### Clinical Findings

#### Pathogens Detected
- Protozoa (including Giardia and Cryptosporidium) are a small, but relevant and treatable part of pediatric gastroenteritis.
- New multiplex molecular methods are sensitive for parasite detection (FilmArray® GI Panel, BioFire Dx, Salt Lake City).
- However, these newer tests are expensive and unnecessary for self-limiting cases of gastroenteritis.
- Goal of the study: Measure the predictors for protozoal detection by multiplex PCR testing in children presenting to Emergency Department with acute gastroenteritis to improve pretest probability.

#### Demographics

<table>
<thead>
<tr>
<th>Mean Age (yrs)</th>
<th>Any Protozoa (N=51)</th>
<th>Giardia Alone (N=18)</th>
<th>Cryptosporidium Alone (N=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5.5 (4.2–6.9)</td>
<td>4.8 (4.4–5.5)</td>
<td>5.6 (4.3–7.7)</td>
</tr>
<tr>
<td>Race</td>
<td>23 (56%)</td>
<td>447 (52%)</td>
<td>9 (50%)</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (2%)</td>
<td>7 (0.1%)</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>16 (39%)</td>
<td>237 (26%)</td>
<td>5 (28%)</td>
</tr>
<tr>
<td>Pacific Island</td>
<td>0 (5%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>White</td>
<td>22 (54%)</td>
<td>654 (71%)</td>
<td>10 (55%)</td>
</tr>
</tbody>
</table>

#### Insurance
- Public: 35 (85%)* 625 (69%) 16 (89%) 20 (83%)
- Private: 8 (20%) 305 (34%) 2 (11%) 6 (25%)
- None: 1 (2.4%) 28 (3%) 0 1 (4.2%)

#### Statistical Analysis
- Standardized Student T Test and Fischer’s Exact analysis.
- Used Multiple Imputation with Chained Equations to extrapolate missing data in combination with 50 iterations of cross validation.
- Used Random Forest Variable Importance to select variables for inclusion in logistic regression.

#### Conclusions
- Testing based on conventional indicators for protozoa is not likely to increase pretest probability.
- Older age and living with children < 5 yo was predictive for protozoa.
- Multiple variations on both parasimimous and non-parasimimous models could not classify protozoal disease well.
- Parasites can cause acute diarrhea [with no difference in length of diarrhea or symptomatology at presentation].
- A seasonality of protozoal illness may extend from July to November.

#### Limitations
- Only patients presenting to Children’s Hospital EDs.
- Low case numbers for protozoa.
- Cyclospora Not detected.
- Majority of cases at 2 sites (Consistent with CDC data).

#### Acknowledgments:
- IMPACT study was funded by NIH/NAID grant R01AI104593 to BioFire Diagnostics, additional funding from BioFire Diagnostics.