Unreported Case Finding

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

Moderator: Lowrie Ward, MPH – Alaska Native Tribal Health Consortium, Alaska Native Epidemiology Center

Presenters:
Erin Austin, MPH – Virginia Department of Health
Rene Borroto, BA – Georgia Department of Public Health

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Council of State and Territorial Epidemiologists

Erin Austin, MPH
Virginia Department of Health

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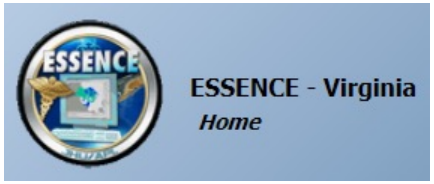
Leveraging ESSENCE Data for Case Finding Using Visits of Interest Email Notifications

Erin Austin, MPH
Virginia Department of Health
2021 Syndromic Surveillance Symposium

Virginia ESSENCE



- State-specific implementation of syndromic surveillance system ESSENCE
  - Reporting by 105 emergency departments and 60+ urgent cares
- Managed by centralized team at state health department
  - Develop resources (queries, dashboards) for local health department users
  - Standardize surveillance practice

Syndromic Surveillance Case Finding

- Virginia ESSENCE has been utilized to identify unreported cases of reportable disease for many years
- Large local health department wanted to streamline and reduce manual ESSENCE review for reportable disease conditions
- Explored “Visits of Interest” email notification with support from Johns Hopkins University – Applied Physics Lab (APL)
  - Based on previous work by the Florida Department of Health

Objective

1. Enhance identification of reportable diseases from ESSENCE which may need immediate public health action
2. Reduce manual workload of communicable disease staff by sending daily emails notifications
3. Increase visibility and utility of ESSENCE data to infrequent local health department users

Methods

- Developed “Visits of Interest” definition specific to Virginia reportable disease list
  - Input from local health department users
  - Primarily includes rapidly reportable disease conditions (notification required to VDH within 24 hours)
  - Identifies ESSENCE visits which may need immediate public health action

REPORT IMMEDIATELY

Anthrax (*Bacillus anthracis*) [a]
Botulism (*Clostridium botulinum*) [a]
Brucellosis (*Brucella* spp.) [a]
Cholera (*Vibrio cholerae* O1/O139) [a]

Diphtheria (*Corynebacterium diphtheriae*) [a]
Disease caused by an agent that may have been used as a weapon
***Haemophilus influenzae* infection, invasive** [a]
Hepatitis A [a]

Measles (Rubeola) [a]
Meningococcal disease (*Neisseria meningitidis*) [a]

Pertussis (*Bordetella pertussis*) [a]
Plague (*Yersinia pestis*) [a]
Poliovirus infection, including poliomyelitis [a]
Psittacosis (*Chlamydophila psittaci*) [a]
Q fever (*Coxiella burnetti*) [a]

Rubella [a], including congenital rubella syndrome [a]
Smallpox (Variola virus) [a]
Syphilis (*Treponema pallidum*), congenital, primary, and secondary [a]
Tuberculosis, active disease (*Mycobacterium tuberculosis* complex) [a,b]
Tularemia (*Francisella tularensis*) [a]
Typhoid/Paratyphoid infection (*Salmonella* Typhi, *Salmonella* Paratyphi) [a]
Unusual occurrence of disease of public health concern
Vaccinia, disease or adverse event [a]
Vibriosis (*Vibrio* spp.) [a,e]
Viral hemorrhagic fever [a]
Yellow fever [a]

REPORT WITHIN 3 DAYS

Amebiasis (*Entamoeba histolytica*) [a]
Arboviral infections (e.g., CHIK, dengue, EEE, LAC, SLE, WNV, Zika) [a]
Babesiosis (*Babesia* spp.) [a]
Campylobacteriosis (*Campylobacter* spp.) [a]
***Candida auris*, infection or colonization** [a,c]
Carbapenemase-producing organism, infection or colonization [a]
Chancroid (*Haemophilus ducreyi*) [a]
Chickenpox (Varicella virus) [a]
Chlamydia trachomatis infection [a]
Cryptosporidiosis (*Cryptosporidium* spp.) [a]
Cyclosporiasis (*Cyclospora* spp.) [a]
Ehrlichiosis/Anaplasmosis (*Ehrlichia* spp., *Anaplasma phagocytophilum*) [a]
Giardiasis (*Giardia* spp.) [a]
Gonorrhea (*Neisseria gonorrhoeae*) [a]
Granuloma inguinale (*Calymmatobacterium granulomatis*)
Hantavirus pulmonary syndrome [a]
Hemolytic uremic syndrome (HUS)
Hepatitis B (acute and chronic) [a]
Hepatitis C (acute and chronic) [a]
Hepatitis, other acute viral [a]
Human immunodeficiency virus (HIV) infection [a]
Influenza, confirmed seasonal strain [a]
Lead, blood levels [a]
Legionellosis (*Legionella* spp.) [a]
Leprosy/Hansen's disease (*Mycobacterium leprae*)
Leptospirosis (*Leptospira interrogans*) [a]
Listeriosis (*Listeria monocytogenes*) [a]
Lyme disease (*Borrelia* spp.) [a]
Lymphogranuloma venereum (*Chlamydia trachomatis*)
Malaria (*Plasmodium* spp.) [a]
Mumps [a]
Neonatal abstinence syndrome (NAS)
Ophthalmia neonatorum
Rabies treatment, post-exposure
Salmonellosis (*Salmonella* spp.) [a]
Shiga toxin-producing *Escherichia coli* infection [a,d]
Shigellosis (*Shigella* spp.) [a]
Spotted fever rickettsiosis (*Rickettsia* spp.) [a]
Streptococcal disease, Group A, invasive or toxic shock [a]

LEGEND

Methods

- Added “Visits of Interest” definition as CCDD Category in Virginia ESSENCE
  - Definition is different from CCDD Category in NSSP ESSENCE
- Enabled automated email notification
  - Template developed by Florida Department of Health
  - Local health department users receive visits by patients residing in their jurisdiction and visits to facilities located in their jurisdiction

ESSENCE Notification - Visits of Interest for Review Inbox ×

syndromic@vdh.virginia.gov
to me

Thu, Sep 9, 10:00 AM Reply

The following Visits of Interest were identified in residents of your health district or in individuals visiting a healthcare facility in your health district:

Note: Bolded entries are new and have not been sent in previous VOI emails

Today's and Yesterday's Visits				
Date	CCDD	Patient Location	Facility	Facility Location
09/09/2021	**RECHECK FOR MEASLES | 416113008;Disorder characterized by fever;**	County 1	Facility A	County 2
09/08/2021	**RASH | B01.9;Varicella without complication;**	County 2	Facility B	County 2
09/08/2021	**SEXUALLY TRANSMITTED DISEASE CHECK PREGNANY TEST | Z20.5;Contact with and (suspected) exposure to viral hepatitis;N89.8;Other specified noninflammatory disorders of vagina;**	County 3	Facility C	County 3
09/08/2021	**COUGH BODY RASH MEASLES | 34014006;Viral disease;49882001;Viral exanthem;**			
09/08/2021	**PUI MEASLE | 444435003;Exposure to measles virus;77386006;Pregnant;**			
09/08/2021	COUGH FEVER POSSIBLE MEASLES | 233604007;Pneumonia;79740000;Candidiasis of mouth;			
09/08/2021	**FEVER COUGH MEASLES RULE OUT | 386661006;Fever;281794004;Viral upper respiratory tract infection;**			
09/08/2021	**MEDIC RED CODE ROOM | B17.9;Acute viral hepatitis, unspecified;B17.9;Acute viral hepatitis, unspecified;**		William Medical Center	

Project Timeline

Spring 2019 — Initial Request

Local health dept request for automated notification process

July 2019 — Development

Visits of Interest definition developed and functionality deployed to Virginia ESSENCE

Fall 2019 — Internal Testing

Internal testing and troubleshooting performed

July 2020 — Pilot Testing

Pilot testing performed by local health dept users

Sep 2020 — Definition Revision

Visits of Interest definition revised

Nov 2020 — Deployment

Email notification deployed to Virginia ESSENCE users statewide

Evaluation Survey

- Conducted in summer 2021
  - All 27 respondents found email notifications to be either very useful (44%) or somewhat useful (56%)
- After receiving emails, users most often performed the following actions:
  - Checked reportable disease surveillance system to determine if investigation was in progress
  - Reviewed medical records or contacted treating facility
- Most useful identifying unreported cases of hepatitis A and varicella

Evaluation of Use

As of October 2021	
# of local health department users currently receiving emails	58
Between November 2020 and October 2021	
# of times Visits of Interest definition accessed in ESSENCE	338
Range per user	1-44
Mean per user	7

Next Steps

- Explore security options to increase PHI content (medical record number) within email templates
- Make small revisions to Visits of Interest definition to trim out additional noise/false positives
- Discuss ability to add ESSENCE as case identification method in Virginia reportable disease surveillance system for ongoing evaluation

Acknowledgements

- Arden Norfleet, MPH
- Meredith Davis, MPH
- Johns Hopkins University – Applied Physics Lab

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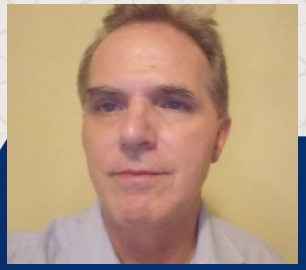

Rene Borroto, BA
Georgia Department of Public Health

CSTE

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Using Syndromic Surveillance for Early Detection of Covid-19 Outbreaks in Long-Term Care Facilities, Georgia, April 2020 – March 2021

2021 Syndromic Surveillance Symposium / Rene Borroto / November 17, 2021

Georgia Department of Public Health

Objective

To describe how syndromic surveillance can be used for early detection of COVID-19 outbreaks in Long-term Care Facilities in the State of Georgia.

Methods

Methods

- List of Long-Term Care Facility names and addresses obtained from the Georgia Department of Community Health

- Patients mapped to at least one of these syndromes: Covid-19, Pneumonia, Influenza-Like Illness, Respiratory, FeverFlu, or Asthma

Methods

Chief Complaint (CC) text string containing

- Generic terms and acronyms related to LTCFs – e.g. ‘nursing home’, ‘nh’, ‘assisted living’, ‘alf’
- Specific names of LTCFs – e.g. ‘Pruitt’, ‘Azalea’, ‘Winthrop’, ‘Ridgewood Manor’

Note: Triage Notes (TN) had been added to the CC field by Data Quality Analyst

```
Data SendSS.InstitNursingHome;
Set SendSS.DailyPatientsZipDd;
If INDEX (Upcase (Chief_Complaint), 'NURSING HOME') > 0 or
INDEX (Upcase (Chief_Complaint), 'NURSING FACILITY') > 0 or
INDEX (Upcase (Chief_Complaint), 'SKILLED NURSING') > 0 or
INDEX (Upcase (Chief_Complaint), 'SKILL NURSING') > 0 or
INDEX (Upcase (Chief_Complaint), 'PERSONAL CARE HOME') > 0 or
INDEX (Upcase (Chief_Complaint), 'HEALTH AND REHAB') > 0 or
INDEX (Upcase (Chief_Complaint), 'HEALTH & REHAB') > 0 or
INDEX (Upcase (Chief_Complaint), 'HLTH AND REHAB') > 0 or
INDEX (Upcase (Chief_Complaint), 'HLTH & REHAB') > 0 or
INDEX (Upcase (Chief_Complaint), 'ASSISTED LIVING') > 0 or
INDEX (Upcase (Chief Complaint), 'ASSISTEDLIVING') > 0 or
```

```
INDEX (Upcase (Chief_Complaint), 'CARTERSVILLE HEIGHTS') > 0 or
INDEX (Upcase (Chief_Complaint), 'MAPLE RIDGE') > 0 or
INDEX (Upcase (Chief_Complaint), 'RIDGE REHAB') > 0 or
INDEX (Upcase (Chief_Complaint), 'SIMPSON') > 0 or
INDEX (Upcase (Chief_Complaint), 'PRISMA') > 0 or
INDEX (Upcase (Chief_Complaint), 'LILA DOYLE') > 0 or
INDEX (Upcase (Chief_Complaint), 'HARTER') > 0 or
INDEX (Upcase (Chief_Complaint), 'GREAT RIVER') > 0 or
INDEX (Upcase (Chief_Complaint), 'TOWNSEND PARK') > 0 or
INDEX (Upcase (Chief_Complaint), 'HUTCHESON') > 0 or
INDEX (Upcase (Chief Complaint), 'PRUITT') > 0 or
```

Methods

Query results emailed to the District Epidemiologists of the 18 public health districts in Georgia from April 2020 through March 2021.

04/05/2020 19:44 : 301530814 : 60Y : W : F : 09 : POLK : ROME (1-1) : 52077985 : 858309
SS: covid19, covidminustest,
CC: pt to er via ems from rome health and rehab secondary to decreased o2 sats per staff. tested positive for covid-19 on 3-27-20.
DX: 2019-nCoV acute respiratory disease | Acute and chronic respiratory failure with hypoxia | Other viral pneumonia | Supraventricular tachycardia | Alkalosis | Chronic diastolic (congestive) heart failure | Chronic obstructive pulmonary disease with (a
CD: U07.1 | J96.21 | J12.89 | I47.1 | E87.3 | I50.32 |
AC: LEVEL 2 - URGENT
TN: -
EH: AD: IT:
PX:
PD:
TV:

Methods

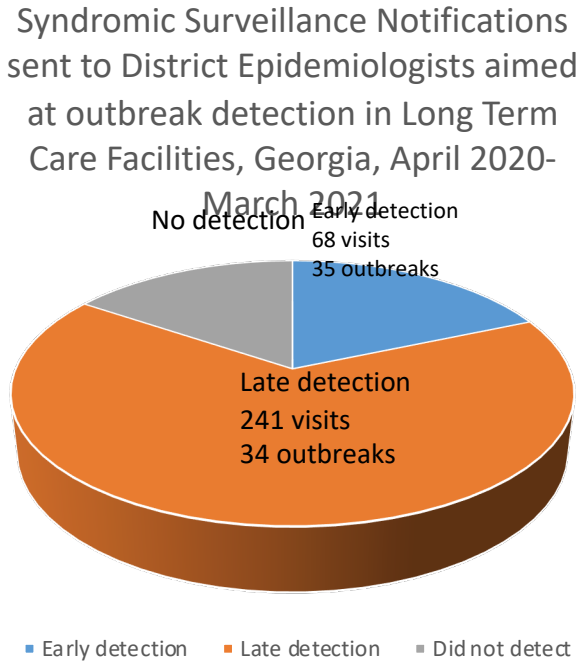
- April 2021 – Reviewed data within the State Electronic Notifiable Disease Surveillance System (SendSS) Outbreak Management System module to identify if an outbreak had been reported by these LTCFs before or after the date of each ED visit.
- Percentage of notifications that could have detected outbreaks with two levels of timeliness:
    1. **<u>early detection</u>**, when the ED visit had occurred at least one day before the outbreak was reported to a HD, or
    2. **<u>late detection</u>**, when the ED visit occurred on the same day or after the outbreak was reported.

Results

Results

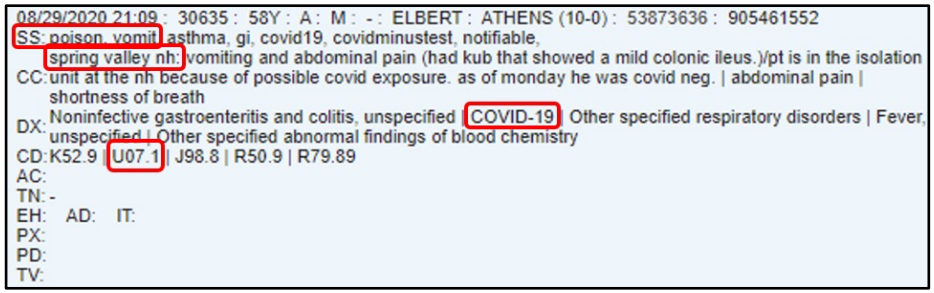
1. ED visits emailed to Districts = 428
2. ED visits excluded because of imperfect name-matching = 62
3. Of the remaining 366 ED visits,

- 68 visits (19%) fell in the early detection category; had occurred before the date of report of 35 Covid-19 outbreaks (median earliness = 17 days; range 1-88).
- 241 visits (66%) fell in the late detection category; linked to 34 ongoing outbreaks.
- 57 ED visits (15%) of patients from LTCFs whose outbreak investigations had already been closed or did not report outbreaks.



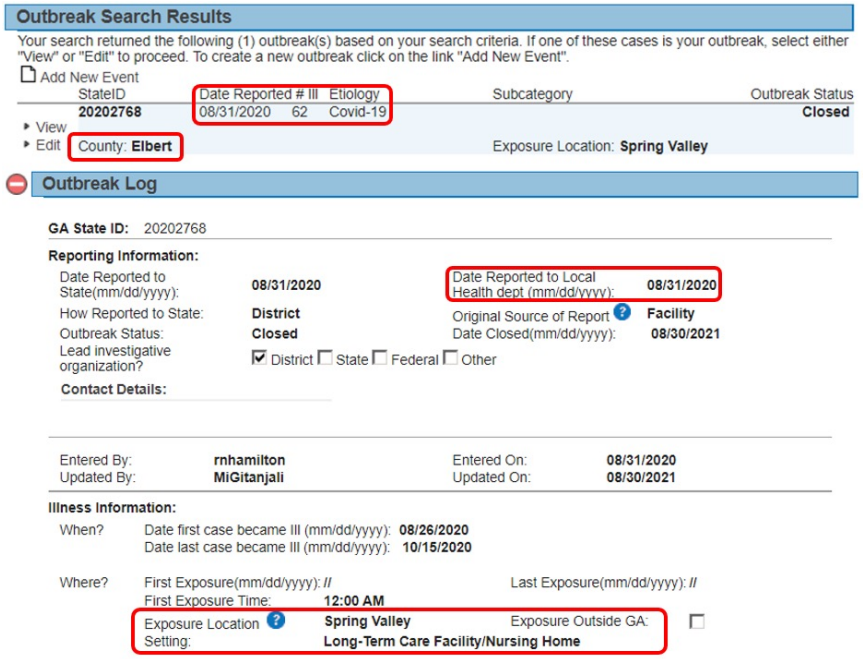
Results

Syndromic Surveillance Module



08/29/2020 21:09 : 30635 : 58Y : A : M : - : ELBERT : ATHENS (10-0) : 53873636 : 905461552
SS: poison, vomit, asthma, gi, covid19, covidminustest, notifiable,
spring valley nh: vomiting and abdominal pain (had kub that showed a mild colonic ileus.)/pt is in the isolation
CC: unit at the nh because of possible covid exposure. as of monday he was covid neg. | abdominal pain | shortness of breath
DX: Noninfective gastroenteritis and colitis, unspecified | COVID-19 | Other specified respiratory disorders | Fever, unspecified | Other specified abnormal findings of blood chemistry
CD: K52.9 | U07.1 | J98.8 | R50.9 | R79.89
AC:
TN: -
EH: AD: IT:
PX:
PD:
TV:

Outbreak Report Module



Outbreak Search Results

Your search returned the following (1) outbreak(s) based on your search criteria. If one of these cases is your outbreak, select either "View" or "Edit" to proceed. To create a new outbreak click on the link "Add New Event".

Add New Event

	StateID	Date Reported	# Ill	Etiology	Subcategory	Outbreak Status
▸ View ▸ Edit	20202768	08/31/2020	62	Covid-19		Closed

County: **Elbert** Exposure Location: **Spring Valley**

Outbreak Log

GA State ID: 20202768

Reporting Information:

Date Reported to State(mm/dd/yyyy): **08/31/2020**
Date Reported to Local Health dept (mm/dd/yyyy): **08/31/2020**
How Reported to State: **District**
Original Source of Report: **Facility**
Outbreak Status: **Closed**
Date Closed(mm/dd/yyyy): **08/30/2021**
Lead investigative organization? ☑ District ☐ State ☐ Federal ☐ Other
Contact Details:

Entered By: **rnhamilton** Entered On: **08/31/2020**
Updated By: **MiGitanjali** Updated On: **08/30/2021**

Illness Information:

When? Date first case became Ill (mm/dd/yyyy): **08/26/2020**
Date last case became Ill (mm/dd/yyyy): **10/15/2020**

Where? First Exposure(mm/dd/yyyy): // Last Exposure(mm/dd/yyyy): //
First Exposure Time: **12:00 AM**
Exposure Location: **Spring Valley** Exposure Outside GA: ☐
Setting: **Long-Term Care Facility/Nursing Home**

Results

Syndromic Surveillance Module

07/30/2020 21:05 : 30458 : 93Y : W : F : 01 : BULLOCH : WAYCROSS (9-2) : 53458476 : 35931
SS: injury2, injury, covid19, covidminustest, notifiable,
CC: pt from browns nh after fall. pt denies loc or hitting head states she sat down on floor while trying to go to restroom.
Unspecified fall, initial encounter | 2019-nCoV acute respiratory disease | 2019-nCoV acute respiratory disease
DX: | Other specified symptoms and signs involving the circulatory and respiratory systems | Fall on same level from slipping, tripping and st;Unsp
CD: W19.XXXA | U07.1 | U07.1 | R09.89 | W01.0XXA | Y92
AC: LEVEL 3 - LESS URGENT
TN: -
EH: AD: IT:
PX:
PD:
TV:

Outbreak Report Module

Outbreak Search Results

Your search returned the following (1) outbreak(s) based on your search criteria. If one of these cases is your outbreak, select either "View" or "Edit" to proceed. To create a new outbreak click on the link "Add New Event".

Add New Event

	StateID	Date Reported	# Ill	Etiology	Subcategory	Outbreak Status
▸ View ▸ Edit	**20202167**	08/03/2020	16	Covid-19		**Closed**

County: **Bulloch**

Exposure Location: **Browns Health And Rehab**

Outbreak Log

GA State ID: 20202167

Reporting Information:

Date Reported to State(mm/dd/yyyy):	**08/03/2020**	Date Reported to Local Health dept (mm/dd/yyyy):	**08/03/2020**
How Reported to State:	**District**	Original Source of Report	**Facility**
Outbreak Status:	**Closed**	Date Closed(mm/dd/yyyy):	**12/31/2020**
Lead investigative organization?	☑ District ☐ State ☐ Federal ☐ Other		

Contact Details:

Entered By:	**rjkakou**	Entered On:	**08/03/2020**
Updated By:	**MiGitanjali**	Updated On:	**09/17/2021**

Illness Information:

When?
Date first case became Ill (mm/dd/yyyy): **06/18/2020**
Date last case became Ill (mm/dd/yyyy): **09/10/2020**

Where?
First Exposure(mm/dd/yyyy): **//** Last Exposure(mm/dd/yyyy): **//**
First Exposure Time: **12:00 AM**
Exposure Location Setting: **Browns Health and Rehab** Exposure Outside GA: ☐
Long-Term Care Facility/Nursing Home

Results

Syndromic Surveillance Module

05/25/2020 19:32 : 30662 : 83Y : W : F : - : FRANKLIN : GAINESVILLE (2-0) : 52560835 : 904814084
SS: fever, asthma, fevflu, covid19, notifiable, covidminustest,
ems - abnormal cxr in patient who tested + covid19 six days ago. afebrile. bp 91/57. hr 88. rr 16 with o2 sat
CC: 92% on o2 @ 2 lpm history of dementia, patient is nonambulatory. hartwell health and rehab. 9 residents are covid 19 positive. | shortn
DX: Urinary tract infection, site not specified | COVID-19
CD: N39.0 | U07.1
AC:
TN: -
EH: AD: IT:
PX:
PD:
TV:

Outbreak Report Module

Outbreak Search Results

Your search returned the following (1) outbreak(s) based on your search criteria. If one of these cases is your outbreak, select either "View" or "Edit" to proceed. To create a new outbreak click on the link "Add New Event".

Add New Event

	StateID	Date Reported	# Ill	Etiology	Subcategory	Outbreak Status
▸ View ▸ Edit	20201103	05/29/2020	21	Covid-19		Closed

County: Hart

Exposure Location: Hartwell Health & Rehab, 94 Cade St, Hartwell, Ga 30643

Outbreak Log

GA State ID: 20201103

Reporting Information:

Date Reported to State(mm/dd/yyyy):	05/29/2020	Date Reported to Local Health dept (mm/dd/yyyy):	05/20/2020
How Reported to State:	District	Original Source of Report	
Outbreak Status:	Closed	Date Closed(mm/dd/yyyy):	06/29/2020
Lead investigative organization?	☑ District ☐ State ☐ Federal ☐ Other		
Contact Details:			

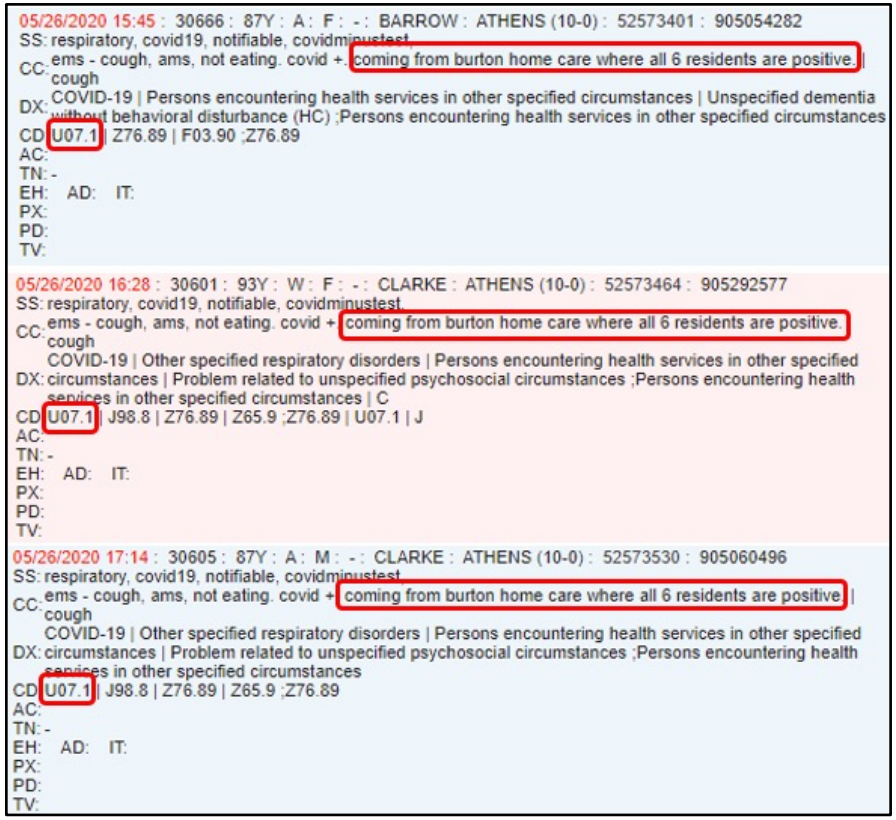
Entered By:	emily.reeves	Entered On:	05/29/2020
Updated By:	mbritez	Updated On:	08/03/2021

Illness Information:

When? Date first case became Ill (mm/dd/yyyy): 05/20/2020
Date last case became Ill (mm/dd/yyyy): //

Where? First Exposure(mm/dd/yyyy): 05/20/2020 Last Exposure(mm/dd/yyyy): //
First Exposure Time: 12:00 AM
Exposure Location: Hartwell Health & rehab, 94 Cade St, Hartwell, GA 30643 Exposure Outside GA ☐
Setting: Long-Term Care Facility/Nursing Home

Results



05/26/2020 15:45 : 30666 : 87Y : A : F : - : BARROW : ATHENS (10-0) : 52573401 : 905054282
SS: respiratory, covid19, notifiable, covidminustest
CC: ems - cough, ams, not eating. covid +. coming from burton home care where all 6 residents are positive. | cough
DX: COVID-19 | Persons encountering health services in other specified circumstances | Unspecified dementia without behavioral disturbance (HC) ;Persons encountering health services in other specified circumstances
CD: U07.1 | Z76.89 | F03.90 ;Z76.89
AC:
TN: -
EH: AD: IT:
PX:
PD:
TV:

05/26/2020 16:28 : 30601 : 93Y : W : F : - : CLARKE : ATHENS (10-0) : 52573464 : 905292577
SS: respiratory, covid19, notifiable, covidminustest
CC: ems - cough, ams, not eating. covid + coming from burton home care where all 6 residents are positive. cough
DX: COVID-19 | Other specified respiratory disorders | Persons encountering health services in other specified circumstances | Problem related to unspecified psychosocial circumstances ;Persons encountering health services in other specified circumstances | C
CD: U07.1 | J98.8 | Z76.89 | Z65.9 ;Z76.89 | U07.1 | J
AC:
TN: -
EH: AD: IT:
PX:
PD:
TV:

05/26/2020 17:14 : 30605 : 87Y : A : M : - : CLARKE : ATHENS (10-0) : 52573530 : 905060496
SS: respiratory, covid19, notifiable, covidminustest
CC: ems - cough, ams, not eating. covid + coming from burton home care where all 6 residents are positive. | cough
DX: COVID-19 | Other specified respiratory disorders | Persons encountering health services in other specified circumstances | Problem related to unspecified psychosocial circumstances ;Persons encountering health services in other specified circumstances
CD: U07.1 | J98.8 | Z76.89 | Z65.9 ;Z76.89
AC:
TN: -
EH: AD: IT:
PX:
PD:
TV:

Limitations

Limitations

- Analysis of timeliness of the detection of Covid-19 outbreaks, NOT of Predictive Positive Value

- We don't know if the District Epidemiologists actually followed up on these notifications – heavy workload and overstretched staff.

Limitations

- Names of LTCFs in the CC and TN field can be subject to misspellings and abbreviations - makes matching LTCF names in the Syndromic Surveillance and Outbreak modules difficult

- To tackle this issue in the evaluation of timeliness, we included LTCFs

    1. with names linked to a single facility located in a specific place or
    2. with a common, usually corporate name, but that also provided location-related specifics in the CC / TN field. For instance,

Included - "*The Oaks at Pooler*" or "*The Oaks at Athens*"

Excluded - "*The Oaks*"

Limitations

- The Date of Outbreak Report to LHDs in the Outbreak module is not always posted. Used Date of Report to State instead.

- Out of 130 Emergency Rooms and Urgent Care Facilities sending data feed to the Syndromic Surveillance module, only 26 (20%) mentioned names of LTCFs in the CC / TN field.

Next Steps

1. Increase the number of facilities sending Triage Notes
2. Use name-matching softwares / algos to improve linkages
3. Combine with statistics-based cluster detection procedures
4. Predictive analytics to find determinants
5. Apply to other communicable diseases
6. Evaluation of notifications in conjunction with District Epidemiologists

Conclusions

Covid-19 outbreaks in LTCFs can be detected early by using queries that search for names of LTCFs in the CC field of the syndromic surveillance data set.

This text-based query can also play a back-up role for identification of outbreaks already notified to local health departments.

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CSTE

Enhanced Surveillance for Unreported Multisystem Inflammatory Syndrome Cases in Virginia

Erin Austin, MPH
Virginia Department of Health
2021 Syndromic Surveillance Symposium

Multisystem Inflammatory Syndrome (MIS)

- Rare but serious condition associated with COVID-19 infection affecting children (MIS-C) and adults (MIS-A)
  - MIS-C = 20 years and younger
  - MIS-A = 21+ years
- CDC issued health advisory and case definition for MIS-C on May 14, 2020
- First Virginia MIS-C case reported on May 19, 2020

MIS Case Identification

- Case identification initially relied on healthcare provider reporting
- VDH explored emergency department (ED) data in Virginia ESSENCE to identify unreported MIS-C and MIS-A cases
- VDH collects 11,000 ED visits each day through Virginia ESSENCE
  - 100% of acute care non-federal hospitals report

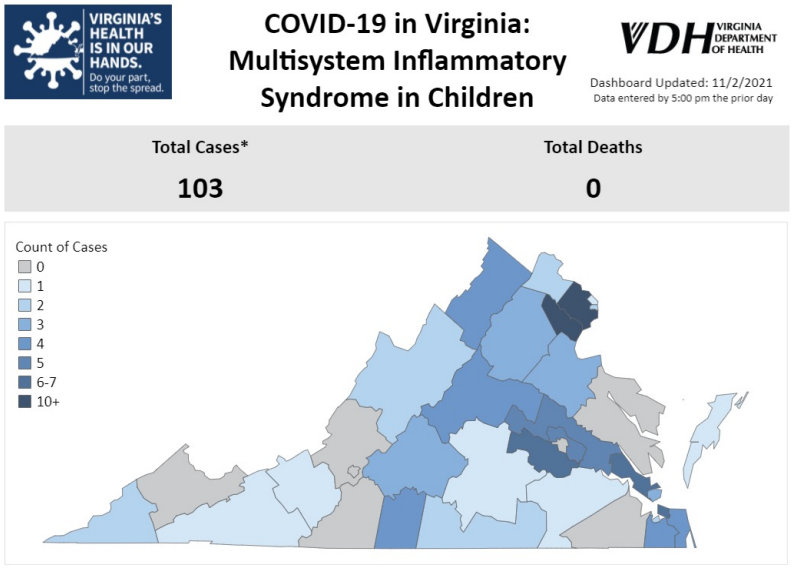
ICD-10 Diagnosis Coding

- Prior to January 1, 2021 no condition-specific ICD-10 code for MIS
  - Initiated enhanced surveillance based on symptoms/syndromes in summer 2020
  - Unsuccessful in identifying cases

- On January 1, 2021 ICD-10 code for MIS implemented = **M35.81**
  - Allowed targeted enhanced surveillance to identify previously unreported MIS cases

Objective

To improve surveillance and identification of MIS cases in Virginia



MIS Surveillance Criteria

- Revised ESSENCE surveillance definition to ICD-10 code **M35.81** or “multisystem inflammatory syndrome” in the CCDD field
- ED patients from ESSENCE matched with Virginia reportable disease surveillance system (VEDSS) to identify patients for public health follow up

Matching ESSENCE and COVID-19 Case Data

- ESSENCE and VEDSS matched on combination of:
  - Patient name (if available), DOB, Medical Record Number, Sex and Zip Code
- Was a MIS investigation already initiated for patient?
- Was there evidence of recent COVID-19 infection based on lab test results (RNA, Antigen, Antibody)?

1.6 ☐ Positive for current or recent SARS-COV-2 infection by (check all applicable below): OR
- **1.6.1** ☐ RT-PCR
- **1.6.2** ☐ Serology
- **1.6.3** ☐ Antigen test

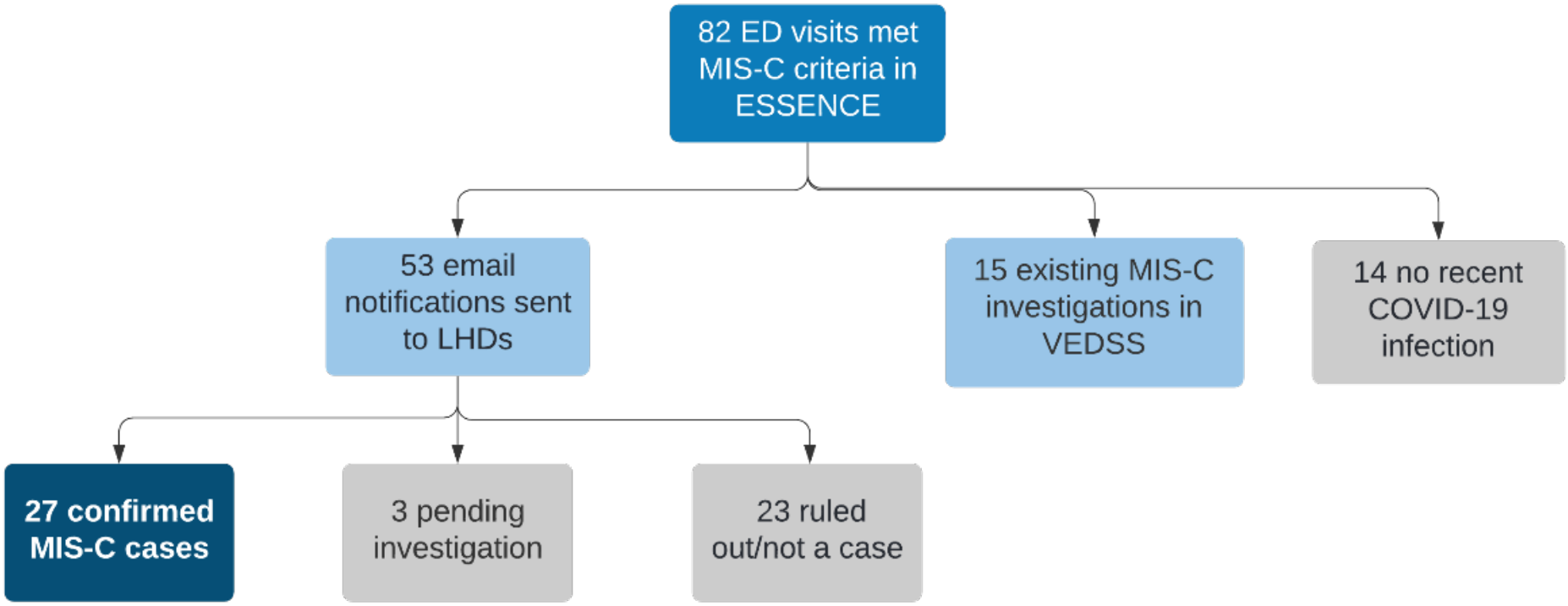
1.7 ☐ COVID-19 exposure within the 4 weeks prior to the onset of symptoms
- **1.7.1** If yes, date of first exposure within the 4 weeks prior : *(MM/DD/YYYY)*: _____

Public Health Follow Up

- Local health department contacted for follow up investigation if:
    1. No MIS investigation in VEDSS and
    2. Patient met recent COVID-19 infection criteria

- Used email template summarizing critical data elements from ESSENCE and VEDSS

MIS-C Surveillance Outcomes (January – September 2021)

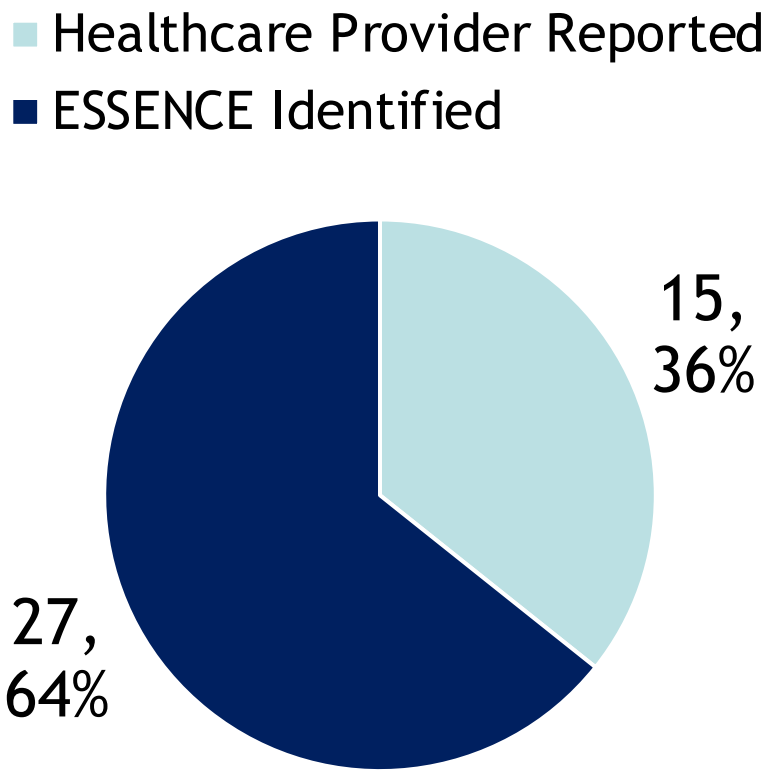


ESSENCE Definition Performance for MIS-C (January – September 2021)

Positive Predictive Value (PPV)	**51%**
82 ESSENCE records met MIS-C surveillance definition	
42 ESSENCE records became confirmed MIS-C cases	
Sensitivity	**58%**
72 MIS-C cases reported by VDH to CDC	
42 ESSENCE records became confirmed MIS-C cases	

Unreported MIS-C Cases

- 42 ESSENCE records meeting the definition became confirmed MIS-C cases
  - 27 (64%) first identified by enhanced surveillance effort
  - Previously unreported to VDH by a healthcare provider



Unreported MIS-A Cases

- Virginia's first MIS-A case reported in February 2021
- 3 out of 4 (75%) MIS-A cases identified with enhanced surveillance

Successes

- Helped identify a cluster of unreported cases in Richmond area
- Reminder for ongoing education to healthcare providers treating MIS cases to immediately report to health department

Cases of Multisystem Inflammatory Syndrome in Children Reported in the Metro-Richmond area

(RICHMOND, Virginia) – Five confirmed cases of Multisystem Inflammatory Syndrome in Children (MIS-C) associated with COVID-19 have been identified in the Chickahominy, Chesterfield, and Richmond/Henrico health districts. Three of these cases were identified by health district staff, prompting a review between October 2020 and February 18, 2021, for any cases that had not been directly reported by clinicians or hospitals to the health districts. As of today, this review has identified two additional confirmed cases and a few others are still being investigated. The increase in

Conclusion

- Use of ESSENCE supplemented traditional reporting methods
  - Identified **27 MIS-C** and **3 MIS-A** cases not reported to VDH from January to September 2021
- Condition-specific diagnosis code supported detection of unreported cases
- Enhanced surveillance allowed Virginia to more accurately assess MIS burden among population

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