

Syndromic What? Sharing Data Outside of Public Health

3:45PM EST | November 17th, 2021 | 2021 SyS Symposium

Moderator: Mayank Modi, MD – Medical University of the Americas

Presenters:

Gabriel Ann Haas, MPH – Kansas Department of Health and Environment

Kellie Wark, MD, MPH – University of Kansas Medical Center

Margaret Cullather, MPH – American College of Emergency Physicians

Laura Fox, MPH – Maricopa County Department of Public Health and Arizona Department of State Health Services

Paul Iniguez, B.S., M.A. – NOAA/NWS Phoenix, AZ

Aaron Gettel, MPH – Maricopa County Department of Public Health



Council of State and Territorial Epidemiologists



Gabriel Ann Haas, MPH - Kansas Department of Health and Environment
&
Kellie Wark, MD, MPH - University of Kansas Medical Center





Awareness of Syndromic Surveillance Amongst Kansas Emergency & Urgent Care Clinicians

Gabriel Ann Haas, MPH & Kellie Wark, MD MPH
Syndromic Surveillance Symposium
Nov. 17th 2021

Background

- 117/139 ED's for almost **98% coverage** of KS ED visits in ESSENCE. >90% within 48hrs of visit. **5** Urgent Care clinics onboarded
- Biosense Only State, **Early Adopter**
- One of our recent program related goals to improve hospital engagement for SyS

Kansas Counties ED Reporting Status



Background

Syndromic Surveillance depends directly upon accurate & timely EHR documentation by clinicians

- Degree to which clinicians are aware this system is in place at all, or that their documentation is monitored for public health, is largely unknown
- Reliability of case definitions reliant on clinician documentation often flawed:
 - Documentation audits reveal large (>50%) discrepancies in ICD codes and actual diagnosis, with **greater experience** associated with **lower accuracy** of billing codes (1-3)
 - Billing codes perceived as negatively impacting day-to-day work, minimally impacting patient care, with perceived irrelevance to clinical care (4-5)
 - No standardization of EHR entry (4)
 - Transmission of contextual factors still relies on past surveillance tools (telephone, fax) --> **if clinicians were aware documentation was utilized for more than administrative billing purposes, would they be more apt to include key contextual or social factors?**

1. MacIntyre C et al Aust NZ J Public Health; 1997, 2. Peabody J. et al. Medical Care; 2004, 3. Farzandipour M. et al. Int J Inf Manage. 2010, 4. Watzlaf et al. 2007, 5. Butz et al. 2016

Methods

Anonymous survey

- 29 questions, ~ 7-10 minutes
 - **Demographics**, training, ED-type (academic, urban, rural)
 - **Knowledge** (purpose public health and syndromic surveillance, coding)
 - **Perceptions** (factors & barriers to documentation, LHD alerts, educational initiatives)
- Pilot tested survey w/ 9 physicians, revised 3 times based on feedback

Dissemination

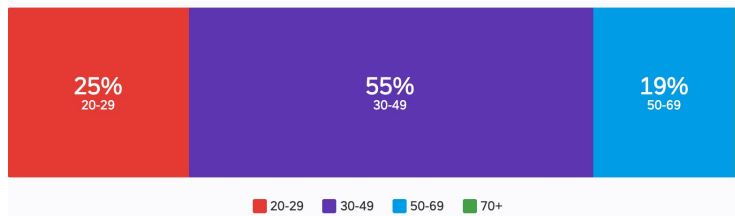
- Dr. Wark – survey requests to KS EM, FM, IM providers (KS Board of Healing Arts licensed providers, no database of ED-clinicians)
- Academic partners – sent to KS American College of Emergency Physicians (KS-ACEP) listserv
- 8/2/21 – 10/29/21

Results

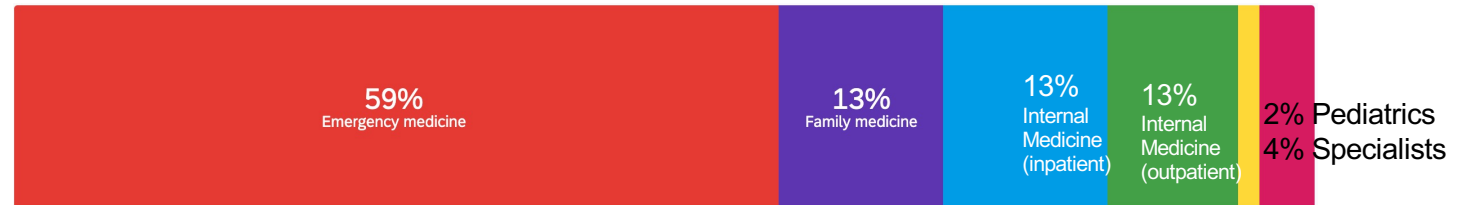
111 respondents

Estimated Response Rate:
 ~10-15%

- Age



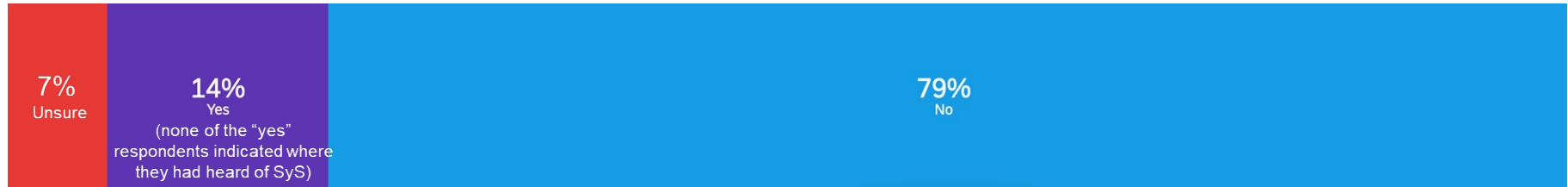
- Specialty



- Facility type (25/106 counties: **8** urban or semi-urban, **17** rural)



Have you heard of syndromic surveillance?



- Components **able to be** monitored at public health level:
 - 32% ICD codes
 - 27% unsure
 - 20% de-identified patient data
 - 8% free-text fields (CC, triage notes)
 - 8% provider assessments (HPI, assessment & plans)
 - 5% identifiable patient data
- **Timeliness** of data retrieval after ED visit:
 - 74% unsure
 - 5% Less than 12 hrs
 - 9% 12-48hrs
 - 4% 2 days to 1 week
 - 5% multiple weeks
 - 3% Not currently possible

Results

Data which **can be** monitored from EHR at public health level

- **16% unsure**
- 10% critical diseases & only via state mandate of importance
- 9% reportable diseases
- 8% emerging conditions of interest
- 7% each: environmental exposures & adverse events
- 6% trauma (child abuse, rape)
- 5% each: acute conditions, injuries and syndromes
- 4% mental health related visits
- 3% preventative & circumstantial visits
- <1% provider-to-provider documentation

Results

Frequency contextual data documented in Chief Complaint or Reason for Visit (e.g., mechanism of injury)

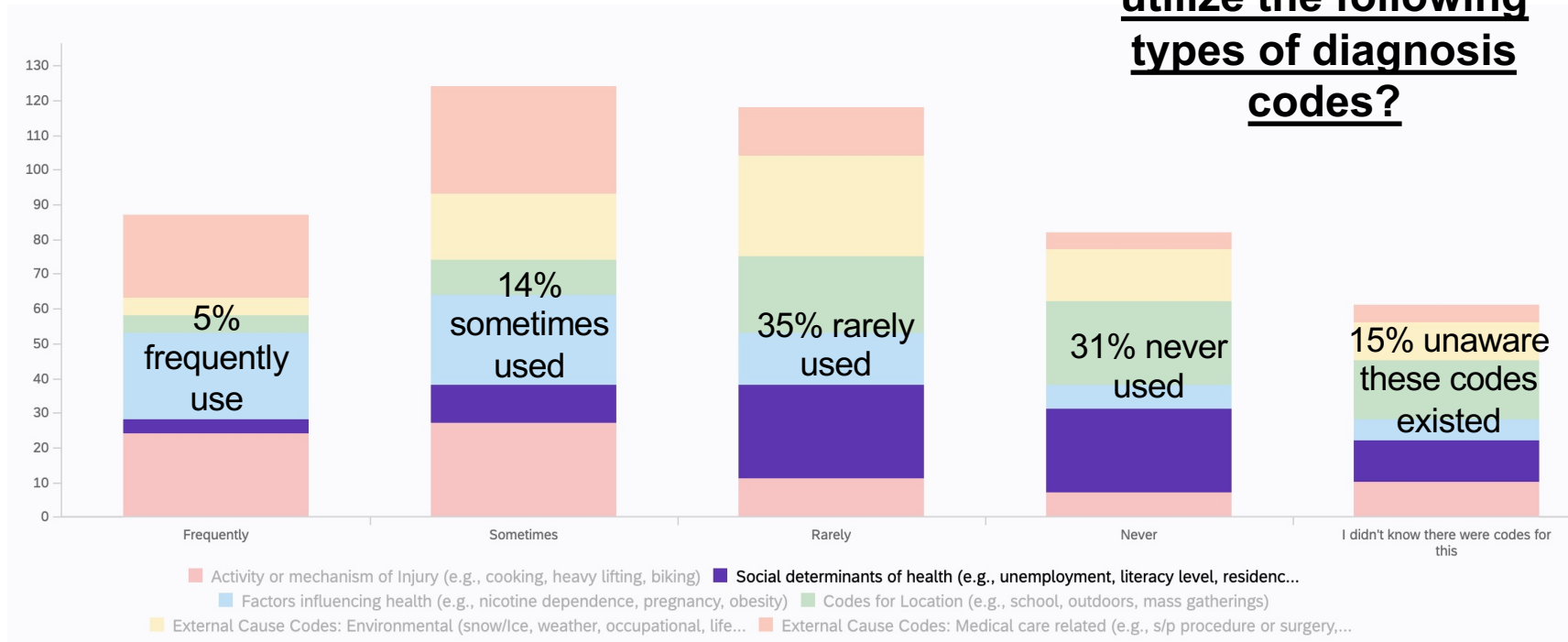
- 36% frequently
- 24% sometimes
- 12% a nurse or receptionist does this
- 15% always
- 10% rarely
- 3% never

Results

Least utilized:

- social determinants of health

**How often do you
utilize the following
types of diagnosis
codes?**

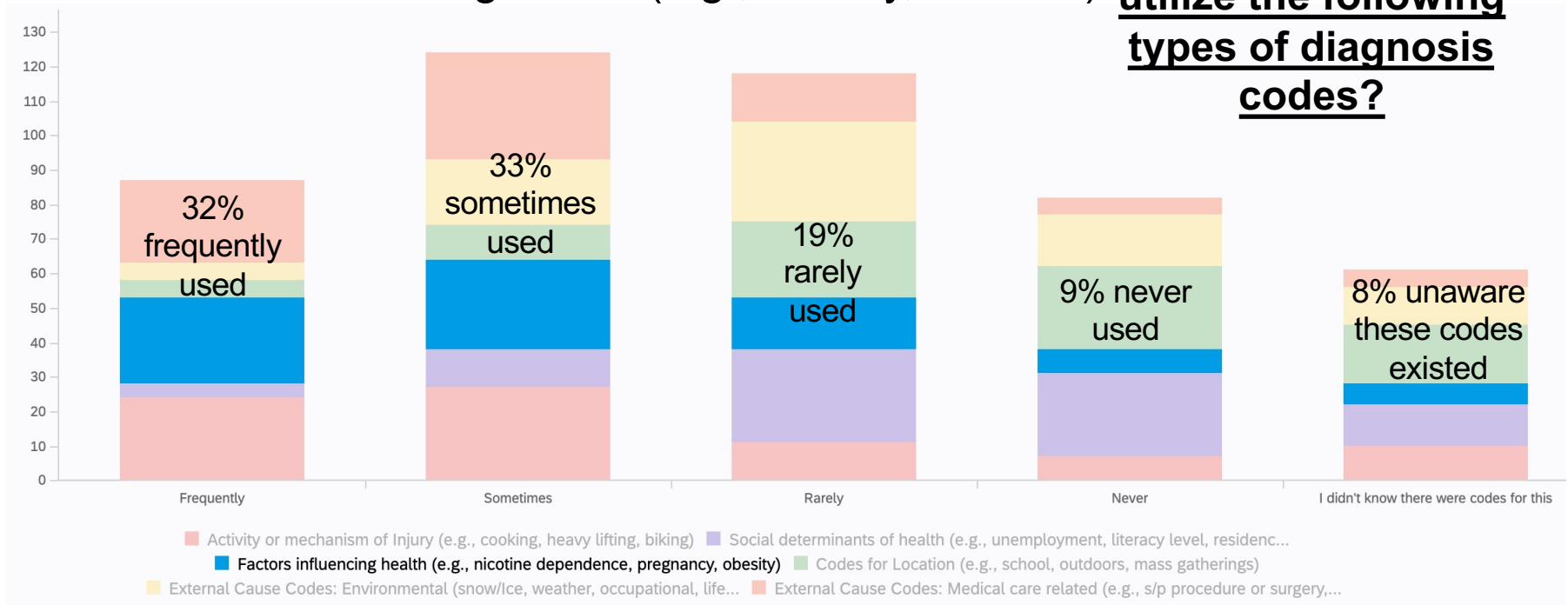


Results

Most Utilized:

- Factors influencing health (e.g., obesity, nicotine)

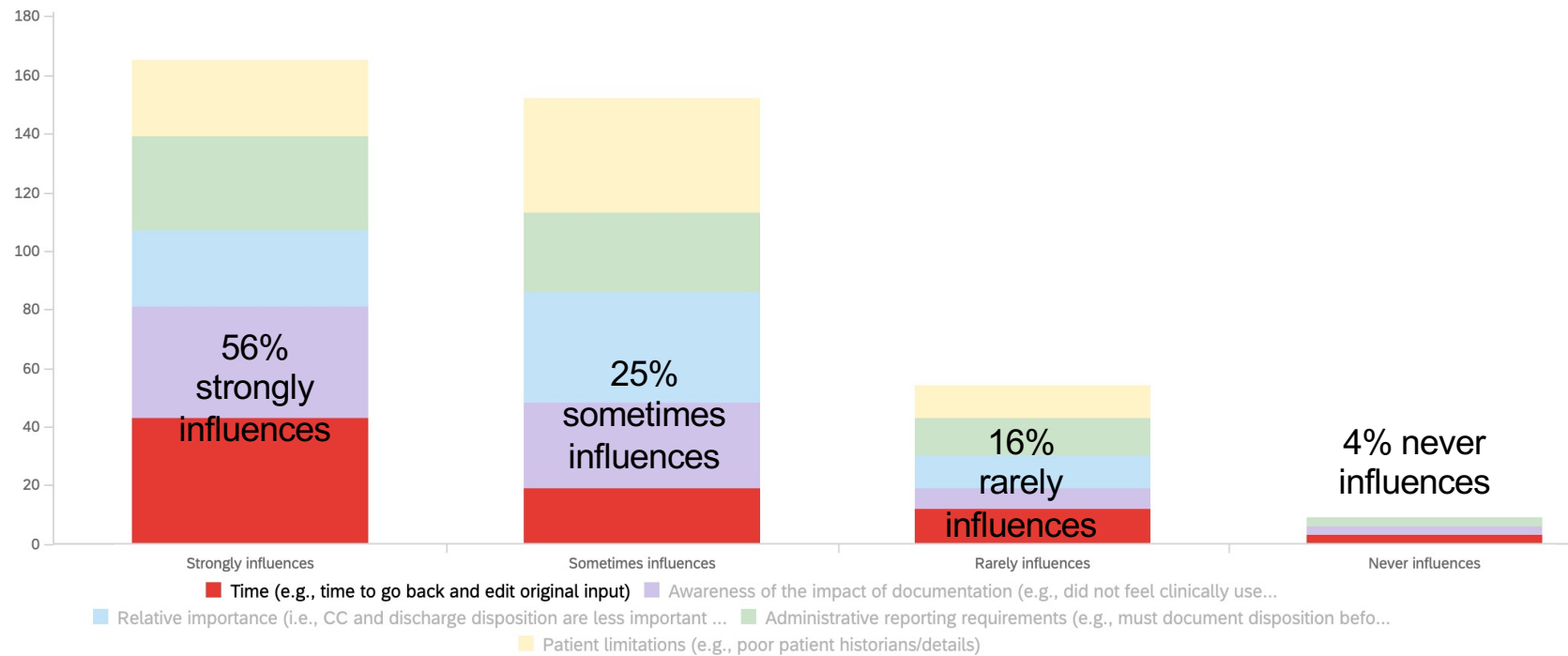
**How often do you
utilize the following
types of diagnosis
codes?**



Results

Most influential factors impacting documentation:

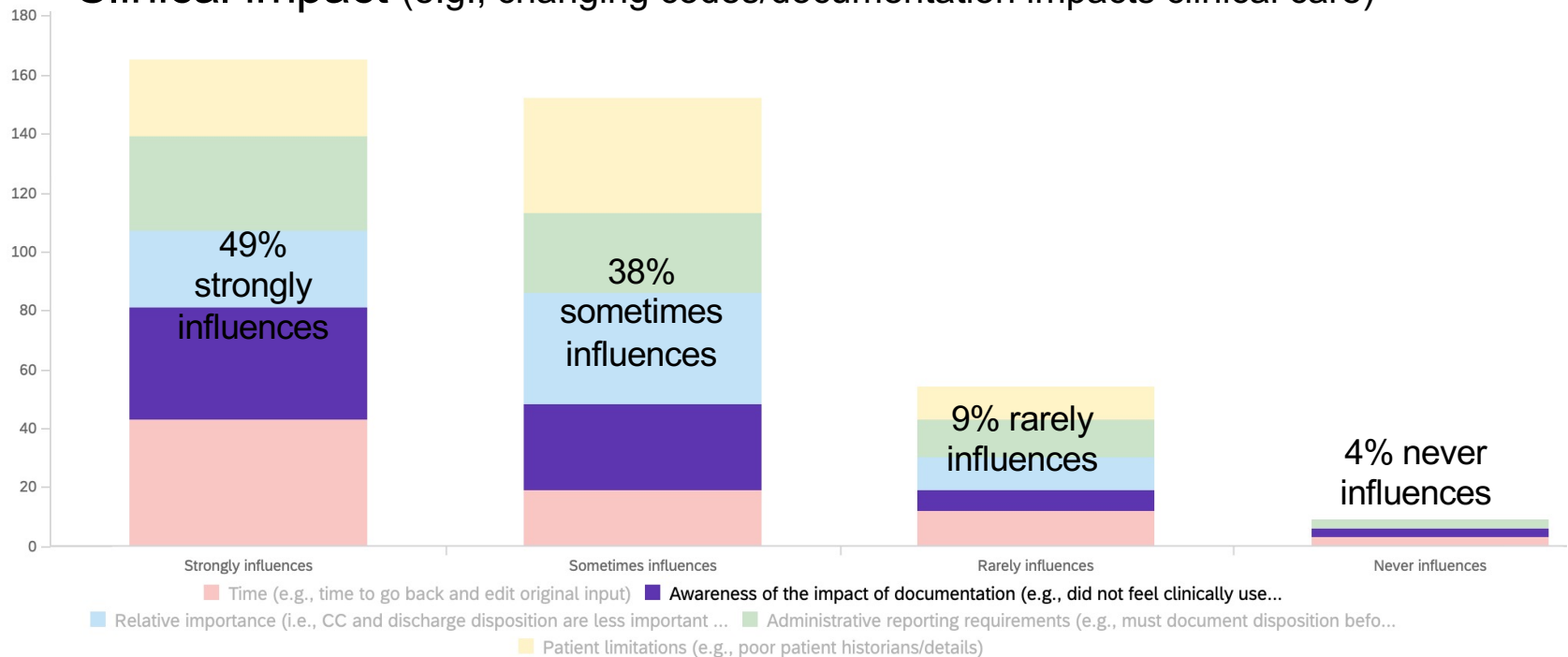
- Time



Results

Most influential factors impacting documentation:

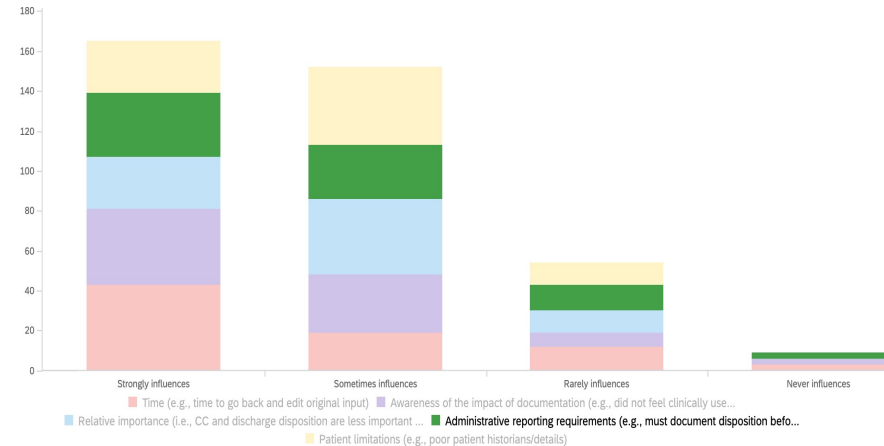
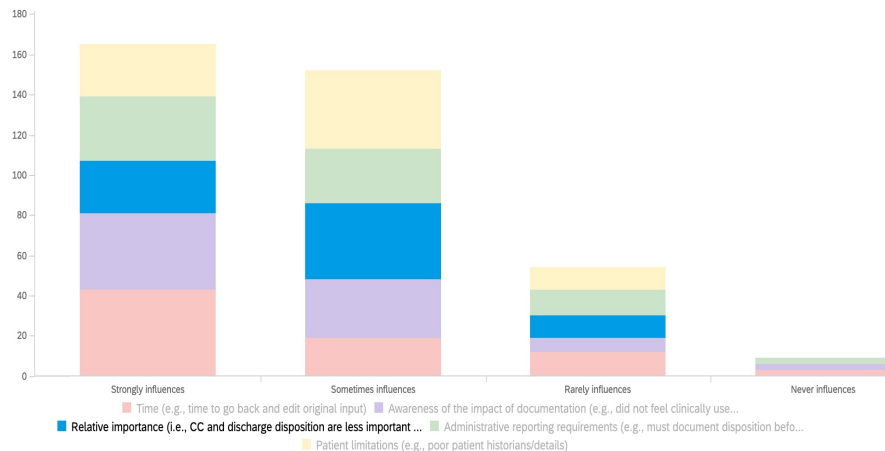
- Clinical impact (e.g., changing codes/documentation impacts clinical care)



Results

Less influencing factors impacting documentation:

- Perceived importance
- Administrative reporting requirements



Results

Perceived importance of being aware of public health surveillance trends

- **36% always important → 48% frequently important → 15% sometimes**

Perceived importance of improving data quality for public health surveillance

- 28% critically important → 36% very important → 32% moderately important → 4% slightly important → 0% not important

“If you knew your documentation and coding impacted public health action and outbreak detection, would you be more inclined to improve the most pertinent parts of your documentation?”

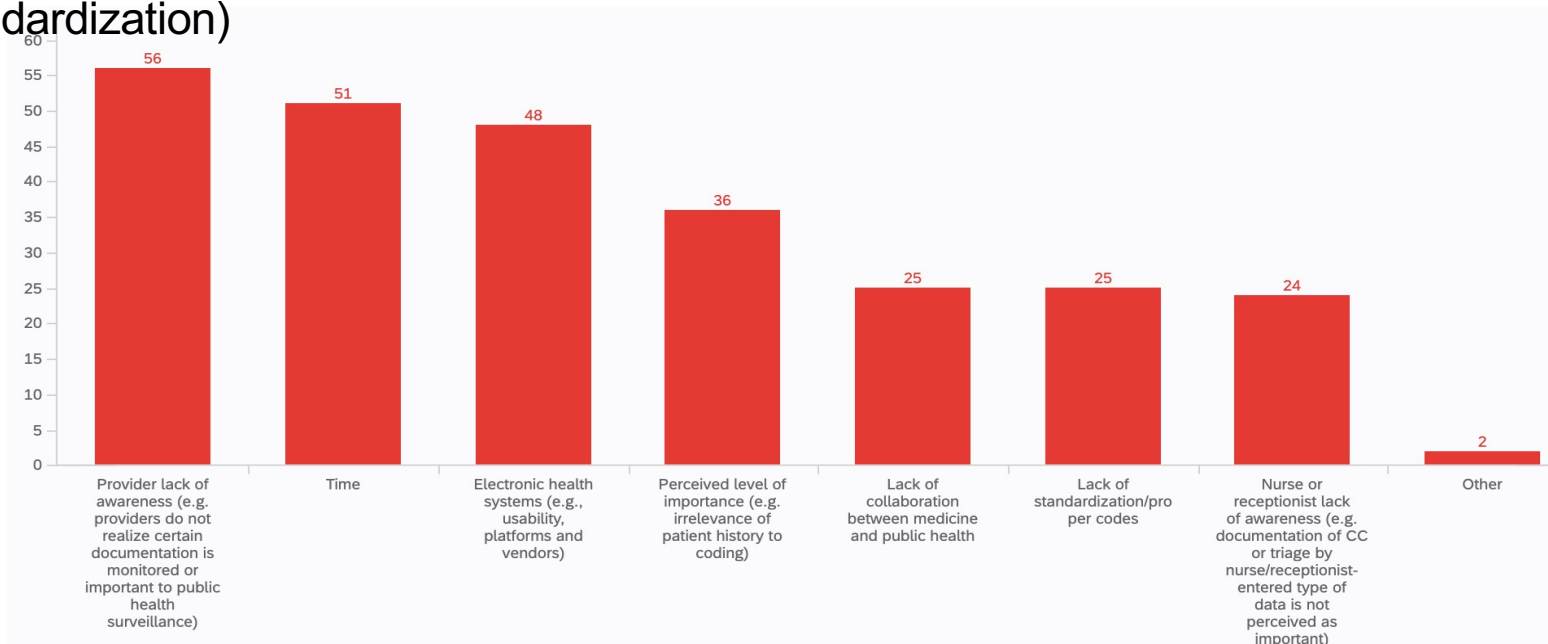
- **61% yes → 37% maybe → 2% no**

“If you knew specific codes or language were more likely to trigger an event of concern, would you be more apt to use those codes or language of interest?”

- **70% yes → 29% maybe → 1% no**

Results

Perceived barriers to improving documentation and coding as it relates to public health surveillance: **most important factor was provider lack of awareness** (perceived more important than time, EHR platforms, public health-healthcare collaboration, coding standardization)



Results

96% Of Respondents were interested in learning more about SyS data

Who would you like to hear from? (top 3)

State Health Department (48%)

Local Health Department (43%)

Chief Medical Officer / Medical Staff (37%)

National Officials or Experts (32%)

Hospital Administration (7%)

Other – Please specify: EMR Vendor (1.5%)

In what format? (top 3)

- 1) In-person didactics (grand rounds, conferences)
- 2) Listserv (e-mail)
- 3) Website or print publication (tie)

Discussion

- ED providers are largely unaware documentation and codes are used for public surveillance purposes, and this **lack of awareness was deemed by physicians as more important than time or utility of EMR** in factors needed to improve data quality
- Critical information that would be typically captured and coded into a key syndrome is often missing, but **providers are unaware of what types of information may be monitored** or useful (and where)
- Clinicians likely more invested than administration/IT in surveillance for public health outcomes and this is an opportunity for frontline clinicians to see their own documentation at work

Action

- **Participatory research approach to engage frontline workers**
 - Heightened awareness among ED clinicians
 - Provider participating to improve data, coding, data representation, use of hashtags
 - Investigate reasons codes, language or documentation pertaining to events of public health interest are not utilized
 - Opportunities for applied public health research, academic-public health partnerships
- **Improved communication**
 - Initially opens channels of communication to target surveillance efforts (tipoffs, inquiry)
 - Feedback loop to clinicians → lower threshold for certain diagnostics (e.g., flu testing, stool cultures)
 - Investigate preferred communication channels to share important trends back to providers, especially in times of crisis

Plans to present at an KS- ACEP chapter meeting and create a listserv based on findings

Limitations

Limitations & Future Directions

- Response bias
- Limited response rate of mid-level providers
- Survey instrument

Future directions: other hospital staff, national distribution, streamlined survey tool, local & national partnerships



Thank You

Questions can be e-mailed to gabe.haas@ks.gov

Additional thanks to partners at the University of Kansas Health System's Department of Emergency Medicine and those who piloted our survey to provide feedback



Maggie Cullather, MPH, CPH
American College of
Emergency Physicians



Leveraging NSSP Data to Create Emergency Department COVID-19 Data Visualization Tool

Presenter: Margaret Cullather MPH

Authors: Margaret Cullather MPH, Dhruv Sharma MS, Sandy Schneider MD,
Loren Rives MNA

Background

- Decrease in ED visits resulted in decreased revenue
 - ▶ Need to match staffing with anticipated volume
- Need more PHE information for first responders
- ACEP and Nssp Partnership
 - ▶ CDC Cooperative Agreement 1 NU50CK000570

Methods

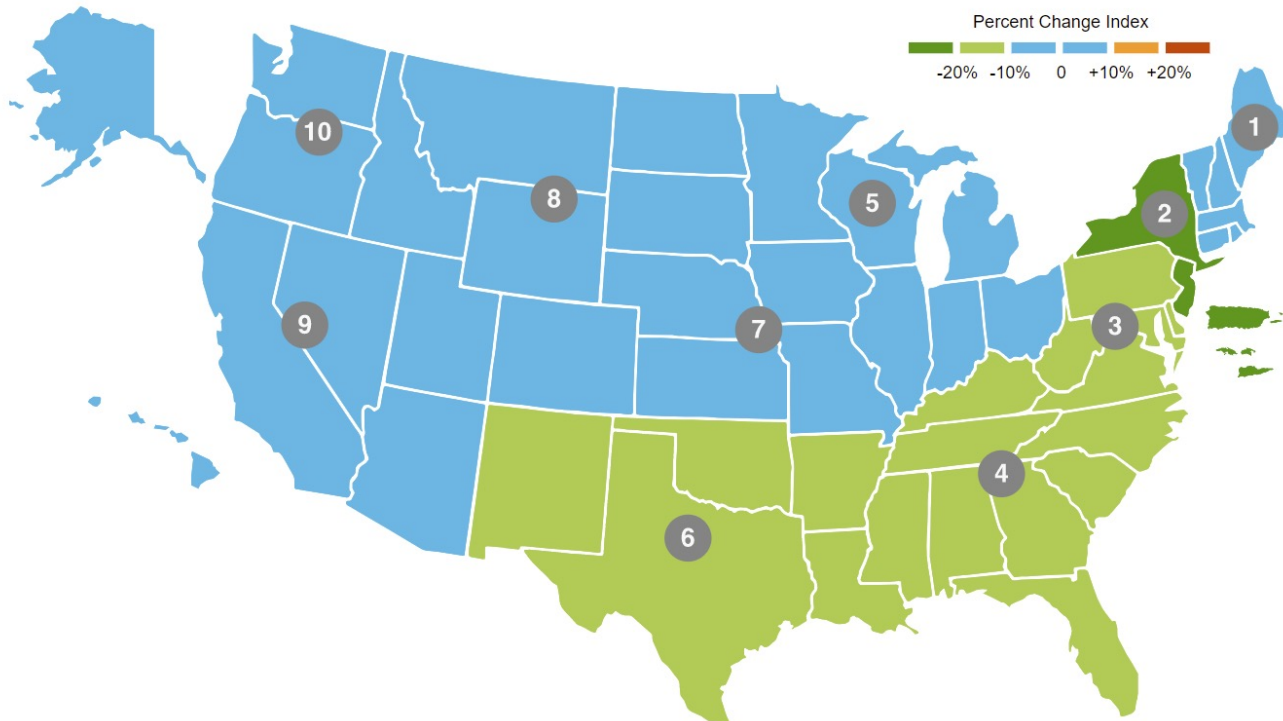
- Aggregate data on country regions
 - ▶ ED volume
 - ▶ COVID-19 Discharge Diagnosis
 - ▶ COVID-19-like illness
 - ▶ Influenza Discharge Diagnosis
 - ▶ Influenza-like illness
- Development of ACEP Data Visualization Site
 - ▶ Interdisciplinary team

Results

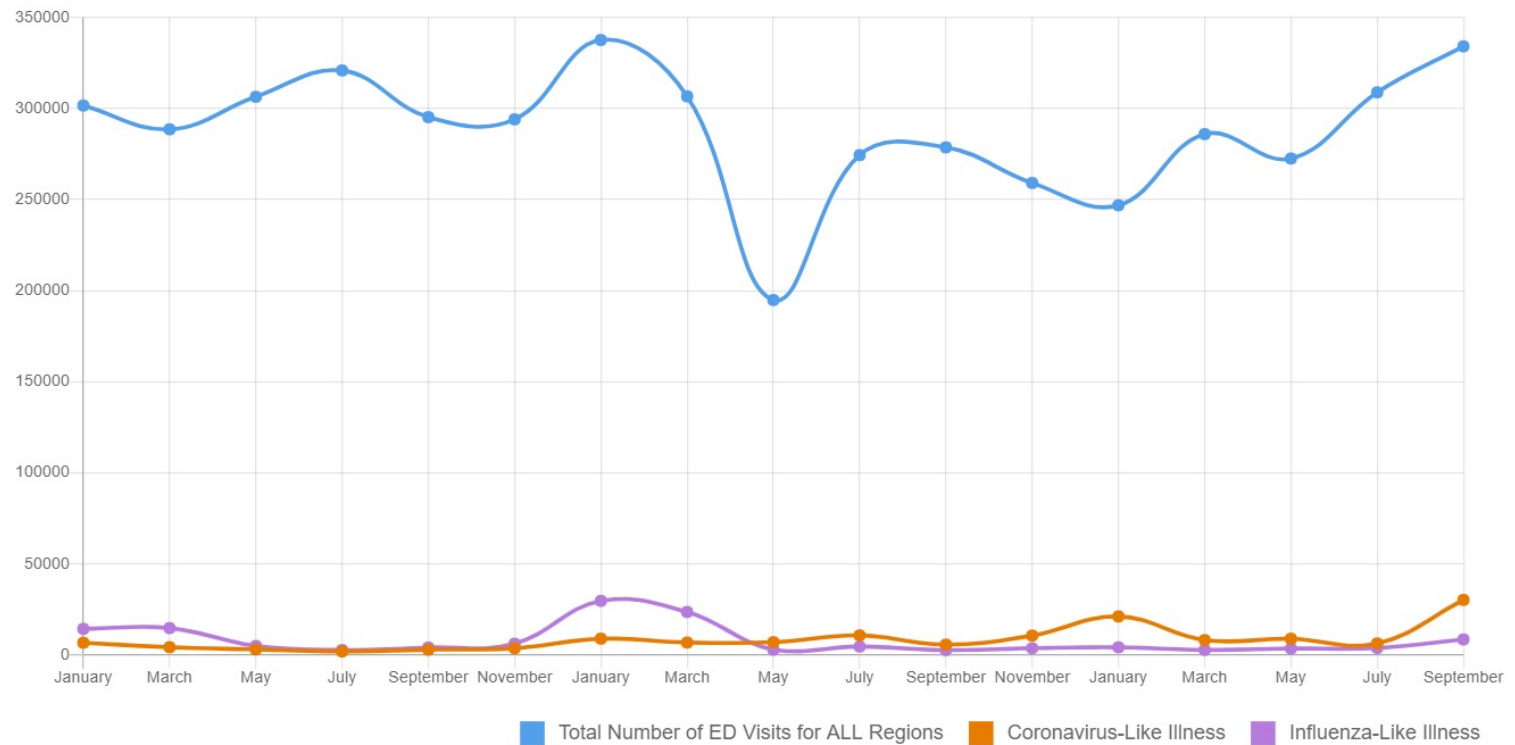
- Data available at:
 - ▶ National and Health and Human Services (HHS) regional resolutions
 - ▶ Several timescales such as 7-day, 30-day, 90-day, this year, previous year
- Data obtained from CDC through NSSP (01/01/2019-10/27/2021)
 - ▶ Updated weekly

COVID-19 At A Glance

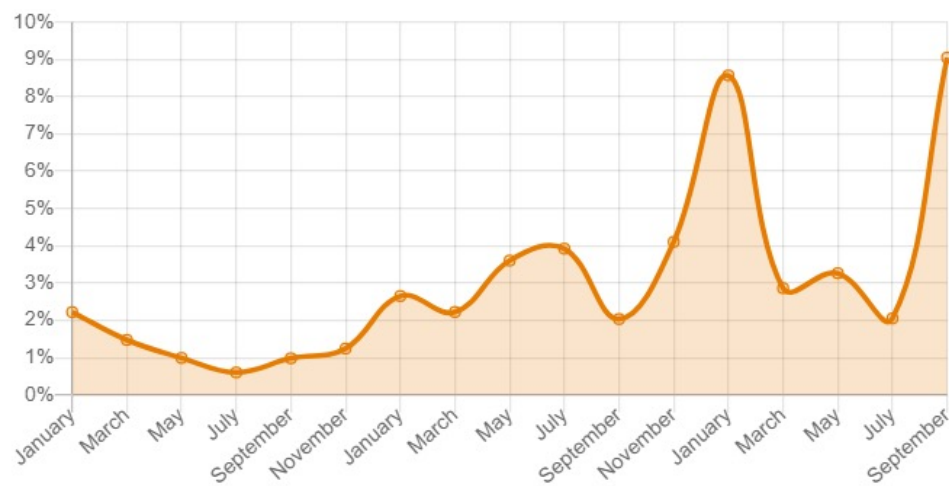
7-day Percent Change in COVID-like illness



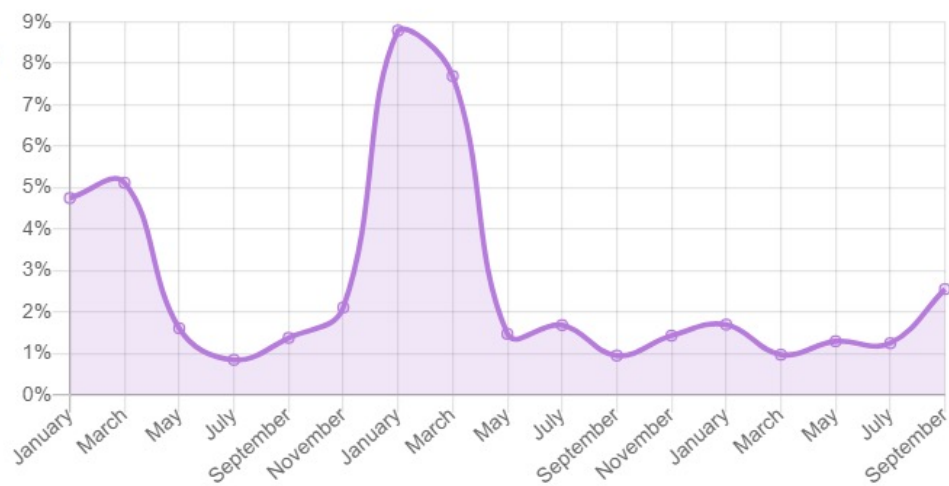
Reported Trends All Dates



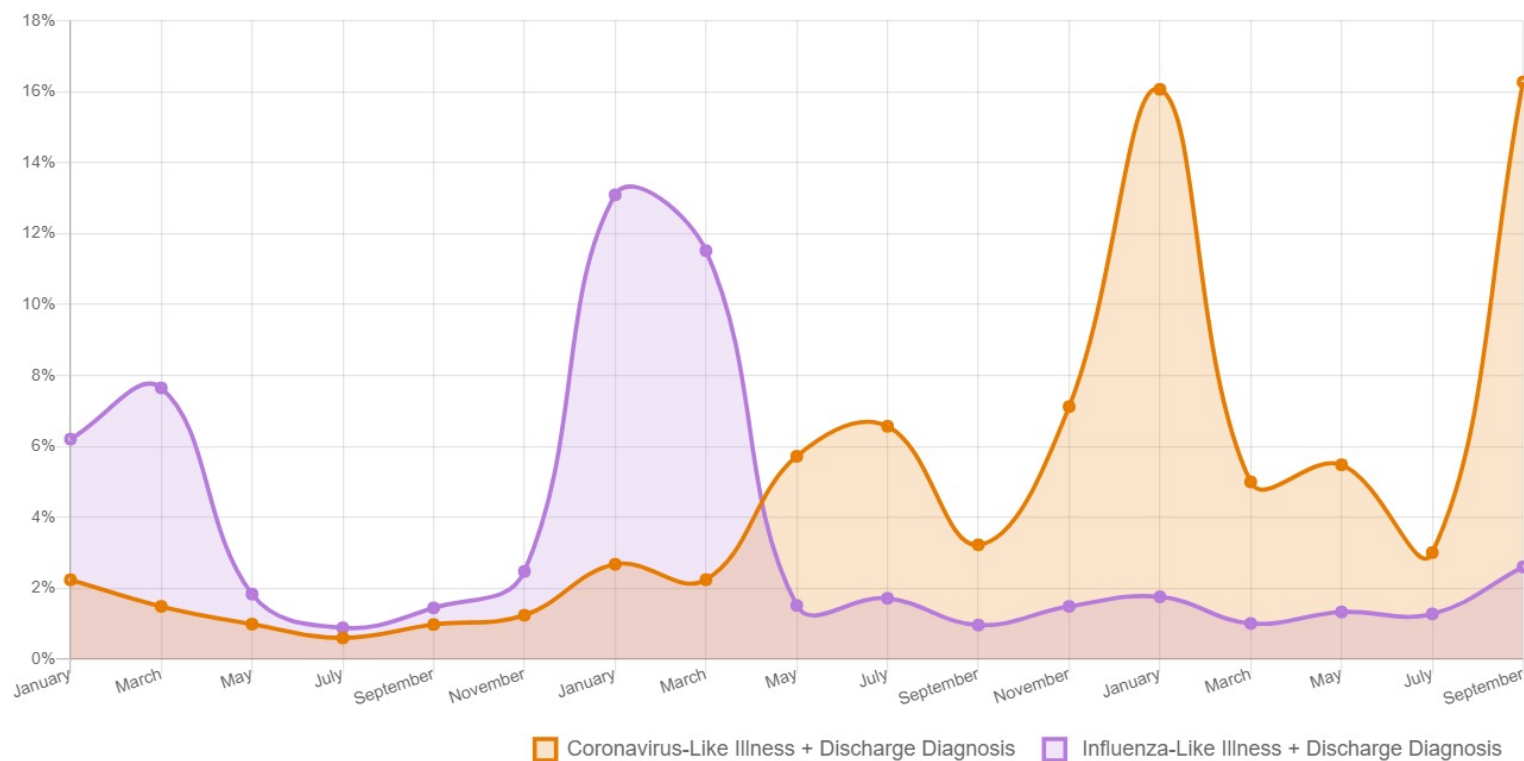
Coronavirus-Like Illness since January 1, 2019



Influenza-Like Illness since January 1, 2019

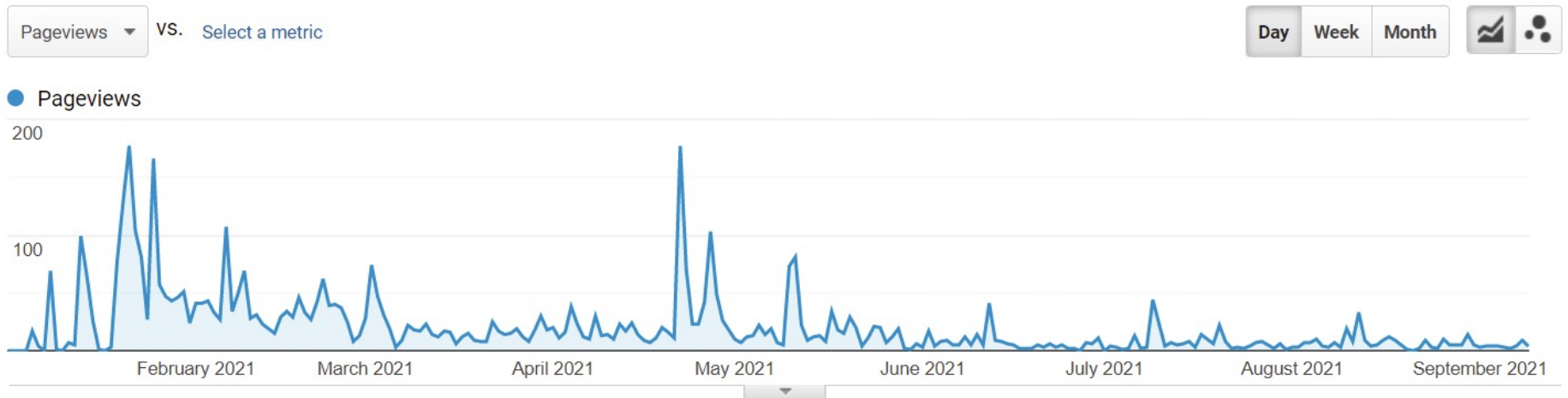


Combine Coronavirus-Like and Influenza-Like Illness + Discharge Diagnosis



Results

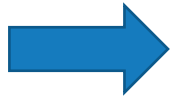
- 5,000 webpage visits
 - ▶ 4,000 unique visits
- Beneficial during recovery period and Delta-variant Wave
- Data most frequently accessed during times of COVID-19 surges
- Emergency physicians who utilize this data often more supportive of NSSP efforts



Conclusion



RAPID PHE DATA
VISUALIZATION



MORE INFORMED
FRONTLINE



BETTER PATIENT &
CLINICIAN
OUTCOMES



Laura Fox, MPH - Maricopa County Department of Public Health and Arizona Department of State Health Services

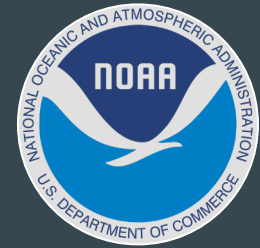
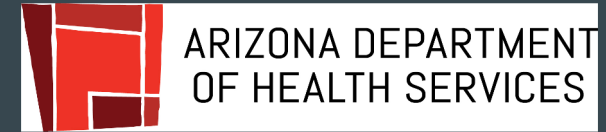


Paul Iniguez - NOAA/NWS Phoenix, AZ

Aaron Gettel - Maricopa County Department of Public Health



Bolstering Heat-Related Illness Surveillance in Arizona through Data Sharing Partnership with National Weather Service Phoenix Office



Presented by:

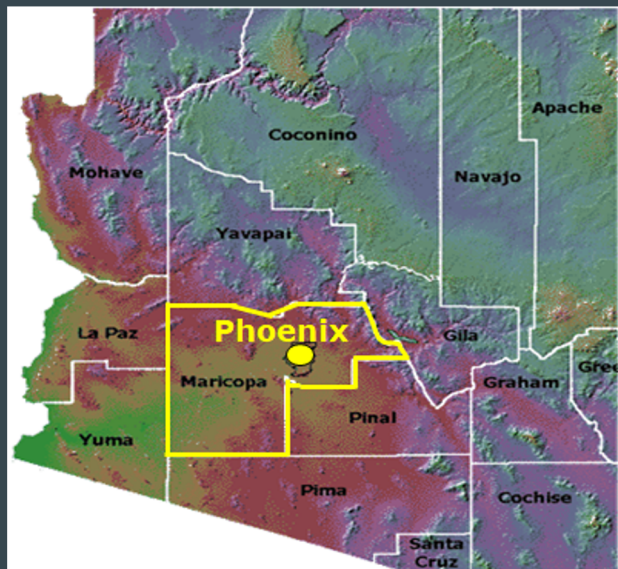
Laura Fox | Arizona Department of Health Services and Maricopa County Department of Public Health

Paul Iniguez | NOAA/National Weather Service - Phoenix, AZ

Aaron Gettel | Maricopa County Department of Public Health

Heat Surveillance in Maricopa County

One of the largest urban centers to experience the nation's most extreme heat.



Typical Year Mid-May thru 1st Week of October		
	Average	2020
Days where environmental temperatures $\geq 100^{\circ}\text{F}$	110	144
Days where maximum temperature is $\geq 110^{\circ}\text{F}$	26	53 15 days $\geq 115^{\circ}\text{F}$
Days where min. temp $\geq 90^{\circ}\text{F}$	13	28

Heat-related deaths reach record

High temperatures a factor in almost 500 deaths in 2020

Ian James Arizona Republic
USA TODAY NETWORK

The number of heat-related deaths in Arizona soared to a new high last year as people endured the hottest summer on record and the complications of the pandemic.

The deaths of at least 494 people were linked to heat during 2020, state health officials said this week, a preliminary number that may continue to grow as more deaths under investigation are resolved.

More than 300 heat-associated deaths have been confirmed in Maricopa County, a number that could also climb.

The statewide toll far surpassed the previous record of 283 heat-related deaths reported in 2019. Over the past five years, state figures show, heat has been linked to more than 1,500 deaths in Arizona.

change.

"We've seen very significant warming take place. And so as those temperatures go up, we have more health impacts," said Paul Iñiguez, science and operations officer for the National Weather Service in Phoenix. Comparing the extreme heat of last year to projections of future temperatures, he said, "it is essentially what you would expect a typical summer or a typical year to be in just a couple of decades."

But worsening heatwaves aren't the only hazards. Though emergency room visits peak on hotter days, Iñiguez said, people are still showing up at hospitals for heat illness daily throughout the summer.

"It doesn't have to be 115 degrees outside for there to be heat illness," Iñiguez said. "On the low and moderate days, you still can have people getting sick and people dying out there."

Officials with Maricopa County Public Health, who are still working on an annual report on heat-associated deaths, confirmed 308 deaths in the county that were either caused by or related to heat, and 25 other deaths that are still under investigation.

More than half the victims in the



A homeless encampment is seen outside the Human Services Campus in Phoenix. ELI IMADALI/THE REPUBLIC FILE

Low Income Home Energy Assistance Program (LIHEAP), increasing the supply of housing and allowing residents to defer rent and utility payments.

The Arizona Corporation Commission last year put in place a moratorium on power shutoffs for unpaid electricity bills, and it's unclear how regulators will address the issue when they revisit these rules.

Hondula said many solutions are known and what's needed is to work toward changes. For example, he said, "we are way behind in energy assistance" and home weatherization assistance for

Examining heat-related deaths that occurred indoors, Solis found that in 16% of those deaths, officials determined the victims had no air conditioning. And of those who did have air conditioning, it wasn't working in 60% of cases. She said more assistance is needed to help people in such situations, and gaps between programs need to be filled.

"Part of that gap happens because they're not eligible for many of our solutions that we have," Solis said. "They're not eligible for LIHEAP because they are in structures that are on wheels and they're not considered homes according to the federal guidelines."

A greater focus on housing and mitigating vulnerability could help people "who are falling between the cracks," she said.

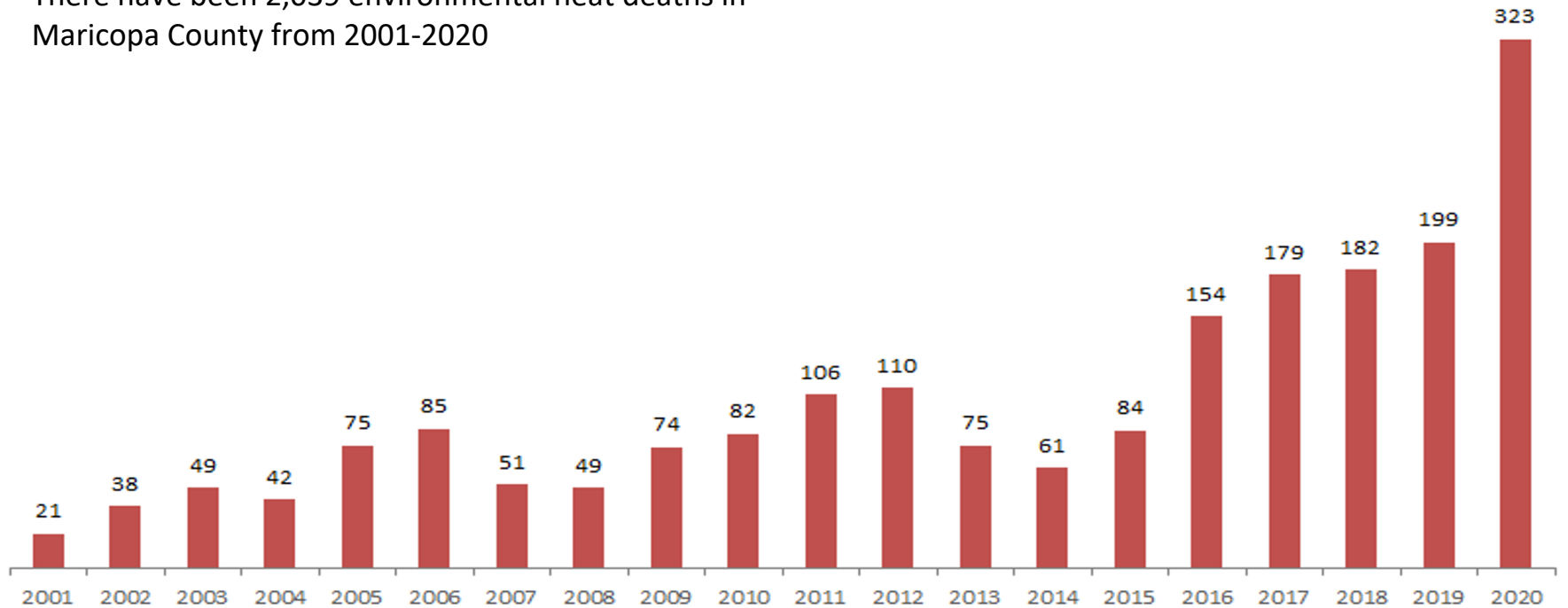
"There's not a one-size-fits-all silver bullet that can take care of this. There are many," Solis said.

For example, she said, setting up a heat alert system in the home of someone who lives alone could help relatives keep tabs on the safety of loved ones on the other side of town.

Cities and electric utilities also have vital roles to play in planning to reduce

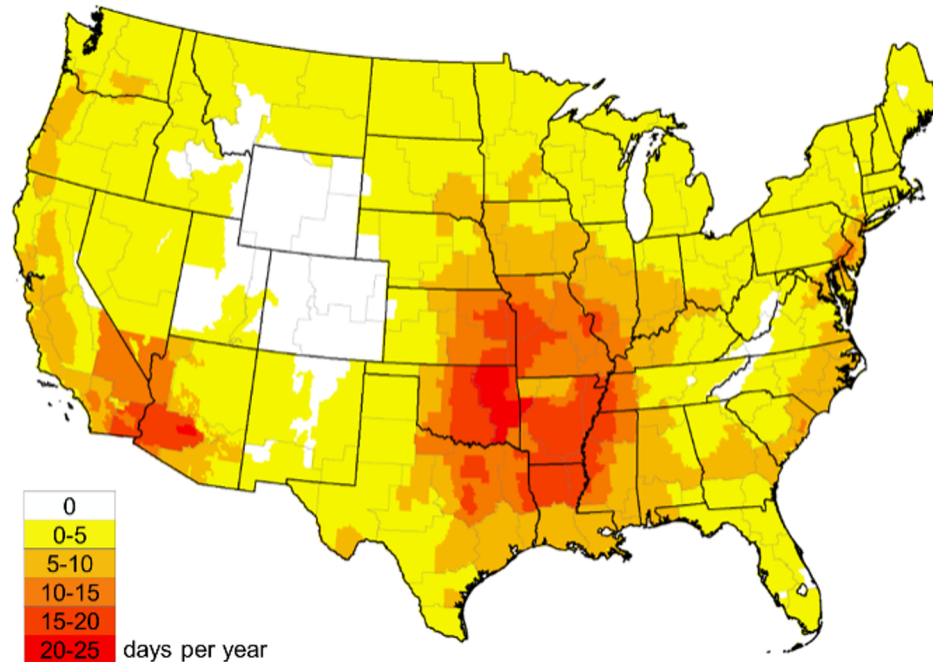
Heat Surveillance in Maricopa County

There have been 2,039 environmental heat deaths in Maricopa County from 2001-2020



NOAA/NWS Average Annual Heat Alert Frequency

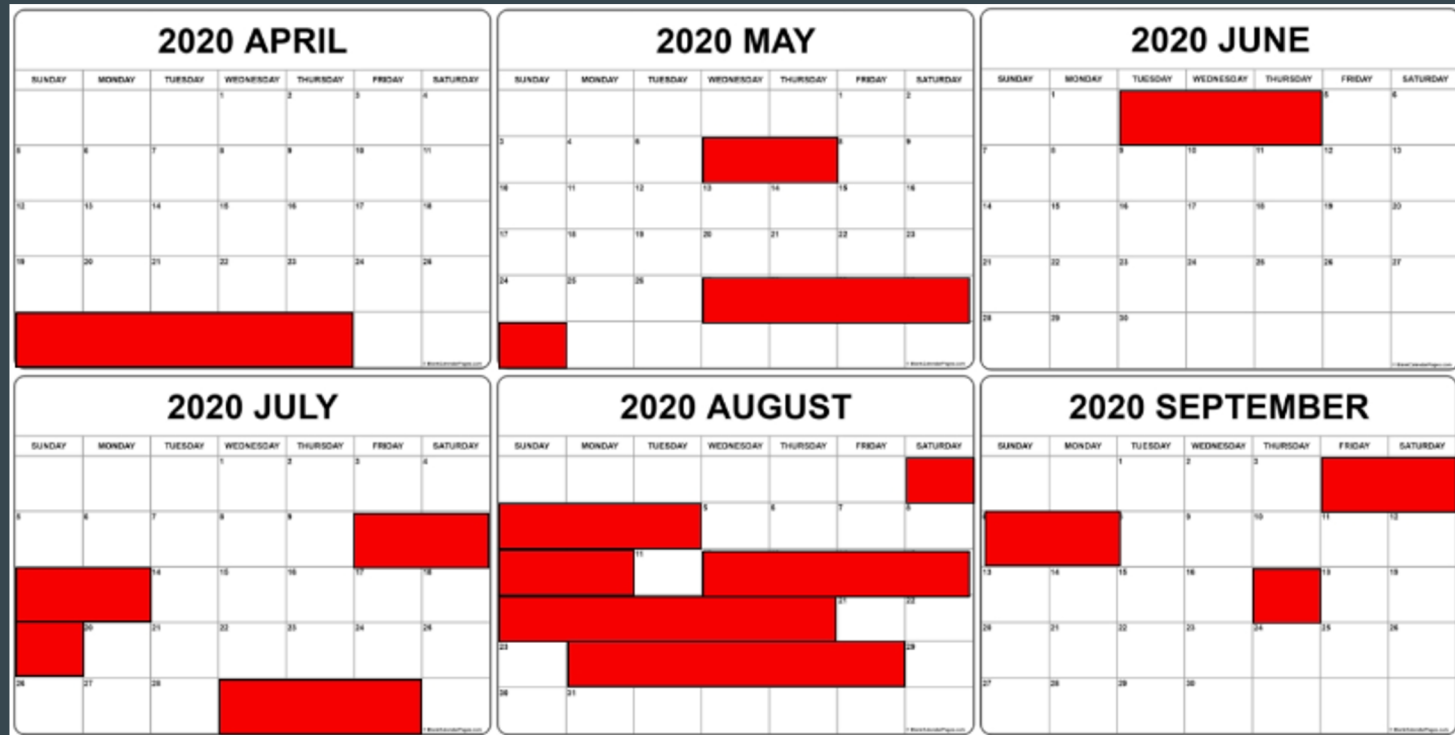
c) Heat alert frequency (warnings and advisories)



NOAA/NWS Heat Warnings in Phoenix

48 Days

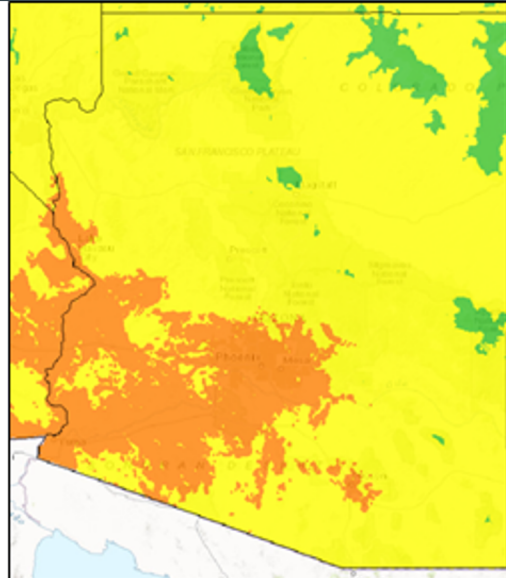
*# of Heat Warning
Days in 2020*



NOAA/NWS HeatRisk

Category	Meaning
Green	No Elevated Risk
Yellow	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Simple Color Scale



Applicable to All Areas

What is it?

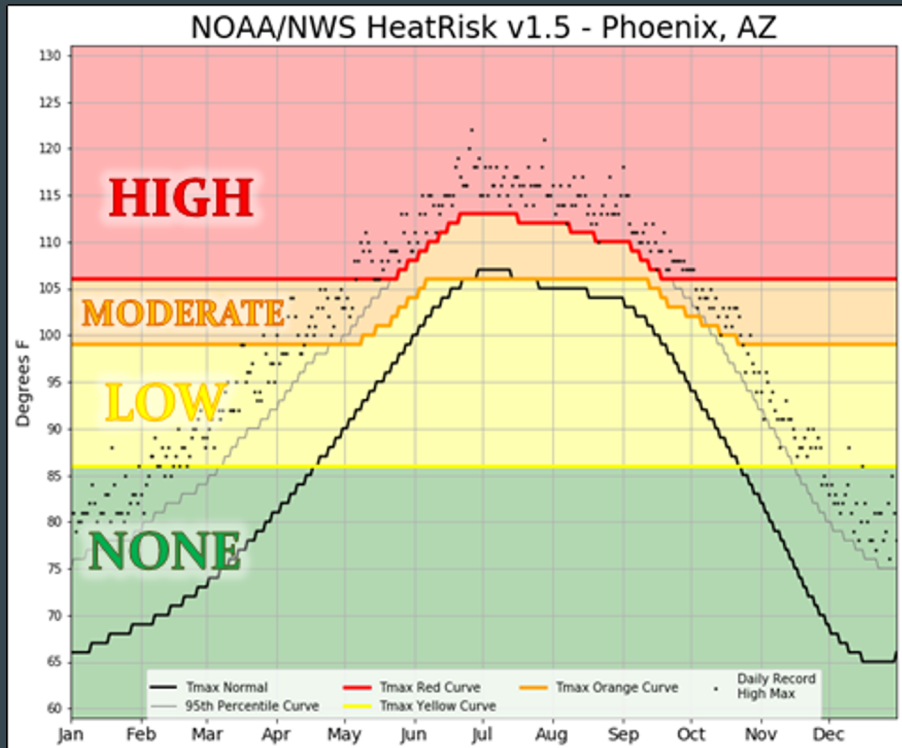
- Simple framework to build consistency and science into our messaging efforts & legacy products.
- Gives customers/partners flexibility to act when they need to.
- Still considered experimental.

How does it work?

- Puts NWS forecast temperatures into a climatological context based on location & time of year.
- Considers duration of expected heat.
- Humidity is indirectly accounted for in elevated low temperatures.

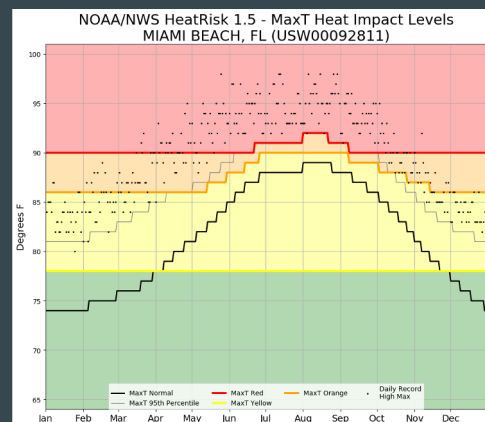
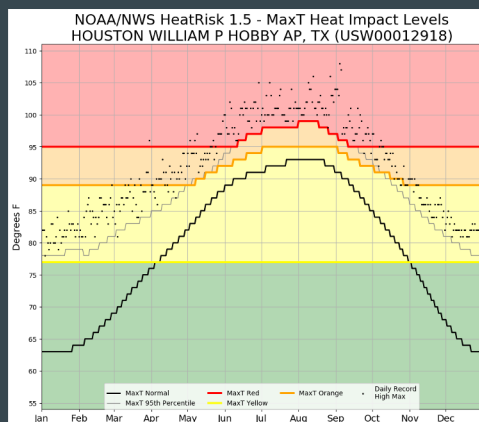
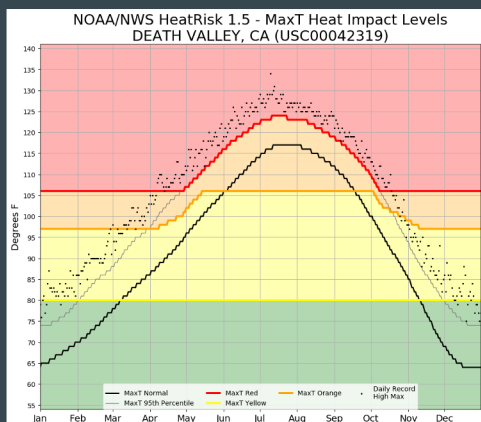
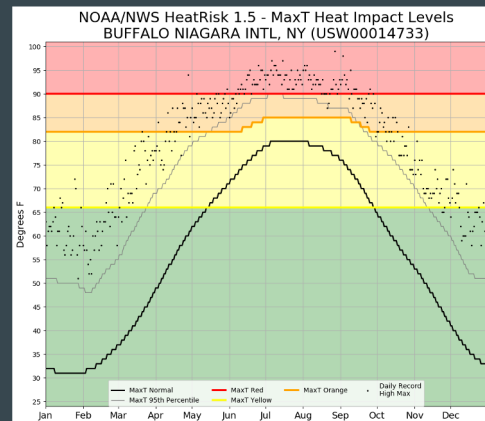
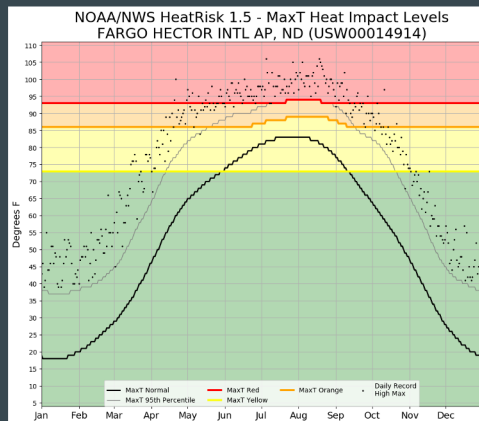
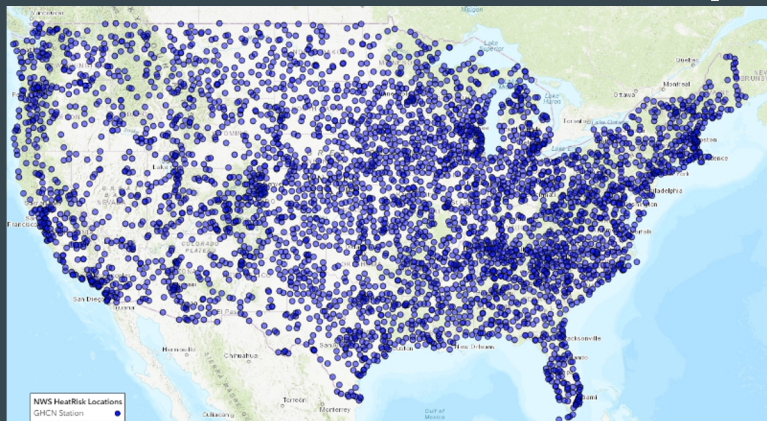
<https://www.wrh.noaa.gov/wrh/heatrisk/>

NOAA/NWS HeatRisk - How?



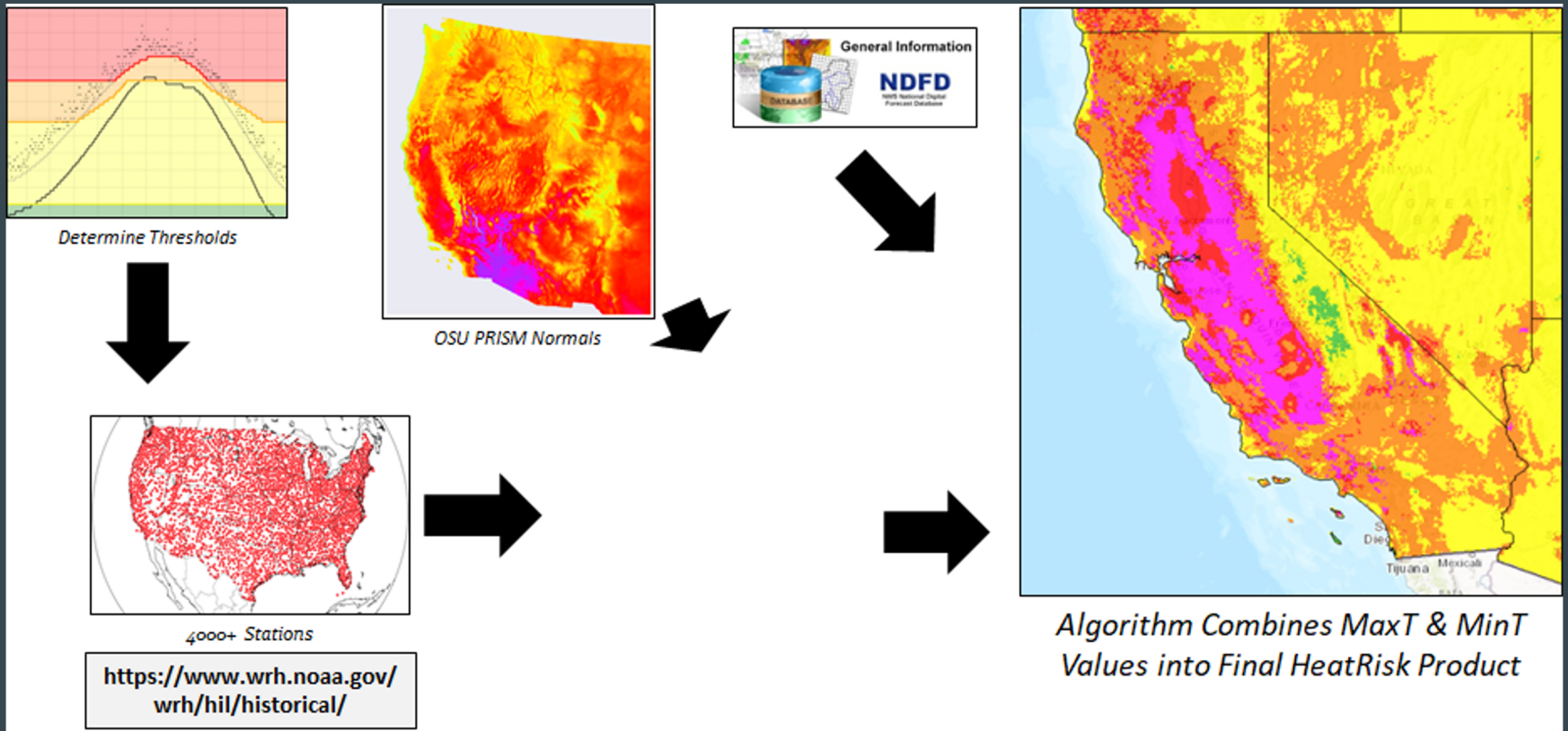
- Start with Normals (1991-2020 update)
- Obtain Full Period of Record for Station
- Determine 95th Percentile
- Calculate Red Base Level From Normals
- Red Level is Red Base *or* 95th Percentile
- Yellow Level Based on Collaboration w/CDC
- Orange Split Between Red/Yellow
- Similar Process for Low Temperature

NOAA/NWS HeatRisk - Examples



<https://www.wrh.noaa.gov/wrh/hil/historical/>

NOAA/NWS HeatRisk Forecasts



Examples of Heat Messaging



Significant End of Week Heat

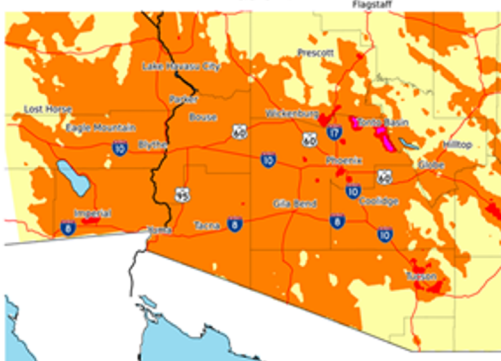
Friday, July 15

What To Do

- Drink before you're thirsty
- Dress for heat
- Reduce time in the sun; avoid strenuous activity during the afternoon
- Help elderly, kids, & pets stay cool
- Close blinds during day – open windows at night

Potential Heat Risks

Valid: Friday, July 15, 2016



Orange Means...

Heat like this happens many times a year. It will be relatively easy to take simple precautions to keep safe.

Red Means...

Heat of this magnitude happens a few times each year. Impacts are likely, even for the general population, if precautions are not taken.

Magenta Means...

Heat of this magnitude is rare, dangerous, and deadly.



VALLEY HEAT RISK





Heat Alert



Excessive Heat Warning Issued for 13 Counties

National Weather Service has issued an Excessive Heat Warning for:

Gila, La Paz, Maricopa, Pinal, Yuma Counties from 10 a.m. on June 17 to 6 p.m. on June 22;

Graham, Greenlee, Pima Counties from 11 a.m. on June 17 to 7 p.m. on June 22;

Coconino and Yavapai Counties from 10 a.m. on June 17 to 6 p.m. on June 21;

Mohave County from 11 a.m. on June 17 to 11 p.m. on June 22;

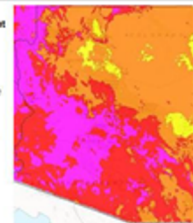
Santa Cruz County from 11 a.m. on June 18 to 7 p.m. on June 22;

Cochise County from 11 a.m. on June 19 to 7 p.m. on June 22.

Daytime highs are expected to be in the **110 to 120 degrees Fahrenheit range**. Residents are advised to stay cool, stay hydrated, and stay informed.

Precautions to prevent heat exhaustion or heat stroke:

- Stay in air-conditioned buildings.
- Limit outdoor activity during the hottest part of the day (mid-day).
- Check on at-risk friends, family, and neighbors at least twice a day.
- Drink water before, during, and after working or exercising outside.



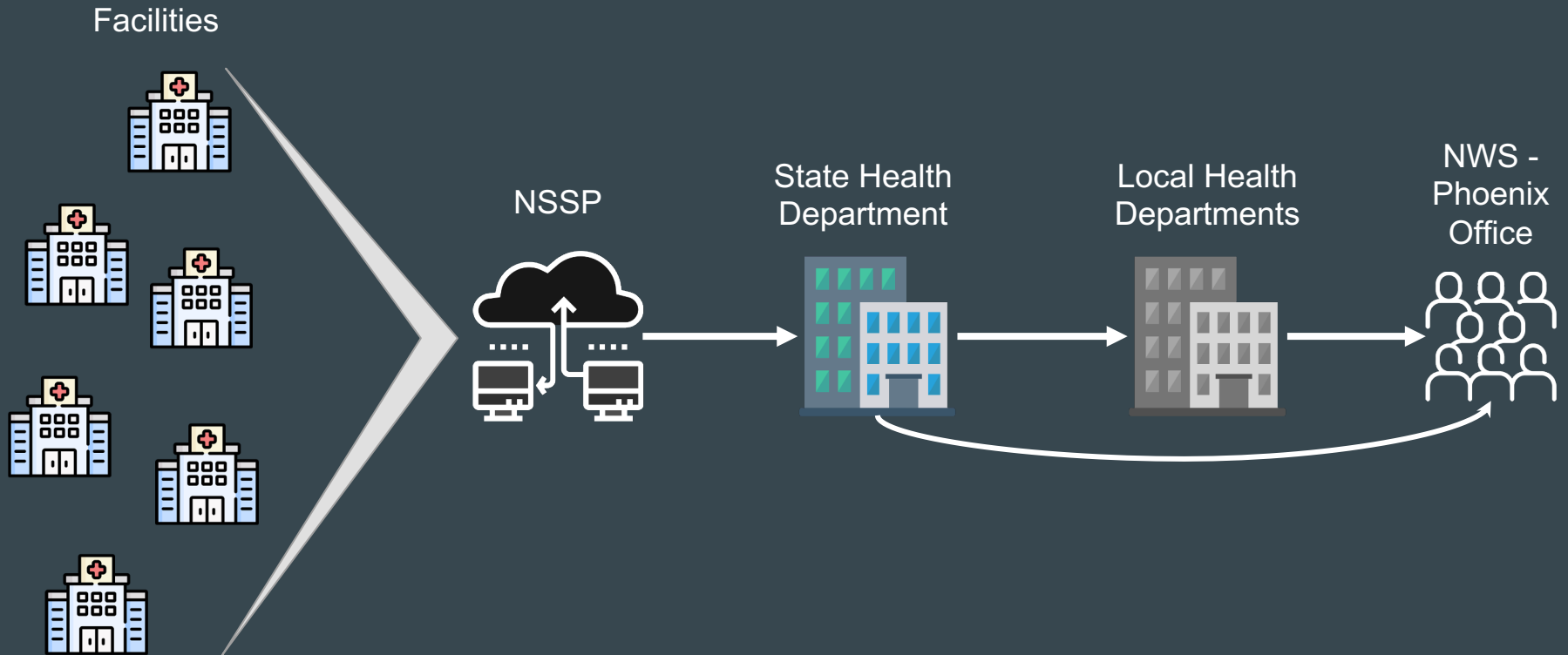
Click [here](#) to learn more about today's heat risk map.

NOAA/NWS Phoenix Data Request

How well calibrated is HeatRisk? Are there any heat “impact” data we could pair with HeatRisk to figure that out?

1. Better understand the timing and magnitude of heat-related impacts as depicted in a near-real time dataset
2. Assess the accuracy of NOAA/NWS forecasts and messaging efforts
3. Compare the expected increase in heat impacts with increasing levels of the experimental NOAA/NWS HeatRisk product

Data Sharing Across Health Jurisdictions in Arizona



Partner Coordination

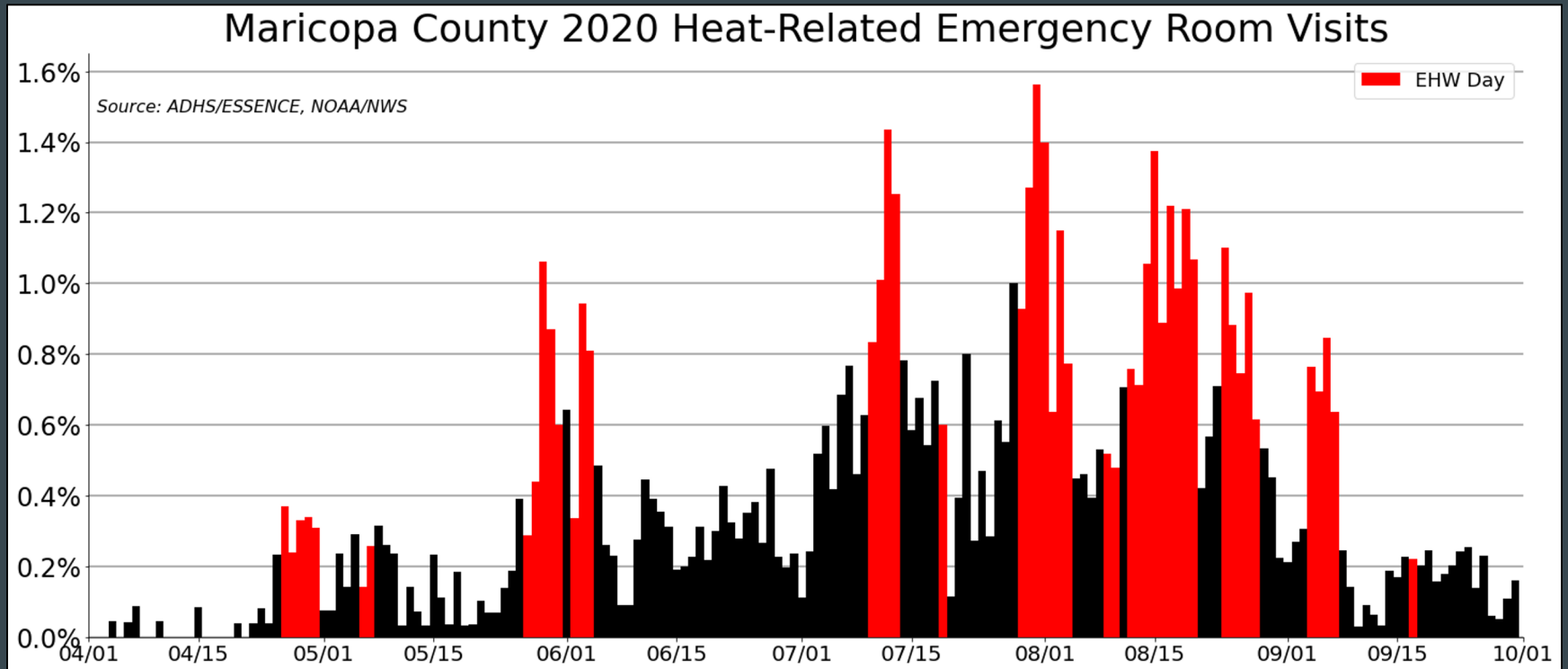
- Arizona Department of Health Services
 - Syndromic Surveillance Program
 - Environmental Public Health Tracking Program
- Maricopa Department of Public Health
 - Syndromic Surveillance Program
 - Climate and Health Program
- Key points to work through at both agencies:
 - Data granularity
 - Time span
 - How data could be used and shared
 - Limitations to consider



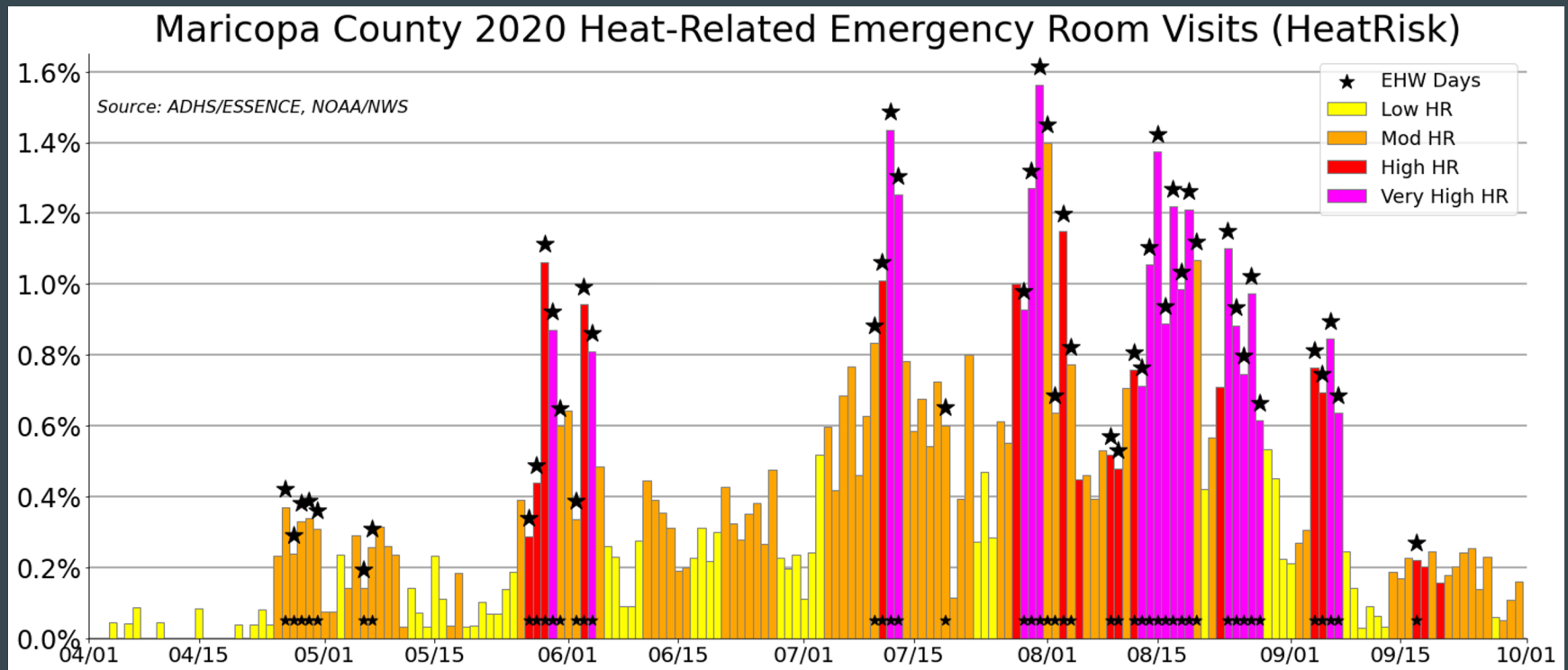
Outcome of Data Request

- In collaboration with Arizona Department of Health Services, the Maricopa County Department of Public Health was able to provide an excel spreadsheet with the Percent of Daily Emergency Department Visits in Maricopa County related to Environmental Heat
- Developed messaging around data limitations and representativeness
- Public Health agency shared data with a non-traditional public health partner

NOAA/NWS Heat Warnings & ER Visits 2020

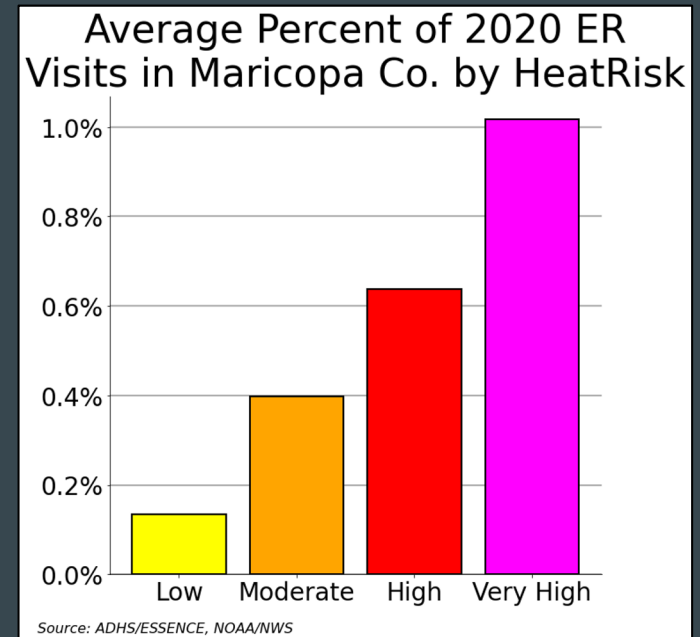


NOAA/NWS HeatRisk & ED Visits 2020



NOAA/NWS HeatRisk & ED Visits 2020

- HeatRisk accurately conveys an increasing threat of heat impacts.
- Near real-time data could aid local NWS office in issuing heat warnings.
- “Impact” data can support NWS messaging.
 - Ex: “You’re 6x as likely to experience a heat emergency on days as hot as today.”
- Model could be utilized in other locations across the agency/US.



Next Steps

- Establish data use agreement between NOAA/NWS Phoenix Office and Maricopa County Department of Public Health to receive heat-related illness ED visit data during heat season months to continue to improve services
- Enhance partnership and collaboration between agencies to identify additional opportunities for data sharing
- Evaluate 2021 heat season data

Thank you!

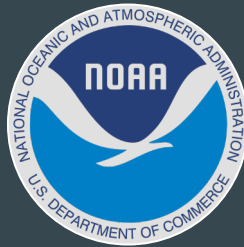
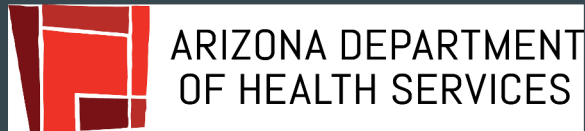
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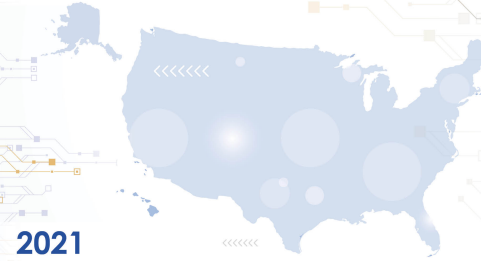
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