Investigating trends in Hepatitis B epidemiology within Indigenous populations in the Northern Territory

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WHO Collaborating Centre for Viral Hepatitis VIDRL

menzies school of health research

Doherty Institute

The University of Melbourne

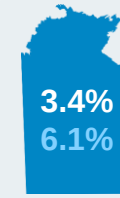
The Royal Melbourne Hospital

A joint venture between The University of Melbourne and The Royal Melbourne Hospital

Chronic hepatitis B in Australia

1%
of Australians
have CHB

3.7%
of Indigenous Australians
have CHB



Highest
CHB prevalence
is in the NT

MacLachlan JH, Thomas L, Cowie BC, Allard N. *Hepatitis B Mapping Project: Estimates of geographic diversity in chronic hepatitis B prevalence, diagnosis, monitoring and treatment - National Report 2016*. 2018. Available from: http://www.ashm.org.au/HBV/more-about/hepatitis-b-mapping-project

Graham S, Guy R, Akre S, Cowie BC, Ward J. *Hepatitis B among Aboriginal and Torres Strait Islander People – Key Sub-groups*. Proceedings of the Australasian Sexual Health Conference; 2011 Sep 26–30.

Davies J, Li SQ, Tong SY, Baird RW, Beaman M, Higgins G, et al. *Establishing contemporary trends in hepatitis B sero-epidemiology in an Indigenous population*. PLoS One. 2017 Sep 8;12(9):e0184082. Available from: http://dx.plos.org/10.1371/journal.pone.0184082

HBV vaccination in the NT

1990
Universal infant vaccination against HBV introduced

1998
School catch-up program for children aged 6-16 years

30%
of the NT population identifies as Indigenous

Vaccination
rates in Indigenous infants are now the same as non-Indigenous children

Methods

- Results for all* HBV tests between 1991 – 2011 in the NT were sourced
- Matched with NT patient data
  - Demographics – age, current residential location, Indigenous status
  - Track people over time
- Tests included HBsAg, anti-HBs, anti-HBc, HBeAg, anti-HBe
  - No titres
  - Viral loads for < 1% of tests
  - No vaccination records
- Vaccination status assessed longitudinally by person, not per individual test

*all = 97.9%

Serology status classification

No markers
HBsAg negative
anti-HBs negative
anti-HBc negative

HBV positive
HBsAg positive
anti-HBs negative
anti-HBc either

Vaccinated
HBsAg negative
anti-HBs positive
anti-HBc negative

Isolated cAb
HBsAg negative
anti-HBs negative
anti-HBc positive

Natural immunity
HBsAg negative
anti-HBs positive
anti-HBc positive

Unknown

Demographics

219,134
tests

103,147
individuals

32
years old

545
days

Demographics

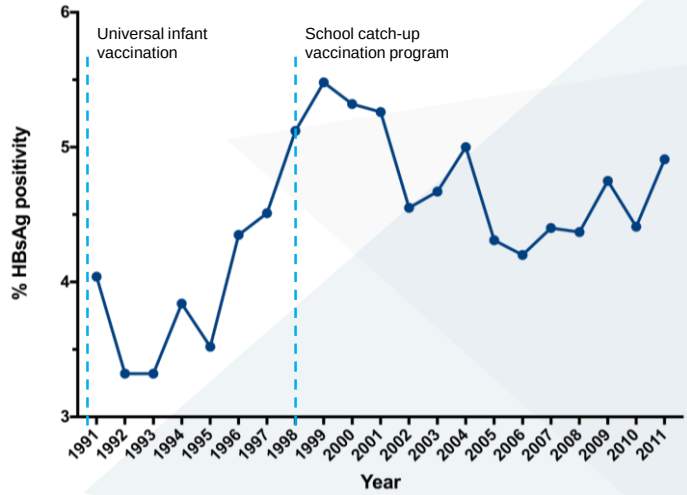
60.4%
Female

47.2%
Indigenous

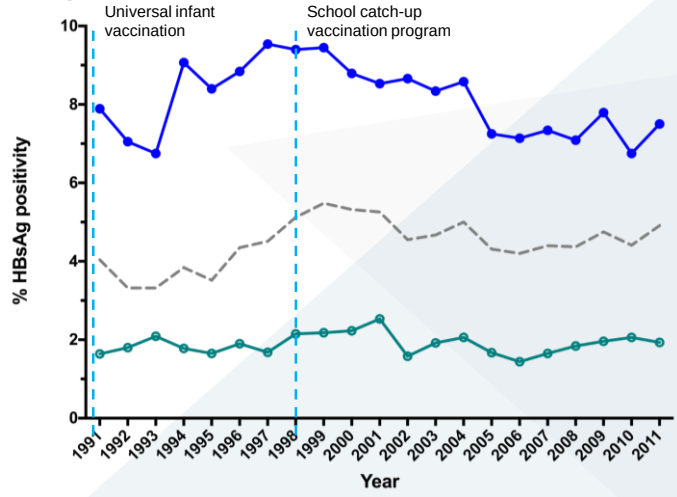
43.9%
Remote or very remote

21.8%
Eligible for routine vaccination programs

Yearly HBsAg point prevalence, 1991 to 2011

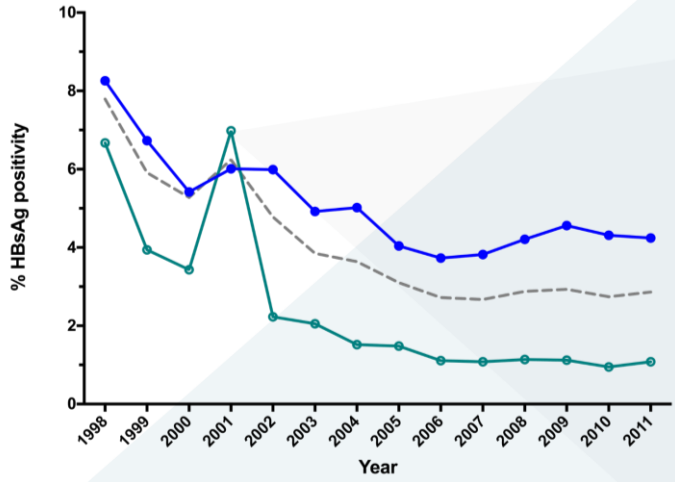


Yearly HBsAg point prevalence, 1991 to 2011



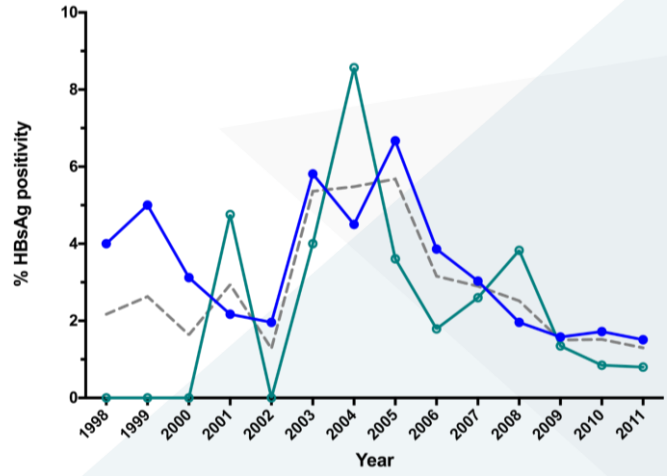
OR = 4.27 (4.06, 4.49)

Yearly HBsAg point prevalence, school catch-up cohort



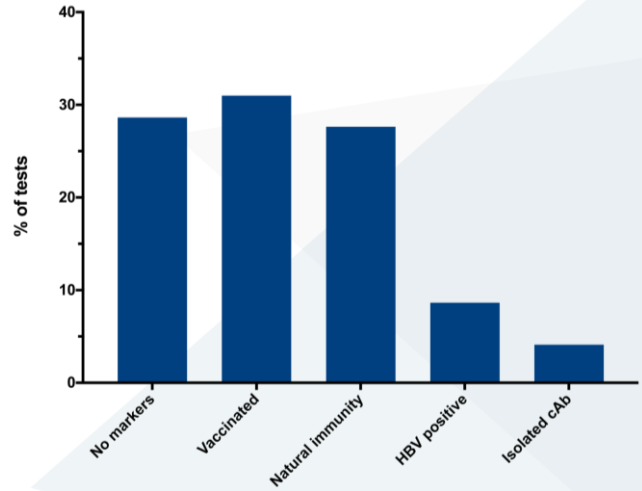
OR = 3.01 (2.61, 3.48)

Yearly HBsAg point prevalence, universal vaccination cohort

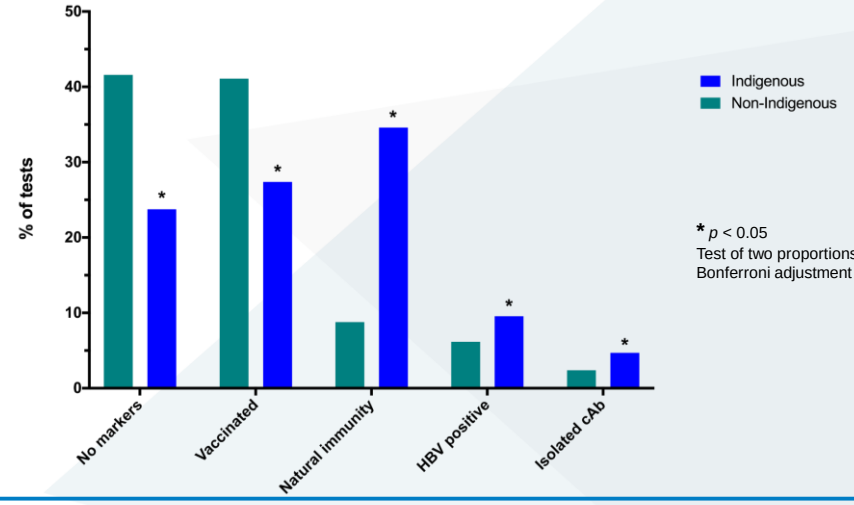


OR = 1.24 (0.93, 1.66)

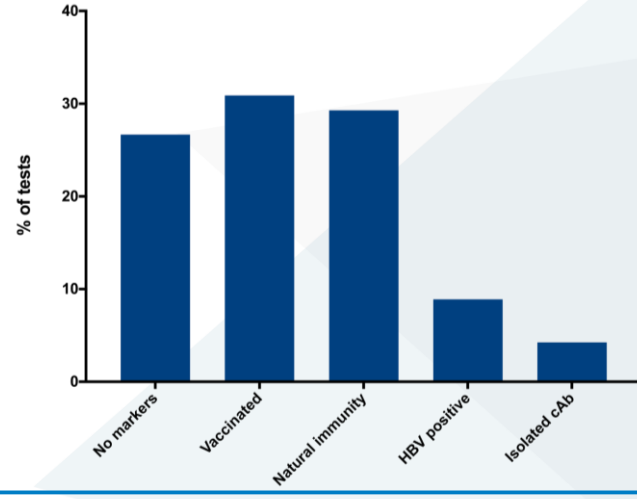
Vaccination status, eligible for routine vaccination programs



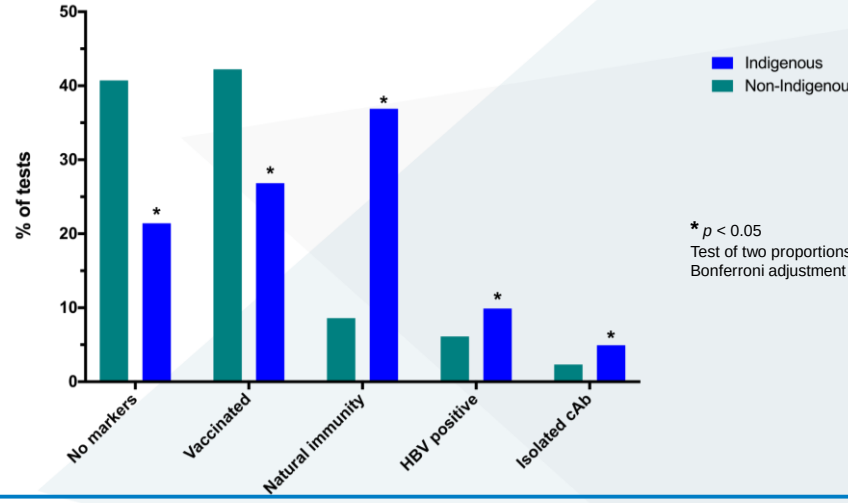
Vaccination status, eligible for routine vaccination programs



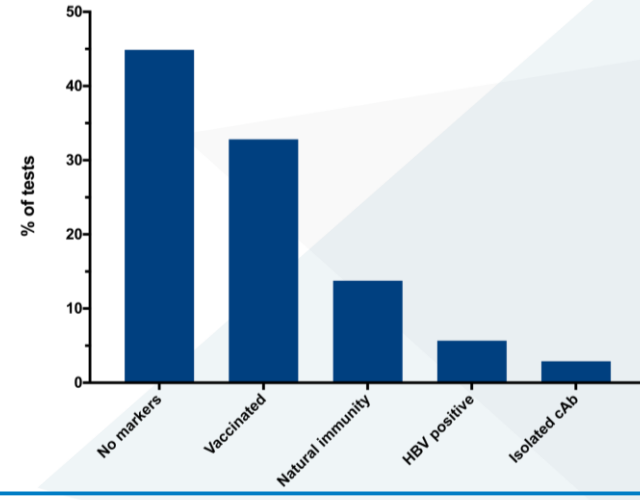
Vaccination status, school catch-up cohort



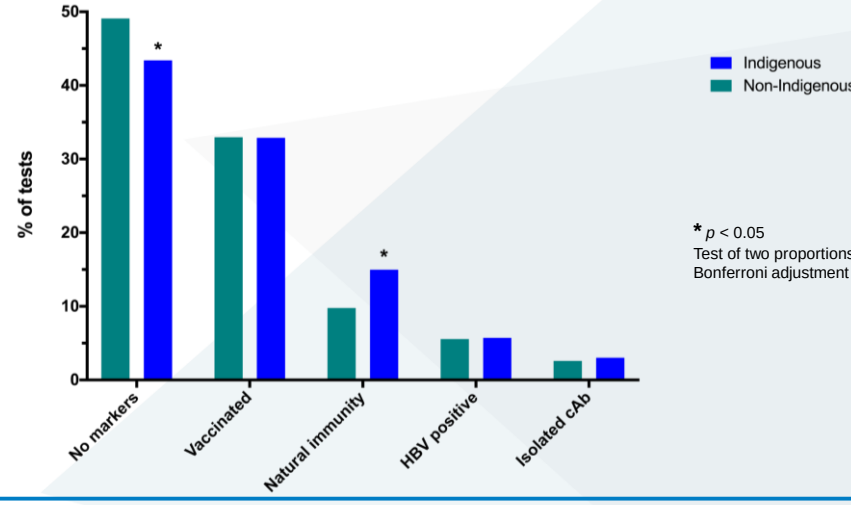
Vaccination status, school catch-up cohort



Vaccination status, universal vaccination cohort



Vaccination status, universal vaccination cohort



* $p < 0.05$
Test of two proportions, Bonferroni adjustment

Summary of our findings

- HBV is still an issue in the NT, with a higher yearly point prevalence than the national average
  - Even in the universal infant vaccination cohort
  - Prevalence is being driven by 79.2% of participants not eligible for routine vaccinations
- HBV rates are higher in Indigenous Australians than non-Indigenous people
  - This gap is narrowing for children born after 1990
- Vaccine-derived immunity is lower in Indigenous people over 28 years old
- Immunity through past infection is higher in Indigenous people

Future directions

Why
are levels of vaccine-derived immunity lower in Indigenous people?

How long
did it take susceptible people to contract HBV?

What
about those people with viral load data available?

How many
people seroconvert, and are there any predictive factors?

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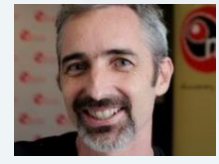

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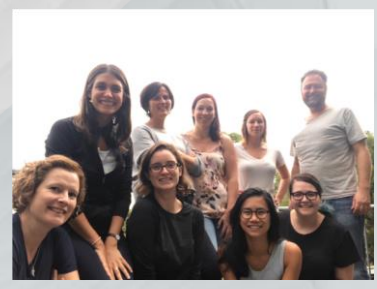

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