

# Probiotics in the neonatal period and long term effects on hospitalisation in infancy: A data linkage study from WA



People caring for people

Ravisha Srinivasjois FRACP, 1,2 3 4 Amanuel Gebremedhin 3. PhD. Desiree Silva 1,3 FRACP, Gavin Pereira PhD.

1. Department of Neonatology and Paediatrics. Joondalup Health Campus, 2. School of Medicine. University of Western Australia 3 School of Population Health. Curtin University. Bentley WA. 4. Edith Cowan university. WA.

## Introduction

- Gut microbiome modification (GMM) in preterm neonates (<32 weeks of gestation) has been practiced since early 2010 in Western Australia.
- Benefits include Reduction in NEC, late onset sepsis, better feed tolerance.
- Commonly used products contain a combinations of *Lactobacilli* and *Bifidobacterium*. Evidence on the longterm risks of hospitalisation in infancy is lacking.

## Aims and Objectives

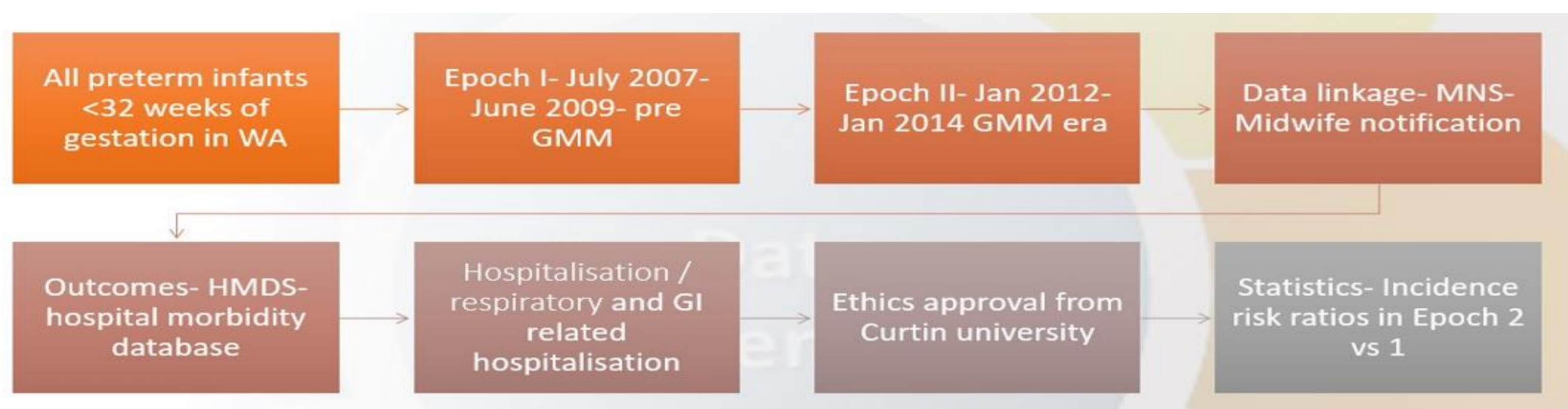
### CLINICAL QUESTION

In preterm infants <32 weeks of gestation (**patient**), does the use of probiotics (**intervention**), reduce the risk of hospitalisation in the first 2 years after discharge from the neonatal unit (**outcomes**) when compared with no probiotic exposure (**comparison**).

**Study Period: Epoch 1- Pre Probiotic era ( July 2007- June 2009). Epoch 2- Probiotic era (Jan 2012-Jan 2014)**

**Sub group: Risk of respiratory and Gastrointestinal infections**

## Methods

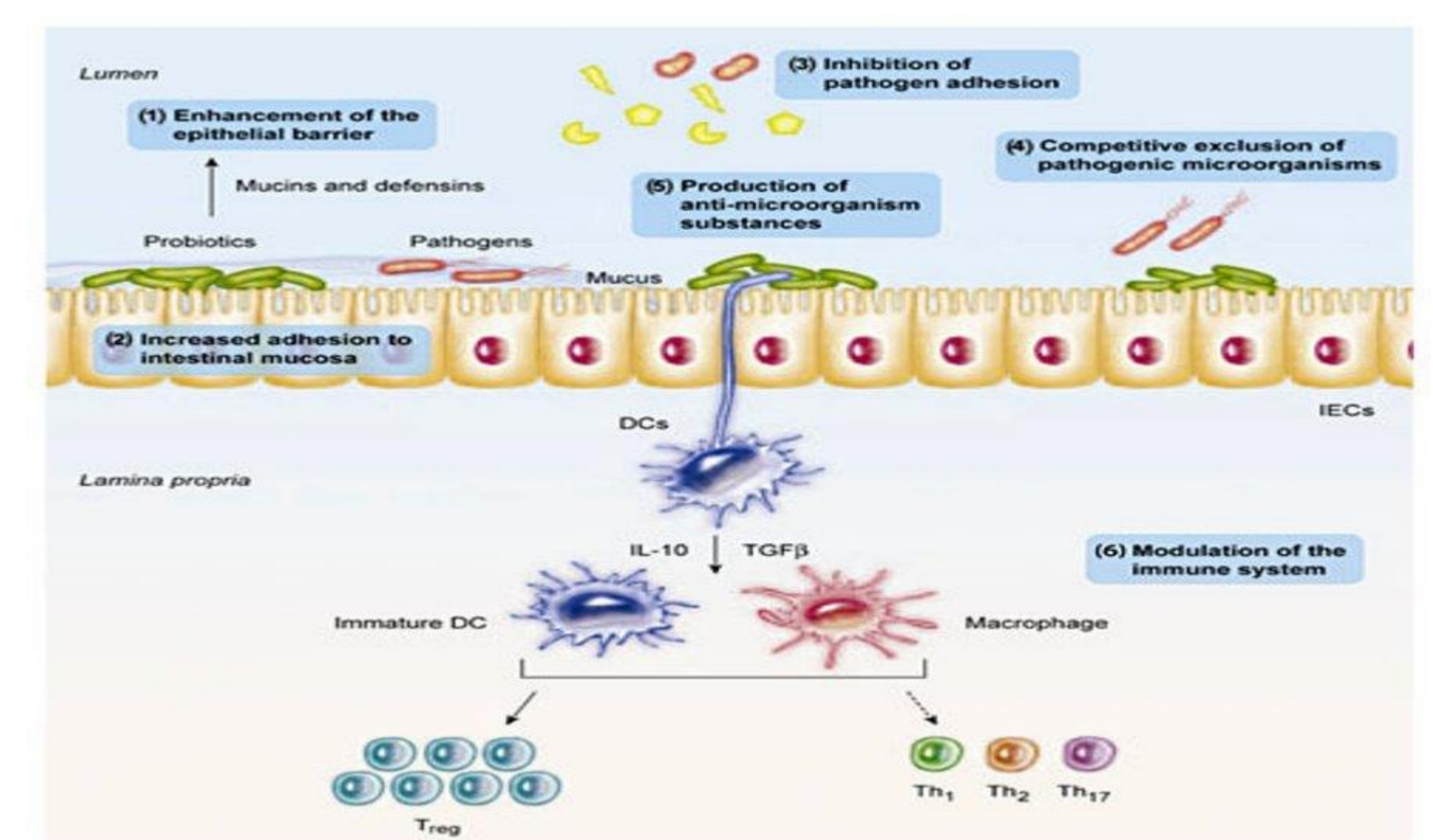


## Results

Epoch 1- 2007-2009- N=1239 Epoch 2- Jan 2012- 2014- N= 887

Demographics were comparable

## Probiotics- mechanism of action



### Risk of hospitalisation in 2 years post discharge

### Risk of GI and respiratory hospitalisation in 2 years post discharge

Characteristic	Model1- 95% CI		adjusted for GA 95% CI		Adjusted for GA, smoking and ethnicity 95% CI		Adjusted for GA, smoking and ethnicity, Mat_age, SES 95% CI		restricted for GA <=28 weeks 95% CI		restricted for GA <=28 weeks and adjusted for GA 95% CI	
	IRR	CI	IRR	CI	IRR	95% CI	IRR	95% CI	IRR	CI	IRR	95% CI
as.factor(epoch)												
Epoch I	--	--	--	--	--	--	--	--	--	--	--	--
Epoch II	0.94	0.87, 1.01	0.93	0.87, 1.01	0.92	0.86, 1.00	0.92	0.86, 0.99	0.95	0.85, 1.07	0.93	0.83, 1.03
ga			1.04	1.03, 1.05	1.04	1.03, 1.05	1.04	1.03, 1.05			1.16	1.14, 1.19
as.factor(Smoke)												
No												
Yes					1.08	0.98, 1.19	1.08	0.97, 1.19				

Characteristic	GI_Infn: Unadjusted-		GI_Infn: Adjusted for GA, smoking ethnicity, Mat_age and SES		Resp_Infn: Unadjusted-		Resp_Infn: Adjusted for GA, smoking ethnicity, Mat_age and SES	
	IRR	95% CI	IRR	95% CI	IRR	95% CI	IRR	95% CI
as.factor(epoch)								
Epoch I								
Epoch II	1.03	0.65, 1.61	0.93	0.59, 1.46	0.81	0.67, 0.98	0.83	0.68, 1.00
ga			1.02	0.95, 1.11			0.94	0.91, 0.97
as.factor(Smoke)								
No								
Yes			1.61	0.93, 2.75			1.23	0.98, 1.55
as.factor(ethnic.cat)								
Caucasian								
ATSI			3.64	2.00, 6.57			1.59	1.21, 2.06
Other			1.59	0.84, 2.88			0.86	0.65, 1.11

## Summary of results

	Epoch 1 (n)	Epoch 2 (n)	IRR (adjusted for GA, smoking, ethnicity, maternal age, SES)
Overall hospitalisation	1504	887	0.92 (0.86-0.99)
GI related hospitalisation	46	33	0.93 (0.59-1.46)
Respiratory hospitalisation	293	166	0.83 (0.68-1.00)

## Conclusion

- Probiotics in preterm neonates reduced the risk of hospitalisation in the first 2 years post discharge from NICU
- Probiotics did not reduce the risk of GI or respiratory related hospitalisation post discharge.
- ATSI have an increased risk of hospitalisation compared with Caucasian population

## Future directions

- Adds strength to the continued benefits of probiotics use in preterm infants
- Reassurance that immune mediated damage in the longterm is unlikely
- A larger study would provide further information.