# INTRODUCTION

- Bipolar I disorder (BD-I) is associated with increased risk of obesity and cardiometabolic conditions such as hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, and stroke<sup>1-4</sup>
- BD-I treatments, including many antipsychotic medications and mood stabilizers, are associated with weight gain and may contribute to obesity in this population<sup>2-1</sup>
- The burden of BD-I is significant and includes increased healthcare resource use (HCRU) and reduced health-related quality of life (HRQoL)<sup>6,7</sup>
- Obesity may add to this burden<sup>8</sup>; however, real-world effects associated with obesity in people with BD-I are not well understood

## OBJECTIVE

- To evaluate clinical, humanistic, and economic outcomes in adults with and those without BD-I
- To assess outcomes stratified by BMI category across respondents with and those without BD-I

## METHODS

### **Study Design and Participants**

- This study was a retrospective, cross-sectional analysis of survey responses to the 2016 and 2020 National Health and Wellness Survey (NHWS)
- The NHWS is a self-administered, internet-based survey conducted annually among a nationally representative sample of adults in the United States based on age, sex, and race
- Respondents aged 18 to 64 years who self-reported a physician diagnosis of BD-I and matched controls without BD-I (1:2 greedy propensity score matching on demographic/health characteristics) were eligible
- Data on bipolar disorder subtype (ie, BD-I) were available from the 2016 and 2020 surveys
- If the survey was completed by the same respondent in both years, responses were excluded from analysis

### Analyses

- Respondents with BD-I and controls were matched and compared using propensity score matching techniques
- The analysis further characterized outcomes among respondents, categorized according to BMI as underweight/normal weight (BMI <25 kg/m<sup>2</sup>), overweight (BMI 25 to <30 kg/m<sup>2</sup>), or obese (BMI  $\geq$ 30 kg/m<sup>2</sup>)
- Clinical outcomes included the prevalence of obesity-related comorbidities and HCRU
- HRQoL was evaluated using the 36-item Short Form Version 2 (SF-36v2) and EuroQol EQ-5D health surveys
- Absenteeism (missed work), presenteeism (lost productivity at work), overall work impairment, and activity impairment were assessed using the Work Productivity and Activity Impairment questionnaire (WPAI)
- Direct medical and indirect costs were estimated using data from the Medical Expenditure Panel Survey and US Bureau of Labor Statistics, respectively
- Study outcomes were adjusted for demographic and health characteristics
- Comparisons made between patients with BD-I and controls overall, as well as by BMI categories, were summarized descriptively

# RESULTS

### **TABLE 1**. Characteristics of NF

### Characteristics

Age, mean (SD), years

Sex, female, n (%)

Race, n (%)

White

Black

Hispanic

Other

Married, n (%)

Unemployed, n (%)

Drinks alcohol, n (%)

Current smoker, n (%)

BD-I, bipolar I disorder; NHWS, National Health and Wellness Survey

# BMI Category



<sup>b</sup>Includes ministroke, stroke, heart attack, and congestive heart failure. BD-I, bipolar I disorder; BMI, body mass index; CV, cardiovascular; NHWS, National Health and Wellness Survey.

# Burden of Bipolar I Disorder on Clinical, Economic, and Humanistic Outcomes: Matched Analysis of US National Health and Wellness Survey Data

Michael J. Doane,<sup>1</sup> Adam Jauregui,<sup>2</sup> Hemangi Panchmatia<sup>1</sup> <sup>1</sup>Alkermes, Inc., Waltham, MA, USA; <sup>2</sup>Cerner Enviza, North Kansas City, MO, USA

HWS Respondents				FIGURE 2. Adjusted	
	Respondents With BD-I (n=1806)	Unmatched Sample Without BD-I (n=122,129)	Matched Controls (n=3612)	100 - 90 -	BD-I
	38.7 (12.3)	41.3 (13.6)	38.8 (12.4)	80 - 70 -	Controls
	1182 (65)	70,608 (58)	2314 (64)	<b>nean)</b> – 09 –	
				<u>50</u> - ອັດ 40 -	
	1122 (62)	71,826 (59)	2279 (63)	ЗО -	
	171 (10)	13,657 (11)	319 (9)	20 - 10 -	
	298 (17)	17,055 (14)	595 (16)	0 0	
	215 (12)	19,591 (16)	419 (12)	<sup>a</sup> Adjusted for ag	ge, sex, race, resider epresent worse hea
	818 (45)	66,901 (55)	1621 (45)	<sup>c</sup> Scaled to 100. BD-I, bipolar I d 36-item Short F	isorder; BMI, body form Version 2.
	976 (54)	84,125 (69)	1961 (54)	FIGURE	<b>3.</b> Adjusted
	1145 (63)	83,179 (68)	2326 (64)	100 _ 	BD-I
	818 (45)	17,386 (14)	1600 (44)	80 -	
					Controls

FIGURE 1. Adjusted Proportions<sup>a</sup> of Self-Reported Medical Comorbidities in Respondents With BD-I vs Matched Controls by



nsurance status, smoking status, alcohol use, exercise frequency, modified Charlson Comorbidity Index, and NHWS year.



BD-I, bipolar I disorder; BMI, body mass index; ED, emergency department; HCP, healthcare professional; HCRU, healthcare resource use; NHWS, National Health and Wellness Survey.

Alkermes. For permission, contact USMedInfo@Alkermes.com.

## REFERENCES

- 1. Goldstein Bl, et al. *Bipolar Disord*. 2011;13(4):387-95. <u>10.1111/j.1399-5618.2011.00932.x</u>.
- 2. Holt RI, Peveler RC. *Diabetes Obes Metab*. 2009;11(7):665-79. <u>10.1111/j.1463-1326.2009.01038.x</u>.
- 3. Bak M, et al. *PLoS One*. 2014;9(4):e94112. <u>10.1371/journal.pone.0094112</u>.
- 4. Doane MJ, et al. *BMC Psychiatry*. 2022;22(1):114. <u>10.1186/s12888-022-03758-w</u>.
- 5. McElroy SL. *J Clin Psychiatry*. 2009;70 Suppl 3:12-21. <u>10.4088/JCP.7075su1c.03</u>.
- 6. Bessonova L, et al. Clinicoecon Outcomes Res. 2020;12:481-97. <u>10.2147/CEOR.S259338</u>.
- 7. McElroy SL, et al. Acta Psychiatr Scand. 2016;133(2):144-53. <u>10.1111/acps.12460</u>.
- 8. McElroy SL, Keck PE, Jr. *Curr Psychiatry Rep*. 2012;14(6):650-8. <u>10.1007/s11920-012-0313-8</u>.

### **AUTHOR DISCLOSURES**

MJD and HP are or were employees of Alkermes, Inc., and may own stock/options in the company. AJ is or was employed by Cerner Enviza, which received payment from Alkermes, Inc., for participation in conducting this research.

### ACKNOWLEDGMENTS

This study was sponsored by Alkermes, Inc. (Waltham, MA, USA). Medical writing and editorial support were provided by Peloton Advantage, LLC (Parsippany, NJ, USA), an OPEN Health company, and funded by Alkermes, Inc.

# Burden of Bipolar I Disorder on Clinical, Economic, and Humanistic Outcomes: Matched Analysis of US National Health and Wellness Survey Data

Michael J. Doane,<sup>1</sup> Adam Jauregui,<sup>2</sup> Hemangi Panchmatia<sup>1</sup> <sup>1</sup>Alkermes, Inc., Waltham, MA, USA; <sup>2</sup>Cerner Enviza, North Kansas City, MO, USA