Sleep and COVID-19:
The Importance of Sleep during a Pandemic and its Relationship to Mental Health

May 13, 2020 @ 2:00 p.m. | Virtual Training Webinar
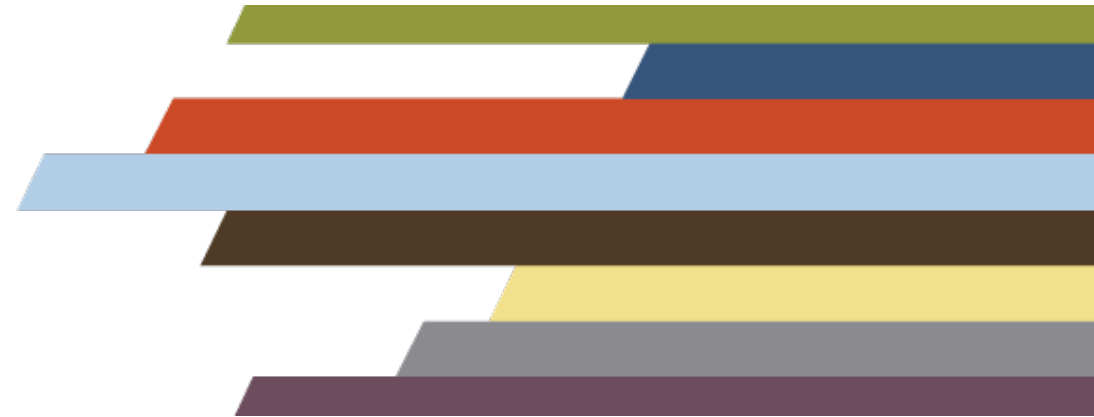
New England (HHS Region 1)

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

Presenter:
Tony Cunningham, PhD
Beth Israel Deaconess Medical Center
Harvard Medical School
Boston College

New England (HHS Region 1)

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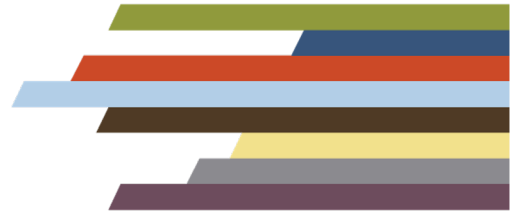Funded by Substance Abuse and Mental Health Services Administration

Beth Israel Deaconess
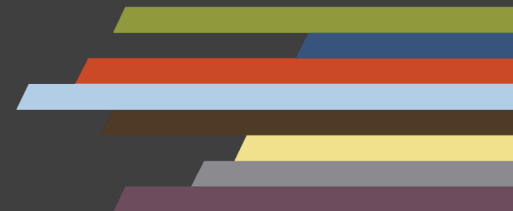Medical Center

Boston College

Conflicts of Interest:
No conflicts of interest to report related to this work

SAMHSA
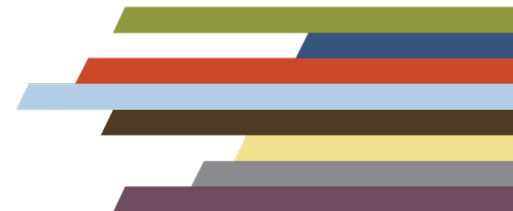Substance Abuse and Mental Health
Services Administration

Outline

- Why is sleep important right now?

- How to sleep during a pandemic.

- Researching sleep during a pandemic.

Why is sleep so important right now?

Photo credit: Twenty20 via @yummypixels, 2020

Sleep and Immune System Function

- Sleep is critical for optimal immune system function
- Nocturnal sleep readies the immune system for infectious challenge
- Reduced sleep increases inflammation and risk of infection
- Study of participants ages 18-55 found reduced sleep increased likelihood of being infected by common cold (a virus!)
- Chronic sleep restriction leads to higher levels of the stress hormone cortisol, higher blood pressure, and *halves* a healthy young person's usual number of antibodies to a flu vaccine
- Sleep may currently be our best defense against COVID-19

Barone & Krieger, 2015, *Function of Sleep*; Prather et al., 2015, *SLEEP;* Spiegel et al, 1999, *The Lancet*; Prather et al., 2020; *IJBM*
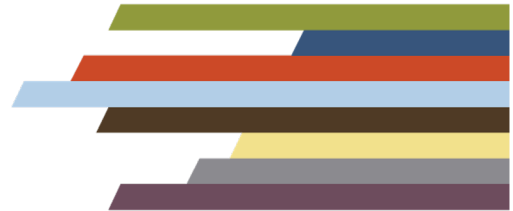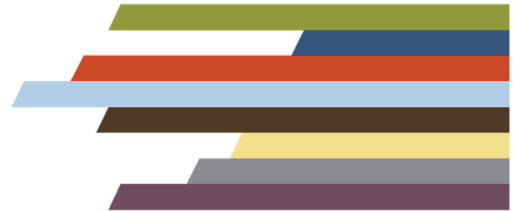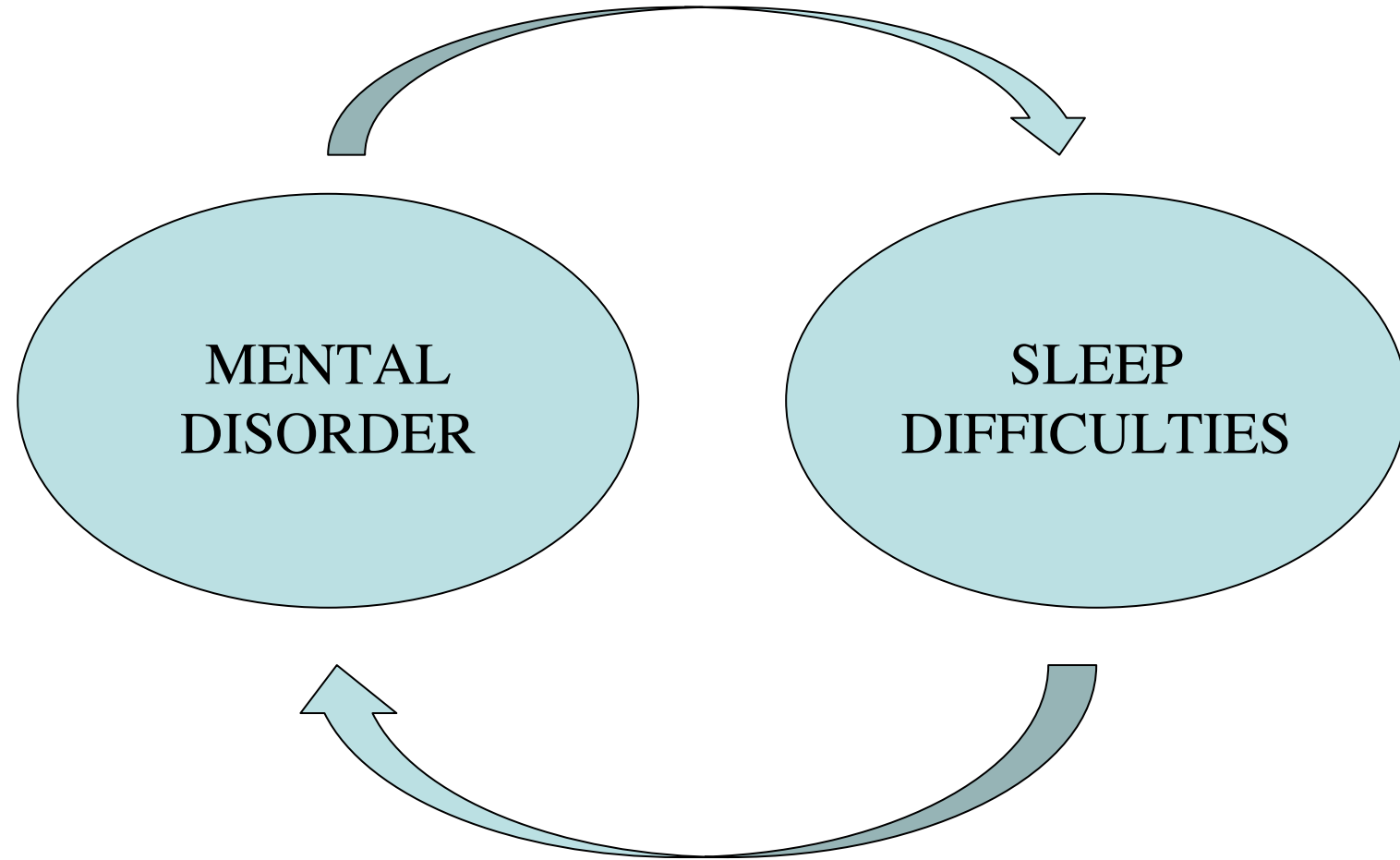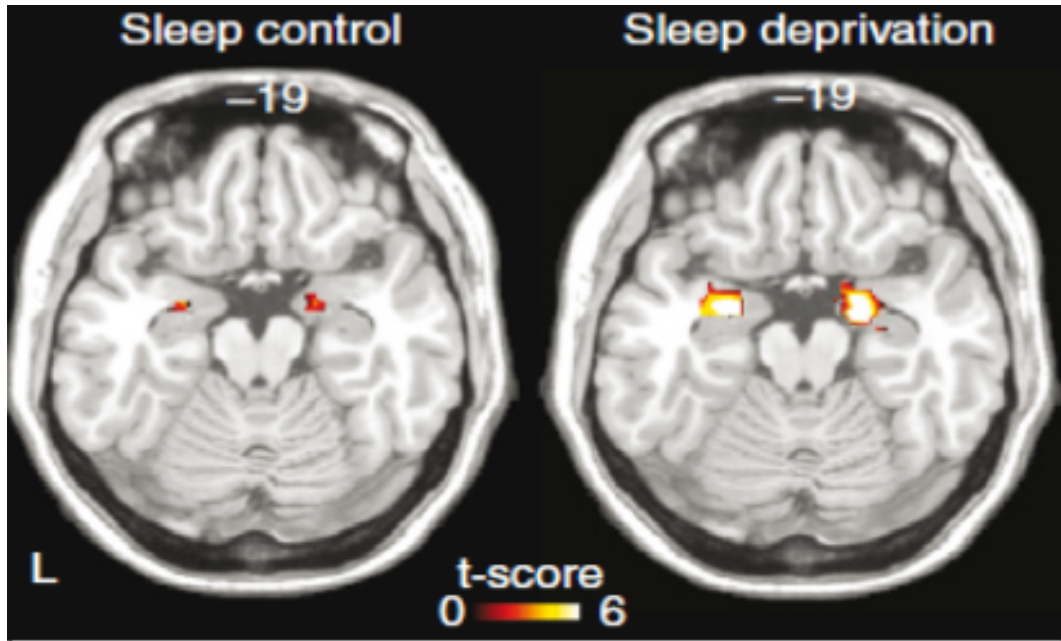
Sleep and Mental Health

- Chronic sleep problems affect 50%-80% of patients in a typical psychiatric practice, compared with 10% – 18% of adults in the general U.S. population.

- Sleep disturbance is the most prevalent symptom in major depression, occurring in 90% of depressed patients.

- 90-100% of Vietnam era Veterans with PTSD had disturbed sleep.

- Long standing belief insomnia = symptom of other disorders.

- More recent evidence: Sleep disruption may exacerbate, trigger, or even cause impaired emotion regulation and psychopathology.

Tsuno et al., 2005; Gehrman et al, 2016; Wulff et al., 2010, Kahn-Greene et al., 2007; Szklo-Coxe et al., 2010; Breslau et al, 1996

Sleep and Mental Health

MENTAL DISORDER

SLEEP DIFFICULTIES

Sleep and Mental Health

Sleep control — Sleep deprivation — t-score 0 – 6

- After sleep loss, amygdala becomes hyperactive to emotional stimuli

- Same neural features found in a variety of mental health disorders
  - Depression
  - Anxiety
  - Anger/Aggression
  - Personality disorders

- Treating insomnia symptoms (e.g., CBT-I) has been shown to effectively reduce other psychiatric symptoms (anxiety, depression)

Yoo et al., 2007; Banks et al., 2007, *SCAN*; Belleville et al., 2011, *Clin Psych Rev*; Cunningham & Shapiro, 2018, *J Psychosomatic Res*

Sleep and Mental Health

- We are living in a coping strategy dystopian nightmare for patients and clinicians

- Previous reliable coping strategies may not be available
  - No visiting family and friends
  - No physical contact
  - No going to gyms
  - No going to restaurants, shopping, movies

- Clinicians:
  - Need to help patients rely on solo strategies
  - Need to get creative
  - Explore uses of technology
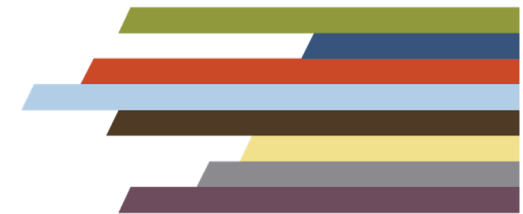 - Need to reinforce self-care techniques (sleep!)

A Storm is Brewing

- Healthcare/Front line workers will need significant support

- "Social isolation seems to be related to suicidal behaviors in a direct and fundamental way" – Trout, 1980

- Unemployment in US past 20% – 26.5 million jobs lost and counting
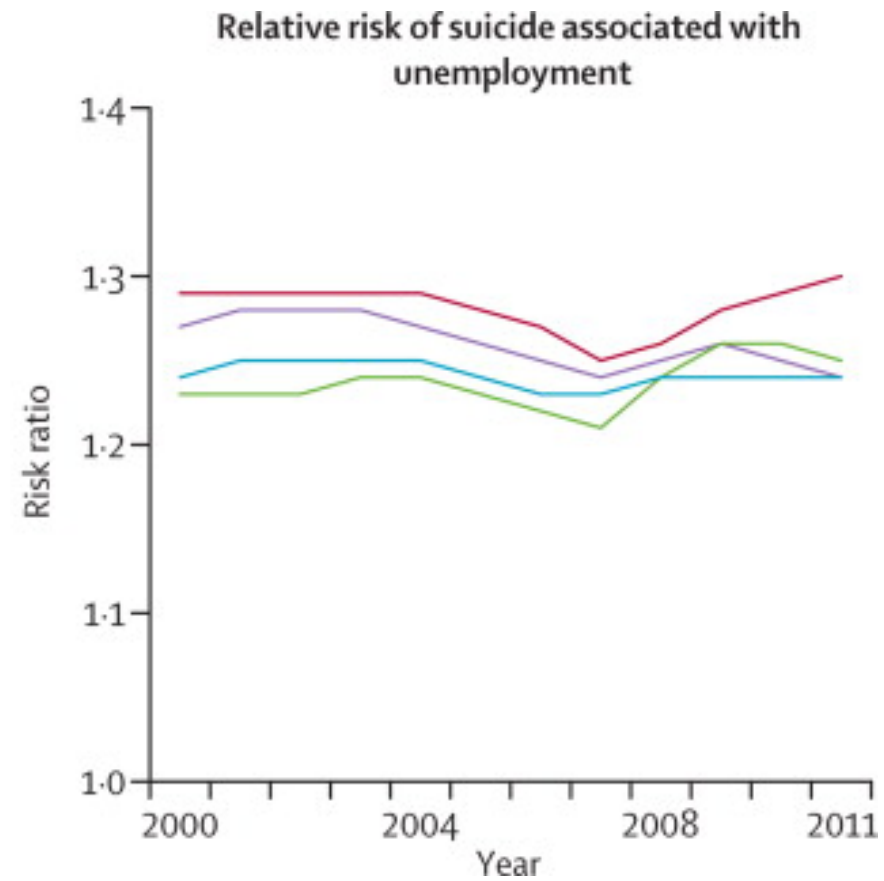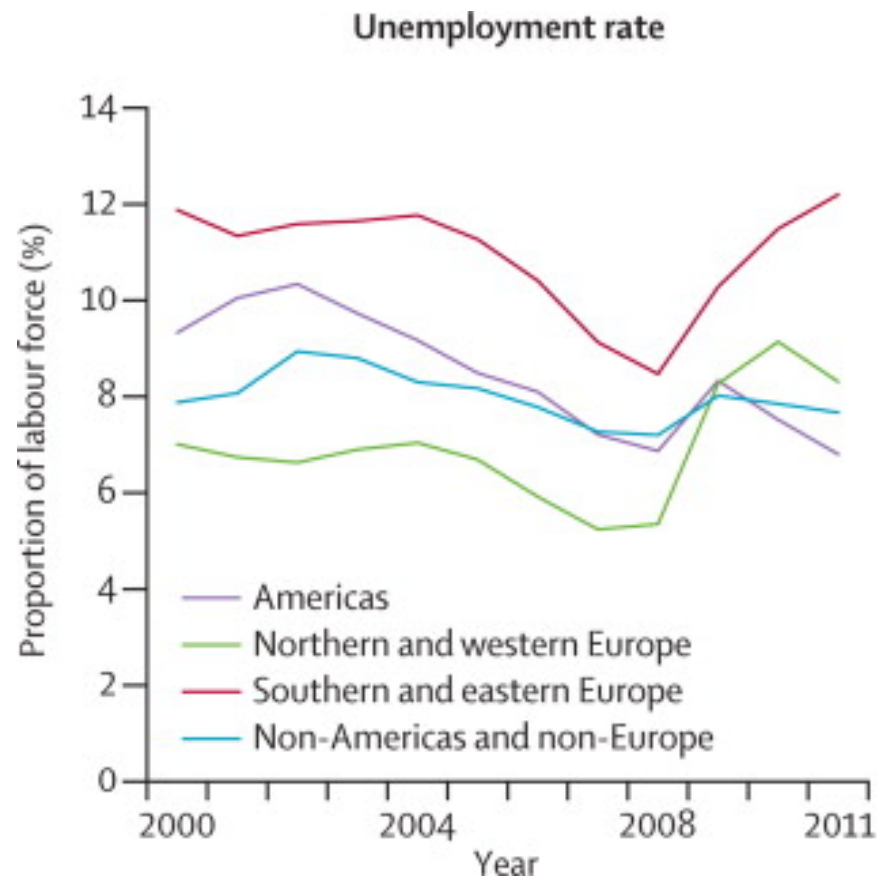
- Insomnia symptoms on the rise – "COVID-related insomnia"

Top ER Doctor on Front Lines of COVID-19 in NYC Dies by Suicide

'HERO'

Unemployment rate

Relative risk of suicide associated with unemployment

Americas
Northern and western Europe
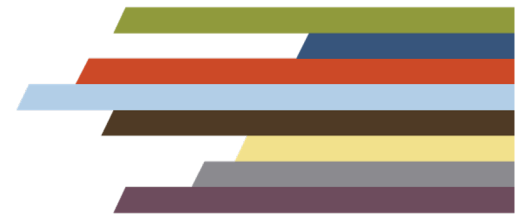Southern and eastern Europe
Non-Americas and non-Europe

Suicidality and Unemployment

- Suicides associated with unemployment totaled a nine-fold higher number of deaths than excess suicides attributed to the 2008 economic crisis.

Nordt et al., 2015, *The Lancet*

Suicidality and Insomnia

- Insomnia independent risk factor for suicidality
- Suicidality typically acute period of emotional turmoil
- Sleep loss sets stage for negative thinking and emotional vulnerability
- Sleep loss also impairs decision making
- Meta-analysis (147,753 participants) found sleep disturbances associated with increased risk for:
  - Suicidal ideation
  - Suicide attempts
  - Suicide decedents – even when controlling for depressive symptoms

McCall & Black, 2013, *Curr Psych Reports*

Suicidality and Insomnia

- Nocturnal wakefulness is also an important risk factor

- When controlling for proportion of population awake, peak incidence of suicide occur between midnight-3am

- Approximately 8x greater risk at midnight

Perlis et al., 2016, *J Clin Psychiatry*; McCarthy et al., 2019, *SLEEP*; Cunningham & Bowman, 2019, *SLEEP*

BETTER SLEEP DURING THE PANDEMIC

How to sleep during a pandemic

Sleeping through a Pandemic

- Mostly the same advice that comes with CBT-Insomnia

- ***Maintain a regular sleep schedule** *(esp. wake up time)**

- Research has shown that even under normal conditions, regular sleepers have:
  - Better quality sleep
  - Earlier melatonin release
  - Better grades

  Phillips et al., 2016 *Scientific Reports*
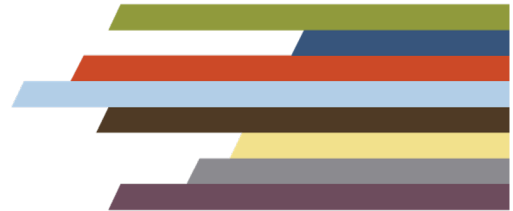
Sleeping through a Pandemic

- Get light in the morning
  - Office workers that got more morning light or worked by a window had better sleep quality
- De-stress/avoid negative news before bed
- Curfew for Electronics
  - Bedtime mobile phone use predicted less sleep duration, insomnia, & increased fatigue.
  - May be increasingly difficult due to isolation
- Avoid excessive time in bed
- *Normalize* some level of acute sleep disturbance

Figueiro et al., 2017, *Sleep Health*; Boubekri et al, 2014, *JCSM;* Exelmans & Bulck 2016, *Social Science & Medicine*

The light in our lives
Even the brightest indoor spaces are dim compared with the outdoors in dayligh

Light intensity (lux)

	Light intensity (lux)	
Direct sunshine	100,000	
Daylight	10,000	Operating theatr
Overcast day	1000	Supermarkets
Very dark day	100	Offices Laboratories
Twilight	10	Classrooms
DAY		
NIGHT	1	Waiting rooms
Deep twilight		
Full moon	0.1	Homes Theatres Warehouses
Quarter moon	0.01	
Starlight	0.001	
Overcast night	0.0001	
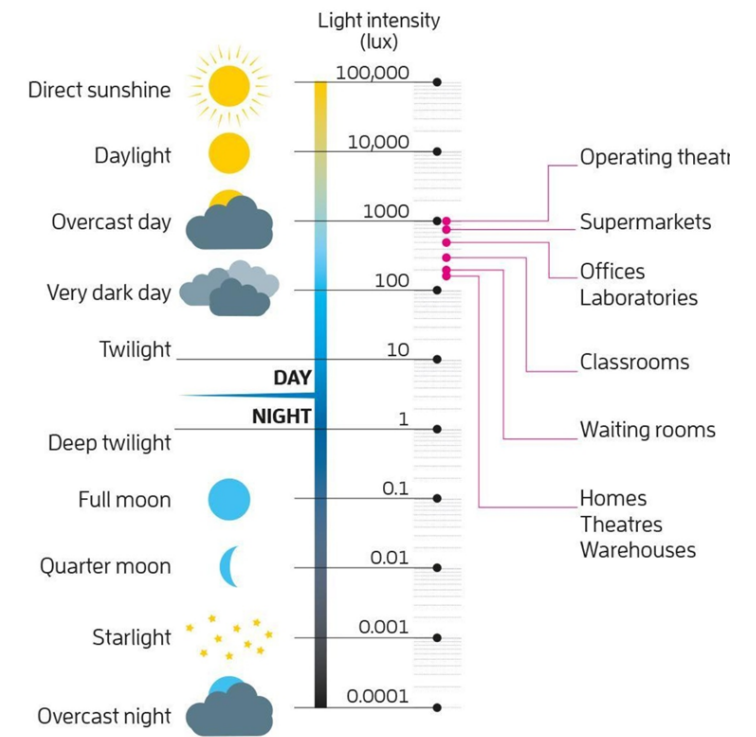
SOURCE: NATIONAL OPTICAL ASTRONOMY OBSERVATORY

Sleeping through a Pandemic

- Physical activity/Diet

- Hot shower ~90 minutes before bed

- Avoid caffeine after noon

- Avoid too much alcohol

- Nap responsibly

- Relaxation techniques/meditation

- Establish CBT-I treatment
  - Directories hosted by Society for Behavioral Medicine and the University of Pennsylvania

- Medication as needed

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

Photo credit: https://slowchathealth.files.wordpress.com/2020/04/blog-titles-73.png?w=560
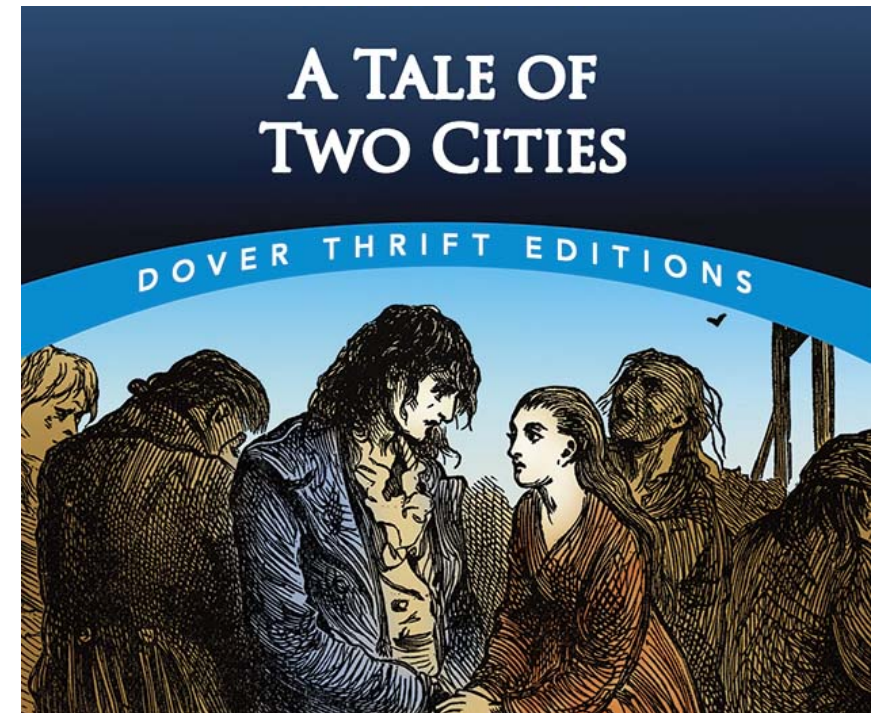
Sleeping through a Pandemic

- 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

Photo credit: Guiainfantil.com, 2019

Sleep Research During a Pandemic

Typical Sleep Research Options

- Polysomnography

- Actigraphy

- Subjective Sleep Logs

Reliability of Sleep Diaries for Assessment of Sleep/Wake Patterns

ANN E. ROGERS • CLAIRE C. CARUSO • MICHAEL S. ALDRICH

Although sleep diaries are widely used in clinical and research settings, only a few studies ha
information recorded in these diaries to objective information about sleep recorded. The goal
determine if a sleep diary could be used to obtain reliable data about home sleep/wake patter
Fifty subjects (25 narcoleptic and 25 matched control subjects) completed a sleep diary while
ambulatory polysomnographic monitoring. The percentage agreement between the subjective
diaries and polysomnographic data was acceptable (kappa = .87). Sensitivity and specificity
95.6%). The sleep diary is a reliable instrument for collecting data about sleep/wake patterns,
caution when collecting data from subjects who are likely to take frequent daytime naps.

Online Survey Study: Specific Aims

1. Determine if certain sleep or activity behaviors generate any additional protection or risk of contracting COVID-19.

2. Determine the societal impacts of COVID-19 and many of the large-scale response measures (e.g., stay-at-home orders, school closures) that have taken affect across the globe on factors related to mental health (sleep, stress, and mood) and associate them with onset of psychiatric symptoms.

3. Determine how important demographics (age, race, LGBT status, SES) and lifestyle factors (exercise, social connectedness, alcohol consumption) affect these relations.
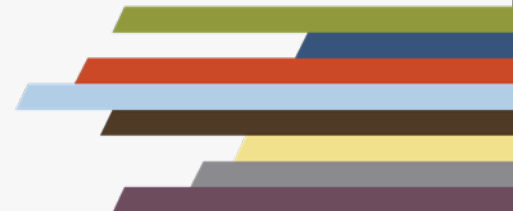
Current Recruitment

- 1,852 participants consented
- 1,439 participants completed demographic survey
- 60 countries
- 6 continents
- 20 different time zones
- 46 U.S. States, Washington DC, and Puerto Rico
  - No Dakotas, Wyoming, or West Virginia
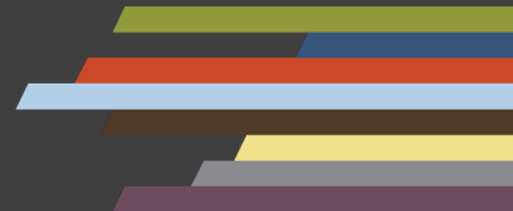
Current Demographics

- Age Range: 18-90 years old
  ~17% of sample 50+ years of age

- Biological Sex: 80% Female, 20% Male

- Gender: 77% Female, 19% Male, 2.5% Non-binary/Third Gender/Self-described, 1.5% Preferred not to say

- Identified as Transgender: 1.3%
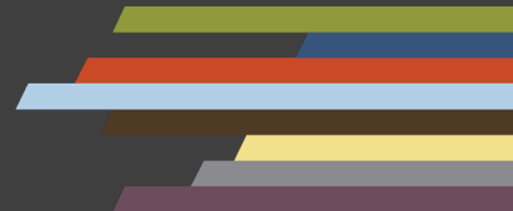
Current Demographics

- Member of LGBT Group: 20%
- African American: 2.3%
- Asian: 12.1%
- White: 81.6%
- Hispanic/Latinx: 5.3%
- Native Hawaiian or Other Pacific Islander: 0.2%
- American Indian/ Alaska Native: 0.5%
- Unknown: 0.5%
- Parents: 32.7%
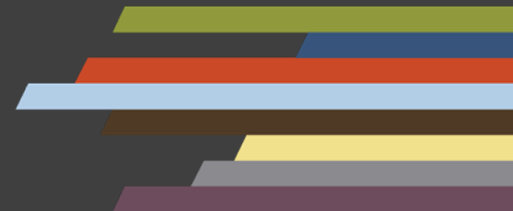
Survey Content: Short Version

- Sleep Duration
- Sleep Efficiency
- Dream Reports

Survey Content: Short Version

- Activity
- Contact with others
- Socialization
- Exercise
- Alcohol Consumption

Survey Content: Short Version

- Coronavirus status/symptoms

Survey Content – Full Version

- All measures of Short Version
- Reports of Mood (PANAS)
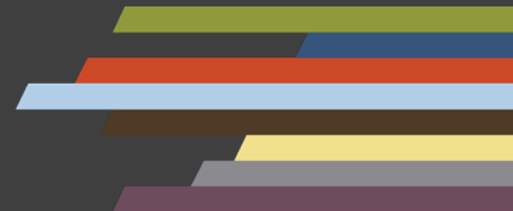- Stress Questions
- PHQ-9 (minus suicidality)

Current Response Numbers

- Study Launch: March 20, 2020

- As of Sunday, May 10, 2020:
  - Days of Daily Assessment: 52 days
  - Daily Survey Responses: 23,254

- Withdraw/Ineligible: 2.3%

Future Study Plan

- Continue Daily Assessments through May 20th

- Transition to 2x/week Assessment through at least June 20th

- At minimum 1 long-term follow up in fall/winter

- *Caveat: this remains a fluid situation*

- Prepping to release a series of 3 additional assessment batteries
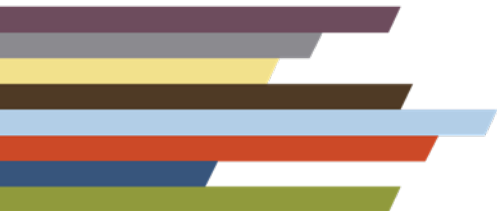
Future Study Plan

- Typical sleep behaviors
- Chronotype
- Emotion regulation strategies
- Pro-social behaviors
- Empathy
- Personality traits
- Perceived stress
- Generalized Anxiety symptoms
- Social Anxiety symptoms
- More extensive demographics
- Extensive report of dream experience
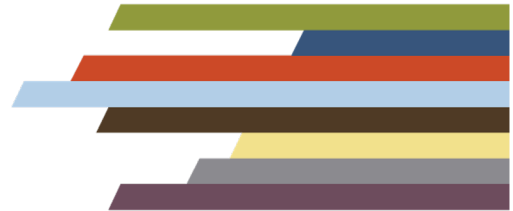
Pandemic Research Advice

- Be understanding

- Be grateful

- Communicate with participants

- Be human

Co-PI:
Elizabeth Kensinger

Lab Manager:
Sandry Garcia

Questions?

We appreciate your time and attention.

Upcoming Events

MAY 14

Person-Centered Recovery Planning - Live Webinar

This webinar will review key indicators of PCRP from both a process and a documentation perspective.

MAY 21

Person-Centered Recovery Planning - Live Webinar

This webinar will review key indicators of PCRP from both a process and a documentation perspective.

MAY 26

Courageous Conversations: A partnering tool to achieve equity in schools

Join us for a webinar about the power of Courageous Conversations, a model for creating safe spaces

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Visit www.mhttcnetwork.org/newengland to register.