

Too Cool for School?: Identifying School-Related Syndromic Surveillance Visits

CSTE Annual Conference

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Special Thanks

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Background

Most children spend a significant portion of their time in daycare or at school.

- 175-180 days
- 900-1000 instructional hours

CSTE Environmental Health in Schools workgroup identified these as a setting for possible “occupational” exposures.

Objectives

To draft and validate a syndromic surveillance **triage note** query for “school-related” emergency department (ED) visits using ESSENCE.

Query

Search Terms:

“in school” or “at school”

“in recess” or “at recess”

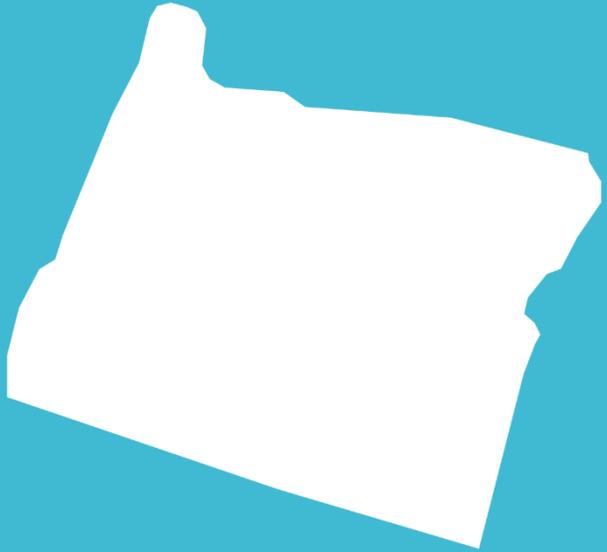
“in daycare” or “at daycare” with either daycare or day care, as long as they don't explicitly state they are “not in/at daycare”

ESSENCE Syntax:

```
^[ia][nt] school^ ,or, ^[ia][nt] recess^ ,or, (,(  
^[ia][nt] dayc^ ,or, ^[ia][nt] day c^ ,)  
,andnot, (, ^not [ia][nt] dayc^ ,or, ^not  
[ia][nt] day c^ ,),)
```

Working Definition

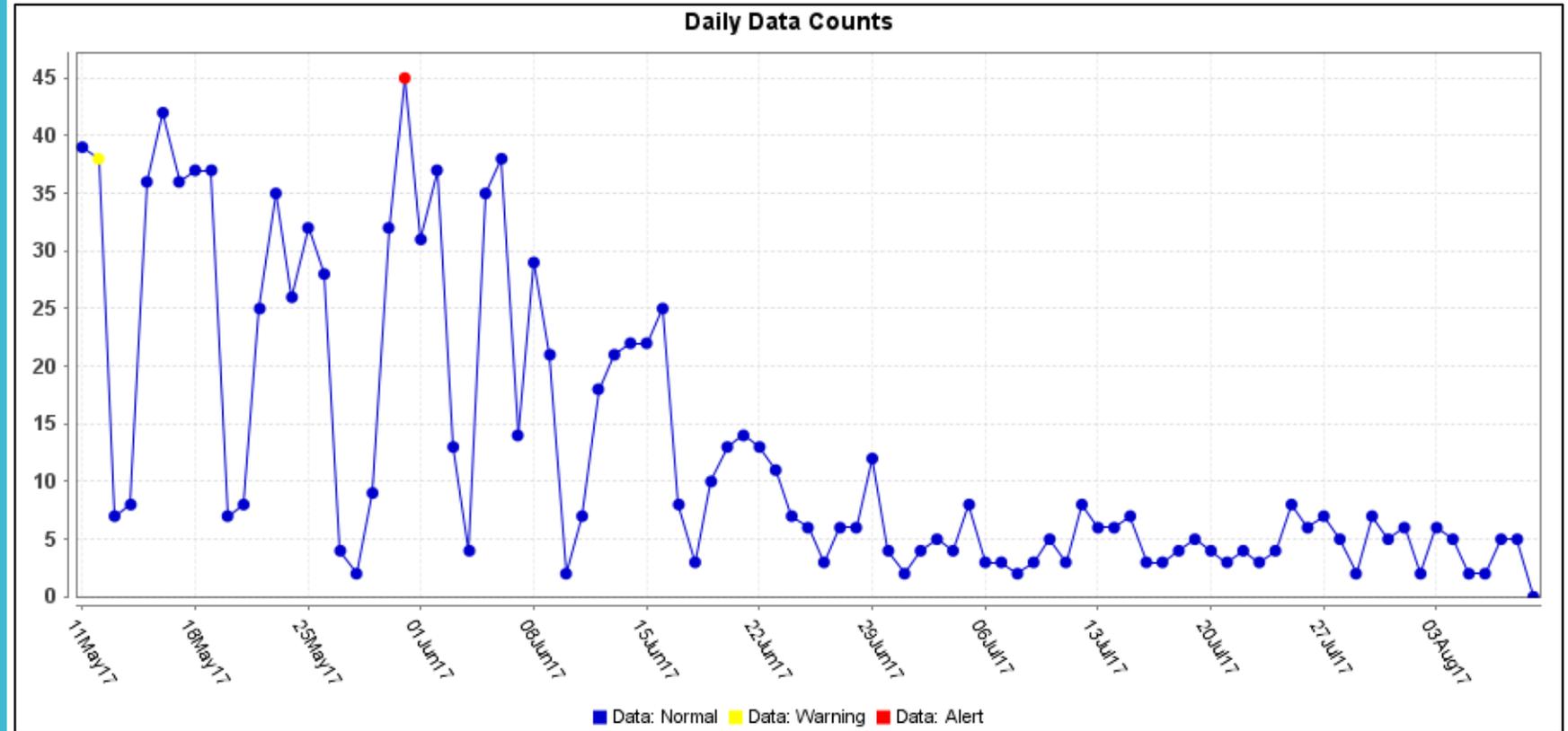
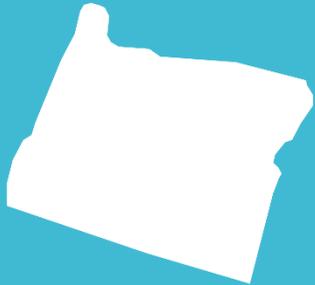
A valid school-related result is defined as a triage note that indicates the immediate reason for the current visit is related to the patient being physically present at an educational institution.



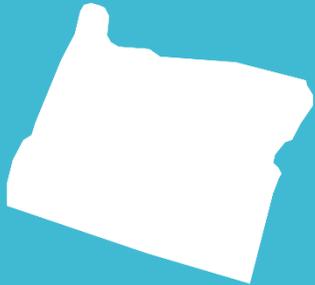
Part 1: Proposal & Validation

Oregon Health Authority

Daily Visit Counts, Oregon, May 11 – August 10, 2017



Daily Visit
Counts by Age
Group,
Oregon, May
11 – August 10,
2017

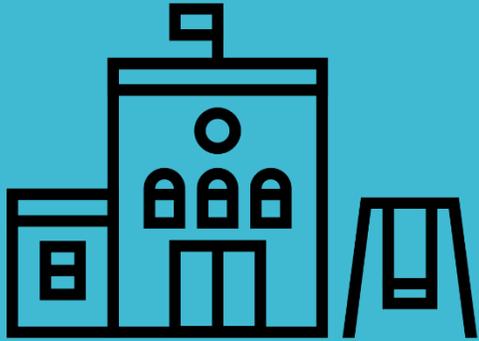


Age Group	Count	Percent
0-4	180	15.5
5-17	846	72.7
18-44	107	9.2
45-64	23	2.0
65+	7	0.6
TOTAL	1162	

Daily Visit
Counts,
Oregon, May
11 – August 10,
2017



- Top Subsyndromes:
 - Poisoning
 - Fall
 - NVD (Nausea, Vomiting, Diarrhea)
 - Fever



Useful Components: “In School” or “At School”

`^[ia][nt] school^`

- N = 958
- Age Group 5-17 = 82%
- Top Subsyndromes: Poisoning, Fall, SuicideOrSelfInflicted, NVD

Note that in proposed query, visits can match on multiple components.

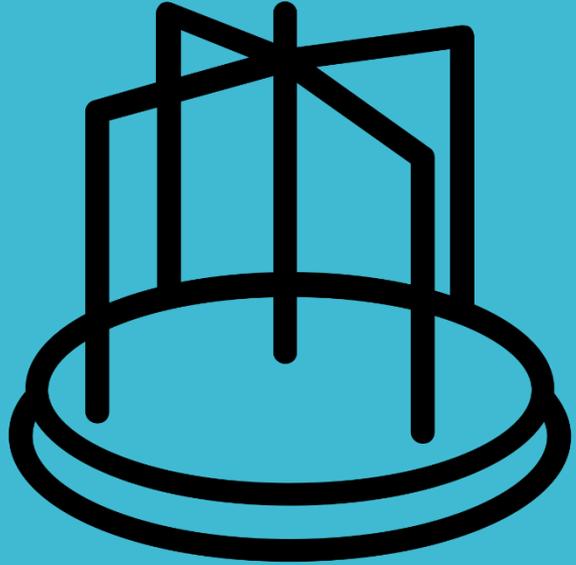


Useful Component: “In Daycare” or “At Daycare”

(, ^[ia][nt] daycare^ ,or, ^[ia][nt] day c^ ,)
,andnot, (, ^not [ia][nt] daycare^ ,or, ^not
[ia][nt] day c^ ,)

- N = 188
- Age Group 0-4 = 75%
- Top Subsyndromes: Fever, NVD

Note that in proposed query, visits can match on multiple components.



Useful
Component:
"In Recess" or
"At Recess"

^[ia][nt] recess^

- N = 23
- Age Group 5-17 = 100%
- Top Subsyndromes: Fall, NVD

Note that in proposed query, visits can match on multiple components.

Not Useful and Rejected Components

^[ia][nt] class^ (term mostly in listing drug classes)

^[ia][nt] preschool^ (less than 10 visits in 90 days and 50% were true positives)

^[ia][nt] kinder^ (less than 10 visits in 90 days and 0% were true positives)

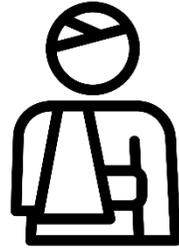
Methods

To validate the query, two staff reviewed 15% of the Oregon ESSENCE visits identified from the last 90 days (May 11-August 10, 2017) to determine if they were actually school-related.

Positive Predictive Value (PPV)

- **Overall PPV: $131/176 = 74.4\%$**
- Excluding Poisoning & Suicide
Subsyndromes PPV: $126/160 = 78.8\%$

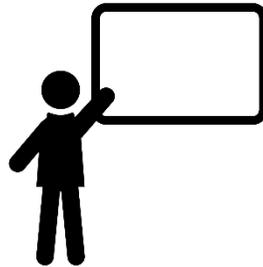
Examples of **Valid** School- related Visits



- Injury, disease, or condition exacerbation directly connected to being at school/daycare



- Indication of a communicable disease or common exposure



- Teacher or staff intervention

Examples of Invalid School- related Visits



- Documentation of school attendance, i.e. “in daycare” or “in school” when visit is not related to attendance



- Documentation of social history, i.e., bullying in childhood

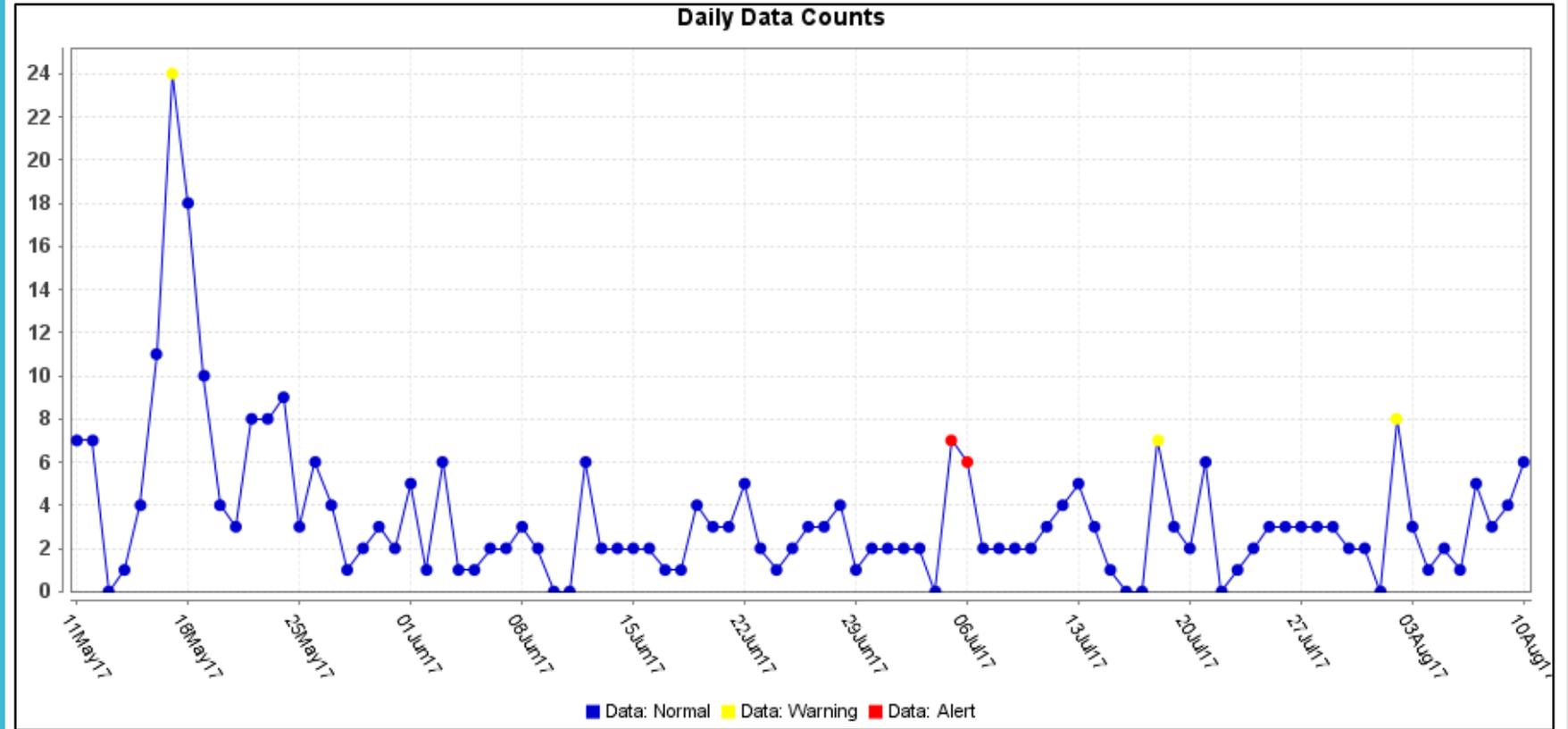


Part 2: Utilization & Comparison

Kentucky Department for Public Health

CDC National Syndromic Surveillance Program (NSSP)

Daily Visit Counts, Kentucky, May 11 – August 10, 2017



Daily Visit
Counts by Age
Group,
Kentucky,
May 11 –
August 10,
2017



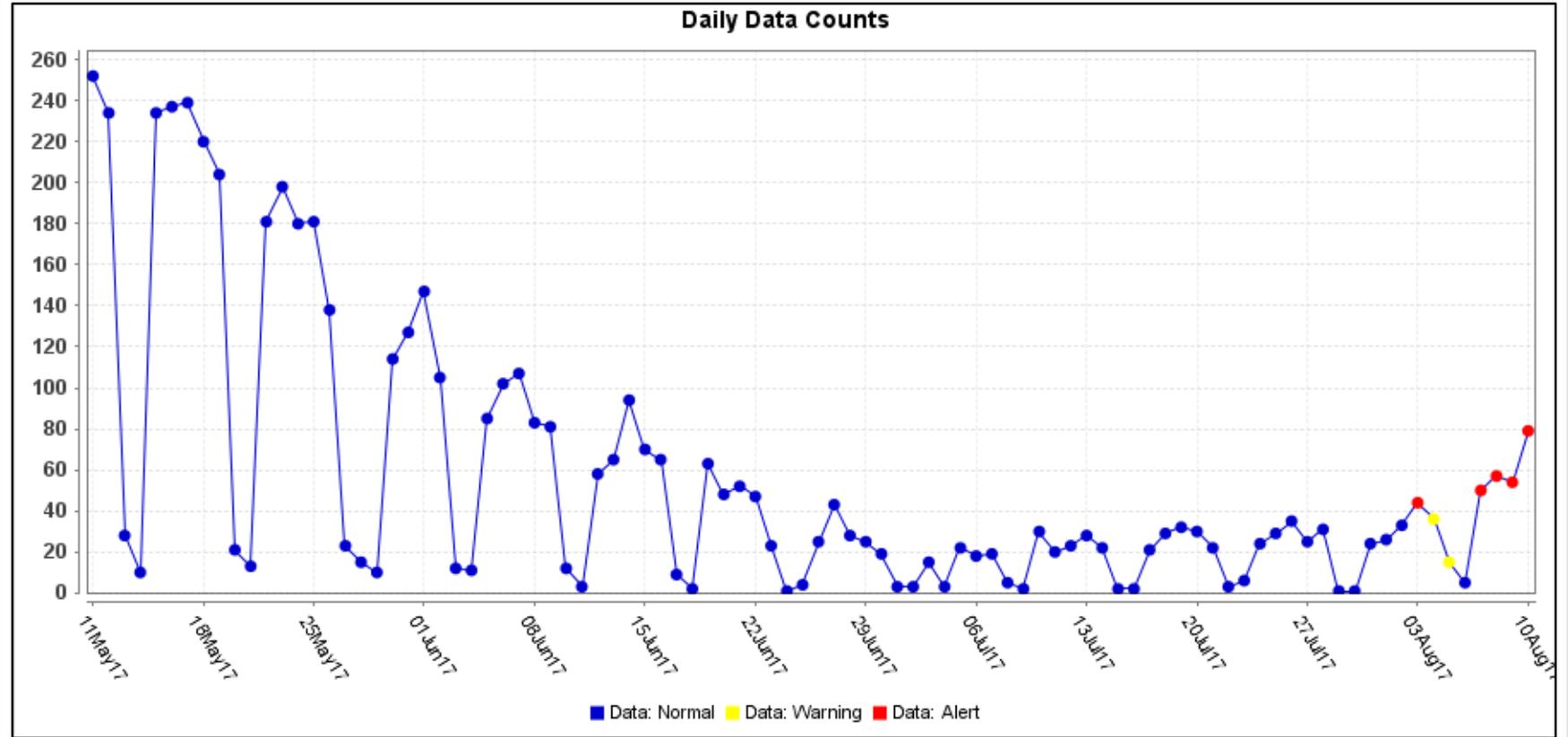
Age Group	Count	Percent
0-4	145	38.8
5-17	175	46.8
18-44	38	10.2
45-64	12	3.2
65+	4	1.1
TOTAL	374	

Daily Visit
Counts,
Kentucky,
May 11 –
August 10,
2017



- Top Subsyndromes:
 - FeverOrChills
 - FeverPlus
 - FeverOnly
 - NVD

Daily Visit Counts, NSSP, May 11 – August 10, 2017



Daily Visit
Counts by Age
Group, NSSP,
May 11 –
August 10,
2017



Age Group	Count	Percent
0-4	1,122	21.3
5-17	3,904	74.0
18-44	193	3.7
45-64	35	0.7
65+	23	0.4
TOTAL	5,277	

Daily Visit
Counts, **NSSP**,
May 11 –
August 10,
2017



- Top Syndromes:
 - Injury;RecordsOfInterest
 - Other
 - GI;Resp;Injury;ILL;Fever
 - Neuro;Resp;Injury;ILL;Fever
 - Shk_coma;Resp;Injury

Daily Visit Counts, NSSP, May 11 – August 10, 2017

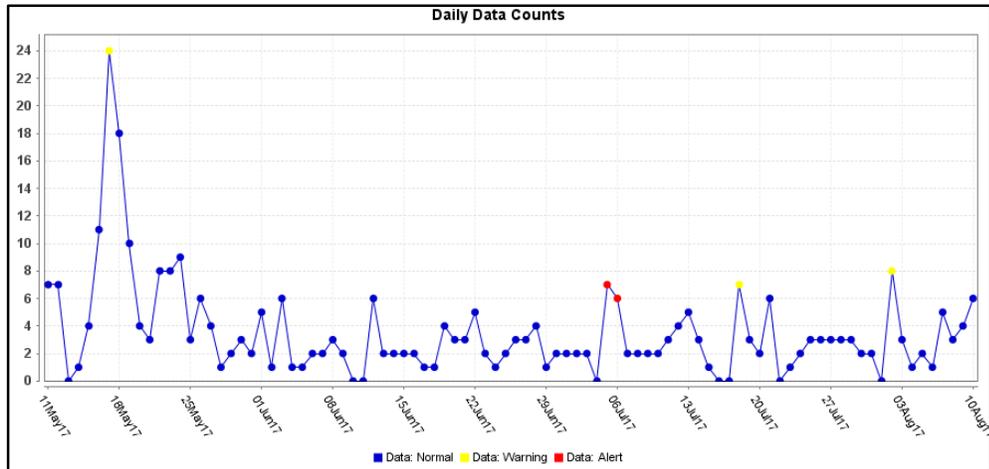
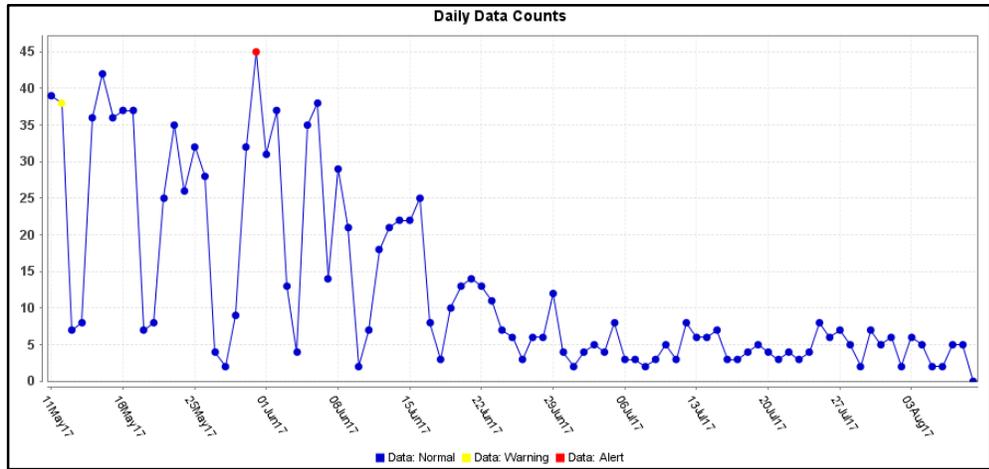
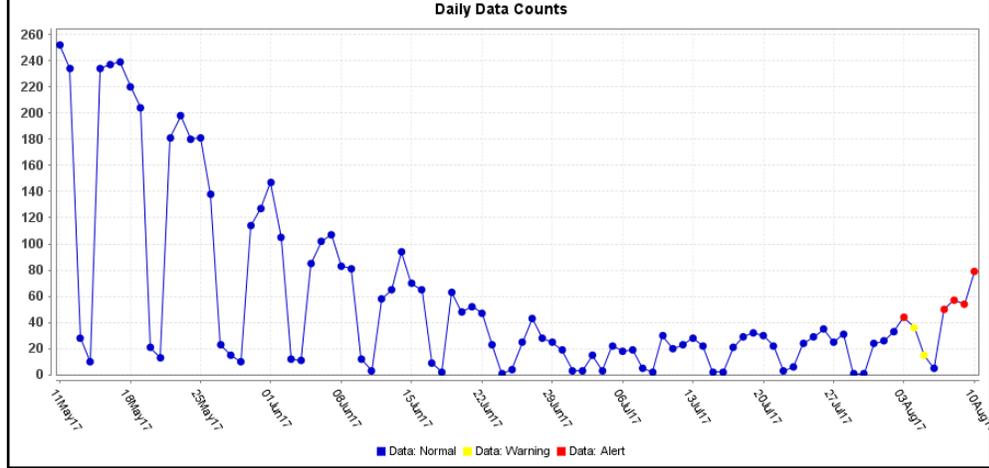


- Top Words
 1. School
 2. Patient
 3. Pain
 4. Today
 5. Right
 6. Daycare
 7. Left
 8. Fell
 9. Head
 10. States

Top 50 Words in ChiefComplaintParsed

Analyzed 6658 rows.

Rank	Word	Count	Rank	Word	Count
1	SCHOOL	5642	26	YESTERDAY	443
2	PATIENT	4339	27	PLAYING	387
3	PAIN	1810	28	WRIST	366
4	TODAY	1669	29	ANKLE	360
5	RIGHT	1447	30	HEADACHE	347
6	DAYCARE	1438	31	HAND	331
7	LEFT	1411	32	SWELLING	327
8	FELL	1366	33	BACK	318
9	HEAD	1252	34	EYE	317
10	STATES	1068	35	STARTED	311
11	INJURY	983	36	NOTED	298
12	HIT	891	37	2	297
13	MOM	743	38	SEIZURE	291
14	COMPLAINS	732	39	CHILD	286
15	CONSCIOUSNESS	716	40	FOOT	279
16	LOSS	701	41	KNEE	265
17	PER	635	42	SINCE	261
18	MOTHER	599	43	POST	231
19	FEVER	575	44	NOW	230
20	DENIES	569	45	1	229
21	LACERATION	533	46	FACE	225
22	VOMITING	489	47	HURT	219
23	ARM	482	48	LAST	218
24	FALL	473	49	NAUSEA	218
25	REPORTS	468	50	BLEEDING	216



Visits by Ages 0-17	Top Syndromes / Subsyndromes
95.3%	Injury;RecordsOfInterest Other GI;Resp;Injury;ILI;Fever
88.2%	Poisoning Fall NVD Fever
85.6%	Fever NVD

Next Steps

- Refine and finalize definition
- Discuss self-harm, mental, and behavioral health limitations
- Draft and validate revised query
 - Consider including other search terms (“student” and “teacher”)
 - Consider exclusions (“not currently,” “not in school,” “denies bullying,” “underachievement in school,” “expelled,” and “does well in school”)

^Thanks^

Say Hi

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- **Melissa Jordan**
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- **Hayleigh McCall**
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Get Involved

- **CSTE Environmental Health in Schools Workgroup**
- Workgroup meetings on the 2nd Monday of each month from 2-3 PM EST
- Sub-teams
 - Syndromic and Poison Control Centers
 - Environmental Sampling in Schools
 - White Paper