



# COVID-19: The Science, The Effects, and The Future

**Melinda Kelley, Ph.D.**

**Director, Office of Legislation, Policy, and International Activities**

**National Institute on Aging**

**National Institutes of Health**

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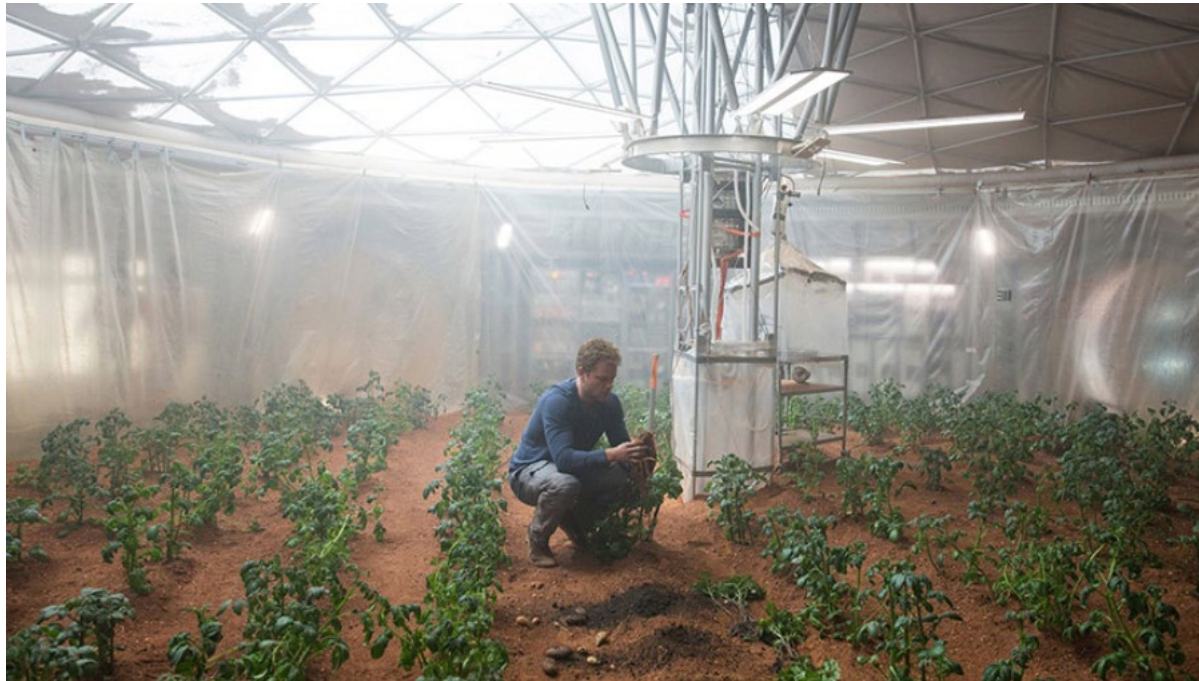
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# COVID-19: We've come a long way in a year

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# January 2020 to January 2021: The good news

- **We were ready:** Years of work in NIH's Vaccine Research Center on "test case" coronaviruses prepared us



*“So, in the face of overwhelming odds, I'm left with only one option: I'm going to have to science the (heck) out of this.”*

— Andy Weir, [The Martian](#)

# January 2020 to January 2021: The good news

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- **We have funding:** \$4.84 billion in supplemental appropriations for COVID-19 from Congress
- **We are vaccinating:** Speed of vaccine development has been unprecedented (< 1 year)
- **We can reduce the spread in the meantime:** Masks, social distancing, avoid crowds, outdoors rather than indoors, wash hands



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# How has NIH contributed to the pandemic response?

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# NIH's Role in COVID-19 Research & Public Health Efforts

- Improving **knowledge** about disease progression, outcomes, and recovery
- Improving **detection**
- Advancing **treatments**
- Accelerating **prevention research**
- Preventing and redressing poor COVID-19 outcomes in **health disparity and vulnerable populations**

**Plus**

- *Contributing to decision-making*



# NIH's Role in COVID-19 Research & Public Health Efforts

- **Accelerating CCOVID-19 Therapeutic Interventions and Vaccines (ACTIV)**
- **Rapid Acceleration of Diagnostics (RADx)**
- **NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities**

# Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV)

- Accelerated development of the most promising COVID-19 vaccines and therapeutics
- Public-private partnership: **NIH, BARDA, CDC, DoD, FDA, VA, Operation Warp Speed, the European Medicines Agency** + universities, funding organizations, and drug companies



# ACTIV Vaccine Development

Developer	Trial Status
Moderna/NIAID	<b>*Granted EUA in the U.S. (12/18)</b>
AstraZeneca/Oxford University Jenner Institute/ Oxford Vaccine Group	Phase 3 trial
Janssen Pharmaceutical Companies (Johnson & Johnson)	Phase 3 trial
Novavax, Inc.	Phase 3 trial
Sanofi/GlaxoSmithKline	Phase 1/2 trial

*Not part of ACTIV: Pfizer-BioNTech: **Emergency Use Authorization issued on 12/11/20***

# ACTIV Treatment Development: Five Key Clinical Trial Protocols

**ACTIV 1: Reducing overactive immune responses**

**ACTIV 2: Antibody trials – out of hospital**

**ACTIV 3: Antibody trials – in hospital**

**ACTIV 4: Blood thinners**

**ACTIV 5: Open testing of drug therapies**

# Rapid Acceleration of Diagnostics (RADx)

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**RADx Tech**: At-home or point-of-care tests (shark tank)

**RADx Underserved Populations**: Enhanced testing in underserved and vulnerable populations

**RADx-Radical**: Novel testing approaches (e.g., community wastewater analysis)

**RADx Advanced Technology Platforms**: Increased and enhanced testing

# Rapid Acceleration of Diagnostics (RADx)

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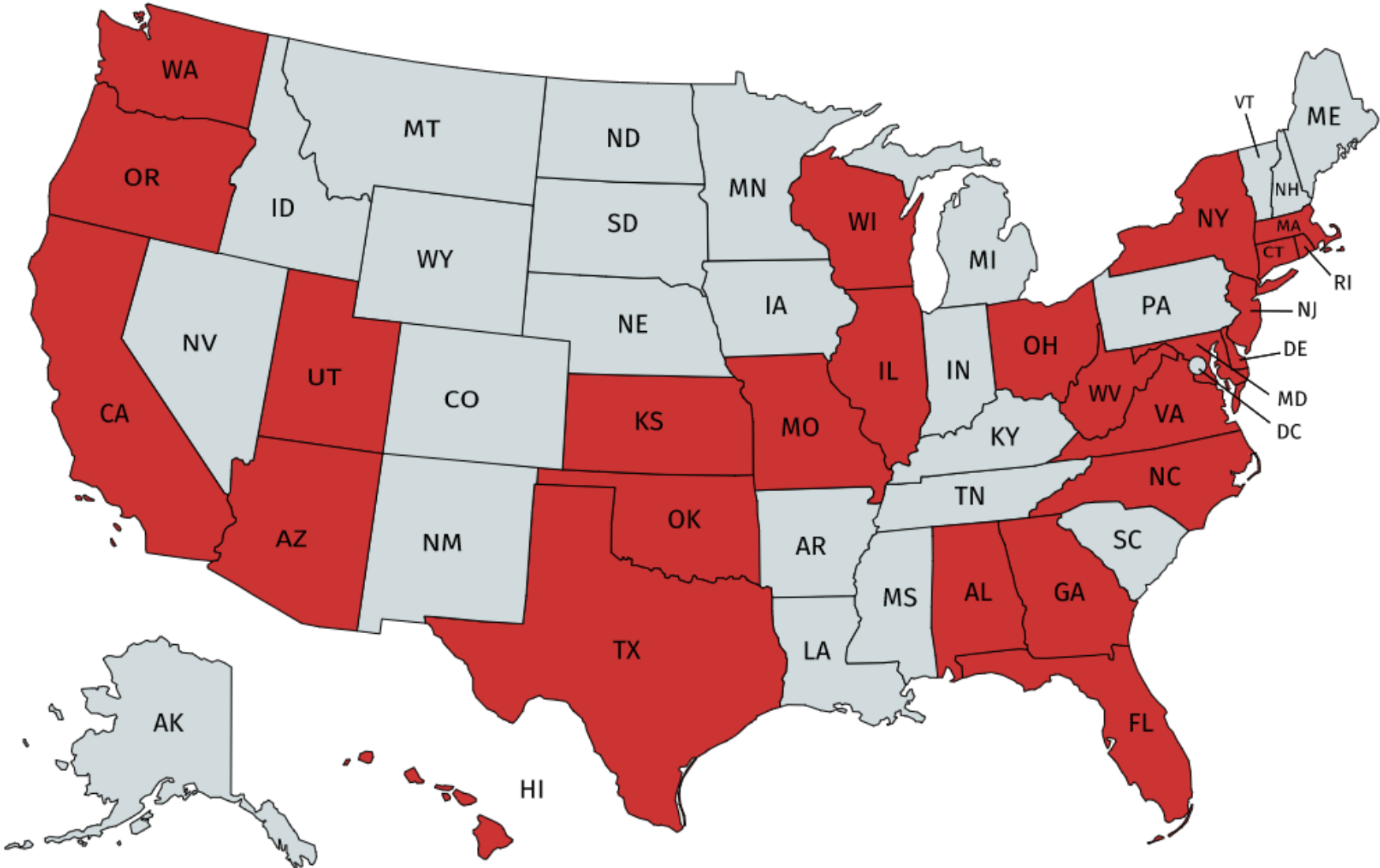
**RADx Underserved Populations**: Enhanced testing in underserved and vulnerable populations

**RADx-Radical**: Novel testing approaches (e.g., community wastewater analysis)

**RADx Advanced Technology Platforms**: Increased and enhanced testing

# States with at least one RADx-UP Award

- Work with established researchers
- Understand COVID-19 testing patterns
- Improve access/reach/uptake



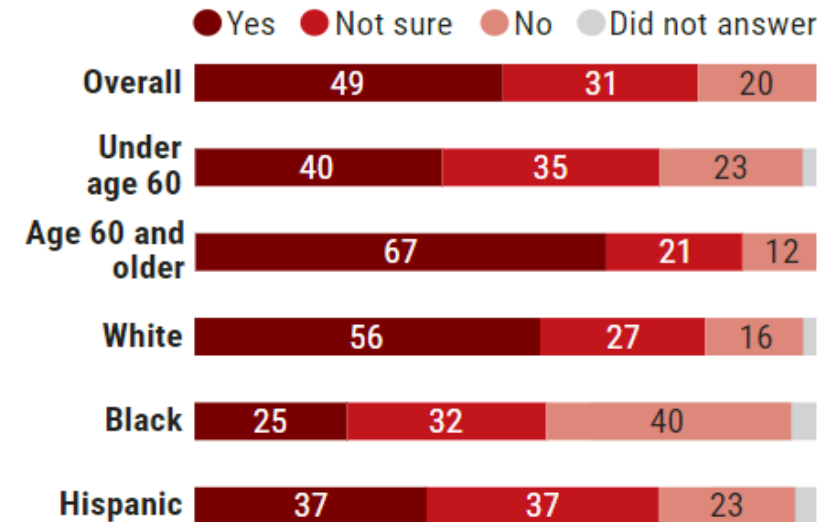
# NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities

## **Focus: Disproportionate impact of the COVID-19 pandemic on diverse populations**

- **Raise awareness about COVID-19**
- **Address misinformation and mistrust**
- **Ensure that clinical trials for COVID-19 prevention and treatment include racially and ethnically diverse communities**

## **Do you plan to get a coronavirus vaccine when one is available?**

For some in the United States, the answer is no, according to a survey of 1056 people in mid-May.

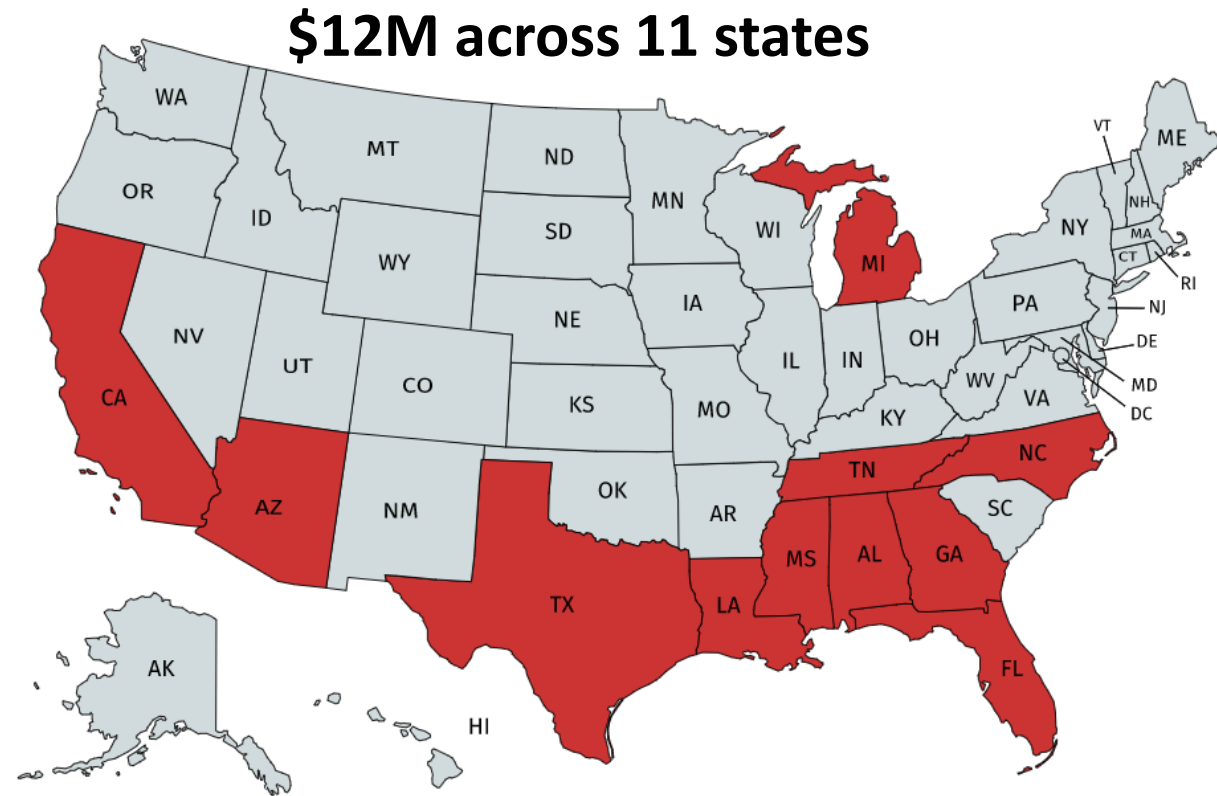


(GRAPHIC) V. ALTOUNIAN/SCIENCE; (DATA) ASSOCIATED PRESS–NORC CENTER FOR PUBLIC AFFAIRS RESEARCH AT THE UNIVERSITY OF CHICAGO



# NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities

- **Partners:** National & local organizations/affiliates, NIH funded researchers, and Federally funded programs
- **Focus:** Outreach and engagement efforts in ethnic and racial minority communities disproportionately affected by the COVID-19 pandemic

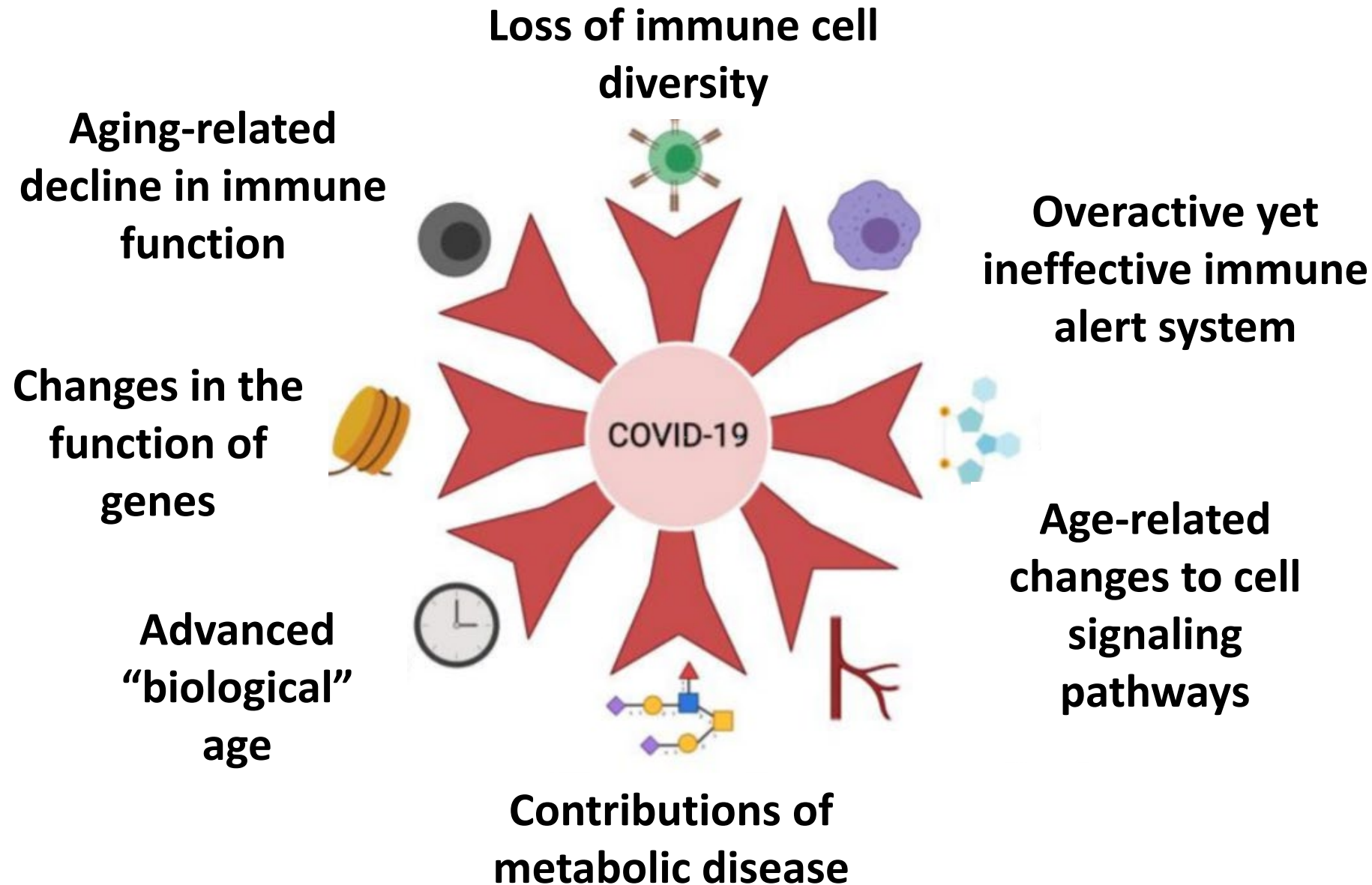


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# NIA-Supported COVID-19 Research

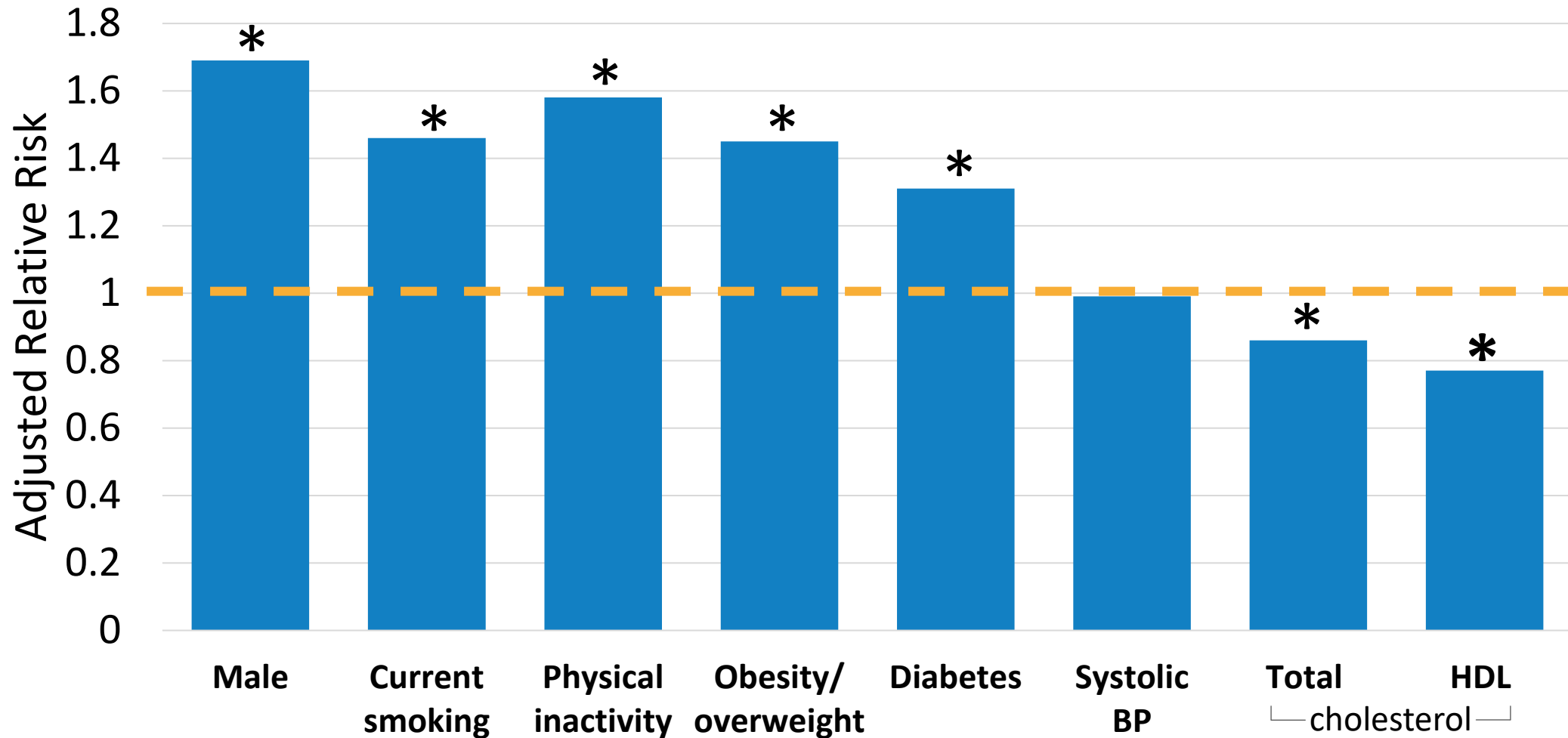
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# Many Possible Causes for Effects of COVID-19 on Older People



Mueller, A. L.,  
McNamara, M. S.,  
and Sinclair, D. A.  
(2020). *Aging*,  
12(10), 9959-9981.

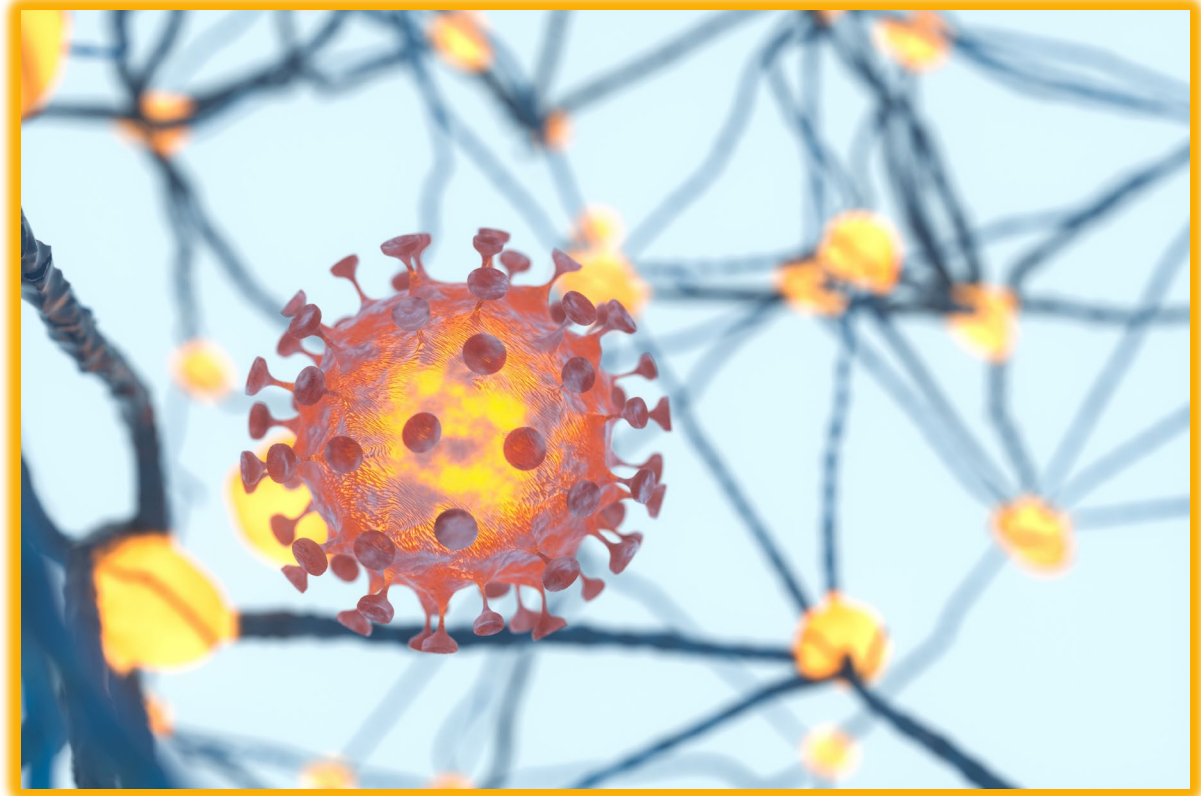
# Cardiovascular Risk Factors are Associated with Increased Risk of COVID-19 Hospitalization



Batty & Hamer.  
(2020).  
*Cardiovasc Res*,  
116(10), 1664-  
1665.

# Neurological Disorders Can Develop as a Result of COVID-19 Infection

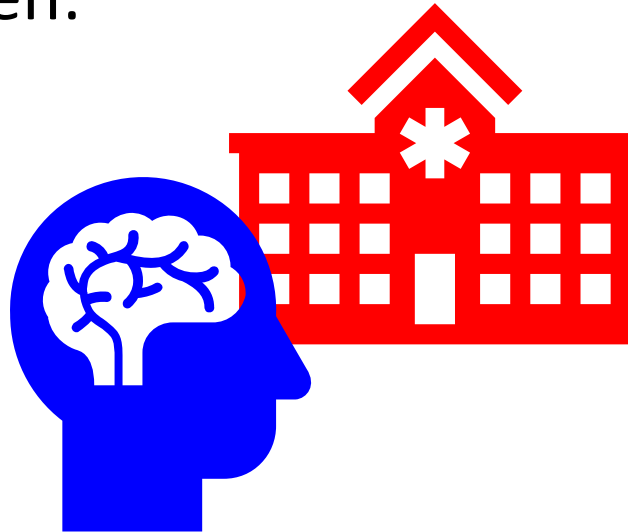
- In a study of ~4,500 hospitalized COVID-19 patients in New York City, **13.5% developed a neurological disorder** with their COVID-19 infection.



Frontera, J. A., et al. *Neurology*. Advance online publication.

# COVID-19-Induced Neurological Disorders Occur More Often in Specific Populations, Associated with Poorer Outcomes

- Patients who developed neurological disorders were more often:
  - Older
  - Male
  - White
  - Hypertensive
  - Diabetic
  - Intubated
  - Experiencing multiple organ failure



- **Neurological disorders predicted:**
  - **Decreased likelihood of discharge home**
  - **Increased risk of in-hospital death**

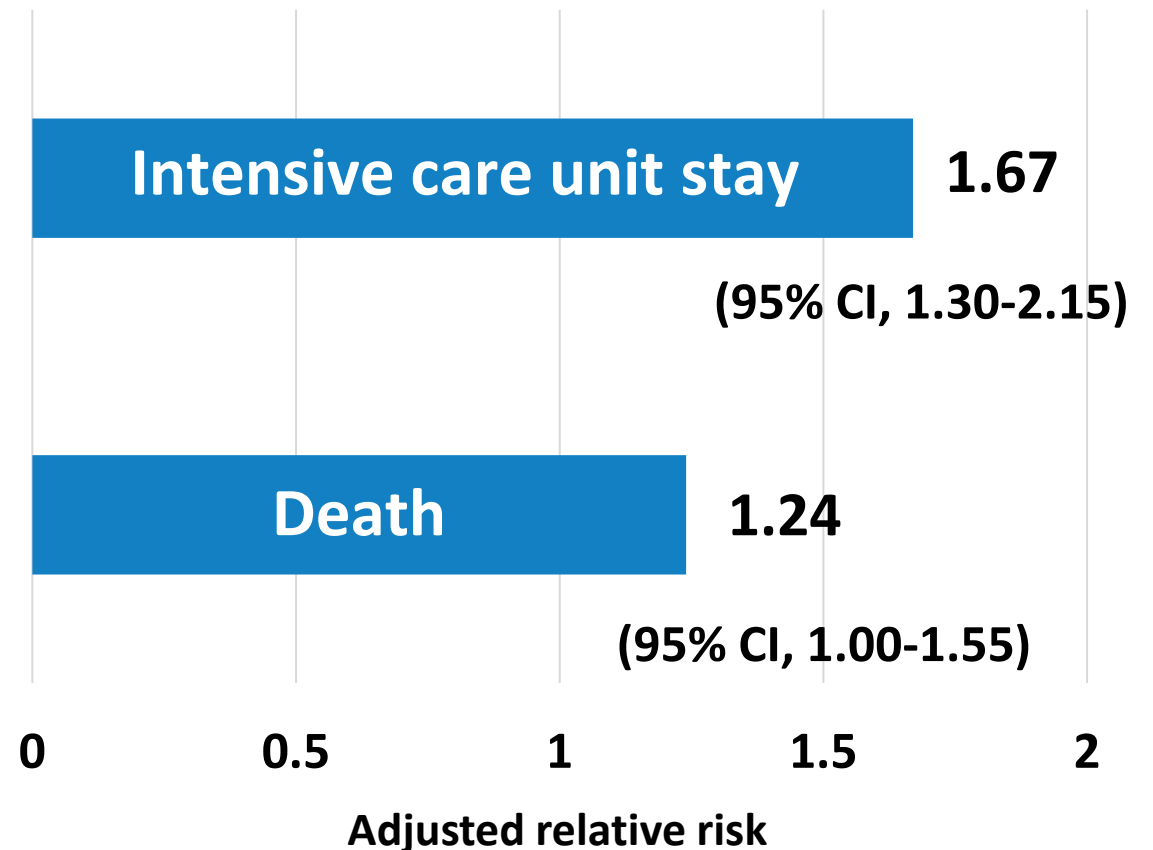
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# Older Adults with COVID-19

## Commonly Present to the Emergency Dept with Delirium

- **28%** of older adult emergency department (ED) patients with COVID-19 **presented with delirium.**
- **37%** of delirious patients **had no typical COVID-19 symptoms** (e.g., cough, fever).
- Delirium risk factors included **age 75+, vision impairment, stroke, and Parkinson's disease.**

### Outcomes associated with delirium:



# Social Isolation and Older Adults

Under “normal” conditions, increases risk for:

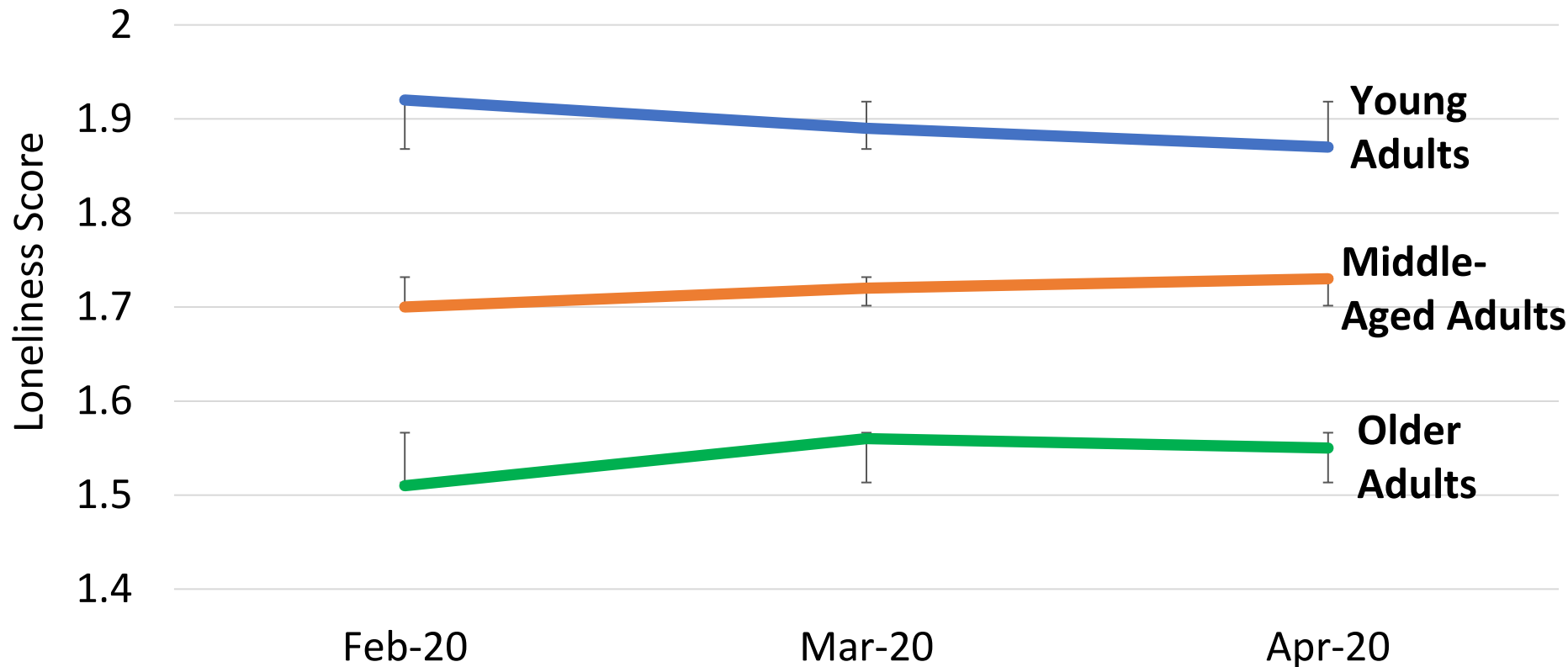
- High blood pressure, Heart disease
- Obesity
- Weakened immune system
- Anxiety
- Depression
- Cognitive decline
- Alzheimer’s disease
- Death

*At greater risk: including immigrants, LGBT populations, minorities, and victims of elder abuse*





# Tracking Loneliness During the COVID-19 Pandemic



- Older adults reported less loneliness than younger counterparts.
- No significant mean-level changes in loneliness observed.
- Important to note individual variability in loneliness – **some may experience it keenly, while others do not.**

Adapted from: Luchetti, M., et al. (2020). *American Psychologist*. Advance online publication.

# Consequences Mixed in Older Adults Sheltering in Place

On March 16, 2020, San Francisco was the 1<sup>st</sup> area in the U.S. to institute shelter-in-place orders in addition to broader physical distancing recommendations.

## Loneliness scores increasing over time:

“[Before the virus] I was socializing and seeing people a lot, but I feel a lot more lonely and isolated.”

**Follow-up:** “I love technology, but have had trouble keeping up. Technology is something I feel comfortable with, but [I am] totally out of date.”

Kotwal, A.A. et al. (2020) *J Am Geriatr Soc* Advance online publication.

# Consequences Mixed in Older Adults Sheltering in Place

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## Loneliness scores high over time:

“I’m so used to not doing anything. This has been terrible.”

**Follow-up #1:** “This has been the hardest thing I’ve had to do in my entire life. The isolation has made my mental and physical health worse.”

**Follow-up #2:** “The longer the coronavirus situation is, the more on edge people are.”

Kotwal, A.A. et al. (2020). *J Am Geriatr Soc*. Online publication.

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**Loneliness scores mid/low over time:**  
“My comfort with technology has gotten better. I think with Twitter [and] Instagram I’m more comfortable. I’m more comfortable with Facetime calling.”  
**Follow-up:** “I go weekly to the arboretum.”

Kotwal, A.A. et al. (2020). *J Am Geriatr Soc* Advance online publication.

# Consequences Mixed in Older Adults Sheltering in Place

- On March 16, 2020, San Francisco was the first county in the United States to institute shelter-in-place orders in addition to broader physical distancing recommendations.

Rates of loneliness improved *on average* by time since shelter-in-place orders began:

- 46% @ 4–6 weeks, vs.
- 27% @ 13–15 weeks

However, loneliness **persisted or worsened for a subgroup of participants.**

Kotwal, A.A. et al. (2020). *J Am Geriatr Soc* Advance online publication.

# Media Exposure During the COVID-19 Pandemic Is Associated with Mental Distress

- Increased mental distress in adults associated with:
  - Time spent on social media per day
  - Number of traditional media sources consulted (e.g., TV, newspaper, radio)



Riehm, K. E., et al. (2020). *American Journal of Preventive Medicine*. Advance online publication.

# Possible Strategies to Address Social Isolation in Older Adults during COVID-19

- Therapy delivered remotely
- Preserving social connectedness
- Regular sleep and mealtimes
- Healthy diet
- Cognitive stimulation
- Physical activity
- Relaxation techniques
- Managing media consumption



# Social Isolation and Older Adults – Some COVID-19 Research Qs

- Does therapy work if *none* of it is in person?
- Do different methods of remote intervention work equally well? (phone? computer?)
- How can we help isolated older adults with cognitive impairment? With pre-existing mental illness?
- How do strategies differ for older adults in long term care settings?



# Social Isolation & Loneliness Resources

Coming soon! @ [www.nia.nih.gov/strongerconnected](http://www.nia.nih.gov/strongerconnected)

All current and upcoming materials will be available in the Social Isolation and Loneliness Outreach Toolkit the week of **February 22**

- **Easy-to-read Booklet:** *“Understanding Loneliness and Social Isolation: How to Stay Connected”*
- **Outreach Toolkit:** [Loneliness and Social Isolation Outreach Toolkit](#) (Animated graphics, social media posts, health care provider flier, clinic poster, and resources)

★ **Facebook Live Q&A Event:** **March 4, 2021 at 2pm ET**

- Older adults and their families are invited to join the event to ask an NIA expert questions and learn about social isolation, loneliness, and how to stay more connected! [www.facebook.com/NIHAging](http://www.facebook.com/NIHAging)
- **+ Many more current resources**

# Looking ahead in 2021

- **Vaccine rollout** – evolving; *universal coronavirus vaccine in development*
- **Participants are needed** for clinical studies, including people who have had COVID-19 **and** those who have not:  
<https://www.coronavirus.gov/> or <https://combatcovid.hhs.gov/>
- **Expansion of remote technology** during COVID-19 may expand future social interactions, medical visits, etc., for many older people
- **Understanding the long-term effects** of the virus in survivors (*initial NIH workshop held in early December*)

# HHS Combat COVID Website

A centralized, one-stop web portal with resources and information about COVID-19, including treatment options and clinical trials.



HOME I'VE NEVER HAD COVID-19 I HAVE COVID-19 ▾ I'VE RECOVERED FROM COVID-19 I'M A DOCTOR

## COVID-19 AND YOU

Information to help you make decisions about your health and what you can do to join the fight against COVID-19.

I've Never Had COVID-19:

[Join a Prevention Trial](#) ↗

I Have COVID-19:

[Find a Treatment Trial](#)

I've Recovered from COVID-19:

[Donate Plasma](#) ↗

I'm a Doctor:

[Treatment Options and Trials](#)

# Questions?

**Melinda Kelley, Ph.D.**

**Director, Office of Legislation, Policy, and International Activities**

**National Institute on Aging**

**National Institutes of Health**

**Email: [kelleym@nia.nih.gov](mailto:kelleym@nia.nih.gov)**



**National Institute  
on Aging**