pacific | 16% | | |
| **Household Size** | | **Household Income** | |
| 1 | 13% | <$20,000 | 17% |
| 2 | 33% | $20,000 - 34,999 | 18% |
| 3 | 20% | $35,000 - 54,999 | 21% |
| 4 | 19% | $55,000 - 84,999 | 22% |
| 5 or more | 15% | >$85,000 | 22% |

* Weighted estimates to account for sample deviations from 2000 US Census demographics

**PREVALENCE**

- Overall lifetime prevalence of MDQ positive screens was 3.7% (weighted, corrected for non-response).
- Only 19.8% of MDQ positive screen subjects reported a diagnosis of bipolar disorder from a healthcare provider.
- 31.2% of MDQ positive screen subjects reported a diagnosis of unipolar depression from a health professional.
- Of MDQ negative subjects, only 1.4% reported a diagnosis of bipolar disorder and 9.5% reported a diagnosis of unipolar depression.

**Health Professional Diagnosis of Bipolar Disorder vs. Unipolar Depression**




**Estimated Prevalence Rates of Bipolar I and II Disorder***

| | | | |
|---|---|---|---|
| Total | 3.4 | Urban vs. Rural | |
| Gender | | <100,000 (Rural) | 4.1 |
| Male | 3.8 | 100,00 - 499,999 | 4.4 |
| Female | 3.0 | 500,000 - 2,000,000 | 3.2 |
| Ethnicity | | >2,000,000 | 2.7 |
| Black | 4.3 | Household Size | |
| White | 3.1 | 1 | 2.5 |
| Asian/Pacific | 4.1 | 2 | 2.5 |
| American Indian | 7.6 | 3 | 3.9 |
| Other | 6.3 | 4 | 3.7 |
| Unknown | 5.2 | 5 or more | 4.8 |
| Age, Years | | Household Income | |
| 18 - 24 | 9.3 | <$20,000 | 5.7 |
| 25 - 34 | 3.9 | $20,000 - $34,999 | 4.1 |
| 35 - 44 | 3.2 | $35,000 - $54, 999 | 3.3 |
| 45 - 54 | 2.5 | $55,000 - $ 84,999 | 2.4 |
| 55 - 64 | 1.5 | >$85,000 | 1.9 |
| > 65 | 0.5 | | |
| Region | | | |
| New England | 2.2 | | |
| Mid Atlantic | 2.7 | | |
| E. No. Central | 3.4 | | |
| W. No. Central | 3.1 | | |
| So. Atlantic | 3.5 | | |
| E. So. Central | 5.2 | | |
| W. So. Central | 3.7 | | |
| Mountain | 3.8 | | |
| Pacific | 3.2 | | |

* Weighted estimates account for sample deviations from 2000 US Census demographics.

**CO-MORBIDITY**

- Subjects with positive MDQ screens were more likely to report co-morbid medical illnesses. Sizeable (>10%) differences were found for hypertension, allergies, and alcohol/substance abuse.
- Subjects with positive MDQ screens were twice as likely to report a history of asthma (16.7% vs. 9.7%) and migraine (15.2% vs. 7.0%).
- 36.4% of those subjects with positive MDQ screens reported blood relatives with manic-depressive illness.

## CONCLUSIONS

The US prevalence of Bipolar I and II Disorders is over three times that previously reported. Only one in five MDQ positive subjects reported having received a diagnosis of bipolar disorder from a healthcare professional, but nearly one third had received a diagnosis of unipolar depression. Prevalence was highest among young adults, those with lower incomes, and those living in rural or small cities. These findings suggest that Bipolar I and II Disorders are under-recognized, under-diagnosed, and potentially mis-diagnosed.

## REFERENCES

1. Weissman MM, Bland RC, Canino GJ, et al. JAMA. 1996;276:293-299.
2. Weissman MM, Bruce LM, Leaf PJ et al. Affective Disorders. In: Robins LN, Reiger DA, eds. Psychiatric Disorders in America: The Epidemiological Catchment Area Study. New York: Free Press, 1991.
3. Kessler RC, McGonagle KA, Zhao S et al. Arch Gen Psychiatry. 1994;51:8-19.
4. Akiskal HS. The bipolar spectrum: new concepts in classification and diagnosis. In: Grinspoon L, ed. Psychiatry Update: The American Psychiatric Association Annual review, vol. II. American Psychiatric Press, Washington, DC, pp 271-292, 1983.
5. Akiskal HS, Bourgeois ML, Angst J et al. Affective Disorders. 2000;59:5S-30.
6. Angst J. J Affect Disorder. 1998;50:143-151.

Funding provided by GlaxoSmithKline

GlaxoSmithKline