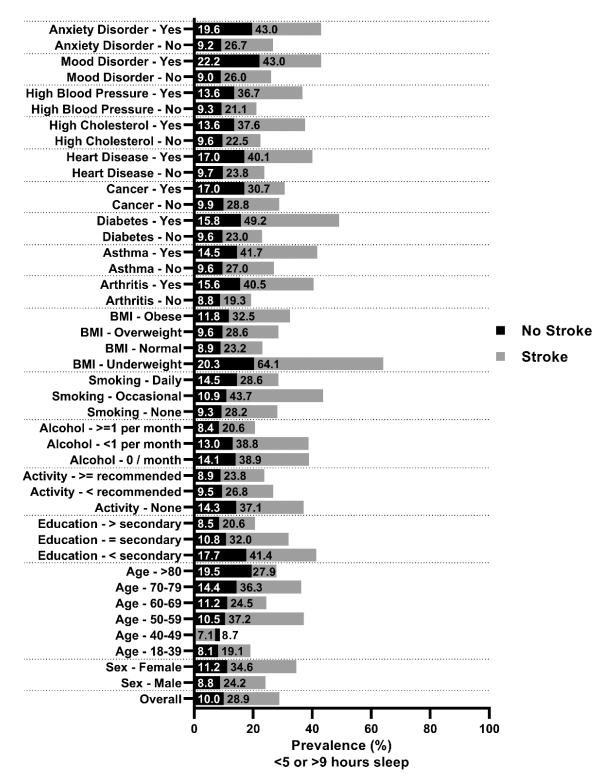
Title: Self-reported sleep disturbances among people who have had a stroke: a cross-sectional analysis

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Anxiety Disorder - Yes-	<b>11.4</b> 25.7	
Anxiety Disorder - No=		
Mood Disorder - Yes-		
Mood Disorder - No-	5.7 9.5	
High Blood Pressure - Yes=	6.2 13.1	
High Blood Pressure - No=	<u>6.1</u> 13.0	
High Cholesterol - Yes=		
High Cholesterol - No=		
Heart Disease - Yes=		
Heart Disease - No=		
Cancer - Yes -		
Cancer - No=	<mark>6.1</mark> 12.7	
Diabetes - Yes -		
Diabetes - No-		
Asthma - Yes=		
Asthma - No=		
Arthritis - Yes=		
Arthritis - No=		
BMI - Obese=		
BMI - Overweight=		No Stroke
BMI - Normal=		Stroke
BMI - Underweight=	<b>-</b> 8.6 19.1	
Smoking - Daily=	7.8 18.3	
Smoking - Occasional=	- 7.2 9.6	
Smoking - None=	5.8 12.0	
Alcohol - >=1 per month=		
Alcohol - <1 per month=		
Alcohol - 0 / month=		
Activity - >= recommended=		
Activity - < recommended=		
Activity - None		
Education - > secondary=		
Education - = secondary=		
Education - < secondary=		
Age - >80 <b>-</b> Age - 70-79-		
Age - 70-79= Age - 60-69=		
Age - 60-69 Age - 50-59		
Age - 50-59 - Age - 40-49 -		
Age - 40-49 - Age - 18-39 -		
Age - 16-39- Sex - Female=		
Sex - Female-		
- Wale- Overall=		
Overall-		7
		100
	Prevalence (%)	
	Difficulty staying awake	
	Dimonty stuying awake	

**Section 1. Prevalence of** *difficulty staying awake* **by participant characteristics and stroke status.** Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially coloured portion to the right shows *excess* prevalence in the more prevalent group (usually those suffering the effects of stroke). Data collected in adults (age 18+) residing in Prince Edward Island, Quebec, Alberta, British Columbia, Yukon Territory, and Nunavut, N = 46,404.



Section 2. Prevalence of <5 or >9 hours nightly sleep duration by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially coloured portion to the right shows *excess* prevalence in the more prevalent group (usually those suffering the effects of stroke). Data collected in adults (age 18+) residing in Prince Edward Island, Quebec, Alberta, British Columbia, Yukon Territory, and Nunavut, N = 46,404.

Anniete Die ender Mee-	20.5		<b></b>				
Anxiety Disorder - Yes=			57.5				
Anxiety Disorder - No=		23.6	140 7				
Mood Disorder - Yes=		25.7	40.7				
Mood Disorder - No=		25.7 32.9					
High Blood Pressure - Yes-							
High Blood Pressure - No=		23.4		• • • • • • • • • • • • • • • • • • • •	••••••		
High Cholesterol - Yes= High Cholesterol - No=		29	.5				
Heart Disease - Yes	** **********	<u></u>	32.2	•••••			
Heart Disease - No=		26.3	<i></i>				
Cancer - Yes		28	9				
Cancer - No=		28.1					
Diabetes - Yes	••	34.2		• • • • • • • • • • • • • • • • • • • •			
Diabetes - No=		26.4					
Asthma - Yes=			32.4				
Asthma - No=		27.5					
Arthritis - Yes		36.7	7				
Arthritis - No=		21.0					
BMI - Obese=	** *********	28.0		••••••			
BMI - Overweight=		25.9					No Stroke
BMI - Normal		30.6				_	0.
BMI - Underweight=	22.4	24.6					Stroke
Smoking - Daily=	23.9	41.0					
Smoking - Occasional=	18.3	41.9					
Smoking - None =	16.7	24.6					
Alcohol - >=1 per month=	17.0	20.9					
Alcohol - <1 per month=	21.3	38.2					
Alcohol - 0 / month=		35.9					
Activity - >= recommended -		28.8					
Activity - < recommended=		19.9					
Activity - None=		32.7					
Education - > secondary=		24.1					
Education - = secondary=		25.5					
Education - < secondary=		38.5					
Age - >80-		23.2					
Age - 70-79=		20.1					
Age - 60-69=		30.5					
Age - 50-59 <del>-</del> Age - 40-49-		41.2 29.1					
Age - 40-49- Age - 18-39-		29.1					
Sex - Female=		20.0	0				
Sex - Male		27.4	.0				
Overall=		28.1	••••••				
	0	20	40	60	80	100	
		F	Prevale	nce (%)			
		Diffic	culty go	ing to slee	∋p		

**Section 3. Prevalence of** *difficulty going to sleep* **by participant characteristics and stroke status.** Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially coloured portion to the right shows *excess* prevalence in the more prevalent group (usually those suffering the effects of stroke). Data collected in adults (age 18+) residing in Prince Edward Island, Quebec, Alberta, British Columbia, Yukon Territory, and Nunavut, N = 46,404.

Anxiety Disorder - Yes=	59 4			74.8			
Anxiety Disorder - No-			35.9	74.0			
Mood Disorder - Yes			00.0	65.	9		
Mood Disorder - No=			35.9		Ū		
High Blood Pressure - Yes=			44.9				
High Blood Pressure - No=			37.4				
High Cholesterol - Yes			38.4		••••••		
High Cholesterol - No-			43.0				
Heart Disease - Yes=			39.9				
Heart Disease - No=			41.6				
Cancer - Yes=			42.0				
Cancer - No=	37.1		41.1				
Diabetes - Yes=	37.1		41.3				
Diabetes - No=	37.2		41.0				
Asthma - Yes=	48.2		5	51.4			
Asthma - No=	36.2		39.6				
Arthritis - Yes=			48	.5			
Arthritis - No=	34.9		36.3				
BMI - Obese=	40.8		41.1				
BMI - Overweight=	36.0		39.8				No Stroke
BMI - Normal=			42.0				Straka
BMI - Underweight=	46.1		67.4	4			Stroke
Smoking - Daily=	44.0			52.1			
Smoking - Occasional -			42.8				
Smoking - None=			38.6				
Alcohol - >=1 per month=	31.3		35.6				
Alcohol - <1 per month=	42.6		49	9.9			
Alcohol - 0 / month=	39.0		54.9				
Activity - >= recommended =			39.6				
Activity - < recommended=			47.8				
Activity - None=			38.6				
Education - > secondary=			38.9				
Education - = secondary=			40.5				
Education - < secondary =			47.9				
Age - >80-	26.1	26.9	I				
Age - 70-79 <b>-</b>			34.3				
Age - 60-69 <b>-</b>			37.5				
Age - 50-59 <b>-</b>			57.6				
Age - 40-49 <del>-</del>			64.2				
Age - 18-39=			52.8				
Sex - Female=			49.7				
Sex - Male=			34.1				
Overall-	37.1		41.1				
	1	I	I	I	I	1	
	0	20	40	60	80	100	
			revalen	• •	_		
		Non	-retresh	ing sleep	0		

**Section 4. Prevalence of** *non-refreshing sleep* by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially coloured portion to the right shows *excess* prevalence in the more prevalent group (usually those suffering the effects of stroke). Data collected in adults (age 18+) residing in Prince Edward Island, Quebec, Alberta, British Columbia, Yukon Territory, and Nunavut, N = 46,404.

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Anxiety Disorder - Yes=	72.2				85.0		
Anxiety Disorder - No-			58	.0			
Mood Disorder - Yes					85.0		
Mood Disorder - No			56	.7			
High Blood Pressure - Yes=		••••••		69.6			
High Blood Pressure - No-				53.7			
High Cholesterol - Yes				65.3			
High Cholesterol - No			5	8.9			
Heart Disease - Yes =				68.0			
Heart Disease - No =	48.0		5	8.7			
Cancer - Yes=				58.2			
Cancer - No =	48.1		6	1.8			
Diabetes - Yes =	52.3			75.8			
Diabetes - No=	47.9		5	7.5			
Asthma - Yes=				76.2			
Asthma - No <del>-</del>			59	9.5			
Arthritis - Yes=				73.8			
Arthritis - No <del>-</del>				51.6			
BMI - Obese=			**********	61.9			
BMI - Overweight=			62	2.5			No Stroke
BMI - Normal	46.1		60	.1		_	O frank a
BMI - Underweight=	58.3			67.4			Stroke
Smoking - Daily=				69.7			
Smoking - Occasional=				66.4			
Smoking - None =	46.8		59	9.5			
Alcohol - >=1 per month -				50.2			
Alcohol - <1 per month =	53.1			74.5			
Alcohol - 0 / month -	52.1			76.1			
Activity - >= recommended -				53.4			
Activity - < recommended =	48.9		6	5.8			
Activity - None-				69.9			
Education - > secondary=			56	.8			
Education - = secondary =				54.2			
Education - < secondary=				78.6			
Age - >80 -			58				
Age - 70-79 <b>-</b>			64.4				
Age - 60-69 <b>-</b>			54.5	5			
Age - 50-59 <b>-</b>			7	0.0			
Age - 40-49 -	50.7			79.9			
Age - 18-39 <b>-</b>	<u>50.4</u>			54.1			
Sex - Female=	52.6			70.2			
Sex - Male=			54.6				
Overall-	48.2		6	1.6			
	1	1	1	∎ 60	I 00	100	
	0	20	40 Brovala		80	100	
	A 4		Prevale:	• •	sturbane -		
	At	ieast 0	ne type of	sieep dis	surbance		

Section 5. Prevalence of experiencing at least one type of sleep disturbance by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially coloured portion to the right shows *excess* prevalence in the more prevalent group (usually those suffering the effects of stroke). Data collected in adults (age 18+) residing in Prince Edward Island, Quebec, Alberta, British Columbia, Yukon Territory, and Nunavut, N = 46,404.

Section 6. Model 1 adjusted relative risks for association of sleep disturbances and stroke: overall, sex-stratified, and age-stratified.#

		Relative risk (95% confidence interval)				
Interaction Term	Comparator	Difficulty staying awake	<5 or >9 hours sleep	Difficulty going to sleep	Non-refreshing sleep	At least one type of disturbance
Overall	Stroke – No Stroke – Yes	2.16 (1.59-2.94)	1.93 (1.57-2.38)	Reference 1.53 (1.28-1.83)	1.30 (1.19-1.40)	1.28 (1.18-1.40)
	Stroke – No			Reference		
Sex – Male	Stroke – Yes	1.98 (1.26-3.12)	1.97 (1.44-2.70)	1.95 (1.51-2.50)	1.17 (0.94-1.44)	1.22 (1.06-1.40)
Sex - Female	Stroke – Yes	2.33 (1.56-3.51)	1.90 (1.46-2.49)	1.18 (0.98-1.67)	1.42 (1.20-1.68)	1.31 (1.20-1.44)
Stroke - No	Sex – Male			Reference		
SLIDKE - NO	Sex - Female	1.22 (1.11-1.34)	1.21 (1.12-1.31)	1.75 (1.65-1.84)	1.24 (1.20-1.28)	1.17 (1.15-1.20)
Straka Vac	Sex – Male			Reference		
Stroke - Yes	Sex - Female	1.44 (0.79-2.61)	1.17 (0.78-1.74)	1.15 (0.80-1.65)	1.51 (1.15-1.97)	1.27 (1.07-1.49)
	Stroke – No			Reference		
Age – 18-39	Stroke – Yes	1.91 (0.57-6.36)	1.95 (0.65-5.83)	1.14 (0.47-2.79)	1.37 (0.89-2.11)	1.06 (0.70-1.62)
Age – 40-49	Stroke – Yes	4.76 (2.15-10.58)	0.83 (0.12-5.60)	1.68 (0.78-3.62)	1.49 (1.03-2.15)	1.40 (1.07-1.84)
Age – 50-59	Stroke – Yes	3.10 (1.87-5.13)	2.79 (1.83-4.29)	1.98 (1.48-2.65)	1.49 (1.19-1.86)	1.27 (1.04-1.54)
Age – 60-69	Stroke – Yes	1.21 (0.56-2.63)	1.94 (1.25-3.00)	1.68 (1.24-2.28)	1.26 (0.96-1.64)	1.17 (0.98-1.40)
Age – 70-79	Stroke – Yes	1.43 (0.65-3.17)	2.13 (1.44-3.15)	1.04 (0.65-1.66)	1.17 (0.84-1.62)	1.28 (1.06-1.53)
Age – 80+	Stroke – Yes	2.86 (1.38-5.92)	1.31 (0.75-2.28)	1.47 (0.87-2.50)	0.99 (0.61-1.59)	1.18 (0.93-1.48)
	Age – 18-39			Reference		
	Age – 40-49	0.89 (0.77-1.02)	1.05 (0.92-1.18)	1.08 (1.00-1.16)	0.99 (0.95-1.03)	0.99 (0.96-1.03)
Stroke – No	Age – 50-59	0.90 (0.79-1.03)	1.15 (1.02-1.29)	1.10 (1.02-1.19)	0.86 (0.83-0.90)	0.94 (0.91-0.97)
STOKE NO	Age – 60-69	0.74 (0.63-0.86)	1.16 (1.03-1.31)	0.99 (0.92-1.07)	0.68 (0.65-0.72)	0.86 (0.83-0.89)
	Age – 70-79	0.70 (0.57-0.85)	1.39 (1.21-1.60)	0.88 (0.79-0.98)	0.59 (0.54-0.63)	0.84 (0.80-0.88)
	Age – 80+	0.67 (0.49-0.91)	1.64 (1.36-1.98)	0.78 (0.65-0.93)	0.56 (0.50-0.63)	0.85 (0.79-0.91)
	Age – 18-39			Reference		
	Age – 40-49	2.21 (0.53-9.28)	0.45 (0.05-4.00)	1.58 (0.49-5.12)	1.08 (0.61-1.89)	1.32 (0.80-2.17)
Stroke – Yes	Age – 50-59	1.46 (0.40-5.33)	1.65 (0.51-5.32)	1.91 (0.75-4.86)	0.94 (0.58-1.51)	1.12 (0.70-1.79)
SUDRE - TES	Age – 60-69	0.47 (0.11-1.93)	1.16 (0.36-3.74)	1.46 (0.57-3.72)	0.62 (0.38-1.03)	0.95 (0.60-1.50)
	Age – 70-79	0.53 (0.12-2.19)	1.52 (0.48-4.83)	0.80 (0.29-2.17)	0.50 (0.29-0.85)	1.01 (0.64-1.60)
	Age – 80+	1.00 (0.25-3.96)	1.10 (0.33-3.73)	1.00 (0.35-2.78)	0.40 (0.21-0.76)	0.94 (0.58-1.52)

<sup>#</sup>Model 1 was adjusted for the effects of age, diabetes, sex, education level, body mass index, physical activity level, alcohol consumption, and smoking status using adjusted model weights to account for the complex survey design of the CCHS. Stroke by sex and stroke by age interactions were not statistically significant, indicating that the "overall" values across all sex and age strata combined is the preferred estimate of prevalence. Bolded values indicate statistically significant strata where the confidence interval of the relative risk does not overlap with zero, for readers with particular interest in possible sex- or age-specific effects on sleep disturbances.

Section 7. Model 2 adjusted relative risks for association of sleep disturbances and stroke: overall, sex-stratified,
and age-stratified.*

	Relative risk (95% confidence interval)					
Interaction Term	Comparator	Difficulty staying awake	<5 or >9 hours sleep	Difficulty going to sleep	Non-refreshing sleep	At least one type of disturbance
Overall	Stroke – No			Reference		
Overall	Stroke – Yes	1.83 (1.35-2.49)	1.50 (1.22-1.85)	1.11 (0.91-1.35)	1.05 (0.92-1.20)	1.06 (0.98-1.15)
	Stroke – No			Reference		
Sex – Male	Stroke – Yes	1.72 (1.09-2.70)	1.63 (1.16-2.30)	1.36 (1.00-1.86)	1.01 (0.83-1.23)	1.06 (0.93-1.22)
Sex - Female	Stroke – Yes	1.93 (1.29-2.88)	1.45 (1.13-1.87)	0.95 (0.69-1.31)	1.09 (0.91-1.29)	1.06 (0.97-1.17)
Stroke - No	Sex – Male			Reference		
Stroke - No	Sex - Female	1.14 (1.03-1.26)	1.10 (1.01-1.20)	1.35 (1.27-1.44)	1.09 (1.06-1.12)	1.06 (1.04-1.09)
Straka Vac	Sex – Male			Reference		
Stroke - Yes	Sex - Female	1.28 (0.71-2.30)	0.98 (0.66-1.46)	0.95 (0.61-1.46)	1.17 (0.90-1.52)	1.07 (0.91-1.25)
	Stroke – No			Reference		
Age – 18-39	Stroke – Yes	1.49 (0.46-4.78)	1.37 (0.41-4.61)	0.81 (0.35-1.90)	1.02 (0.57-1.82)	0.95 (0.62-1.48)
Age – 40-49	Stroke – Yes	3.52 (1.66-7.45)	0.61 (0.08-4.61)	1.06 (0.37-3.06)	1.16 (0.69-1.95)	1.15 (0.72-1.83)
Age – 50-59	Stroke – Yes	2.45 (1.48-4.04)	2.14 (1.33-3.43)	1.34 (0.89-2.01)	1.15 (0.86-1.53)	1.08 (0.86-1.37)
Age – 60-69	Stroke – Yes	1.08 (0.50-2.34)	1.52 (0.99-2.31)	1.24 (0.92-1.67)	1.06 (0.87-1.30)	1.04 (0.93-1.16)
Age – 70-79	Stroke – Yes	1.26 (0.57-2.80)	1.78 (1.15-2.74)	0.90 (0.52-1.55)	1.02 (0.76-1.37)	1.11 (0.91-1.35)
Age – 80+	Stroke – Yes	2.53 (1.22-5.24)	1.16 (0.59-2.26)	1.14 (0.60-2.14)	0.92 (0.62-1.36)	1.05 (0.82-1.34)
	Age – 18-39			Reference		
	Age – 40-49	0.89 (0.77-1.02)	1.03 (0.90-1.17)	1.03 (0.95-1.13)	0.99 (0.95-1.03)	0.99 (0.96-1.02)
Stroke – No	Age – 50-59	0.89 (0.78-1.03)	1.09 (0.96-1.24)	1.01 (0.93-1.11)	0.89 (0.85-0.93)	0.95 (0.92-0.98)
STOKE NO	Age – 60-69	0.73 (0.62-0.86)	1.08 (0.94-1.24)	0.90 (0.82-1.00)	0.76 (0.72-0.80)	0.89 (0.86-0.92)
	Age – 70-79	0.69 (0.56-0.85)	1.25 (1.06-1.47)	0.82 (0.72-0.93)	0.69 (0.65-0.74)	0.87 (0.83-0.91)
	Age – 80+	0.67 (0.48-0.92)	1.46 (1.17-1.82)	0.74 (0.61-0.90)	0.68 (0.61-0.75)	0.88 (0.82-0.94)
	Age – 18-39			Reference		
	Age – 40-49	2.09 (0.53-8.28)	0.45 (0.04-4.78)	1.35 (0.35-5.21)	1.12 (0.52-2.44)	1.19 (0.63-2.26)
Stroke – Yes	Age – 50-59	1.47 (0.42-5.17)	1.70 (0.47-6.17)	1.67 (0.66-4.25)	1.00 (0.53-1.92)	1.07 (0.66-1.77)
Stroke Tes	Age – 60-69	0.53 (0.13-2.13)	1.19 (0.33-4.27)	1.37 (0.56-3.36)	0.79 (0.43-1.47)	0.97 (0.62-1.53)
	Age – 70-79	0.59 (0.14-2.38)	1.61 (0.45-5.80)	0.90 (0.33-2.46)	0.69 (0.36-1.33)	1.01 (0.63-1.64)
	Age – 80+	1.13 (0.30-4.35)	1.23 (0.31-4.83)	1.03 (0.36-2.93)	0.61 (0.30-1.22)	0.96 (0.58-1.59)

\*Model 2 was adjusted for the effects of age, diabetes, sex, education level, body mass index, physical activity level, alcohol consumption, smoking status, arthritis, asthma, cancer, heart disease, high blood cholesterol, high blood pressure, mood disorder, and anxiety disorder using adjusted model weights to account for the complex survey design of the CCHS. Stroke by sex and stroke by age interactions were not statistically significant, indicating that the "overall" values across all sex and age strata combined is the preferred estimate of prevalence. Bolded values indicate statistically significant strata where the confidence interval of the relative risk does not overlap with zero, for readers with particular interest in possible sex- or age-specific effects on sleep disturbances.

Characteristic - Category	Unadjusted	Model 1 – adjusted	Model 2 – adjusted
* Stroke - Yes	2.13 (1.58-2.88)	2.16 (1.59-2.94)	1.83 (1.35-2.49)
Sex - Female	1.20 (1.09-1.32)	1.22 (1.11-1.35)	1.14 (1.04-1.26)
Age			
18-39	Ref.	Ref.	Ref.
40-49	0.91 (0.79-1.04)	0.89 (0.78-1.03)	0.90 (0.78-1.03)
50-59	0.98 (0.86-1.11)	0.91 (0.80-1.04)	0.90 (0.79-1.04)
60-69	0.81 (0.70-0.94)	0.72 (0.62-0.84)	0.71 (0.62-0.84)
70-79	0.79 (0.66-0.95)	0.68 (0.56-0.83)	0.68 (0.55-0.83)
80+	0.87 (0.66-1.15)	0.70 (0.52-0.93)	0.70 (0.52-0.95)
Education			
Less than secondary school	1.29 (1.12-1.48)	1.22 (1.05-1.42)	1.17 (1.01-1.36)
Secondary school	1.27 (1.14-1.41)	1.23 (1.10-1.37)	1.20 (1.08-1.34)
Post-secondary certificate or degree	Ref.	Ref.	Ref.
Physical activity			
No physical activity minutes reported	1.16 (1.03-1.31)	1.11 (0.97-1.26)	1.10 (0.97-1.25)
Active below recommended level	1.13 (1.01-1.26)	1.10 (0.98-1.23)	1.09 (0.98-1.22)
Active at / above recommended level	Ref.	Ref.	Ref.
Frequency of alcohol consumption			
Did not drink in the last 12 months	1.21 (1.07-1.36)	1.14 (1.01-1.30)	1.14 (1.00-1.29)
Occasional drinker (<1 per month)	1.21 (1.06-1.37)	1.11 (0.97-1.27)	1.09 (0.96-1.25)
Regular drinker (≥1 per month)	Ref.	Ref.	Ref.
Frequency of smoking			
Not at all	Ref.	Ref.	Ref.
Occasionally	1.23 (1.02-1.49)	1.22 (1.00-1.48)	1.13 (0.93-1.38)
Daily	1.37 (1.20-1.55)	1.30 (1.14-1.48)	1.19 (1.04-1.35)
Body mass index (BMI)			
Underweight	1.47 (1.01-2.14)	1.33 (0.91-1.93)	1.30 (0.89-1.89)
Normal weight	Ref.	Ref.	Ref.
Overweight	1.02 (0.91-1.14)	1.08 (0.96-1.21)	1.06 (0.95-1.19)
Obese – class I, II, III	1.18 (1.05-1.32)	1.18 (1.04-1.33)	1.11 (0.98-1.25)
Diabetes - Yes	1.24 (1.05-1.47)	1.25 (1.04-1.49)	1.17 (0.97-1.40)
Arthritis - Yes	1.15 (1.02-1.29)	N/A	1.10 (0.96-1.25)
Asthma - Yes	1.42 (1.23-1.65)	N/A	1.20 (1.03-1.40)
Cancer - Yes	1.11 (0.78-1.58)	N/A	1.13 (0.79-1.60)
Heart disease - Yes	1.31 (1.07-1.60)	N/A	1.22 (0.98-1.52)
High blood cholesterol - Yes	1.13 (0.98-1.30)	N/A	1.06 (0.90-1.23)
High blood pressure - Yes	1.04 (0.92-1.17)	N/A	0.99 (0.86-1.14)
Mood disorder - Yes	2.05 (1.80-2.32)	N/A	1.47 (1.27-1.71)
Anxiety disorder - Yes	2.04 (1.80-2.31)	N/A	1.49 (1.28-1.73)

Section 8. Relative risks (95% confidence intervals) for the associations between self-reported difficulty staying awake and all covariates.

\* Primary exposure of interest, N = 46,404. Ref. = reference category; N/A = variable not included in model

Characteristic - Category	Unadjusted	Model 1 – adjusted	Model 2 – adjusted
* Stroke - Yes	2.88 (2.40-3.47)	1.93 (1.57-2.38)	1.50 (1.22-1.85)
Sex - Female	1.27 (1.19-1.37)	1.21 (1.12-1.30)	1.10 (1.01-1.19)
Age			
18-39	Ref.	Ref.	Ref.
40-49	1.07 (0.95-1.20)	1.04 (0.92-1.18)	1.02 (0.90-1.17)
50-59	1.32 (1.19-1.47)	1.17 (1.04-1.31)	1.12 (0.99-1.26)
60-69	1.41 (1.26-1.56)	1.17 (1.04-1.32)	1.09 (0.95-1.25)
70-79	1.85 (1.65-2.07)	1.42 (1.24-1.62)	1.29 (1.11-1.50)
80+	2.45 (2.11-2.84)	1.62 (1.36-1.93)	1.48 (1.21-1.79)
Education			
Less than secondary school	2.14 (1.95-2.34)	1.46 (1.31-1.63)	1.37 (1.22-1.53)
Secondary school	1.29 (1.19-1.41)	1.15 (1.05-1.26)	1.12 (1.01-1.23)
Post-secondary certificate or degree	Ref.	Ref.	Ref.
Physical activity			
No physical activity minutes reported	1.62 (1.49-1.76)	1.16 (1.05-1.28)	1.13 (1.02-1.25)
Active below recommended level	1.07 (0.97-1.17)	0.96 (0.87-1.06)	0.96 (0.87-1.06)
Active at / above recommended level	Ref.	Ref.	Ref.
Frequency of alcohol consumption			
Did not drink in the last 12 months	1.70 (1.56-1.85)	1.35 (1.23-1.49)	1.28 (1.15-1.42)
Occasional drinker (<1 per month)	1.56 (1.42-1.71)	1.29 (1.17-1.44)	1.24 (1.11-1.38)
Regular drinker (≥1 per month)	Ref.	Ref.	Ref.
Frequency of smoking			
Not at all	Ref.	Ref.	Ref.
Occasionally	1.17 (1.01-1.36)	1.32 (1.12-1.55)	1.20 (1.01-1.43)
Daily	1.54 (1.41-1.69)	1.43 (1.29-1.58)	1.24 (1.11-1.39)
Body mass index (BMI)			
Underweight	2.27 (1.80-2.86)	1.88 (1.46-2.42)	1.76 (1.33-2.34)
Normal weight	Ref.	Ref.	Ref.
Overweight	1.08 (0.99-1.17)	1.06 (0.96-1.16)	1.02 (0.93-1.13)
Obese – class I, II, III	1.35 (1.24-1.48)	1.21 (1.10-1.33)	1.10 (0.99-1.22)
Diabetes - Yes	1.75 (1.57-1.95)	1.24 (1.09-1.41)	1.13 (0.99-1.30)
Arthritis - Yes	1.82 (1.69-1.97)	N/A	1.21 (1.09-1.34)
Asthma - Yes	1.52 (1.37-1.70)	N/A	1.16 (1.02-1.32)
Cancer - Yes	1.73 (1.40-2.13)	N/A	1.15 (0.92-1.42)
Heart disease - Yes	1.91 (1.69-2.17)	N/A	1.16 (0.98-1.36)
High blood cholesterol - Yes	1.51 (1.37-1.66)	N/A	1.04 (0.92-1.17)
High blood pressure - Yes	1.52 (1.40-1.65)	N/A	1.03 (0.93-1.15)
Mood disorder - Yes	2.49 (2.28-2.71)	N/A	1.65 (1.46-1.88)
Anxiety disorder - Yes	2.14 (1.95-2.35)	N/A	1.38 (1.21-1.57)

Section 9. Relative risks (95% confidence intervals) for the associations between self-reported <5 or >9 hours of sleep and all covariates.

\* Primary exposure of interest, N = 46,404. Ref. = reference category; N/A = variable not included in model

Characteristic - Category	Unadjusted	Model 1 – adjusted	Model 2 – adjuste
* Stroke - Yes	1.60 (1.33-1.92)	1.53 (1.28-1.84)	1.11 (0.91-1.35)
Sex - Female	1.66 (1.58-1.75)	1.73 (1.64-1.83)	1.35 (1.27-1.43)
Age			
18-39	Ref.	Ref.	Ref.
40-49	1.11 (1.03-1.19)	1.08 (1.00-1.17)	1.04 (0.95-1.13)
50-59	1.19 (1.11-1.28)	1.11 (1.03-1.19)	1.02 (0.93-1.11)
60-69	1.10 (1.02-1.19)	1.00 (0.92-1.08)	0.91 (0.82-1.00)
70-79	0.98 (0.88-1.08)	0.86 (0.78-0.96)	0.81 (0.71-0.92)
80+	0.91 (0.77-1.07)	0.78 (0.66-0.92)	0.74 (0.61-0.90)
Education			
Less than secondary school	1.23 (1.14-1.33)	1.15 (1.07-1.25)	1.06 (0.97-1.17)
Secondary school	1.09 (1.02-1.15)	1.06 (1.00-1.13)	1.02 (0.95-1.09)
Post-secondary certificate or degree	Ref.	Ref.	Ref.
Physical activity			
No physical activity minutes reported	1.14 (1.07-1.22)	1.03 (0.96-1.10)	1.01 (0.93-1.09)
Active below recommended level	1.02 (0.96-1.09)	0.96 (0.90-1.02)	0.97 (0.90-1.04)
Active at / above recommended level	Ref.	Ref.	Ref.
Frequency of alcohol consumption			
Did not drink in the last 12 months	1.01 (0.94-1.09)	0.91 (0.85-0.98)	0.92 (0.85-1.00)
Occasional drinker (<1 per month)	1.26 (1.18-1.35)	1.11 (1.04-1.19)	1.06 (0.98-1.15)
Regular drinker (≥1 per month)	Ref.	Ref.	Ref.
Frequency of smoking			
Not at all	Ref.	Ref.	Ref.
Occasionally	1.10 (0.99-1.23)	1.18 (1.06-1.32)	1.17 (1.08-1.27)
Daily	1.44 (1.35-1.54)	1.43 (1.33-1.53)	1.24 (0.97-1.59)
Body mass index (BMI)			
Underweight	1.48 (1.21-1.81)	1.37 (1.12-1.67)	1.24 (0.97-1.59)
Normal weight	Ref.	Ref.	Ref.
Overweight	1.02 (0.96-1.09)	1.10 (1.03-1.17)	1.03 (0.96-1.11)
Obese – class I, II, III	1.21 (1.14-1.29)	1.21 (1.13-1.29)	1.04 (0.97-1.13)
Diabetes - Yes	1.29 (1.18-1.41)	1.30 (1.18-1.42)	1.10 (0.99-1.24)
Arthritis - Yes	1.69 (1.59-1.78)	N/A	1.36 (1.25-1.46)
Asthma - Yes	1.74 (1.61-1.87)	N/A	1.26 (1.15-1.38)
Cancer - Yes	1.30 (1.09-1.56)	N/A	1.15 (0.94-1.40)
Heart disease - Yes	1.47 (1.32-1.62)	N/A	1.18 (1.04-1.35)
High blood cholesterol - Yes	1.28 (1.19-1.38)	N/A	1.08 (0.98-1.18)
High blood pressure - Yes	1.21 (1.13-1.29)	N/A	1.04 (0.96-1.13)
Mood disorder - Yes	2.59 (2.44-2.74)	N/A	1.53 (1.39-1.68)
Anxiety disorder - Yes	2.45 (2.30-2.60)	N/A	1.45 (1.32-1.59)

Section 10. Relative risks (95% confidence intervals) for the associations between self-reported difficulty going to sleep and all covariates.

\* Primary exposure of interest, N = 46,404. Ref. = reference category; N/A = variable not included in model

Characteristic - Category	Unadjusted	Model 1 – adjusted	Model 2 – adjusted
* Stroke - Yes	1.11 (0.96-1.27)	1.30 (1.14-1.49)	1.05 (0.92-1.20)
Sex - Female	1.22 (1.18-1.26)	1.24 (1.20-1.28)	1.09 (1.06-1.13)
Age			
18-39	Ref.	Ref.	Ref.
40-49	1.01 (0.97-1.05)	0.99 (0.95-1.03)	0.99 (0.95-1.03)
50-59	0.91 (0.87-0.95)	0.87 (0.83-0.91)	0.90 (0.86-0.94)
60-69	0.73 (0.69-0.77)	0.68 (0.65-0.72)	0.77 (0.74-0.81)
70-79	0.64 (0.59-0.68)	0.58 (0.54-0.63)	0.71 (0.66-0.76)
80+	0.63 (0.56-0.71)	0.55 (0.49-0.62)	0.69 (0.62-0.76)
Education			
Less than secondary school	1.10 (1.05-1.16)	1.16 (1.10-1.22)	1.07 (1.02-1.12)
Secondary school	1.13 (1.09-1.17)	1.12 (1.08-1.16)	1.06 (1.02-1.10)
Post-secondary certificate or degree	Ref.	Ref.	Ref.
Physical activity			
No physical activity minutes reported	1.05 (1.00-1.09)	1.06 (1.02-1.11)	1.03 (0.99-1.07)
Active below recommended level	1.03 (1.00-1.08)	1.02 (0.98-1.06)	1.01 (0.97-1.04)
Active at / above recommended level	Ref.	Ref.	Ref.
Frequency of alcohol consumption			
Did not drink in the last 12 months	1.11 (1.06-1.15)	1.09 (1.04-1.13)	1.04 (1.00-1.09)
Occasional drinker (<1 per month)	1.20 (1.15-1.25)	1.14 (1.10-1.19)	1.07 (1.02-1.11)
Regular drinker (≥1 per month)	Ref.	Ref.	Ref.
Frequency of smoking			
Not at all	Ref.	Ref.	Ref.
Occasionally	1.19 (1.12-1.27)	1.17 (1.10-1.24)	1.06 (1.00-1.13)
Daily	1.23 (1.18-1.28)	1.18 (1.13-1.23)	1.06 (1.01-1.10)
Body mass index (BMI)			
Underweight	1.30 (1.15-1.47)	1.20 (1.07-1.36)	1.10 (0.97-1.26)
Normal weight	Ref.	Ref.	Ref.
Overweight	1.01 (0.98-1.05)	1.09 (1.05-1.13)	1.03 (0.97-1.07)
Obese – class I, II, III	1.15 (1.10-1.19)	1.19 (1.14-1.24)	1.06 (1.02-1.10)
Diabetes - Yes	1.00 (0.94-1.07)	1.11 (1.04-1.18)	1.02 (0.96-1.08)
Arthritis - Yes	1.14 (1.10-1.18)	N/A	1.14 (1.09-1.19)
Asthma - Yes	1.33 (1.27-1.40)	N/A	1.09 (1.04-1.15)
Cancer - Yes	1.13 (1.01-1.26)	N/A	1.15 (1.04-1.27)
Heart disease - Yes	0.99 (0.91-1.07)	N/A	1.04 (0.96-1.12)
High blood cholesterol - Yes	1.02 (0.97-1.07)	N/A	1.04 (0.99-1.09)
High blood pressure - Yes	0.97 (0.93-1.01)	N/A	1.03 (0.99-1.08)
Mood disorder - Yes	1.82 (1.75-1.88)	N/A	1.28 (1.22-1.34)
Anxiety disorder - Yes	1.69 (1.63-1.76)	N/A	1.17 (1.11-1.23)

Section 11. Relative risks (95% confidence intervals) for the associations between self-reported non-refreshing sleep and all covariates.

\* Primary exposure of interest, N = 46,404. Ref. = reference category; N/A = variable not included in model

Section 12. Relative risks (95% confidence intervals) for sleep disturbance based on short, long, and combined short and long duration sleep.

Sleep disturbance measure	Unadjusted	Model 1 – adjusted <sup>#</sup>	Model 2 – adjusted <sup>*</sup>
<5 or >9 hours sleep	2.88 (2.40-3.47)	1.93 (1.57-2.38)	1.50 (1.22-1.85)
<5 hours sleep	2.84 (2.15-3.74)	1.99 (1.52-2.62)	1.48 (1.15-1.90)
>9 hours sleep	2.94 (2.19-3.95)	1.94 (1.45-2.59)	1.60 (1.16-2.20)

<sup>#</sup>Model 1 controls for the effects of age, diabetes, sex, education level, body mass index, physical activity level, alcohol consumption, and smoking status. \*Model 2 controls for the same factors as Model 1, with the addition of arthritis, asthma, cancer, heart disease, high blood cholesterol, high blood pressure, mood disorder, and anxiety disorder. N = 46,404; <5 or >9 hours sleep, n = 5,365; <5 hours sleep, n = 2,909; >9 hours sleep, n = 2,456.