

1 **ONLINE SUPPLEMENT**2 **Cause-specific excess mortality after first diagnosis of bipolar disorder: population-based cohort study**

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5 **eTable 1.** The International Classification of Diseases, tenth revision (ICD10), Finnish modification codes used in the
6 study.

Description	ICD10 codes
Malignant neoplasms (cancer)	C00 – C98
Diabetes mellitus	E10, E11
Alcohol-related causes ^a (mental and behavioural disorders due to use of alcohol, degeneration of nervous system due to alcohol, epileptic seizures related to alcohol, alcoholic polyneuropathy, alcoholic myopathy, alcoholic cardiomyopathy, alcoholic gastritis, alcoholic liver disease, alcohol-induced acute pancreatitis, alcohol-induced chronic pancreatitis, accidental poisoning by and exposure to alcohol)	F10, G312, G4051, G621, G721, I426, K292, K70, K852, K860, X45, Y15
Substance use-related mental and behavioural disorders, other than alcohol	F11 – F19
Schizophrenia-spectrum disorders	F20 – F29
Bipolar disorder	F30, F31
Cardiovascular diseases	I00 – I99
Respiratory diseases	J00 – J99
Other chronic obstructive pulmonary disease (COPD)	J44
External causes and violence	V01 – Y89
Accidents	V01 – X59
Suicides (intentional self-harm)	X60 – X84, Y870
Events of undetermined intent	Y10 – Y34, Y872

7 ^aAccording to Statistics Finland definition.

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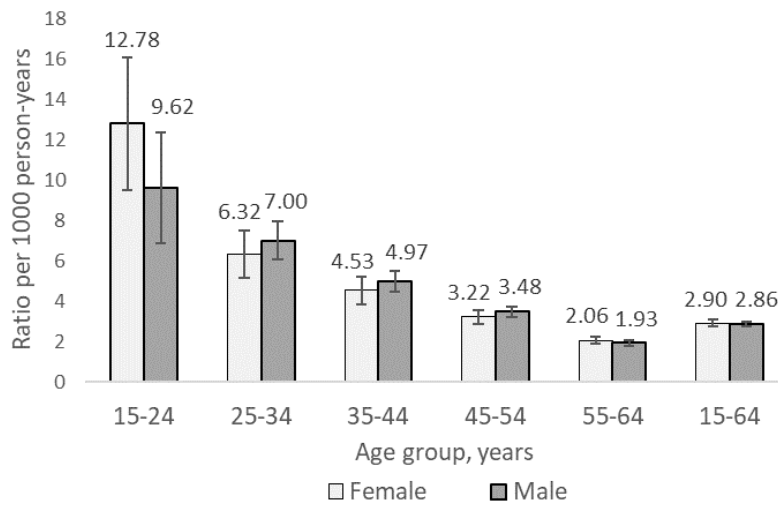
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10 **eTable 2.** Number of deaths in those aged 65 and above.

Causes of death	Number of deaths by age group, n (%)	
	65-75 years (n=1066)	65+ years (n=2773)
Any somatic cause	934 (88)	2560 (92)
Cardiovascular disease	324 (30)	996 (35)
Diseases of the nervous system, including Alzheimer's disease, dementia, and Parkinson's disease	99 (9)	663 (23)
Cancer	270 (25)	478 (17)
Respiratory diseases	73 (7)	164 (6)
Alcohol-related causes	61 (6)	70 (2)
Diabetes	8 (0.7)	30 (1)
Other somatic causes	33 (3)	159 (6)
Any external cause	132 (12)	213 (8)
Suicides	66 (6)	80 (3)

11 According to The International Classification of Diseases, tenth revision (ICD10), Finnish modification codes

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14 **eFigure 1.** Standardised mortality ratios per 1000 person-years for all-cause mortality in individuals with bipolar
15 disorder during 2004 – 2018 by sex and age group. Finnish general population as a reference. Error bars represent
16 95% confidence intervals.

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18 **eTable 3.** Models under which cause-specific mortality would be reduced by 50% in the bipolar disorder population,
 19 and its effect on relative excess all-cause mortality.

50% reduction in cause of death category	Observed deaths, n	SMR	95%CI	Std rate	Std rate difference^a	Percent reduction
Baseline, no change	3300	2.76	2.67, 2.85	7.61	n/a	n/a
Alcohol-related causes	3003	2.51	2.42, 2.60	6.92	-0.69	-9
Cardiovascular diseases	3024	2.53	2.44, 2.62	6.97	-0.64	-8
Alcohol-related causes and cardiovascular diseases	2727	2.28	2.19, 2.36	6.28	-1.33	-17
External causes	2664	2.23	2.14, 2.31	6.14	-1.47	-19
External causes and alcohol-related causes	2366	1.98	1.90, 2.06	5.46	-2.15	-28
External causes, alcohol-related causes, and cardiovascular diseases	2090	1.75	1.67, 1.82	4.82	-2.79	-37

20 Reduction applied equally across all age groups. Standardised mortality ratio, SMR; Confidence interval, CI; Non-
 21 applicable, n/a; Standardised rate in the bipolar disorder population, Std rate. ^aStd rate difference compared to
 22 baseline. Finnish general population as a reference.
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24 **eTable 4.** Accidental alcohol poisonings included in accidents and deaths due to any external cause, and excluded
 25 from somatic causes of death.

Deaths by age group	Obs. deaths	Exp. deaths	SMR (95%CI)
Accident ^a			
15-24	23	4	5.42 (3.20, 7.63)
25-34	90	16	5.48 (4.35, 6.61)
35-44	142	25	5.60 (4.68, 6.52)
45-54	226	47	4.83 (4.20, 5.46)
55-64	193	63	3.07 (2.64, 3.51)
15-64	674	155	4.33 (4.01, 4.66)
Any external cause ^a			
15-24	76	9	8.63 (6.69, 10.57)
25-34	260	35	7.32 (6.43, 8.21)
35-44	318	46	6.85 (6.10, 7.60)
45-54	449	76	5.93 (5.38, 6.48)
55-64	335	88	3.82 (3.41, 4.23)
15-64	1438	254	5.66 (5.37, 5.95)
Any somatic cause ^b			
15-24	12	3	4.23 (1.84, 6.63)
25-34	63	21	3.06 (2.30, 3.81)
35-44	185	64	2.86 (2.45, 3.28)
45-54	573	235	2.44 (2.24, 2.64)
55-64	1029	619	1.66 (1.56, 1.76)
15-64	1862	942	1.98 (1.89, 2.07)

26 Observed deaths, Obs. deaths; Expected deaths, Exp. deaths. ^aIncluding accidental alcohol poisoning. ^bExcluding
 27 accidental alcohol poisoning, but including other alcohol-related causes.