

Digital Health Literacy and US College Students in the Time of COVID-19

Health Literacy Research Conference (HARC)
Health Literacy in Action (HLiA)
October 18, 2020

Agenda

- ◎ A review of health literacy and digital health literacy for U.S. college students

Phillip Massey

- ◎ Digital health literacy and social networks of a racially and ethnically diverse sample of US college students collected in July 2020 (n=250)

Uday Patil, Uliana Kostareva, and Tetine Sentell

- ◎ Digital health literacy and health literacy in a sample of current New York college students (n=250) collected in July 2020

Jennifer Manganello and Molly Hadley

- ◎ Digital health literacy, social networks, and health education in international college students from the COVIDHL Consortium data (n> 40,145) collected across 44 countries from March to July 2020

Kevin Dadaczynski

- ◎ Discussion/Q&A with audience members

Tetine Sentell

Agenda

©A review of health literacy and digital health literacy for U.S. college students

Phillip Massey



A review of health literacy and digital health literacy for U.S. college students

Philip Massey, PhD, MPH

Associate Professor

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Health literacy is an important factor that can influence health decisions.

- Health literacy: the capacity to obtain, process, understand, and apply basic health information needed to make appropriate health decisions.
- Requires a complex group of reading, listening, analytical, and decision-making skills.
- Specific skills needed to navigate the health care system and the importance of clear communication between health care providers and their patients.

Health literacy is particularly important in the era of COVID-19.

U.S. surpasses 200,000 coronavirus deaths, eight months after first reported case

BY ZOE CHRISTEN JONES

UPDATED ON: SEPTEMBER 22, 2020 / 7:10 PM / CBS NEWS



- Reliable and trustworthy health information is key in this situation for citizens to act upon and slow down the spread of COVID-19.

Thousands of new COVID-19 cases continue to emerge on U.S. college campuses

The New York Times

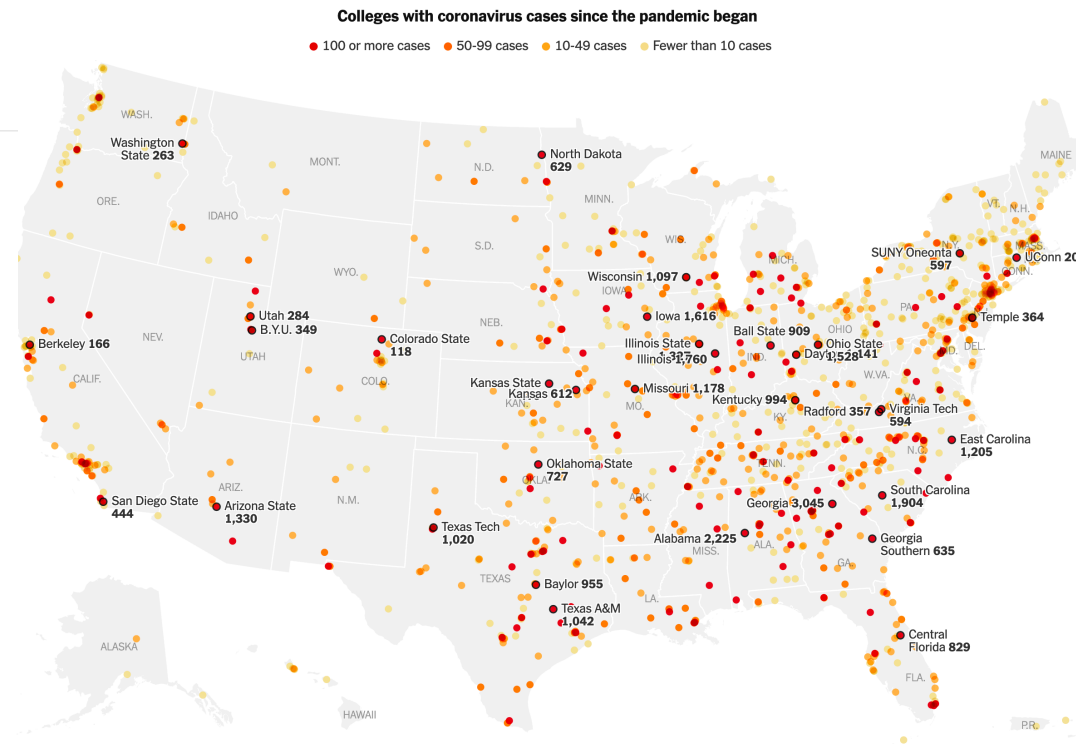
Tracking Covid at U.S. Colleges and Universities

By The New York Times Updated Sept. 10, 2020

88,000+
Cases

1,190+
Colleges

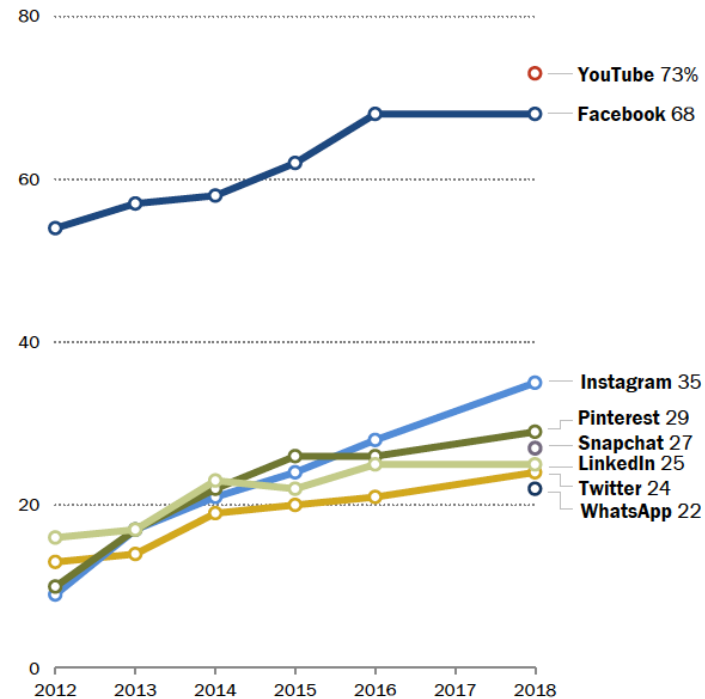
The New York Times is tracking coronavirus cases on campuses through a rolling survey. This page will be updated periodically and was last updated Sept. 10.



Social media is *the* way college students communicate and find information (about health).

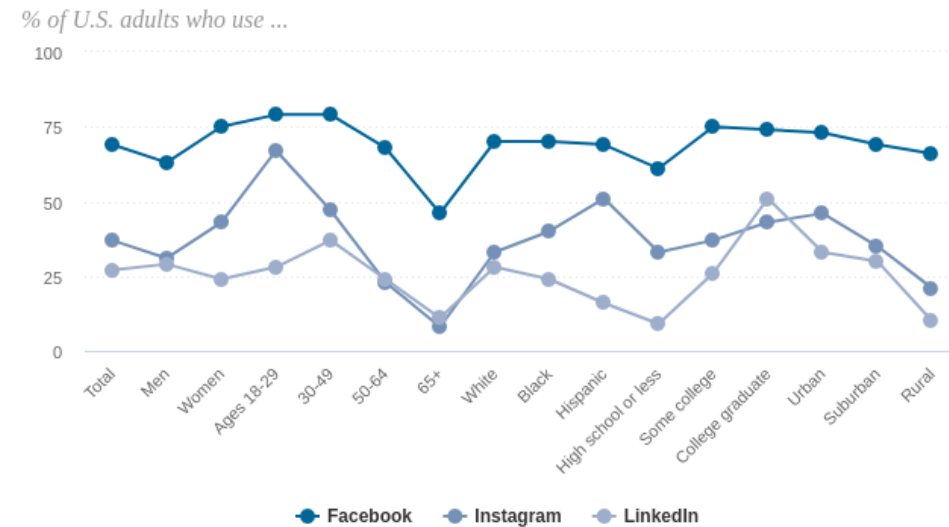
Majority of Americans now use Facebook, YouTube

% of U.S. adults who say they use the following social media sites online or on their cellphone



Who uses Facebook, Instagram and LinkedIn

% of U.S. adults who use each social media platform



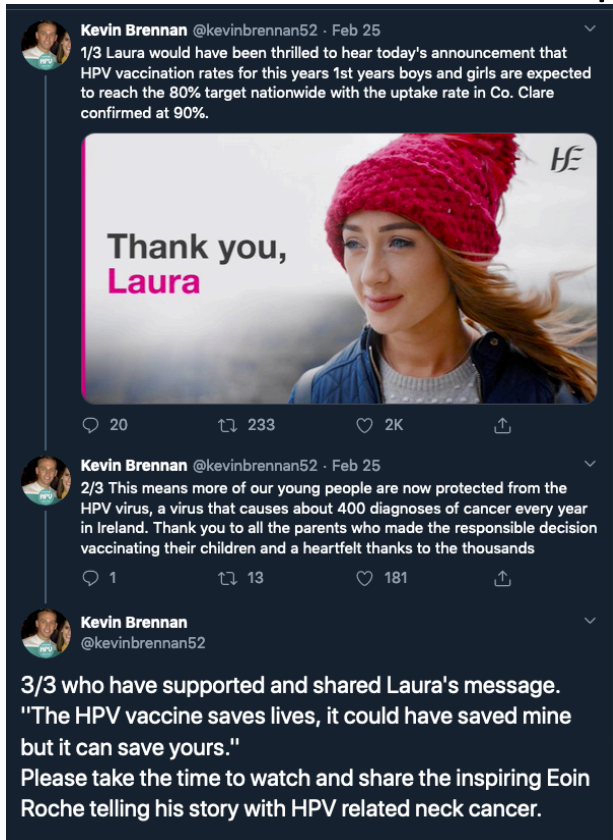
Source: Survey conducted Jan. 8 to Feb. 7, 2019.

A photograph of three young people sitting outdoors on a grassy area. A young woman with long blonde hair is on the left, wearing a red sweater and looking down at her smartphone. In the center is a young man with dark hair, wearing a blue hoodie and looking at his smartphone. On the right is a young woman with dark curly hair, wearing a white shirt and a denim vest, also looking at her smartphone. The background is a soft-focus view of trees and foliage.

Health information and health content on social media is, well, *social*.

- Of those online, 3 in 4 look for health information.
- 1 in 5 tried to find others who might share same health concerns.
- 1 in 4 consulted online reviews or rankings of health care services or treatments.
- 1 in 4 read or watched someone else's experience about health issue.

Health content told through stories, experience, and narratives can be powerful tools to promote health.



Social media provide new avenues to disseminate content, engage audiences, and evaluate impact



We go to social media to feel something. To connect with others and to look at what others are doing.

Misinformation is a major threat to public health and medicine.

With intent to spread → DISINFORMATION



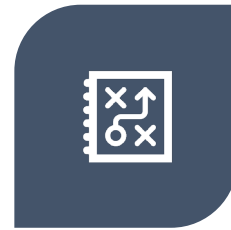
Misinformation takes on many shapes and sizes



CONCEALMENT



AMBIVALENCE



DISTORTION



FALSIFICATION

Identifying misinformation is an important step.

The diagram illustrates the process of identifying misinformation. It shows a tweet by Donald J. Trump (@realDonaldTrump) claiming that mail-in ballots are fraudulent and that the Governor of California is sending them to millions of people. A red arrow points from this tweet to a news article titled "Updating our Approach to Misleading Information" by Yoel Roth and Nick Pickles, dated May 11, 2020. Another red arrow points from the tweet to a news article titled "Trump makes unsubstantiated claim that mail-in ballots will lead to voter fraud" by CNN Politics, dated 3 hours ago. The news article provides context and fact-checks the tweet, stating that the claims are unsubstantiated and that mail-in ballots are very rarely linked to voter fraud.

Product

Updating our Approach to Misleading Information

By Yoel Roth and Nick Pickles
Monday, 11 May 2020

In serving the public conversation, our goal is to make it easy to find credible information on Twitter and to limit the spread of potentially harmful and misleading content. Starting today, we're introducing new labels and warning messages that will provide additional context and information on some Tweets containing disputed or misleading information related to COVID-19.

In March, we **broadened our policy** guidance to address content that goes directly against guidance on COVID-19 from authoritative sources of global and local public health information. Moving forward, we may use these labels and warning messages to provide additional explanations or clarifications in situations where the risks of harm associated with a Tweet are less severe but where people may still be confused or misled by the content. This will make it easier to find facts and make informed decisions about what people see on Twitter.

New labels and warnings

During active conversations about disputed issues, it can be helpful to see additional context from trusted sources. **Earlier this year**, we introduced a new label for Tweets containing synthetic and manipulated media. Similar labels will now appear on Tweets containing potentially harmful, misleading information related to COVID-19. This will also apply to Tweets sent before today.

Thread

Donald J. Trump @realDonaldTrump

There is NO WAY (ZERO!) that Mail-In Ballots will be anything less than substantially fraudulent. Mail boxes will be robbed, ballots will be forged & even illegally printed out & fraudulently signed. The Governor of California is sending Ballots to millions of people, anyone.....

Get the facts about mail-in ballots

8:17 AM · May 26, 2020 · Twitter for iPhone

33.9K Retweets 96.2K Likes

Donald J. Trump @realDonaldTrump · 11h

Replying to @realDonaldTrump

....living in the state, no matter who they are or how they got there, will get one. That will be followed up with professionals telling all of these people, many of whom have never even thought of voting before, how, and for whom, to vote. This will be a Rigged Election. No way!

Get the facts about mail-in ballots

Trump makes unsubstantiated claim that mail-in ballots will lead to voter fraud

Politics · 3 hours ago

On Tuesday, President Trump made a series of claims about potential voter fraud after California Governor Gavin Newsom announced an effort to expand mail-in voting in California during the COVID-19 pandemic. These claims are unsubstantiated, according to CNN, Washington Post and others. Experts say mail-in ballots are very rarely linked to voter fraud.

Photo via @CNNPolitics

Share your thoughts

What you need to know

- Trump falsely claimed that mail-in ballots would lead to "a Rigged Election." However, fact-checkers say there is no evidence that mail-in ballots are linked to voter fraud.
- Trump falsely claimed that California will send mail-in ballots to "anyone living in the state, no matter who they are or how they got there." In fact, only registered voters can request a mail-in ballot.

Health and media literacy will be important skills to build and practice while we ask and look for our many questions online and on social media.

How long is a person contagious?

How does the virus spread?

What treatments are available?

How can you tell if a person has the virus?

Will the vaccine be safe?

Do masks protect me against the virus?

When is it safe to go out in public?

When will it be safe for my kids to go back to school?

When will there be a vaccine?

What actions should I take to protect myself? Protect my family?



Sanitize before you share

4 quick steps
to stop the spread
of misinformation

Remember:

Taking these steps can eliminate
a large percentage of viral rumors




1. Pause.
Don't let your emotions take over.



2. Glance through comments.
Has someone replied to this with a fact check?



3. Do a quick search.
In the search bar, turn the claim you're checking into a question. Look for credible sources in the results.



4. Ask for the source.
Reply to the person who shared the post, asking for the

Digital health literacy and social networks of a racially and ethnically diverse sample of US college students



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Background

College and university students have become a topic of increasing interest and relevance during the COVID-19 pandemic.

The health-related decisions and behaviors of students have an impact on COVID-19 infection rates, health outcomes, and the economic welfare of campuses and surrounding communities.

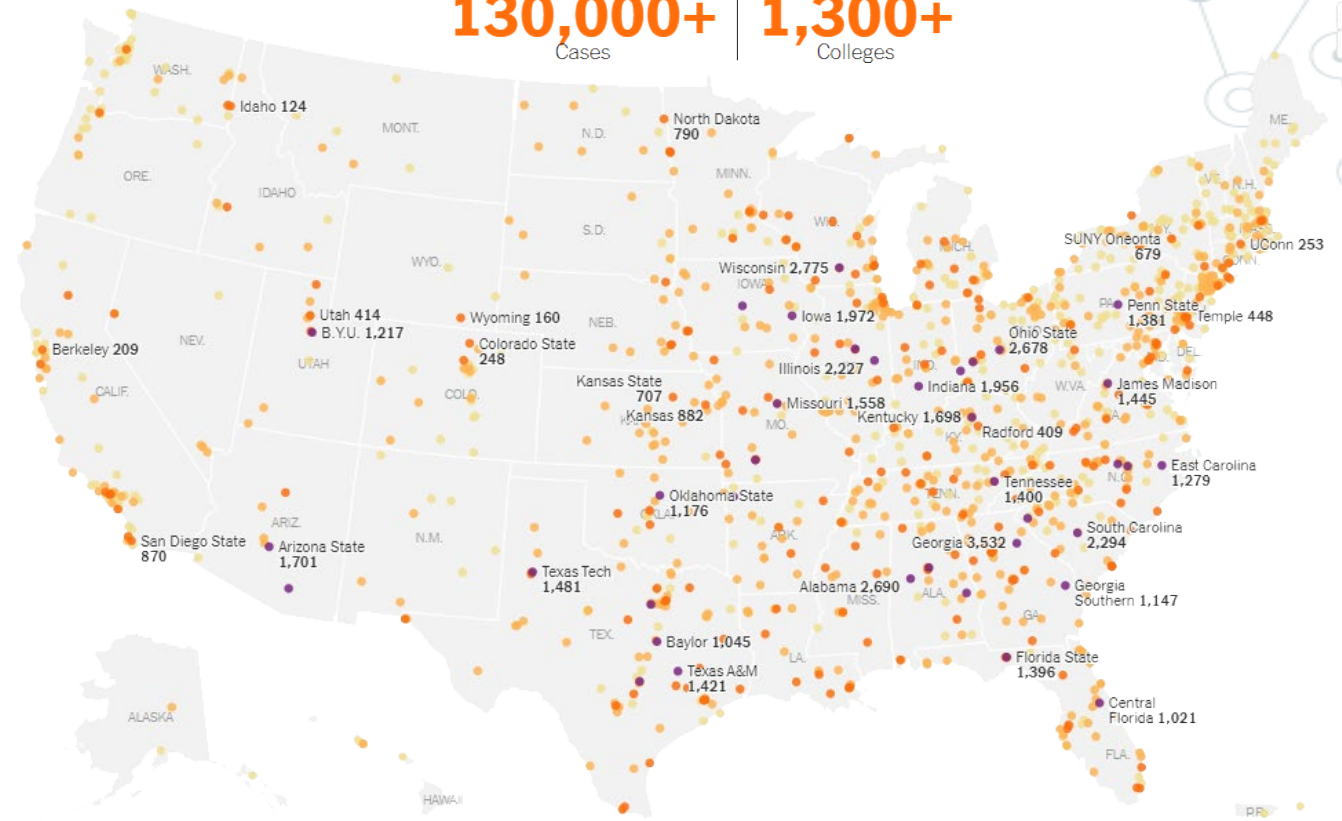
For college students, social networks are critical, especially digital ones, which are even more relevant in this time of physical distancing.

A better understanding of health literacy for this digitally connected population is critical to building useful programs, developing policies, and issuing health information across universities, health systems, and public health departments.

Tracking Covid at U.S. Colleges and Universities

By The New York Times Updated Sept. 25, 2020

130,000+ Cases
1,300+ Colleges



Goals

The goal of this study was to consider the associations of:

- ◎ **health information access** and
 - ◎ **COVID-19-related attitudes and behaviors**
- to
- ◎ **health literacy** and
 - ◎ **digital health literacy**

in a representative sample of US college students.

We had a particular interest in social network sizes and engagement by health literacy levels.

Sampling

256 students responded to a Qualtrics-administered panel Survey between July 7 and July 23, 2020.

We used sampling quotas to be representative of racial/ethnic and gender diversity in the US collegiate population.

Inclusion criteria:

- Enrolled in college or university
 - Either an associate or bachelor's degree program in Spring 2020
- English speaking
- 18 years or older

Methods

Survey included:

Background

Demographics

- Education

- Political affiliation

- Housing and financial stability

Health

- Disability

- WHO Well-being Index (WHO-5)

COVID-19-related

- Attitudes and Perceptions

- Guidance Compliance

- Vaccination Planned Behaviors

Validated Health Literacy Measure

- Single-Item Literacy Screener (SILS)

Digital Health Literacy Measure

- Digital Health Literacy Instrument (DHLI) [Abbreviated]

Information Topics & Sources

- Utilization

- Trust

Social network

- Discussion Partners

- Social network Focus Index

Analyses included:

Bivariate comparisons in X and multivariable models predicting access, attitudes, and behaviors

Tools used:

STATA 13, R 4.0, Excel 2008

Health Literacy

256

Total Respondents

130

Low
Health Literacy

126

Adequate
Health Literacy

51%

49%

Digital Health Literacy

When you searched the Internet for information (for example, "Googled") about the coronavirus or related topics, how easy or difficult was it to...

	$\bar{x}(s)$
DHL Index (n=246)	2.99 (0.51)
Search for Information	3.08 (0.57)
Determine Reliability	2.83 (0.62)
Establish Relevance	3.06 (0.51)

[1] very difficult, [2] difficult, **[3] easy**, [4] very easy

General Characteristics & Health Literacy

	Low (n=130)	Adequate (n=126)
Gender		
Female	32%	53%
Male	67%	41%
Other Identity	1%	6%
Ethnicity & Race		
Non-Hispanic Black	16%	13%
Non-Hispanic Asian	9%	10%
Non-Hispanic White	34%	37%
Non-Hispanic Other	1%	4%
Hispanic	40%	37%
US Born	96%	91%
Multilingual	29%	27 %
First-Generation Student	63%	51%
Near or Below Poverty	38%	53%

	\bar{x} (s)	\bar{x} (s)
Age	25.0 (4.9)	22.7 (3.2)
Semesters Enrolled	4.6 (4.4)	4.7 (2.7)

Samples is highly representative of the gender, ethnic/racial, nativity, linguistic, and financial status diversity at US colleges and universities.

Female identification associated with Low HL.

First-generation student status associated with Low HL.

Students above poverty level is associated with Low HL.

Older students associated with Low HL.

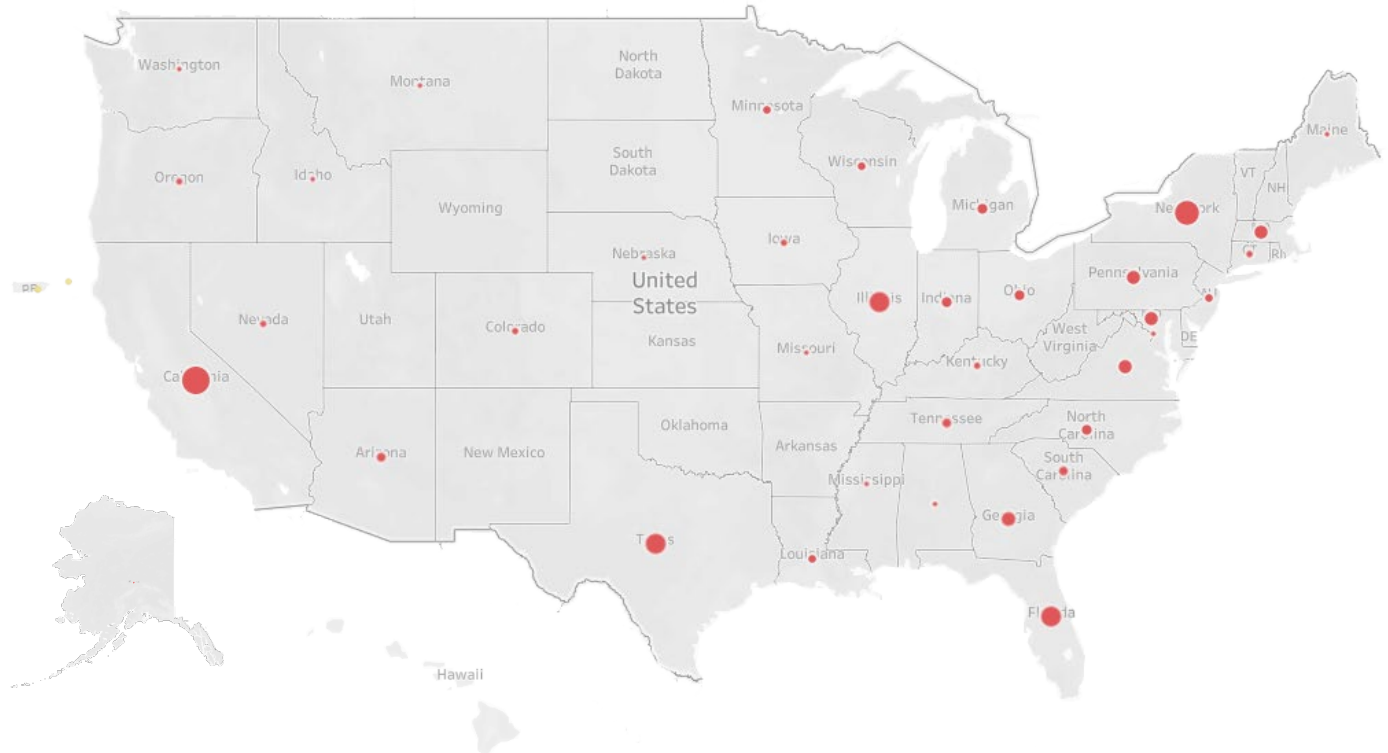
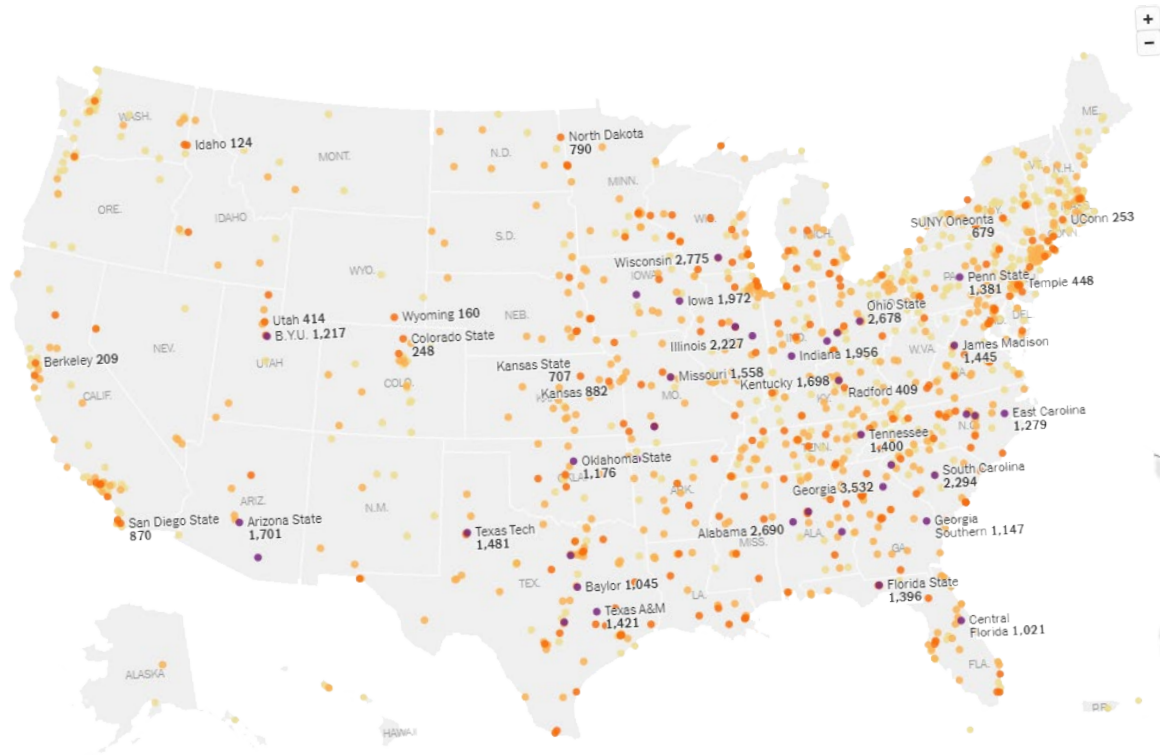
General Characteristics & Digital Health Literacy

	\bar{x}	s
Total	2.99	0.51
Health Literacy		
Low	3.01	0.51
Adequate	2.97	0.51
Gender		
Female	2.96	0.52
Male	3.01	0.49
Other Identity	3.14	0.65
Ethnicity & Race		
Non-Hispanic Black	2.94	0.55
Non-Hispanic Asian	2.91	0.53
Non-Hispanic White	3.03	0.51
Non-Hispanic Other	2.78	0.53
Hispanic	3.01	0.49
US Born		
Yes	3.00	0.51
No	2.91	0.48

	\bar{x}	s
Age		
18 - 20	3.01	0.42
21 - 23	2.96	0.50
24 - 27	3.01	0.56
28 or Older	3.01	0.55
Semesters (Equiv.) Enrolled		
2.0 or less	2.95	0.52
2.5 - 3.5	3.01	0.62
4.0 - 6.0	2.97	0.45
6.5 or more	3.10	0.50

No significant differences in DHL among levels of any demographic or general characteristic.

Locations



Social Network

Size

Health Discussion Partners	\bar{x} (s)
Discussed Own Health	4.3 (5.0)
Discussed Their Health	4.5 (5.8)

Min	Q1	Median	Q3	Max
0	2	3	5	50
0	2	3	5	50

Focus

	Low	Adequate
Focus		
Own Health	21%	23%
Balanced	71%	56%
Other Health	9%	21%

Network size does not differ by HL level.

Those focused on other's (vs. own) health were more likely to have adequate HL.

No differences in DHL among groups.

Health Literacy and Digital Health Literacy

	\bar{x}	s
Health Literacy		
Low	3.01	0.51
Adequate	2.97	0.51

No significant difference in DHL between HL levels.

COVID-19 Information

Mean Sources Used
in Top 10 Social Media & Internet Forums

	\bar{x}	s
Health Literacy		
Low	4.36	2.02
Adequate	3.15	1.69

More usage associated with Low HL.

Usage not associated with DHL.

Students much more likely to trust college websites.

COVID-19 Attitudes

	Low	Adequate
Perception		
Overreaction	32%	25%
Fair Reaction	53%	43%
Underreaction	15%	32%

	Low	Adequate
Very Likely to be Vaccinated	46%	51%

Overreaction to the pandemic associated with low HL.

No association between planned vaccination and HL.

Students very likely to vaccinate show higher DHL.

COVID-19 Behaviors

Some association between public health guidance compliance and HL.

Strong association between planned vaccination and DHL. Students more likely to be always compliant with:

- Hand Washing
- Social Distancing
- Mask Wearing
- Staying at Home

Students always compliant with all four guidance measures have much higher DHL.

Key Findings

HL and DHL are related but unique measures.

Adequate Health Literacy

Characteristics	More female
Location	-
Health Profile	Less disability
Social Networks	Focus on other's health in discussions
Information	Fewer social media and forum sources Trust college websites more
Attitudes	Underreaction to pandemic
Behaviors	Mixed

Higher Digital Health Literacy

Characteristics	-
Location	Mid-Atlantic Region
Health Profile	Less disability
Social Networks	-
Information	-
Attitudes	Very likely to vaccinate
Behaviors	More compliant with public health guidance

Limitations

- ◎ Small, online, English-only panel survey
- ◎ Social network data limited
- ◎ Health literacy assessment limited
- ◎ Modified digital health literacy instrument

Conclusions

- ◎ Provides timely, new insights into digital health literacy of students in the midst of university COVID-19 outbreaks.
- ◎ Shows clear links between digital health literacy and compliance with public health guidance.
- ◎ Affirms need for university websites to serve as source for preventive health information.

Future Considerations

- ◎ Inspire regional, global ventures
- ◎ Conduct comparative HL research
- ◎ Provide student-focused literacy programming
- ◎ Highlight role of HL in digital information navigation

References & Further Reading

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Agenda

◎ Digital health literacy and health literacy in a sample of current New York college students (n=250) collected in July 2020

Jennifer Manganello, Molly Hadley



DIGITAL HEALTH LITERACY & HEALTH LITERACY IN A SAMPLE OF CURRENT NEW YORK COLLEGE STUDENTS

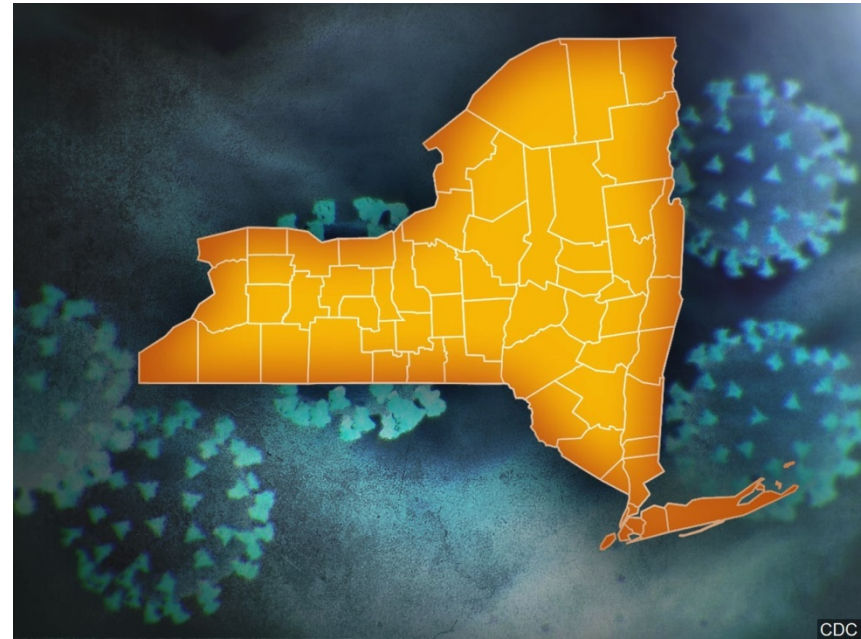
Molly Hadley, MPH

Dr. Jennifer Manganello, PhD, MPH



Background

- New York (NY) was the initial COVID-19 epicenter in the United States
- Early on, NY implemented strict COVID-19 public health guidelines
- Phased reopening



Background

- March 2020: NY universities and colleges closed campuses and transitioned to remote learning
- Many students forced to return home
- Besides emails and social media posts from a school, students had no exposure to coordinated on-campus education efforts
- Students were more likely to independently access information regarding COVID-19
 - BUT, college students have been shown to have low digital health literacy levels (Stellefson et al., 2011)

Study Goals

- Using a cross-sectional online survey, we sought to discover information seeking and COVID-19 attitudes and beliefs of NY college students during the COVID-19 pandemic
- Key questions included:
 - Access to and understanding of COVID-19 related information
 - Attitudes and beliefs towards the virus
 - Adherence to current public health guidelines
 - Intentions to receive a COVID-19 vaccine in the future

Sample

➤ Cross-sectional survey of 245

➤ Inclusion criteria:

- NY state resident
- Enrolled in a NY school during Spring 2020 in either an associates or bachelors degree program
- 18 years or older
- English speaking



Methods

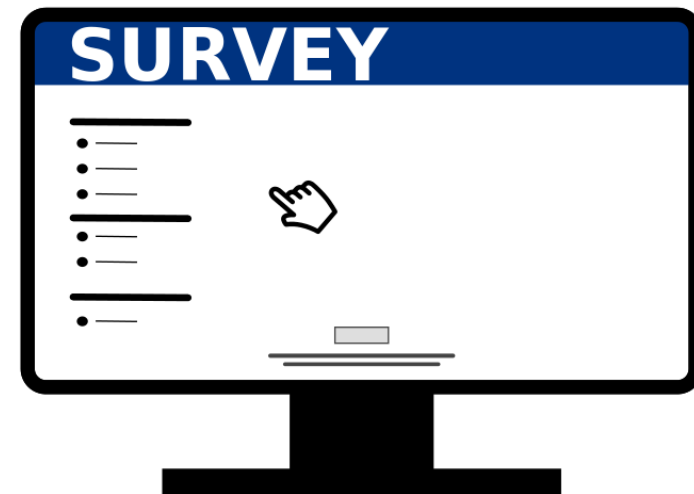
➤ Recruitment

- Occurred July 14th – September 14th 2020
- Departmental emails and other listservs at NY universities and colleges
- Personal contacts at UAlbany and other schools
- Sponsored social media ads on Instagram and Facebook
- Posts on personal social media accounts

➤ Incentive

Methods

- Screening questionnaire
 - If eligible, provide .edu email
- Emailed unique survey link (one-time)
 - Informed consent
 - Consortium survey plus additional questions
 - 54 main questions, some with sub-questions



Demographics

N=245

Gender Identity

Female	80% (196)
Male	17.6% (43)
Gender variant/non-conforming	2% (5)
Other	0.4% (1)

Age

Mean	20.9 years old
Range	18-49 years

Ethnicity

Non-Hispanic	84.9% (208)
Hispanic	15.1% (37)

Race

White	61.5% (150)
Black or AA	18% (44)
Asian	9.4% (23)
Two or more races	9% (22)
American Indian/Alaska Native	1.6% (4)
Native Hawaiian/Pacific Islander	0.4% (1)

First generation college student

No	68.2% (167)
Yes	31.8% (78)

Type of degree

Bachelors degree	95.5% (234)
Associates degree	4.5% (11)

Political affiliation

Democrat	60.2% (145)
Independent	26.1% (63)
Republican	7.9% (19)
Other	5.8% (14)

Health Literacy

How often do you need help to read instructions, pamphlets, or other written material from your doctor or pharmacy?

Higher Health Literacy	80.7% (197)
Never	56.1% (137)
Rarely	24.6% (60)

Lower Health Literacy	19.3% (47)
Sometimes	16.4% (40)
Often	2% (5)
Always	0.8% (2)

Missing=1

Digital Health Literacy

The WHO defines digital health literacy as the “*ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem*”.

Digital Health Literacy Scale

12 items in consortium survey

Item #	Missing	Item #	Missing
1 ★	52	7	52
2	52	8	52
3 ★	52	9	52
4 ★	52	10	153
5	52	11	153
6	53	12	153

3 items used for this analysis (missing=52)

access, understand, analyze

Digital Health Literacy

(item 1, understand)

When you searched the Internet (for example “Googled”) about the coronavirus or related topics, how easy or difficult was it to...

...understand the information you find?

Very easy 31% (60)

Easy 59% (114)

Difficult 9.8% (19)

Very difficult 0% (0)

Missing=52

Digital Health Literacy

(item 3, access)

When you searched the Internet (for example “Googled”) about the coronavirus or related topics, how easy or difficult was it to...

...find the exact information you are looking for?

Very easy	22.3% (43)
Easy	46.6% (90)
Difficult	28.5% (55)
Very difficult	2.6% (5)

Missing=52

Digital Health Literacy

(item 4, analyze)

When you searched the Internet (for example “Googled”) about the coronavirus or related topics, how easy or difficult was it to...

...decide whether the information is reliable?

Very easy	17.1% (33)
Easy	36.8% (71)
Difficult	34.2% (66)
Very difficult	11.9% (23)

Missing=52

Digital Health Literacy Level

3 items

Very easy (1)

Easy (2)

Difficult (3)

Very difficult (4)

3-7 = Higher digital health literacy

8-12 = Lower digital health literacy

Higher digital health literacy 71.5% (138)

Lower digital health literacy 28.5% (55)

DHL level vs. HL level

	Low DHL level	High DHL level	Total
Low HL level	8.3% (16)	11.5% (22)	19.8% (38)
High HL level	20.3% (39)	60% (115)	80% (154)
Total	28.7% (55)	71.4% (137)	
	Missing=53		

Beliefs regarding COVID-19

How would getting COVID-19 affect your life (perceived severity)?

This would make me very sick	39.3% (95)
This would make me a little sick	49.1% (119)
This is not a big deal to me	11.6% (28)

Beliefs regarding COVID-19

What are your chances of getting COVID-19 (perceived susceptibility)?

High	7.9% (19)
Medium	44.2% (107)
Low	45.9% (111)
None	2% (5)

Beliefs regarding COVID-19

All in all, do you think the COVID-19 outbreak has been made a bigger deal than it really is, made a smaller deal than it really is, or approached about right (perceived handling)?

Bigger deal	18.9% (46)
Just about right	46.3% (113)
Smaller deal	34.8% (85)

Public Health Guidelines



How often do you follow public health guidelines related to COVID-19?

	Never or Rarely	Sometimes	Often or Always
Wearing a mask in public spaces	0.4%	0.8%	98.8%
Frequent hand washing	1.2%	5.7%	93%
Social/physical Distancing	3.3%	13%	83.6%
Staying at home except for essential trips	7%	30.6%	60.4%

COVID-19 Vaccine Intentions

How likely would you be to get a COVID-19 vaccine, if available?

Very likely	52.5% (128)
Somewhat likely	31.6% (77)
Not likely	16% (39)



HL and DHL Associations

- Fishers exact test used to assess associations between HL and DHL and:
 - COVID-19 beliefs
 - following public health guidelines
 - vaccination intentions
- No statistically significant associations were found

Demographic Associations

- Fishers exact test used to assess associations between demographic variables and COVID-19 beliefs, following public health guidelines, and vaccine intentions
- No statistically significant associations were found with gender or ethnicity
- Two or more associations were found with race and political affiliation

Demographic Associations

Race

Perceived severity ($p < 0.05$)

Intentions to receive COVID-19 vaccine ($p < 0.01$)

Demographic Associations

Political affiliation

Perceived severity ($p=0.0084$)

Perceived handling ($p<0.0001$)

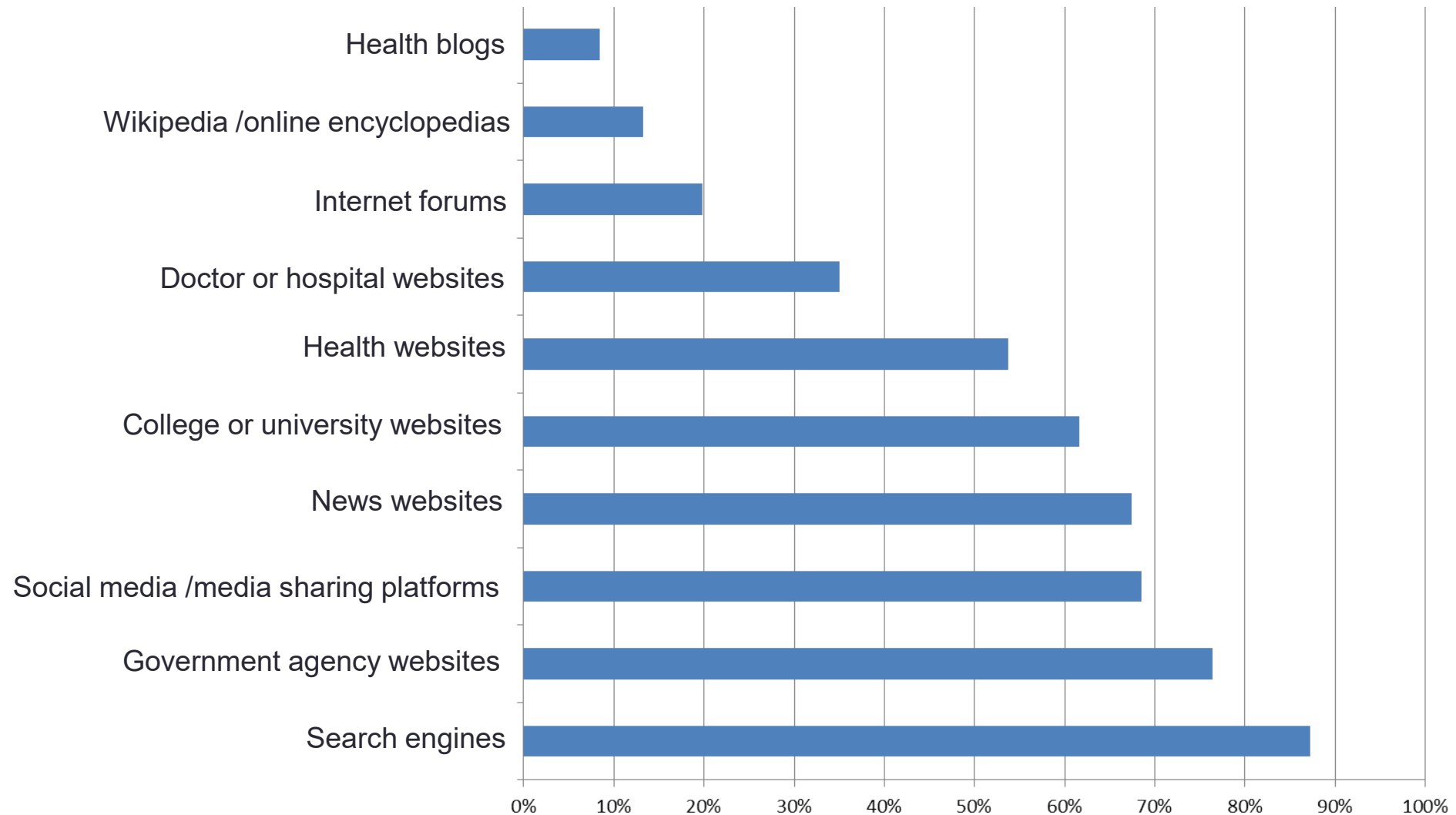
Following public health guidelines

Social/physical distancing ($p<0.05$)

Wearing a mask in public spaces ($p<0.05$)

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Digital Sources for COVID-19 Information



Limitations

Requesting .edu email

Social media advertisements

Bias: similar degrees, mostly female, most of sample from same university

Many digital health literacy items were missing

Future Directions

Continue analysis and finalize results

Combine datasets (west coast data and Consortium data)

Assess associations between main source of COVID-19 information and COVID-19 perceptions/public health guidelines/vaccination intentions

Conduct focus groups with college students to better understand survey results

References

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Agenda

◎ Digital health literacy, social networks, and health education in international college students from the COVIDHL Consortium data ($n > 40,145$) collected across 44 countries from March to July 2020

Kevin Dadaczynski





Health literacy is the degree to which **individuals** have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.

-- Institute of Medicine

...the personal characteristics and social resources needed for individuals and communities to access, understand, appraise and use information and services to make decisions about health.

-- World Health Organization

An individual's health literacy is not independent of support and resources in an individual's

social environment.

-- Lee et al., 2004

How might we consider health literacy as a community issue, and what are the implications for action?

-- Lurie and Parker, 2007

“Health literacy is a complex phenomenon that involves individuals, families, communities and systems”

-- NIH website

Health Literacy in Social Networks

◎ US College Students:

- Discussed Own Health: 4.3(5.0)
- Discussed Their Health: 4.5(5.8)

◎ New Moms in Hawai'i:

- On average, the mothers made health decisions with 2.9 people (range 1-6); 1 partners/spouses and mothers/mothers-in-law were most common.
- Across the full sample, the average number of people in individuals' health decision networks was 2.5 (range 0-7).
- Preventable Hospitalization for Chronic Disease:
 - 14% had no alters "isolates"
 - 82% had less than 4

Agenda

◎ Discussion/Q&A with audience members





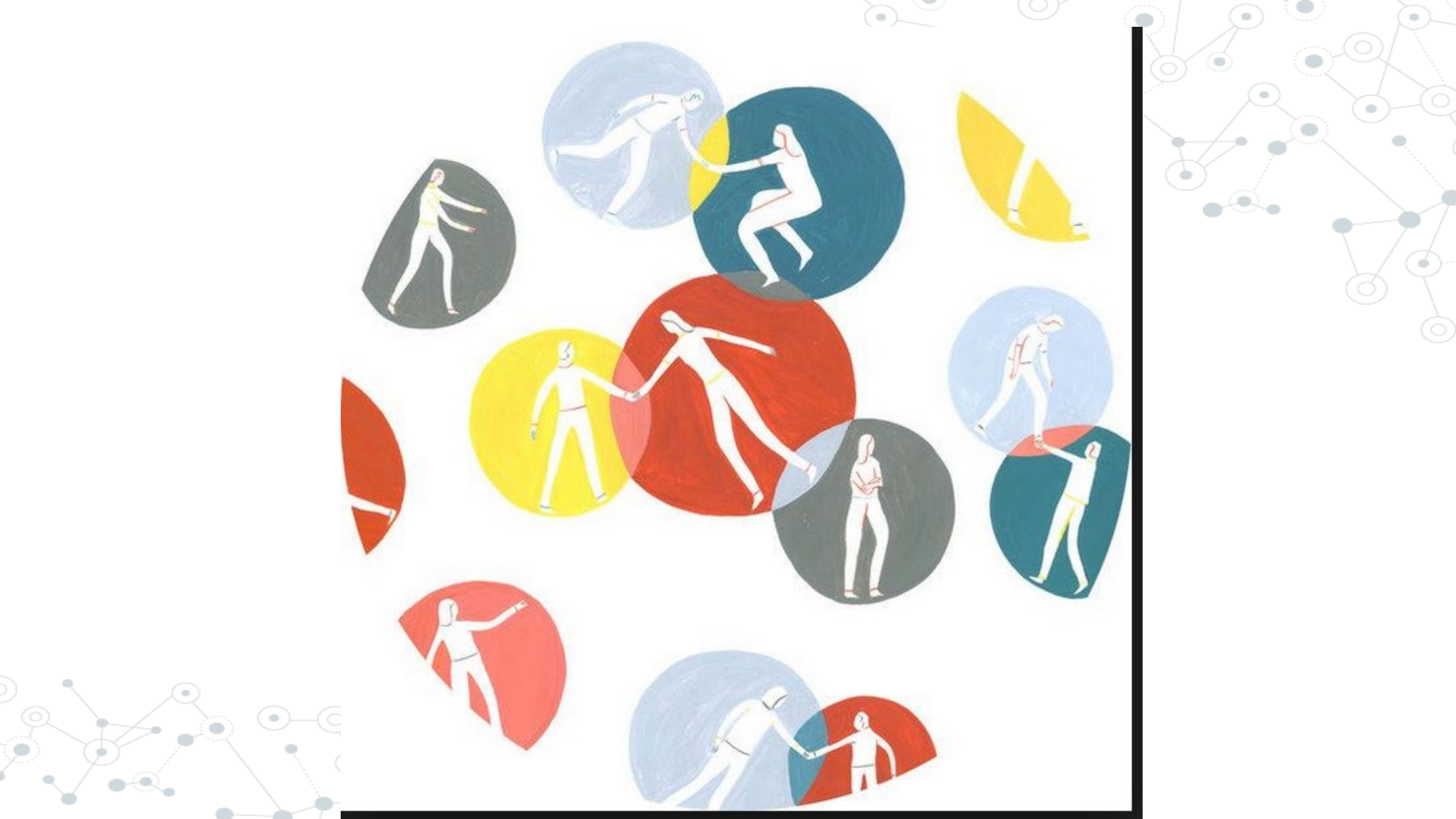
“Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.”

-- Institute of Medicine



“Health literacy is the degree to which **individuals** have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions”

-- Institute of Medicine





MAHALO!!!!

Raymond J. Green



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With Some Help From My Network: Supplementing eHealth Literacy With Social Ties

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