My year of HOT NORTH respiratory research
- genomics, clinical trials, and recalcitrant crocodiles

Heidi Smith-Vaughan
Head, Child Health Laboratory Research
Head, HealthLAB
Child Health Respiratory Lab team works along the research timeline
The Child Health/Respiratory lab teams (Darwin and Ho Chi Minh City)
Microbiology
Immunology
‘omics
Epidemiology
Medicinal plants

RCTs (~10), local, national, international (micro, immunol, ‘omic outcomes)

Discovery
Research

Clinical Studies

Translation

Evaluation

HealthLAB
Nontypeable *Haemophilus influenzae* (NTHi)
*Streptococcus pneumoniae*
*Moraxella catarrhalis*
Haemophilus species – *H. influenzae, H. haemolyticus, H. parainfluenzae*

- SNP phylogeny - orthologous (core) characters
- Nose, throat, blood, BAL, middle ear...
- Menzies (-400) plus published genomes
- New diagnostic targets for Hi, Hh, Hp
Can rapid PCR assays improve antibiotic stewardship in the treatment of COPD and bronchiectasis exacerbations?

CIA Heidi + RDH (Rob Baird) + Monash Medical (Paul King) + Edinburgh Uni (Adam Hill) +++
Understanding pathogenesis
- Genome-wide association studies

Tegan Harris
A systems biology approach to understanding the interaction of NTHi with the human lower respiratory tract epithelium.

CIA Tegan Harris
Clinical studies - Vietnam

Evaluation of different infant vaccination schedules incorporating pneumococcal vaccination (The Vietnam Pneumococcal Project) – PI Kim Mulholland

<table>
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<th>Gp</th>
<th>PCV</th>
<th>Schedule</th>
<th>Age of doses</th>
<th>No. enrolled</th>
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<td>A</td>
<td>PCV10</td>
<td>3+1</td>
<td>2, 3, 4, 9m</td>
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<tr>
<td>B</td>
<td>PCV10</td>
<td>3+0</td>
<td>2, 3, 4m</td>
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<td>2, 4, 9m</td>
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<td>2-dose</td>
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<td>2+1</td>
<td>2, 4, 9m</td>
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<td>F</td>
<td>Controls</td>
<td>(18m, 24m)</td>
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</table>

- NP swabs collected at 2, 6, 9, 12, 18, 24 mo
- Our role – train and support Pasteur Institute Ho Chi Minh City staff in generating carriage outcomes of the trial (2ndary outcome)
Clinical studies - Vietnam

Micro progress
- ~4000 swabs analysed to date
- Primary endpoint data – analysis/publication
Hospital surveillance predicts community pneumococcal antibiotic resistance in Vietnam.
Rapid diagnostics for AMR

- $bla_{TEM}$ PCR would detect all these $\beta$-lactamase positive isolates
- Common conventions will not reliably detect BLNAR or AMC non-susceptible
2017 HealthLAB Ambassadors - Wurrumiyanga

- 6000 participants since 2014
- Delivering the LiveLighter Campaign in remote NT
- Evaluation commenced...

Ramingining
Acknowledgements

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- Amy Llewellyn
- Harry Owen
- Taylah Church
- Raelene Collins
- Cain Hendy
- Celestine Aho

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- Steve Baddeley
- Kate Duncan
- Child Health lab team and other volunteers and students

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- Huong Vu Thi Que
- Van Thanh Phan

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