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Research Article

Impact of COVID-19 on Reports of School Ages Flu Activity in Rural Areas of State of Georgia

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Abstract

Introduction: Influenza, known as flu, is a notifiable disease in state of Georgia. COVID-19, which was declared a pandemic between February 2020 and September 2022, disrupted many health district systems, including notifiable disease reporting. This study compared flu activity among daycare and school ages during flu season (Sep to May every year) before, during, and after to see if the pandemic had an impact on school influenza case reporting.

Materials and methods: School flu data are reported through syndromic surveillance system and school reporting system. SENDSS is an electronic disease surveillance system in Georgia. Using excel, data were pulled from syndromic surveillance in SENDSS, and analyzed from these categories: "district 7", "influenza" or "Ili", "0-17 years old". School reporting data were pulled through outbreak log and WCHD flu monitor log. Duplicated cases were removed. Summary of total flu cases was reported. One-way anova test was performed to compare rates of flu before COVID-19 pandemic, during COVID-19 pandemic and post pandemic period.

Results: 424, 123 and 676 influenza school cases were received prior to, during and post-pandemic period. The difference is significant (p=0.002) between pre-pandemic, during and post-pandemic.

Conclusion: School-age flu activity reporting has significantly diminished throughout the pandemic. Pandemic has had an impact on school age case reporting.

Keywords: Flu; COVID-19 pandemic; Impact; Report; School ages

Introduction

Coronavirus Disease 2019 (COVID-19) is a contagious disease caused by the virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019 [1]. Soon was announced as a pandemic on January 31, 2020 in US, and declared end of pandemic in May 2023. Till now, according to Georgia Department of Public Health website, more than 2 million cases have been confirmed. One of the basic core functions of the local health departments is to receive notifiable diseases and do investigations. Before COVID-19 pandemic, other notifiable diseases were reported through State Electronic Notifiable Disease Surveillance System (SENDSS). However, during pandemic, almost all focuses were put on COVID-19. Other notifiable diseases cases were reported far less than before. Among all other notifiable diseases, the symptoms of influenza (flu) are similar to COVID-19, they are both contagious respiratory illnesses, but they are caused by different viruses. COVID-19 is caused by infection with a coronavirus (SARS-CoV-2) first identified in 2019. Flu is caused by infection with the flu virus [2]. School-age flu cases are reported by school nurses via email or phone calls. During pandemic, COVID-19 cases were reported through share form and filled out by school principals, nurses or secretaries.

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Objectives

This study aimed to compare flu activity among daycare and school ages during flu season, which is among September to May every year, and to see if COVID-19 did have influence on flu school-age cases report in 16 counties under West Central of state of Georgia pre, during and post pandemic periods.

- To build a school report system so that school staff can report cases more directly.
- To aware the importance of getting vaccinated, and department of public health can provide free flu vaccines to schools twice a year, especially in relatively rural areas.

Materials and Methods

Daycare and school flu data were mainly collected through two ways, one through passive surveillance, which is syndromic surveillance system, and the other way is through school reporting system (phone calls/emails from schools). Since US president Biden announced "COVID-19 is over" in Sep 2022, post pandemic period was defined from Sep 2022 till May 2023. Pre-Pandemic was ranged from Sep 2017 till Jan 2020. During pandemic period was defined from Feb 2020 till May 2022. All periods were calculated during flu season, which is from September till next year May every year.

SENDSS platform was used for data collection. Data could be extracted by filtering "Analysis" and "Syndromic surveillance" tabs, and then clicked strata selection as "Columbus (7-0)", where West Central district at, and chose "Event Selection" as "Fever flu", clicked "dates" from Sep 2017 till Jan 2020; during pandemic, from Feb 2020 till Aug 2022; post-pandemic, from Sep 2022 till May 2023.

By Excel, sorted these data by "district 7", "influenza" or "Ili", "0-17 years old", and removed duplicate data by checking name. Then organized data by month, then divided data into three periods, pre-pandemic, which was from Sep 2017 till Jan 2020; during pandemic,

which was from Feb 2020 till Aug 2022; post-pandemic, which was from Sep 2022 till Mar 2023. Cases that were from school were also organized in the same way (Figure 1).

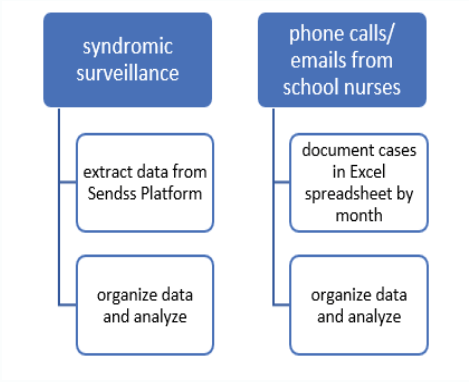

Figure 1: Data collection and analyze steps.

Statistical analysis

Analysis was mainly by Excel and SAS 9.4, one-way Anova test method was used to determine if there are significant differences between pre, during and post pandemic for daycare and school age flu cases in district 7. Value of $p<0.05$ was considered to be statistically significant.

Results

Prior to the COVID-19 pandemic, from Sep 2017 till Jan 2020, 424 school age influenza cases were received during flu seasons. During the pandemic, from Feb. 2020 to Aug. 2022, only 123 school age cases were received. From Sep 2022 till May 2023, a total of 676 cases were received (Figure 2). We used one-way ANOVA test to see if the average cases between three periods are significant. Pre-COVID, total 23 months, average cases were 18.43. During COVID, in total 22 months, average cases were only 5.59. Post COVID, in total for 9 months, average cases were 75.11. The difference is significant ($p=0.002$) between pre-pandemic, during and post-pandemic (Tables 1 and 2).

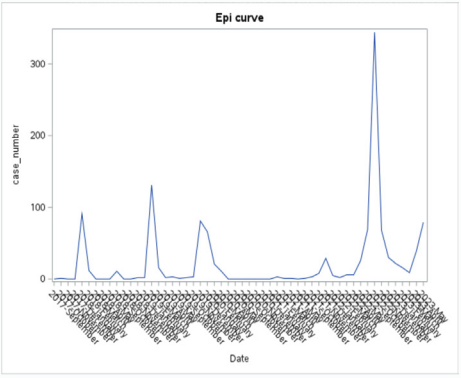

Figure 2: Epi curve.

Discussion

There are 16 counties under the West Central Health District. The 16 counties include Chattahoochee, Crisp, Clay, Dooly, Harris, Macon, Marion, Muscogee, Randolph, Quitman, Schley, Stewart, Sumter, Talbot, Taylor and Webster. Besides Muscogee and Harris County, others are rural areas, which are experiencing resources

Table 1: Flu cases distribution by month.

Pre	cases	During	cases	Post	cases
2017-September	0	2020-February	21	2022-September	69
2017-October	1	2020-March	11	2022-October	344
2017-November	0	2020-April	0	2022-November	68
2017-December	0	2020-May	0	2022-December	30
2018-January	91	2020-September	0	2023-January	22
2018-February	12	2020-October	0	2023-February	16
2018-March	0	2020-November	0	2023-March	9
2018-April	0	2020-December	0	2023-April	39
2018-May	0	2021-January	0	2023-May	79
2018-September	11	2021-February	3		
2018-October	0	2021-March	1		
2018-November	0	2021-April	1		
2018-December	2	2021-May	0		
2019-January	2	2021-September	1		
2019-February	131	2021-October	3		
2019-March	16	2021-November	8		
2019-April	2	2021-December	29		
2019-May	3	2022-January	5		
2019-September	1	2022-February	2		
2019-October	2	2022-March	6		
2019-November	3	2022-April	6		
2019-December	81	2022-May	26		
2020-January	66				

Table 2: Anova table.

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	31580.46	2	15790.23	6.876698	0.002269	3.178799
Within Groups	117105.9	51	2296.193			
Total	148686.3	53				

And we can see $p=0.002<0.05$. The difference is significant between these three periods.

shortages. But we are not the only ones that experienced a sharp drop of flu cases reporting. The Centers for Disease Control and Prevention (CDC) recently reported that it had logged 1,316 positive flu cases in its surveillance network between September 2020 and the end of January 2021. During that same period last year, the CDC had recorded nearly 130,000 cases [3].

Possible reasons include 1) Students were studying at home due to lock down. 2) Wearing masks is mandatory based on state law during pandemic, so everyone was wearing masks wherever they went. This policy not only limited COVID-19 spread, but also to some extent decreased influenza spread. 3) Social distancing policy also limited the spread of respiratory diseases. 4) Limited school staff, especially in rural areas. Among all 16 counties, most of them are rural. During pandemic, most of school resources were put into COVID-19 prevention and COVID-19 cases reporting, so there might be unreported cases. 5) Limited testing due to similar symptoms. When patients presented symptoms and got tested in testing centers, they were probably only tested for COVID, but not flu tests. This led to untested flu cases.

Conclusion and Recommendations

School age flu activity reporting has significantly diminished throughout the pandemic. Difference is significant for daycare and school ages flu cases reporting pre-pandemic, during and post-pandemic. Pandemic has had an impact on school age flu cases reporting-only 19 flu cases were received through phone calls or emails during pandemic.

We see creating easier access for school nurses to report any diseases among students, no matter what diseases, such as Flu, Strep Throat, Hand Foot, and mouth are important. Many schools in rural

areas do not know how to report cases to health departments, resulting in missing cases. Also, holding routine free flu vaccine clinics among daycares and schools during flu seasons are necessary too. This might lower the flu cases and outbreaks among daycares and schools.

Limitation

Data was collected through only two methods; there should be other methods to report. And though the health department has routine contacts with school nurses, some schools never reported. This led to bias. Some school age students never knew he/she had influenza since he/she never got tested. Above all, these resulted in uncompleted data.

References

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