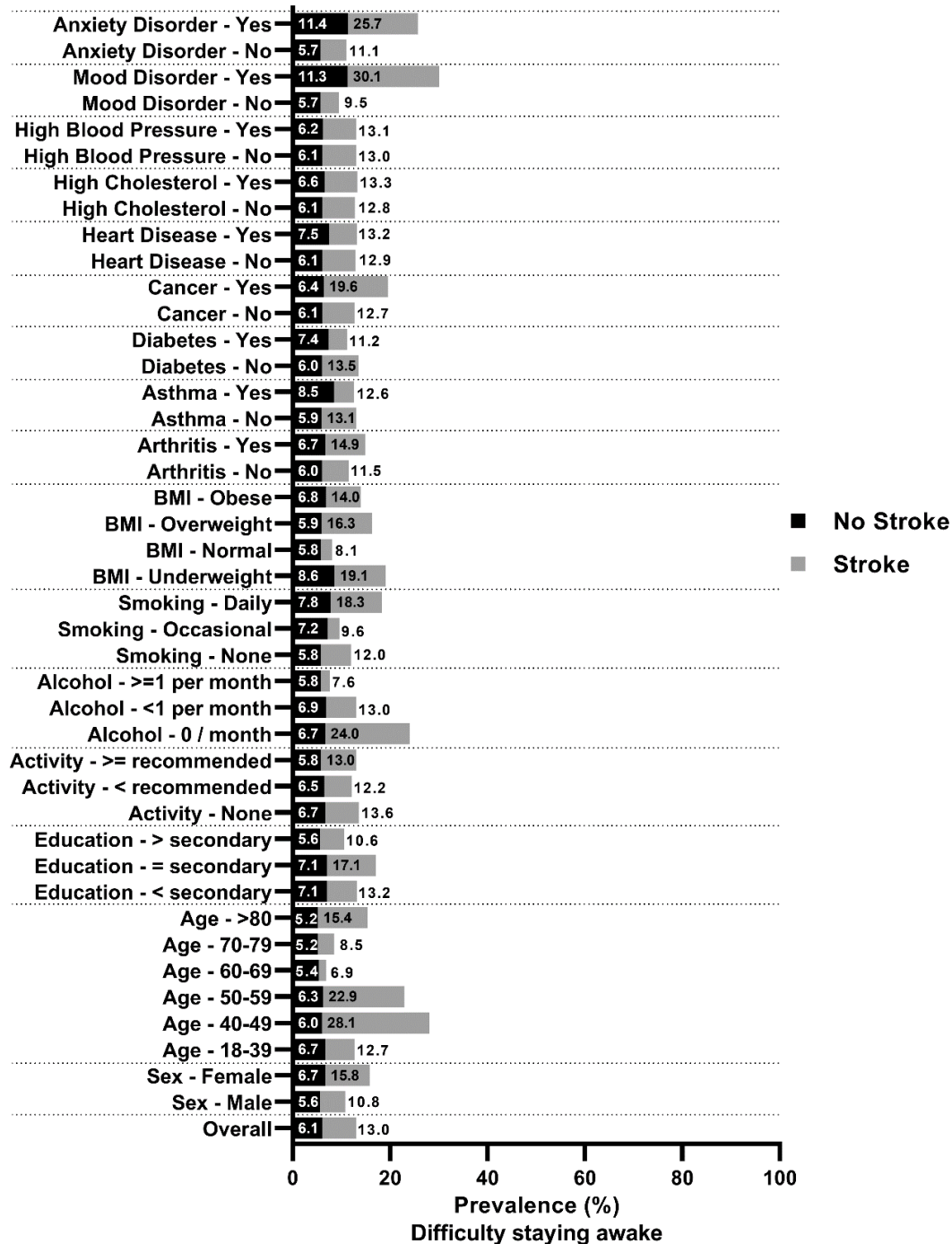


Manuscript Appendix 1

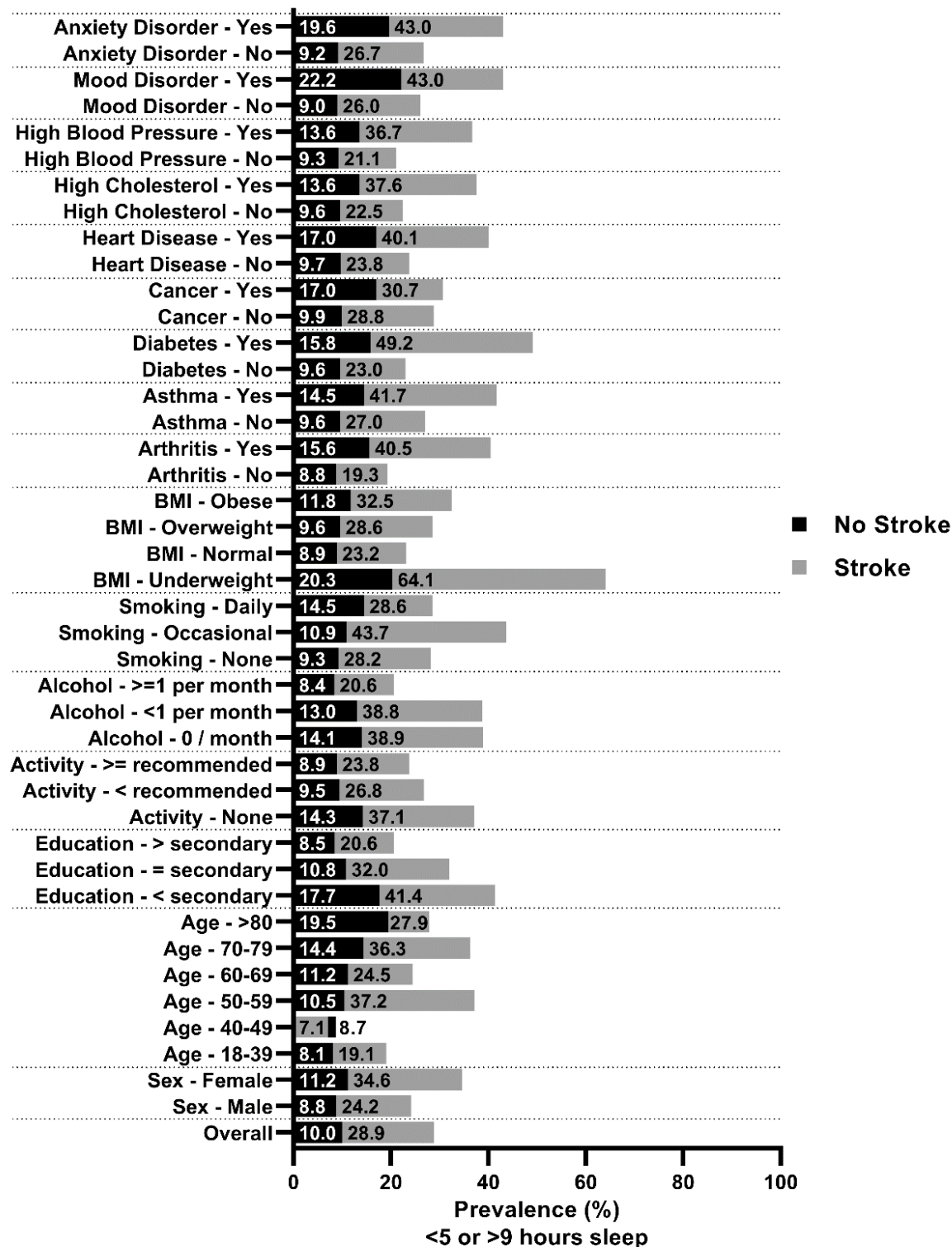
Title: Self-reported sleep disturbances among people who have had a stroke: a cross-sectional analysis

Authors: Matthew S. Jeffers MSc, Alison C. Pittman MD, Tetyana Kendzerska MD PhD, Dale Corbett PhD, Kathryn S. Hayward PhD, Yue Chen PhD



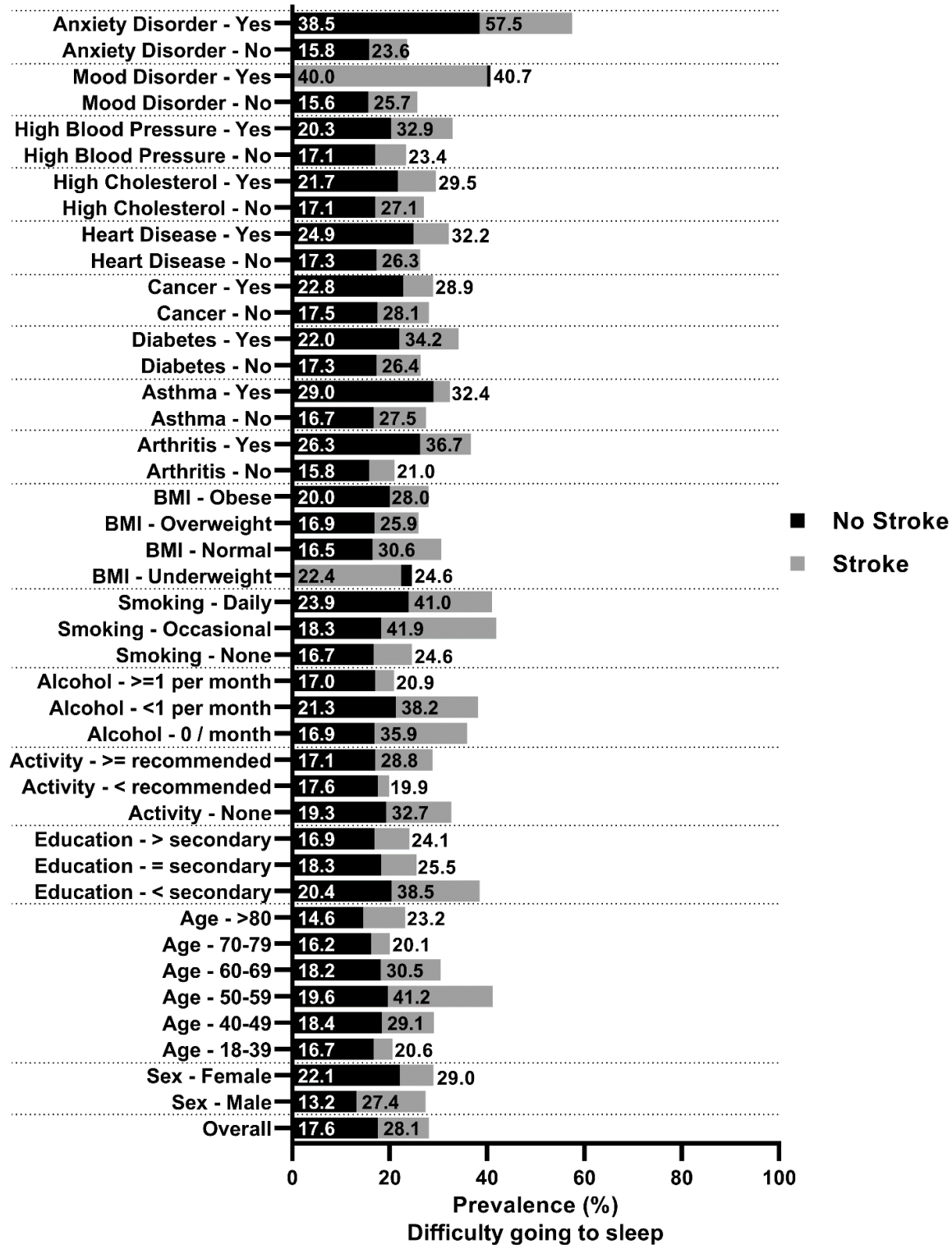
Section 1. Prevalence of *difficulty staying awake* by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially 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.

Manuscript Appendix 1



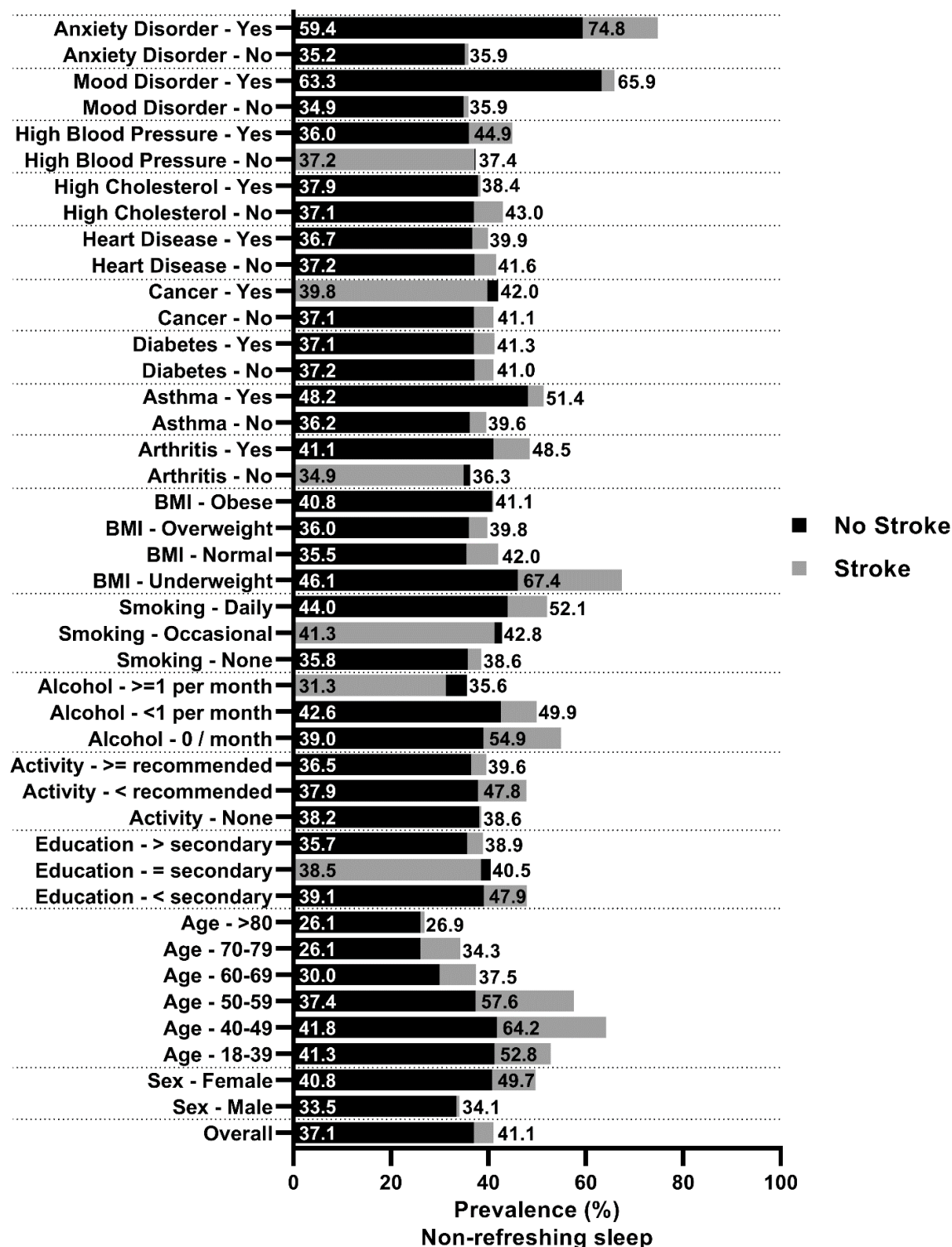
Section 2. Prevalence of <5 or >9 hours nightly sleep duration by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the 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.

Manuscript Appendix 1



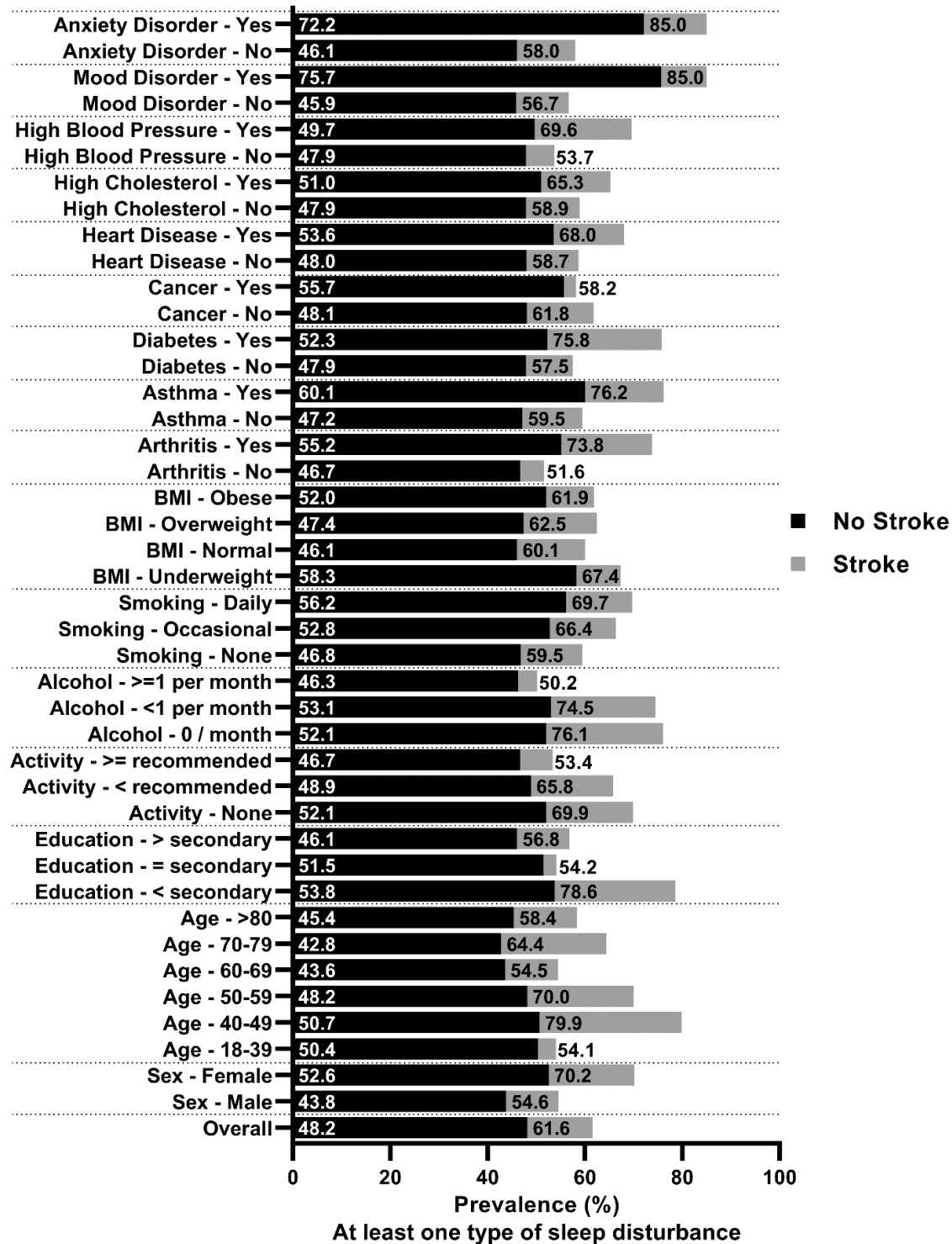
Section 3. Prevalence of difficulty going to sleep by participant characteristics and stroke status. Inset numbers represent prevalence (%) of relevant sleep disturbance weighted to the Canadian population. Portion of the bar next to the axis shows the group with lower prevalence, while the differentially 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.

Manuscript Appendix 1



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.

Manuscript Appendix 1



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.

Manuscript Appendix 1

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

Interaction Term	Comparator	Relative risk (95% confidence interval)				
		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		
	Stroke – Yes	2.16 (1.59-2.94)	1.93 (1.57-2.38)	1.53 (1.28-1.83)	1.30 (1.19-1.40)	1.28 (1.18-1.40)
Sex – Male	Stroke – No			Reference		
	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		
	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)
Stroke - Yes	Sex – Male			Reference		
	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)
Age – 18-39	Stroke – No			Reference		
	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)
Stroke – No	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)
	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)
	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)
Stroke – Yes	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)
	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)
	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)

#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.

Manuscript Appendix 1

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

Interaction Term	Comparator	Relative risk (95% confidence interval)				
		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		
	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)
Sex – Male	Stroke – No			Reference		
	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		
	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)
Stroke - Yes	Sex – Male			Reference		
	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)
Age – 18-39	Stroke – No			Reference		
	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)
Stroke – No	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)
	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)
	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)
Stroke – Yes	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)
	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)
	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.

Manuscript Appendix 1

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

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)

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

Manuscript Appendix 1

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

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)

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

Manuscript Appendix 1

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

Characteristic - Category	Unadjusted	Model 1 – adjusted	Model 2 – adjusted
* 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)

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

Manuscript Appendix 1

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

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)

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

Manuscript Appendix 1

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 [#]	Model 2 – adjusted [*]
<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)

[#]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.