With the discovery of five new respiratory viruses since 2000 including Metapneumovirus, SARS-CoV, Avian Influenza A, Influenza B and Rhinovirus, there has been a need to improve the methods for the diagnosis of respiratory viral infections. To establish the epidemiology of respiratory virus infections using molecular technology, we have tested a total of 1,060 nasopharyngeal specimens collected from symptomatic patients over a 12 month period in Hamilton, Ontario.

The specimens were collected from children and adults (N=526) and one half were from adults (N=534). Specimens were collected blindly without knowledge of DFA and culture results. Total nucleic acid (DNA and RNA) was extracted using the MiniMag extractor (Biomerieux) and an aliquot was processed by the TaqDx™ RT-PCR Test from Tridisc Corporation. The RVP assay is a multiple PCR coupled to a fluidic micrometer that detects and identifies 20 respiratory virus types and subtypes. Methodology includes DNA extraction using Influenza A and B, Rhinovirus, Parainfluenza types 1-4, RSV, Bocavirus, A, B and C adenovirus, Metapneumovirus, Rhinovirus/Enterovirus, Coronavirus OC43, 229E, NL63, HKU1, and SARS-CoV. A second aliquot just was PCR amplified using a respiratory PCR. Clinical information was collected by chart review. All results were analyzed by month and by age group. Of the 1,060 specimens tested, 424 (40%) were positive for at least one respiratory virus. Of those 205 (19.3%) were Influenza A or B, 45 (4.3%) Parainfluenza types 1-4, 41 (3.9%) RSV type A or B, 41 (3.9%) Metapneumovirus, 39 (38.9%) Bocavirus, 20 (2.0%) Adenovirus 1-5, 14 (1.4%) Rhinovirus/Enterovirus, 13 (1.4%) Coronavirus, 12 (1.2%) Parainfluenza types 3-4, and 6 (0.6%) Influenza C. Twenty five of the 39 (8.4%) Bocavirus infections represented dual infections and were positive for a second respiratory virus. Only Rhino/Enterovirus, RSV and Bocavirus infections were more prevalent in the <20 yr age group (p<0.05). Influenza, Metapneumovirus and Coronavirus were only detected in spring/summer months while Parainfluenza type 1 was positive only in summer months; all others were distributed across the majority of months. The average rate of positives diagnosed per month for the pediatric group was 65% compared to 23% for adults (p<0.05). The epidemiology of respiratory virus infection in symptomatic pediatric and adult patients was studied using the new TaqDx™ RT-PCR Test from Tridisc. The following conclusions could be made from this study: 1) Rhino/Enterovirus was the most prevalent respiratory virus infection of symptomatic children and adults, 2) only RSV and Bocavirus infections were more prevalent in children compared to adults, 3) almost two thirds of Bocavirus infections were dual respiratory virus infections, 4) 90% of dual infections (mostly Bocavirus and Rhino/Enterovirus) occurred in children in the summer months, and 5) Influenza, Metapneumovirus and Coronavirus displayed a winter seasonally. The RVP test should assist hospital and public health laboratories in diagnosing the etiology of respiratory tract infections in individuals and in outbreaks.

REFERENCES