

# The Link Between Sleep and Mood: Improving Sleep and Mental Health During the COVID-19 Pandemic

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December 8, 2021



HARVARD  
MEDICAL SCHOOL

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# Acknowledgment

Presented in 2021 by the Mental Health Technology Transfer Center (MHTTC) Network.

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At the time of this publication, Miriam E. Delphin-Rittmon, Ph.D, served as Assistant Secretary for Mental Health and Substance Use in the U.S. Department of Health and Human Services and the Administrator of the Substance Abuse and Mental Health Services Administration.

The opinions expressed herein are the view of TTC Network and do not reflect the official position of the Department of Health and Human Services (DHHS), SAMHSA. No official support or endorsement of DHHS, SAMHSA, for the opinions described in this document is intended or should be inferred.

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Presented 2021

The MHTTC Network uses affirming, respectful and recovery-oriented language in all activities. That language is:

STRENGTHS-BASED  
AND HOPEFUL

INCLUSIVE AND  
ACCEPTING OF  
DIVERSE CULTURES,  
GENDERS,  
PERSPECTIVES,  
AND EXPERIENCES

HEALING-CENTERED AND  
TRAUMA-RESPONSIVE

INVITING TO INDIVIDUALS  
PARTICIPATING IN THEIR  
OWN JOURNEYS

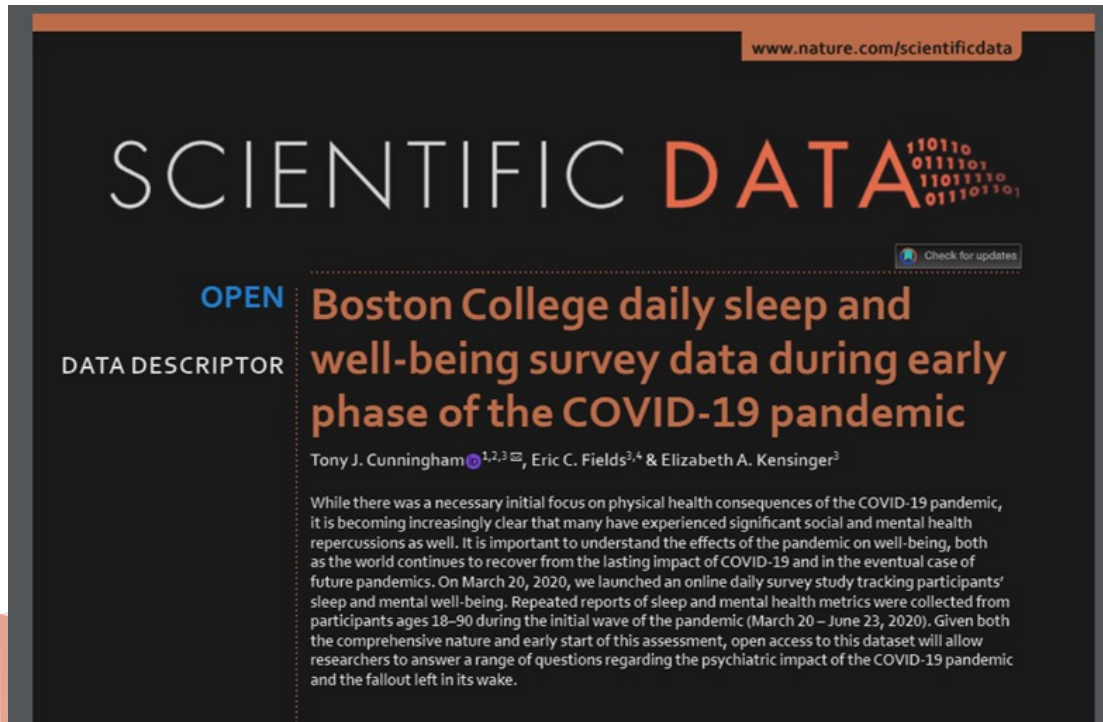
PERSON-FIRST AND  
FREE OF LABELS

NON-JUDGMENTAL AND  
AVOIDING ASSUMPTIONS

RESPECTFUL, CLEAR  
AND UNDERSTANDABLE

CONSISTENT WITH  
OUR ACTIONS,  
POLICIES, AND PRODUCTS

# Free Data!



www.nature.com/scientificdata

## SCIENTIFIC DATA

OPEN DATA DESCRIPTOR

### Boston College daily sleep and well-being survey data during early phase of the COVID-19 pandemic

Tony J. Cunningham<sup>1,2,3</sup>, Eric C. Fields<sup>3,4</sup> & Elizabeth A. Kensinger<sup>3</sup>

While there was a necessary initial focus on physical health consequences of the COVID-19 pandemic, it is becoming increasingly clear that many have experienced significant social and mental health repercussions as well. It is important to understand the effects of the pandemic on well-being, both as the world continues to recover from the lasting impact of COVID-19 and in the eventual case of future pandemics. On March 20, 2020, we launched an online daily survey study tracking participants' sleep and mental well-being. Repeated reports of sleep and mental health metrics were collected from participants ages 18–90 during the initial wave of the pandemic (March 20 – June 23, 2020). Given both the comprehensive nature and early start of this assessment, open access to this dataset will allow researchers to answer a range of questions regarding the psychiatric impact of the COVID-19 pandemic and the fallout left in its wake.



OSFHOME

Boston College COVID-19 Sleep and We... Files Wiki Analytics Registrations

### Boston College COVID-19 Sleep and Well-Being Dataset



[osf.io/gpxwa/](https://osf.io/gpxwa/)

Or contact [acunnin4@bidmc.harvard.edu](mailto:acunnin4@bidmc.harvard.edu) for more information

# Today's outline

1. Personal experience
2. Remember when...
3. Boston College COVID-19 Sleep and Well-Being Study
4. Initial Sleep Results
5. Initial Affect Results
6. Improving sleep (even during a pandemic)



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# In the early months of the COVID-19 pandemic, how did your average sleep duration change?

- A. Slept more than pre-pandemic
- B. Slept less than pre-pandemic
- C. Slept about the same as pre-pandemic
- D. Sleep amount was all over the place at start of pandemic

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**In the early months of the COVID-19 pandemic, how did your sleep schedule consistency change on average?**

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# In the early months of the COVID-19 pandemic, how did your average morning wake/rise time change?

- A. Woke up later than pre-pandemic
- B. Woke up earlier than pre-pandemic
- C. Woke up about the same time as pre-pandemic
- D. Wake time was all over the place at start of pandemic

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# What types of activities did you engage in to cope/pass the time during early months of COVID-19 pandemic?

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# As things have begun to "return to normal", how has your sleep schedule consistency changed compared to the early days of the pandemic?

- A. My sleep schedule is now LESS consistent than early pandemic
- B. My sleep schedule is now MORE consistent than early pandemic
- C. My sleep schedule is now is equally consistent compared to early pandemic

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Remember when  
(US edition)...

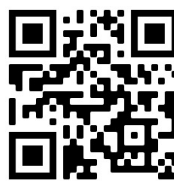




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osf.io/gpxwa/



# Today's Paper

The Times in Print For Feb. 14, 2020 ▼

THE FRONT PAGE | INTERNATIONAL | NATIONAL | OBITUARIES | EDITORIALS, OP-ED AND LETTERS | NEW YORK | BUSINESS DAY | SPORTS FRIDAY | WEEKEND ARTS | PAGES A2-A3 AND CORRECTIONS

## The Front Page



T.J. KIRKPATRICK FOR THE NEW YORK TIMES

### Barr Says Attacks From Trump Make Work 'Impossible'

The attorney general said that the president's attacks on prosecutors' handling of his friend Roger Stone's sentencing undermine the legal system and the Justice Department.

February 19, 2020 · By KATIE BENNER



ALEX PLAVEVSKI/EPA, VIA SHUTTERSTOCK

### China Expands Chaotic Dragnet in Coronavirus Crackdown

The "wartime" campaign to round up all who might be sick was extended to cities beyond the epicenter, even as it was marred by confusion that has isolated vulnerable patients and left some to die.

February 14, 2020 · By AMY QIN

### How Months of Miscalculation Led the U.S. and Iran to the Brink of War

The Trump administration escalated pressure on Iran to try to negotiate over its nuclear aims. Instead, Iran fought back with violent attacks. At critical points, each country misjudged the other.



October 26, 2020 · By MARK MAZZETTI, RONEN BERGMAN and FARNAZ FASSIHI

### Biden Needs Black Voters to Lift His Campaign. But He Has Competition.

Joe Biden is looking ahead to South Carolina to





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## The Front Page



EMMANUEL DUNAND/AGENCE FRANCE-PRESSE — GETTY IMAGES

### Lawmakers Are Warned That Russia Is Meddling to Re-elect Trump

A classified briefing to House members is said to have angered the president, who complained that Democrats would “weaponize” the disclosure.

September 22, 2020 · By ADAM GOLDMAN, JULIAN E. BARNES, MAGGIE HABERMAN and NICHOLAS FANDOS



T.J. KIRKPATRICK FOR THE NEW YORK TIMES

### Roger Stone Is Sentenced to Over 3 Years in Prison

The sentencing played out amid extraordinary upheaval at the Justice Department and a virtual standoff between the president and the attorney general.

July 19, 2020 · By SHARON LAFRANIÈRE

### How Bloomberg Bungled a Debate That He Had Been Prepped For

Michael Bloomberg's campaign advisers had anticipated



tough debate questions on stop-and-frisk and nondisclosure agreements. The former mayor's performance left his team rattled.

November 3, 2020 · By MATT FLEGENHEIMER, ALEXANDER BURNS and JEREMY W. PETERS

### Far-Right Shooting Shatters an Already Fragile Sense of Security in Germany

The attack showed that no part of the country is immune to the potential for violence fueled by anti-





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## The Front Page



JEENAH MOON FOR THE NEW YORK TIMES

### Coronavirus Fears Drive Stocks Down for 6th Day and Into Correction

The virus, which has now spread to 47 countries, has put pressure on businesses and supply chains around the world.

February 28, 2020 · By MATT PHILLIPS



GHAITH ALSAYED/ASSOCIATED PRESS

### Airstrike Hits Turkish Forces in Syria, Raising Fears of Escalation

The Turkish Army suffered mass casualties in the strike, officials said, an attack that could set off a direct conflict between Turkey and Russia.

February 27, 2020 · By CARLOTTA GALL

### Scarred and Weary, an Afghan Force Wonders: What Is Peace?

A truce is prompting introspection. "Who is it on the other side?" mused a 15-year veteran of intimate warfare. "They are not even from a different district."

March 4, 2020 · By MUJIB MASHAL and KIANA HAYERI



### U.S. Health Workers Responding to Coronavirus Lacked Training and Protective Gear, Whistle-Blower Says

Team members were not properly trained, lacked necessary gear and





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## The Front Page



SPENCER PLATT/GETTY IMAGES

### 'Almost Without Precedent': Airlines Hit Hard by Coronavirus

The effects could wipe out up to \$113 billion in worldwide revenues this year, a trade group said, a new blow to the industry.

April 29, 2020 · By DAVID GELLES and NIRAJ CHOKSHI



### Elizabeth Warren, Once a Front-Runner, Drops Out of Presidential Race

Ms. Warren, a senator and former law professor, staked her campaign on fighting corruption and changing the rules of the economy.

January 20, 2021 · By SHANE GOLDMACHER and ASTEAD W. HERNDON

NEWS ANALYSIS

### Was It Always Going to Be the Last Men Standing?

For Elizabeth Warren, the historic number of women in the 2020 field and the Democrats who supported them, the question will linger.

March 6, 2020 · By LISA LERER



### Judge Calls Barr's Handling of Mueller Report 'Distorted' and 'Misleading'

The judge said the attorney general lacked credibility on the matter and said he would review the report to decide whether to make its contents public.







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## The Front Page



JEENAH MOON/GETTY IMAGES

### Congress Nears Stimulus Deal With White House as Wall Street Suffers Rout

House Democrats closed in on a compromise with the Trump administration that would provide paid sick leave and free testing as coronavirus fears fueled a steep sell-off in stocks.

March 13, 2020 · By EMILY COCHRANE, JEANNA SMIALEK and JIM TANKERSLEY



CHET STRANGE FOR THE NEW YORK TIMES

### Sick People Across the U.S. Say They Are Being Denied the Coronavirus Test

In a health care system that is already difficult to navigate, some patients describe Kafkaesque quests for tests.

March 13, 2020 · By FARAH STOCKMAN

### Italy's Health Care System Groans Under Coronavirus — a Warning to the World

In less than three weeks, the virus has overloaded hospitals in



northern Italy, offering a glimpse of what countries face if they cannot slow the contagion.

March 17, 2020 · By JASON HOROWITZ

NEWS ANALYSIS

### The President as Bystander: Trump Struggles to Unify a Nation on Edge

School superintendents, sports commissioners, college presidents, governors and business owners have taken



# Maybe this is going to be a big deal...



- Contacted my supervisor (Dr. Elizabeth Kensinger) on March 13
  - “Hey... worst case scenario this will only be for a few weeks, month tops, right?”
- One week later, we received IRB approval and launched the Boston College COVID-19 Sleep and Well-Being Study on March 20, 2020...

**LET'S GO!**



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## The Front Page



DEMETRIUS FREEMAN FOR THE NEW YORK TIMES

### One in Five Americans Ordered to Stay Home in Coronavirus Crackdown

Strict new directives in New York, California, Illinois and other states were intended to slow the spread of the coronavirus.

March 26, 2020 · By JULIE BOSMAN and JESSE MCKINLEY



COOPER NEILL FOR THE NEW YORK TIMES

### Trump Resists Pressure to Use Wartime Law to Mobilize Industry in Virus Response

The president insisted he has used the Defense Production Act, but said at a briefing that "we are literally being besieged" by companies "that want to do the work and help our country."

March 21, 2020 · By KATIE ROGERS, MAGGIE HABERMAN and ANA SWANSON

### Coronavirus in N.Y.: 'Deluge' of Cases Begins Hitting Hospitals

There are already critical shortages: A Bronx hospital is running out of ventilators. In Brooklyn, doctors are reusing masks.

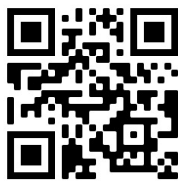


March 21, 2020 · By BRIAN M. ROSENTHAL, JOSEPH GOLDSTEIN and MICHAEL ROTHFELD

### Coronavirus Could Overwhelm U.S. Without Urgent Action, Estimates Say

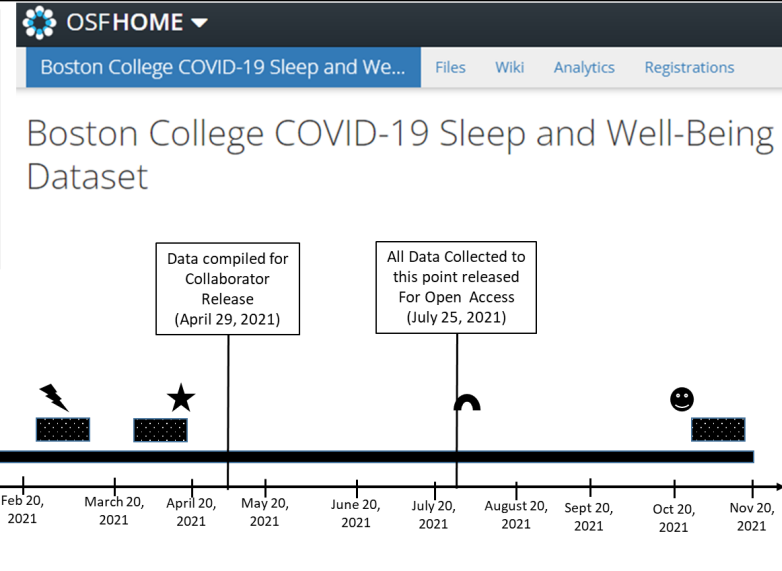
Immediate steps to limit social contact in parts of the United States where few cases have been identified are needed to slow the outbreak, a model suggests.





# Study Design

- = Study Enrollment Open (March 20, 2020 - Present)
- = Daily survey assessment (March 21 – May 20, 2020//Oct 1 – Oct 14, 2020//Oct 31 – Nov 14, 2020// Feb 22 – March 8, 2021//April 5 – April 18, 2021// Nov 1 – Nov 15, 2021)
- = Survey Assessment 2x/week (May 21 – June 23, 2020)
- = Launch of Round 1 Assessment (May 19, 2020)
- = Launch of Round 2 Assessment (June 16, 2020)
- = Launch of Round 3 Assessment (June 29, 2020)
- = Launch of Round 4 Assessment (September 28, 2020)
- = Launch of Round 5 Assessment (February 27, 2021)
- = Launch of Round 6 Assessment (April 18, 2021)
- = Launch of Round 7 Assessment (July 27, 2021)
- = Launch of Round 8 Assessment (**Oct 28, 2021**)



# Data Collected

- Short Daily Survey:
  - Sleep Logs
    - TIB, try to fall asleep, sleep latency, awakenings/time, time awake, out of bed
  - Dream Reports
  - Naps
  - Activity/Steps
  - Contact with others
  - Virtual Socialization
  - Exercise
  - Alcohol Consumption
  - Overall Stress
  - COVID Symptoms/Diagnosis

- 'Full' Daily Survey:
  - All Short Survey Questions
  - Positive and Negative Affect Schedule (PANAS)
  - Patient Health Questionnaire - 8 (w/o suicidality question)
  - COVID-19 Worry Questions

<b>Round 1 Assessment</b>
Pittsburgh Sleep Quality Index (PSQI)
Munich Chronotype questionnaire (MTQ) - Prior to Feb 1, 2020
Munich Chronotype questionnaire (MTQ) 2 - Last 6 weeks
Generalized anxiety disorder (GAD)-7 questionnaire
Cognitive emotion regulation questionnaire (CERQ)
Liebowitz social anxiety scale (LSAS)- added element about pre-COVID behavior
Big 5 Personality assessment

<b>Round 2 Assessment</b>
Insomnia Severity Index (ISI)
Reduced Morningness-Eveningness Questionnaire
Perceived Stress Scale
Toronto Empathy Questionnaire
Memory Questions that do not include free-response elements

<b>Round 3 Assessment</b>
Emotion Regulation Questionnaire (ERQ)
Brief Self-Control Scale
Short Impulsive Behavior Scale
Intolerance of Uncertainty
Spring Wrap-up/Extra Demographics that do not include free-response elements

<b>Round 4 Assessment</b>
PSQI (reassessment)
Insomnia Severity Index (reassessment)
Munich Chronotype Questionnaire (reassessment)
Generalized Anxiety Disorder (GAD-7) reassessment
COVID memory (reassessment)
Peak COVID emotions (reassessment)
Pro-social Behavior Assessment
News Source assessment
COVID Symptoms
Political Ideology

<b>Round 5 Assessment</b>
PSQI (reassessment)
Insomnia Severity Index (reassessment)
Munich Chronotype Questionnaire (reassessment)
PROMIS Fatigue Survey
Generalized Anxiety Disorder (GAD-7) reassessment
Perceived Stress Scale (PSS) reassessment
Multifactorial Memory Questionnaire
Demographic/COVID Diagnosis update
COVID Impact/COVID Expectations
Vaccination Questions
Interpersonal Reactivity Index (IRI)
Personality Inventory for DSM-5 Brief Form (PID-5-BF)
John Henryism Adaptive Coping Scale (JHACS)
Adverse Childhood Experiences Survey (ACE)

<b>Round 6 Assessment</b>
Full version of Daily Survey <a href="#">here</a>
Liebowitz social anxiety scale (LSAS)-reassessment
COVID Impact/COVID Expectations
Vaccination Questions

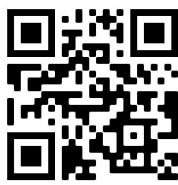
<b>Round 7 Assessment</b>
Vaccination Memory Questions
Epworth Sleepiness Scale
Connor-Davidson Resilience Scale - 10
Pre-Sleep Arousal Scale (PSAS)
Ford Insomnia Response to Stress Test (FIRST)
Multifactorial Memory Questionnaire - Ability

<b>Round 8 Assessment</b>
PSQI (reassessment)
Insomnia Severity Index (reassessment)
Munich Chronotype Questionnaire (reassessment)
PROMIS Fatigue Survey (reassessment)
Iowa Sleep Disturbance Inventory (extended) ISDI
Liebowitz social anxiety scale (LSAS; reassessment)
Generalized Anxiety Disorder (GAD-7; reassessment)
Perceived Stress Scale (PSS; reassessment)
Demographic/COVID Diagnosis update
Personality Inventory for DSM-5 Brief Form (PID-5-BF; reassessment)
COVID Impact
Vaccination Questions
PROMIS Sleep Related Impairment
PROMIS Sleep Disturbance
COVID Memory/Nostalgia Questions
Demographic/COVID Diagnosis update



# Participants

- 2,243 Consent forms submitted
- 60 countries
- 6 continents
- 20 different time zones
- 47 U.S. States, Washington DC, and Puerto Rico
  - No Dakotas or West Virginia



# Participants

- **1660 'active' participants at peak**
  - Currently ~1500 participants still enrolled
- **Residence**
  - US = 81.8%
  - Non-US = 18.2%
- **Member of LGB Group:** 20.8%
- **Sex**
  - Female: 80%
  - Male: 20%
- **Gender**
  - Cisgender: 97.9%
  - Transgender: 1.4%
  - Prefer not to say: 0.7%
- **Parents:** 32.7%
- **Employment**
  - Employed: 77.4%
  - Unemployed/Retired/Full-time Student: 22.6%
- **Race**
  - African American: 1.5%
  - Asian: 10.3%
  - White: 76.9%
  - More than one race/self-describe: 7%
  - Hispanic/Latinx: 3.0%
  - Native Hawaiian or Other Pacific Islander: 0.1%
  - American Indian/ Alaska Native: 0.1%
  - Unknown/prefer not to say: 1%
- **Ethnicity**
  - Hispanic: 6.8%
  - Not Hispanic: 91.6%
  - Prefer not to say: 1.7%



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# Initial Sleep Results

**SAMHSA**

Substance Abuse and Mental Health  
Services Administration

2024 Canadian Sleep Society Virtual  
Conference





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UC Davis Health / Newsroom / COVID-19 is wrecking our sleep with coronasomnia – ...

NEWS | September 23, 2020

## COVID-19 is wrecking our sleep with coronasomnia – tips to fight back

The coronavirus may be causing a second pandemic of insomnia

(SACRAMENTO) — COVID-19 has given us plenty of reasons to lose sleep. Here is another one: Because of the pandemic and!

# Covid: How the pandemic is affecting your dreams

By Georgina Rannard  
BBC News

1 day ago

WORKLIFE

What is Worklife? How We Work How We Live How We Think Creativity Collective More

HOW WE LIVE

The 'coronasomnia' phenomenon keeping you from getting sleep



SLEEP

## Why You're Having Weird Dreams During the COVID-19 Pandemic

WELLNESS

And how to handle

# COVID-19 and Sleep: Here's Why You Have 'Coronasomnia' and How to Get Rid of It

By: Lindsay Champion | Jan. 22, 2021



NEWS

## "Coronasomnia:" Why we're losing sleep during the COVID-19 pandemic



Apr 2, 2021, 06:00am EDT | 665 views

# Women Are Losing Sleep During Covid-19: How Marketers Should Respond

10 BOSTON

LOCAL WEATHER INVESTIGATIONS VIDEOS SPORTS TRAFFIC NEWSLETTERS

Protesters in Portrait AAPI Heritage Month 10 in Your Town Mikayla Miller Investigation New MA Reopening, Mask Guidance Comparing th

CORONAVIRUS PANDEMIC

## Sleeping Troubles? Could Be 'COVID-somnia'

While you may not have COVID-19, you could have a bad case of 'COVID-somnia' – it's what some doctors are calling the spike in sleep issues during the coronavirus pandemic.

Doctors: Twice as many people having sleep disturbances during pandemic

CBS NEWS  
POSTED FEB 10, 2021

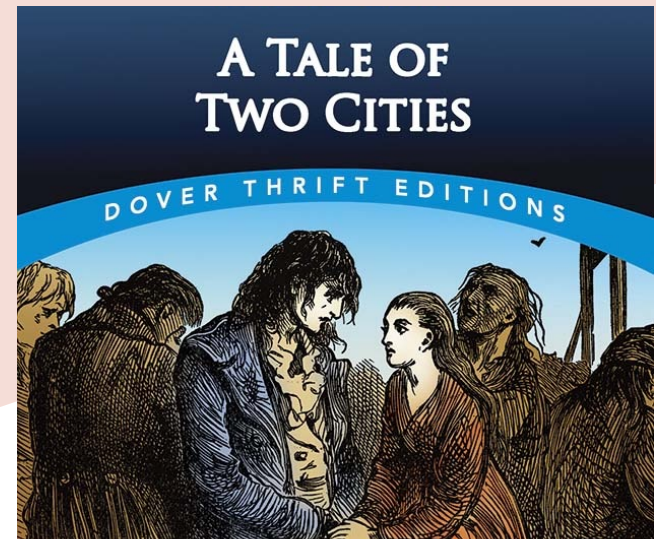
# Sleep Neurologists Call It 'COVID-Somnia'—Increased Sleep Disturbances Linked to the Pandemic



FOR YOUR PATIENTS

# Sleeping through a Pandemic

- Sleeping during COVID-19: Tale of Two Cities
- Many individuals are reporting worse sleep/ increased insomnia symptoms
  - Directly impacted by COVID-19
  - Under incredible amounts of chronic stress
  - Food insecure/Housing issues
  - Financial difficulties
  - Difficulties transitioning to home
  - Loss of coping strategies
  - Loss of childcare



# ICOSS Study

- International, multi-center online survey of 22,330 adults (mean age = 41.9 years old, range 18–95; 65.6% women)
- 13 countries and four continents
- High rates of insomnia symptoms (36.7%) and disorder (17.4%) associated with COVID-19.
  - Nearly twice as high as typical prevalence rates
- High rates of anxiety (25.6%) and depression (23.1%) associated with COVID-19.
  - Significantly higher than typical prevalence rates
- People in confinement, living alone or with five or more people, at higher risk for insomnia.

# Sleeping through a Pandemic

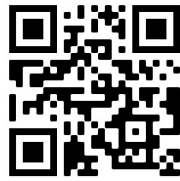
- Some individuals are reporting *BETTER* sleep
  - Relatively unaffected by devastation of COVID-19
  - Avoiding unpleasant news/highly adept at coping
  - Working from home, no commute time, more flexibility
  - Financially secure (perhaps benefitted)
  - Fair better with social isolation or established a “quaran-team”
  - No children to chase around all day



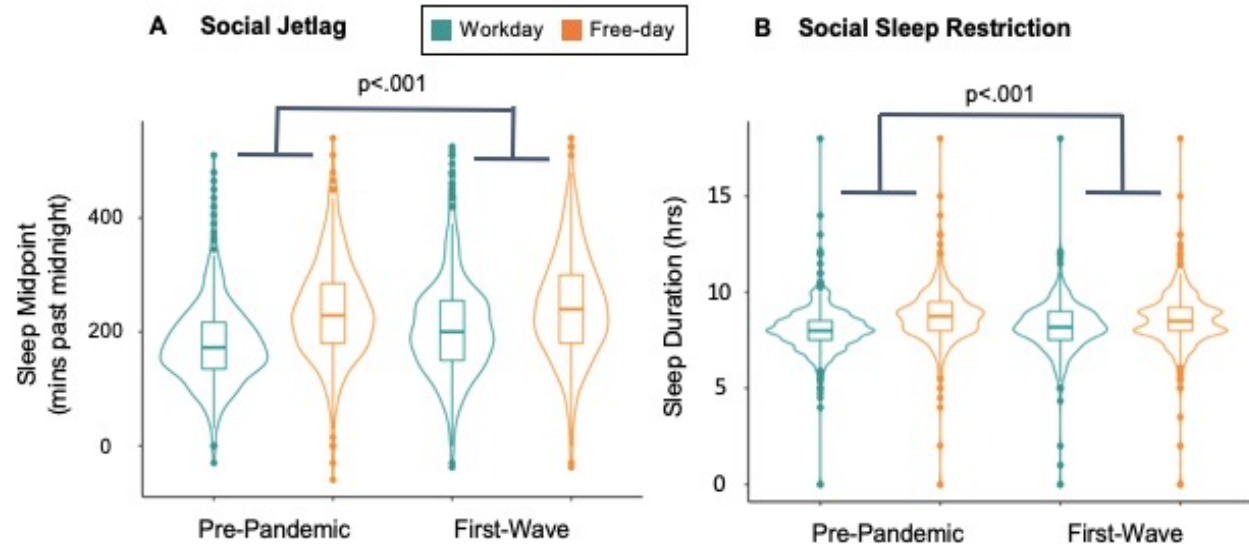
# Initial Sleep Results



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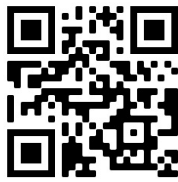


- Pre-registered subset analysis of 610 US adults, age 18-89 years
- Sleep timing using  $\mu$ Munich Chronotype Questionnaire
- $\mu$ MCTQ collected retrospectively on ~May 19 for sleep prior to (Dec-Jan, 2019) and during the first wave of the pandemic (April-May, 2020)
- **Social jetlag (SJL)** =  $\Delta$  sleep midpoint (workday – free-day)
- **Social sleep restriction (SSR)** =  $\Delta$  sleep duration (workday – free-day)



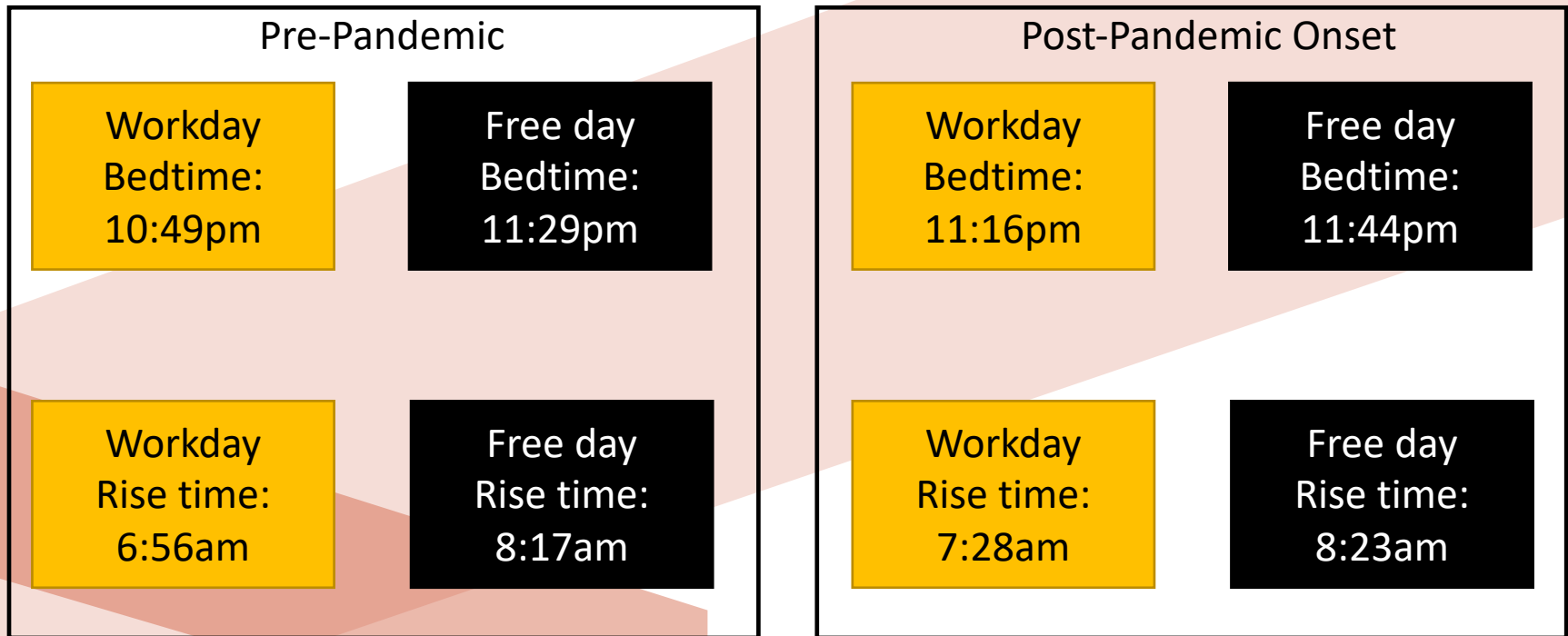
\*Sleep timing and sleep duration became more consistent between work days and free days

Bottary et al. (2021). *J Sleep Res.*



# Sleep Results

- **Decrease** in Social Jetlag and Social Sleep Restriction with onset of pandemic
  - Increased consistency in sleep schedule





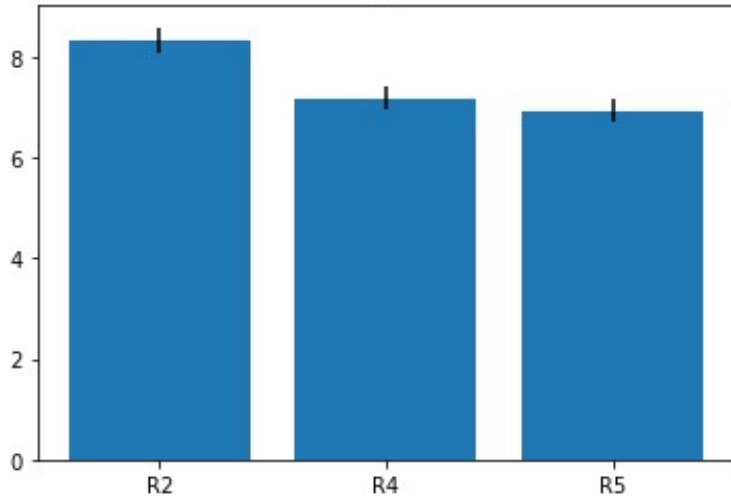
# Sleep Results

- Sleep duration increased by a “significant” 5 min at onset of pandemic
- Effects greatest in young and those with evening chronotypes
  - Similar results when ran separately for non-US residents

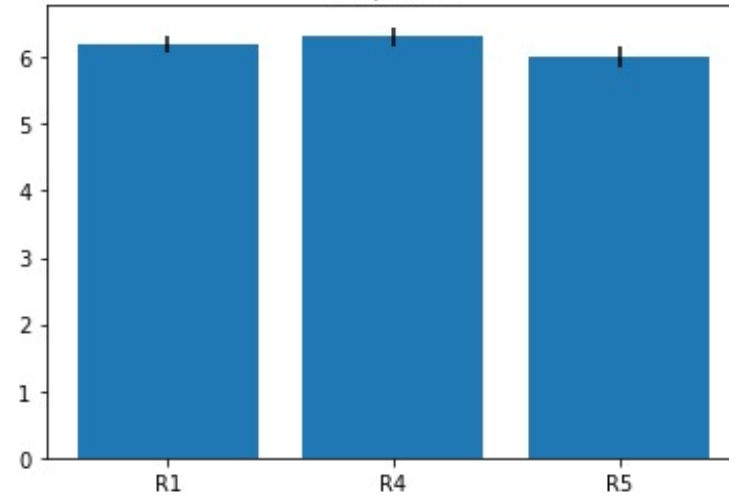


# Sleep Results

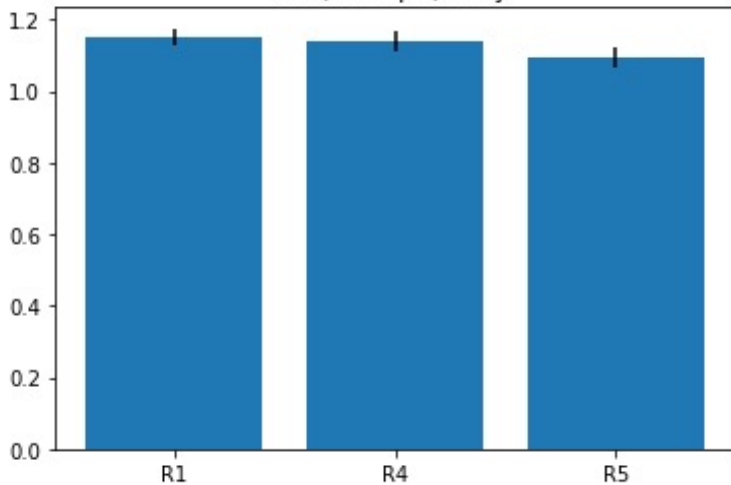
Insomnia Severity Index



PSQI Total



PSQI Sleep Quality



R1 = May 19, 2020

R2 = June 16, 2020

R4 = Sept 28, 2020

R5 = Feb 27, 2021

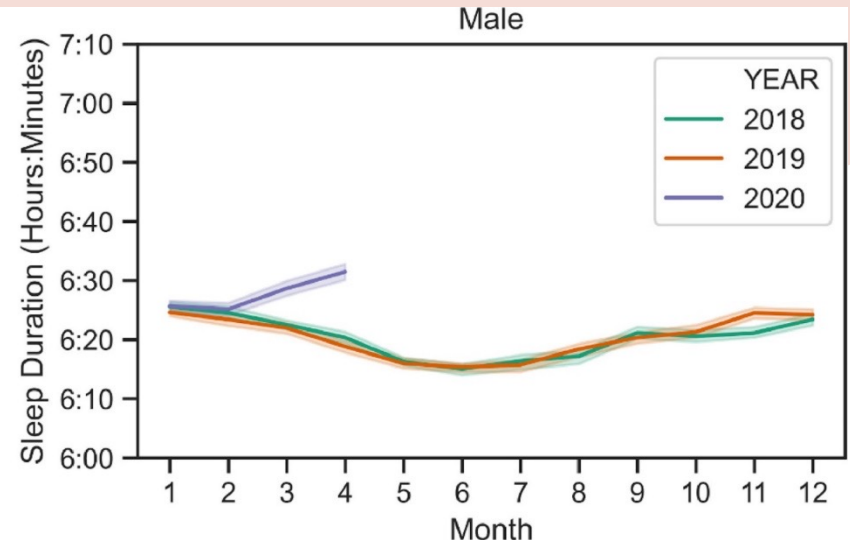
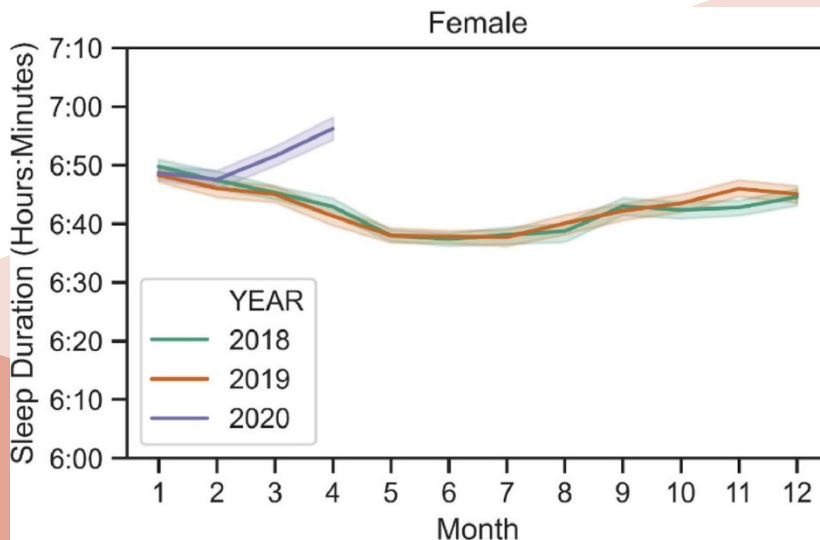
**In our sample**  
sleep largely  
appeared to  
improve **on**  
**average** with the  
onset of the  
pandemic

Opportunity for sleep  
scientists and clinicians  
to highlight the  
detrimental impact of  
“normal” society on our  
sleep!



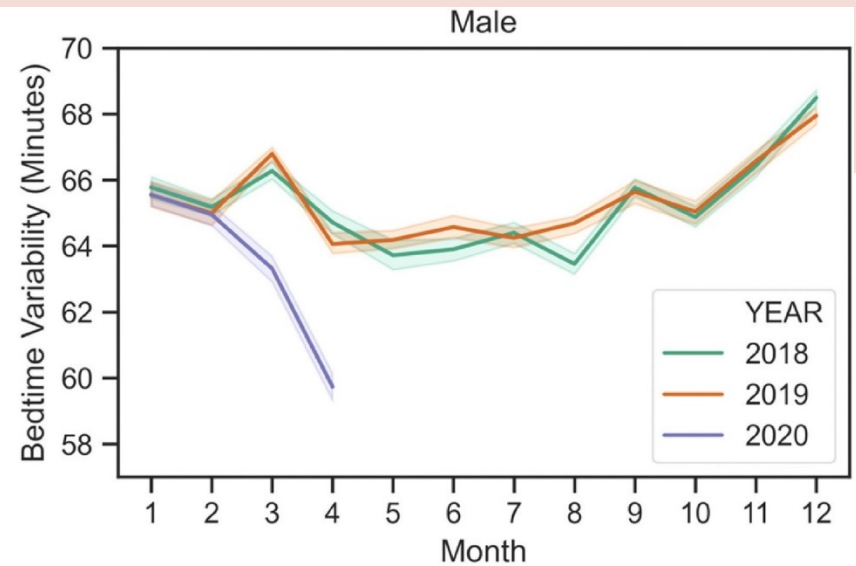
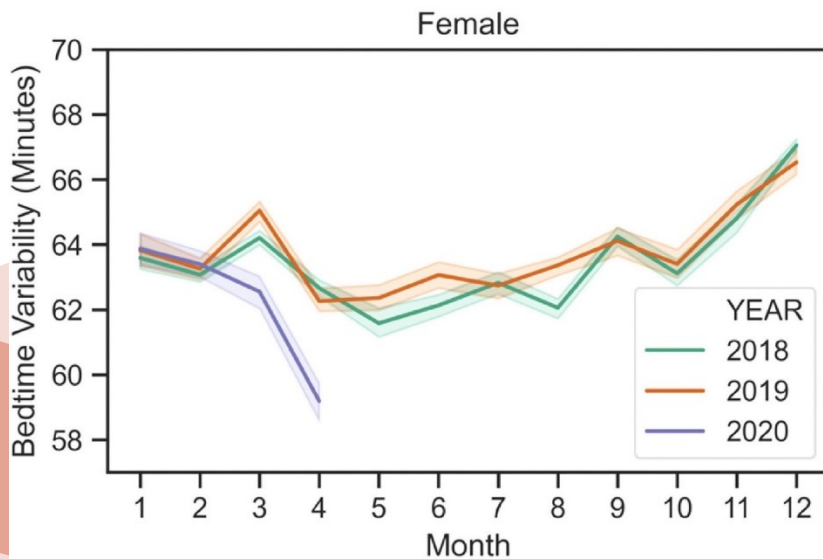
# Sleep during COVID-19

- Rezaei & Grandner, 2021, Sleep Health – Access to sleep Fitbit data from 6 major US cities- Chicago, Houston, Los Angeles, New York, San Francisco, and Miami (163,524 active users)



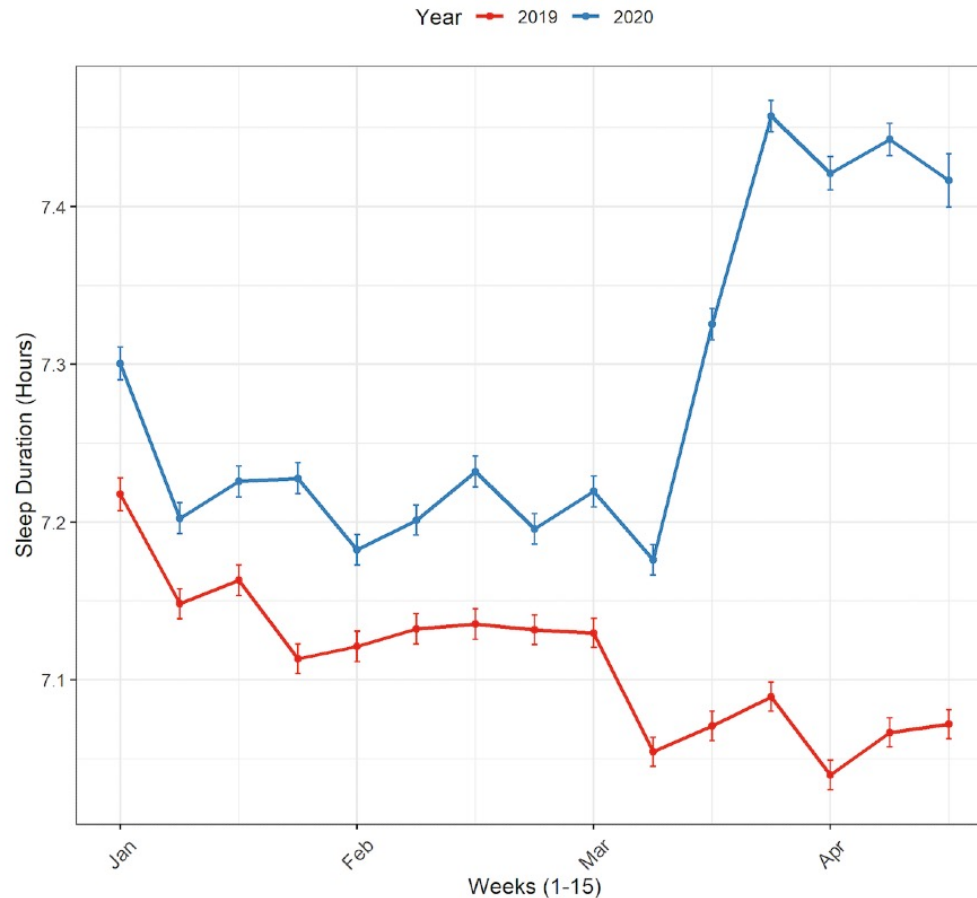
# Sleep during COVID-19

- Rezaei & Grandner, 2021, Sleep Health – Access to sleep Fitbit data from 6 major US cities- Chicago, Houston, Los Angeles, New York, San Francisco, and Miami (163,524 active users)

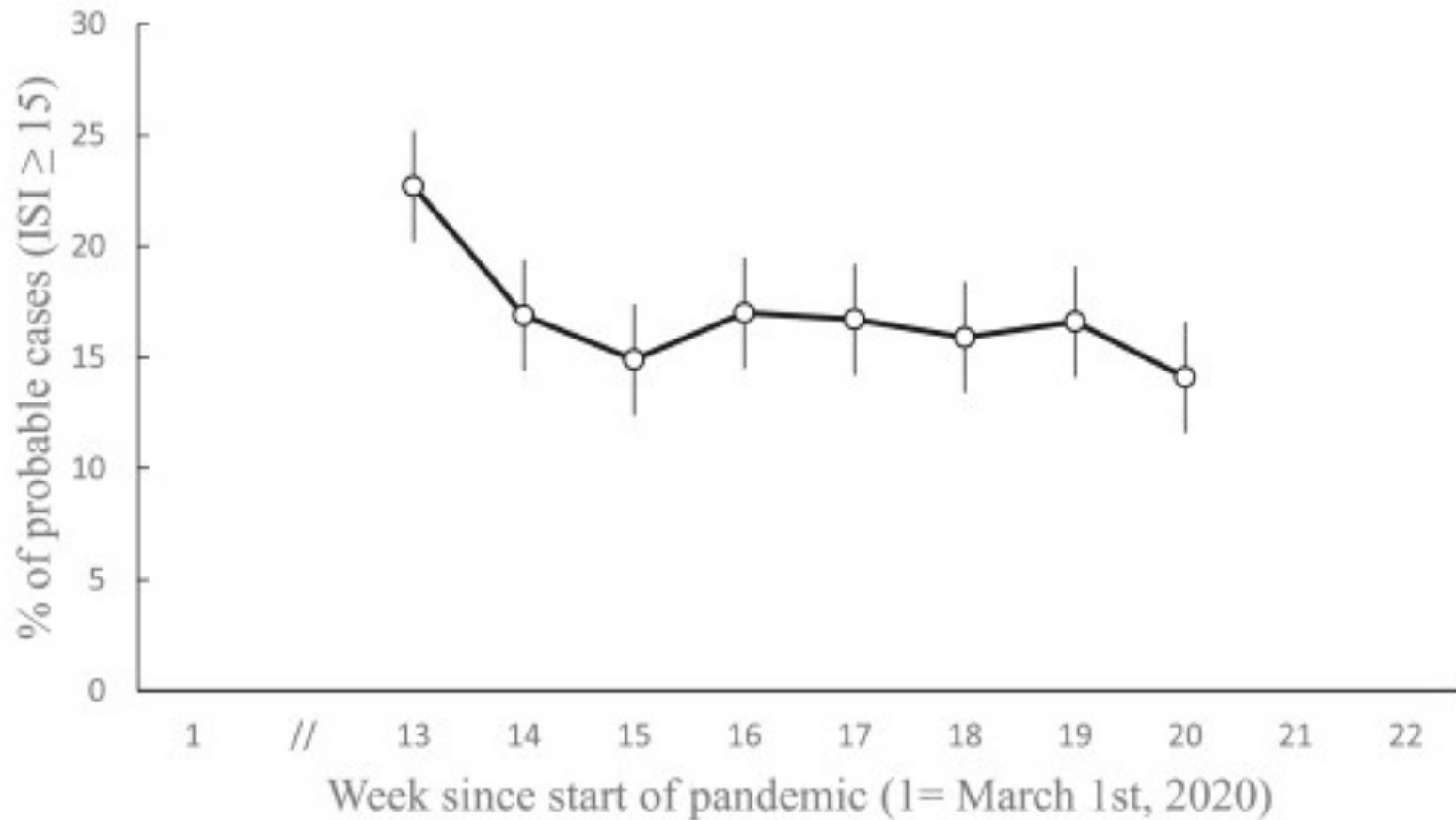


# Sleep during COVID-19

- Robbins et al, 2021, JMIR– Access to almost 3 million nights of smartphone app sleep reports- London, Seoul, Los Angeles, New York City, and Stockholm



# ICOSS Study





# Sleep during COVID-19 Summary

- On average across the entire population there has been a strong improvement in sleep regularity, a delay in sleep timing, and (to some extent) a general increase in sleep duration
  - Does not mean this was the case for everyone!
- Individual differences/circumstances may put people at more or less at risk for sleep disruption
  - Job security, healthcare workers, shift-workers, essential workers, age, previous physical/mental health concerns, caretaking,
- Timing of assessment, location, timeline of the spread of disease in area, other societal factors need to be taken into consideration
- Important considerations moving forward:
  - Find groups that are particularly at risk and determine effective interventions prior to the next pandemic
  - Find ways to reduce the negative impact of the ***return to normalcy*** on sleep!



MHTTC

Mental Health Technology Transfer Center Network  
Funded by Substance Abuse and Mental Health Services Administration

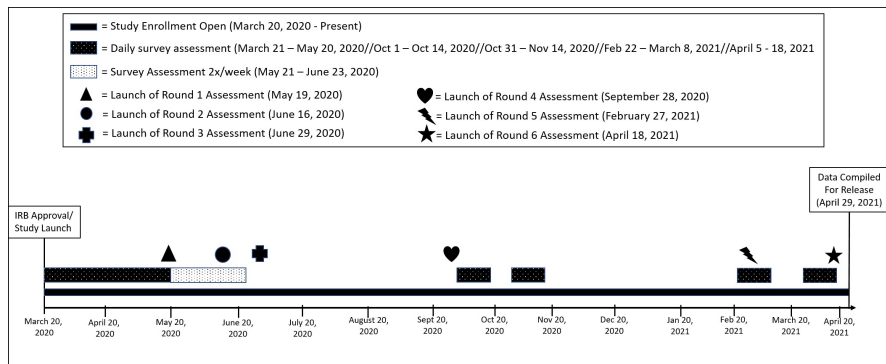
# Initial Affect Results

**SAMHSA**

Substance Abuse and Mental Health  
Services Administration

2024 Canadian Sleep Society Virtual  
Conference

# Daily Survey Affect Results



Initial analysis done in context of age effects on mood, stress, and emotional well-being

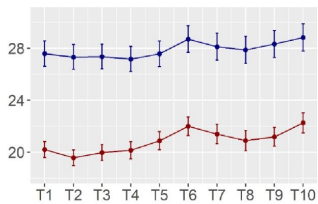
Time Bin	Start	End	Duration	Description
T1	3/23/20	4/12/20	3 weeks	Overlaps with the beginning of significant institutional responses to the pandemic. Many schools and universities closed or went to remote education in mid- to late-March, and most US states implemented some kind of lockdown order or stay at home order/advisory during this period.
T2	4/13/20	5/3/20	3 weeks	Initial discussions and implementations of "re-opening" after lockdowns in many states, but case numbers and deaths were still rising in most parts of the country.
T3	5/4/20	5/24/20	3 weeks	Re-opening plans continued in this period. Case numbers and deaths were declining in some parts of the country, but still rising in others.
T4	5/25/20	6/14/20	3 weeks	George Floyd was killed on May 25, setting off nation-wide protests and a wide-ranging national discussion on race.
T5	6/16/20	6/22/20	1 week	The last week of data collection in the spring period. Initial examination of trends suggest that much of the increased stress and negative mood following George Floyd's murder had subsided by this time period.
T6	9/30/20	10/13/20	2 weeks	Our first period of daily data collection since June. This marked the end of a period where COVID cases had been down (relative to the spring or mid-summer) in most of the country and is mostly before they started to rise again in October.
T7	10/30/20	11/5/20	1 week	The US election was on November 3. Uncertainty about the result continued through November 6.
T8	11/7/20	11/13/20	1 week	The US presidential race was called for Joe Biden by all major networks on November 7.
T9	2/22/21	3/7/21	2 weeks	Our first period of data collection since November. This marked the beginning of vaccinations becoming available to older adults.
T10	4/4/21	4/17/21	2 weeks	Our final period of data collection before vaccines became available to all adults on April 19, 2021. This time bin was also selected to be well matched, seasonally, to the T1 assessment.

Fields et al, (In Press)

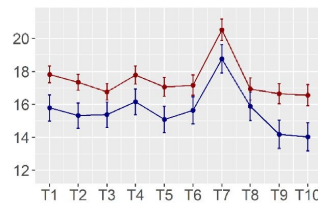
# Affect Results

- Model estimates for a 25 year old (in red) and a 65 year old (in blue) for each time bin (T1-T10) in US participants (n=1171)

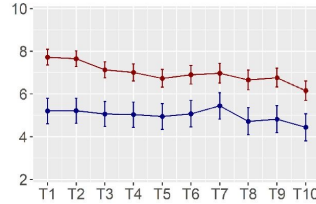
Positive Affect



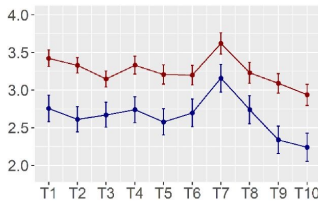
Negative Affect



Depression

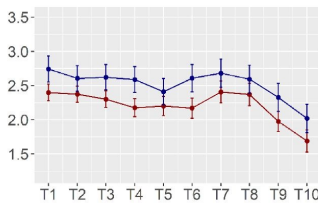


Stress

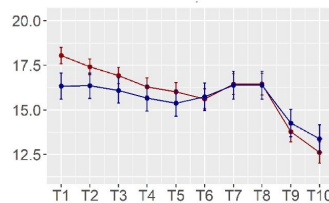


— 25 year old  
— 65 year old

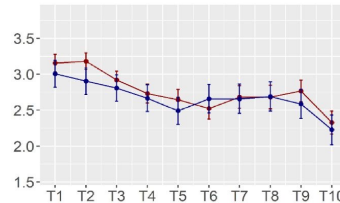
Worry Health



Worry Composite

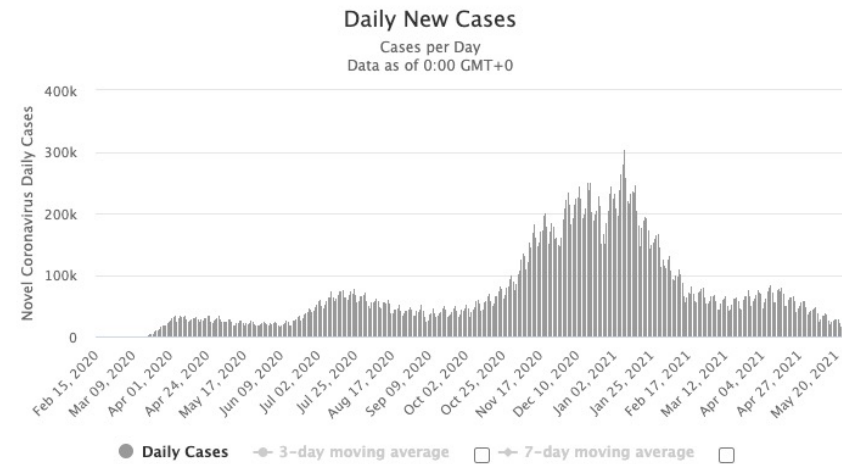


Social Isolation



T1	Mar 23, 2020	Apr 12, 2020
T2	Apr 13, 2020	May 3, 2020
T3	May 4, 2020	May 24, 2020
T4	May 25, 2020	Jun 14, 2020
T5	Jun 16, 2020	Jun 22, 2020
T6	Sep 30, 2020	Oct 13, 2020
T7	Oct 30, 2020	Nov 5, 2020
T8	Nov 7, 2020	Nov 13, 2020
T9	Feb 22, 2021	Mar 7, 2021
T10	Apr 4, 2021	Apr 17, 2021

Daily New Cases in the United States



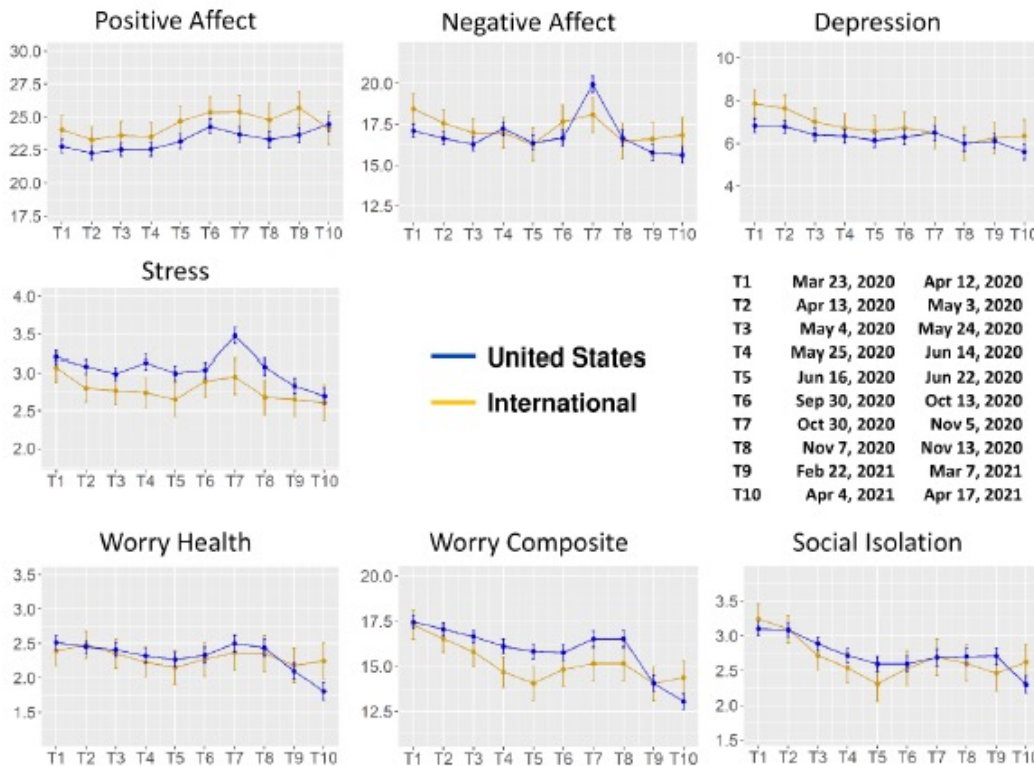
- No differences in social isolation
- \*IMPORTANT\* COVID WASN'T THE ONLY THING GOING ON LAST YEAR**





# Affect Results

- Model estimates non-US participants (in gold) and US participants (in blue) for each time bin (T1-T10) controlling for Age



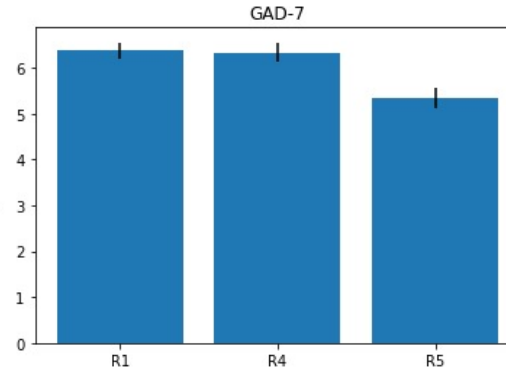
- Again, main effect of TIME across the board
- Main effect of “residence” on positive affect and stress
- Residence x Time interactions for negative affect, stress, worry about individual health, worry composite, and social isolation
- \*IMPORTANT\*** Effects of COVID and timeline of impact were different depending on where you lived!



# Affect Results

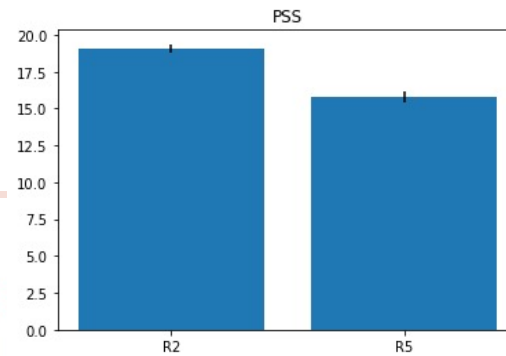
## Generalized Anxiety Disorder (GAD)-7 Scale

	F	df num	df denom	p-value
intercept	1269.82	1	778.2	<.001
Age	24.75	1	742.4	<.001
Time	13.30	2	855.7	<.001
Age x Time	1.07	2	836.4	.343



## Perceived Stress Scale

	F	df num	df denom	p-value
intercept	4055.14	1	561.7	<.001
Age	79.86	1	554.0	<.001
Time	132.65	1	384.0	<.001
Age x Time	0.10	1	380.2	.755



## GAD-7 Time Bin Comparison

	estimate	p-value	CI Low	CI Upp	d
intercept	5.99	<.001	5.66	6.32	--
Age	-0.05	<.001	-0.07	-0.03	-0.40
R4-R1	0.03	.863	-0.33	0.40	0.01
R5-R4	-0.93	<.001	-1.32	-0.53	-0.19
Age x R4-R1	0.01	.159	-0.01	0.04	0.12
Age x R5-R4	0.00	.708	-0.03	0.02	-0.03

## PSS Time Bin Comparison

	estimate	p-value	CI Low	CI Upp	d
intercept	17.32	<.001	16.79	17.85	--
Age	-0.14	<.001	-0.17	-0.11	-0.80
R5-R2	-3.59	<.001	-4.19	-2.98	-0.53
Age x R5-R2	0.01	.755	-0.03	0.04	0.03

- One-time assessments generally mirroring these findings (e.g. GAD-7 & PSS)
- For these and the daily assessments, we can actually look to see where things change from time bin to time bin

R1 = May 19, 2020

R2 = June 16, 2020

R4 = Sept 28, 2020

R5 = Feb 27, 2021



# Sleep during COVID-19 Summary

- Across our sample, participants mood and affect largely improved from the launch of the study
  - Again, not the case for everyone!
- Older age continued to be a beneficial moderating factor for emotional well-being on all measures except worry about individual health and social isolation
- Main effects and interactions with residence indication location to be an important factor in the pandemics effects
- Important considerations moving forward:
  - Find groups that are particularly at risk and determine effective interventions prior to the next pandemic
  - The timing/context is important to consider when reviewing COVID-19 research!
    - Quick Resiliency
    - COVID-19 did not occur in isolation



# So much more to learn!



Journals of Gerontology: Psychological Sciences  
cite as: *J Gerontol B Psychol Sci Soc Sci*, 2021, Vol. XX, No. XX, 1–7  
<https://doi.org/10.1093/geronb/gbab140>  
Advance Access publication July 28, 2021



> Emotion. 2021 Jun 17. doi: 10.1037/emo0000982. Online ahead of print.

## The relation between age and experienced stress, worry, affect, and depression during the spring 2020 phase of the COVID-19 pandemic in the United States

Tony J Cunningham<sup>1</sup>, Eric C Fields<sup>2</sup>, Sandry M Garcia<sup>2</sup>, Elizabeth A Kensinger<sup>2</sup>

Affiliations + expand

PMID: 34138584 DOI: 10.1037/emo0000982

Research Report

## Aging, Empathy, and Prosocial Behaviors During the COVID-19 Pandemic

Isu Cho, PhD,<sup>1,\*</sup> Ryan T. Daley, MA,<sup>2,\*</sup> Tony J. Cunningham, PhD,<sup>2,3</sup> Elizabeth A. Kensinger, PhD,<sup>2</sup> and Angela Gutches, PhD<sup>1</sup>



PMCID: I

SHORT REPORT | [Free Access](#)

## Age and chronotype influenced sleep timing changes during the first wave of the COVID-19 pandemic

Ryan Bottary  Eric C. Fields, Elizabeth A. Kensinger, Tony J. Cunningham,

First published: 04 October 2021 | <https://doi.org/10.1111/jsr.13495>



Data Descriptor | [Open Access](#) | [Published: 16 April 2021](#)

## Boston College daily sleep and well-being survey data during early phase of the COVID-19 pandemic

[Tony J. Cunningham](#) , [Eric C. Fields](#) & [Elizabeth A. Kensinger](#)

[Scientific Data](#) **8**, Article number: 110 (2021) | [Cite this article](#)

2106 Accesses | 26 Altmetric | [Metrics](#)

[Innov Aging](#). 2020; 4(Suppl 1): 954.

Published online 2020 Dec 16. doi: [10.1093/geroni/igaa057.3490](https://doi.org/10.1093/geroni/igaa057.3490)









## Older age is associated with more positive reframing of memory from the spring phase of the covid-19 pandemic

[Sandry Garcia](#),<sup>1</sup> [Jaclyn Ford](#),<sup>2</sup> [Eric Fields](#),<sup>3</sup> [Tony Cunningham](#),<sup>2</sup> and [Elizabeth Kensinger](#)<sup>2</sup>

ORIGINAL RESEARCH article

Front. Psychiatry, 22 December 2020 | <https://doi.org/10.3389/fpsyg.2020.590318>

## Comparing the Impact of COVID-19-Related Social Distancing on Mood and Psychiatric Indicators in Sexual and Gender Minority (SGM) and Non-SGM Individuals

 [Craig Rodriguez-Seijas](#)<sup>1</sup>,  [Eric C. Fields](#)<sup>2,3</sup>,  [Ryan Bottary](#)<sup>3,4</sup>,  [Sarah M. Kark](#)<sup>5</sup>,  [Michael R. Goldstein](#)<sup>6</sup>,  [Elizabeth A. Kensinger](#)<sup>5</sup>,  [Jessica D. Payne](#)<sup>7</sup> and  [Tony J. Cunningham](#)<sup>3,9\*</sup>

Manuscript Title

With age comes well-being: Older age associated with lower stress, negative affect, and depression throughout the COVID-19 pandemic

Journal

Aging & Mental Health



MHTTC

Mental Health Technology Transfer Center Network  
Funded by Substance Abuse and Mental Health Services Administration

# Improving Sleep and Mental Health (Even during a Pandemic)

**SAMHSA**

Substance Abuse and Mental Health  
Services Administration

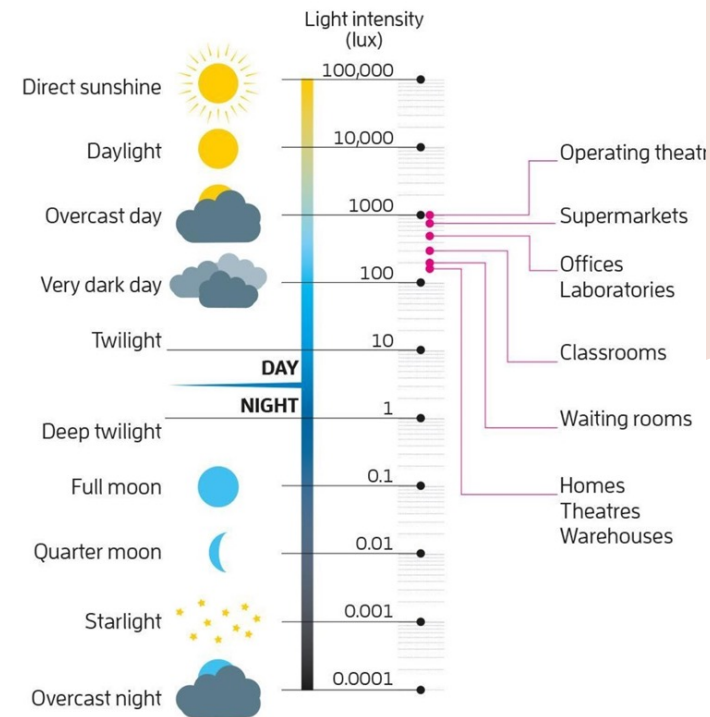
2022 Canadian Sleep Society Virtual  
Conference

# Importance of light

- **Get light first thing in the morning**
  - Office workers that got more morning light or worked by a window had better sleep quality
- **Avoid light (screens) at night**
  - De-stress/avoid negative news before bed
  - Curfew for Electronics
    - Bedtime mobile phone use predicted less sleep duration, insomnia, & increased fatigue.

## The light in our lives

Even the brightest indoor spaces are dim compared with the outdoors in daylight



SOURCE: NATIONAL OPTICAL ASTRONOMY OBSERVATORY

# Sleep Hygiene



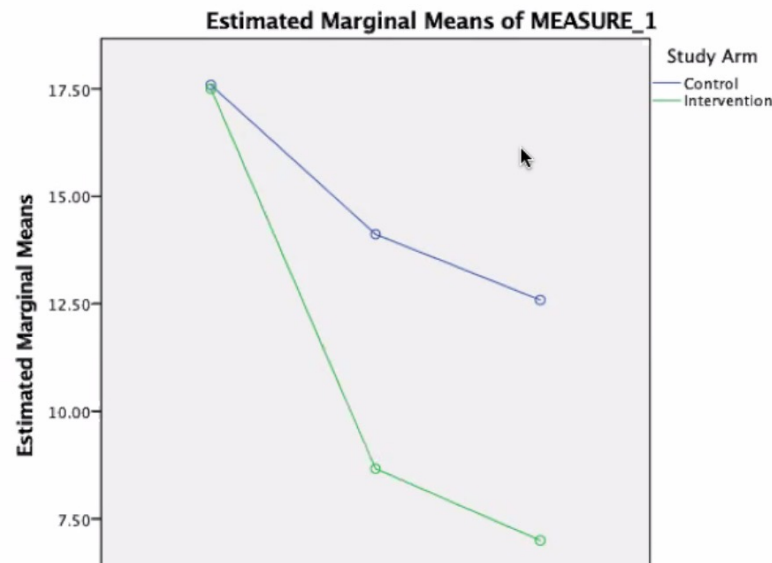
- *Normalize* some level of acute sleep disturbance (manage expectations)
- Get out of bed if can't sleep
- Physical activity/Diet
- Hot shower ~90 minutes before bed
- Avoid caffeine after noon
- Avoid too much alcohol
- Nap responsibly
- Relaxation techniques, meditation, and mindfulness
- Establish CBT-I treatment
  - May need to make adjustments as needed for given populations
    - Pain management
    - Nightmares
    - Hyperarousal
  - Directories hosted by Society for Behavioral Medicine and the University of Pennsylvania
- Medication as needed (including melatonin)

# Sleep Interventions During and After Pandemic

- During pandemic recommendations unchanged
- Post-pandemic – take into consideration schedules and obligations

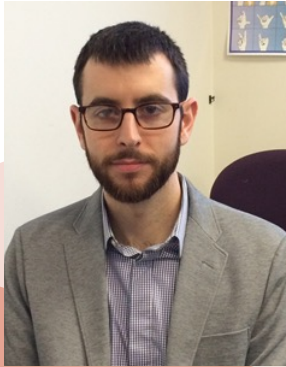
Profile Plots

Change in ISI Severity





# Thank you!!

A screenshot of the OSFHOME website. The top navigation bar is dark blue with the OSFHOME logo and a dropdown arrow. Below it, a blue header contains the text "Boston College COVID-19 Sleep and We...". To the right of the header are links for "Files", "Wiki", "Analytics", and "Registrations". The main content area displays the title "Boston College COVID-19 Sleep and Well-Being Dataset" and a large QR code. The entire screenshot is overlaid on a light pink geometric shape.

OSFHOME ▾

Boston College COVID-19 Sleep and We... Files Wiki Analytics Registrations

Boston College COVID-19 Sleep and Well-Being Dataset



[osf.io/gpxwa/](https://osf.io/gpxwa/)

[acunnin4@bidmc.harvard.edu](mailto:acunnin4@bidmc.harvard.edu)

@Sleep\_Strong on Twitter



# MHTTC

Mental Health Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

The purpose of the MHTTC Network is technology transfer - disseminating and implementing evidence-based practices for mental disorders into the field.

Funded by the Substance Abuse and Mental Health Services Administration (SAMHSA), the MHTTC Network includes 10 Regional Centers, a National American Indian and Alaska Native Center, a National Hispanic and Latino Center, and a Network Coordinating Office.

Our collaborative network supports resource development and dissemination, training and technical assistance, and workforce development for the mental health field. We work with systems, organizations, and treatment practitioners involved in the delivery of mental health services to strengthen their capacity to deliver effective evidence-based practices to individuals. Our services cover the full continuum spanning mental illness prevention, treatment, and recovery support.

## CONNECT WITH US



[MHTTCnetwork.org](https://MHTTCnetwork.org)



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