EVALUATING THE POTENTIAL CLINICAL UTILITY OF A HOST-PROTEIN SIGNATURE FOR DISTINGUISHING BETWEEN BACTERIAL AND VIRAL DISEASE IN FEBRILE CHILDREN

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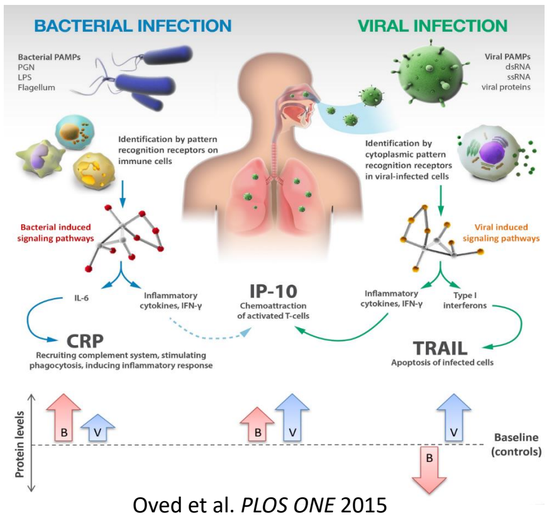
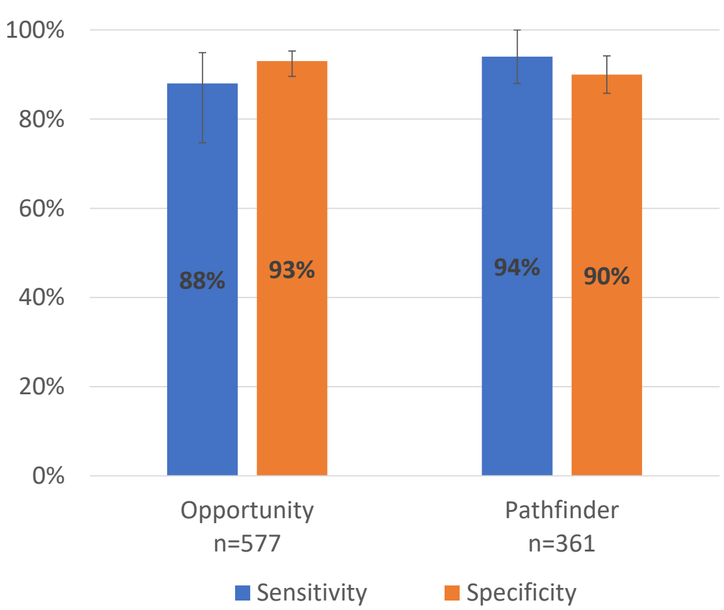
Background

A novel assay (ImmunoXpert™) that integrates the serum levels of three host-response proteins (TRAIL, IP-10 and CRP) was developed to assist in differentiation between bacterial and viral disease.



Oved et al. *PLOS ONE* 2015

The assay exhibited high performance in double blind validation studies.



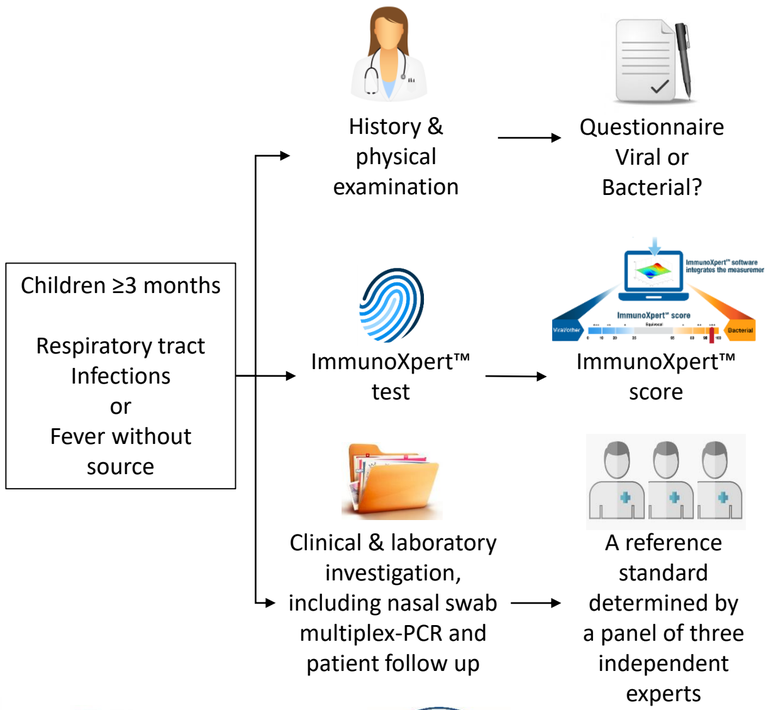
'Opportunity' study – van-Houten et al. *Lancet Infectious Diseases* 2016

'Pathfinder' study – Srugo et al. *Pediatrics* 2017

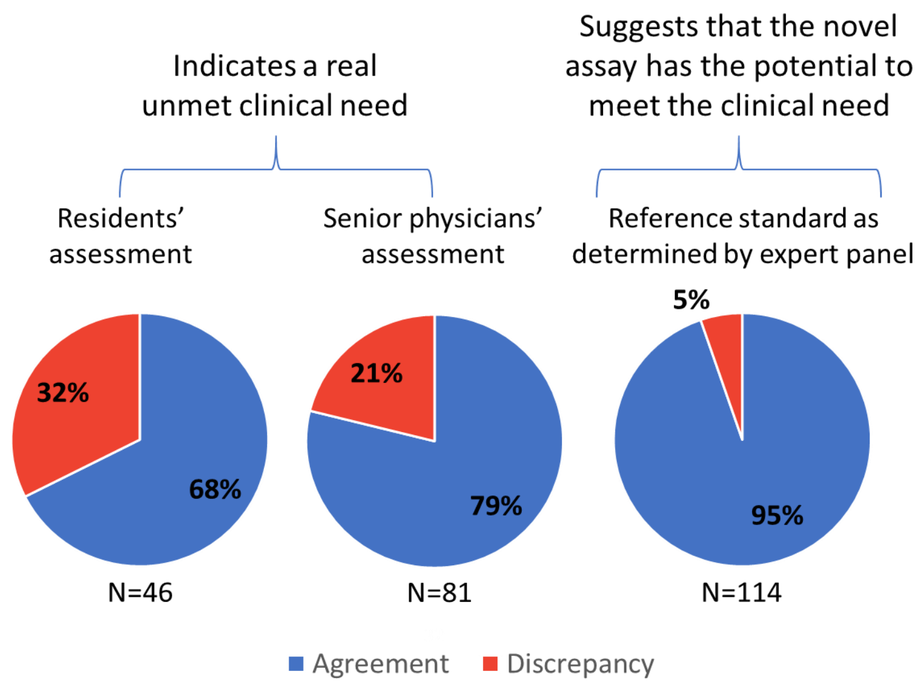
Here we evaluate the assay's potential clinical utility.

Methods

- The study was conducted at the emergency department of a pediatric tertiary care facility.
- As part of the interim analysis of the ongoing "ROSETTA" study, we performed a sub-analysis of prospectively recruited children ≥3 months, presenting with upper and lower respiratory tract infections or fever without source.
- For every participant, the managing physician completed a questionnaire indicating whether they suspected a bacterial or viral etiology after the initial history and physical examination. We analyzed the concordance between ImmunoXpert™ results and:
  - (a) The physician assessment at presentation
  - (b) A reference standard diagnosis, determined by three independent experts based on comprehensive clinical and laboratory investigation, including a nasal swab multiplex-PCR and patient follow up.



Results and Conclusions



ImmunoXpert™ concordance increases with physician's seniority and when compared with reference standard

- **Out of 127 children, 37% presented with fever without source, 42% with upper and 21% with lower respiratory tract infection.**
- **As shown in the figure, senior physicians' diagnoses were with better concordance with ImmunoXpert™ results than residents' diagnoses.**
- **Notably, the assay had a concordance of 95% to the reference standard, significantly higher than that of the residents and senior physicians (P=0.01).**

The ImmunoXpert™, taken at presentation, demonstrated a higher concordance rate with expert panel diagnosis, compared with initial clinical suspicion. This supports the assay's potential clinical utility in facilitating timely and accurate diagnosis, thereby reducing diagnostic work-up and antibiotic misuse.

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