**P1425**
**Poster Session V**
**Molecular and non-molecular diagnostics of viruses**

# SEVEN DAY PCR TESTING FOR MEASLES VIRUS – A RAPID SCREENING TOOL TO AID PUBLIC HEALTH ACTIONS.

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## Objectives

Measles is a highly infectious disease and a single case can lead to multiple secondary cases in unvaccinated populations. In order to provide the right clinical management accurate diagnostics is required in a timely way. The aim was to show the value of seven–day a week PCR testing and to validate an automated option to facilitate 7 day testing.

## Methods

All samples sent for measles virus PCR testing from 1 March 2013 to 1-September 2013 were included. All patients included were assessed for signs of measles which had to include fever (>38C) and presence of maculopapular rash. The samples collected from each case were throat swabs in universal transport medium (Copan). The turnaround time (TAT) to results and the clinical decisions based on the results were assessed for each case. All samples were all extracted on easyMAG (bioMérieux) and real-time PCR was performed on ABI7500 (Applied Biosystems). The assay on the BD MAX™ System (Becton Dickinson) was optimised using BD MAX™ RNA Extraction Kit (Becton Dickinson) for sample extraction and PCR was performed with Express mastermix containing superscript III (Life Technologies). The BDMax was compared to easyMag/ABI with a dilution series to show limit of detection and positive (n=26) and negative (n=26) samples.

## Results.

In total 186 throat swabs were tested. There were 26 positive cases. The TAT was 6 hours (range 4 -16 hours). The number of samples tested each day was a mean of 2 (range 1-9). There were 35 reported on Saturday and 12 reported on Sunday. The measles types identified were D8 (15 cases), D4 (1 case), B3 (4 cases) and 5 vaccine strain. All those with vaccine strain had history of measles mumps rubella vaccination (MMR) within 1 to 3 months. The diagnosis of measles PCR enabled MMR to be given to >150 contacts within 3 days of the contact and facilitated testing in health care workers (HCW) unsure of their measles status. No contacts or HCW developed measles. The molecular test was optimised on the BD Max and shown to have the same limit of detection of current in-house method. All positive samples were detected. The mean CT for positive was 24.5 and 27.3 on the BDMax and ABI7500 respectively. There was 100% agreement with results. The time required to process 8 samples on BDMax was around 2 hours.

## Conclusions

Seven day testing with rapid diagnostic real-time PCR enables prompt clinical management of measles cases. Those with fever and rash and recent MMR can be diagnosed positive by real-time PCR. The BDMax enables the PCR to be run with same assay performance but has ease of use to facilitate reactive testing within 7 day working in a diagnostic laboratory.