

MEDICAL MISINFORMATION AND DISINFORMATION RELATED TO THE COVID-19 PANDEMIC

KAREN L. KIER, PHD, MS, RPH, BCPS, BCACP, CTTS, FASHP, FCCP

MICHAEL J. RUSH, PHARM.D, MBA, BCACP, CDCES, NCTTP

DISCLOSURES

Karen L. Kier

No actual or potential conflicts of interest to disclose.

Michael J. Rush

No actual or potential conflicts of interest to disclose.



LEARNING OBJECTIVES

After this presentation, the participant will be able to:

- Define medical misinformation and disinformation
- Describe historical perspectives on misinformation from previous pandemics
- Describe the impact of medical misinformation on rural health
- Describe the impact of medical misinformation to marginalized and vulnerable populations
- Describe methods to overcome misinformation specifically as it applies to vaccine hesitancy



I am urging all Americans to help slow the spread of health misinformation during the COVID-19 pandemic and beyond. Health misinformation is a serious threat to public health. It can cause confusion, sow mistrust, harm people's health, and undermine public health efforts. Limiting the spread of health misinformation is a moral and civic imperative that will require a whole-of-society effort.

US Surgeon General Vivek Murthy

MISINFORMATION: COVID-19 VACCINES/INFERTILITY

- Late 2020, a semi-retired British scientist co-authored a petition to Europe's medicines regulator
- The petitioners made a bold demand--Halt COVID-19 vaccine clinical trials
- Without providing evidence, the petition speculated that the vaccines could cause infertility in women
- The document appeared on a German website on 12/1/2020
- Scientists denounced the theory
- Regulators weren't swayed
- Weeks later, the European Medicines Agency approved the European Union's first COVID-19 shot

MISINFORMATION: COVID-19 VACCINES/INFERTILITY

- Social media quickly spread exaggerated claims that COVID-19 vaccines cause female infertility
- *Within weeks*, doctors and nurses in Britain began reporting that concerned women were asking them whether it was true
- *By January 2021*, a survey by the Kaiser Family Foundation found that 13% of unvaccinated people in US had heard that “COVID-19 vaccines have been *shown to cause* infertility”
- Petition co-author was Michael Yeadon, 60-year-old former Pfizer VP, later co-founded a biotech firm purchased by for at least \$325 million
- Hero to the antivaxxers including members of the Dirty Dozen who posted on their antivax social media sites

MISINFORMATION: COVID-19 VACCINES/INFERTILITY

- mRNA vaccine-induced antibodies attacking the placental protein, syncytin-1, causing infertility (misinformation—appears factual and very scientific)
- Studies verify the lack of impact of mRNA COVID-19 vaccines on fertility in both males and females
- Joint statement from the American College of Obstetricians and Gynecologists, the American Society of Reproductive Medicine, and the Society for Maternal-Fetal Medicine that there is no evidence of COVID-19 mRNA vaccine causing a loss of fertility

MISINFORMATION: COVID VACCINES/INFERTILITY

The US Surgeon General Vivek Murthy emailed a statement to the Journal of the American Medical Association

“misinformation about COVID-19 vaccines impacting fertility has been one of the most persistent myths during this pandemic” and “has led to alarmingly low rates of vaccination amongst pregnant people, who are actually at a greater risk of adverse outcomes”

Widespread misinformation about infertility continues to create COVID-19 vaccine hesitancy

DEFINITIONS

- Hear lots of names such as fake news, yellow journalism, quackery
- Common themes for misinformation are false or misleading information that is NOT supported by current scientific literature

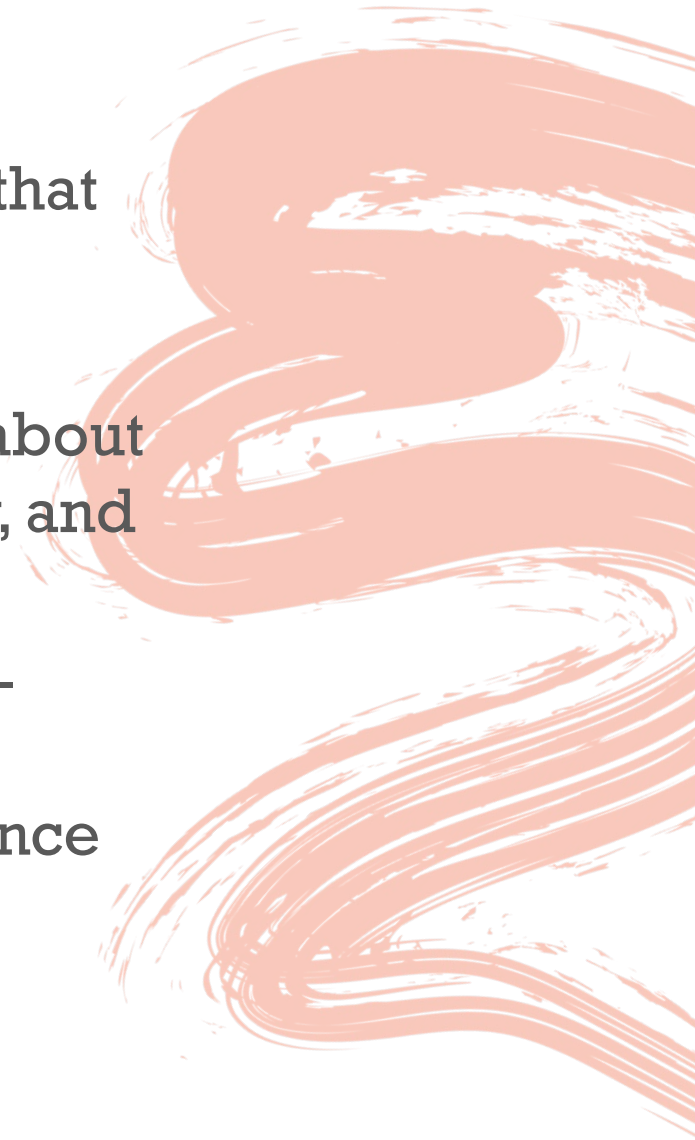


CDC DEFINITIONS

- **Misinformation** is false information shared by people who do not intend to mislead others
 - information proven inaccurate, false, or misleading, or anecdotal evidence
- **Disinformation** is false information deliberately created and disseminated with *malicious intent*
- The difference is in the INTENT!!

INFODEMIC

- Infodemic
 - an excessive amount of information about a problem that is typically unreliable, spreads rapidly, and makes a solution more difficult to achieve
 - WHO defines as an excessive amount of information about a problem that is typically unreliable, spreads rapidly, and makes a solution more difficult to achieve
 - *massive infodemic*: an overabundance of information – some accurate and some not – that makes it hard for people to find trustworthy sources and reliable guidance when they need it

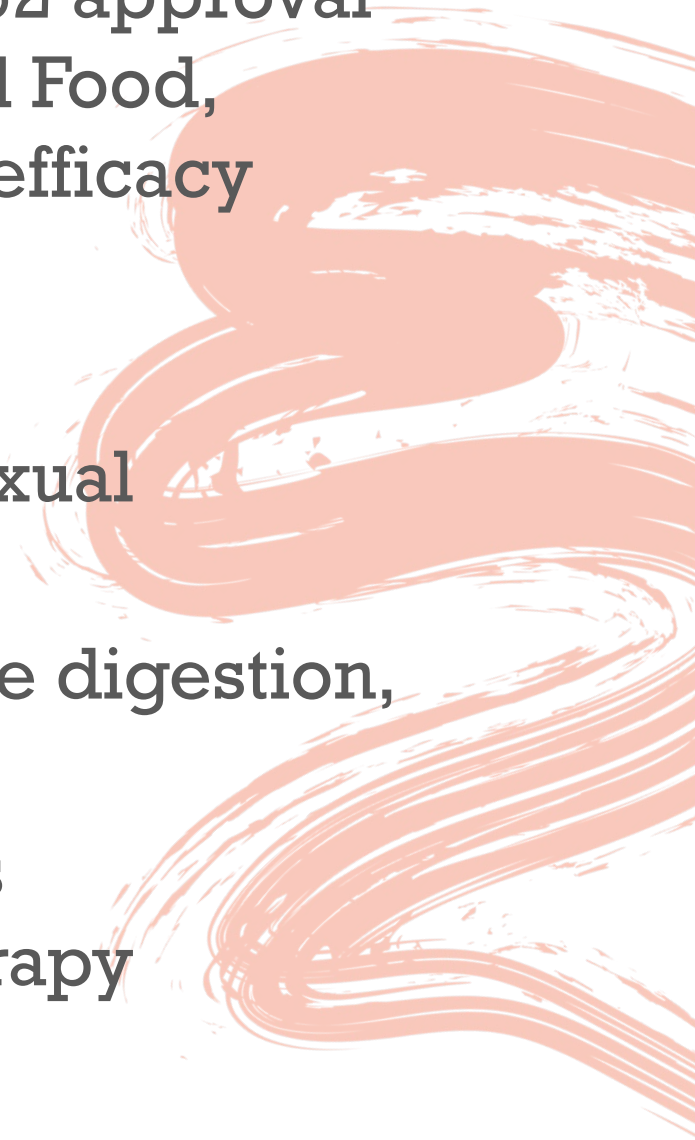


Infodemic Example, March 2020

361,000,000 videos were uploaded on YouTube in the last 30 days under the “COVID-19” and “COVID 19” classification, and about **19,200 articles** have been published in Google Scholar since the pandemic started. In the month of March, around **550 million tweets** included the terms **coronavirus, corona virus, covid19, covid-19, covid_19, or pandemic.**

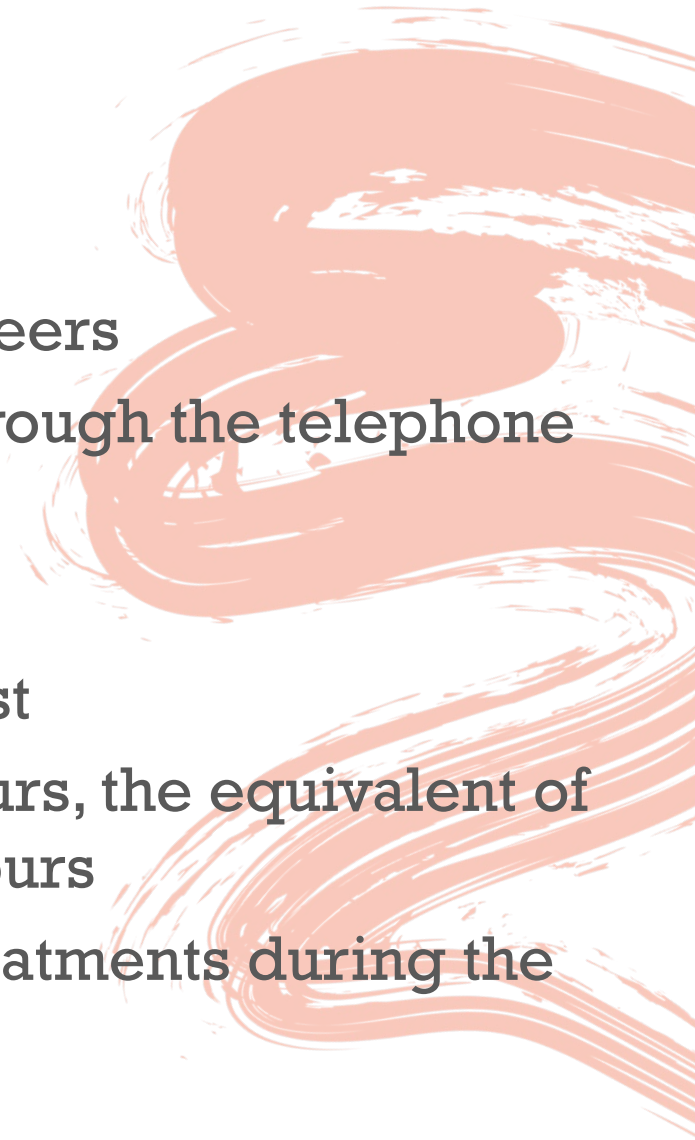
HISTORICAL PERSPECTIVE

- Impact of medical misinformation prior to the 1962 approval of the Kefauver–Harris Amendment to the Federal Food, Drug, and Cosmetic Act, which required proof of efficacy and safety of medications
- Medicated cigarettes for the treatment of asthma
- Radium water for the relief of aches/pains and sexual invigoration
- Radon water to enhance kidney function, stimulate digestion, and treat rheumatic disease
- Disfigurement and death were among the serious consequences observed from such unproven therapy



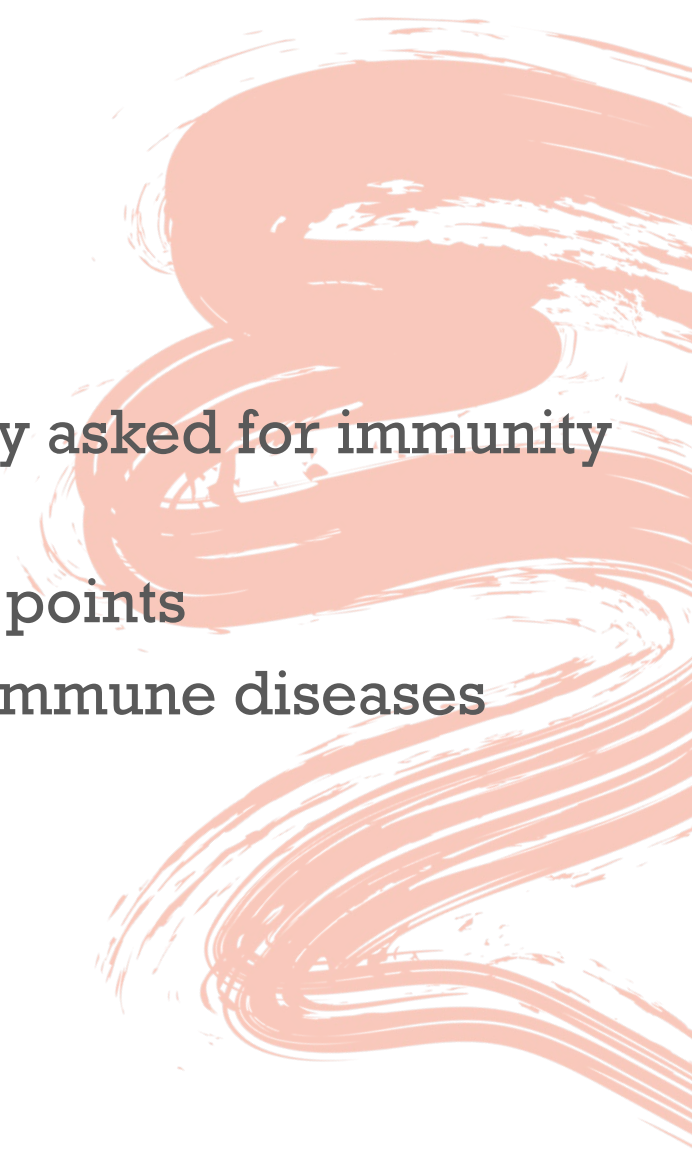
HISTORICAL PERSPECTIVE—LESSONS LEARNED?

- 1918 Influenza Outbreak
 - “Spanish flu”
 - Control and censorship of the media
 - Lack of coordination with health departments and volunteers
 - Newspapers reported the Spanish flu was transmitted through the telephone
 - Spread by poisonous vapors
 - Newspapers reported just the seasonal flu
 - Reports in cities but not in rural areas, especially Midwest
 - Use of aspirin dosing of 1,000 milligrams every three hours, the equivalent of almost 25 standard 325-milligram aspirin tablets in 24 hours
 - Quinine was used as one of the unscientifically based treatments during the 1918 influenza pandemic



HISTORICAL PERSPECTIVE—LESSONS LEARNED?

- 2009 H1N1 Influenza
 - “Swine flu”
 - Swine flu vaccine is 100x more dangerous than swine flu
 - Influenza was more dangerous than the swine flu
 - Manufacturers wanted to rush the vaccine process so they asked for immunity from lawsuits
 - Thiomersal is horribly dangerous and lowers your IQ by 10 points
 - Squalene present in H1N1 influenza vaccine causes autoimmune diseases

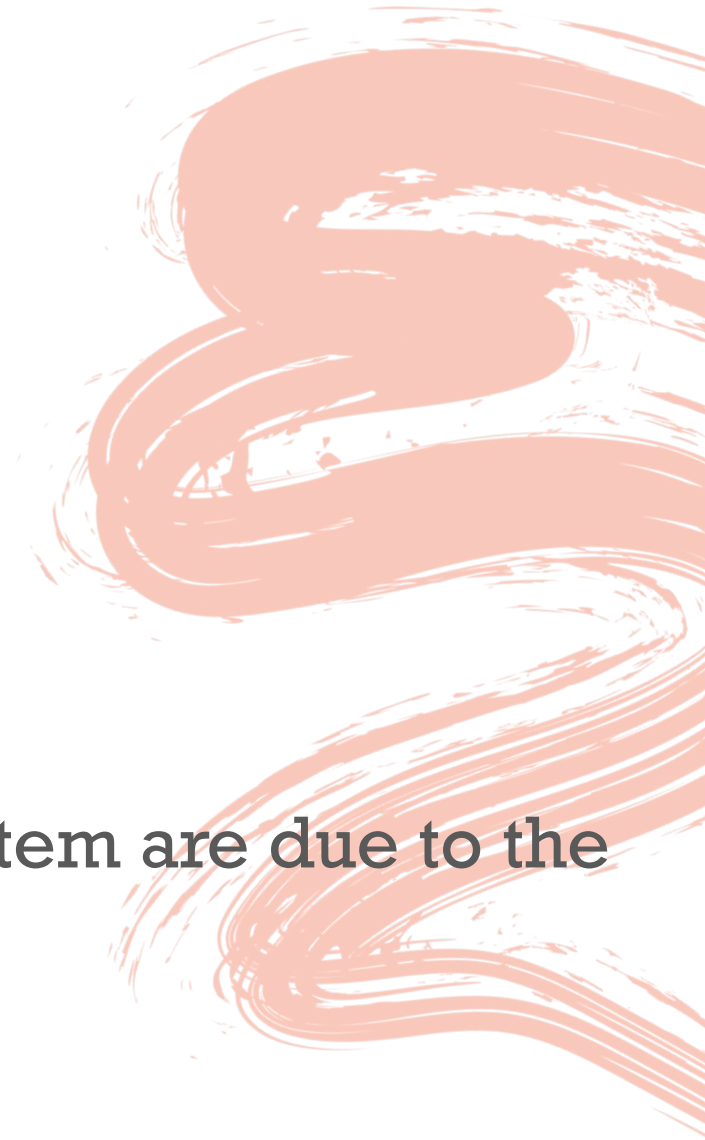


COVID-19 MISINFORMATION

- Quercetin, essential oils and other supplements can protect you from the coronavirus or treat COVID-19
- Herd immunity will end the coronavirus pandemic, so vaccinations are not necessary
- Ivermectin cures or prevents COVID-19
- Warm water or saline will protect you from getting sick if you're exposed to the coronavirus
- You can protect yourself from COVID-19 by injecting, swallowing, bathing in or rubbing onto your body bleach, disinfectants or rubbing alcohols
- Getting COVID-19 will protect you from future infections and is better than the vaccines

COVID-19 VACCINE MISINFORMATION

- Developed too fast
- Did not compare to a placebo in clinical trials
- Makes you magnetic
- Puts a microchip in you
- Is a live virus so it gives you COVID-19
- Infertility for both men and women
- Ingredients in vaccine are not safe
- All adverse reactions reported to the VAERS system are due to the vaccine
- Vaccine will alter your DNA



VACCINE HESITANCY

- Vaccine hesitancy is a delay in acceptance, or refusal of vaccines despite the availability of vaccine services. The term covers outright refusals to vaccinate, delaying vaccines, accepting vaccines but remaining uncertain about their use, or using certain vaccines but not others

CDC Survey data

- Strongly hesitant: includes only survey responses indicating that they would “definitely not” receive a COVID-19 vaccine when available
- Hesitant: includes survey responses indicating that they would “probably not” or “definitely not” receive a COVID-19 vaccine when available
- Hesitant or unsure: includes survey responses indicating that they would “probably not” or “unsure” or “definitely not” receive a COVID-19 vaccine when available

HARMS OF MISINFORMATION

- Unapproved and potentially harmful therapies
 - Ivermectin
 - Surgisphere database release on benefit of ivermectin, then discredited
 - 5-fold increase in calls to Poison Control Centers (vet formulation)
 - Hydroxychloroquine
 - Risk of cardiovascular adverse effects, including QT prolongation
 - Colloidal silver
- Inability for those who need therapy to receive it
 - Peace Corps and malaria prophylaxis
 - Rheumatoid arthritis, lupus, and other autoimmune disease treatment

MECHANISMS/SPREAD

- Social Media—negative content more likely shared than positive or neutral—direct goal oriented searching results in more positive results than clicking on shared media
 - Twitter
 - Facebook—more information on vaccines and autism
 - WhatsApp—international platform owned by Meta
 - YouTube
 - Blogs
- Internet
 - Key player in spread of information
 - Search algorithms focus on popularity/highest hits



MECHANISMS/SPREAD

Social Media

- Social media posts tend to be more personal, negative, or opinionated
- Tend to use language that invokes fear or anxiety
- Leads to mistrust
- An individual's information literacy may play a role in spreading misinformation
- Those with higher level of scientific literacy are less likely to share misinformation
- Use of bots (social robots) has been responsible for spread

MECHANISMS/SPREAD

Sources available to evaluate credibility

- California State University at Chico designed CRAAP
 - Currency, relevancy, authority, accuracy, purpose
- Other debunking sites
 - Reuters Fact Check (www.reuters.com/fact-check)
 - Annenberg Public Policy Center at University of Pennsylvania (www.factcheck.org)

MECHANISMS/SPREAD

Preprint Publications

- Available digitally
- Various preprint platforms
 - BioRxiv
 - Research Square
 - MedRxiv
- 10-fold increase in publications between 2015-2018
- COVID-19 gave a further increase
- Within 4 months, over 16,000 COVID articles with about 6,000 being preprint
- Concerns with peer-review process
 - Retractions may not help in misinformation spread



DIRTY DOZEN

- Researchers have found just 12 people are responsible for the bulk of the misleading claims and outright lies about COVID-19 vaccines that proliferate on Facebook, Instagram and Twitter
- ‘Disinformation Dozen’ produce 65% of the shares of anti-vaccine misinformation on social media platforms
- Many of the messages about the COVID-19 vaccines being widely spread online mirror what's been said in the past about other vaccines
- Many of the 12, have been spreading scientifically disproven medical claims and conspiracies for years
- One of the most prominent is Robert F. Kennedy, Jr. and his foundation Children’s Health Defense
- Anti-vaxx views have brought in over ½ million dollars to his charities

IMPACT ON RURAL HEALTH

- Lower health literacy in rural areas as well as social vulnerabilities
- Less access to health care resources
- Higher COVID-19 Impact Score in rural
- Rural areas average age is older, more pre-existing conditions
- May have had better access to ivermectin (vet use)
- Michigan study showed rural population relied more on local TV stations (58%) for news with younger population less likely to be able to discern misinformation
 - Elderly more informed and more likely to follow public health guidelines
 - Recommendation to use local TV and target younger age groups
 - Use community resources targeting younger age

IMPACT ON RURAL HEALTH

- Digital divide, lack of Internet resources
- More likely to share misinformation over social media
- KFF report
 - Half (50%) say the threat COVID-19 poses has been “generally exaggerated” in the news, a belief held by fewer urban (27%) and suburban (37%)
 - Most rural residents (62%) view getting vaccinated as mostly a personal choice rather than part of everyone’s responsibility to protect the health of others (36%)
 - Most urban residents (55%) and nearly half of suburban residents (47%) view getting vaccinated as part of everyone’s responsibility
- CDC survey 6/30/2022
 - Survey of parents, 4 of 10 parents in rural communities said their pediatricians – who in general are the most trusted health provider– did not recommend COVID vaccines, far more than 1 out of 10 in urban communities

- Excess of information
- Unreliable sources
- Disconnection between science and politics

Misinformation



C
O
V
I
D

Wellbeing



- Stress
- Depression
- Anxiety
- Low immune system
- Socio-economic hardship

THE FORGOTTEN PRIORITIES OF THE PANDEMIC

1
9

- Indigenous
- Low socioeconomic status
- Homeless
- Prison
- Living with disabilities

Vulnerable groups



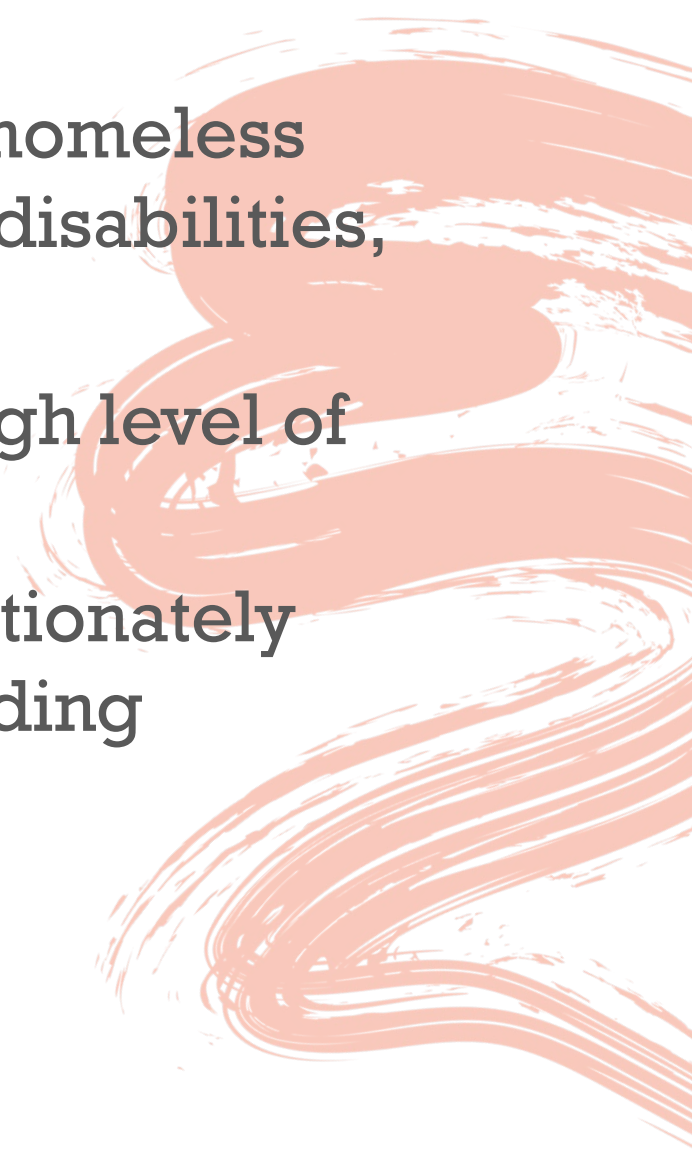
Preventive measures



- Quarantine/isolation
- Spatial distancing
- Community action

IMPACT ON VULNERABLE POPULATIONS

- Vulnerable groups are indigenous, prison and homeless populations; migrants, the elderly, people with disabilities, pregnancy, LGBTQ+, and healthcare workers
- Vulnerable groups include those who have a high level of mistrust in medical system
- Vulnerable groups are experiencing disproportionately negative outcomes from the infodemic surrounding COVID-19



SOLUTIONS: WHO

- Proactively engage with patients and the public on health misinformation
- Use technology and media platforms to share accurate health information with the public
- Partner with community groups and other local organizations to prevent and address health misinformation
- Train journalists, editors, and others to recognize, correct, and avoid amplifying misinformation
- Proactively address the public's questions
- Carefully review information in preprints



SOLUTIONS: WHO

- Use a broader range of credible sources— particularly local sources
- Consider headlines and images that inform rather than shock or provoke
- Assess the benefits and harms of products and platforms and take responsibility for addressing the harms
- Give researchers access to useful data to properly analyze the spread and impact of misinformation
- Strengthen the monitoring of misinformation
- Prioritize protecting health professionals, journalists, and others from online harassment

SOLUTIONS: WHO

- Continue to modernize public health communications
- Expand efforts to build long-term resilience to misinformation
- Increase investment in research on misinformation



SOLUTIONS-CDC RECOMMENDATIONS

Monitoring Misinformation through Social Media Listening

- Identify your jurisdiction's existing information sources
- Create and maintain a social media influencer list
- Create and maintain a rumor log
- Set up a social and traditional media monitoring system
- Analyze and develop insights



CDC RECOMMENDATIONS: VACCINE HESITANCY

- Listen to and analyze misinformation circulating
- Engage with and listen to your community
- Share accurate, clear, and easy-to-find information
- Use trusted messengers



CDC RECOMMENDATIONS: MISINFORMATION

- **FACT**
 - Lead with fact
 - Clear, relevant, memorable
- **WARNING**
 - Misleading tactics
 - Misleading information
- **FALLACY**
 - Unintentional
 - Intentional
- **FACT**
 - Correct, replace, improve the narrative



ONU HEALTHWISE EFFORTS

- Strong reputation in community/county prior to pandemic
 - Name recognition after establishing in 2010
 - Mobile Clinic, Drug and Health Information Center, Outreach Services key components to community relations
 - Employee and student wellness events
 - Engaged partnerships
 - National, state, and local recognition for innovative services, public relations, and community transformation
 - Good relationship with health department
 - Other vaccine clinics



ONU HEALTHWISE EFFORTS

- Name one of the state's mass vaccination clinics by Governor DeWine
- Worked directly with Ohio Department of Health as a vaccine provider
- Included updated information for community especially as age groups qualified including pediatrics
- Lots of miles, vaccines, and visibility
- Media coverage
- State employee efforts to improve vaccination rates

ONU HEALTHWISE EFFORTS

Drug and Health Information Center pharmacists and interns

- Speaking at various venues
- Outreach events to community
- Personal meetings upon request
- Participated in training other pharmacists and pharmacy technicians throughout the country prior to COVID-19 vaccine release in December 2020
- Recognized as COVID-19 vaccine experts by other healthcare professionals



ONU HEALTHWISE EFFORTS

Drug and Health Information Center pharmacists and interns

- Speaking at regional and state meetings that were not health care related by other professions
- Newspaper articles on OTC therapies started in September 2019
 - Newspaper editors asked for COVID-19 articles after start of pandemic
 - Continues today with a mix of information with large percentage still focused on COVID-19
- Newsletter articles produced by ONU student pharmacists and edited by DHIC pharmacists

QUESTIONS?



REFERENCES

- Abbasi J. Widespread Misinformation About Infertility Continues to Create COVID-19 Vaccine Hesitancy. *JAMA*. 2022;327(11):1013–1015. doi:10.1001/jama.2022.2404)
- Reschini M, Pagliardini L, Boeri L, et al. COVID-19 Vaccination Does Not Affect Reproductive Health Parameters in Men. *Front Public Health*. 2022;10:839967. Published 2022 Feb 2. doi:10.3389/fpubh.2022.839967
- Confronting Health Misinformation, HHS, <https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf>
- How to Address COVID-19 Vaccine Misinformation. <https://www.cdc.gov/vaccines/covid-19/health-departments/addressing-vaccine-misinformation.html>
- Special Report: The ex-Pfizer scientist who became an anti-vax hero. <https://www.reuters.com/article/us-health-coronavirus-vaccines-skeptic-s/special-report-the-ex-pfizer-scientist-who-became-an-anti-vax-hero-idUSKBN2BA179>
- Bazotte RB, Hirabara SM, Serdan TAD, et al. 4-Aminoquinoline compounds from the Spanish flu to COVID-19. *Biomed Pharmacother*. 2021;135:111138. doi:10.1016/j.biopha.2020.111138
- Karen M. Starko, Salicylates and Pandemic Influenza Mortality, 1918–1919 Pharmacology, Pathology, and Historic Evidence, *Clinical Infectious Diseases*, Volume 49, Issue 9, 15 November 2009, Pages 1405–1410, <https://doi.org/10.1086/606060>
- King M. Internet Misinformation and H1N1 Pandemic Influenza Vaccine. *Australian Pharmacist*. 200;28(12):1078–1079.
- Wang V, Liu S E, Fuller R, et al. (January 29, 2022) Discerning Fact From Fiction: An Assessment of Coronavirus-19 Misinformation Among Patients in Rural Michigan. *Cureus* 14(1): e21710. doi:10.7759/cureus.21710
- Analysis: Rural Residents Stand Out as One of the Most Hesitant Groups to Get a COVID-19 Vaccine and Pose Special Challenges for the Mass Vaccination Efforts, <https://www.kff.org/coronavirus-covid-19/press-release/analysis-rural-residents-stand-out-as-one-of-the-most-hesitant-groups-to-get-covid-19-vaccine-and-pose-special-challenges-for-the-mass-vaccination-efforts/>
- Clark-Ginsberg A, Petrun Sayers EL. Communication missteps during COVID-19 hurt those already most at risk. *Journal of Contingencies and Crisis Management*. 2020;28(4):482-484. doi:10.1111/1468-5973.12304

MEDICAL MISINFORMATION AND DISINFORMATION RELATED TO THE COVID- 19 PANDEMIC

KAREN L. KIER, PHD, MS, RPH, BCPS, BCACP, CTTS, FASHP, FCCP

MICHAEL J. RUSH, PHARM.D, MBA, BCACP, CDCES, NCTTP