Application and Expansion of SyS to Other Extreme Weather Scenarios

December 11, 2018

Presenting To

Monitoring Health Impacts from Extreme Heat Events in North America Workshop
Phoenix, AZ

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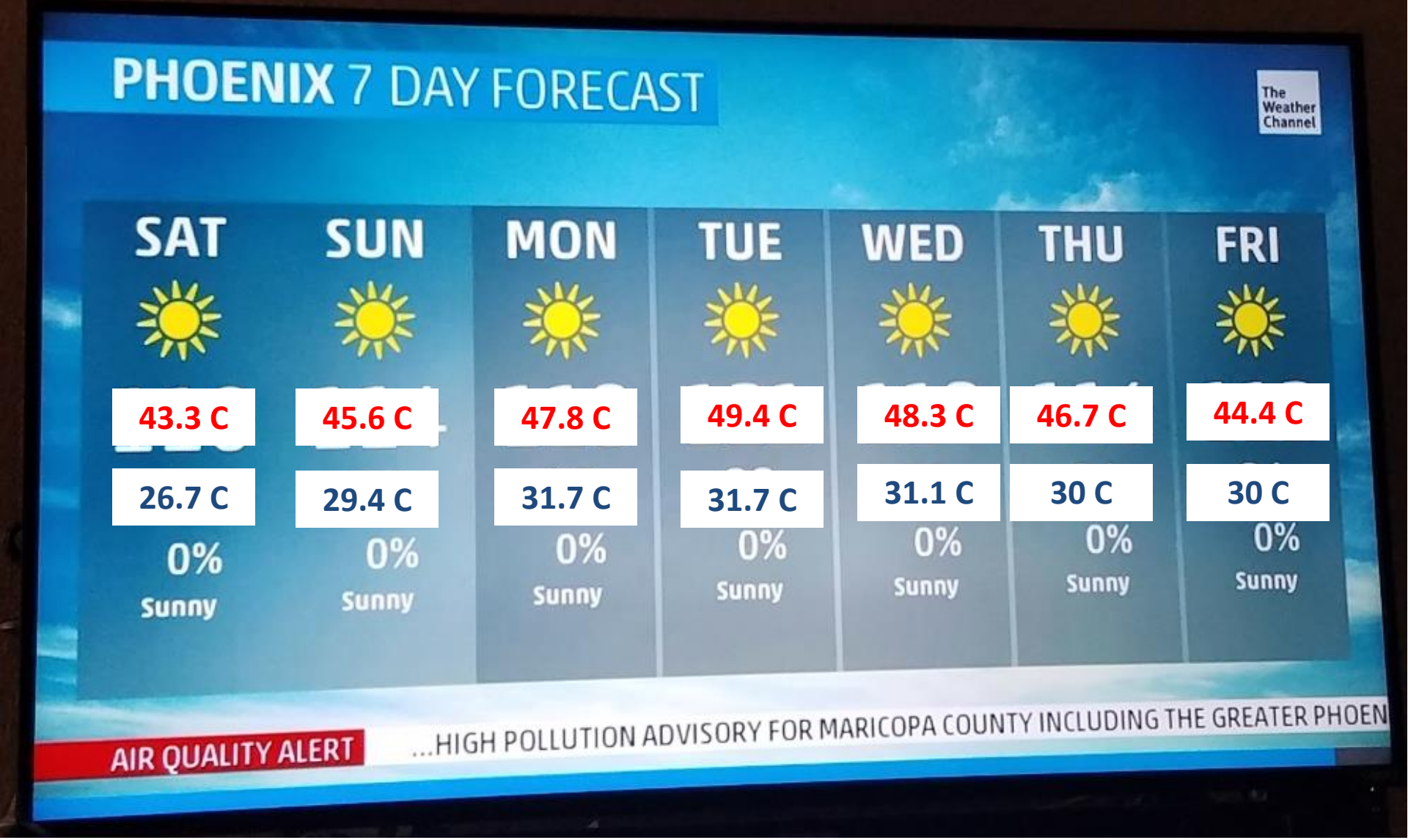
Epidemiology Program Manager


PHOENIX 7 DAY FORECAST
The Weather Channel
SAT
SUN
MON
TUE
WED
THU
FRI
43.3 C
45.6 C
47.8 C
49.4 C
48.3 C
46.7 C
44.4 C
26.7 C
29.4 C
31.7 C
31.7 C
31.1 C
30 C
30 C
0%
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Sunny
Sunny
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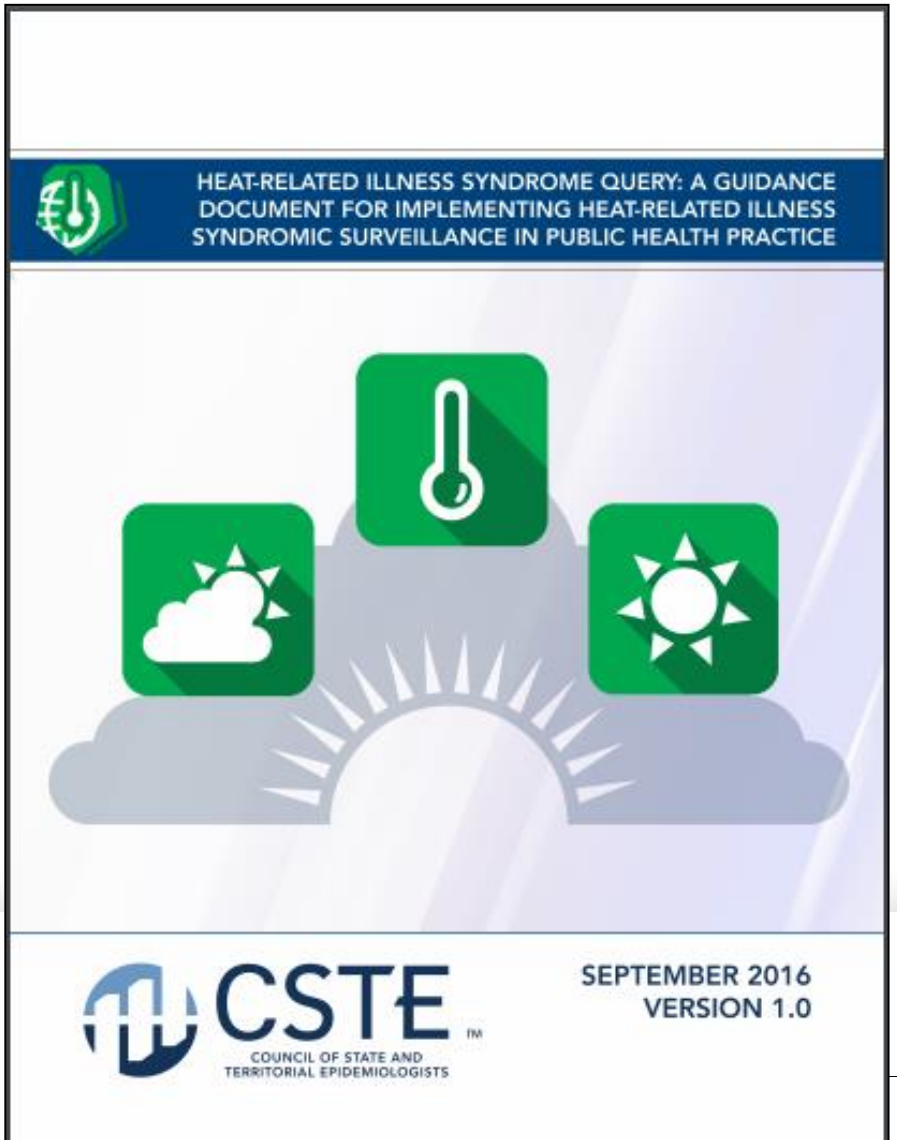
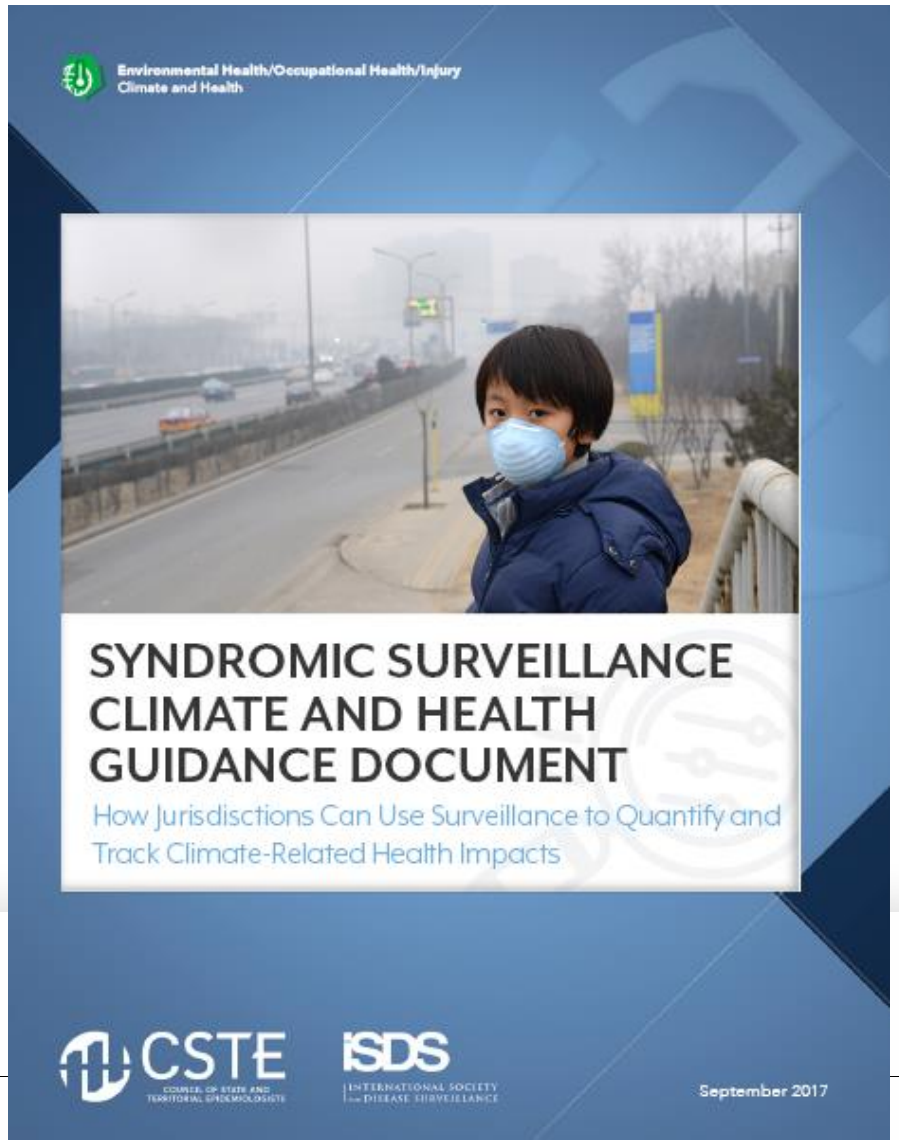
Sunny
AIR QUALITY ALERT
...HIGH POLLUTION ADVISORY FOR MARICOPA COUNTY INCLUDING THE GREATER PHOEN

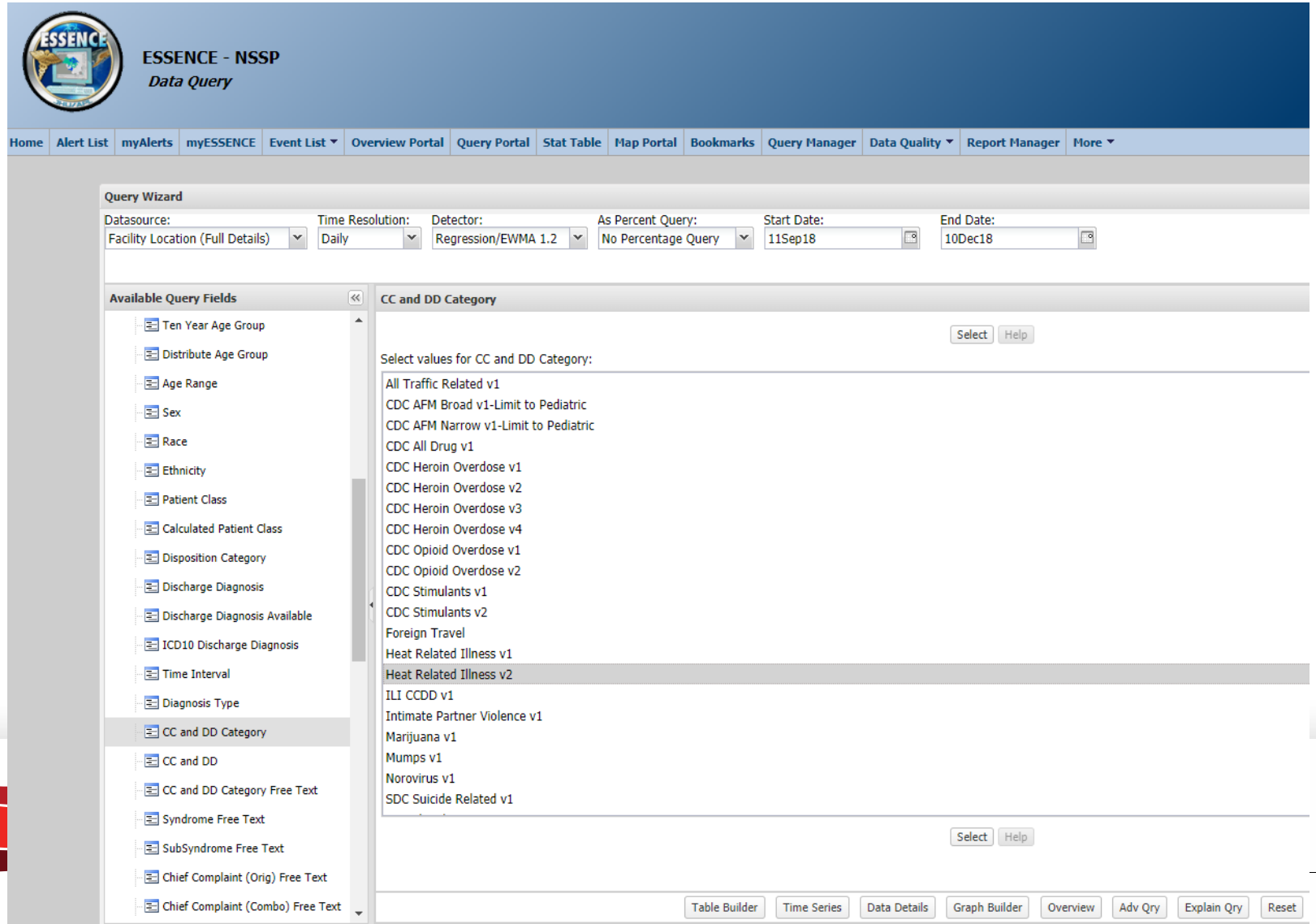
LIVE
WEATHER ALERT
RECORD-BREAKING RAIN IN THE VALLEY
MONSOON STORMS DAMAGE HOMES, ROADS IMPASSABLE
CURRENTS
TOP STORIES
15 I-17 NORTH: ALL LANES NOW CLEAR AT BUMBLE BEE (MILE 253)
15 Desert DOPPLER
#abc15
abc 15
8:49
74°

Council of State and Territorial Epidemiologists Resource Documents

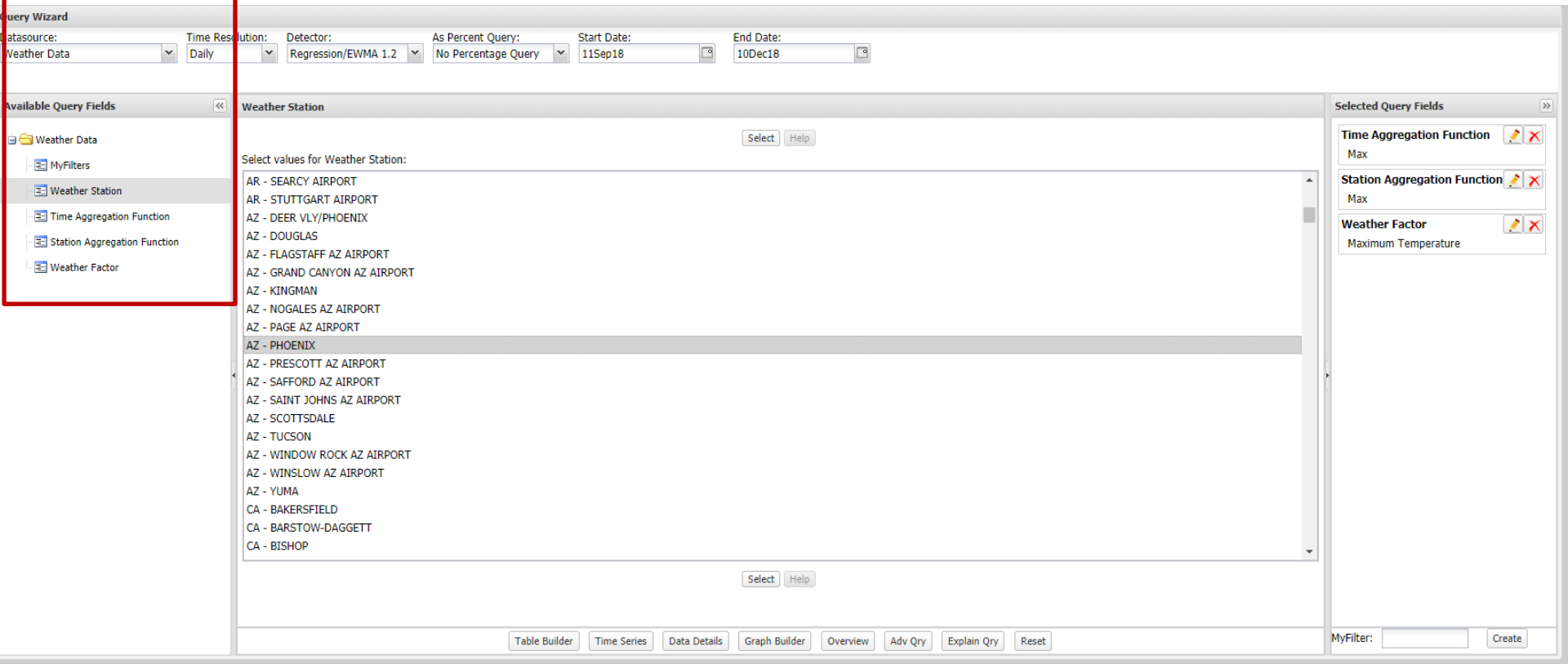




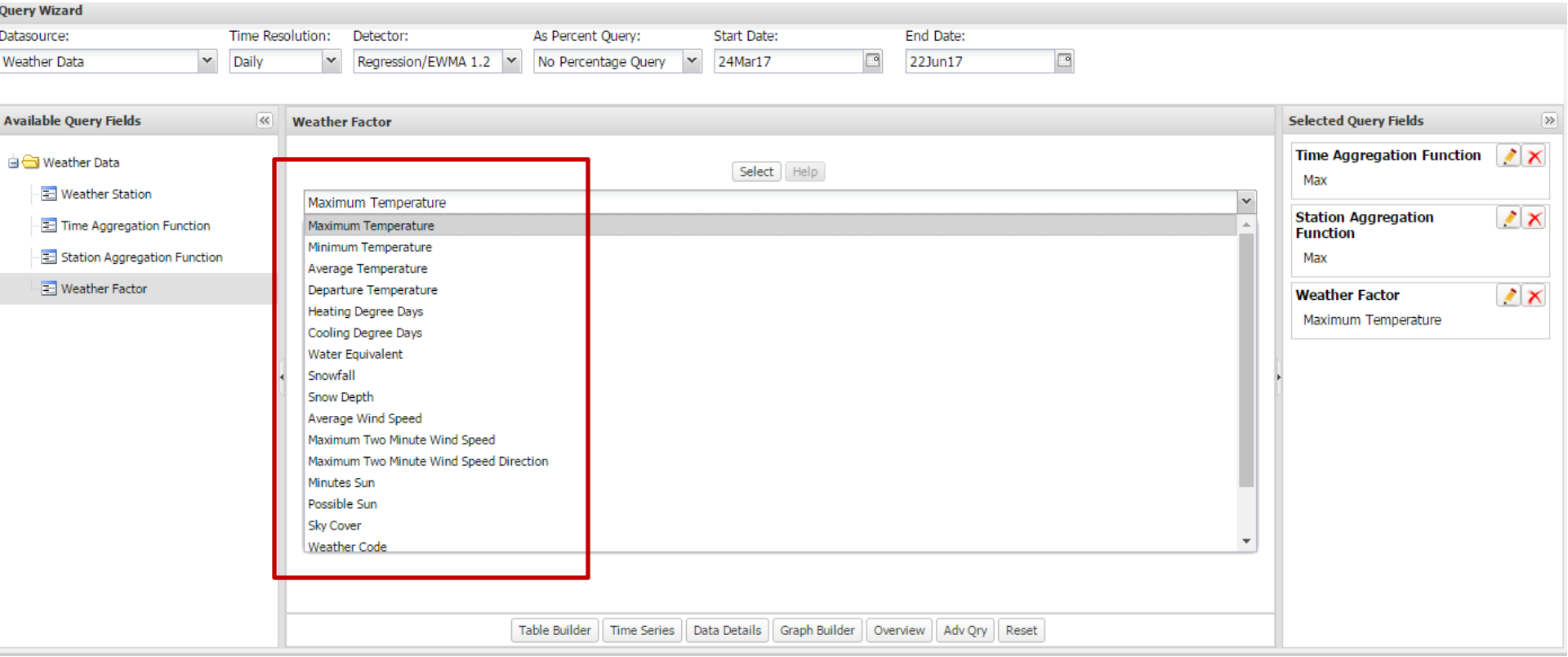
Implementation into the National Syndromic Surveillance Program



Finding Weather Data

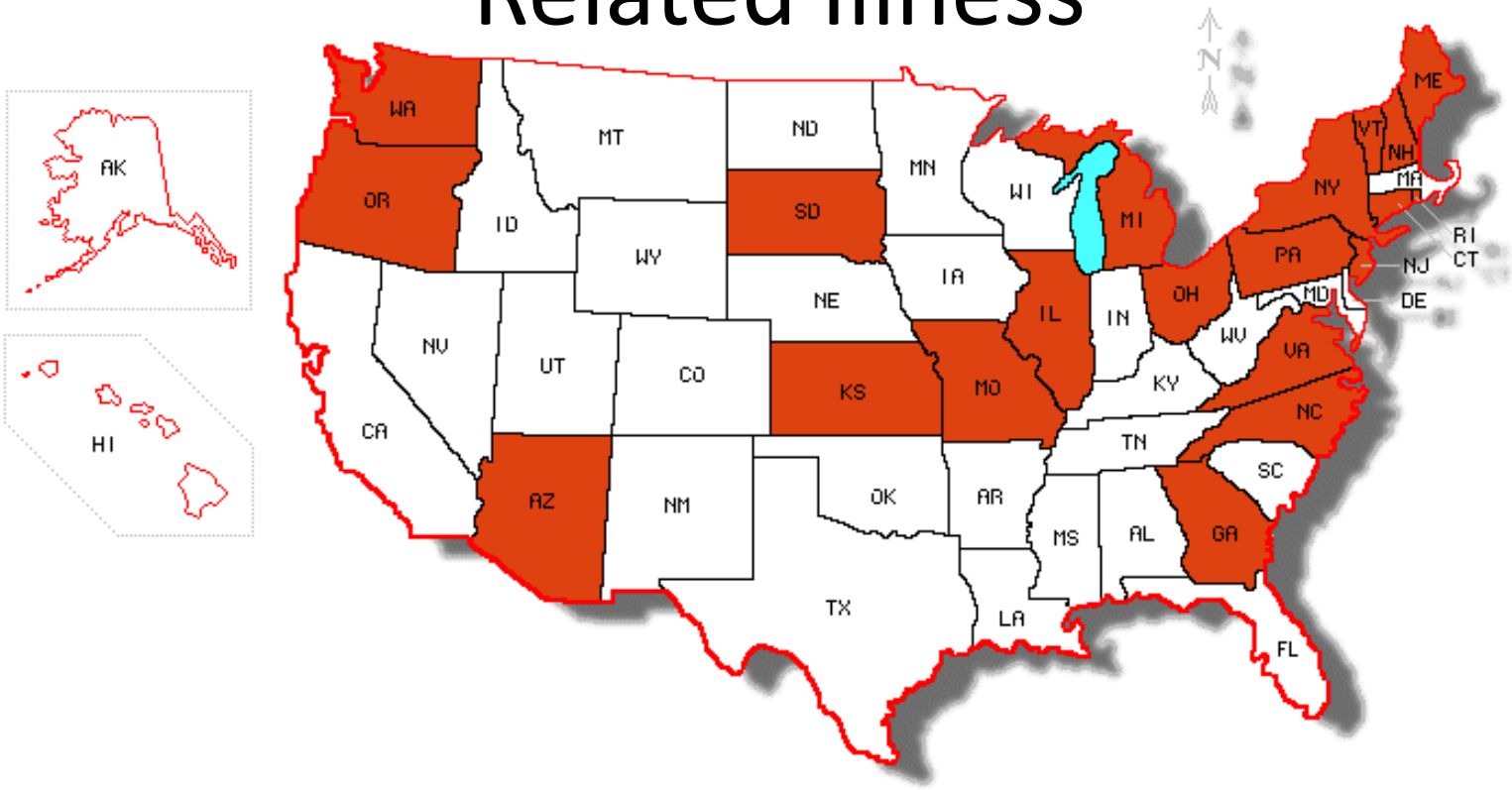


Weather Station Variables



- This survey was created to understand the use of Syndromic Surveillance Systems (SyS) for detecting and reducing illnesses related to extreme weather events.
- Online survey sent to Syndromic Surveillance Coordinators in the U.S. and Canada in July 2015
  - CSTE disseminated the survey in the U.S.
- Results will help to:
  - Create inventory of Canadian and United States SyS systems
  - Inform the development of a public health guidance document with best practices and recommendations on how to use SyS for weather related events

Survey Subset of Responses for Heat-Related Illness



*Focusing on the extreme heat responses only

National Survey on Climate and Health Syndromic Surveillance - CSTE (2015)

Have you used your SyS system to track weather or climate-related events with potential health outcomes? (n=34)		
Extreme Heat	**23**	**68%**
Extreme Cold	14	41%
Hurricanes	10	29%
Poor Air Quality	10	29%
Climate-Related Disease Vectors	8	24%
Flooding	6	18%
Tornadoes/Straight Line Winds	5	15%
Wildfire	4	12%
Drought	1	3%

What syndromes/illnesses/conditions do you typically track with your SyS system? (n=34)		
Influenza-like illness	29	85%
Respiratory	25	74%
Gastrointestinal	24	71%
CO Poisoning	20	59%
Neurological	16	47%
Heat-related illness	**16**	**47%**
Infectious dermatological	14	41%
Injuries	13	38%
Cold-related illness (e.g. hypothermia)	13	38%
Asthma	13	38%
Lyme disease	5	15%
West Nile virus	2	6%

"After a hurricane, surveillance was used for injuries and CO exposures. SyS identified an increase in CO illnesses and public health messaging was distributed."

"Based off heat-related illness data in our SyS, we worked with the National Weather Service to tailor their messaging to early season heat events."

"Surveillance of ED visits and EMS calls has prompted press events and increase PH messaging during heat waves."

"Used SyS data to find missing disaster victims after a major tornado and reunited them with their families."

Table 3. What information does your system collect? (n=34)

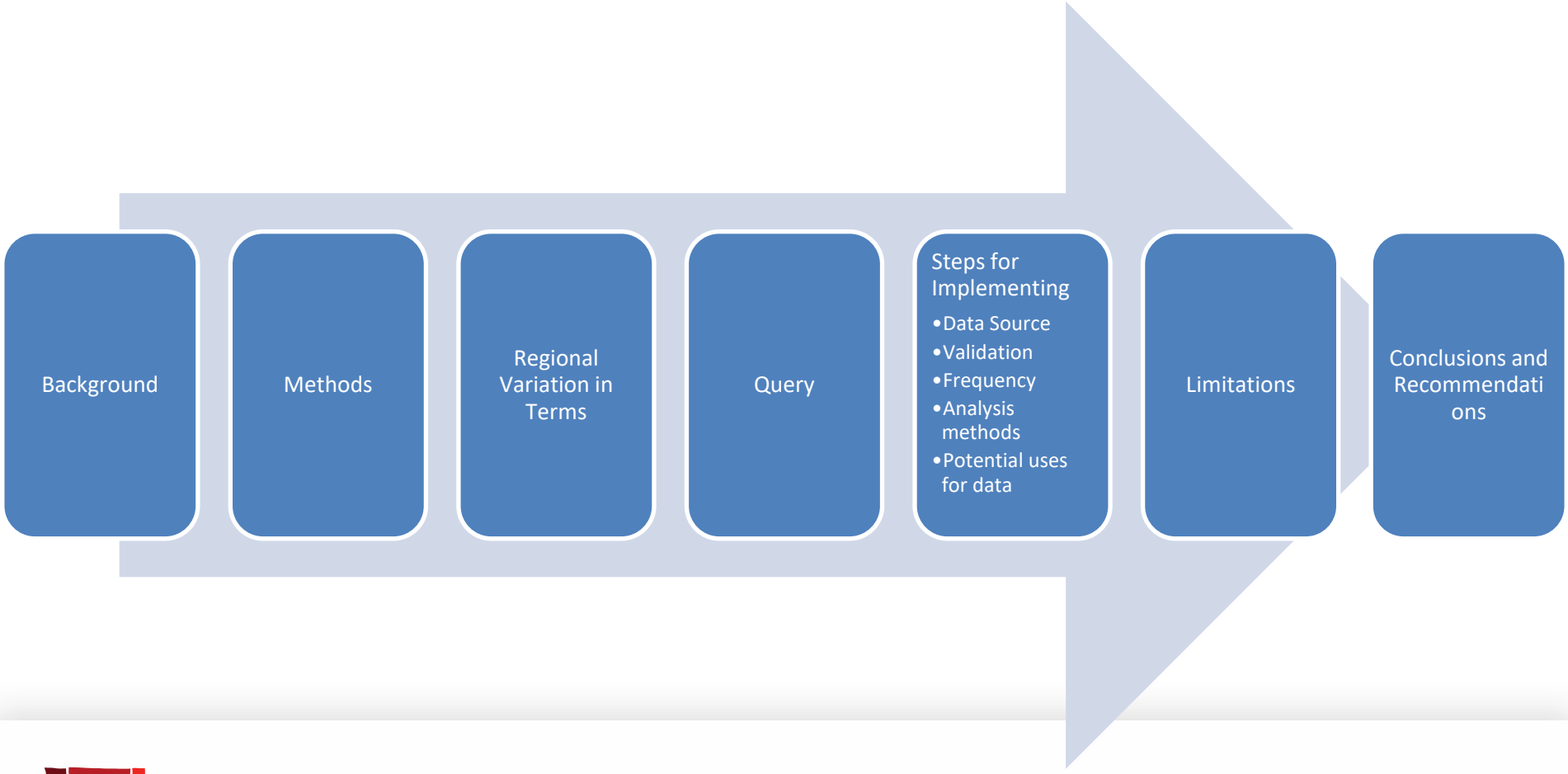
Emergency Department-Chief complaint data	**31**	**91%**
Emergency Department-ICD 9/10 codes	**21**	**62%**
Emergency Department-Triage notes	13	38%
Sales of over the counter pharmaceuticals	6	18%
School/work absenteeism data	5	15%
Inpatient-Chief complaint data	3	9%
Inpatient-ICD 9/10 codes	3	9%
Ambulatory/outpatient	3	9%
Prescription drug data	2	6%
Emergency calls (911 calls)	1	3%
Coroner's data/OME (Office of Medical Examiner)	0	0%
Death registration records	0	0%
Telehealth	0	0%
Trauma data	0	0%
Internet searches	0	0%

Comparison to 3rd National Climate Assessment for Weather Hazards By Region

Table 4.			
National Climate Assessment		Syndromic Surveillance Survey Responses	
Regions	Weather-related Events	Weather-related Events	Total Survey Responses
Northwest	Wildfire, Disease Vectors*, Extreme Heat	Extreme Heat (2), Extreme Cold (1),Wildfire (2)	2
Southwest	Extreme Heat, Drought, Disease Vectors*, Flooding	Extreme Heat (2), Poor air quality (1), Disease Vectors* (1)	4
Great Plains	Drought, Extreme precipitation, Flooding, Extreme Heat, Extreme Cold, Tornadoes	Extreme Heat (2), Extreme Cold (1), Flooding (1), Tornadoes (2), Poor Air Quality (1)	3
Midwest	Extreme Heat, Extreme Cold, Poor Air Quality, Extreme Precipitation, Flooding, Disease Vectors	Extreme Heat (4), Extreme Cold (4), Drought (1), Flooding (2), Tornadoes (2), Poor Air Quality (1), Disease Vectors* (1)	6
Southeast	Extreme Heat, Hurricanes, Disease Vectors*, Extreme Precipitation	Extreme Heat (3), Extreme Cold (3), Flooding (1), Wildfire (2), Tornadoes (1), Poor Air Quality (3), Disease Vectors* (1)	4
Northeast	Extreme Heat, Flooding, Extreme Precipitation, Hurricanes, Poor Air Quality, Disease Vectors*	Extreme Heat (10), Extreme Cold (6), Flooding (2), Hurricanes (8), Poor Air Quality (4), Disease Vectors* (5)	15

CSTE Heat/Cold Syndrome Workgroup

Guidance Document Process



Draft Cold-Related Illness Query in ESSENCE Syntax

(,^cold exp^,or,^cold-exp^,or,^env exp^,or,^environmental exp^,or,^exp to env^,or,^exposure to env^,or,^exp to cold^,or,^exposure to cold^,or,^cold exposure^,or,^coldexposue^,or,^out in the cold^,or,^frostbit^,or,^forstbit^,or,^forst bit^,or,^frost bit^,or,^frost nip^,or,^frostnip^,or,^frost ni^,or,^hypothe^,),or,(,^froze^,and,^hand^,andnot,^meat^,),or,(,^froze^,and,^feet^,),or,(,^x31^,or,^t68^,or,^t69^,or,^t33^,or,^t34^,or,^;991;^,or,^e901.0^,or,^e901.8^,or,^e901.9^,or,^e988.3^,or,^e9010^,or,^e9018^,or,^e9019^,or,^e9883^,),andnot,(,^recheck^,or^re-check^,or,^history of frostbite^,or,^history frostbite^,or,^dressing chang^,or,^asthma^,or,^chest^,or,^congestion^,or,^cough^,or,^ear^,or,^ears^,or,^infection^,or,^preg^,or,^pregnant^,or,^sob^,or,^sore throat^,or,^sx^,or,^symptoms^,or,(,^991.8^,and,^asthma^,),or,(,^9918^,and,^asthma^,),or,^w93^,or,^e901.1^,or,^780.65^,or,^e9011^,or,^78065^,or,^xd^,)

Draft CRI Syndrome Inclusion and Exclusion Criteria

Category	Terms to include in query
Chief complaint search terms	COLD EXP
	COLD - EXP
	COLD-EXP
	COLDEXPOSURE
	ENV EXP
	ENVIRONMENTAL EXP
	EXP TO COLD
	EXP TO ENV
	EXPOSURE TO ENV
	EXPOSURE TO COLD
	FROST BIT
	FROSTBIT
	FROST NI
	"FROZEN" and "HANDS"
	"FROZEN" and "FEET"
	HYPOTHE
	"OUT IN THE COLD"
	"FROZE "
ICD-9-CM diagnosis codes	991 – Effects of reduced temperature E901.0 – Excessive cold due to weather conditions
	E901.8 – Excessive cold, other specified origin
	E901.9 – Excessive cold, of unspecified origin
	E988.3 – Extremes of cold, undetermined intent
ICD-10-CM diagnosis codes	X31 – Exposure to excessive cold of natural origin
	T68 – Hypothermia
	T69 – Other effects of reduced temperature
	T33 – Superficial frostbite
	T34 – Frostbite with tissue necrosis

Category	Terms to exclude from query
Chief complaint terms	RECHECK
	HISTORY OF FROSTBITE
	HISTORY FROSTBITE
	DRESSING CHANG
	991.8 & ASTHMA
	ASTHMA
	CHEST
	CONGESTION
	COUGH
	EAR
	EARS
	INFECTION
	PREG
	PREGNANT
	SOB
	SORE THROAT
	SX
	SYMPTOMS
	FROZEN "FROZE" and "HAND" and not "MEAT"
ICD-9-CM diagnosis codes	E901.1 – Excessive cold of man-made origin 780.65 – Hypothermia not associated with low environmental temperature
ICD-10-CM diagnosis codes	W93 – Exposure to excessive man-made cold
	R68.0 – Hypothermia not associated with low environmental temperature Exclude codes ending in D or S to suppress non-incident cases.

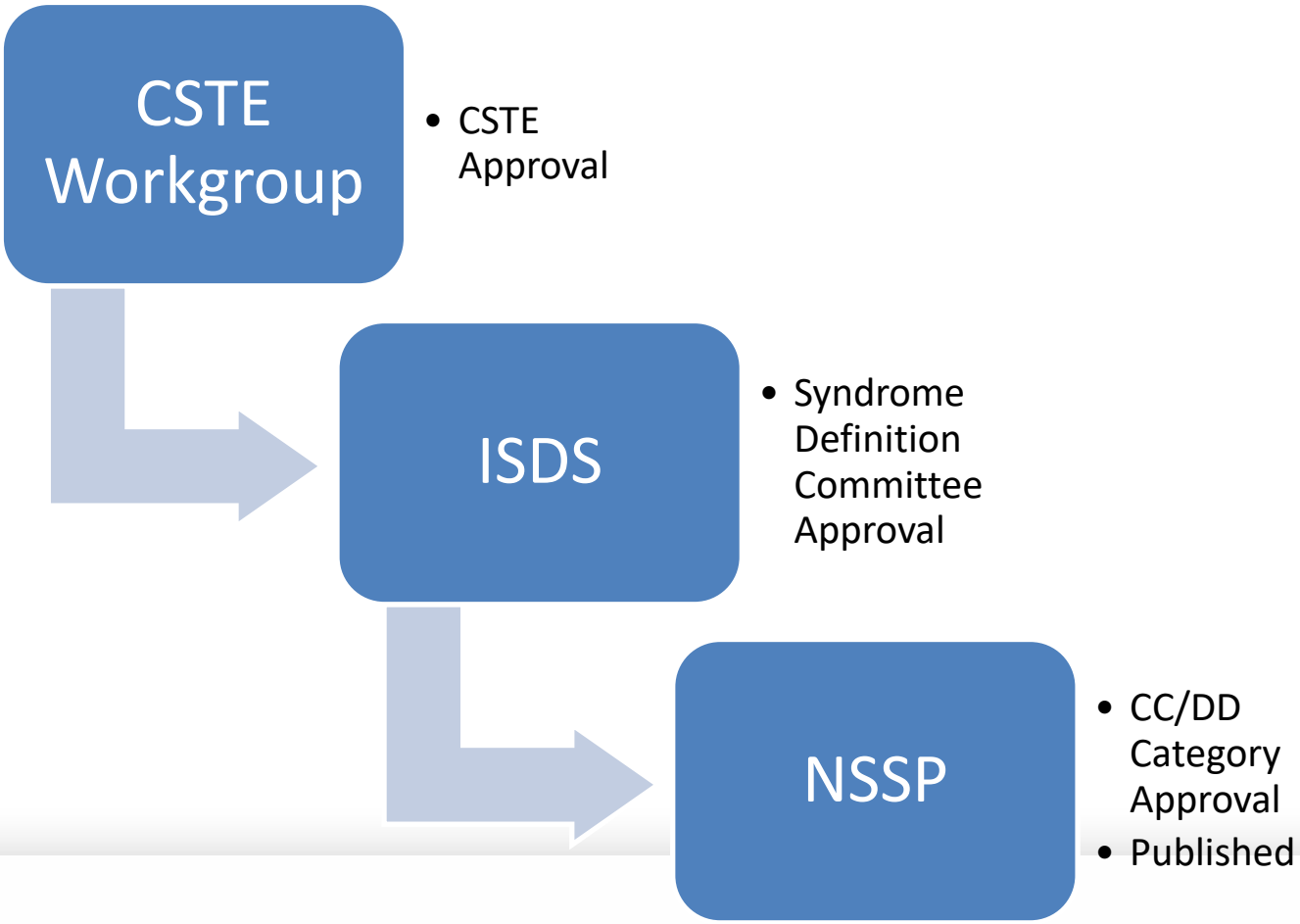
Validation of **Draft** CRI Syndrome

Cold-Related Illness (CRI) Emergency Department and Syndromic Surveillance Data,[1] New York City, 2014 Cold Season Months

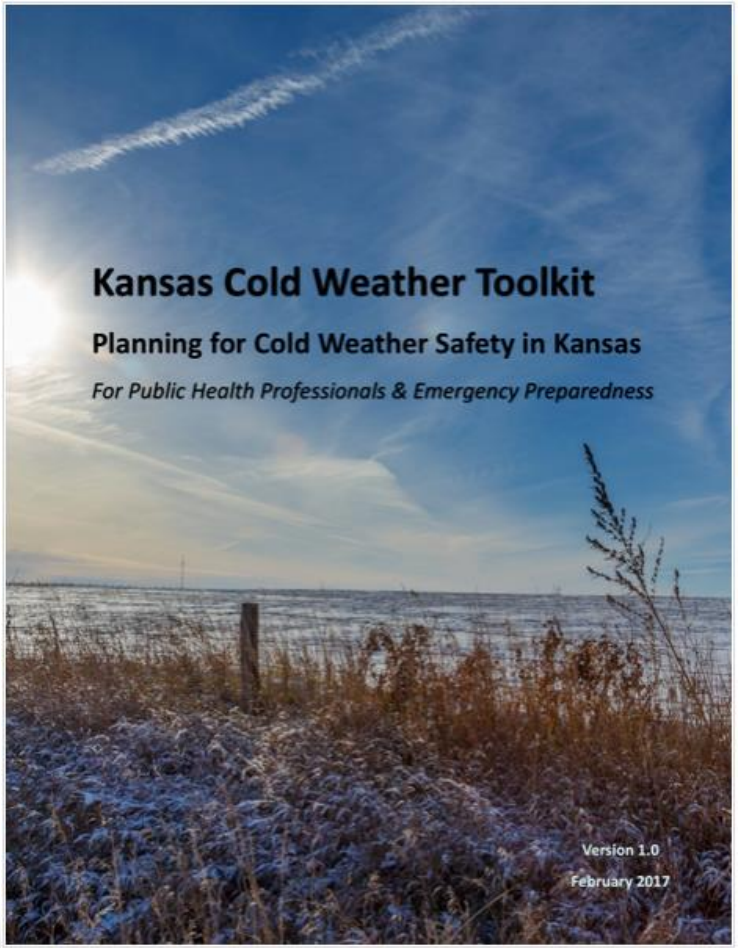
Prevalence	0.04
Sensitivity	38.23
Specificity	99.99
Positive Predictive Value	61.13
Negative Predictive Value	99.98

1) Data source: New York State Department of Health, Statewide Planning and Research Cooperative System (SPARCS) and Bureau of Communicable Disease Syndromic Surveillance Unit.

Process Flow for Adding New Syndrome



Examples


Kansas Cold Weather Toolkit
Planning for Cold Weather Safety in Kansas
For Public Health Professionals & Emergency Preparedness
Version 1.0
February 2017

WINTER WEATHER
TOOLKIT
A planning toolkit for public health and emergency response professionals
BUILDING RESILIENCE AGAINST CLIMATE EFFECTS PROGRAM
Bureau of Environmental and Occupational Health
OCTOBER 2016

Discussion and Questions?

Acknowledgements

- CSTE Heat/Cold Syndrome Workgroup
- CDC Environmental Public Health Tracking Network
- CDC Climate Ready States and Cities Initiative

THANK YOU

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