

Disclosure Statement 2024-2026

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Ad hoc Consulting/Advisory	Asia-Pacific Economic Cooperation, BetterUp, Canadian Network for Mood and Anxiety Treatments (CANMAT), CB Solutions, Eisai, Genome BC, Neurotorium, Otsuka.
Ad hoc Speaking honoraria	Carnot, Lundbeck, Otsuka, Shanghai Mental Health Center, Viatrix.
Clinical trials/research (through UBC)	BC Leading Edge Endowment Fund, Brain Canada, Canadian Institutes of Health Research, CANMAT, Grand Challenges Canada, Healthy Minds Canada, Michael Smith Foundation for Health Research, Ontario Brain Institute, Unity Health, Vancouver Coastal Health Research Institute, VGH-UBCH Foundation.
Stocks/Options/Gifts	None
Patents/Copyrights	Lam Employment Absence and Productivity Scale (LEAPS)
Book Royalties	Cambridge University Press, Oxford University Press.



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Management of Potential Conflicts

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To mitigate against potential conflicts of interest (COI), I will:

- Indicate when talking about an intervention/drug in which I have a potential COI;
- Present balanced data for any treatments and talk about both benefits and harms;
- Include citations for all data and statements; and
- Place recommendations in context to published peer-reviewed clinical guidelines.

Note: For this presentation I have no conflicts with light device companies or organizations.

Seasonal Affective Disorder (Winter Depression)

Over-eating

Increased appetite
Carbo Craving
Weight gain

SAD symptoms



Over-sleeping

Increased sleeping
Increased need for sleep
Trouble waking



DSM-5 Diagnosis

Seasonal Pattern

- Recurrent DSM-5 major depressive episodes
- Regular episode onset at a particular time of year
- Full recovery or switch at regular time of year
- At least 2 seasonal episodes in past 2 years

SAD affects 1-3% of Canadians

BUT

Seasonal changes occur in up to 30%

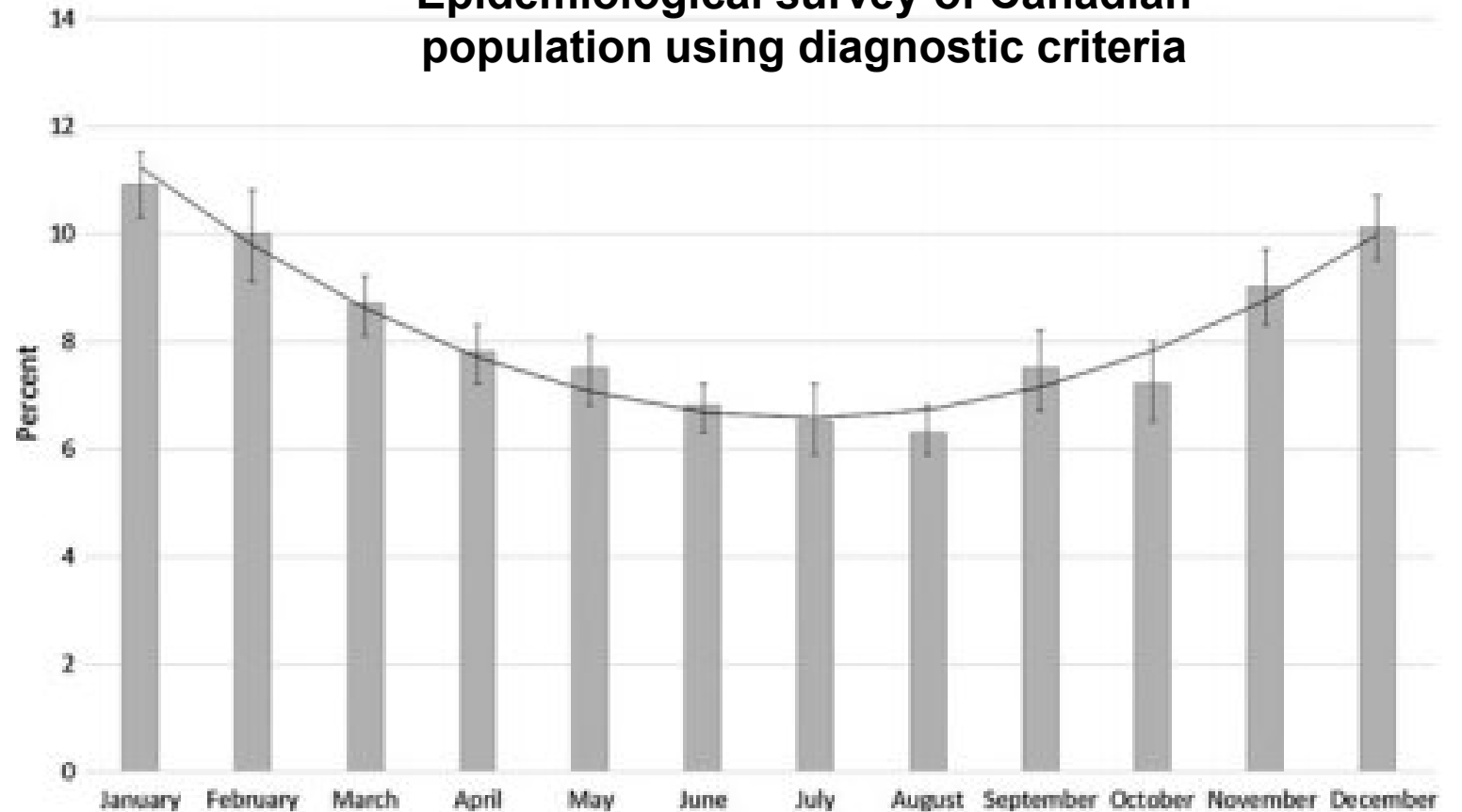


www.UBCsad.ca

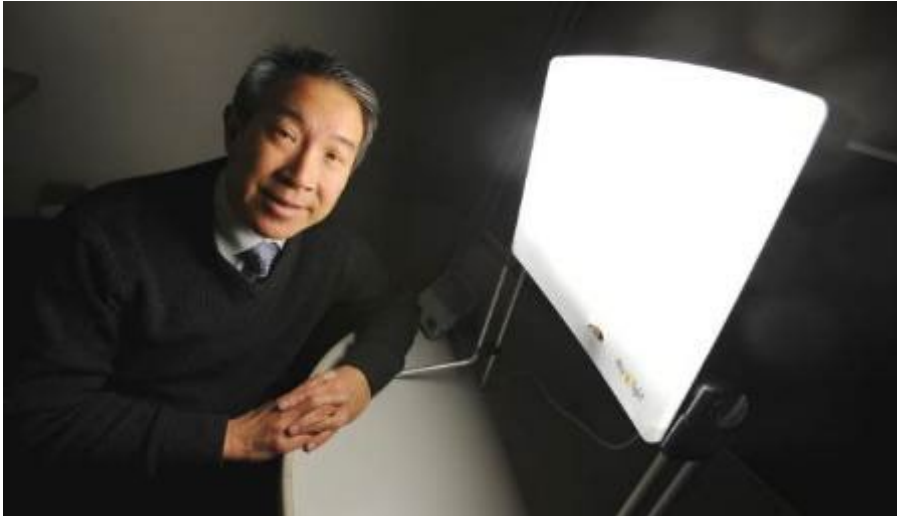
Canadian Population Studies of Major Depressive Episodes

- In Canada, about 1 in 15 (7%) people have major depressive episodes.
- There is seasonal variation, with more people depressed in the winter months compared to the summer months.

Epidemiological survey of Canadian population using diagnostic criteria



Light therapy for SAD



Effective Light therapy is NOT...

- Changing the kitchen lights
- Having more windows
- Going to tanning studios
- Using a special type of light

Light Therapy Protocol for Depression

- Fluorescent or LED light box
- 10,000 lux white light
- No ultraviolet wavelengths
- 30 minutes daily
- Early morning exposure

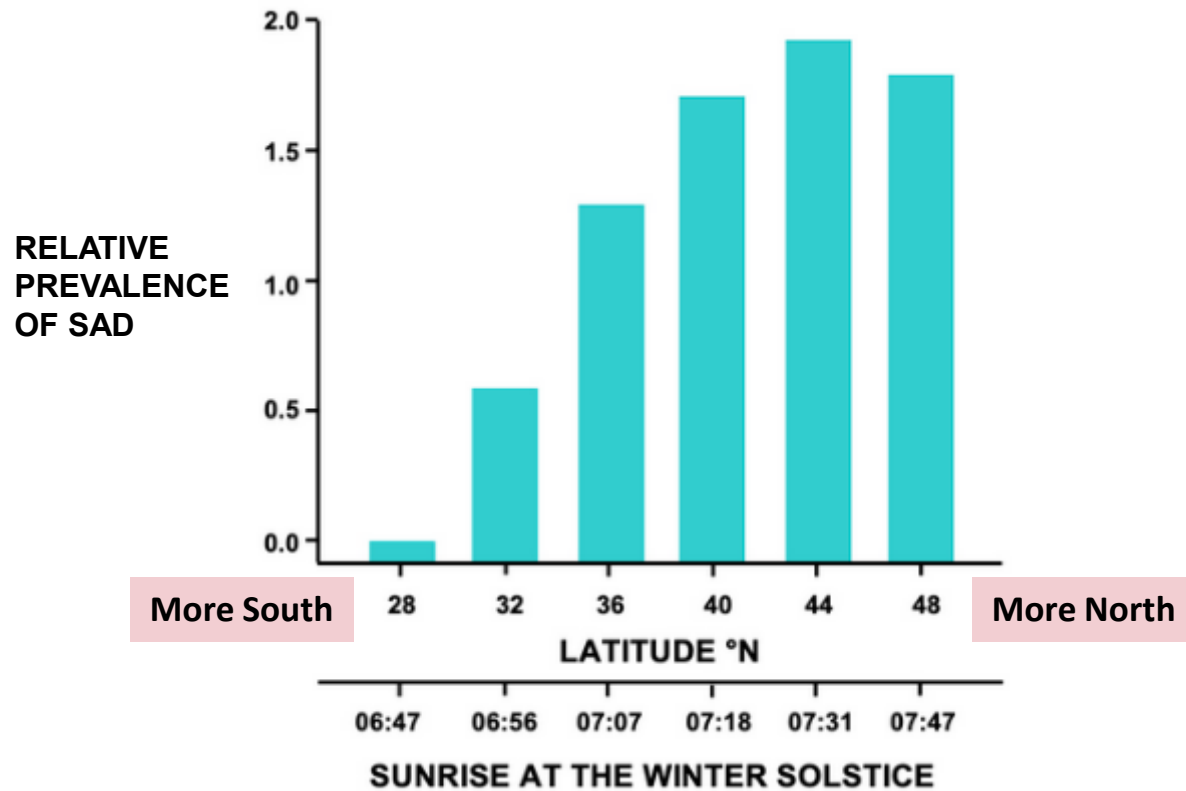
Circadian Rhythm Hypothesis for SAD and Light

- SAD arises from a phase delay in circadian rhythms
- Morning bright light corrects the phase delay
- The later the sunrise, the worse is the phase delay

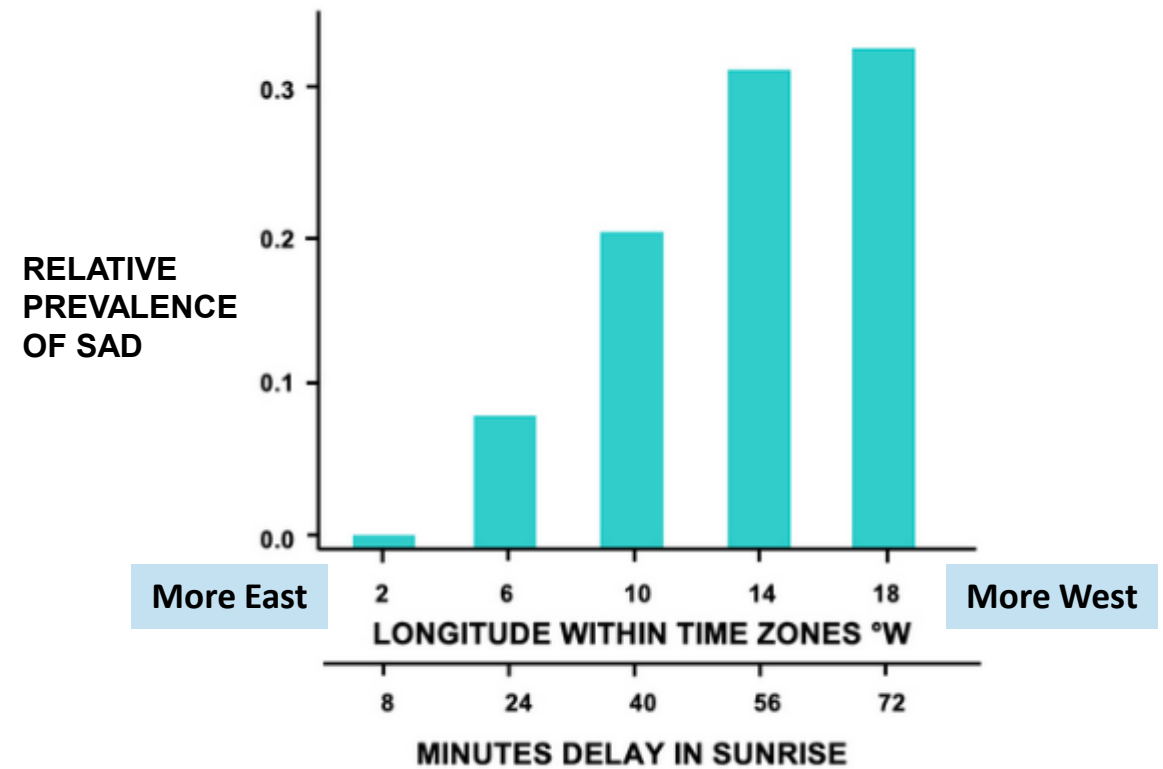


Both Latitude AND Longitude Affect Prevalence of SAD

More **northern** latitudes are associated with **later** sunrise, and **higher** rates of SAD.

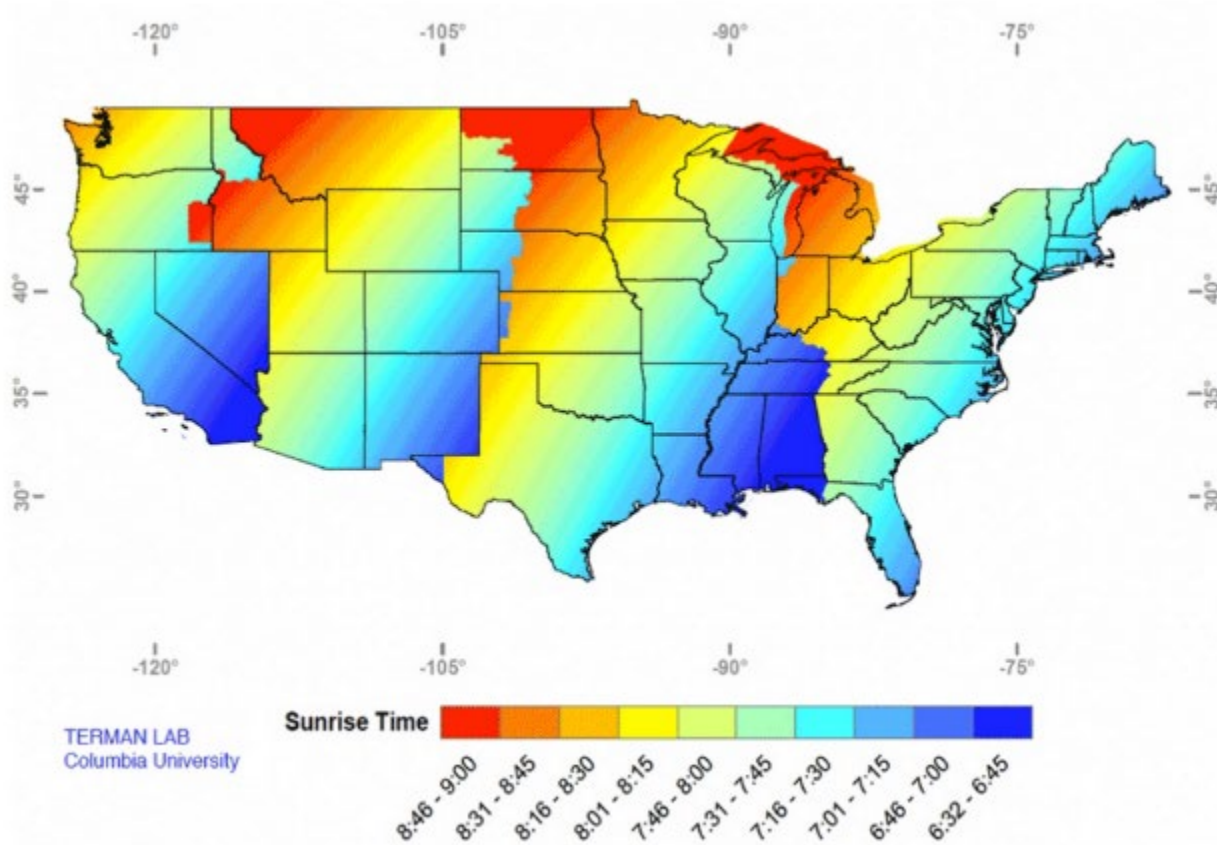


More **western** regions within time zones are associated with **later** sunrise, and **higher** rates of SAD.



Internet survey of 1510 adults living between 32-47° N latitude and two adjacent time zones (eastern and central).

Natural Experiments for Permanent Daylight Savings Time: The Western Edge Effect



The East-to-West Progression: The Earth rotates from west to east, meaning the sun naturally hits eastern locations first.

As you go farther west, the sun rises later within each time zone.

In effect, the western edge of a time zone is an hour delayed relative to the eastern edge, hence a form of permanent DST.

Later sunrise times lead to greater phase-delays in circadian rhythms.

- **IF** phase-delayed circadian rhythms are associated with depression, especially in winter;
- **THEN** we would expect that the prevalence of depression would be **higher in the western part of the time zone** compared to the eastern part.

Natural Experiments for Permanent Daylight Savings Time: The Western Edge Effect



Hypothesis:

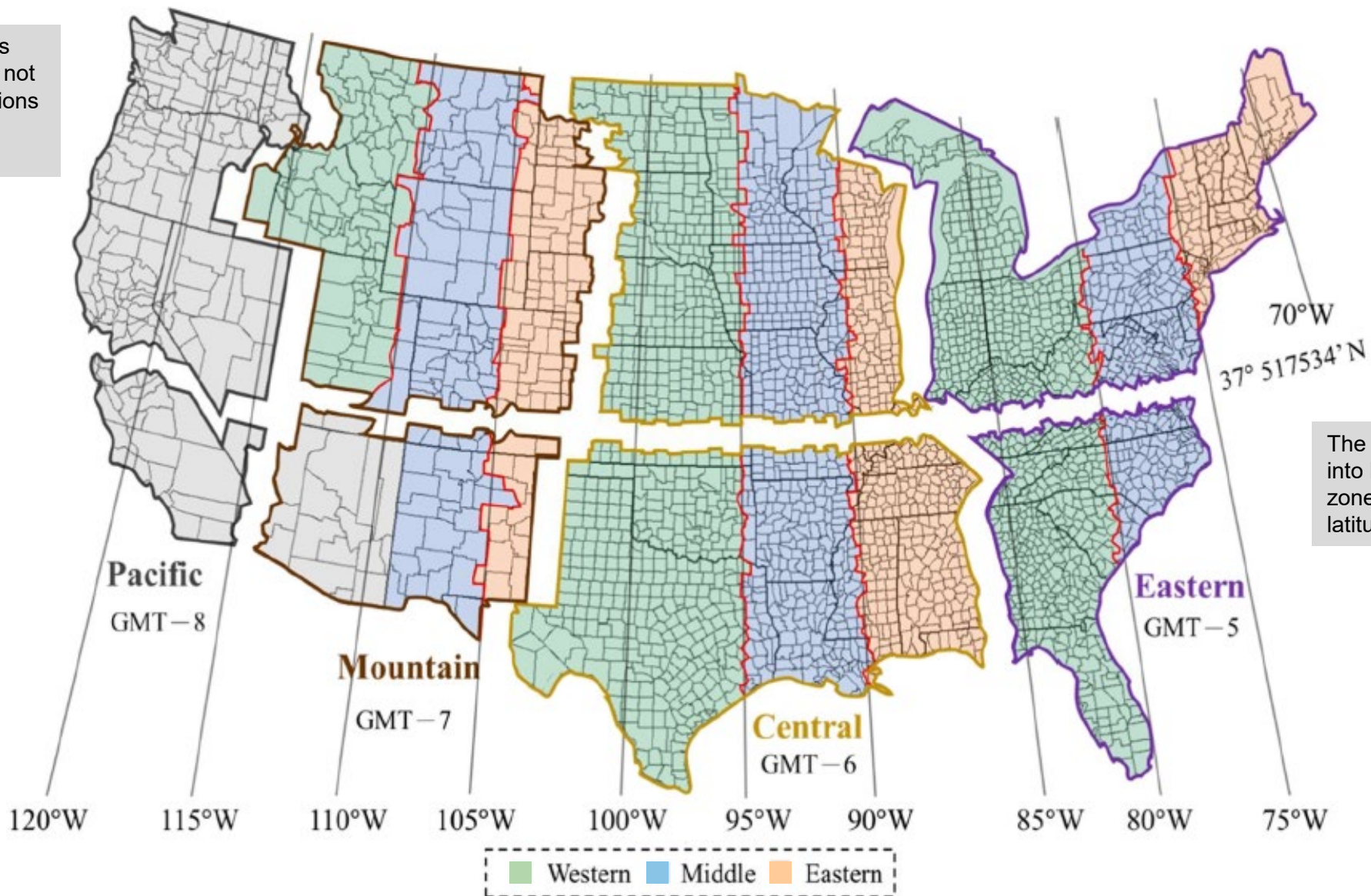
- **Western** time zone partitions will have **higher** suicide rates than eastern partitions.

Methods:

- United States (U.S.) county-level suicide and demographic data, from 2010 to 2018, were obtained.
- Time zones were partitioned into western, middle, or eastern thirds based on longitude.
- The U.S. was also split into Northern and Southern halves to examine latitude (photoperiod) differences.
- Linear regressions used to estimate associations between suicide rates and time zone partitions, adjusting for gender, race, ethnicity, age group, and unemployment rates.

Representation of Time Zone Partitioning for U.S. Counties

The Pacific Time Zone was excluded because it could not be divided into three partitions with the same rules as the other time zones.

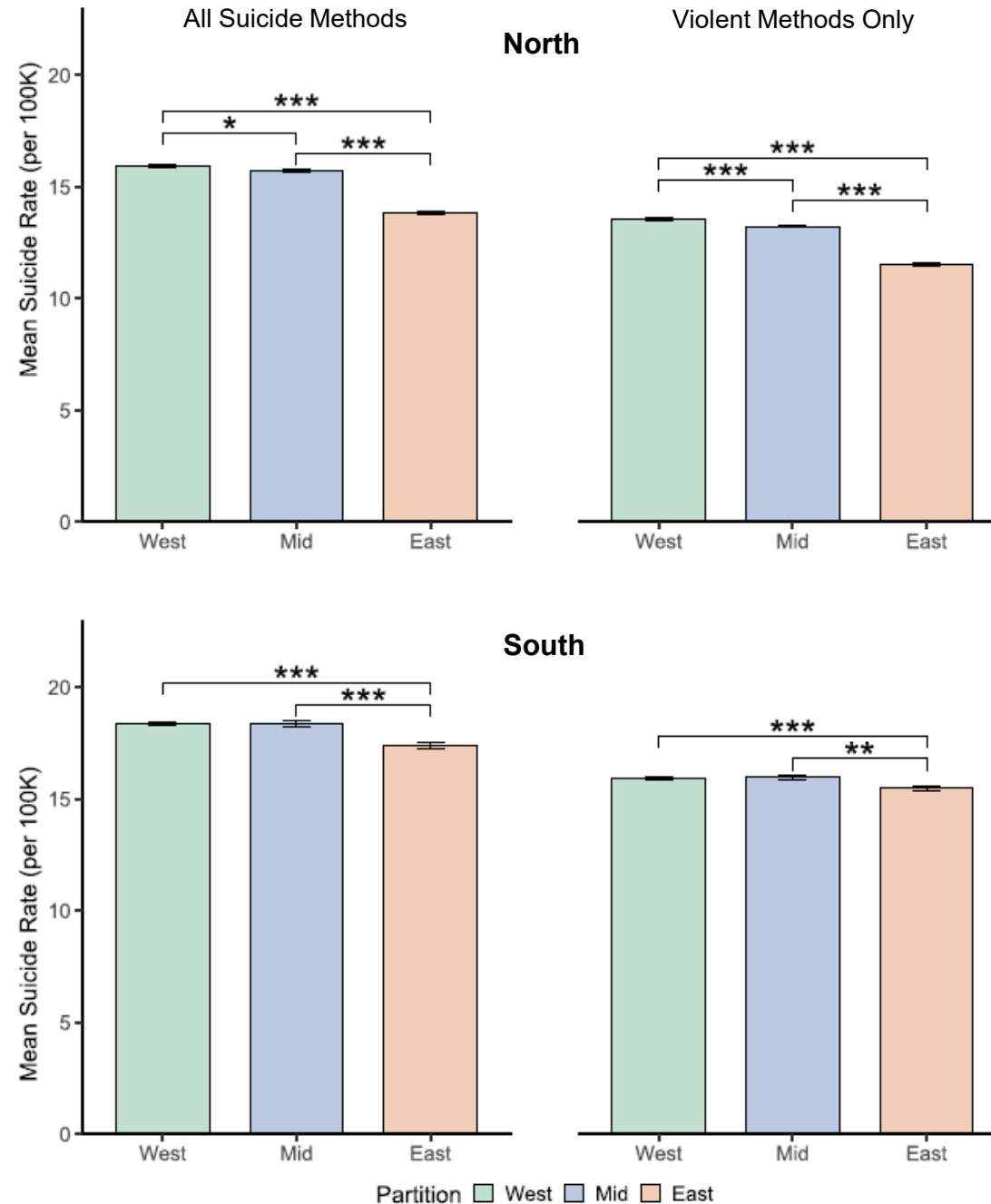


The U.S. was divided into North and South zones to account for latitude differences.

Estimated Adjusted Suicide Death Rates per 100,000 People Across Time Zone Partitions in the Northern and Southern U.S.

In the **northern U.S.**, western partitions had an adjusted average of over **2 additional suicides per 100,000** people each year (both for All Suicide Methods and Violent Methods Only).

In the **southern U.S.**, western partitions had an adjusted average of nearly **1 additional suicide per 100,000** people each year for All Suicide Methods and nearly **0.5 additional suicides per 100,000** people each year for Violent Methods Only.



* p<0.05
 ** p<0.01
 *** p<0.001

after adjusting for multiplicity

Note: North was not compared to South.

Natural Experiments for Permanent Daylight Savings Time: The Western Edge Effect

Suicide Rates within Time Zones

Hypothesis:

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Methods:

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Other studies have shown that living in the **western** region of a U.S. time zone, compared to an eastern region, is associated with:

- Decreased total **sleep time** (Giuntella & Mazzonna 2019)
- Higher rates of **depression** (Argys et al. 2026)
- Higher prevalence of **obesity, diabetes, and cardiovascular diseases** (Giuntella & Mazzonna 2019)
- Elevated risk of **traffic fatalities** (Gentry et al. 2022)

- Higher **cancer incidence** and **mortality** (Borisenkov 2011)
- Higher risk of **multiple types of cancers** (Gu et al. 2017)
- Higher incidence of **breast cancer** (Giuntella & Mazzonna 2019)

Public Health and Permanent Daylight Savings Time: Effects on Mood and Depression

- Later sunrise in winter is associated with higher rates of SAD and seasonal changes in mood, sleep, and appetite.
- The “western edge effect” (later sunrise within time zones) simulates the effect of permanent DST.
- The western edge effect shows detrimental effects on depression, suicide, sleep, and medical conditions.
- Permanent DST is predicted to have the same detrimental effects.
- Optimizing circadian cues and using light therapy may help mitigate some of the winter effects on mood and sleep.



5 Top Tips to prevent and treat the winter blues

1. Use light therapy
2. Spend more time outdoors
3. Exercise for mental health
4. Keep a regular sleep schedule
5. Use a sunrise light clock

