

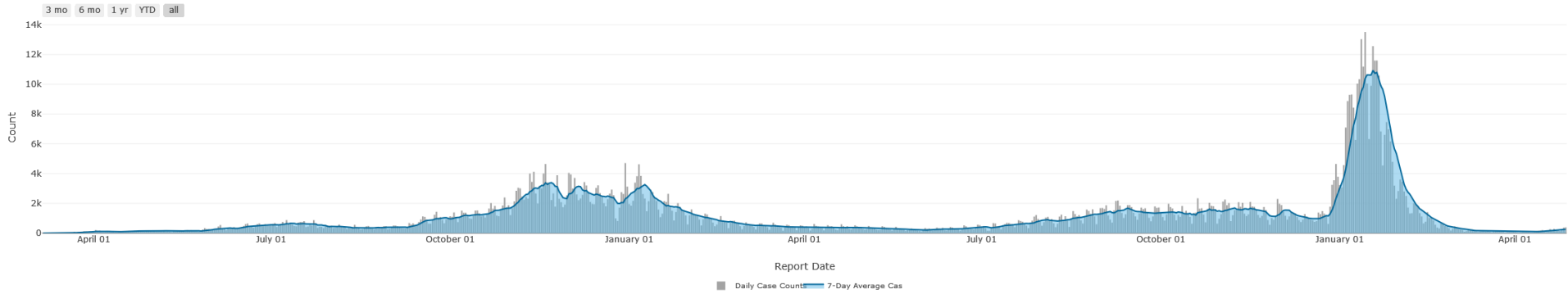
# Side Effects of COVID-19

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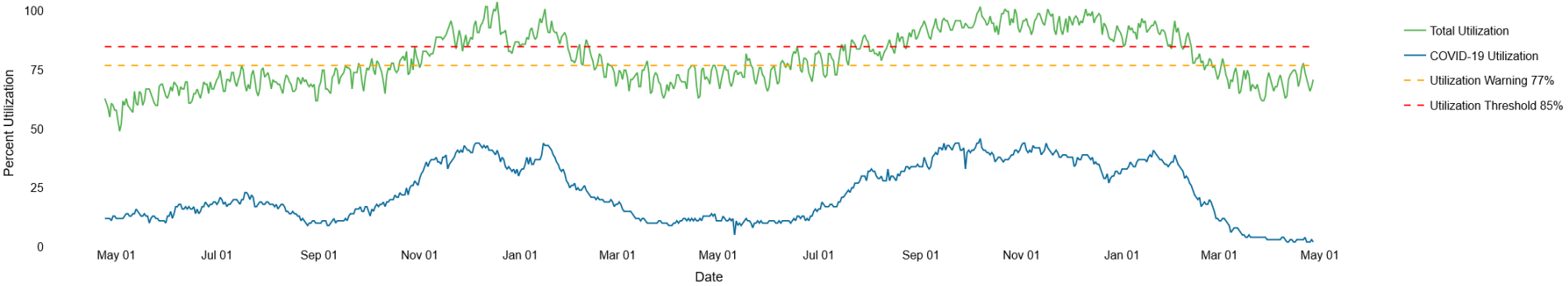
Impact on the rest of health

Leisha Nolen, MD PhD  
Utah State Epidemiologist

# Stressed Population



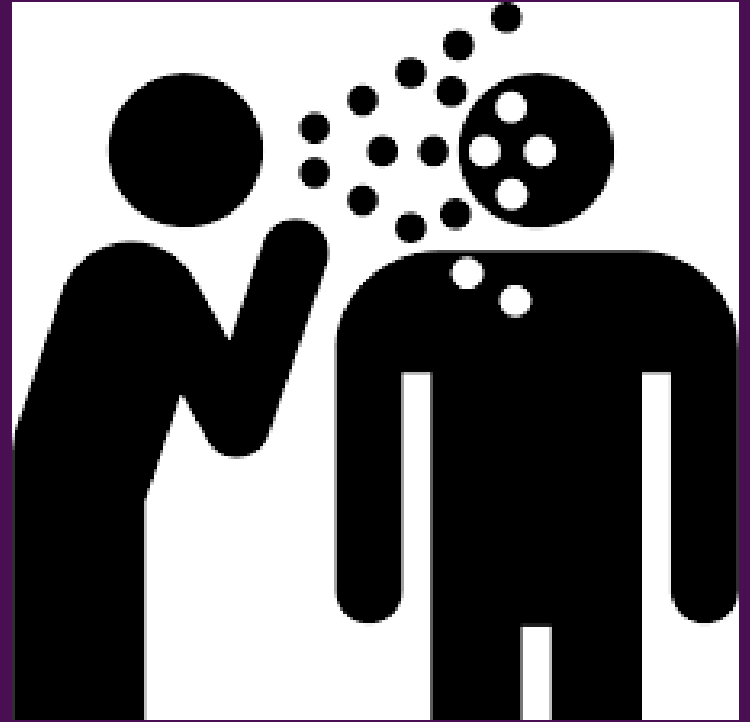
# Stressed Hospital System



# Impacts Beyond COVID-19

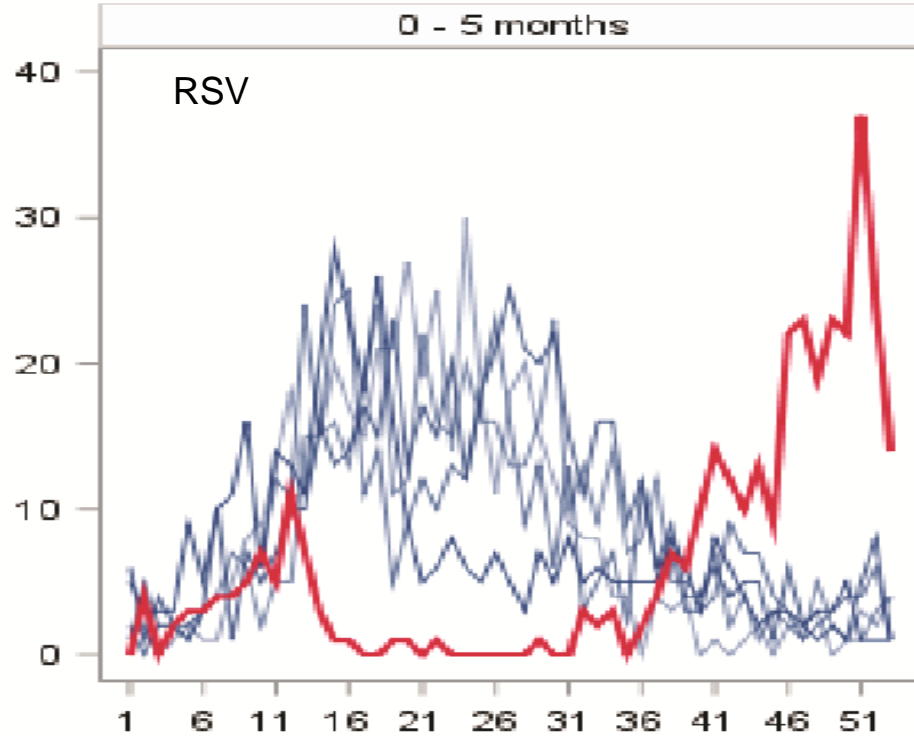
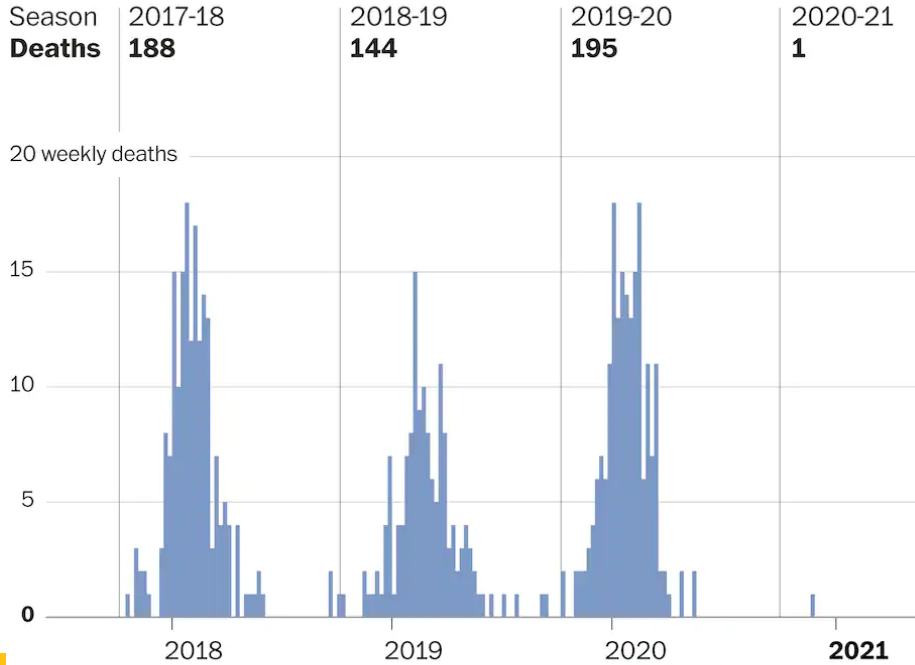
- Other infectious diseases
- Vaccination
- Suicide
- Cancer screening
- Hospital acquired infections

# Infectious Diseases



# Trends in respiratory illnesses

Pediatric flu deaths have plummeted during pandemic

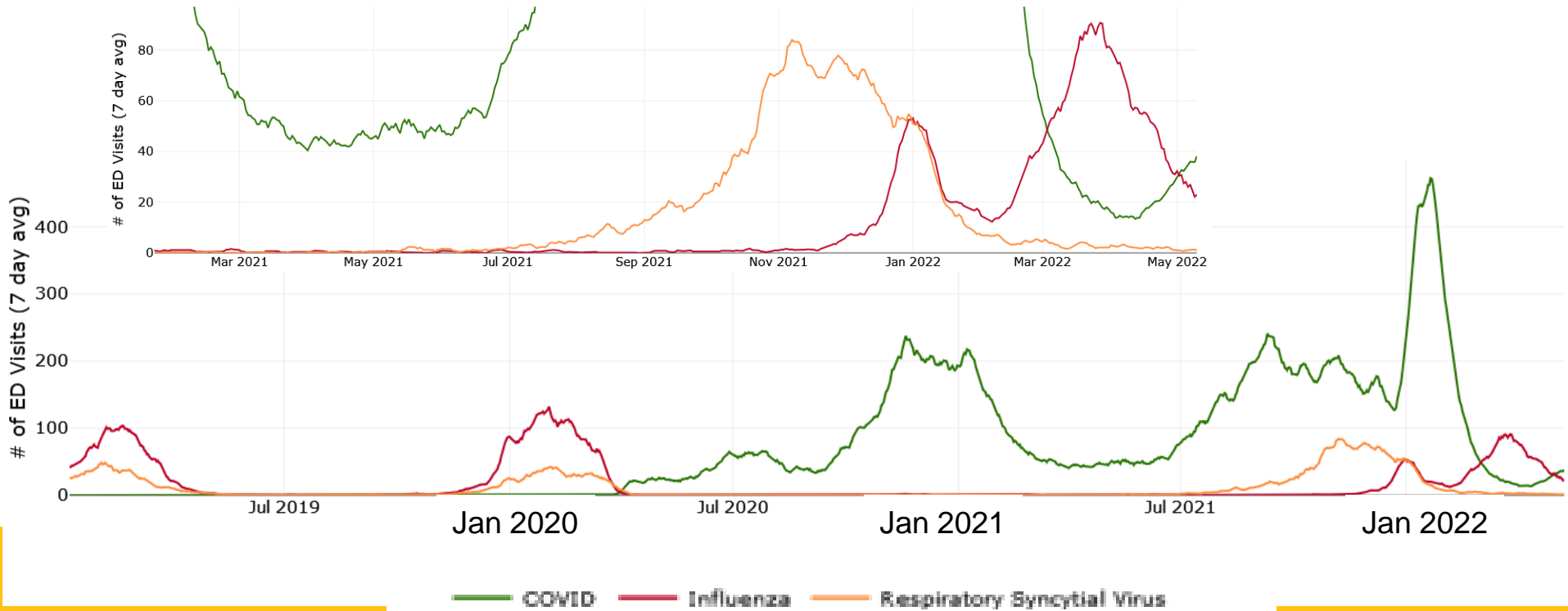


Source: Centers for Disease Control and Prevention

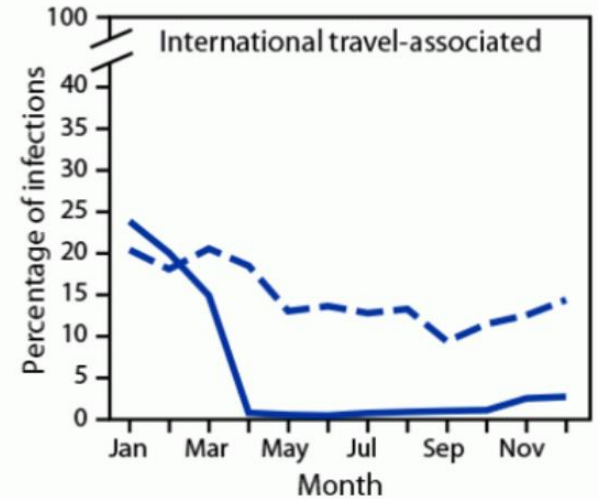
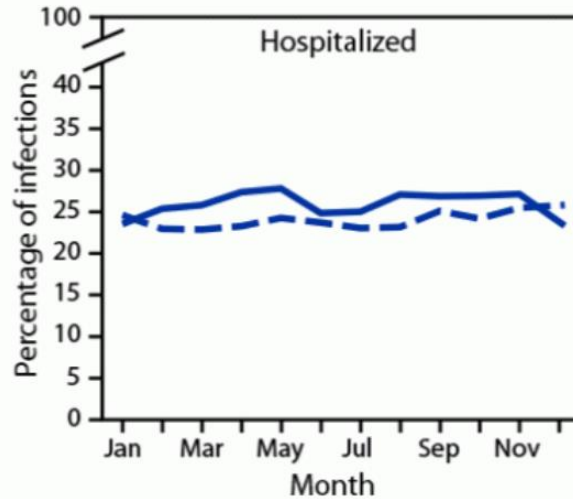
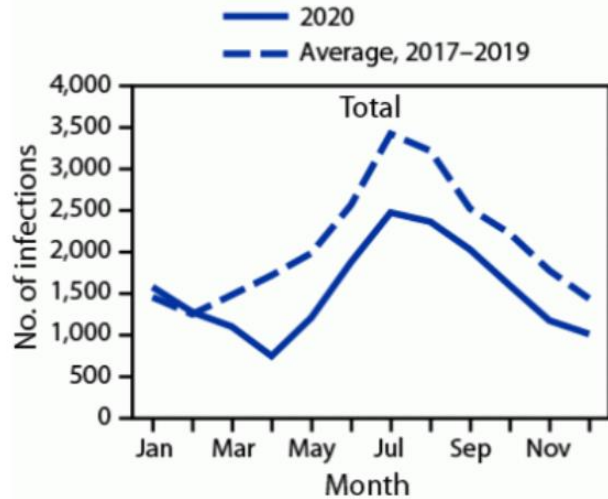
ARTUR GALOCHA / THE WASHINGTON POST

**RSV Epidemiology in Australia Before and During COVID-19 | Pediatrics | American Academy of Pediatrics (aap.org)**

# Respiratory viruses in Utah

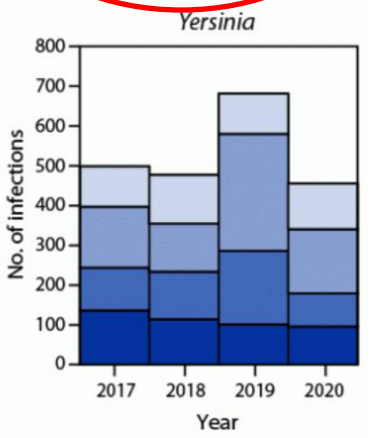
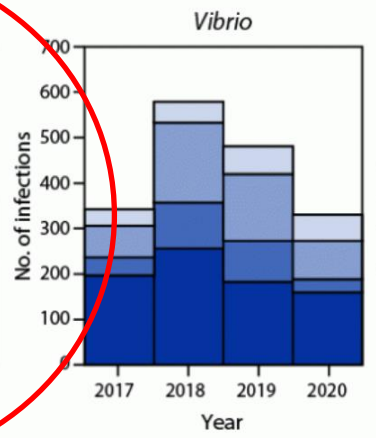
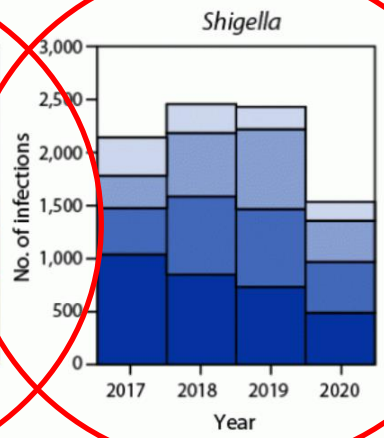
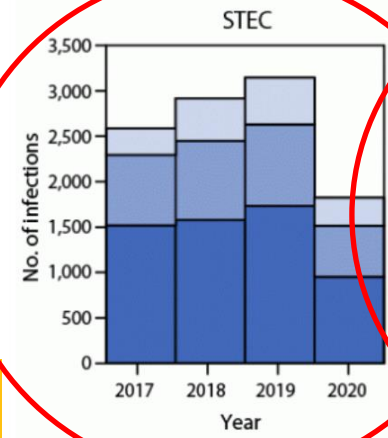
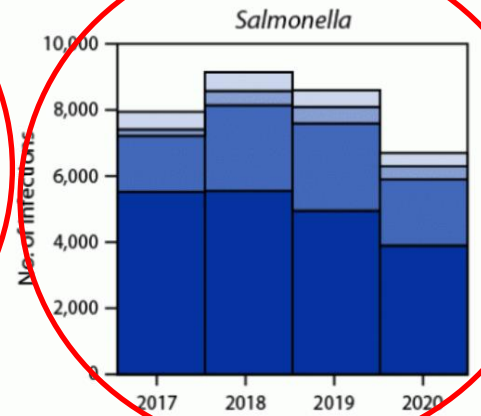
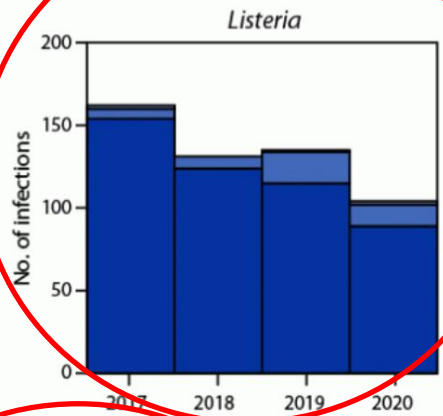
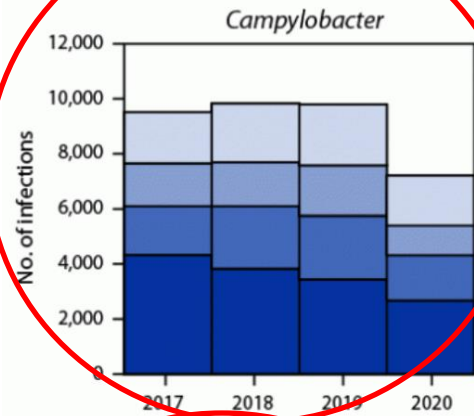


# Foodborne illnesses



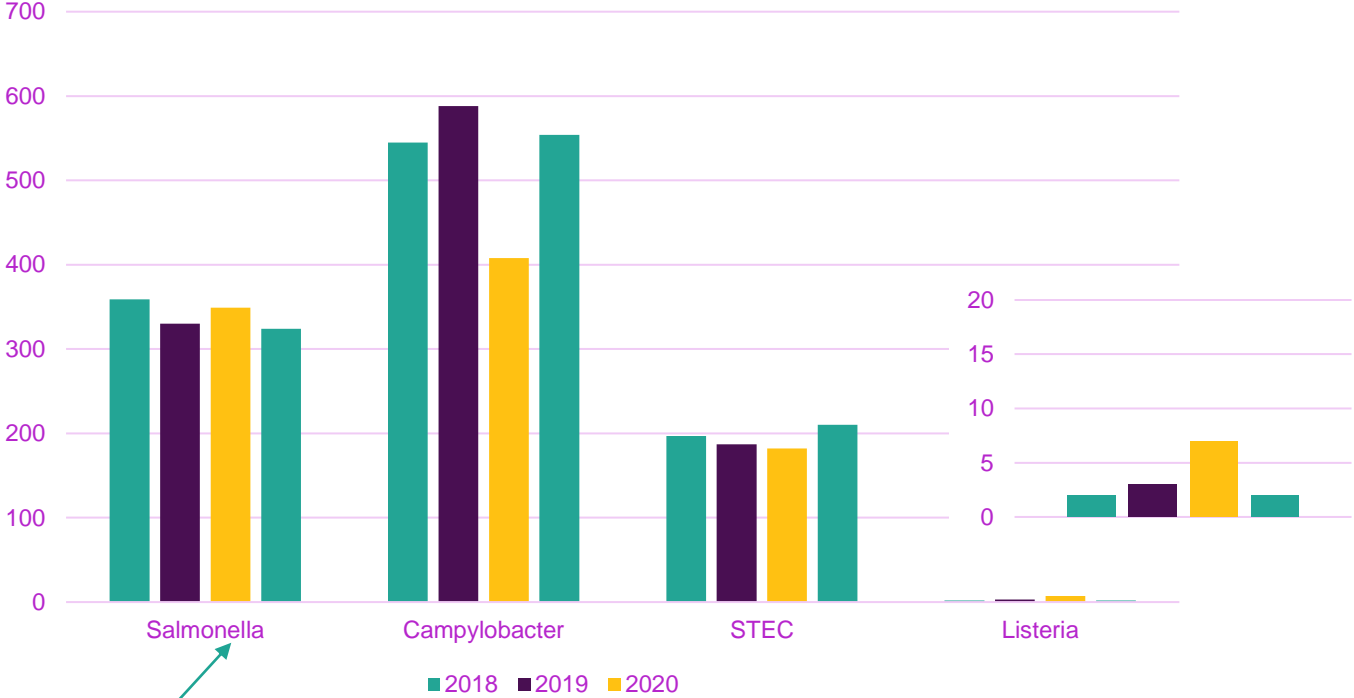
**Decreased Incidence of Infections Caused by Pathogens Transmitted Commonly Through Food During the COVID-19 Pandemic — Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2017-2020 | MMWR (cdc.gov)**





■ Culture-positive only   
 ■ CIDT-positive, culture-positive   
 ■ CIDT-positive, culture-negative   
 ■ CIDT-positive, culture not done

# Foodborne illnesses in Utah



Lettuce Outbreak

# Infectious Diseases

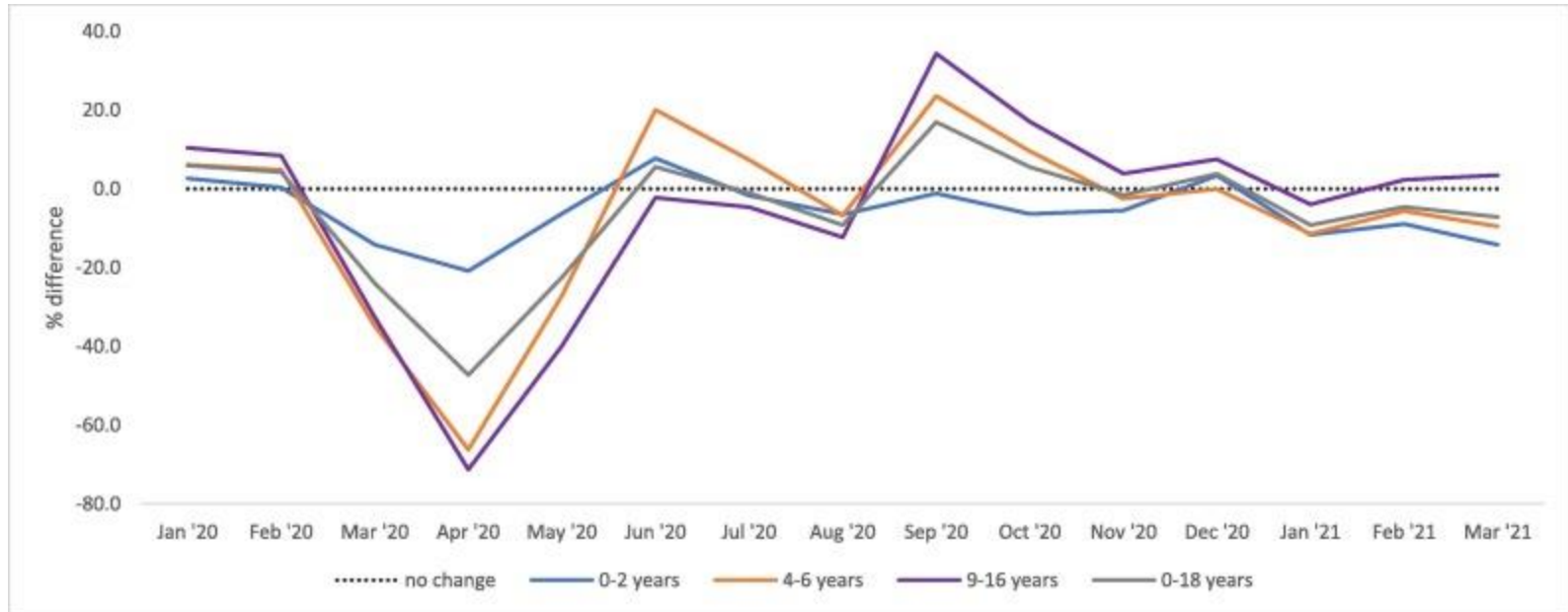
Decreased respiratory illnesses  
Mixed effect on foodborne illness

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# Vaccines



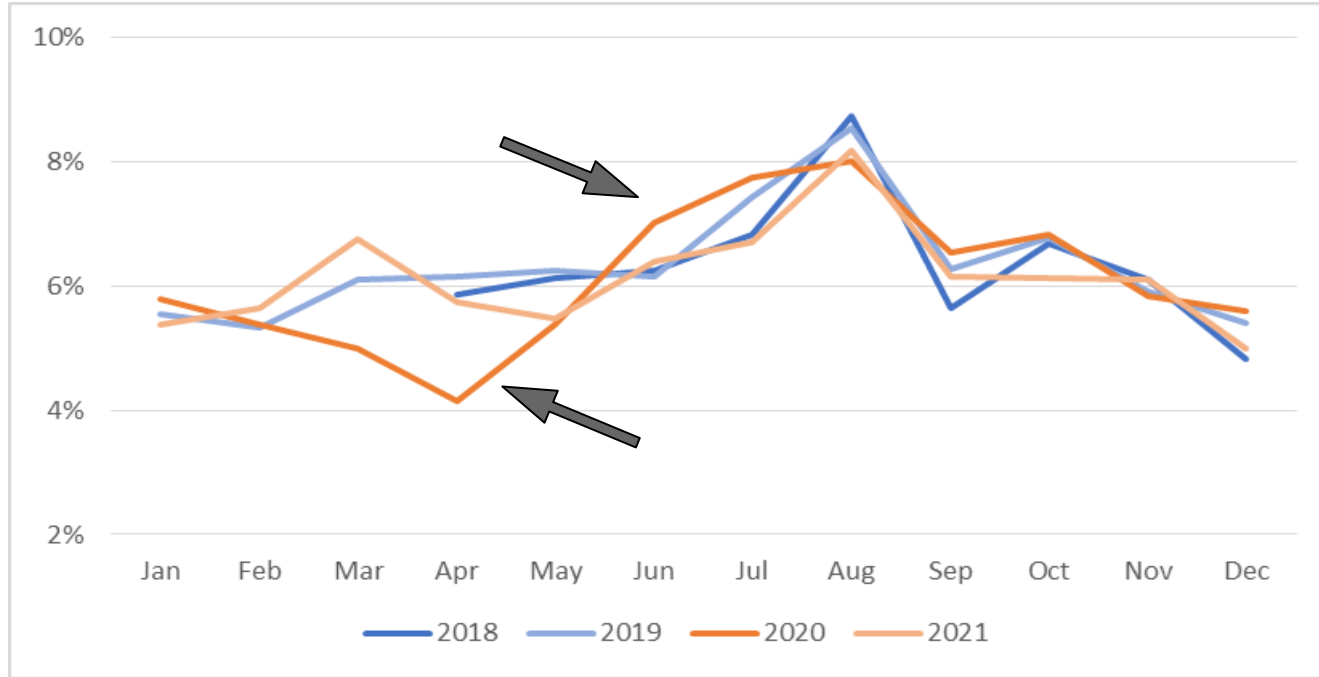
# Pediatric primary care visits during COVID



**Impact of the COVID-19 pandemic on pediatric and adolescent vaccinations and well child visits in the United States: A database analysis - ScienceDirect**

# Well-child care in Utah

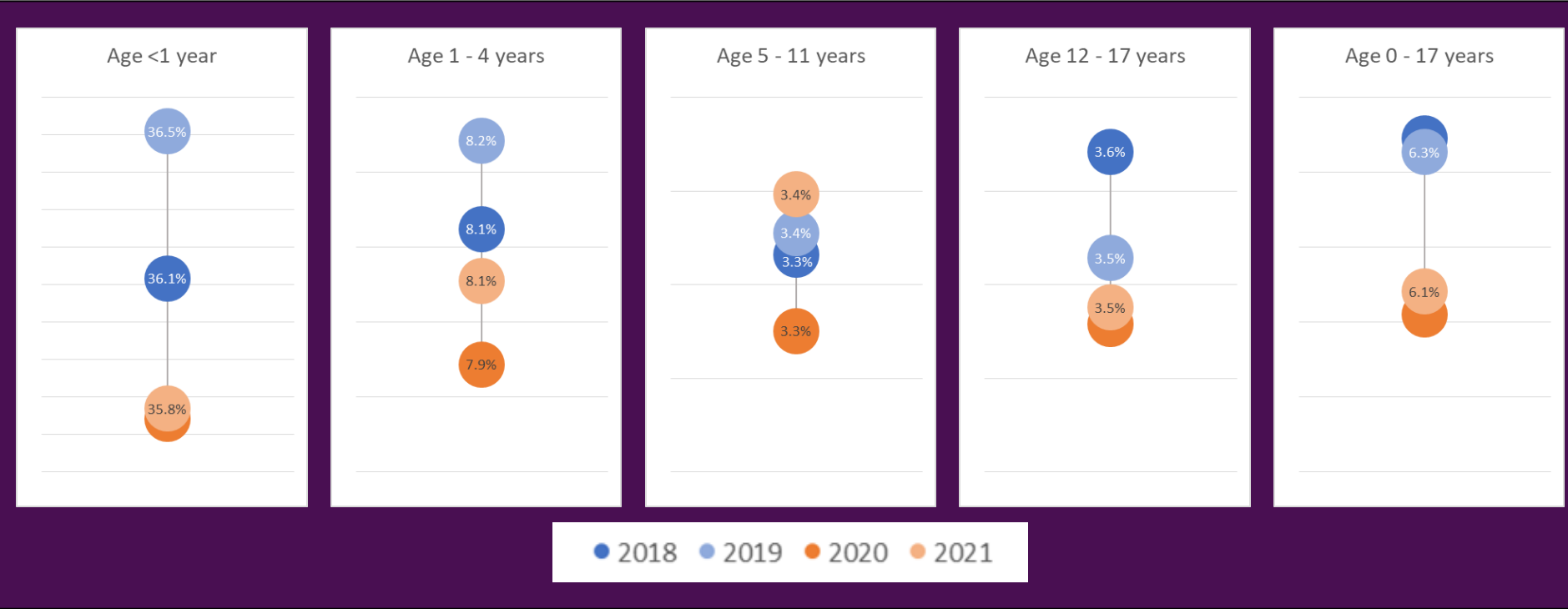
Percentage of children age 0-17 with a well-child visit



Members age 0-17 in the all payer claims database

Source: All Payer Claims Database

# Change in well-child visits in Utah



Percentage of members by age group in the APCD with a well-child visit, 2018-2021

Source: All Payer Claims Database

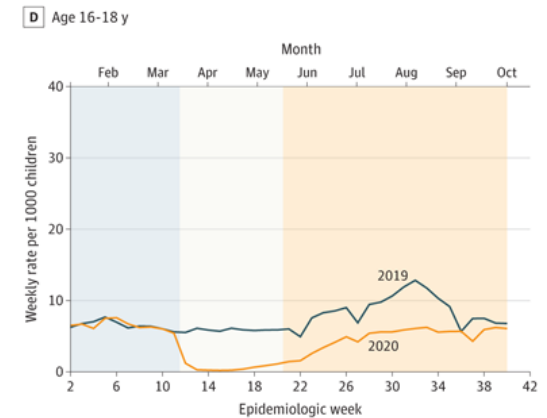
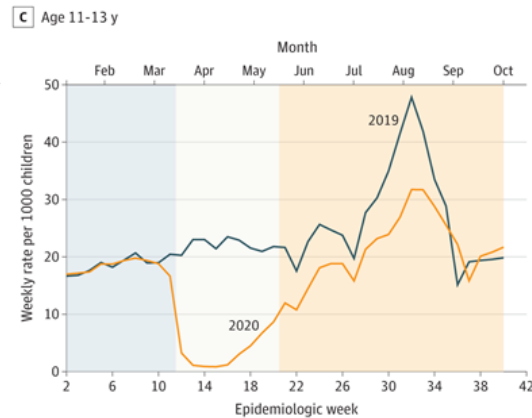
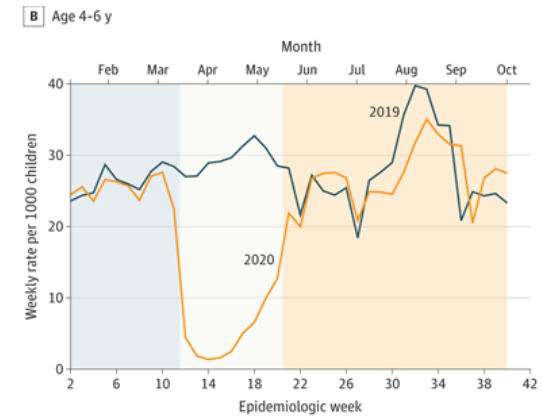
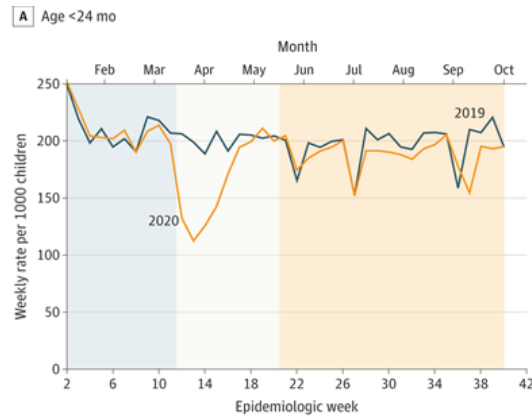
# Impact of COVID-19 on childhood vaccines

JAMA Pediatrics

Association of the COVID-19

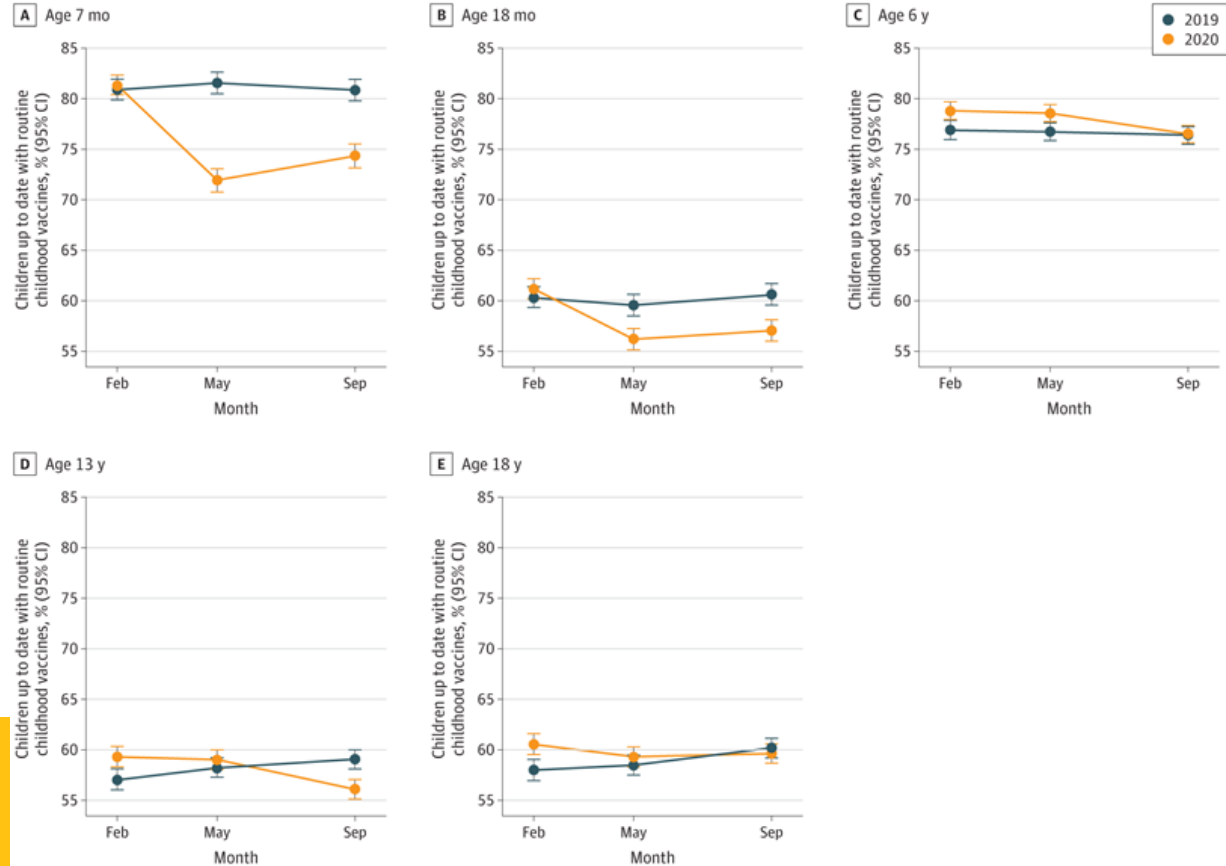
Pandemic With Routine Childhood  
Vaccination Rates and Proportion

Up to Date With Vaccinations Across  
8 US Health Systems in the Vaccine  
Safety Datalink





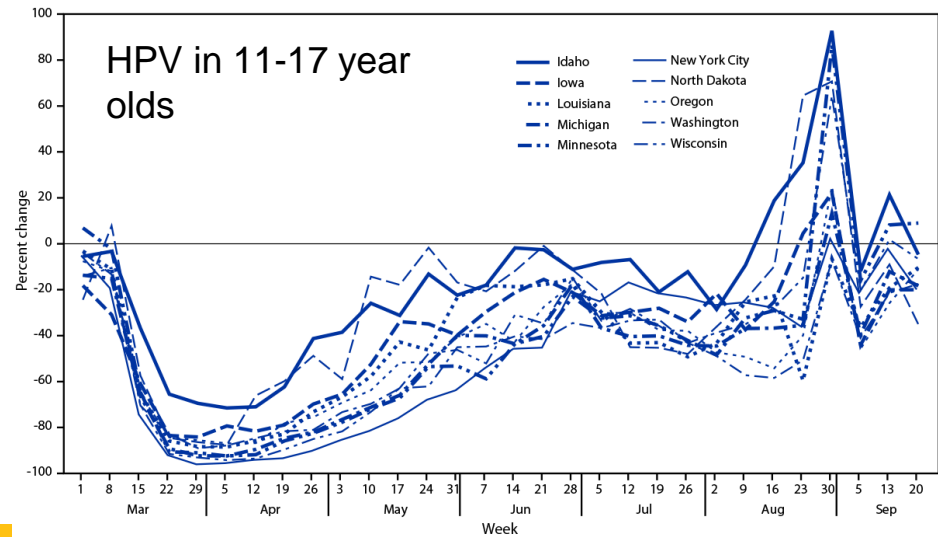
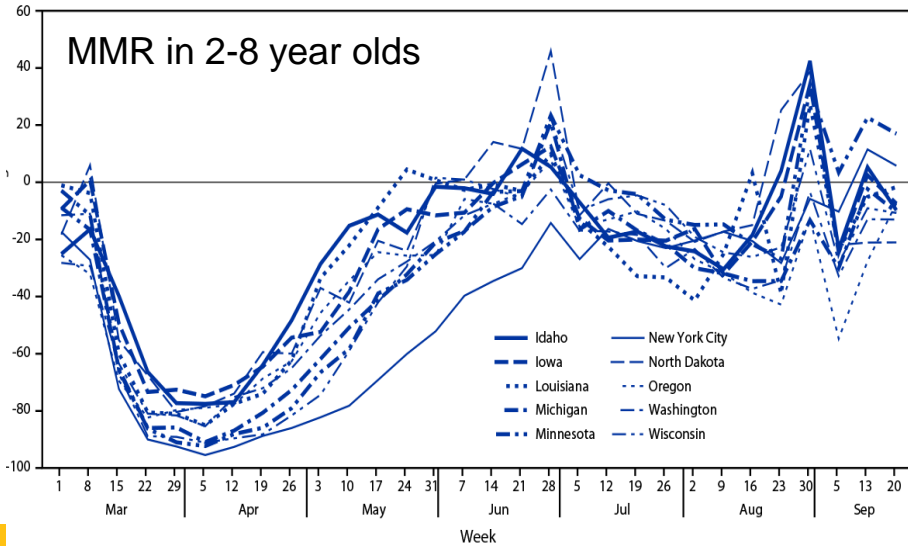
# Impact of COVID-19 on vaccine status



# Impact of COVID-19 on childhood vaccines

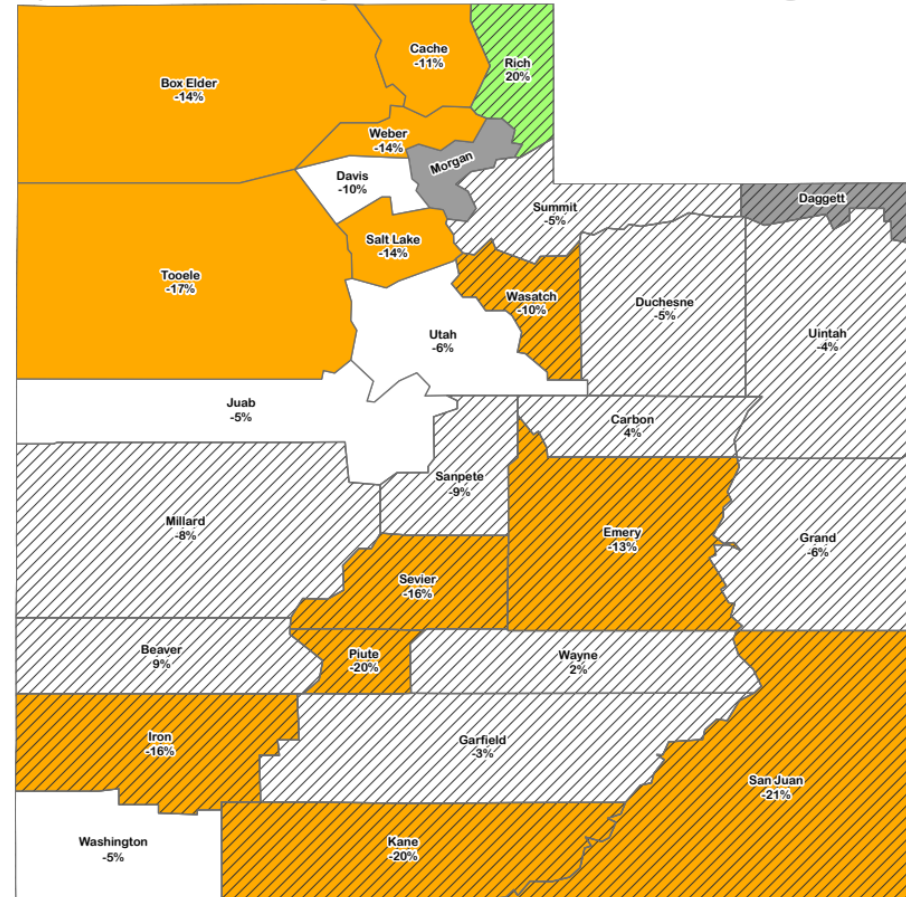
## MMWR

*Impact of the COVID-19 Pandemic on Administration of Selected Routine Childhood and Adolescent Vaccinations — 10 U.S. Jurisdictions, March–September 2020*

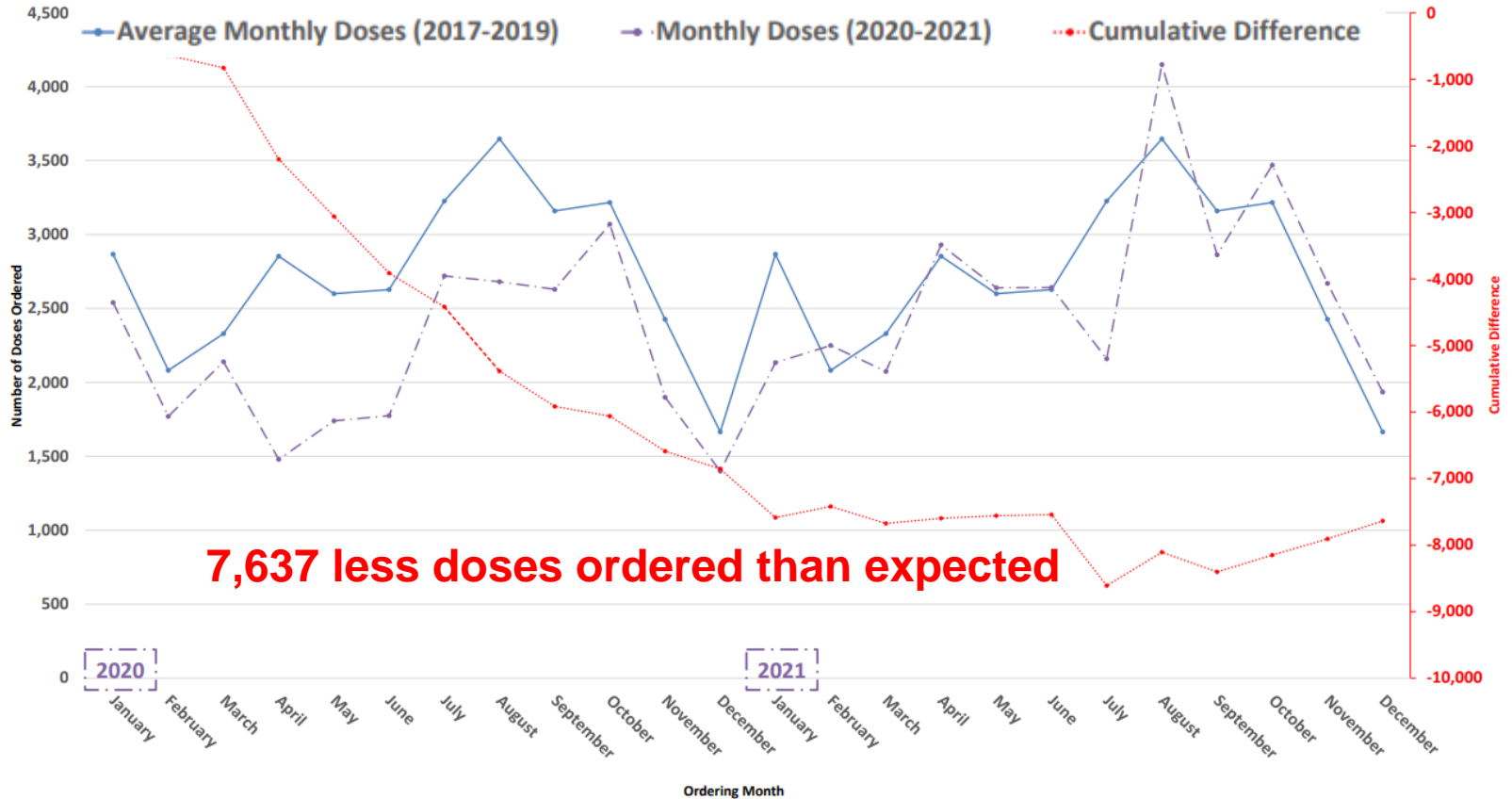


# Utah vaccination changes

Non-Influenza VFC Vaccine Doses  
Ordered via CDC's Vaccine Tracking  
System

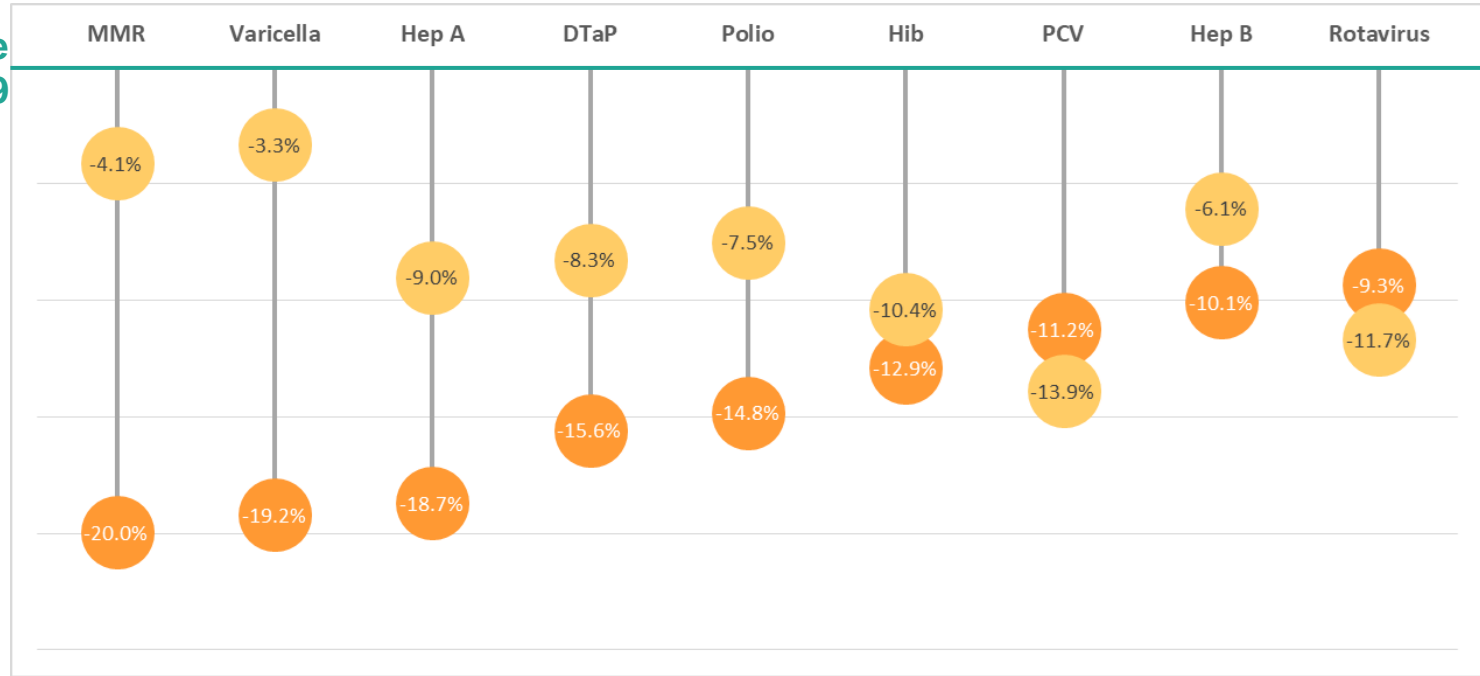


# MMR ordered in Utah



# Utah childhood vaccines ordered - 2020 & 2021 compared to 2017-2019

Average  
2017-2019

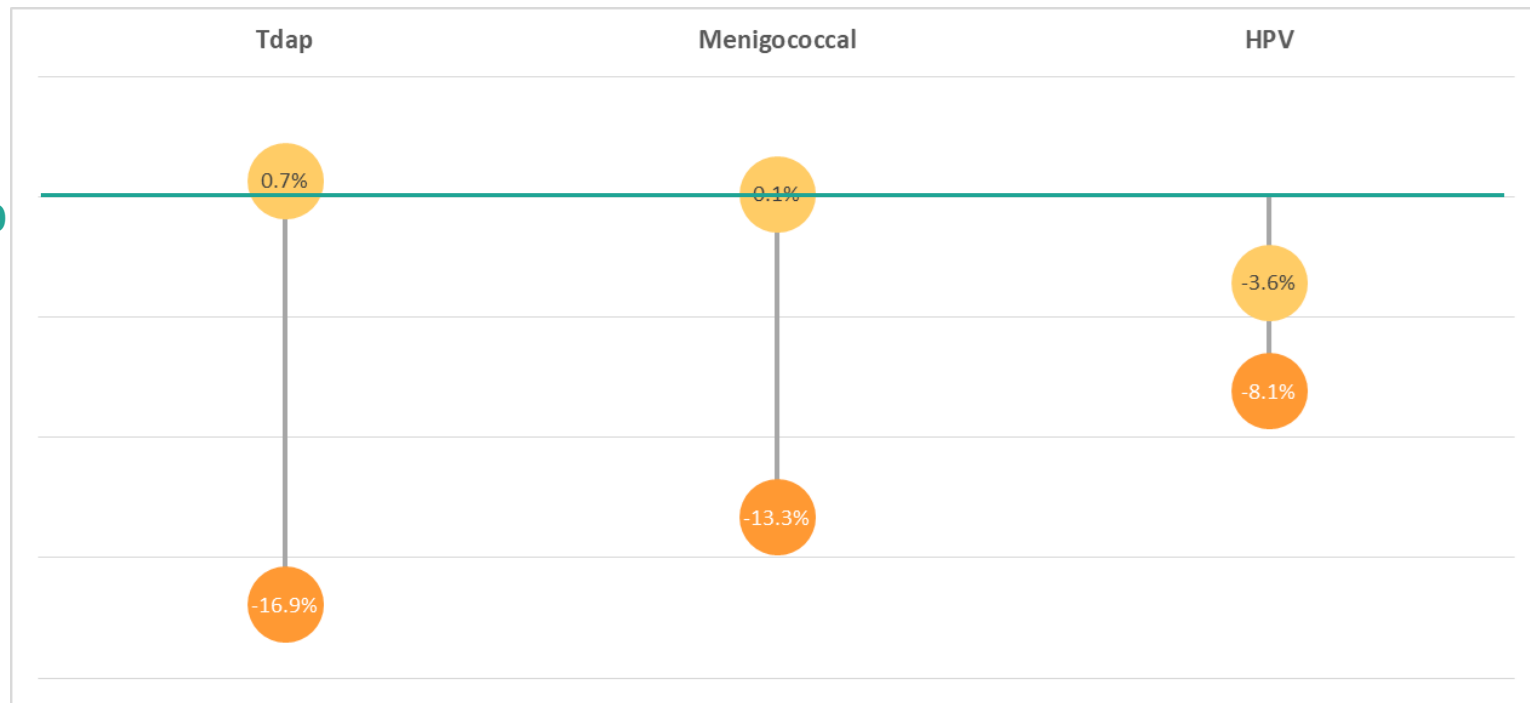


Percentage decrease in yearly pediatric doses ordered, average 2017-19, 2020 & 2021

Source: Vaccine Historic Ordering Tool (VHOT), CDC

# Utah teen vaccines ordered: 2020 & 2021 compared to 2017-2019

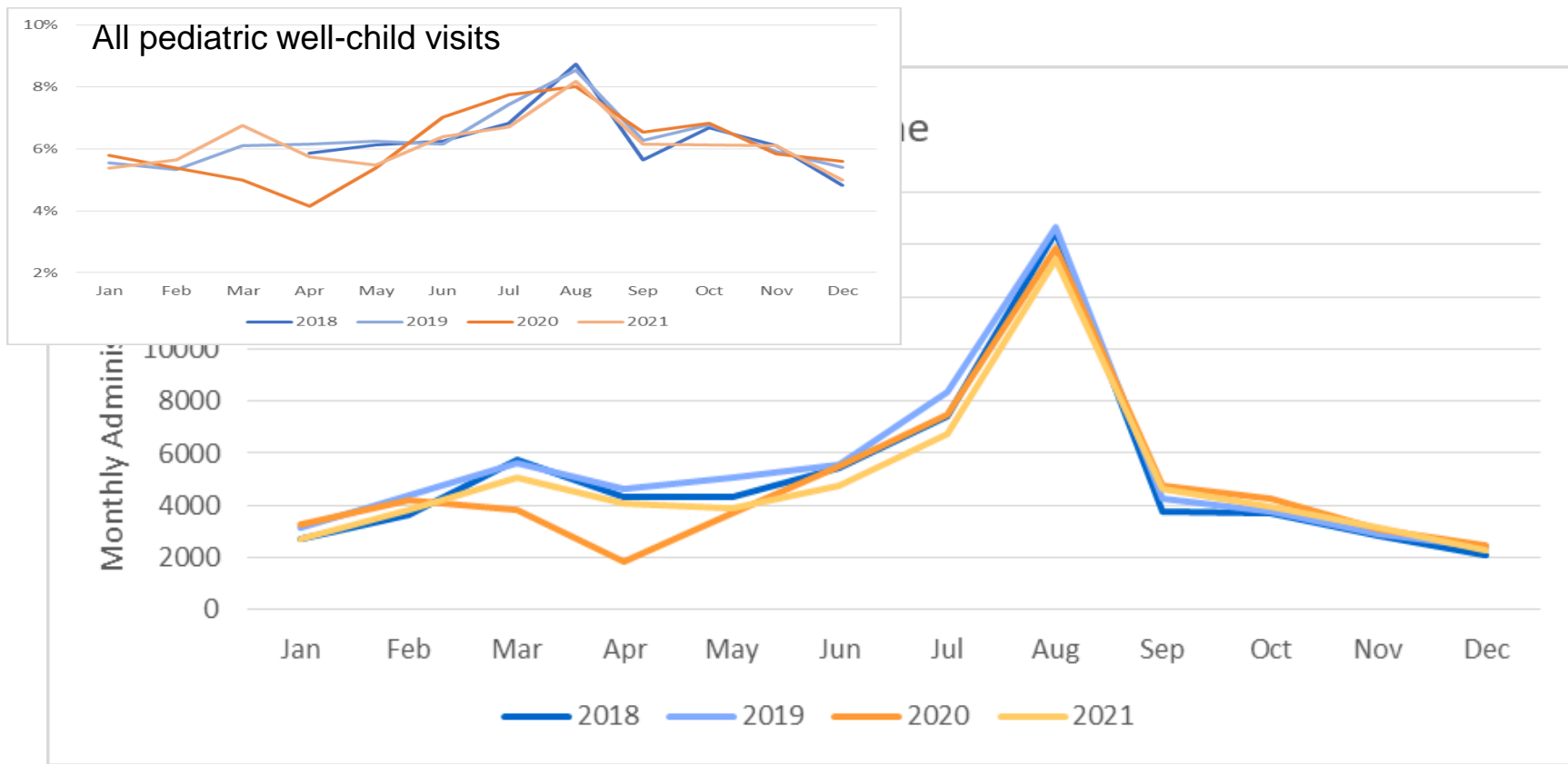
Average  
2017-2019



Percentage decrease in yearly pediatric doses ordered, average 2017-19, 2020 & 2021

Source: Vaccine Historic Ordering Tool (VHOT), CDC

# Teen vaccine administrations example



Tdap vaccine administrations recorded in USIIS, age 11-18 years, 2018 - 2021

Source: Utah Statewide Immunization Information System (USIIS)

# Childhood vaccines missed in Utah

2020

- 10% decrease in total doses = 160,000 doses missed

2021

- 11% decrease in total doses = 180,000 doses missed

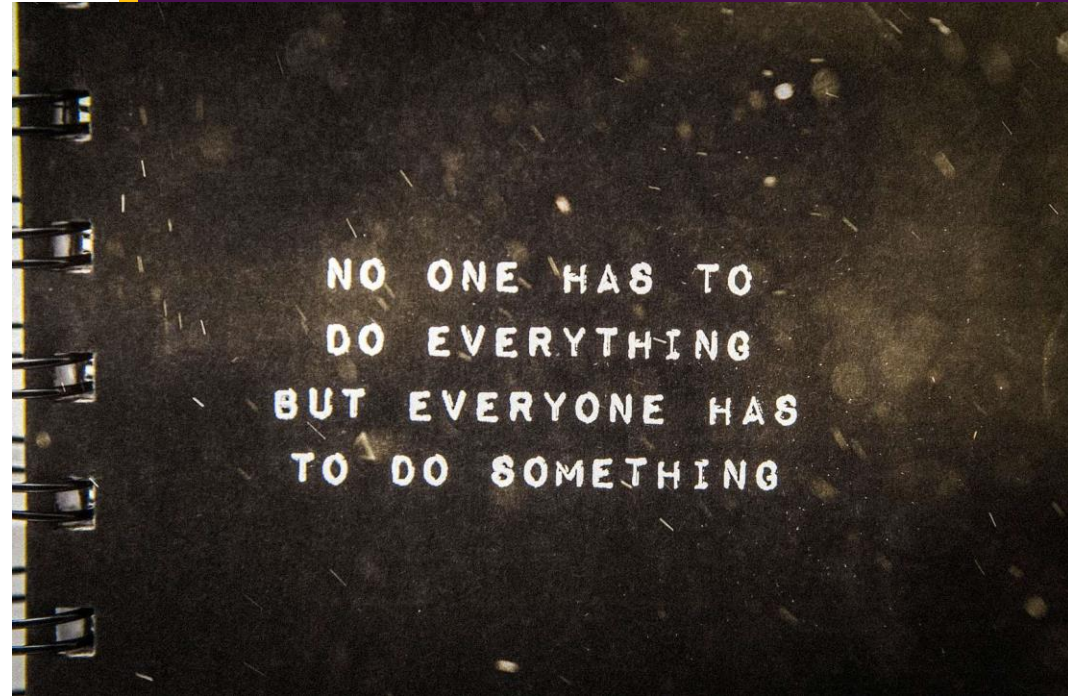


# Vaccines

**We have many  
unprotected children**

---

# Suicide



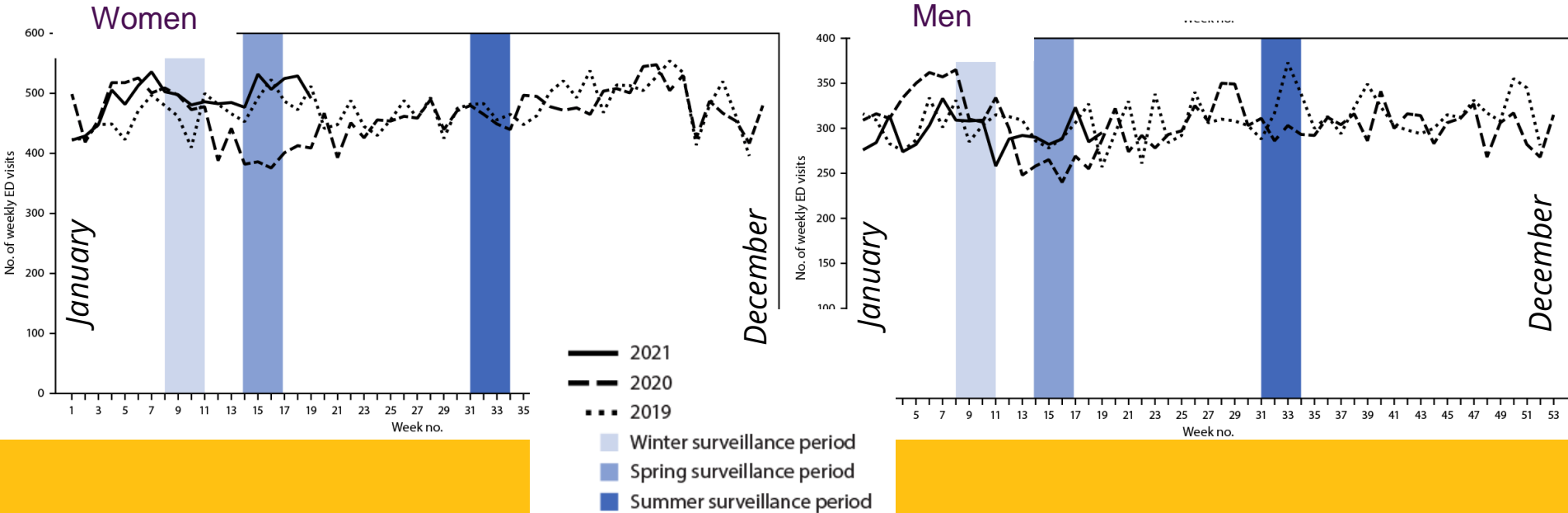
# **Suicide - Attempts**

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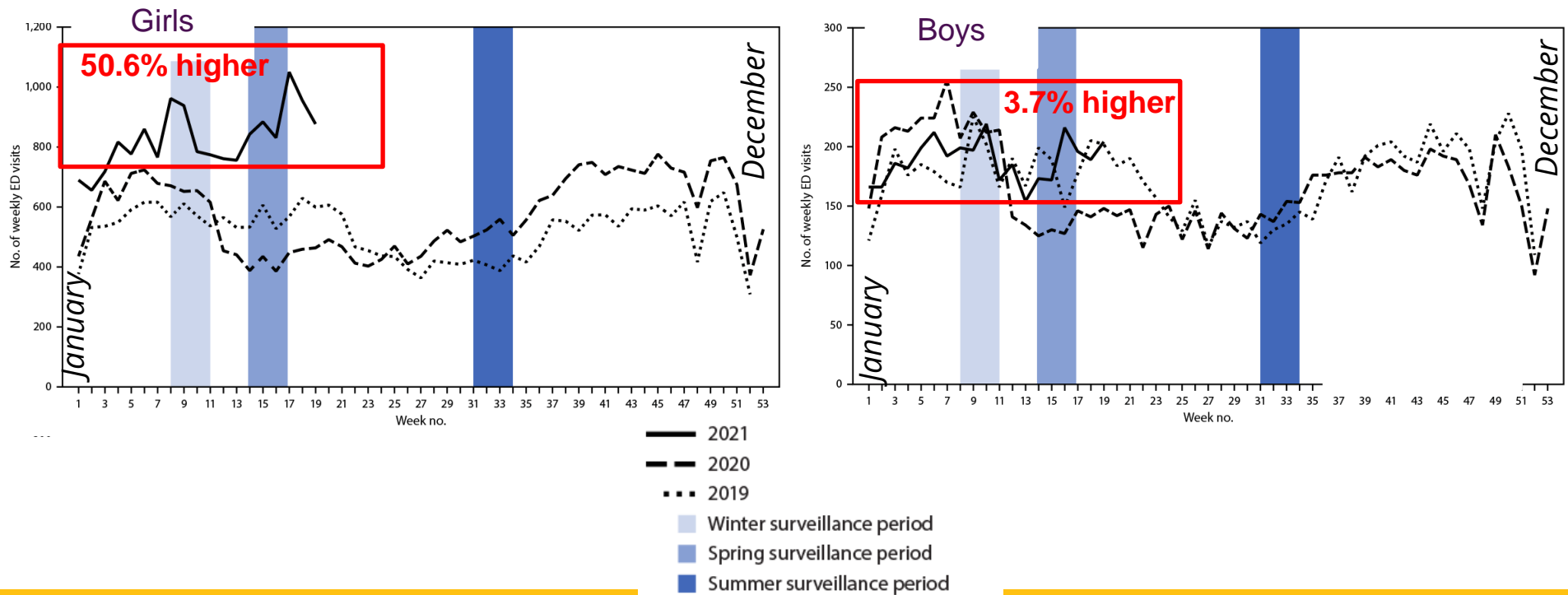
# Suicide attempts early in the pandemic

## MMWR

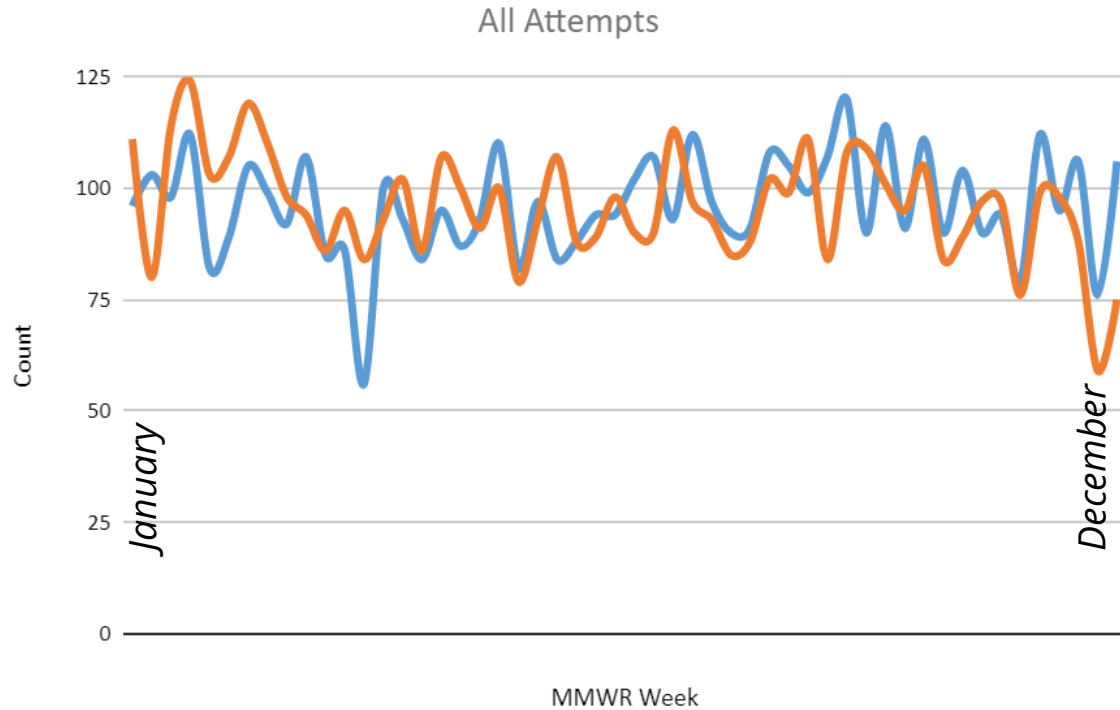
*Emergency Department Visits for Suspected Suicide Attempts Among Persons Aged 12–25 Years Before and During the COVID-19 Pandemic — United States, January 2019–May 2021*



# Suicide attempts early in the pandemic

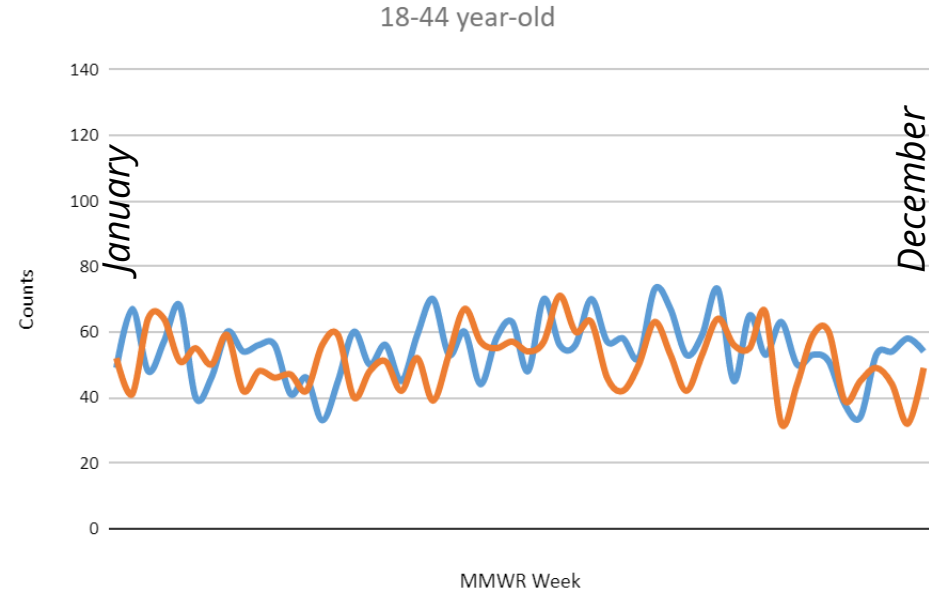
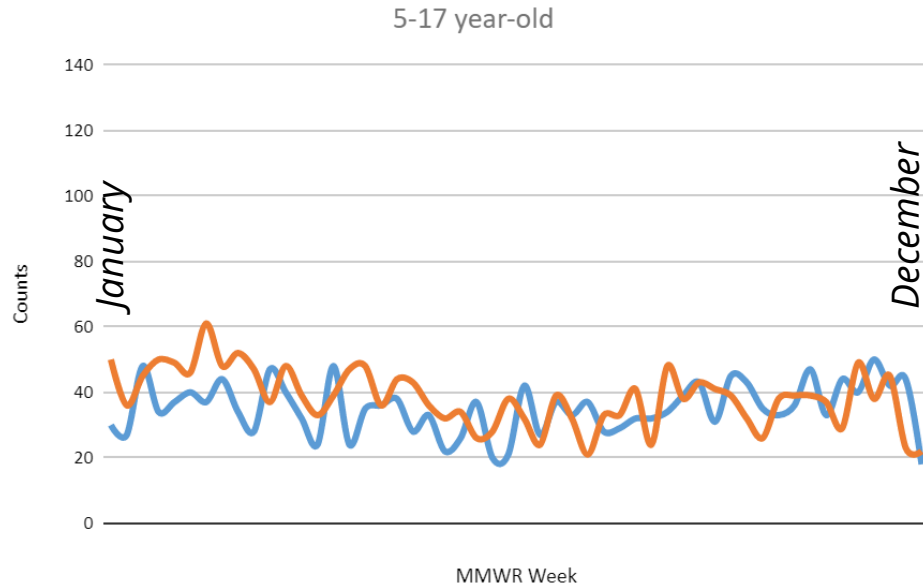


# Suicide attempts in Utah 2020-2021



2020 2021

# Suicide attempts in Utah 2020-2021



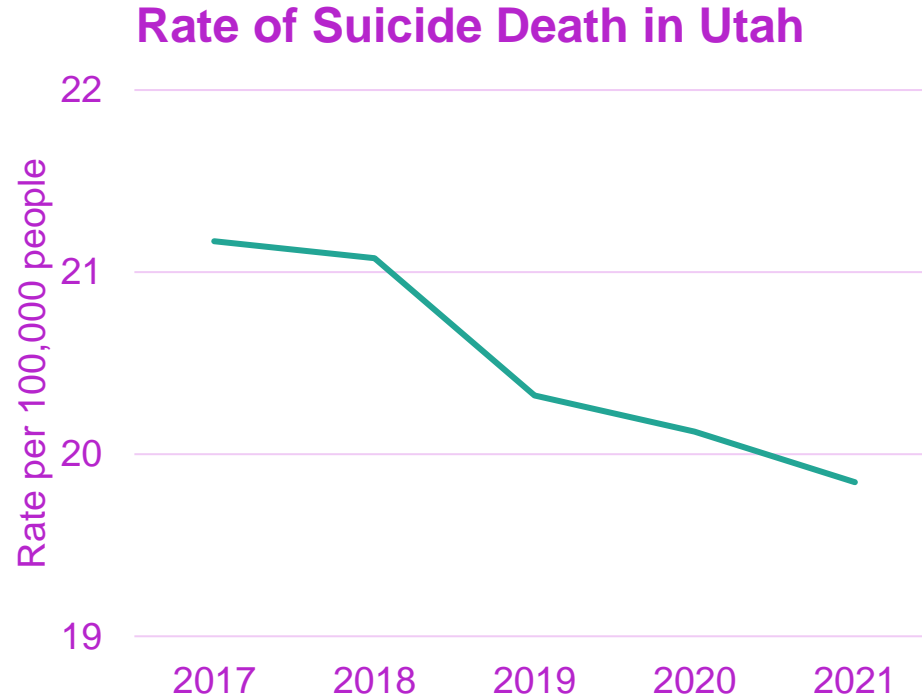
2020 2021

# **Suicide - Deaths**

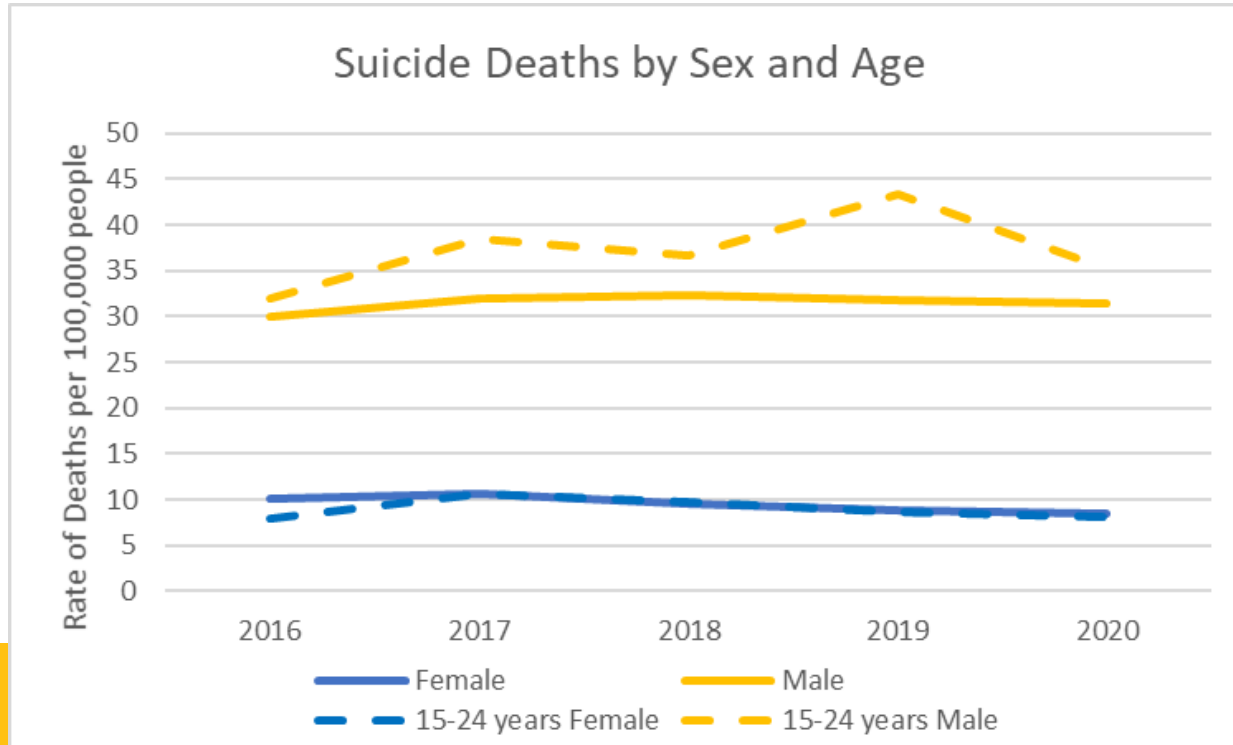
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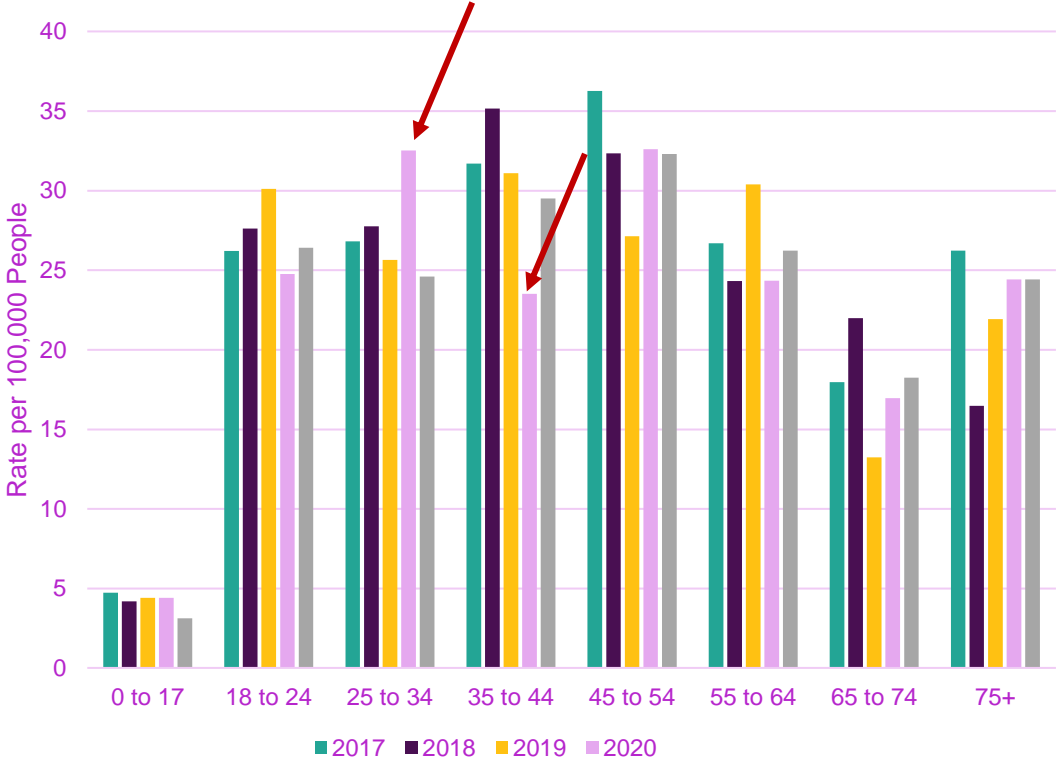
# Suicide deaths in Utah



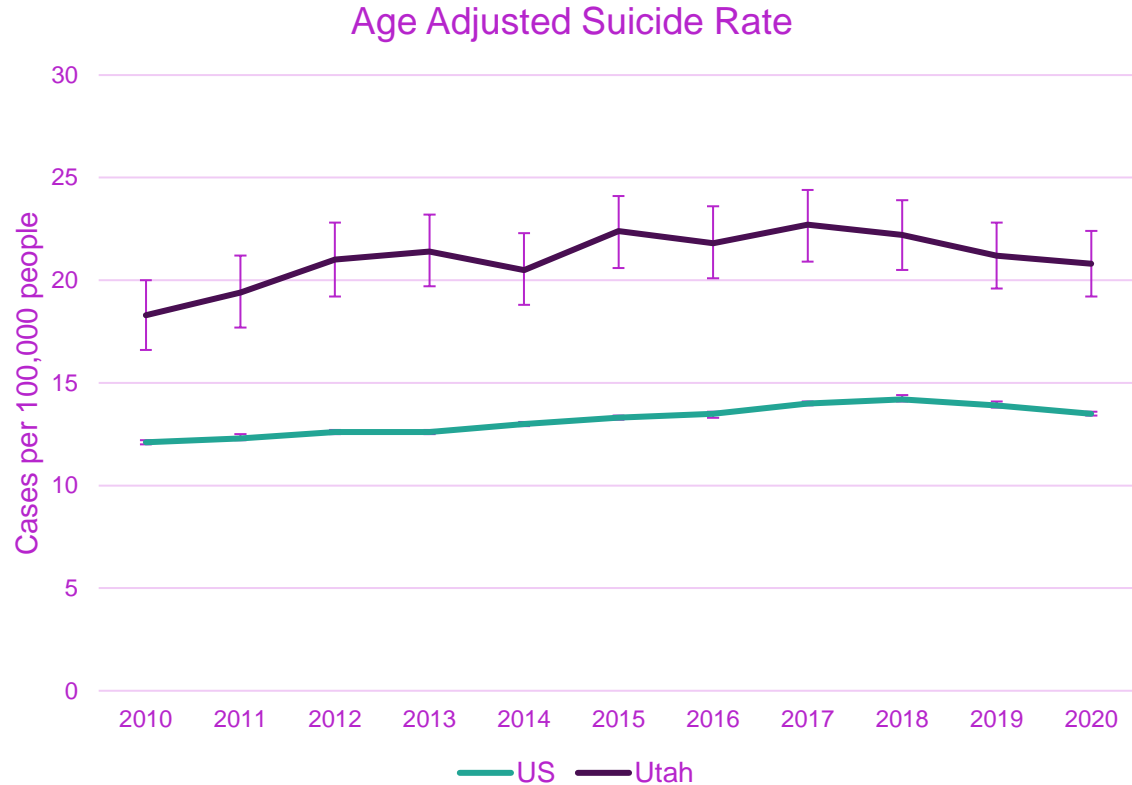
# Recent suicide trends in Utah



# Suicide death in Utah by age and year



# Suicide in Utah beyond COVID-19

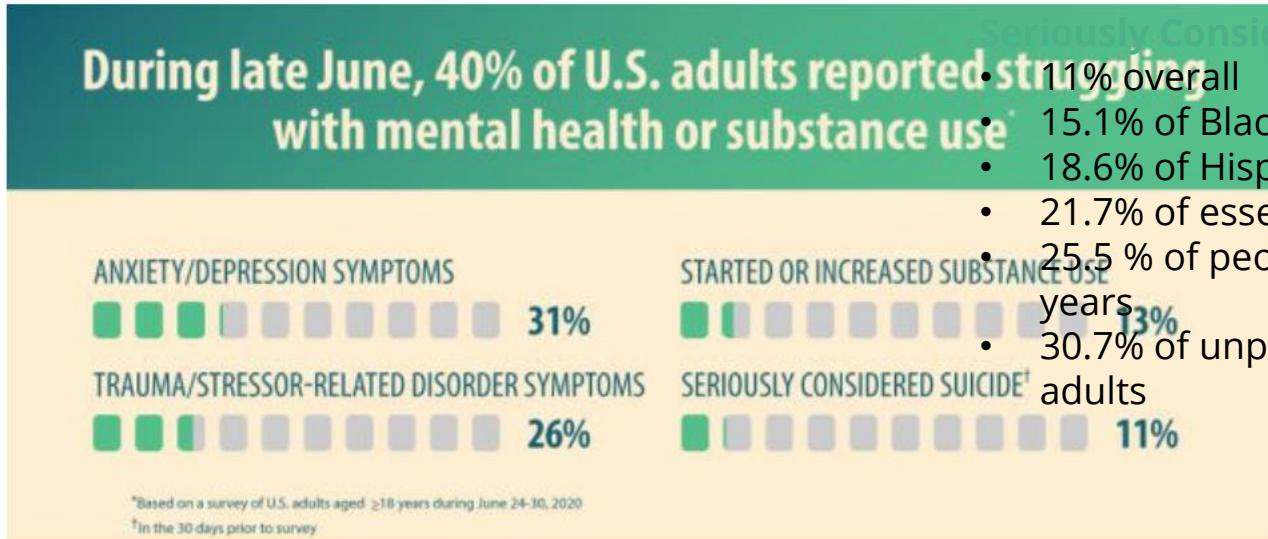


# **Suicide - Mental Health**

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# Mental health has suffered - US

## Survey data from 2020



### Seriously Considered Suicide

- 11% overall
- 15.1% of Black NH respondents
- 18.6% of Hispanic respondents
- 21.7% of essential workers
- 25.5 % of people aged 18-24 years
- 30.7% of unpaid caregivers for adults

# Mental health in Utah

## **Behavioral Risk Factor Surveillance System (BRFSS)**

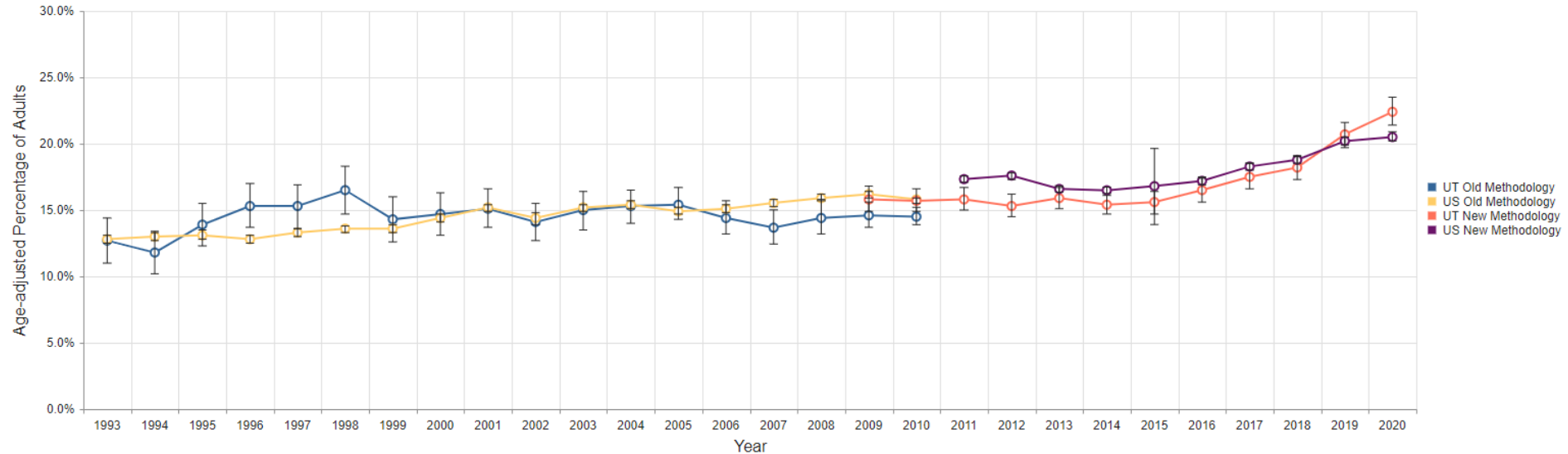
- Telephone survey
- CDC based designed evaluation of health-related risk behaviors, chronic health conditions, and use of preventive services
- Utah conducted continuously since 2011
  - 12,500 randomly selected households across the state

## **School Health and Risk Prevention (SHARP) survey**

- Survey of Utah School students
- Collaboration between Utah Department of Health and Human Services and the Utah State Board of Education (USBE)
- Self-administered survey
- Grades 6, 8, 10 and 12
- Ever odd year since 2013

# Mental health in Utah

Seven or More Days of Poor Mental Health in the Past 30 Days, Utah and U.S., 1993-2020

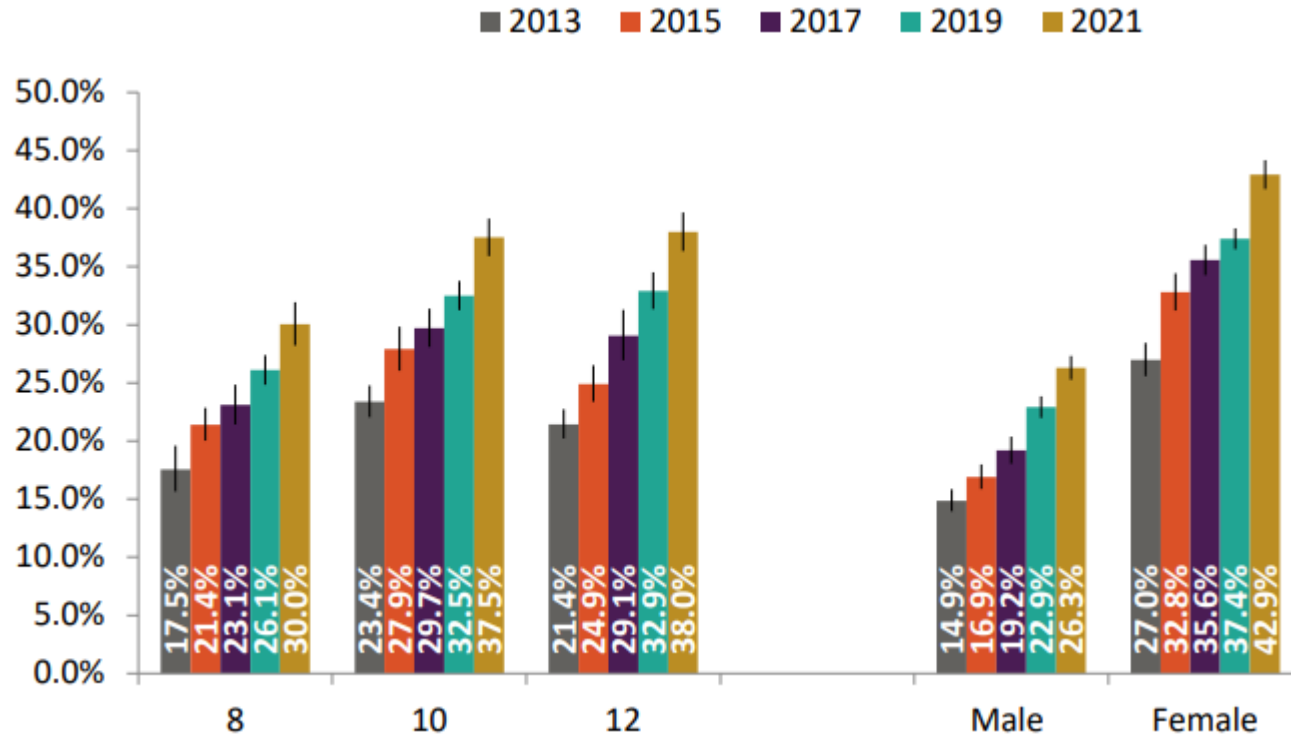


Utah Data: Behavioral Risk Factor Surveillance System, Office of Public Health Assessment, Utah Department of Health

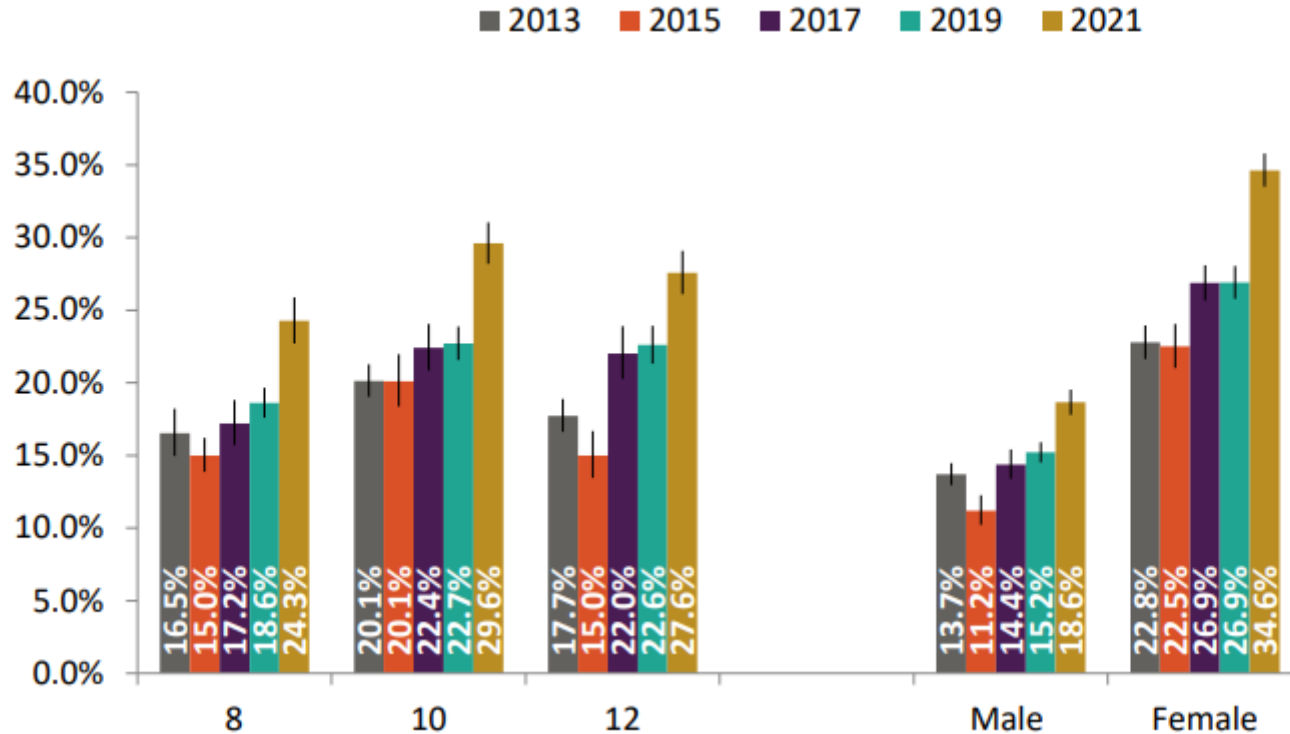
U.S. Data: Behavioral Risk Factor Surveillance System (BRFSS), Division of Behavioral Surveillance, CDC Office of Surveillance, Epidemiology, and Laboratory Services



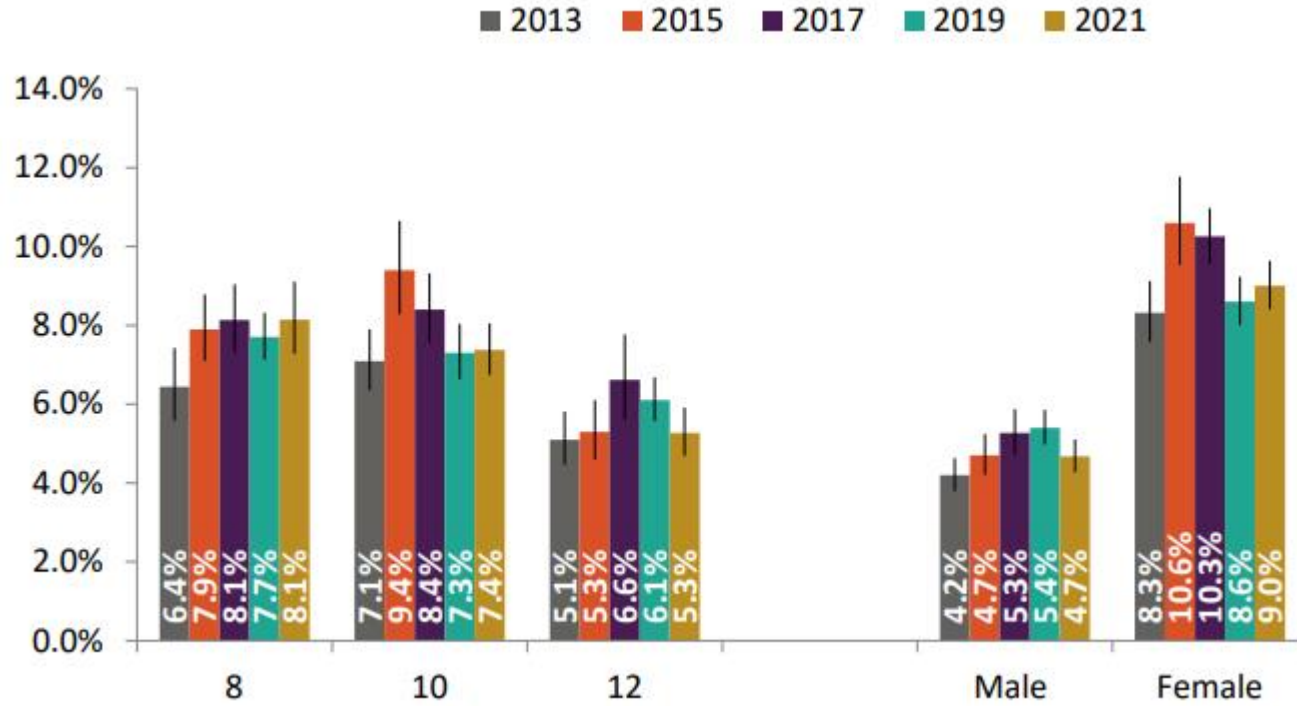
# Students feeling sad or hopeless in last 12 months



# Students with high score on psychological distress evaluation



# Students who attempted suicide in last 12 months



# Suicide

- **Utah has not seen an increase in suicide attempts or deaths**
    - **However suicide has been a significant health issue even prior to the pandemic**
  - **Both adults and school-age children show an increase in indicators of mental distress**
-

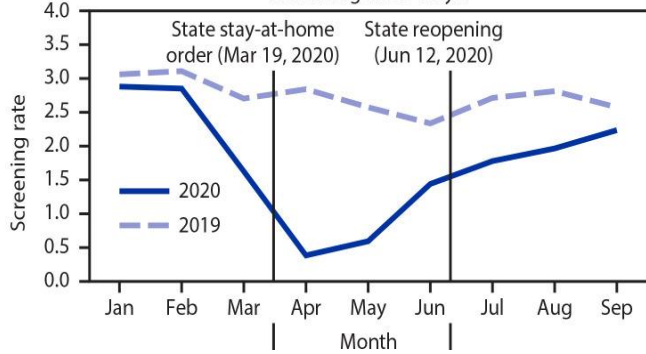
# Cancer



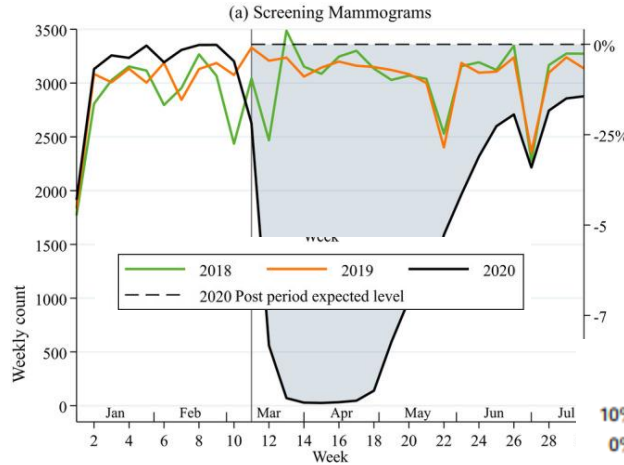
# Drop in cancer screening

## Cervical Cancer Screening in CA

Women aged 21-29 yrs

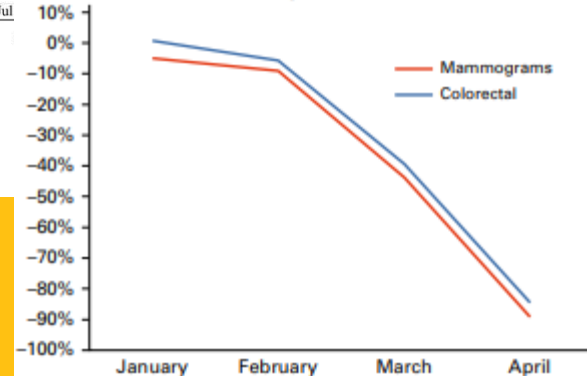


## Mammogram at Independence Blue Cross in 34 states



## Mammogram and Colorectal screening American Cancer Society covering 20 Institutions

### Percent Change in Cancer Screenings (2019-2020)



## American Society for Radiation Oncology

More advanced disease **66%**

Missed screenings **73%**

Treatment interruptions **66%**

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7842810/>

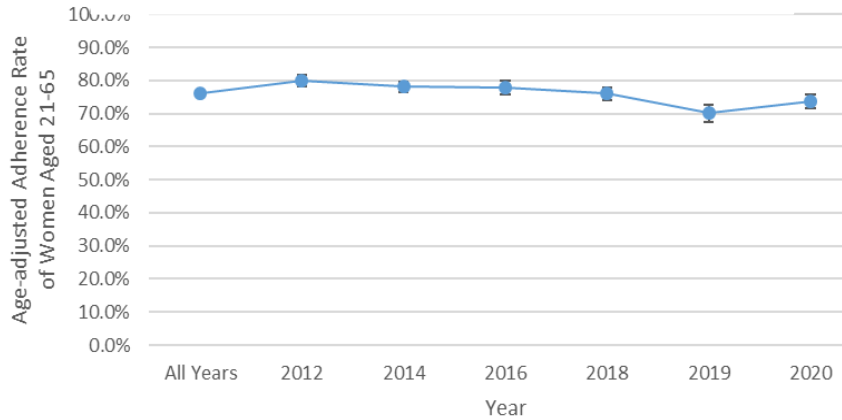
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7839639/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9014329/>

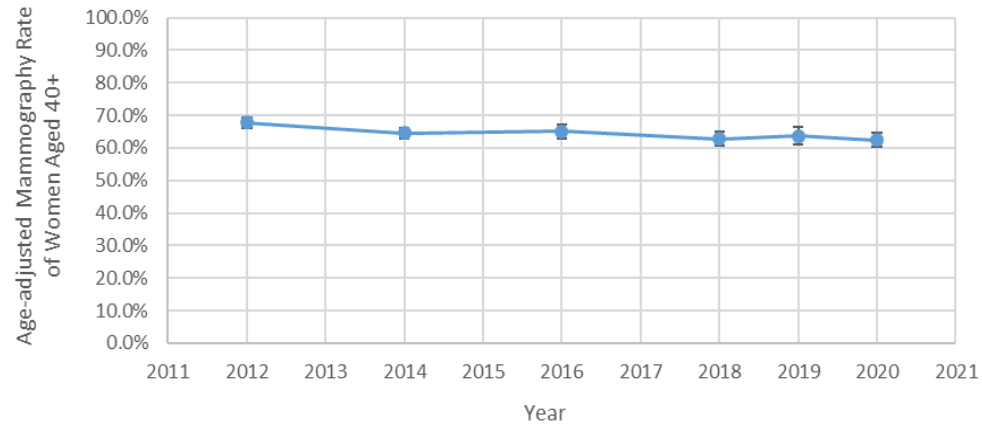
<https://www.astro.org/Daily-Practice/COVID-19-Recommendations-and-Information/Coronavirus-Information>

# Reported cancer screening in Utah

## Cervical Cancer Screening



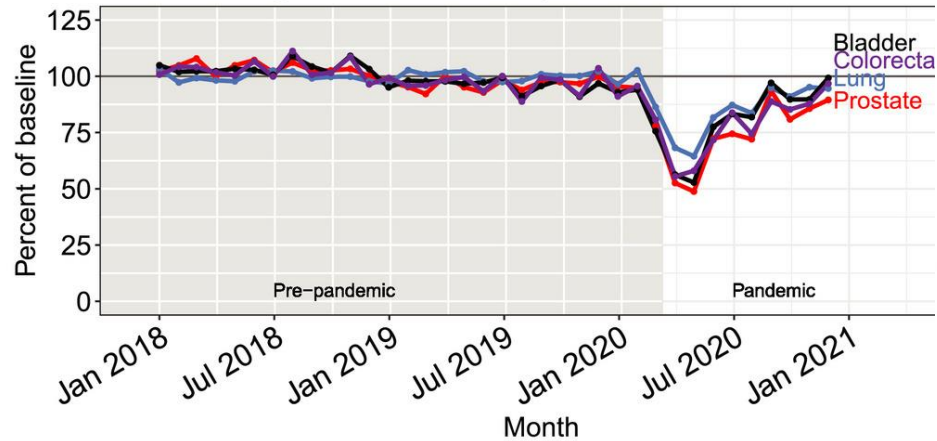
## Breast Cancer Screening



Behavioral Risk Factor Surveillance System (BRFSS)

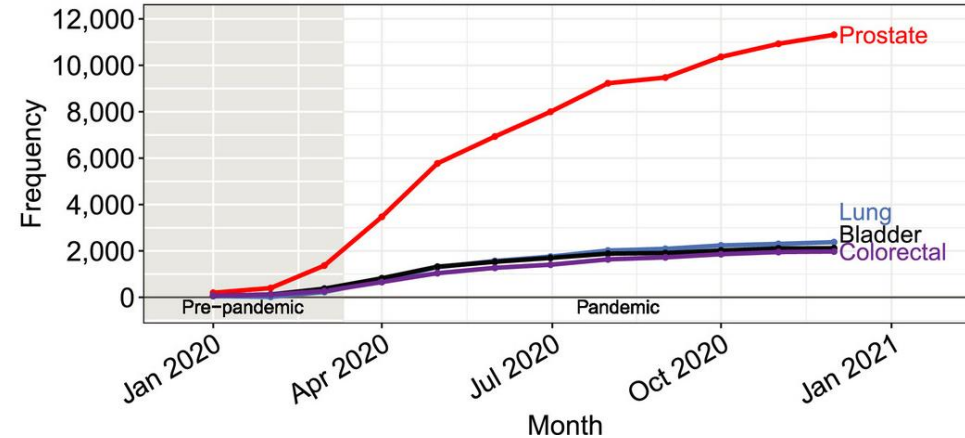
# Cancer deficit at VA hospitals

New cancer diagnoses normalized per month



2304 fewer prostate cancers diagnosed in May alone

Estimated cumulative undiagnosed cancers per month



## Compared to baseline

- 11,362 fewer prostate cancers
- 2365 fewer lung cancers
- 2130 fewer bladder cancers
- 1979 fewer colorectal cancers

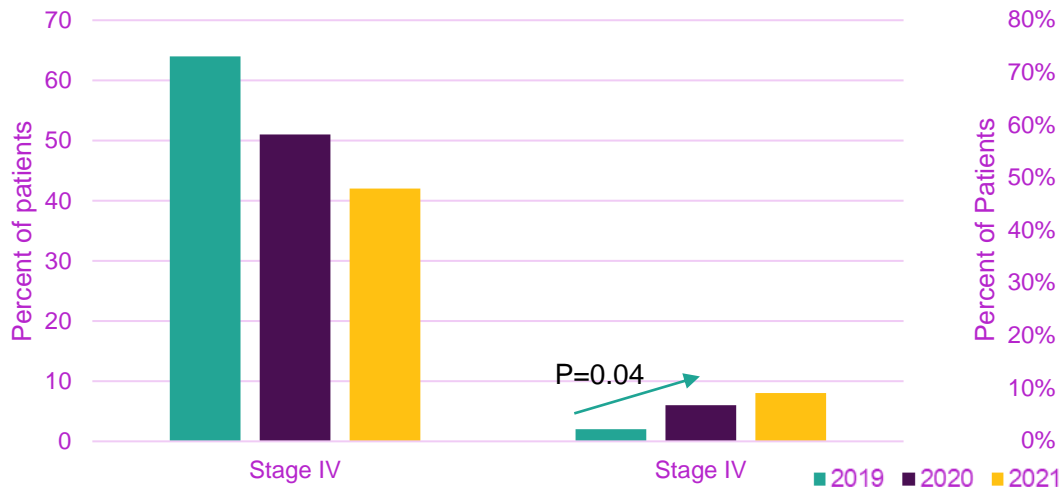


# Advanced Cancer Diagnoses

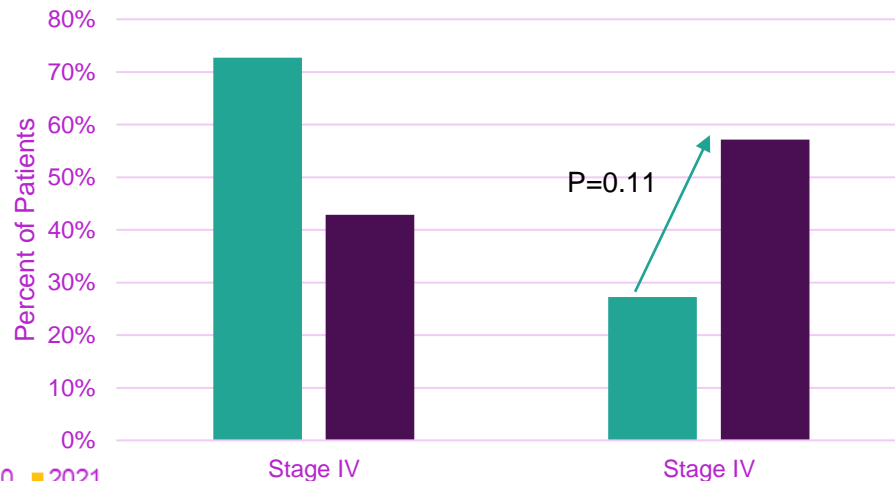
Comparison of Early- and Late-Stage Breast and Colorectal Cancer Diagnoses During vs Before the COVID-19 Pandemic - JAMA

- Moores Cancer Center at University of California San Diego Health
- All colorectal or breast cancer is 2019 and 2020  
- 522 cases

### Stage of Breast Cancer Diagnosis



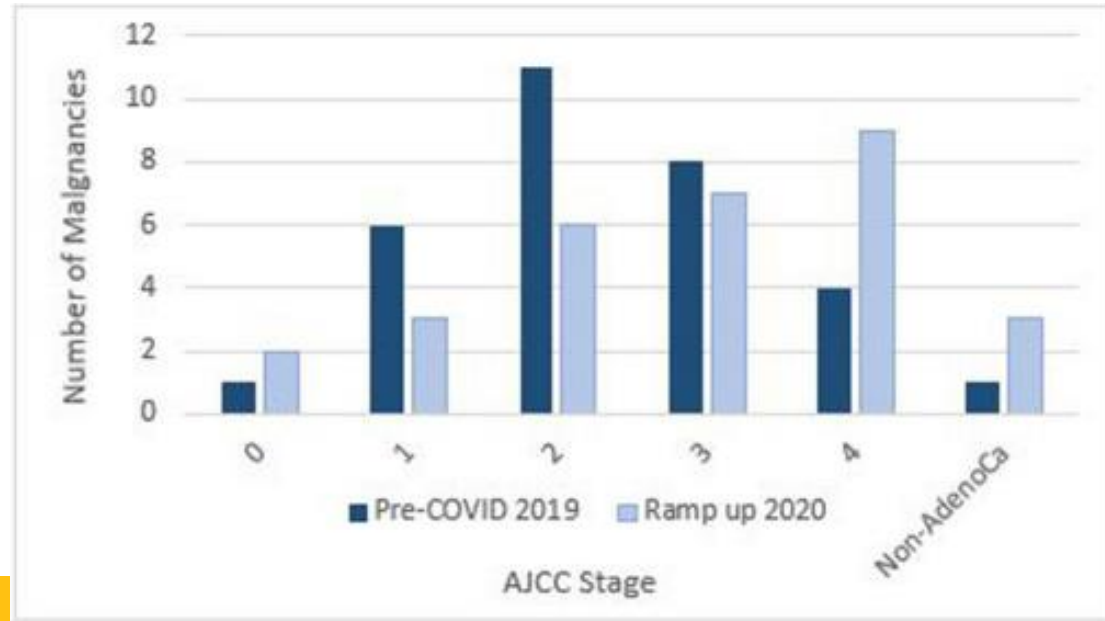
### Stage of Colorectal Cancer Diagnosis



# Advanced Cancer Diagnoses

*The impact of delaying colonoscopies during the COVID-19 pandemic on colorectal cancer detection and prevention*

- Tertiary care center in Toronto, Canada
- Colorectal screening and cancer
- 82% reduction in colonoscopy
- Drop in AJCC Stage 1 and increase in AJCC Stage 4



# Cancer

- **Significant drop in all types of cancer screening in 2020**
- **Utah data is very limited**
- **Early evidence of more advanced cancers**

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# Health Care Associated Infections



























# Health care associated infections (HAI)

- o Central line-associated bloodstream infections (CLABSIs)
- o Catheter-associated urinary tract infections (CAUTIs)
- o Surgical site infections (SSIs)
  - colon surgeries
  - abdominal hysterectomy surgeries
- o Clostridioides difficile (C. difficile) infections
- o Methicillin-resistant Staphylococcus aureus (MRSA) bacteremia infections

# Nation-wide patterns

US National Healthcare Safety Network

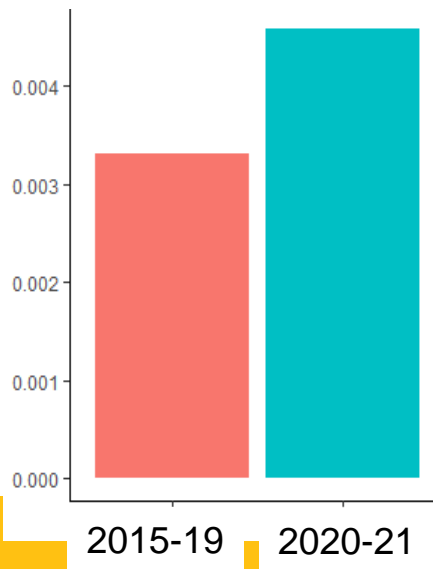
- Compared HAIs in 2020 to the same time period in 2019

	2020 Q1	2020 Q2	2020 Q3	2020 Q4
Central line blood infections	 -11.8%	 27.9%	 46.4%	 47.0%
Catheter urinary tract infections	 -21.3%	No Change <sup>1</sup>	 12.7%	 18.8%
Ventilator-associated	 11.3%	 33.7%	 29.0%	 44.8%
SSI: Colon surgery	 -9.1%	No Change <sup>1</sup>	 -6.9%	 -8.3%
SSI: Abdominal hysterectomy	 -16.0%	No Change <sup>1</sup>	No Change <sup>1</sup>	 -13.1%
Laboratory-identified MRSA bacteremia	 -7.2%	 12.2%	 22.5%	 33.8%
<i>Clostridioides difficile</i>	 -17.5%	 -10.3%	 -8.8%	 -5.5%

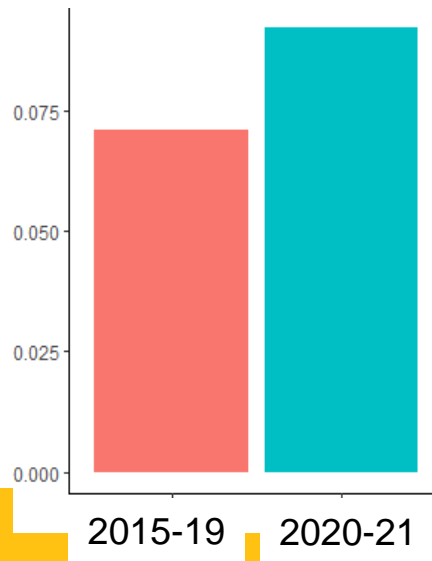
# Utah vs US patterns

	2020 Q1	2020 Q2	2020 Q3	2020 Q4	Utah
Central line blood infections	↓ -11.8%	↑ 27.9%	↑ 46.4%	↑ 47.0%	↑
Catheter urinary tract infections	↓ -21.3%	No Change <sup>1</sup>	↑ 12.7%	↑ 18.8%	
Ventilator-associated	↑ 11.3%	↑ 33.7%	↑ 29.0%	↑ 44.8%	NA
SSI: Colon surgery	↓ -9.1%	No Change <sup>1</sup>	↓ -6.9%	↓ -8.3%	
SSI: Abdominal hysterectomy	↓ -16.0%	No Change <sup>1</sup>	No Change <sup>1</sup>	↓ -13.1%	
Laboratory-identified MRSA bacteremia	↓ -7.2%	↑ 12.2%	↑ 22.5%	↑ 33.8%	↑
<i>Clostridioides difficile</i>	↓ -17.5%	↓ -10.3%	↓ -8.8%	↓ -5.5%	

MRSA Infections



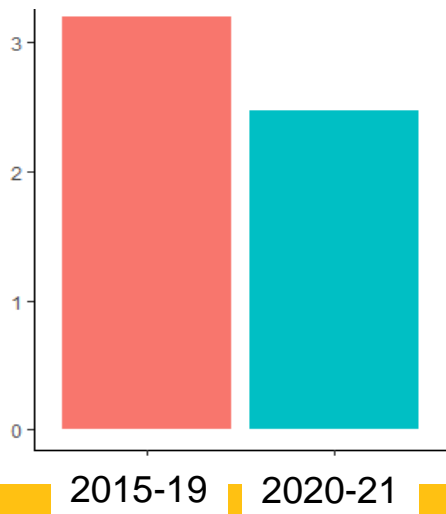
Central line associated Infections



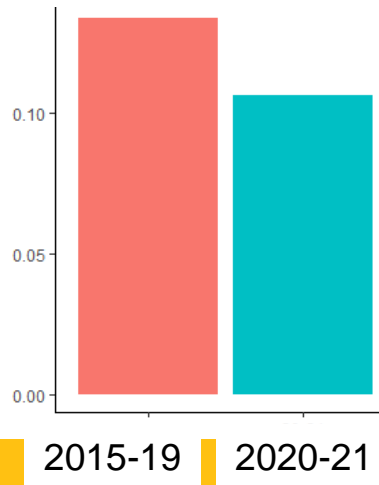
# Utah vs US patterns

	2020 Q1	2020 Q2	2020 Q3	2020 Q4	Utah
Central line blood infections	↓ -11.8%	↑ 27.9%	↑ 46.4%	↑ 47.0%	↑
Catheter urinary tract infections	↓ -21.3%	No Change <sup>1</sup>	↑ 12.7%	↑ 18.8%	↓
Ventilator-associated	↑ 11.3%	↑ 33.7%	↑ 29.0%	↑ 44.8%	NA
SSI: Colon surgery	↓ -9.1%	No Change <sup>1</sup>	↓ -6.9%	↓ -8.3%	↓
SSI: Abdominal hysterectomy	↓ -16.0%	No Change <sup>1</sup>	No Change <sup>1</sup>	↓ -13.1%	
Laboratory-identified MRSA bacteremia	↓ -7.2%	↑ 12.2%	↑ 22.5%	↑ 33.8%	↑
<i>Clostridioides difficile</i>	↓ -17.5%	↓ -10.3%	↓ -8.8%	↓ -5.5%	↓

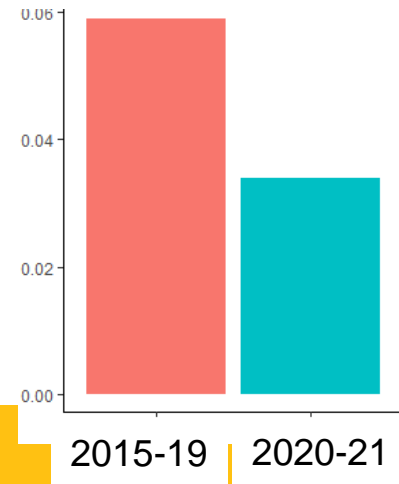
Colon Surgical Site Infections



Catheter Associated Infections



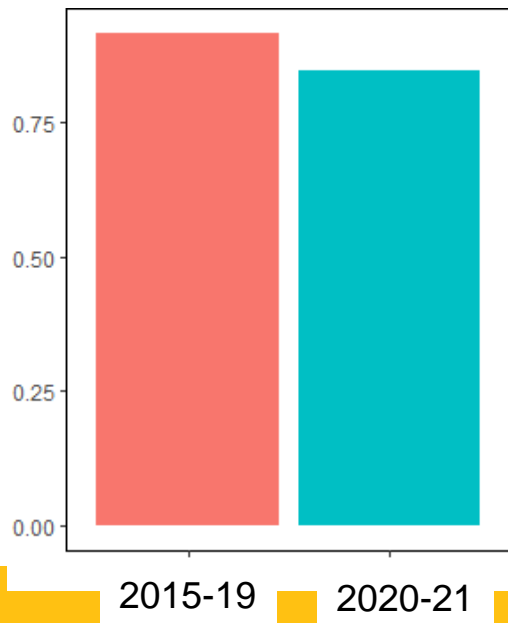
*C difficile* Infection





# Utah vs US patterns

Hysterectomy Surgical Site Infections



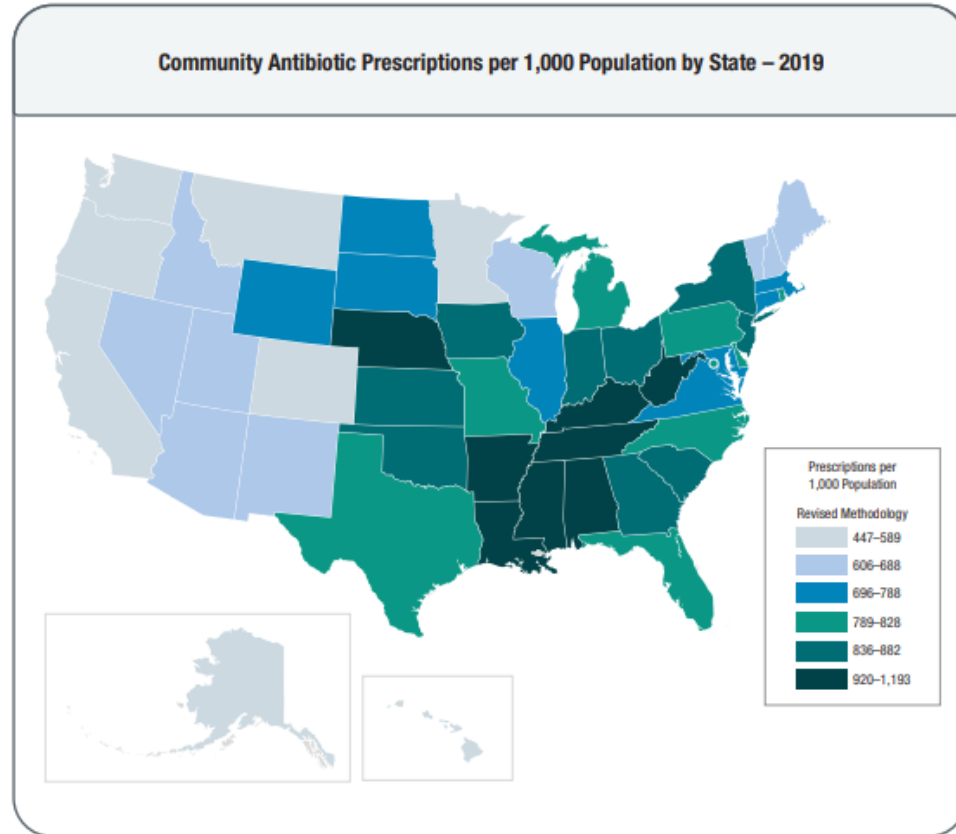
	2020 Q1	2020 Q2	2020 Q3	2020 Q4	Utah
Central line blood infections	↓ -11.8%	↑ 27.9%	↑ 46.4%	↑ 47.0%	↑
Catheter urinary tract infections	↓ -21.3%	No Change <sup>1</sup>	↑ 12.7%	↑ 18.8%	↓
Ventilator-associated	↑ 11.3%	↑ 33.7%	↑ 29.0%	↑ 44.8%	NA
SSI: Colon surgery	↓ -9.1%	No Change <sup>1</sup>	↓ -6.9%	↓ -8.3%	↓
SSI: Abdominal hysterectomy	↓ -16.0%	No Change <sup>1</sup>	No Change <sup>1</sup>	↓ -13.1%	No Change
Laboratory-identified MRSA bacteremia	↓ -7.2%	↑ 12.2%	↑ 22.5%	↑ 33.8%	↑
<i>Clostridioides difficile</i>	↓ -17.5%	↓ -10.3%	↓ -8.8%	↓ -5.5%	↓

# Covid burden and HAIs

Two studies looked at correlation between COVID-19 burden in the hospitals and HAI

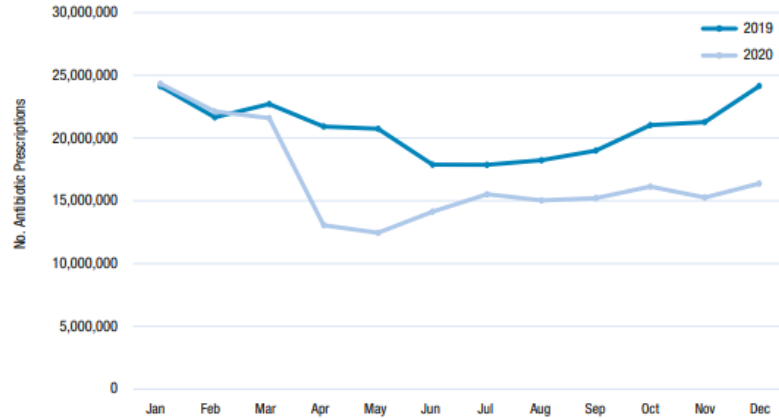
- Both found increases in central line infection along side no change in catheter-associated urinary tract infection
- Difference in relationship between HAI and burden
  - Fakhri et. al.
    - 78 hospitals in a large, multistate healthcare system
    - Compared March 2019–February 2020 to March–August 2020
    - 2.38X more central line bloodstream infections in hospitals with >10% COVID-19 patients compared to those with <5%
  - Evans et. al.
    - VA system data
    - Evaluated January 1, 2018, through December 31, 2020
    - No correlation between the facility monthly COVID-19 admission prevalence and the monthly facility HAI incidence

# Antibiotic Use



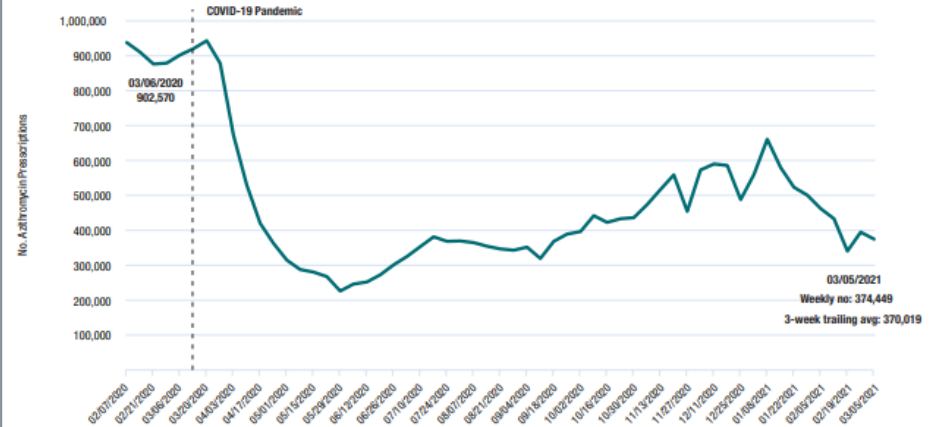
# Antibiotic use during COVID-19 (2020)

Antibiotic Prescriptions Dispensed from Retail Pharmacies in the United States, 2019–2020



Source: IQVIA National Prescription Audit. Last update: March 15, 2021

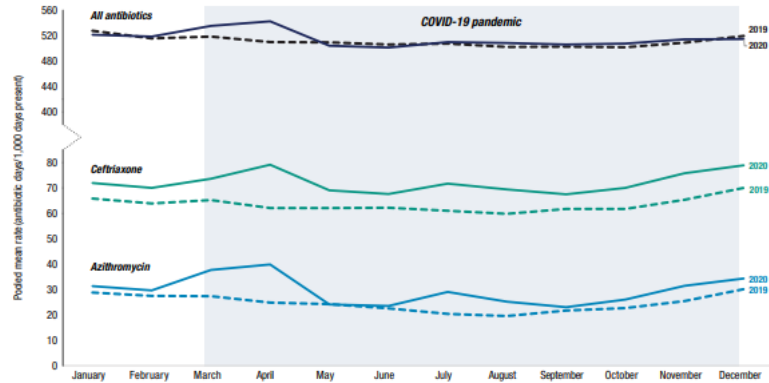
Azithromycin Prescriptions Dispensed from Retail Pharmacies in the United States, 2019–2020



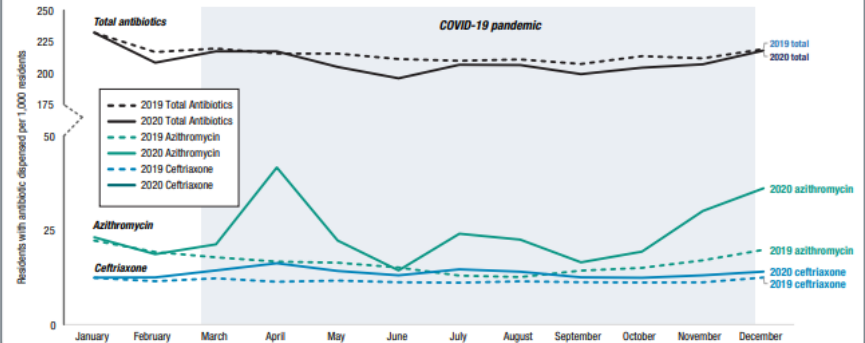
Source: IQVIA National Prescription Audit. Last update: March 15, 2021

# Antibiotic use during COVID-19 (2020)

Total Facility-wide Inpatient Antibiotic Use Across 808 U.S. Hospitals, January 2019–January 2020



All Antibiotic, Azithromycin, and Ceftriaxone Use Among U.S. Nursing Home Residents, January – December 2019 and January – December 2020



# Health Care Associated Infections

- **Mixed impact of the pandemic on HAIs**
- **Decrease on outpatient antibiotic use**

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# Impacts Beyond COVID-19

- Other infectious diseases – decrease in respiratory illnesses, minimal impact on GI
- Vaccination – significant decrease in vaccination
- Suicide – limited impact on actions, but increase in mental health indicators
- Cancer screening – possible impact on screening
- Hospital acquired infections – mixed impact on infections

# Telehealth

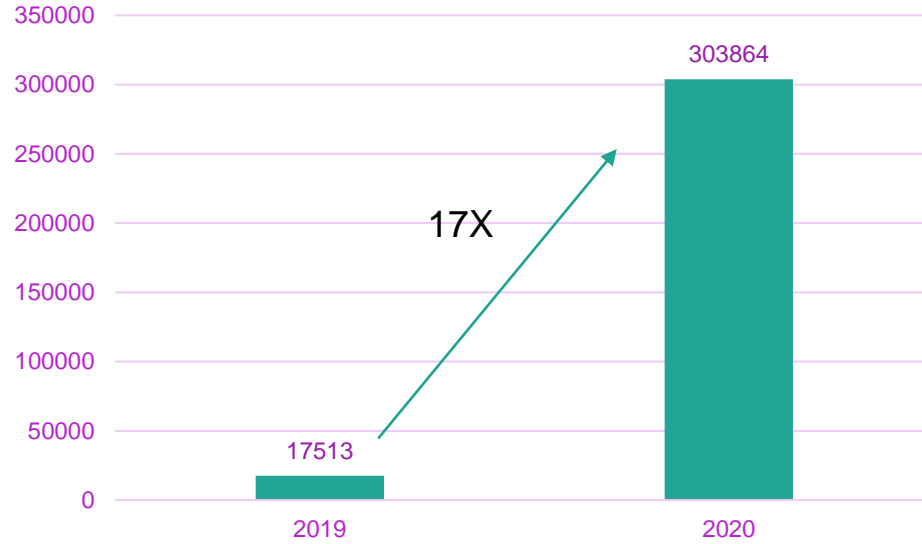


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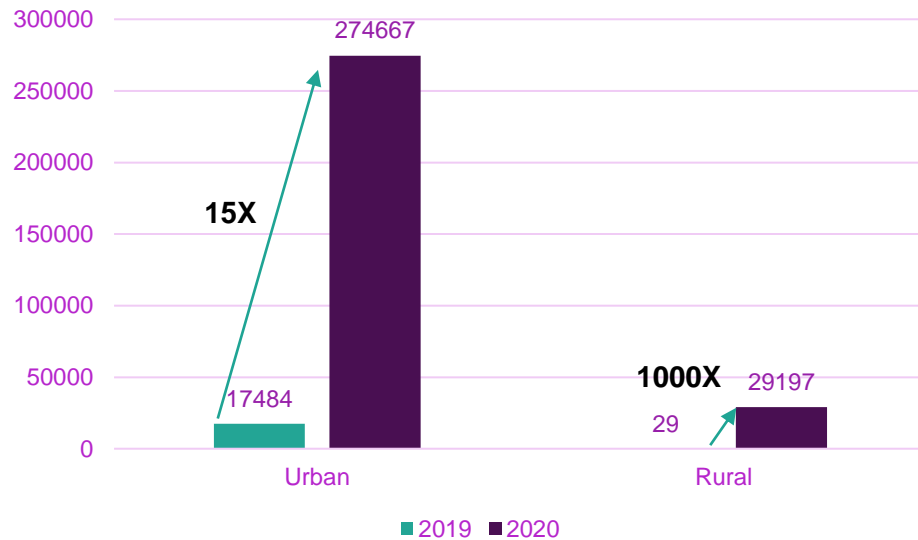
[Doctor Telemedicine Laptop](#) - Free photo on Pixabay



# Telehealth claims in Utah



# Telehealth claims in Utah: urban vs rural



# Impacts Beyond COVID-19

- Other infectious diseases
- Vaccination
- Suicide
- Cancer screening
- Hospital acquired infections

# Thanks to so many!

Vaccine Preventable Disease Program –  
Jessica Payne

Healthcare Associated Infections Program –  
Scarlett Thompson, Joshua Mongillo

Office of Disease Control – Delany Moore

Office of the Medical Examiner – Michael  
Staley

Utah Cancer Screening Program – Michelle  
Mumper, Brad Belnap

Deputy State Epidemiologist – Michael  
Friedrichs



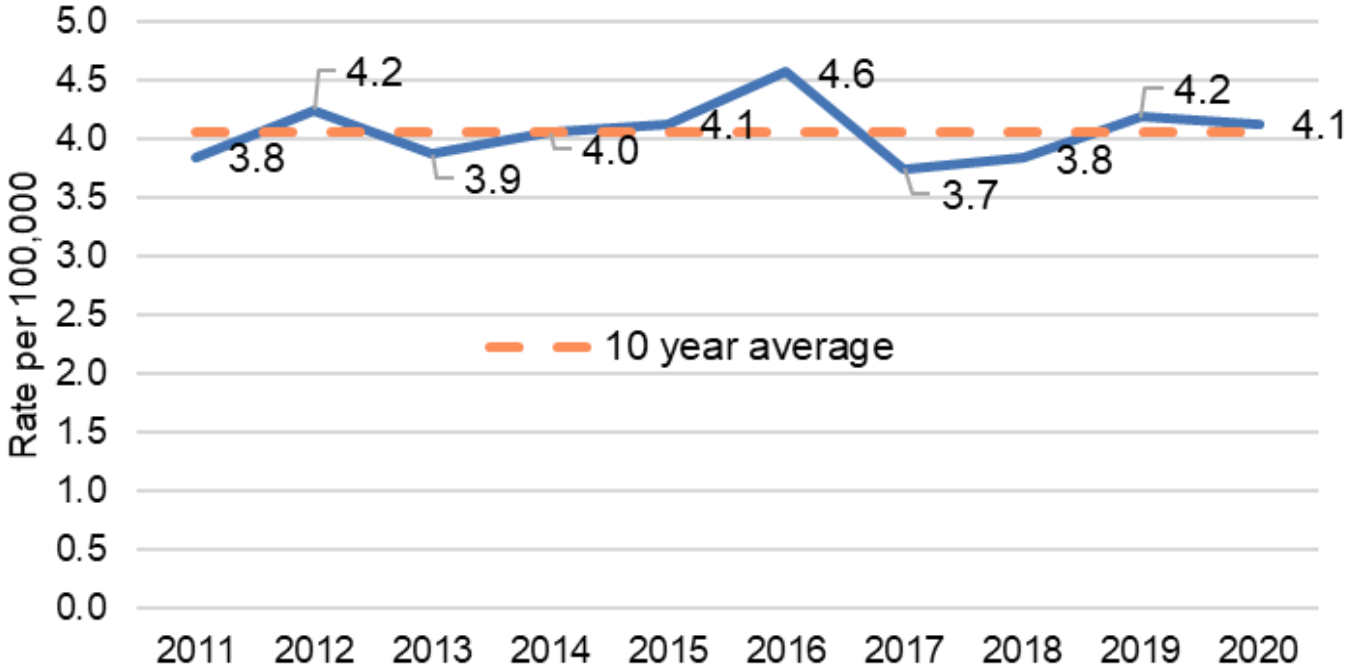
Utah Department of  
**Health & Human**  
Services



**HIV**

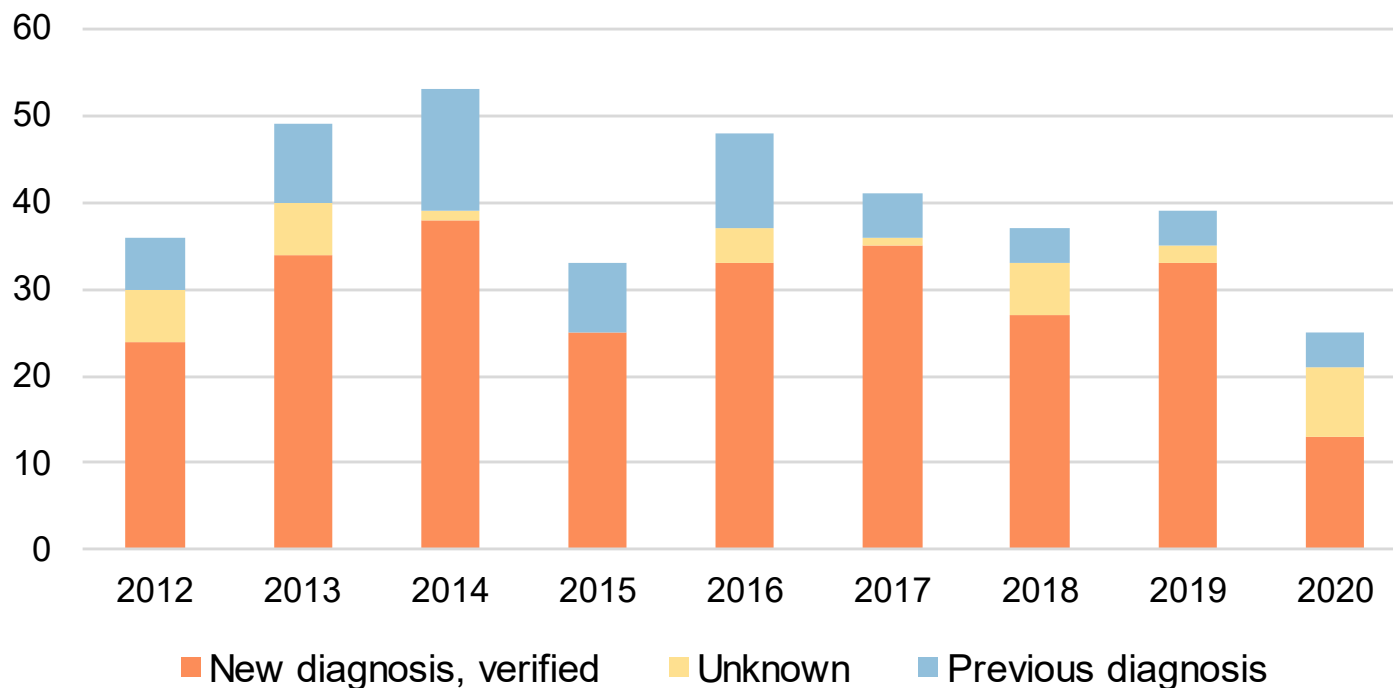
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# HIV incidence in Utah



# HIV Testing at Utah Department of Health Sites

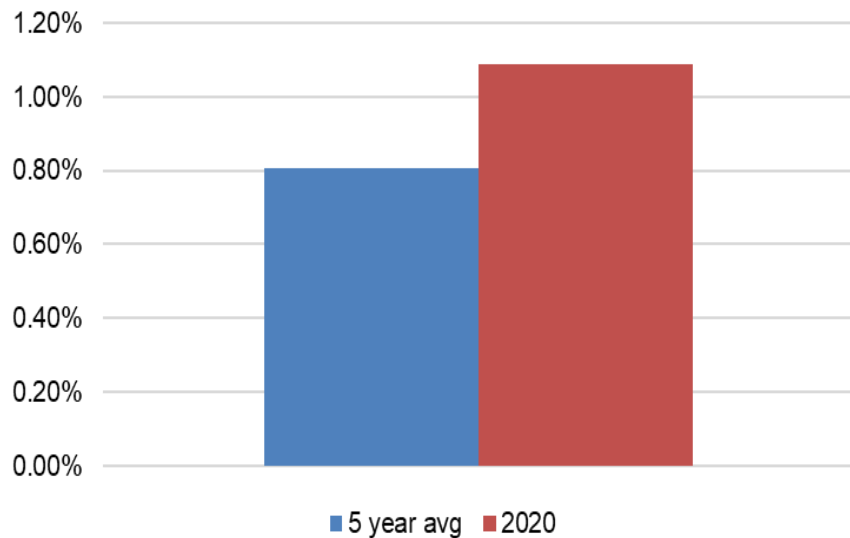
## HIV+ Test Results by Prior HIV Status



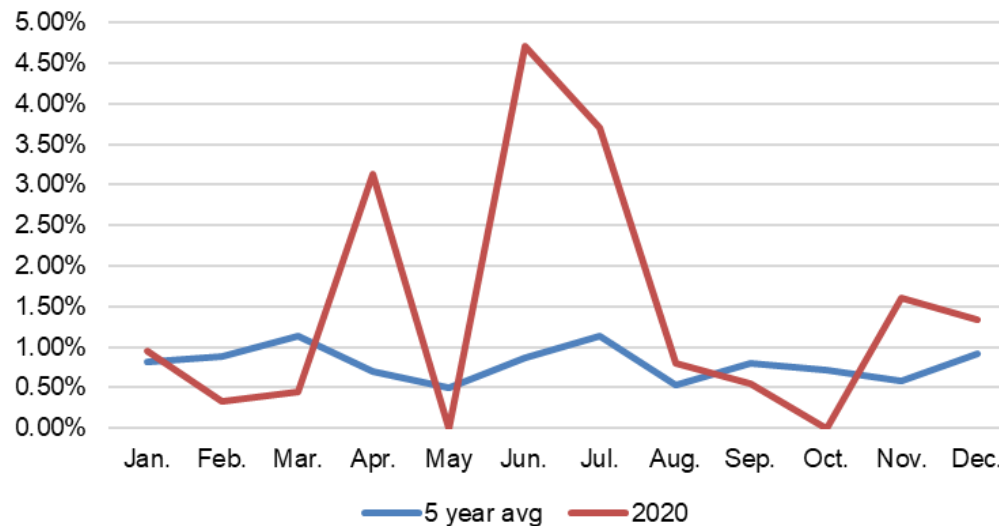


# Testing during COVID-19 at UDOH sites

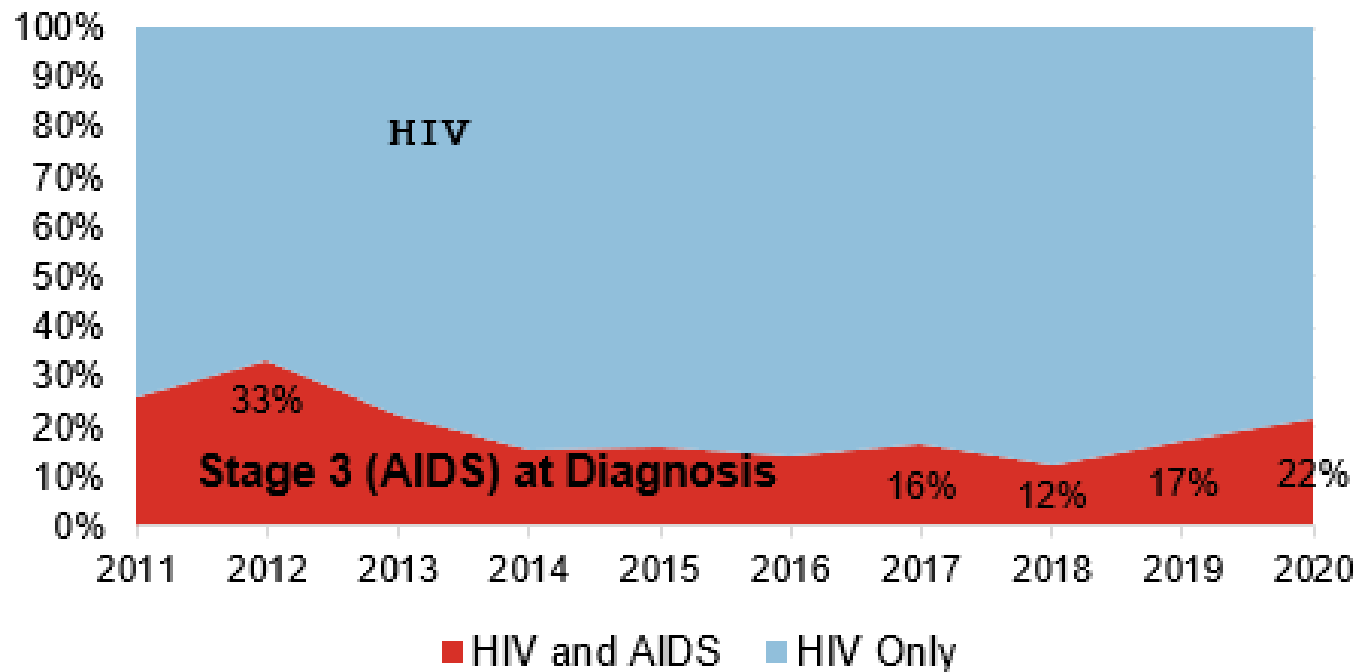
Percent Positivity, Utah, 2020 vs 5-year Average



Percent Positivity by Month, 2020 vs 5-year Average



# AIDS incidence in Utah



# Getting people to care during COVID-19 across Utah

