

Etiologies of medically attended acute respiratory infections among young Ecuadorian children prior to the start of the 2020 SARS-CoV-2 pandemic

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Background: Data regarding respiratory pathogen epidemiology in the tropical country of Ecuador are limited. Here, we describe the temporal patterns and etiologies of medically attended acute respiratory infections among Ecuadorian children during the 20-month period preceding the onset of the 2020 SARS-CoV-2 pandemic. **Methods:** Children < 5 years old presenting to a designated outpatient clinic with at least 2 new symptoms consistent with an acute respiratory infection were eligible for enrollment. Informed consent was obtained. Demographic and clinical details were collected. A nasopharyngeal sample was collected for diagnostic testing of 22 target pathogen groups using BioFire's Respiratory Panel v1.7 multiplex polymerase chain reaction assay. **Results:** Of the 820 subjects enrolled between July 15, 2018 and March 15, 2020, 655 (80%) tested positive for at least one pathogen. The detection of pathogens was more likely from samples collected from children enrolled in Quito (85%) compared to Machala (76%) ($p < 0.05$). The most frequently detected pathogen groups were rhinovirus/enterovirus (46%), parainfluenza virus (14%), respiratory syncytial virus (RSV) (12%), and influenza virus (10%). Two or more pathogen groups were co-detected in 174 (27%) of the respiratory samples. Pathogen specific seasonal patterns were not observed for rhinovirus/enterovirus, adenovirus, or atypical bacteria at either site. Samples collected in Quito were positive for the detection of RSV spanning a 32-week period between November and June. In contrast, detection of RSV from samples collected in Machala spanned only a 17-week period between February and May. In Quito, influenza viruses were detected between August and February, with influenza A activity preceding influenza B. In Machala, the detection of influenza B virus coincided with the dry season, while detection of influenza A virus was clustered in the rainy period between January and March. **Conclusion:** The specific etiologies and seasonality of acute respiratory tract infections among Ecuadorian children < 5 years of age differ by site of enrollment. Such differences in regional data can be used to optimize regional implementation of existing and soon-to-be available public health prevention measures.

Background

- Public health measures for prevention of acute respiratory tract infections require a detailed understanding of local epidemiology
- Data regarding respiratory virus epidemiology in Ecuador are limited

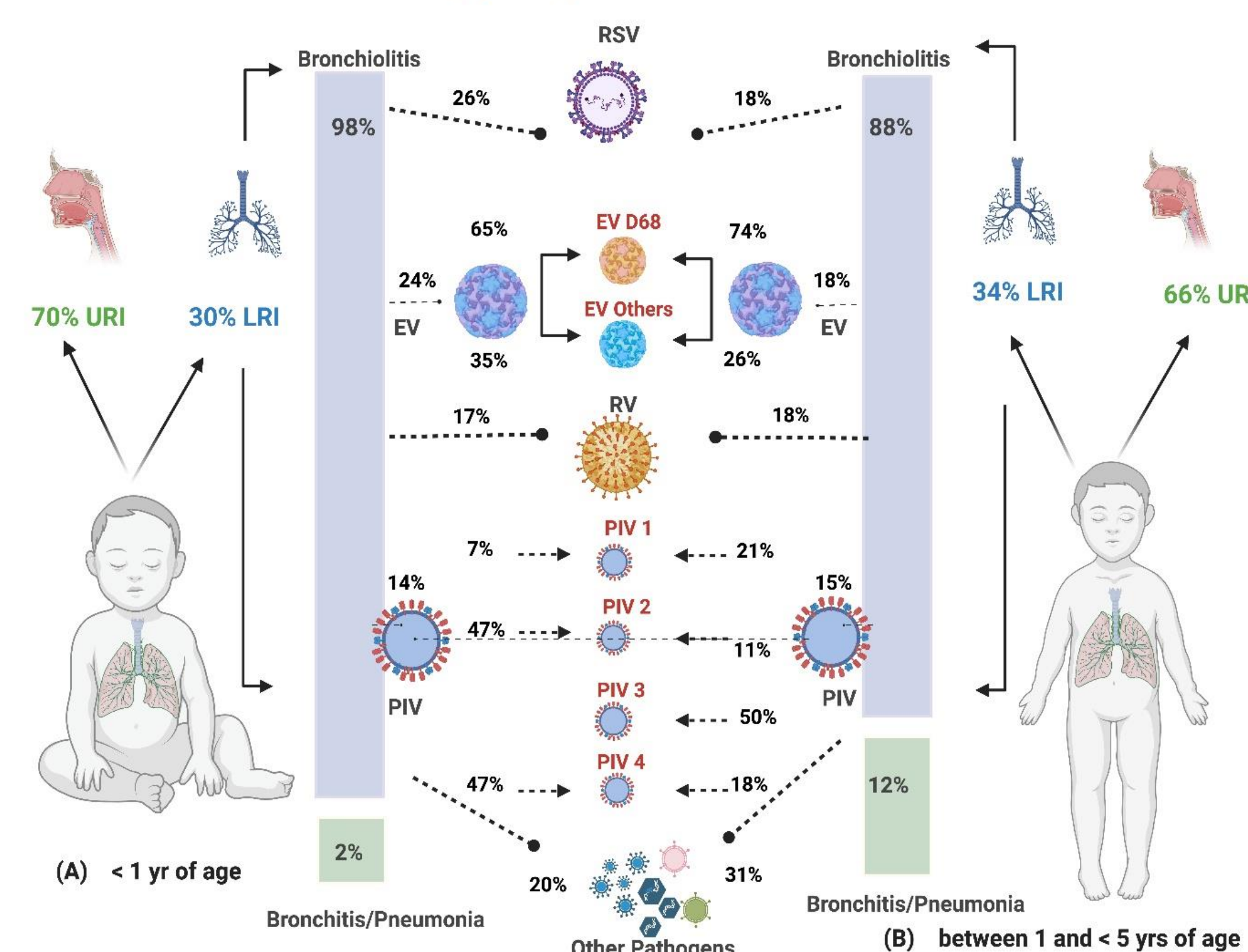
Methods

- July 2018 – March 2020; Machala (coastal) and Quito (highlands) Ecuador
- Children < 5 years of age seeking outpatient care
- At least 2 respiratory symptoms
 - Nasal congestion, cough, sore throat, dyspnea, tachypnea, wheezing, apnea, hypoxemia
- Informed consent obtained
- Demographic and medical information collected
- Nasopharyngeal swab analyzed by BioFire Respiratory Panel v1.7
- Rhinovirus/enterovirus positive samples characterized by genomic sequencing

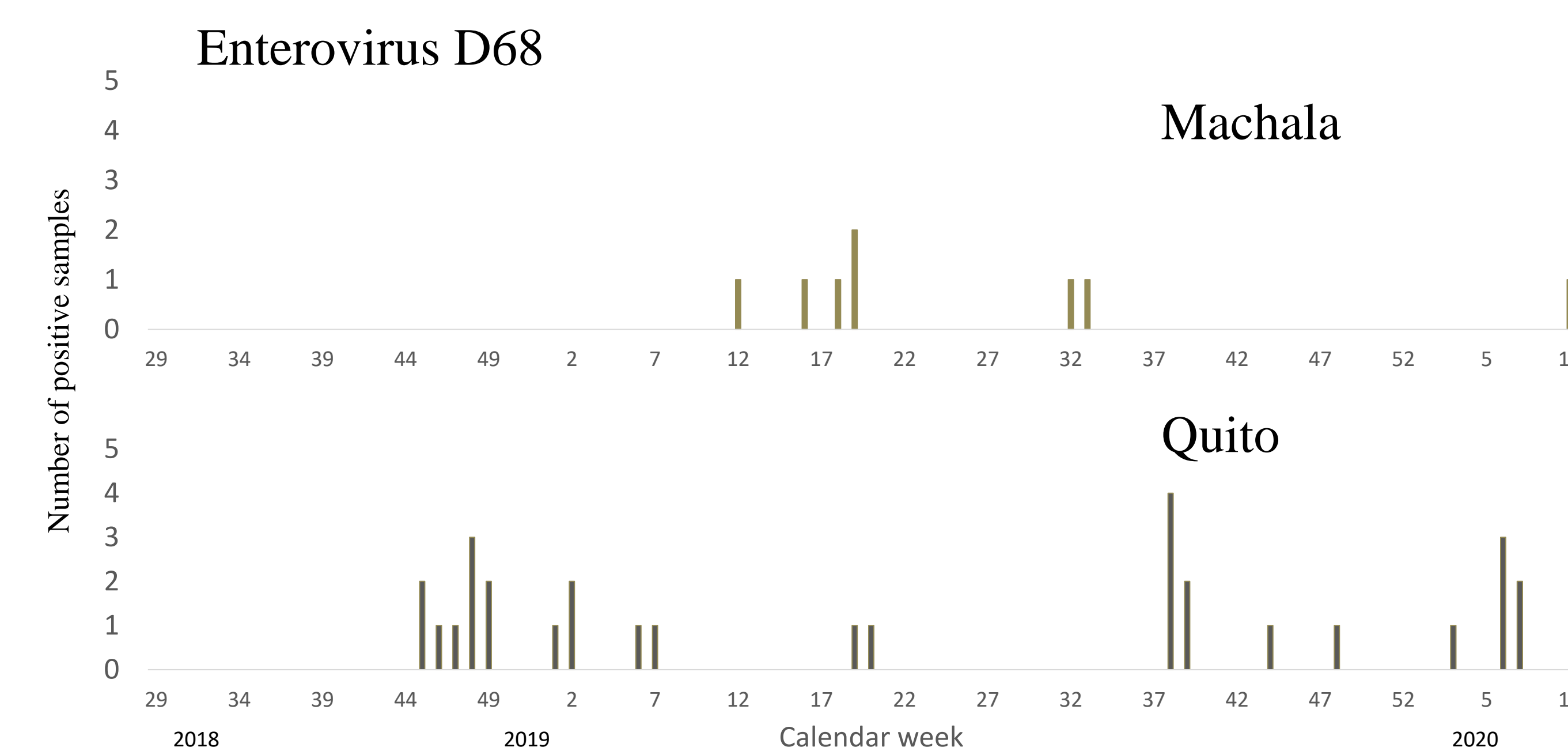
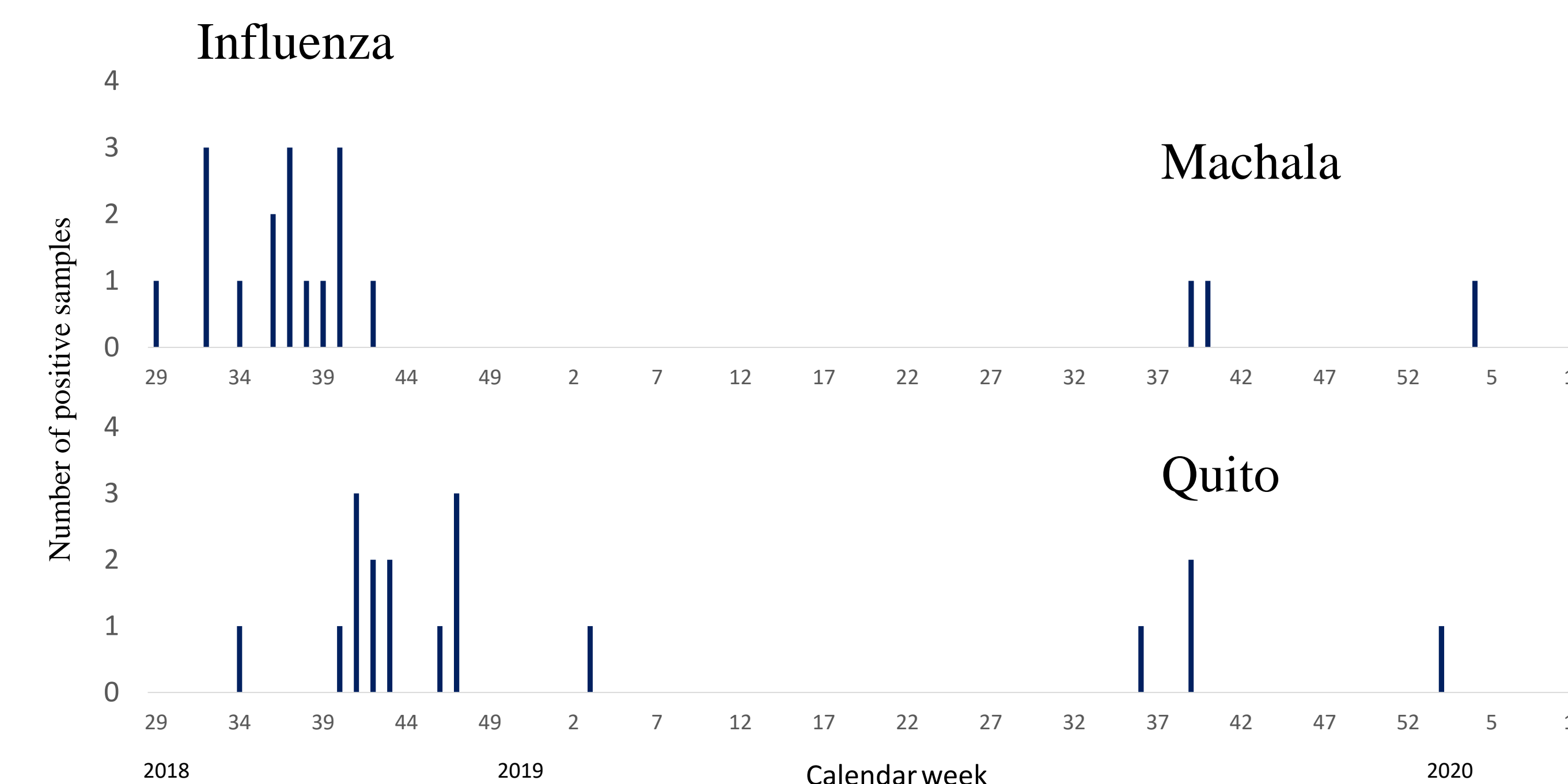
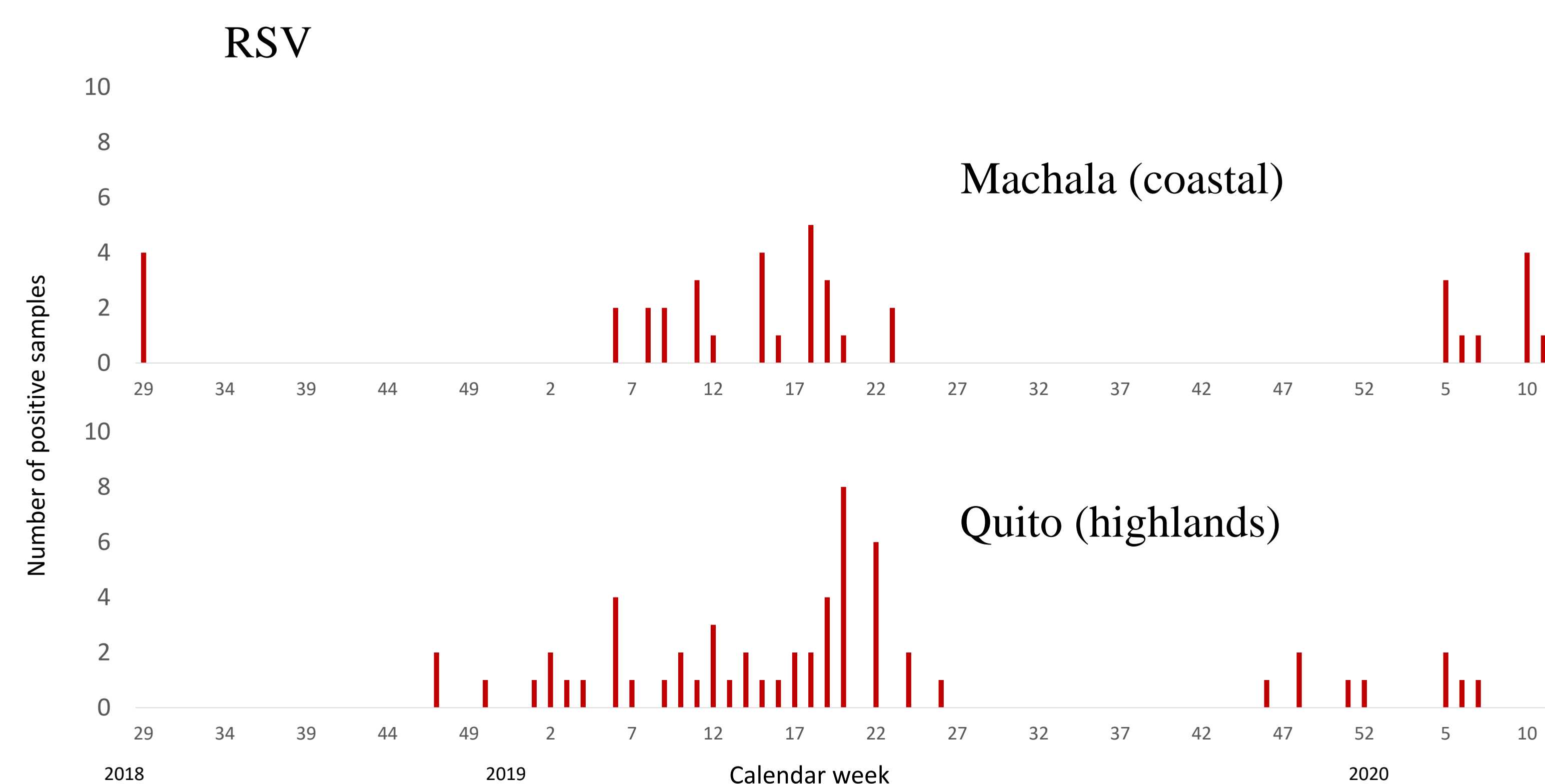
Results

Pathogen group detected	Machala n (%)	Quito n (%)	P-value
Rhinovirus	184 (49)	101 (36)	< 0.001
Enterovirus	29 (8)	82 (29)	<0.001
Parainfluenza virus	57 (15)	56 (20)	0.12
RSV	40 (11)	59 (21)	< 0.001
Influenza virus	38 (10)	45 (16)	0.03

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Respiratory virus seasonality in Machala and Quito Ecuador



Conclusions

- Bronchiolitis ranks among the leading clinical diagnoses among Ecuadorian children < 5 years seeking ambulatory care for an acute respiratory tract infection
- RSV, EV-D68, PIV-3, and rhinoviruses were the most common causes of bronchiolitis among enrolled Ecuadorian children during the study period
- Respiratory pathogen seasonality varies by virus and by enrollment site

Reference

GBD 2016 Lower Respiratory Infections Collaborators. Estimates of the global, regional, and national morbidity, mortality, and aetiologies of lower respiratory infections in 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *Lancet Infect Dis.* 2018; 18: 1191-1210