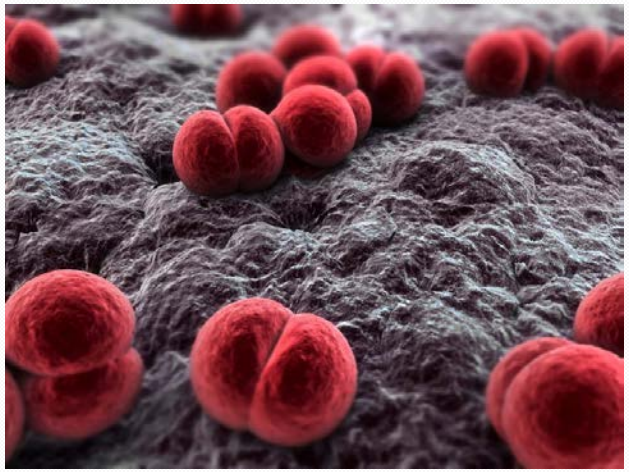
PAEDIATRIC INVASIVE MENINGOCOCCAL DISEASE IN AUCKLAND, 2004-2017



C. Burton, M. Broom, E. Best, S. Johansson,
M. Hansen, H. Heffernan, S. Briggs, R. Webb

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NEISSERIA MENINGITIDIS

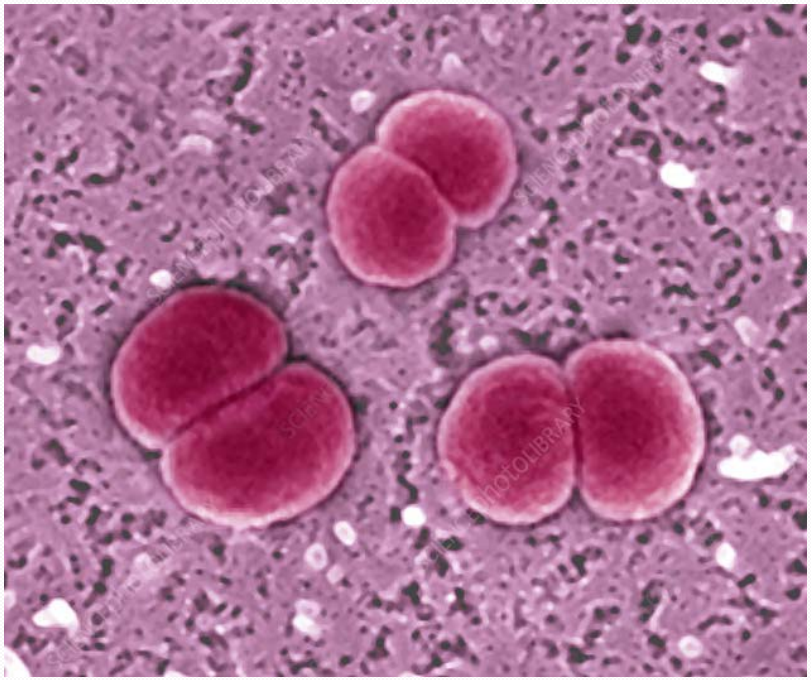
Gram negative diplococcus

Serogroups based on polysaccharide capsule – A, B, C, W, Y

Human reservoir – nasopharynx

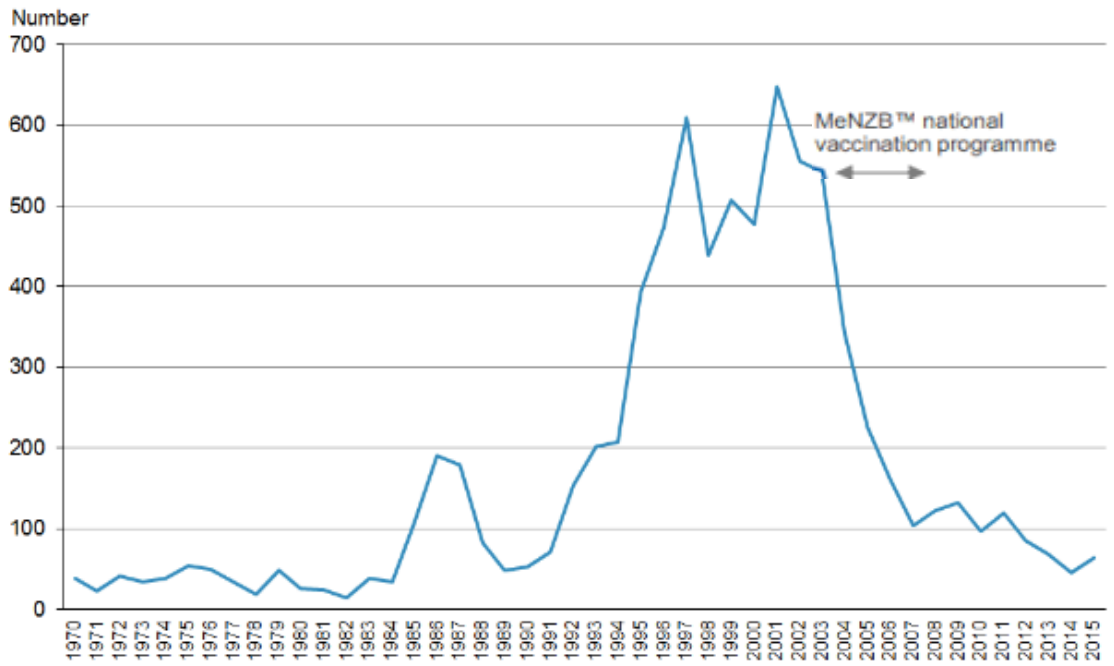
Transmission through respiratory droplets or direct contact with nasopharyngeal secretions

Meningococcus invades epithelium and enters bloodstream – sepsis, meningitis

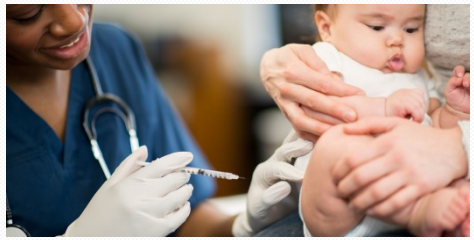


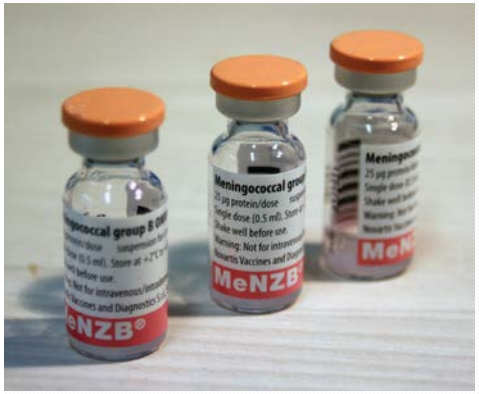
MENZB™ & THE NEW ZEALAND EPIDEMIC

Figure 12.1: Notified cases of meningococcal disease, 1970–2015



Source: ESR





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AIMS & METHODS

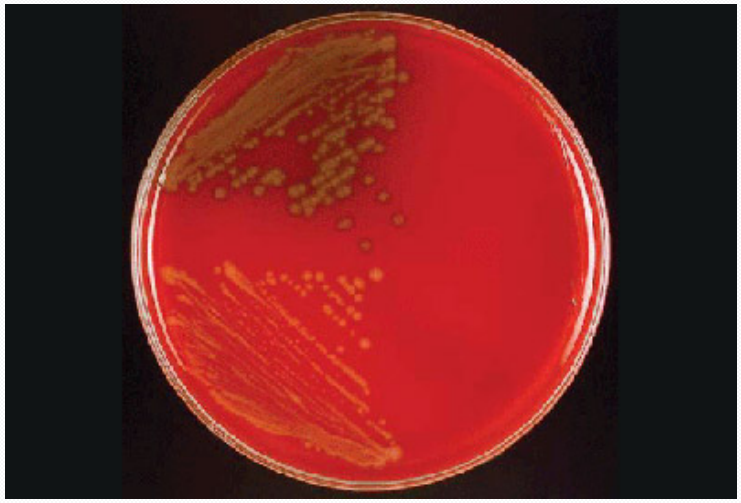
To describe the Auckland experience of paediatric invasive meningococcal disease

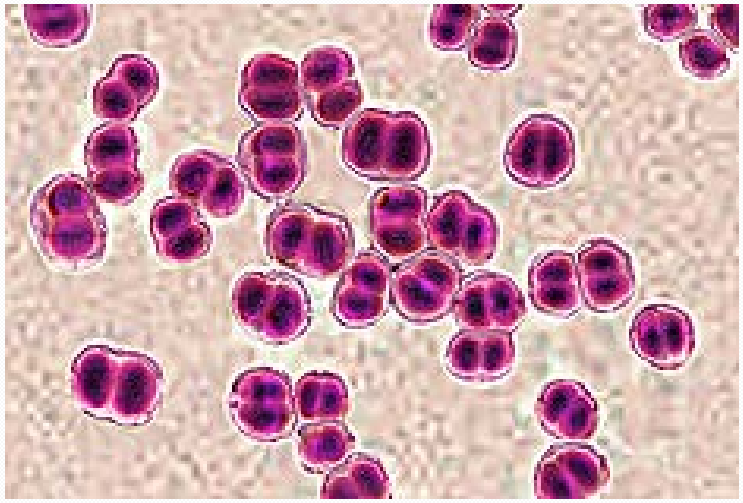
Assessment of outcomes related to penicillin-susceptible vs reduced penicillin susceptibility

Institute of Environmental Science and Research (ESR) notifications for all positive meningococcal cultures from sterile sites

Between 2004 and 2017 in children <15 years from the Auckland region

Clinical notes and National Immunisation Register data reviewed





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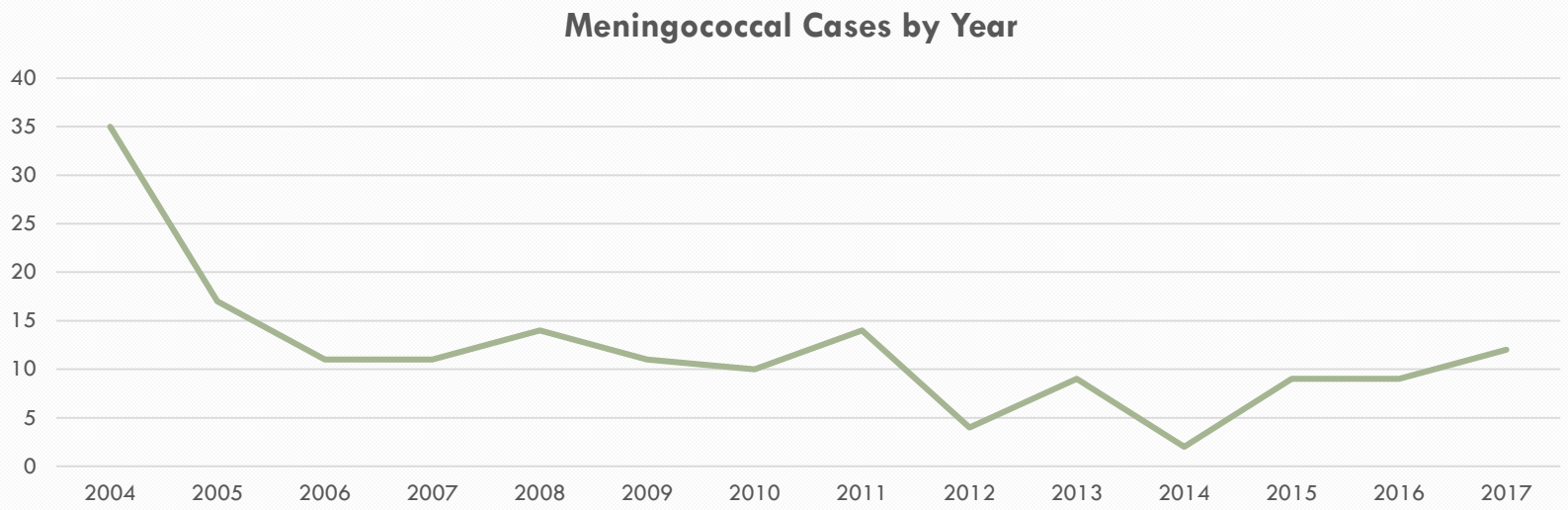
RESULTS

168

cases of invasive meningococcal disease in children <15 years in the greater Auckland region between 2004 and 2017

- Estimated $^{2}/_{3}$ of Auckland paediatric IMD, $^{1}/_{4}$ of New Zealand paediatric IMD



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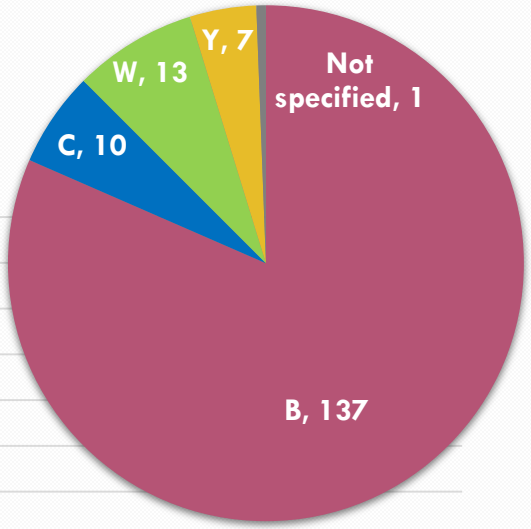
SEROGROUPS



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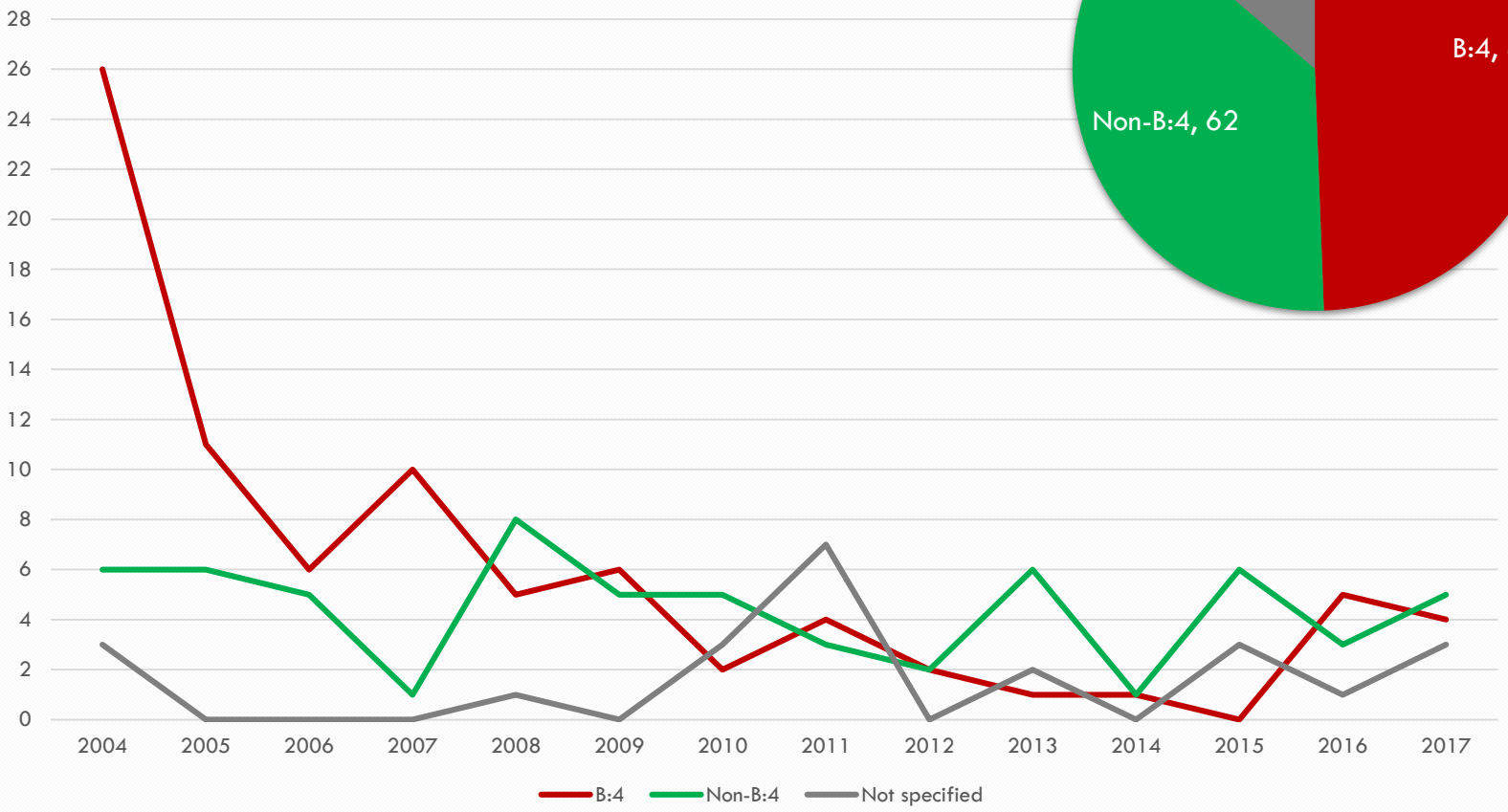
GROUP B:4 STRAIN



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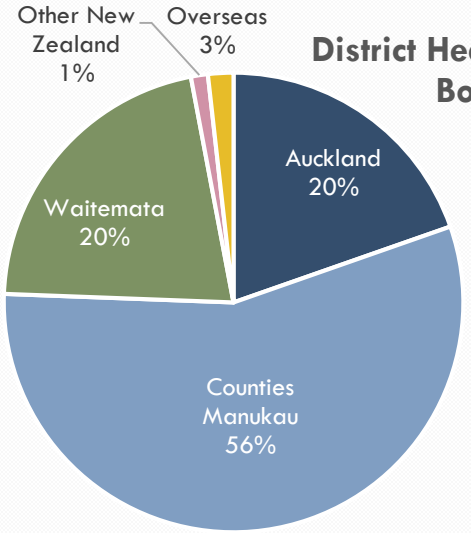
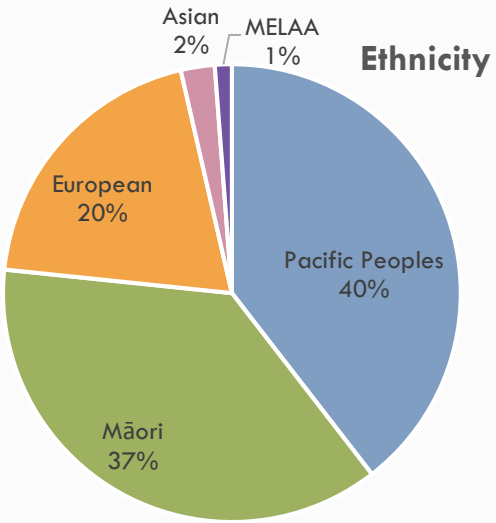
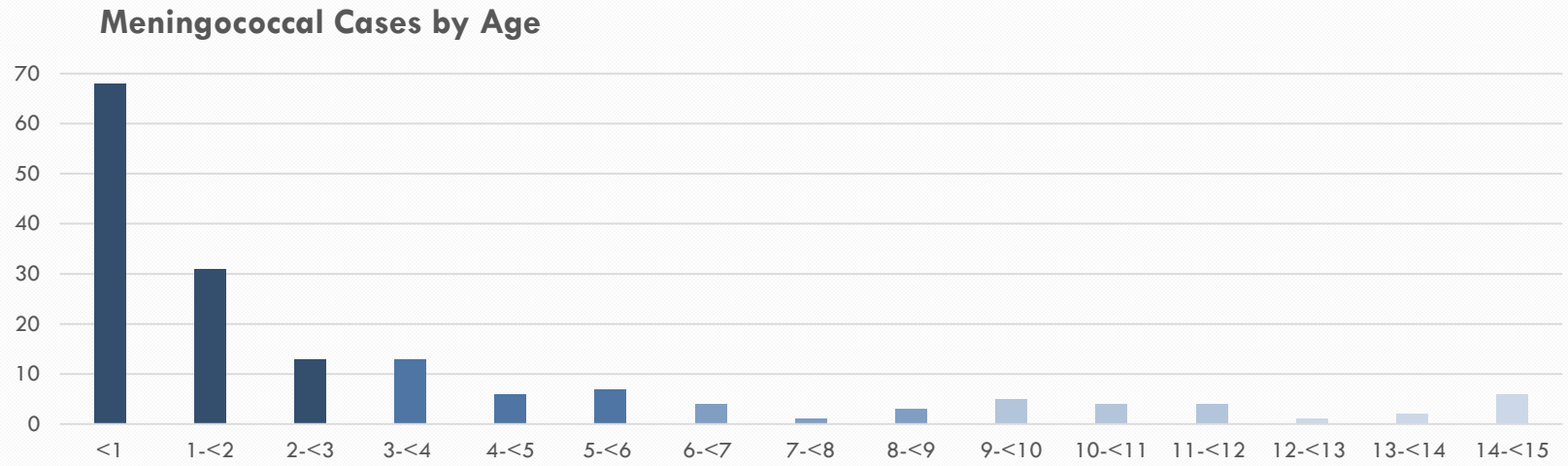
DEMOGRAPHICS

57%
(95)

boys







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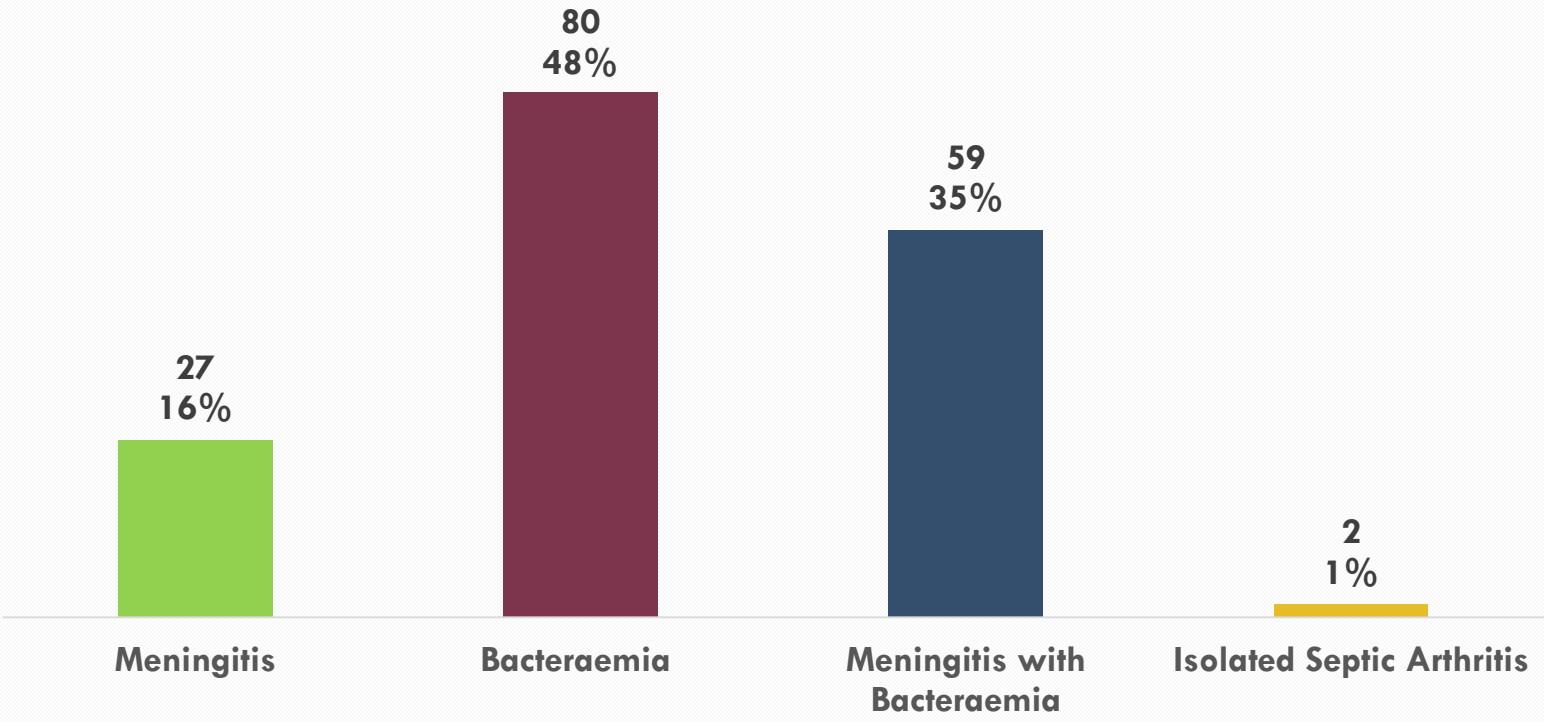
CLINICAL PRESENTATIONS

168 cases



CLINICAL PRESENTATIONS

65% (109) had an initial temperature ≥38°C or <36°C

72% (116) presented with a rash

- 33% petechiae
- 27% purpuric
- 4% blanching
- 7% mixed

70% (68/86) of those with meningitis presented with meningism

3% (5) presented with septic arthritis

6% (9) with arthralgia

INTENSIVE CARE

22% (37) were admitted to an intensive care unit

14% (24) required inotropic support

11% (18) required mechanical ventilation

2% (4) required renal replacement therapy

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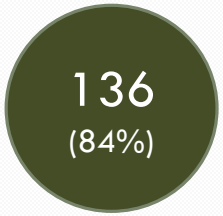
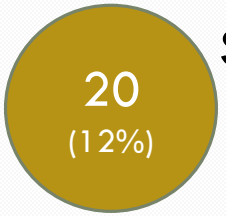
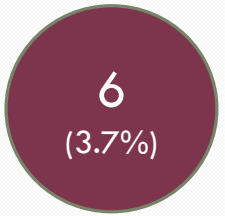
OUTCOMES



Cure



Sequelae



Deaths

	Cure	Sequelae	Death	Total	p-value
Meningitis	22 (85%)	4 (15%)	0 (0%)	26	0.92
Bacteraemia	66 (85%)	9 (13%)	3 (4%)	78	
Meningitis with Bacteraemia	46 (82%)	7 (13%)	3 (5%)	56	
Septic Arthritis	2 (100%)	0 (0%)	0 (0%)	2	
Total	**136**	**20**	**6**	**162**	
Admitted to ICU	22 (61%)	10 (28%)	4 (11%)	36	<0.001
Not admitted to ICU	114 (90%)	10 (8%)	2 (2%)	126	

SEQUELAE

9% (14) Sensorineural hearing loss

5% (8) Skin or extremity complications

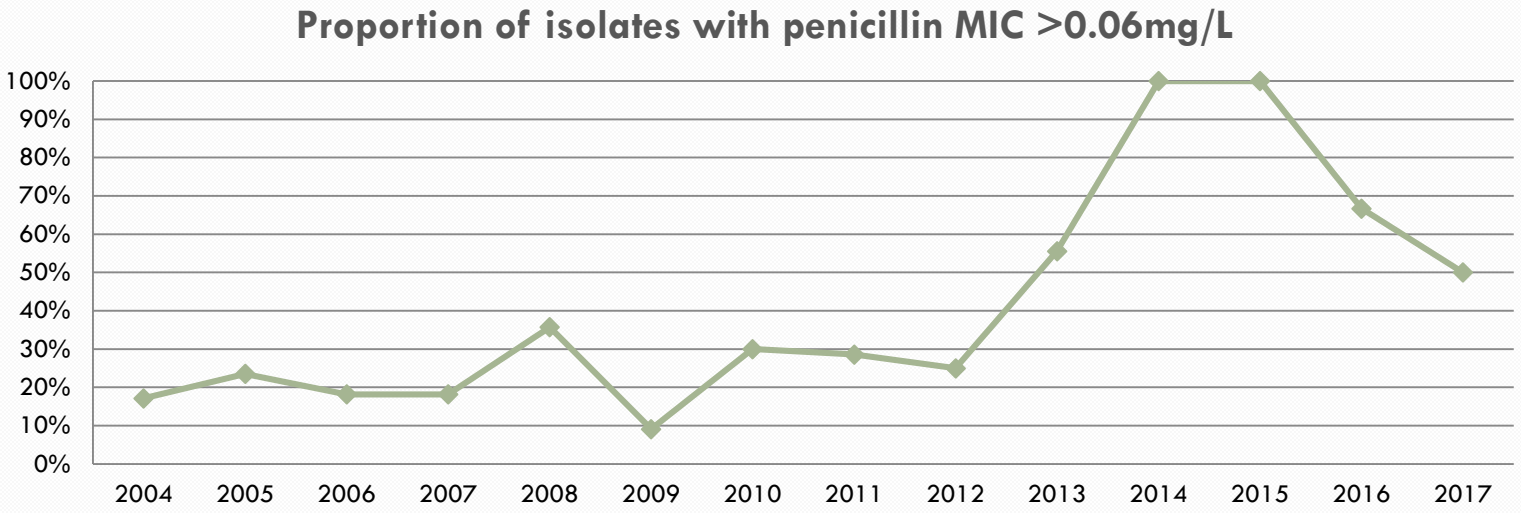
4% (7) Neurological sequelae

2% (3) Chronic renal impairment

6% required hearing aids

2% referred for cochlear implants

PENICILLIN MIC



No statistically significant difference in outcomes in those with penicillin-susceptible isolates compared to those with reduced penicillin susceptibility

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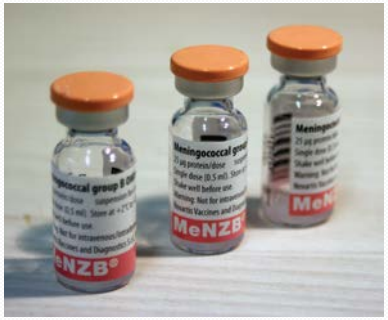
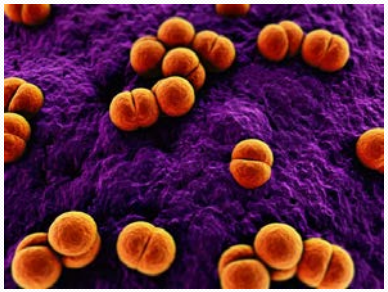


101/168 were eligible to receive MeNZB™

90% completed MeNZB™

MeNZB™ received before admission:

- Completed course: 31 (19%)
- Partially-completed: 29 (18%)
- Not received MeNZB™: 104 (63%)



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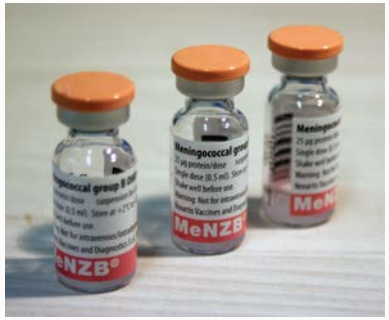
MENZB™ & PRESENTATIONS



B:4 Strain Presentation	MeNZB™ Schedule			p-value
	No MeNZB Received	Partially Complete	Complete	
Meningitis	2 (4%)	6 (30%)	1 (6%)	0.06
Bacteraemia	28 (61%)	8 (40%)	7 (44%)	
Meningitis with Bacteraemia	15 (33%)	6 (30%)	7 (44%)	
Isolated septic arthritis	1 (2%)	0 (0%)	1 (6%)	
Total	**46**	**20**	**16**	
Required ICU	12 (26%)	5 (25%)	2 (13%)	0.53

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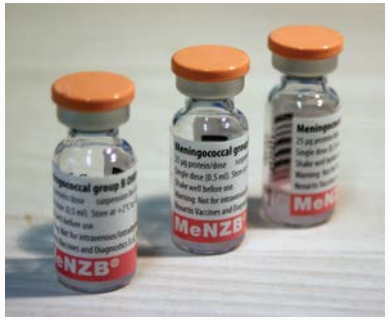
MENZB™ & OUTCOMES



B:4 Strain Outcome	MeNZB™ Schedule			P-value
	No MeNZB Received	Partially Complete	Complete	
Cure	37 (80%)	16 (80%)	14 (88%)	0.75
Sequelae	5 (11%)	2 (10%)	2 (13%)	
Death	2 (4%)	2 (10%)	0 (0%)	
Total	**44**	**20**	**16**	

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CONCLUSIONS

Invasive meningococcal disease remains a significant cause of morbidity and mortality in Auckland

Lower case fatality rate (3.7%) from Auckland paediatric cohort

Burden of sequelae (12%) – hearing loss (9%)

In those who developed B:4 disease, prior administration of MeNZB™ did not appear to impact on morbidity and mortality

Meningococcal disease remains a public health priority in New Zealand

Thank you!