



## Leveraging the FCSM Data Quality Framework to Better Communicate Data Quality

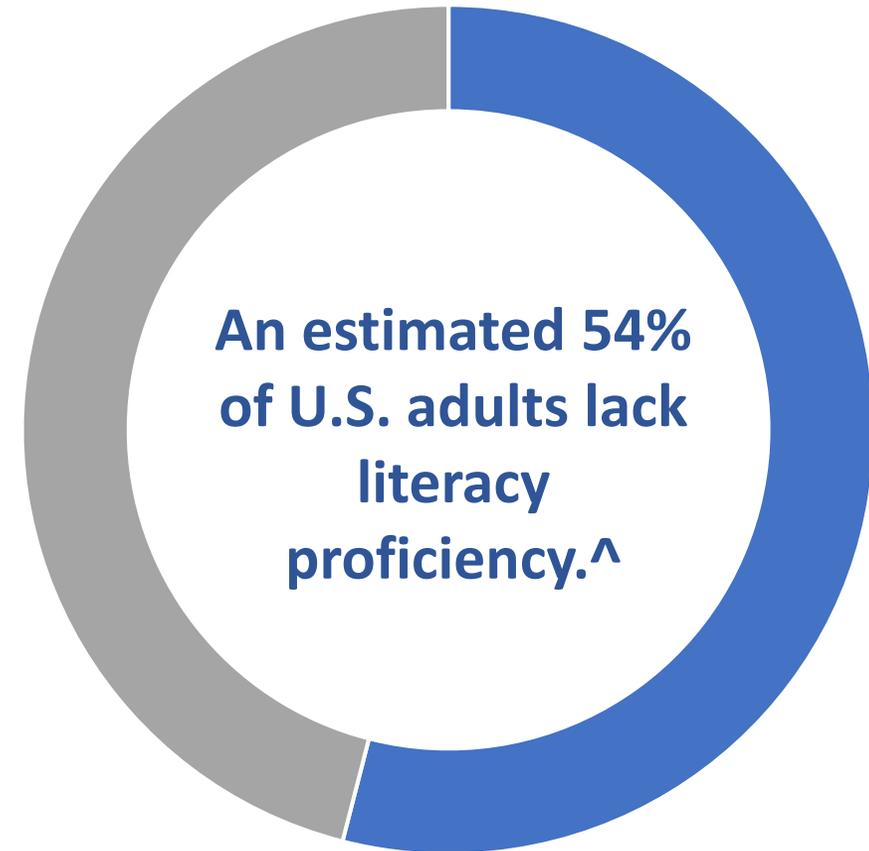
**Kate Lamoreaux (ORISE Fellow, National Center for Health Statistics, Centers for Disease Control and Prevention) – Presenting Author**

**Jennifer Parker (Director, Division of Research and Methodology, National Center for Health Statistics, Centers for Disease Control and Prevention)**

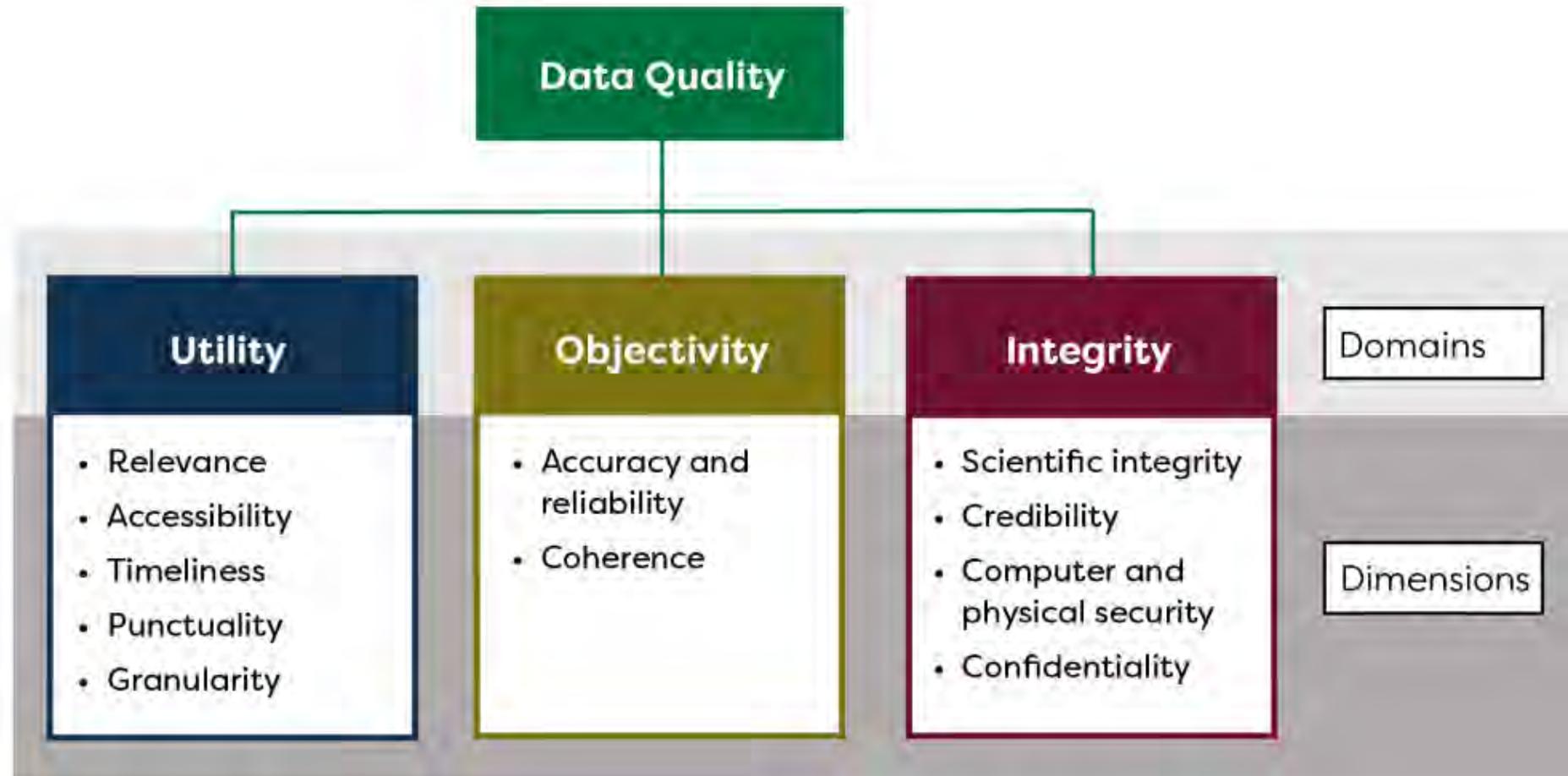
Session H-4: Data Quality: Addressing Disclosure, Deidentification, and the Utility of Publicly Available Data (Thursday, October 26, 2023; 8:30-10:15 AM)

# Why Study Data Quality Communication?

1. NCHS Goal: expand relevance and external engagement
2. Adherence to Federal Plain Language Guidelines (Plain Writing Act of 2010)
3. The Federal Committee on Statistical Methodology (FCSM) launched the **Framework for Data Quality** in 2020

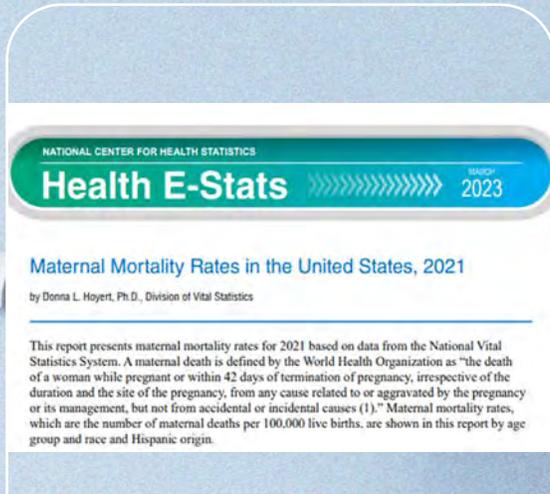


# FCSM Framework for Data Quality



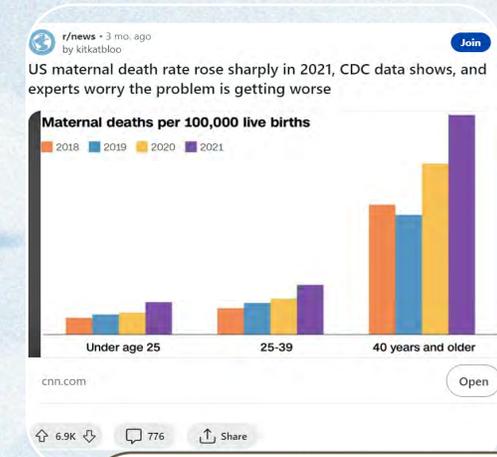
Federal Committee on Statistical Methodology. 2020. *A Framework for Data Quality*. FCSM 20-04, September 2020.

# Hypothesis: Data Quality Communication



**US maternal death rate rose sharply in 2021, CDC data shows, and experts worry the problem is getting worse**

By [Jacqueline Howard](#), CNN  
Updated 6:11 PM EDT, Thu March 16, 2023



## Input

- NCHS Data Releases

## Interpretation

- News outlets
- Academic Publications



## Output: Public Discussion and Opinions

- Tweets, Reddit posts

# Anticipating Noise

## Morbidity and Mortality Weekly Report (MMWR)

Trends  
20  
Estin  
and l

**Peter A. McCullough, MD, MPH™**  
@PMcCulloughMD

BREAKING--In 2021, U.S. worst rates of maternal mortality in history, according to a new report @CDCgov. The report found that 1,205 people died of maternal causes--40% increase from the previous year. Need immediate analysis of #CovidVaccines

**Lindsey Boylan**  
@LindseyBoylan

They're killing us when we don't want children & even when we do.

Before the pandemic, the U.S. had the highest maternal mortality rate of any industrialized nation. These abysmal numbers soared by 40% in 2021.



nytimes.com  
Covid Worsened a Health Crisis Among Pregnant Women  
In 2021, deaths of pregnant women soared by 40 percent in the United States, according to new government figures. Here's how one family coped after the ...

7:59 AM · Mar 16, 2023 · 41.9K Views

227 Retweets 12 Quotes 620 Likes 21 Bookmarks



ts  
ring the pandemic, far  
men are at especially ...



npr.org  
Maternal deaths in the U.S. spiked in 2021, CDC reports  
After years of high rates, the country hit a new high during the pandemic, far exceeding rates in other developed nations. Black women are at especially ...

9:25 AM · Mar 16, 2023 · 1,039 Views

15 Retweets 22 Likes

## Racial Disparities in Pregnancy-Related Deaths — United States,

**missmitten92** · 3 mo. ago

2020 and 2021 in particular were driven in large part by Covid it seems. I had my pandemic baby in early 2021 and there were so many expecting moms in the baby subs who were terrified of getting vaccinated well into 2021. The harm the disinformation campaigns against the vaccines caused is disgusting.

121

**o\_p\_o\_g** · 3 mo. ago

2022? That data wasn't in the article.

Honestly, 2020 wasn't too far off from 2019, and I think the majority of Covid 19 effects manifested in the 2021 data.

2022 data is going to be scary, in my opinion. Like you said, the whole disinformation around vaccines, plus the overturning of Roe... shit is gonna get real.

14

**missmitten92** · 3 mo. ago

Oops, typo, I'll correct it.

3

**peg\_leg\_dan** · 3 mo. ago

Why is race the only demographic they focus on when they present data like this? Tell us what the difference in death rates is between income levels instead.

And don't group everyone under 50k together. Do it in 10k increments up to 100k.

4

## aged 18-49 years ted to CDC - Vaccine

**The Washington Post**  
@washingtonpost

The rate of Americans dying while giving birth — or in the weeks afterward — increased by more than one-third in 2021 compared with a year earlier, with the burden of death disproportionately borne by communities of color, according to a new report.

A photograph of a pregnant woman sitting on the floor, holding a clipboard and a pen. She is wearing a pink top and blue pants.

washingtonpost.com  
U.S. maternal mortality climbs dramatically during pandemic, study finds  
It marked the third consecutive year the nation's maternal mortality rate, long the highest among high-income nations, increased.

1:14 AM · Mar 16, 2023 · 97.6K Views

157 Retweets 21 Quotes 179 Likes 9 Bookmarks

911-917, May 2023. | DOI:

10.1097/AOG.0000000000005182

# Research Questions and Exploratory Study Methods

- **This research aims to understand:**

- How is data quality communicated to NCHS data users, specifically public audiences?
- How does the FCSM data quality framework fit into data quality conversations?

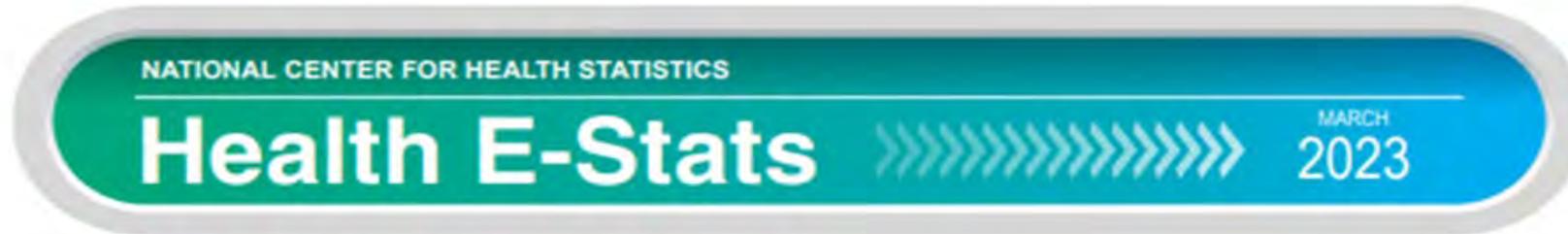
- **By:**

- Identifying methods and practices used for communication of NCHS data quality
- Reviewing language across public-facing sources
- Compiling case studies, or “conversations,” about NCHS data
- Evaluating message clarity using FCSM data quality framework

# Selected conversation



# Case study: 2021 Release of Maternal Mortality Data and Reactions



## Maternal Mortality Rates in the United States, 2021

by Donna L. Hoyert, Ph.D., Division of Vital Statistics

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This report presents maternal mortality rates for 2021 based on data from the National Vital Statistics System. A maternal death is defined by the World Health Organization as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (1).” Maternal mortality rates, which are the number of maternal deaths per 100,000 live births, are shown in this report by age group and race and Hispanic origin.

# Evaluating Data Quality Communication: Input

Utility

Objectivity

Integrity

This report presents maternal mortality rates for 2021 based on data from the National Vital Statistics System. A maternal death is defined by the World Health Organization as “the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes” (1). Maternal mortality rates, which are the number of maternal deaths per 100,000 live births, are shown in this report by age group and race and Hispanic origin.

This report updates a previous one that showed maternal mortality rates for 2018–2020 (2). In 2021, 1,205 women died of maternal causes in the United States compared with 861 in 2020 and 754 in 2019 (2). The maternal mortality rate for 2021 was 32.9 deaths per 100,000 live births, compared with a rate of 23.8 in 2020 and 20.1 in 2019 (Table).

# Interpretations: News Organizations

- **Clarity**
  - FCSM Framework Domains of Data Quality communicated:
    - Utility
    - Objectivity
    - Integrity
  - Findings and arguments contextualized

In 2021, the U.S. had one of the worst rates of maternal mortality in the country's history, according to a [new report](#) from the Centers for Disease Control and Prevention. The report found that 1,205 people died of maternal causes in the U.S. in 2021. That represents a 40% increase from the previous year.

These are deaths that take place during pregnancy or within 42 days following delivery, according to the [World Health Organization](#).

According to [data from the World Health Organization](#), the maternal mortality rate in high-income nations overall was 12 per 100,000 live births in 2020, while in low-income countries it was 430 per 100,000.

International comparisons of maternal deaths are difficult because of differences in methodology in tracking the data, warns the author of the new U.S. report, Donna Hoyert, a health scientist at the National Center for Health Statistics, at the CDC. But, she notes, the U.S. is "usually not faring all that well" on maternal mortality.

# Interpretations: News Organizations

- **Introducing noise**
  - Headline tells a different narrative than NCHS report alone
  - Later, not contextualizing or citing new information when bringing it in dialogue with prior information

**The New York Times**

## ***Covid Worsened a Health Crisis Among Pregnant Women***

In 2021, deaths of pregnant women soared by 40 percent in the United States, according to new government figures. Here's how one family coped after the virus threatened a pregnant mother.

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Even before the pandemic, the United States had the **highest maternal mortality rate of any industrialized nation**. The coronavirus worsened an already dire situation, pushing the rate to 32.9 per 100,000 births in 2021 from 20.1 per 100,000 live births in 2019.

Text sourced from NCHS input source in **blue**, from external sources in **yellow**

# Output:

## Twitter Reactions

- **Maternal Mortality was a top trending topic on Twitter**
- **Tweets' short format:**
  - Outside reports and other topics fused together without context
  - Domains of data quality communicated to a lesser extent with different language: “study finds”, “new report”, “during pandemic”



The Washington Post   
@washingtonpost



The rate of Americans dying while giving birth — or in the weeks afterward — increased by more than one-third in 2021 compared with a year earlier, with the burden of death disproportionately borne by communities of color, according to a new report.



washingtonpost.com

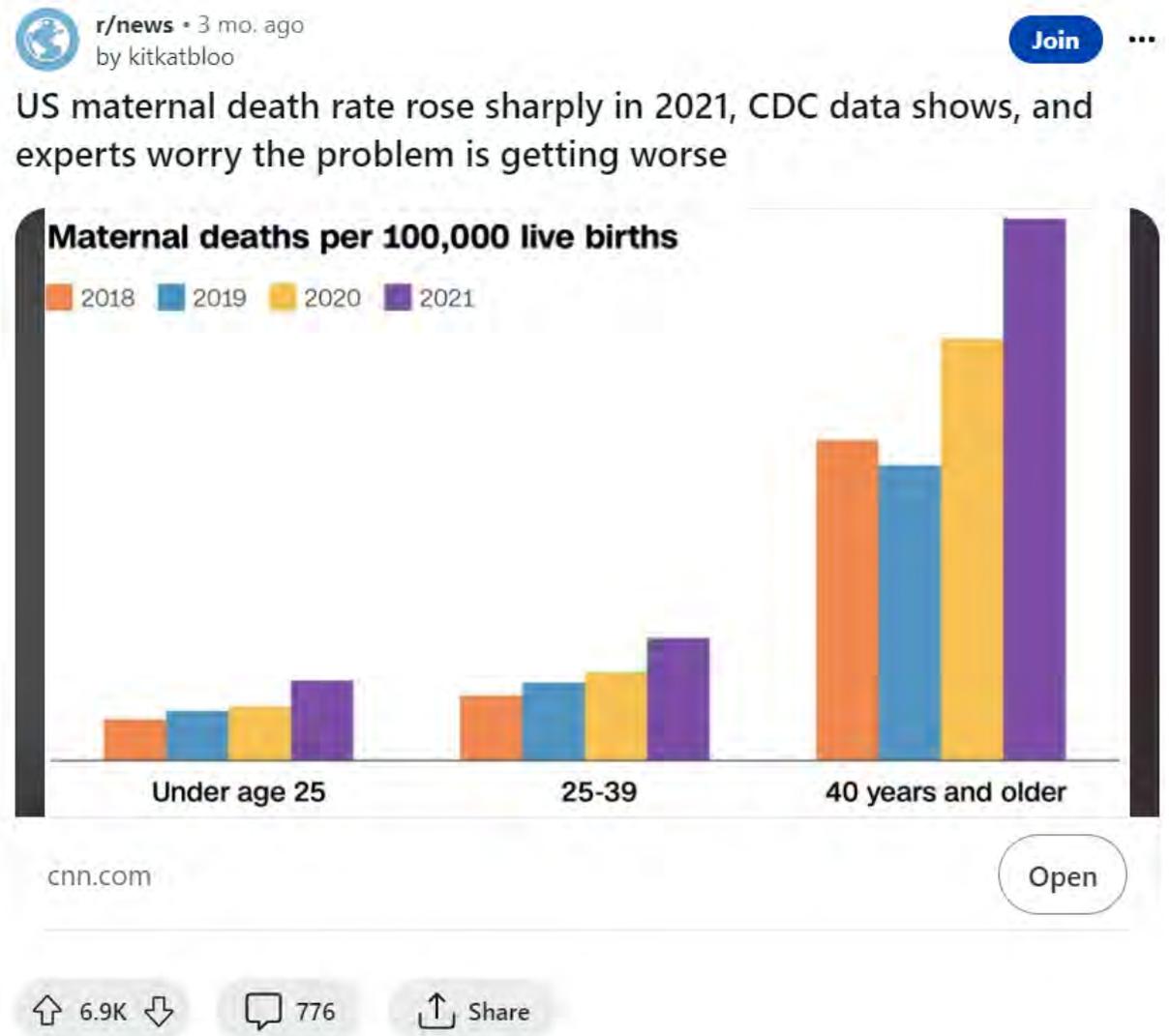
U.S. maternal mortality climbs dramatically during pandemic, study finds  
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# Output: Reddit Reactions

- **High visibility:** many posts, thousands of upvotes, and hundreds of comments
- **Like Twitter:** posts as direct reactions to news interpretations, fuses topics together without context
- **Unlike Twitter:** Comment threads enabled the domains of data quality and context to be discussed in depth



# Summary

- FCSM Framework domains and dimensions of data quality are **evident across different stages of communication but can become distorted as data quality conversations go on.**
- While the source of communication was an ideal communication input through the lens of the FCSM data quality framework, **many reactions ignored statements of nuance and failed to contextualize findings.**

# Findings and Future Directions



# Preliminary Findings

- **The domains and dimensions of the FCSM Data Quality framework can be used evaluate data quality communication.**
- Clear communication of data quality cannot prevent all noise introduced through interpretations and reactions
- Data quality communication can become noisy when:
  - Information isn't contextualized
  - Language differences exist between the input and output levels

# Future Directions

- This selected example is a case study. Further research would need to be conducted to gauge whether this case study represents a systemic problem.
- Scaling up quantitatively using Natural Language Processing (NLP) text annotation machine learning methods to measure:
  - Communication of data quality domains and dimensions
  - Contextualization of information

# Thank you!

- Contact: [clamor@umd.edu](mailto:clamor@umd.edu)

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

## Referenced Links 1/2

1. [FCSM-20-04 A Framework for Data Quality](#)
2. [Microsoft Word - BBFoundation GainsFromEradicatingIlliteracy 9 8.docx \(barbarabush.org\)](#)
3. [PIAAC - What PIAAC Measures \(ed.gov\)](#)
4. [Maternal Mortality Rates in the United States, 2021 \(cdc.gov\)](#)
5. [Covid Worsened a Maternal Mortality Crisis in the U.S. - The New York Times \(nytimes.com\)](#)
6. [Maternal mortality rose during the pandemic, hitting Black women especially hard : Shots - Health News : NPR](#)
7. [GAO-23-105871, Accessible Version, MATERNAL HEALTH: Outcomes Worsened and Disparities Persisted During the Pandemic](#)
8. [US maternal death rate rose for another year, CDC data shows | CNN](#)

## Referenced Links 2/2

9. [The Washington Post on Twitter: "The rate of Americans dying while giving birth — or in the weeks afterward — increased by more than one-third in 2021 compared with a year earlier, with the burden of death disproportionately borne by communities of color, according to a new report. https://t.co/t86Xli5yUJ" / Twitter](https://t.co/t86Xli5yUJ)
10. [US maternal death rate rose sharply in 2021, CDC data shows, and experts worry the problem is getting worse : r/news \(reddit.com\)](https://www.reddit.com/r/news/)