

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



Council of State and Territorial Epidemiologists



Erin Austin, MPH
Virginia Department of Health



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 using ESSENCE
2. Reduce manual workload of local health department staff
3. Increase visibility and utility of ESSENCE data to infrequent 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 needing 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
 - Sent daily at 10am
 - Includes 1) visits by patients residing in local jurisdiction and 2) visits to facilities located in local jurisdiction

ESSENCE Notification - Visits of Interest for Review

Inbox x



syndromic@vdh.virginia.gov
to me

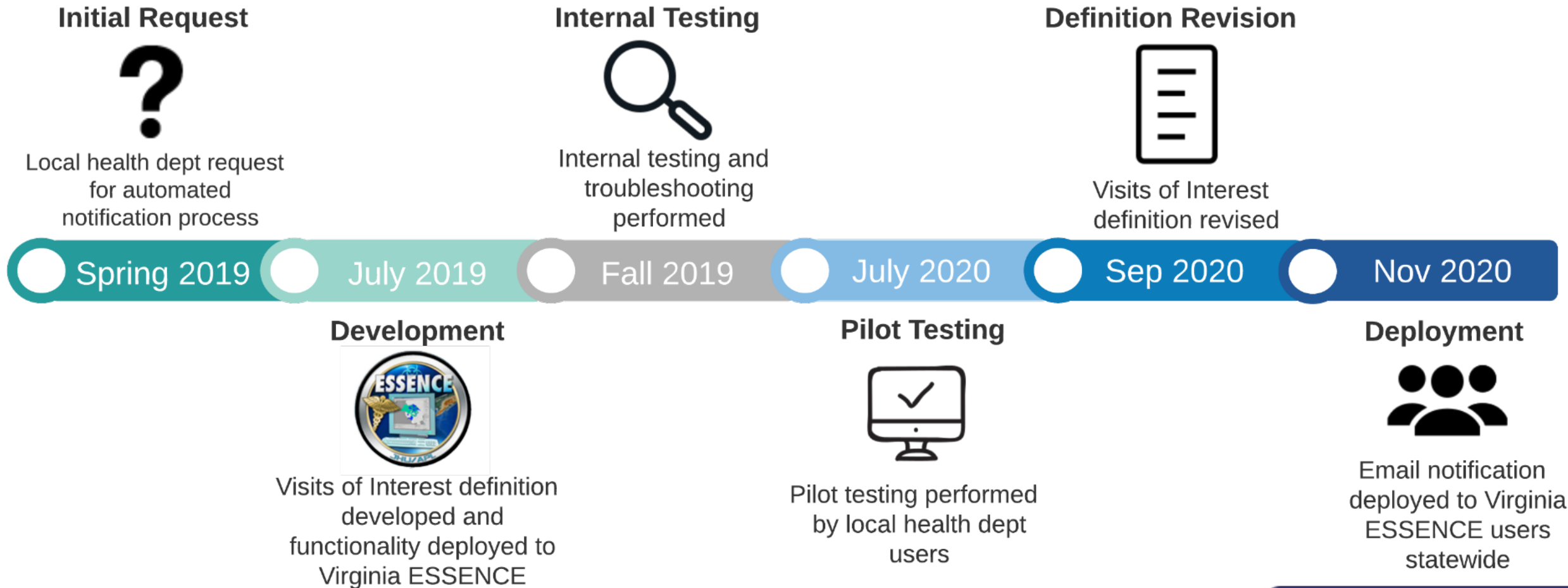
Thu, Sep 9, 10:00 AM ☆ Reply

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



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 (medical record number) within email template
- Make small revisions to Visits of Interest definition to trim out additional noise/false positives
- Explore adding “ESSENCE” as case identification method in Virginia reportable disease surveillance system

Acknowledgements

- Arden Norfleet, MPH
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- Johns Hopkins University - Applied Physics Lab

Contact Information

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Public Health



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

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

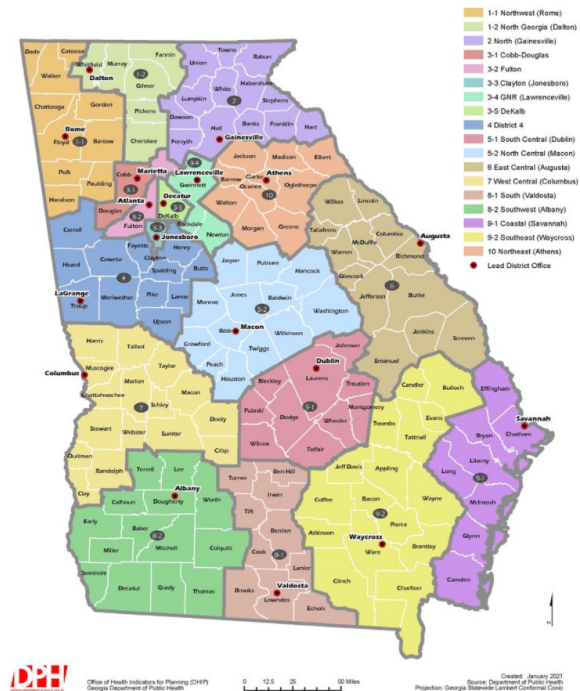
```
Data SendSS.InstitNursingHome;
Set SendSS.DailyPatientsZipDd;
If INDEX (Ucase (Chief_Complaint), 'NURSING HOME') > 0 or
INDEX (Ucase (Chief_Complaint), 'NURSING FACILITY') > 0 or
INDEX (Ucase (Chief_Complaint), 'SKILLED NURSING') > 0 or
INDEX (Ucase (Chief_Complaint), 'SKILL NURSING') > 0 or
INDEX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

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

Methods

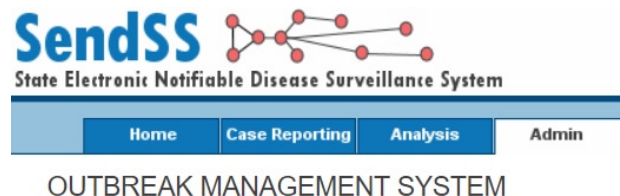
Query results emailed to the District Epidemiologists of the 18 public health districts in Georgia from April 2020 through March 2021.

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.
2019-nCoV acute respiratory disease | Acute and chronic respiratory failure with hypoxia | Other viral
DX: 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. **early detection**, when the ED visit had occurred at least one day before the outbreak was reported to a HD, or
 2. **late detection**, when the ED visit occurred on the same day or after the outbreak was reported.

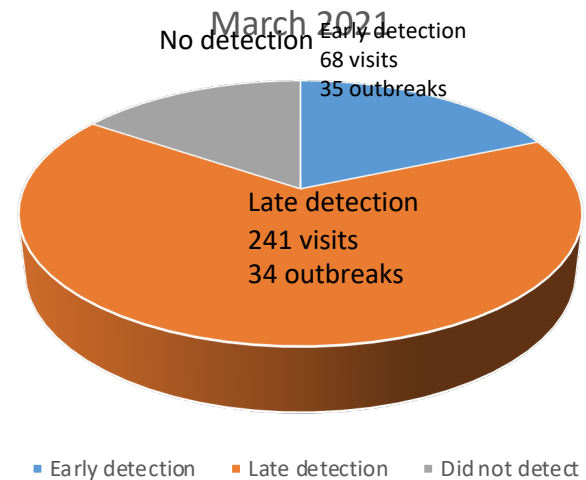


Results

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.

Syndromic Surveillance Notifications sent to District Epidemiologists aimed at outbreak detection in Long Term Care Facilities, Georgia, April 2020-March 2021



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
	20202768	08/31/2020	62	Covid-19		Closed
► View						
► Edit	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
Updated By: MiGitanjali
Entered On: 08/31/2020
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): //
First Exposure Time: 12:00 AM
Last Exposure(mm/dd/yyyy): //
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
20202167	08/03/2020 16	Covid-19		Closed
View				
Edit				

Outbreak Log

GA State ID: 20202167

Reporting Information:

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

Contact Details:

Entered By: rjkakou
Updated By: MiGitanjali
Entered On: 08/03/2020
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): //
First Exposure Time: 12:00 AM
Last Exposure(mm/dd/yyyy): //
Exposure Location: Browns Health and Rehab
Setting: Long-Term Care Facility/Nursing Home
Exposure Outside GA: ☐

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, | shorten
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 #	III	Etiology	Subcategory	Outbreak Status
20201103	05/29/2020	21	Covid-19		Closed

► View

► Edit 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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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

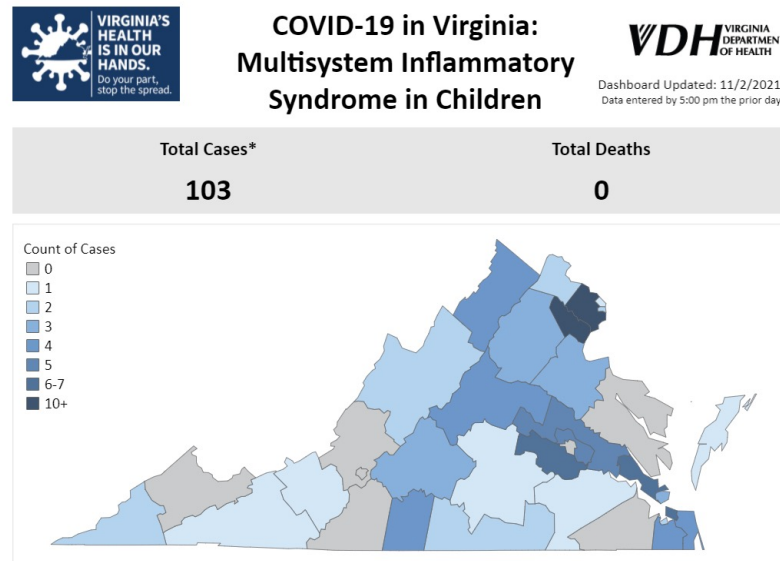
- Case identification initially relied on healthcare provider reporting
- VDH explored emergency department (ED) data in Virginia ESSENCE to identify unreported MIS-C and MIS-A cases
- VDH collects 11,000 ED visits each day through Virginia ESSENCE
 - 100% of acute care non-federal hospitals report

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

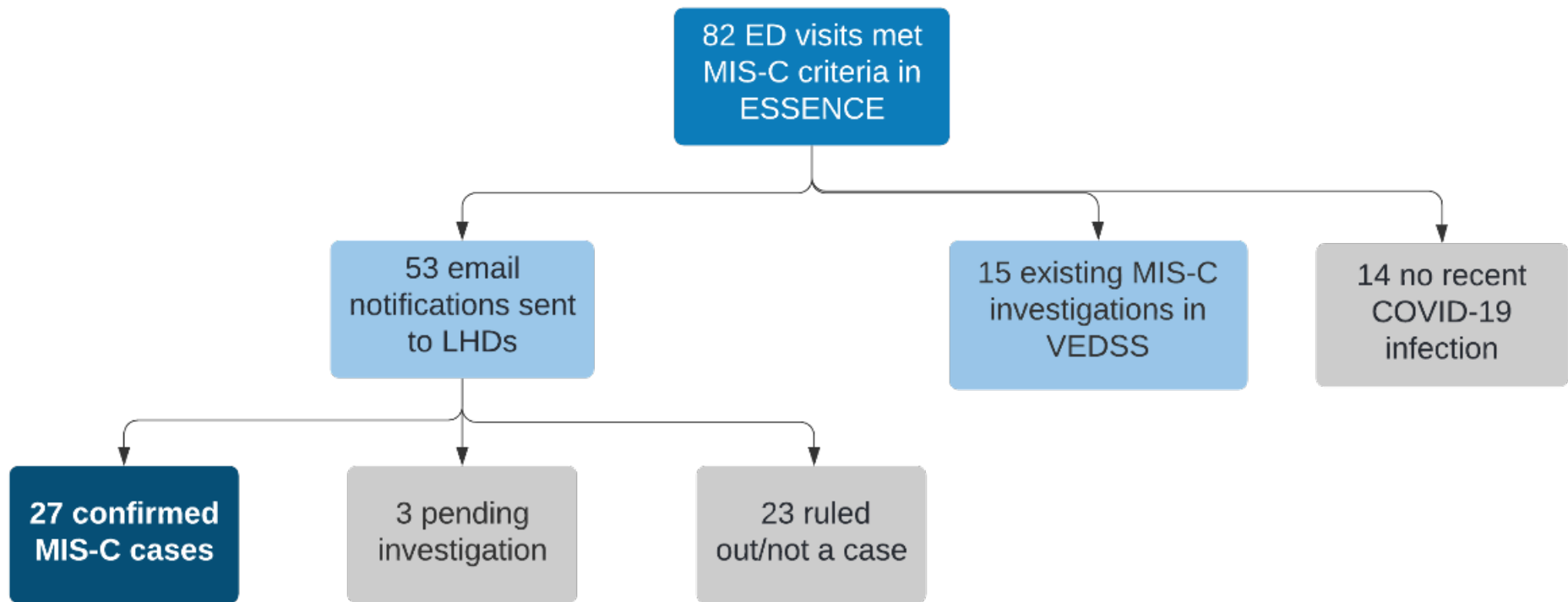
1.7 ☐ COVID-19 exposure within the 4 weeks prior to the onset of symptoms

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)



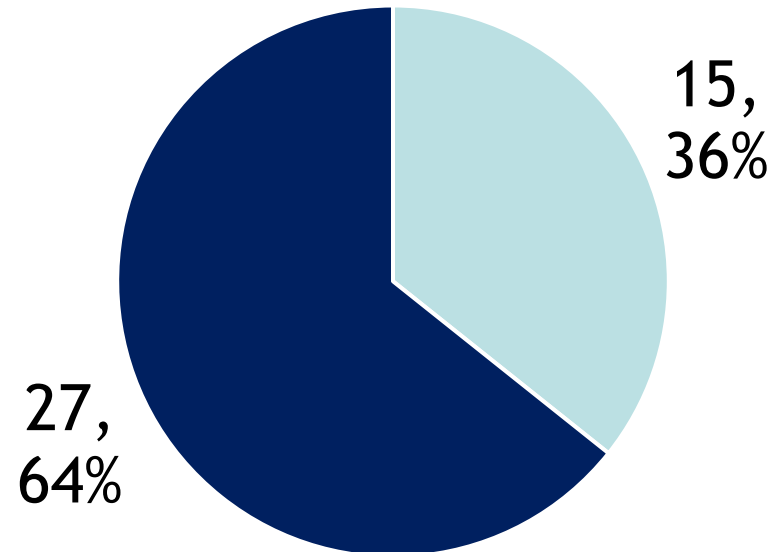
ESSENCE Definition Performance for MIS-C (January - September 2021)

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

- Healthcare Provider Reported
- ESSENCE Identified



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

Acknowledgements

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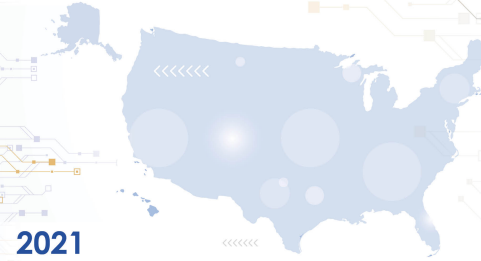
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2021

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