

BOP ARF findings from schools and GP alone models, & observations on Gender, GAS & probiotics

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Aotearoa New Zealand

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23rd PUBLIC HEALTH
SUMMER SCHOOL



Bay of Plenty Acute Rheumatic Fever

- 2000-2018
- 92% Maori (4% Pacific on single prioritized MOH ethnicity, 11% Pacific on multiple ethnicities)
- 72% Male dominate stats every year, all ages; Why?
- 65% in Eastern BOP where 44% Maori live
- 32% of Maori with ARF in WBOP live NZDeps 2-6
- ARF linked closer to ethnicity than deprivation.

Outline

- Pharyngeal Group A streptococcus prevalence, colonization, and S.Salivarius probiotic
- Gender
 - i. and GAS prevalence ,
 - ii. sore throat presentations
 - iii. GAS positivity of sore throat presenters
- Outcomes 2011-18 for Maori 5-14yr in three regional cohorts by cohorts & gender compared to baseline; variables include School programmes, and NZ Deps

Three Whakatane, N.Z. Schools, 2015

No school ARF programmes, throat GAS 24% baseline prevalence
 S.Salivarius Blis K12 probiotic, school allocated, prevalence and
 sore throat trial

Schools (September 2015)	Total school roll	Education Decile	Gender female %	Mean age	Māori (%)	Pasifika	European/Pākehā, %	Asian (%)
School A	263	2	53	8.404	260 (99)	2	1	0
Schools BC	251	2	52	8.035	202 (80)	0	41(16.3%)	8(3%)

School probiotic *S.Salivarius*; cluster randomization

1. One month whole school outcomes on GAS prevalence?
2. Re-analysis; Does Blis probiotic prevent colonization or enhance Abiotic?

Whakatane 2015	End Term 2 Last week June	School hols 2 weeks	One month	Mid August 6 weeks later	First Evaluation School outcome	Recent Evaluation by baseline GAS status
School A	Throat swab & treat GAS +ves	10/7 Amoxil for Gas +ves		Throat swab	School Gas reduction	Positives who became -ve or still +ve
						Negatives Still -ve or became +ve
School BC	Throat swab & treat GAS +ves	10/7 Amoxil for Gas +ves	Whole school <i>S Salivarius</i> BlisK12 daily	Throat swab	School Gas reduction greater	Positives who became -ve or still +ve
						Negatives Still -ve or became +ve

Subgroup analysis 1

Outcomes for initially GAS negative students

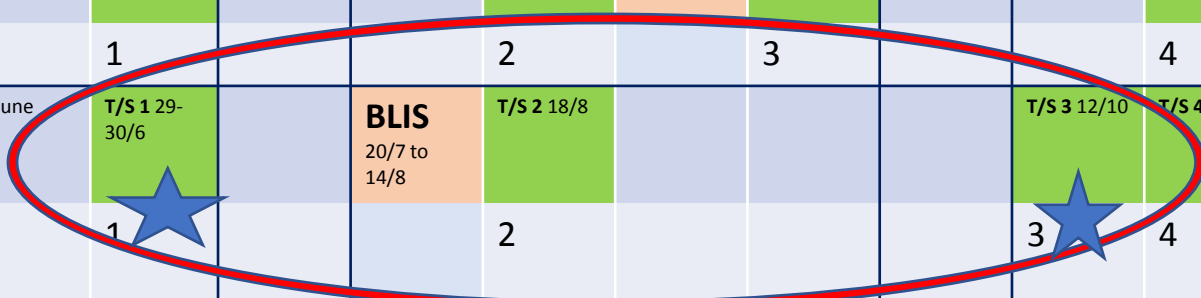
- Natural history, of rapid GAS colonization within one month almost to community levels
- Blis protects from this rapid GAS colonization

Subgroup analysis 2 BLIS antibiotic adjuvant effect;

- For initially GAS Positive students treated with antibiotics, the addition of Blis K12 probiotic made (in this study) no significant difference in GAS clearance at one month

GAS Sore Throats 3 months later; School B data n=94

	School Kura	Term 2 (end 3 July)			Holiday 2 week	Term 3 (20/7 to 25/9)			Holiday 2 week	Term 4 (began 12/10)	
Month		June	June	June 29 – mid - July		July & August		Sept		Oct	Nov
Tasks		Student & parents informed	Consent	T/swab 1, GAS +ves Rx 10/7		BLIS	T/swab 2, GAS +ves Rx 10/7	BLIS	T/swab 3, GAS +ves Rx 10/7	T/swab 3, GAS + ves Rx 10/7	T/swab 4 GAS +ves Rx 10/7
Dates	A	1-26	26 June	T/S 1 29-30/6			T/S 2 11-12/8	BLIS 24/8 to 20/9	T/S 3 21/9		T/S 4 16/11
Data-point	A			1			2		3		4
Dates	BC	1-26	26 June	T/S 1 29-30/6		BLIS 20/7 to 14/8	T/S 2 18/8			T/S 3 12/10	T/S 4 9/11
Data-point	BC			1			2			3	4



Probiotic *S.Salivarius* BlisK12 Summary

- BlisK12 achieved greater GAS prevalence decline, than antibiotics alone
- BlisK12 prevented students acquiring GAS carriage
- BlisK12 contributed to fewer GAS sore throats
- BlisK12 efficacy as an antibiotic adjuvant, was not shown in this study.

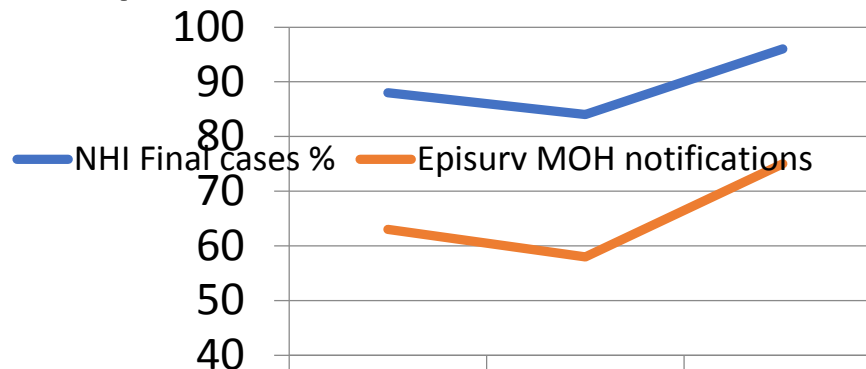
Observations on pharyngeal GAS & Gender

- Kawerau **RFPP** schools GAS point prevalence **2010** 23%, **2013** 12%, **2014** 6%.*
- **Boys GAS M:F ratio; prevalence (carriage and symptomatic) 1.4-1.7, #**
- **School programme sore throat presentation, & positivity by gender**
- **Boys M:F ratio; present less 0.73 with sore throats , equal positives arise as**
- **Boys M:F ratio; more likely GAS positive 1.4 if presenting with sore throat.**
- School programmes encourage presentation, making GAS ▲ & Rx accessible.
- *Ball, Malcolm, Hartley, Bennett, Wana, Lennon, Stewart; ASID poster 2015 & Lennon HRC report Which works best 2017
Thanjon Michniewicz U Newcastle Australia Equity Paediatric Elective Kawerau data BOP 2014

BOP ARF notifications to MOH improve but cases < than discharges;
Using these single data sources alone risks ascertainment bias,
under estimating school programme effectiveness; We use both with case-note scrutiny.

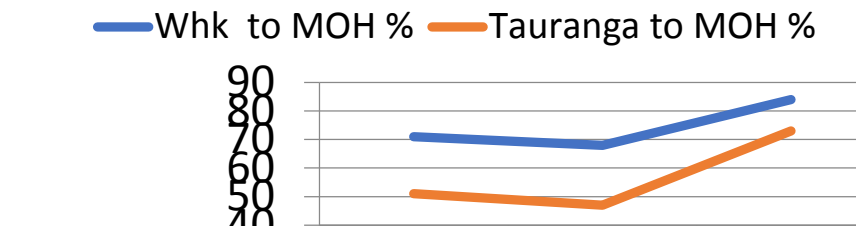


Episurv MOH still misses 25%



NHI Final cases %	88	84	96
Episurv MOH notifications	63	58	75

Tau, Whk, & Adult Drs to improve



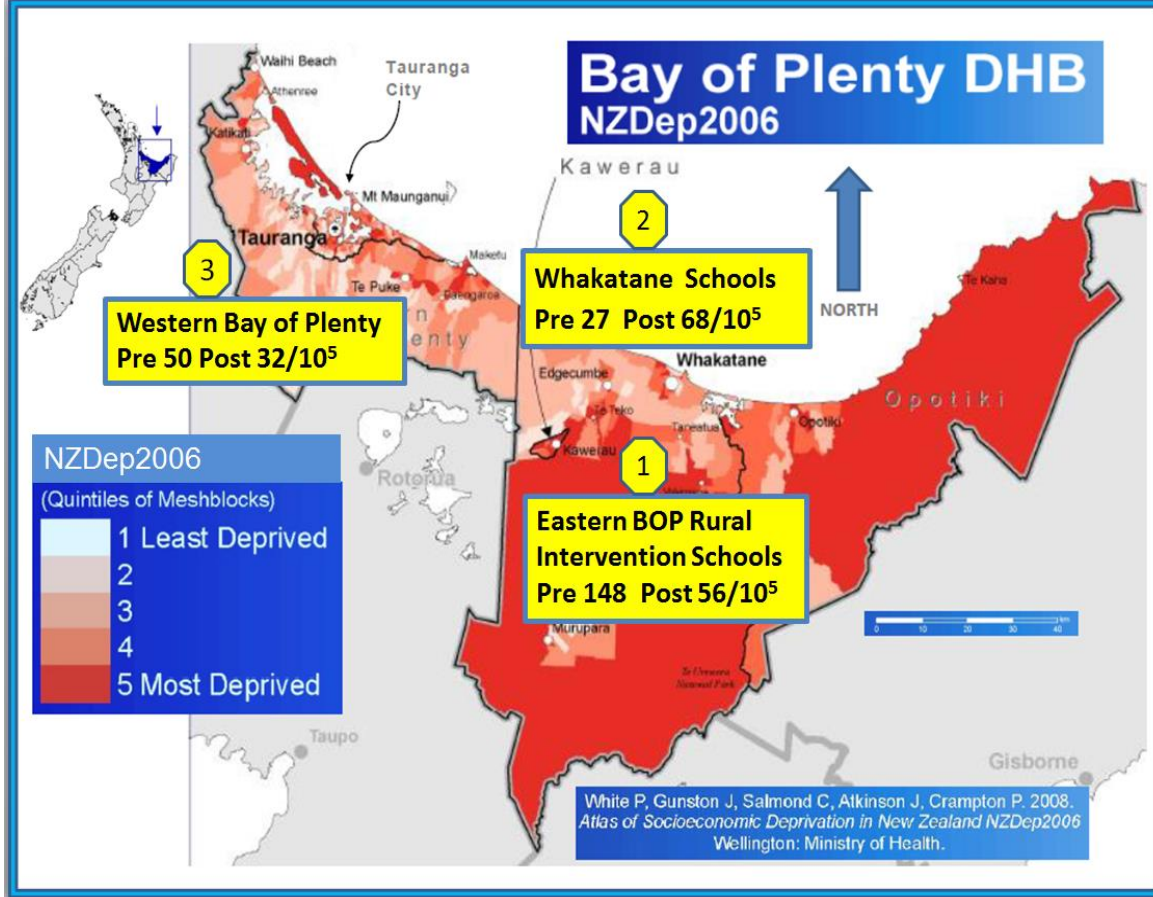
	2000-2005	2006-2010	2011-2015
Whk to MOH %	71	68	84
Tauranga to MOH %	51	47	73

MOH Notification	Notify	<15yr age	>15yr
	MOH	70 %	42%

**Pre & Post intervention
 Maori 5-14yr ARF rates
 2000-10 & 2011-18 ;
 3 cohorts (yellow boxes)**

Bay of Plenty Health Board on Ministry of Health Deprivation map; NZDeprivation quintiles.

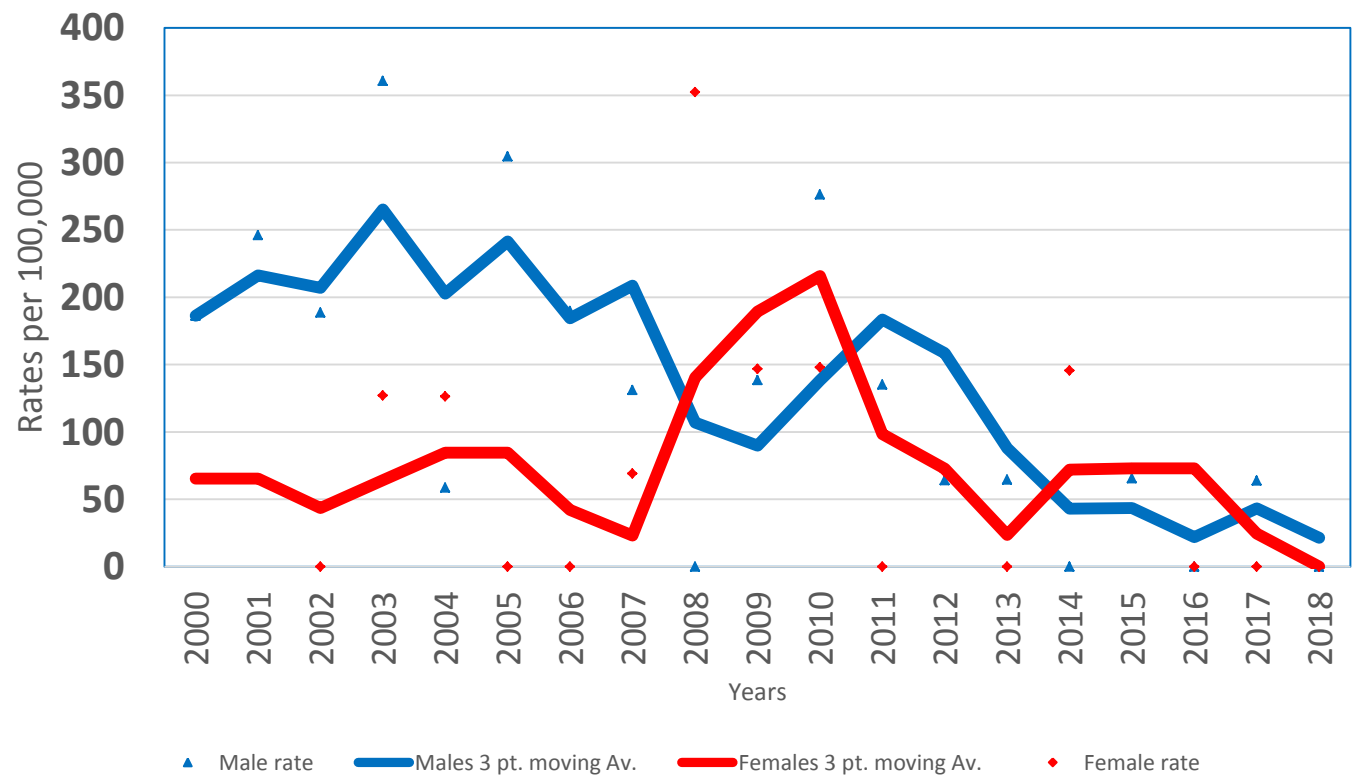
Cohorts 1-3 East to West
 1 Eastern BOP Schools with GP support,
 2 Whakatane town & surrounds EBOP GP only,
 3 Western BOP mainly GP care + 3/58 schools



Male Maori 5-14yr

ARF Rate
 2000-18
 trend toward
 Female rate
 in BOP RFPP
 school
 intervention
 areas

Gender Rates 5-14 NZM 2000-2018
 with 3yr moving average



Whole BOP Maori 5-14yr ARF rate

2000-10 vs 2011-18; change over 18 years

- Rate change 71 to 46/100,000/annum
- RR 0.65 CI 0.45-0.94
- P = 0.0209

Summary 1 GAS

- Pharyngeal GAS colonizes GAS –ve students rapidly
- Probiotic S.Salivarius can protect GAS-ve students
- Pharyngeal GAS declines throat (& skin) programme
- Maori Boys;more ARF,carry GAS more, presented less

Summary 2 Programmes

- School programme 62% less Maori ARF, in highest Deps
- School programmes trend to closing gender gaps
- Whakatane doubled ARF without school programmes

Summary 3 Methodology

- School allocation in GAS & Probiotic Blis studies
- Combine Discharges & Notifications with case scrutiny
- Historic Relative rates compare similar context
- Control contemporaneous cohorts for ethnicity & NZiDep
- Risk of ascertainment bias using notifications alone

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