PRISMA Flow Diagram for study selection.

Identification
- Records identified through database searching (n=225)
- Additional records identified through other sources (n=0)

Screening
- Records identified (n=225)
- Duplicated records excluded (n=29)
- Records after duplicates removed (n=196)
- Excluded by title and abstract (n=120)

Eligibility
- Full-text articles assessed for eligibility (n=25)
- Articles excluded
  6: studies are narrative review
  3: studies discuss mechanism of herpes and infertility

Included
- Studies included in qualitative synthesis (n=25)
- Studies included in meta-analysis (n=17)
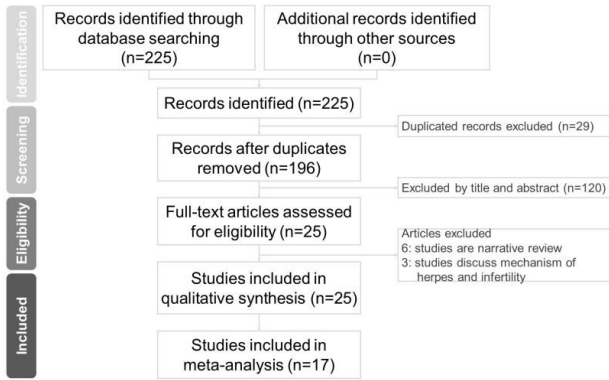
Results: 17 retrospective studies were included in this review. In the male-infertility cohort, a total of 11 studies were compared. The random-effects pooled prevalence was 12.7% in semen sample, and 16.8% in serum sample. In the female-infertility cohort, a total of 6 studies were compared. The random-effects pooled prevalence was 12.1% in menstrual fluid /endocervical sample, and 17.8% in serum sample.

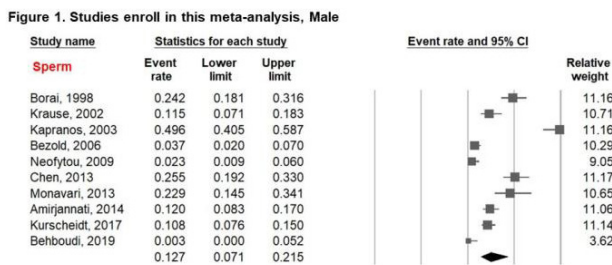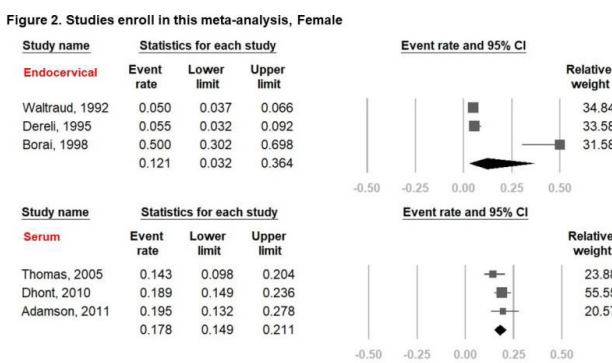Figure 1. Studies enroll in this meta-analysis, Male

Figure 2. Studies enroll in this meta-analysis, Female

Conclusion: The prevalence of HSV in semen-cervical sample was about 12%, compared to HSV in serum sample is about 17%. Therefore, HSV contribution to infertility will be overestimated when we use serum sample for diagnosis. It is noteworthy to mention that the seroprevalence of HSV IgG is much higher in general population, previously reported at 35% to 50%. In addition, given that current antiviral treatment for HSV has side effects that could cause infertility on its own, as seen in animal studies. More studies are needed to evaluate the role HSV plays in causation of infertility.

Disclosures. **All Authors**: No reported disclosures

1711. Comparison of the clinical course and prognosis of dengue cases with and without Diabetes Mellitus

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Session: P-75. Virology: Studies of the Epidemiology of Viral Infections

Background. Dengue, the most prevalent arboviral infection disease worldwide affects more than 2.5 billion people. Puerto Rico has endemic transmission of dengue virus (DENV). Chronic diseases like diabetes mellitus (DM) tend to increase susceptibility to infectious diseases. Diabetes mellitus (DM) is also one of the chronic diseases with higher prevalence in the United States (9.1%) and Puerto Rico (12.8%), and its effect on arboviral infections is understudied.

Methods. A Sentinel Enhanced Dengue Surveillance System was established in a tertiary hospital in the southern region of Puerto Rico. Study aims are to describe and compare the clinical course and prognosis of dengue in patients with and without the DM co-morbidity. A retrospective case-control study (2012-2015) was performed, where 1,005 participants with confirmed dengue were identified.

Results. In those with dengue, we examined 57 cases with DM and 171 controls without DM on presentation. Mean age of participants was 40 years old, 31 (54.4%) were males. Relevant clinical features of cases were high blood pressure (HBP) in 51%, muscle pain (70.2%) and joint pain (63.2%). Laboratory results were thrombocytopenia (40%), high creatinine >1.2mg/dl (18.5%), high BUN >20mg/dl (16.6%) and low albumin < 3.4 g/dl (28.7%). For controls, clinical and laboratory results were HBP in 26.9%, muscle pain (64.3%) and joint pain (56.7%); thrombocytopenia (38.6%), high creatinine (4.7%), high BUN (1.8%) and low albumin (21.6%). ANOVA test compared the means of clinical features and laboratory parameters between the case and control groups. The results indicate that high blood pressure, high creatinine and high BUN were significantly more common in cases than in controls (P < 0.01). Cases that had high creatinine (OR = 2.03 [CI: 0.01 – 6.08]), high BUN (OR = 1.30 [CI: 0.93 – 1.81]) and high blood pressure (OR = 1.02 [CI: 0.93 – 1.11]) were more likely to present bleeding, a warning sign for severe dengue. Also, diabetic cases that presented thrombocytopenia were more likely to be admitted to the hospital (OR = 2.64 [CI: 0.36 – 19.37]).

Conclusion. Understanding the clinical manifestation of dengue in patients with DM can increase clinician awareness of the importance of this co-morbidity in order to implement preventive measures and improve clinical outcomes.

Disclosures. **All Authors**: No reported disclosures

1712. Epidemiology, Clinical Characteristics, and Outcomes of Influenza-Associated Hospitalizations in Children in the post-2009 Pandemic Era

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Session: P-75. Virology: Studies of the Epidemiology of Viral Infections

Background. Significant changes in influenza vaccination coverage and antiviral treatment guidance occurred following the 2009 influenza pandemic in children. However, data are limited describing recent epidemiology, clinical characteristics, antiviral use, vaccine coverage, and outcomes of influenza-related hospitalizations in children.

Methods. Children < 18 years hospitalized with influenza during seasons 2010–2011 through 2018–2019 were included through the US Influenza Hospitalization Surveillance Network (FluSurv-NET). Age-stratified hospitalization rates were calculated using the number of catchment-area residents with laboratory-confirmed influenza within 14 days prior to or ≤3 days after hospital admission during October 1-April 30 of each influenza season. Data on underlying medical history, influenza vaccination, antiviral use, and outcomes were abstracted from medical records using standard case report forms by trained surveillance officers.

Results. Over 9 seasons, 13,235 children were identified. Stepwise decreases in unadjusted hospitalization rates with age occurred, with the highest rates in infants < 6 months (ranging 56–184 per 100,000 persons) (Fig.1). Among these children, 56% were male, 34% were non-Hispanic White, 55% had a preexisting medical condition, and 8% were immunocompromised (Table 1). Use of antiviral treatment substantially increased from 56% to 85%, and influenza vaccination rates among hospitalized children increased from 34% to 43% over time. Regarding severe outcomes, 2,676 (20%) were admitted to ICU, 2,262 (17%) had pneumonia, 690 (5%) required mechanical ventilation, and 72 (0.5%) died. In univariable analysis, compared to hospitalized infants < 6 months, children >13 years had higher odds of ICU admission (odds ratio (OR), 2.0; 95% CI, 1.7–2.4), mechanical ventilation (OR, 1.7; 95% CI, 1.2–2.3), and pneumonia (OR, 2.6; 95% CI, 2.1–3.3) (Table 2).

Figure 1

Figure 1. Age-specific, Unadjusted Influenza-Associated Hospitalization Rates among Children <18 Years, by Season and by Age Category, FluSurv-NET, 2010-2019.
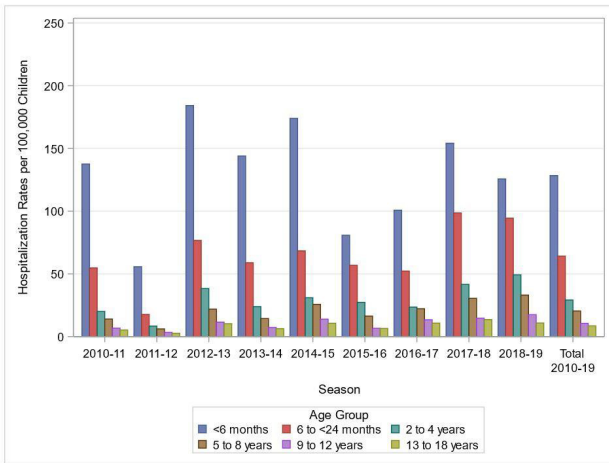

Table 1

Table 1. Characteristics and Outcome of Children <18 Years of Age Hospitalized with Laboratory-Confirmed Influenza by Age Group, FluSurv-NET, 2010-2019

Demographic characteristics and outcome	<6 Months	6 to <24 Months	2 to 4 Years	5 to 8 Years	9 to 12 Years	13 to <18 Years	Total
	n = 2029	n = 3040	n = 2791	n = 2633	n = 1366	n = 1376	n = 13235
	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Sex							
Male	1176 (58.0)	1717 (56.5)	1571 (56.3)	1527 (58.0)	774 (56.7)	699 (50.8)	7464 (56.4)
Female	853 (42.0)	1323 (43.5)	1220 (43.7)	1106 (42.0)	592 (43.3)	677 (49.2)	5771 (43.6)
Race							
Non-Hispanic White	654 (32.2)	865 (28.5)	920 (33.0)	995 (37.8)	514 (37.6)	555 (40.3)	4503 (34.0)
Non-Hispanic Black	484 (23.9)	785 (25.8)	792 (28.4)	746 (28.3)	381 (27.9)	383 (27.8)	3571 (27.0)
American Indian or Alaska Native	22 (1.1)	59 (1.9)	42 (1.5)	23 (0.9)	12 (0.9)	11 (0.8)	169 (1.3)
Asian/Pacific islander	107 (5.3)	211 (6.9)	146 (5.2)	120 (4.6)	61 (4.5)	58 (4.2)	703 (5.3)
Multiracial	32 (1.6)	61 (2.0)	38 (1.4)	40 (1.5)	19 (1.4)	10 (0.7)	200 (1.5)
Hispanic	494 (24.3)	748 (24.6)	598 (21.4)	487 (18.5)	255 (18.7)	253 (18.4)	2835 (21.4)
Unknown	236 (11.6)	311 (10.2)	255 (9.1)	222 (8.4)	124 (9.1)	106 (7.7)	1254 (9.5)
Pre-existing medical conditions							
Immunocompromising status							
Yes	10 (0.5)	123 (4.1)	201 (7.2)	293 (11.1)	177 (13.0)	235 (17.1)	1039 (7.9)
No/Unknown	2019 (99.5)	2917 (96.0)	2590 (92.8)	2340 (88.9)	1189 (87.0)	1141 (82.9)	12196 (92.1)
Any chronic condition							
Yes	531 (26.2)	1342 (44.1)	1574 (56.4)	1748 (66.4)	1035 (75.8)	1079 (78.4)	7309 (55.2)
No/Unknown	1498 (73.8)	1698 (55.9)	1217 (43.6)	885 (33.6)	331 (24.2)	297 (21.6)	5926 (44.8)
ICU Admission							
Yes	308 (15.2)	623 (20.5)	550 (19.7)	499 (19.0)	336 (24.6)	360 (26.2)	2676 (20.2)
No	1714 (84.5)	2410 (79.3)	2228 (79.8)	2121 (80.6)	1025 (75.0)	1010 (73.4)	10508 (79.4)
Unknown	7 (0.3)	7 (0.2)	13 (0.5)	13 (0.5)	5 (0.4)	6 (0.4)	51 (0.4)
Death							
Yes	6 (0.3)	14 (0.5)	13 (0.5)	15 (0.6)	13 (1.0)	11 (0.8)	72 (0.5)
No	2020 (99.6)	3021 (99.4)	2772 (99.3)	2607 (99.0)	1350 (98.8)	1364 (99.1)	13134 (99.2)
Unknown	3 (0.2)	5 (0.2)	6 (0.2)	11 (0.4)	3 (0.2)	1 (0.1)	29 (0.2)
Mechanical Ventilation							
Yes	83 (4.1)	154 (5.1)	152 (5.5)	120 (4.6)	89 (6.5)	92 (6.7)	690 (5.2)
No	1935 (95.4)	2872 (94.5)	2623 (94.0)	2494 (94.7)	1270 (93.0)	1279 (93.0)	12473 (94.2)
Unknown	11 (0.5)	14 (0.5)	16 (0.6)	19 (0.7)	7 (0.5)	5 (0.4)	72 (0.5)
Pneumonia							
Yes	133 (6.6)	559 (18.4)	623 (22.3)	481 (18.3)	252 (18.5)	214 (15.6)	2262 (17.1)
No	1896 (93.5)	2481 (81.6)	2168 (77.7)	2152 (81.7)	1114 (81.6)	1162 (84.5)	10973 (82.9)
Unknown	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)

Table 2

Table 2. Odds Ratios for ICU Admission, Mechanical Ventilation, and Pneumonia among Children Hospitalized with Laboratory-Confirmed Influenza, FluSurv-NET, 2010-2019.

	ICU Admission[a]		Mechanical Ventilation[b]		Pneumonia[c]	
	Univariable Analysis		Univariable Analysis		Univariable Analysis	
	OR	95% CI	OR	95% CI	OR	95% CI
Age, years						
≥0 months to <6 months	reference		reference		reference	
≥6 months to <2 years	1.4	1.2 - 1.7	1.3	1.0 - 1.6	3.2	2.6 - 3.9
2 - 4 years	1.4	1.2 - 1.6	1.4	1.0 - 1.8	4.1	3.4 – 5.0
5 - 8 years	1.3	1.1 - 1.5	1.1	0.8 - 1.5	3.2	2.6 - 3.9
9 – 12 years	1.8	1.5 – 2.2	1.6	1.2 - 2.2	3.2	2.6 - 4.0
13 - <18 years	2.0	1.7 – 2.4	1.7	1.2 - 2.3	2.6	2.1 - 3.3

[a]For the univariable analysis, n = 13184 and 2676 cases with ICU admission.
[b]For the univariable analysis, n = 13163 and 690 cases with mechanical ventilation.
[c]For the univariable analysis, n = 13235 and 2262 cases with pneumonia.

Conclusion: Although influenza-related hospitalization rates decreased with increasing age, severe outcomes were more common among hospitalized older children. Room for improvement exists in influenza vaccination coverage and antiviral use. While 20% of children were admitted to ICU, death was uncommon.

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1713. Factors Associated with Viral Rebound post Blip in Patients from a Community HIV Clinic

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Session: P-75. Virology: Studies of the Epidemiology of Viral Infections

Background. Blips are detectable increases in the HIV viral load (VL) that occur after therapy has effectively suppressed the virus to an undetectable level. There is no clear etiology for the development of blips. The association between blips and viral failure remains unclear.

Methods. This retrospective chart review aimed to clinically characterize patients who developed blips in a community HIV clinic in north Philadelphia between 2014-2018. A blip was defined as a single detectable VL < 500 copies/mL which appears between two undetectable VL measurements. Multivariate analysis was performed to examine the relationship of certain variables and viral rebound (VR) in patients with blips. Viral rebound was defined as post blip VL > 200 copies/mL that was not followed by an undetectable viral load.

Results. Of a total of 666 patients, 225 (33.7%) had at least 1 blip. 59% were male and 41% were female. The majority were African American (84.4%). Sixty seven percent were heterosexuals and 25.7% were MSM. Analyzing CD4 counts at the moment of blip, 68% had >500 cells/mm3. The average value of the blips was 85 copies/mL with 48.8% of the patients having a blip between 20-50 copies/mL. Most of the patients were on INSTIs (49.5%) followed by NNRTIs (35.6%). Of the 225 patients, 148 had at least 1 year of follow up post-blip. Those who were followed for less than 1-year post-blip were not included in the statistical analysis to find potential factors associated with VR. Thirty-two (21.6%) patients developed rebound. The multivariate analysis showed that being male and having a higher blip value were factors associated to increased likelihood of VR. Factors associated to decreased likelihood of rebound were the use of NNRTIs at blip and an HIV transmission factor that was not heterosexual sex (MSM and IDU). All of these associations were noted to be statistically significant.

Conclusion. The variables that were found to be associated to viral rebound could help guide clinicians during the surveillance of patient's with blips. Further research in larger cohorts would help clarify the role of these variables in patients who develop treatment failure.

Disclosures. All Authors: No reported disclosures

1714. Influenza C Virus in U.S. Children with Acute Respiratory Infection 2016-2019

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Session: P-75. Virology: Studies of the Epidemiology of Viral Infections

Background. Influenza C virus (ICV) is associated with acute respiratory infection (ARI); however, the burden of ICV is not well-described. We sought to determine the burden and characteristics of ICV in a prospective, population-based cohort.

Methods. The study was conducted within the New Vaccine Surveillance Network (NVSN), a CDC-led, seven-site network that performs population-based surveillance for ARI in children < 5 years. Nasal/throat swabs were collected from emergency department (ED) or inpatient children with ARI, or healthy controls in clinic, between 12/05/2016-10/31/2019 and tested by real-time RT-PCR for ICV and other respiratory viruses. Preliminary data were extracted and demographic/clinical features of ICV+ cases analyzed. We sequenced the hemagglutinin-esterase (HE) gene from ICV+ Pittsburgh samples.

Results. Among 19,321 children with ARI or healthy controls enrolled and tested for ICV from 2016-2019, 115/17,668 (0.7%) ARI cases and 8/1653 (0.5%) healthy controls tested positive for ICV. The median age of ICV+ ARI subjects was 19 months (IQR 10,46) and 81(70%) were ≤36 months. 42.6% (49) were white, 33.9% (39) black, and 16.5% (19) Hispanic, with the remainder Asian or unknown; 56.5% (62) attended daycare. Among ICV+ ARI cases, 67.8% (78) had fever, 94.8% (109) cough, and 60.8% (70) wheezing. 45.2% (52) ICV+ cases occurred in 2016-17, 6.5% (8) in 2017-2018, and 47.8% (55) in 2018-19 (**Table**). 40% (46) of ICV+ cases were seen in the ED, while the remainder were inpatients. Median length of stay was 2d (IQR,1-3) with 15 admitted to ICU. 67.8% (78/115) ARI cases had 1 or 2 co-detected pathogens, with rhinovirus (26), respiratory syncytial virus (26), and adenovirus (14) most frequently co-detected. ARI symptoms including fever, myalgias, chills, and wheezing did not differ significantly between coinfected subjects and those who were only ICV+. HE sequences were in the two currently circulating Kanagawa and Sao Paulo lineages.