# P1407: Molecular assays for the diagnosis of respiratory viruses in hospitalized patients: is it cost-effective? A Brazilian perspective

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## INTRODUCTION AND PURPOSE

Viruses are the major contributors to the morbidity and mortality of lower acute respiratory infections (ARIs) for all age groups and are associated with numerous challenges for infection control. Polymerase chain reaction (PCR) assays are more sensitive and are able to detect multiple respiratory viruses. However, questions remain regarding cost-effectiveness of performing these diagnostic tests in routine and their real impact on patient care. Moreover most of healthcare insurances in Brazil do not pay for molecular diagnostic tests. In 2016, H1N1 cases appeared in early autumn in south Brazil, maximizing the need for early detection in order to start proper treatment and to make better strategies for bed management in the hospital setting.

## METHODS

From April 7th to July 26th, we investigated patients that came to emergency room (ER) in a private hospital in south Brazil with suspicion of ARIs that met criteria for in-hospital care. From time zero they were kept in isolation (droplets and contact) and began the diagnostic strategy as follows:

Indirect Immunofluorescence (IIF) for virus (Influenza, Parainfluenza, Adenovirus and RSV), results in 48h → Negative Results → PCR assay 9 different types of respiratory virus, results in 48h

We calculated the costs related to diagnosis and care of isolated patients with viral infections:

- PCR assay = US 277,00;
- Private room, exclusive nursing care, expenses with isolation material (gloves, gowns, masks) = extra cost of US 430,00/day.

## RESULTS

We investigated a total of 450 patients: 76% were children aged less than 10 years, 15% were between 18 and 59 y and 9% were older than 60 years. Indirect immunofluorescence recognized respiratory viruses in 240 **samples** (52% ) . The most prevalent pathogen was respiratory syncytial virus (RSV).

**Prevalence of respiratory viruses in IIF test**

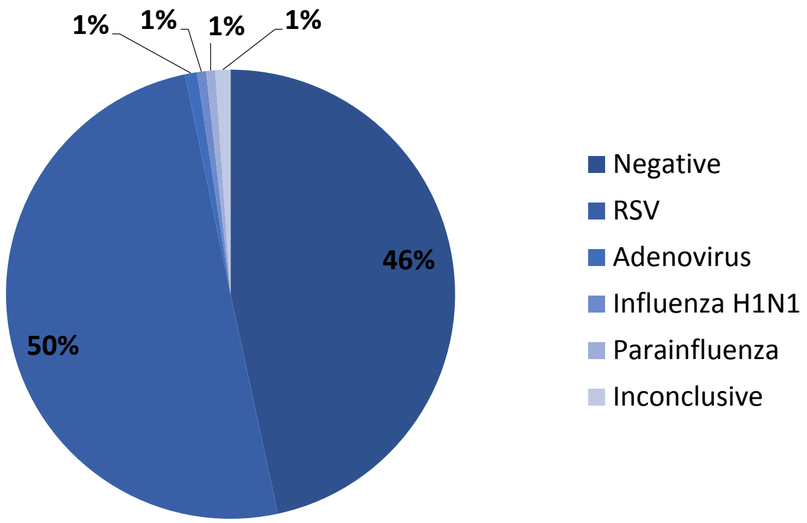


**Table 1 - Virus isolation by PCR assay**

| RESULTS PCR | | |
|---|---|---|
| | N | % |
| Negative | 96 | 47 |
| RSV | 18 | 9 |
| Adenovirus | 7 | 4 |
| Influenza H1N1 | 37 | 18 |
| Parainfluenza | 5 | 3 |
| Human bocavirus | 9 | 4 |
| Enterovirus | 7 | 3 |
| Human metapneumovirus | 5 | 3 |
| Human rhinovirus | 19 | 9 |
| | **193** | **100** |

**Table 2 - Comparative cost table**

| | Unit value (US) | Absolut number | Total value (US) |
|---|---|---|---|
| Isolation cost | 430,00 | 6 days | 2.580,00 |
| PCR assay | 277,00 | 193 assay | 42.765,00 |

**If PCR assay would be performed in the ER, the hospital could have saved US 165.420,00 since 4 days of exclusive care would be avoided.**

## CONCLUSION

The use of PCR assay increased the viral detection by 23% and revealed a larger number of respiratory viruses implicated in ARI cases that stayed at the hospital. Our study suggests that using PCR could be a cost-effective strategy even when the hospital is paying for the test, especially in setting of high costs for securing infection control measures.