

DIABETES RESEARCH

ENDIA and TRIALNET



Julianne Wilson Emma Brownrigg-ENDIA

Angela Schmidt-TRIALNET

ENDIA

Who has heard of ENDIA?

Who has referred to ENDIA?



About the ENDIA Study



EN Environmental **D** Determinants **IA:** of Islet Autoimmunity

Study is finding out what causes type 1 diabetes so we can find ways to prevent it.

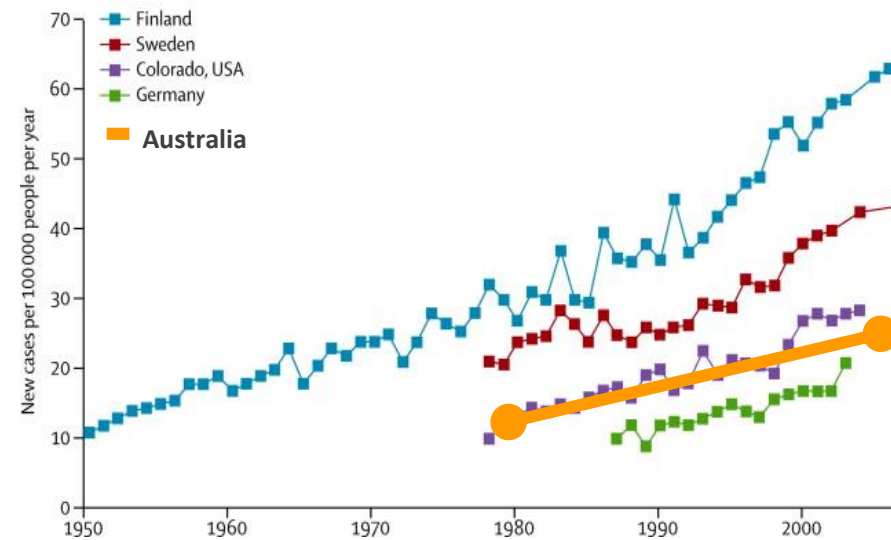


WHY do we need ENDIA?



- Incidence increasing worldwide; doubled in Australia in last 20-30 years

- 1980s: ~11 per 100,000 head of population aged 0-14 diagnosed every year
- 2006: 21.7 per 100,000 head of population (0-14 years)
- 2014: 25 per 100,000 population (0-14 years)
- Highest rate of increase seen in under 5s



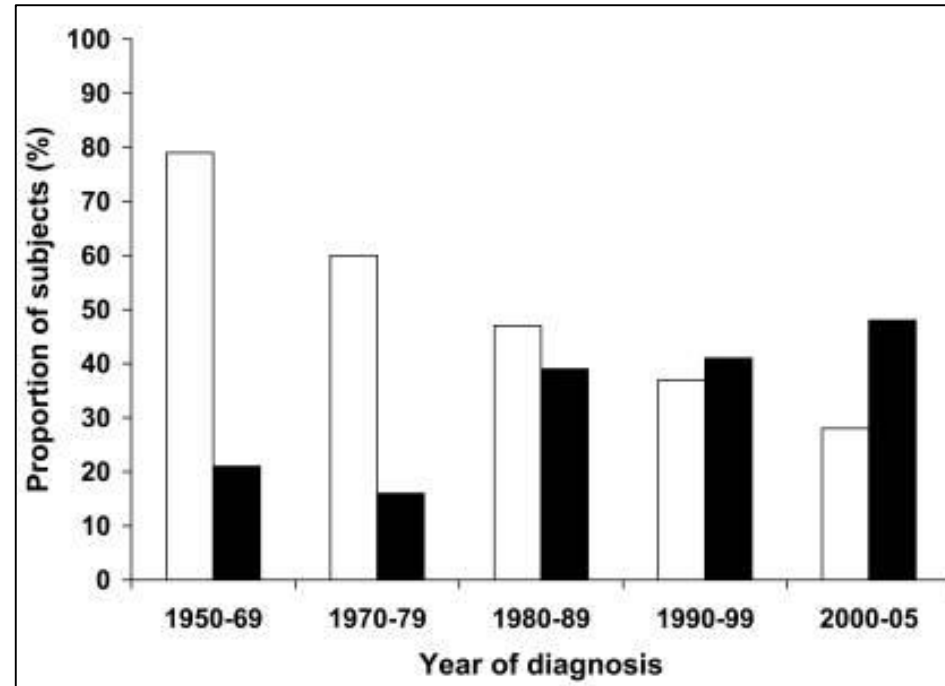
Modified from: Atkinson, *The Lancet* 2014

WHY do we need ENDIA?



□ High Risk HLA genotype combinations have decreased over time....

■ Low risk HLA genes increased overtime



Furlanos, Diabetes Care 2008

WHY do we need ENDIA?

Genetics and the development of T1D

If one identical twin have T1D the other twin has less than 40% chance of developing the disease.

If T1D was unquestionably genetic then 100% of identical twins with T1D would both develop the disease.

Around 85% of people diagnosed with T1D have no family history of the disease (JDRF, 2018)



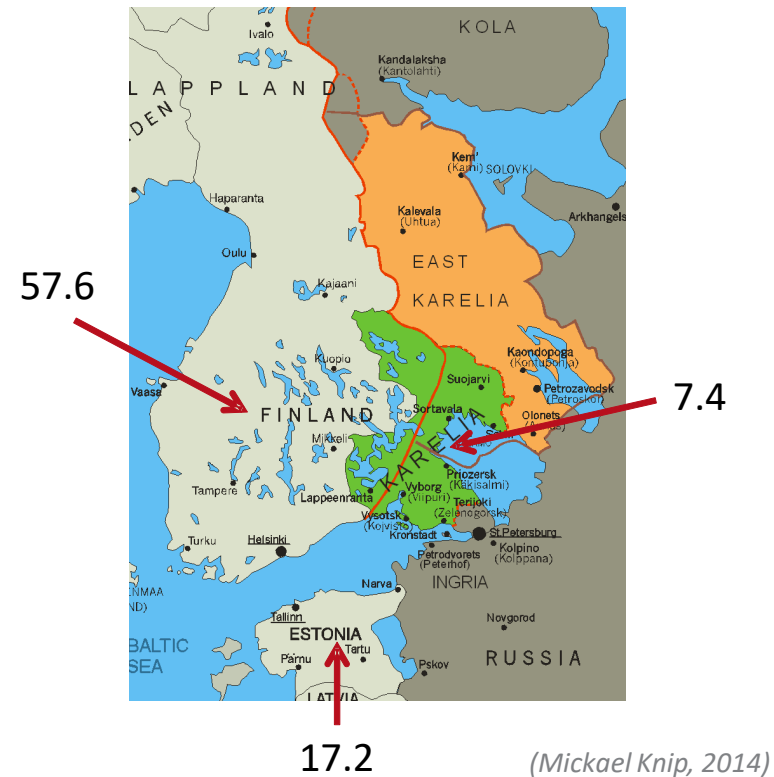
WHY do we need ENDIA?



Genetics and the development of T1D

Genetically similar populations living in different regions have different incidence rates of T1D

Cases/100,000/year (<15 years)



Environmental role

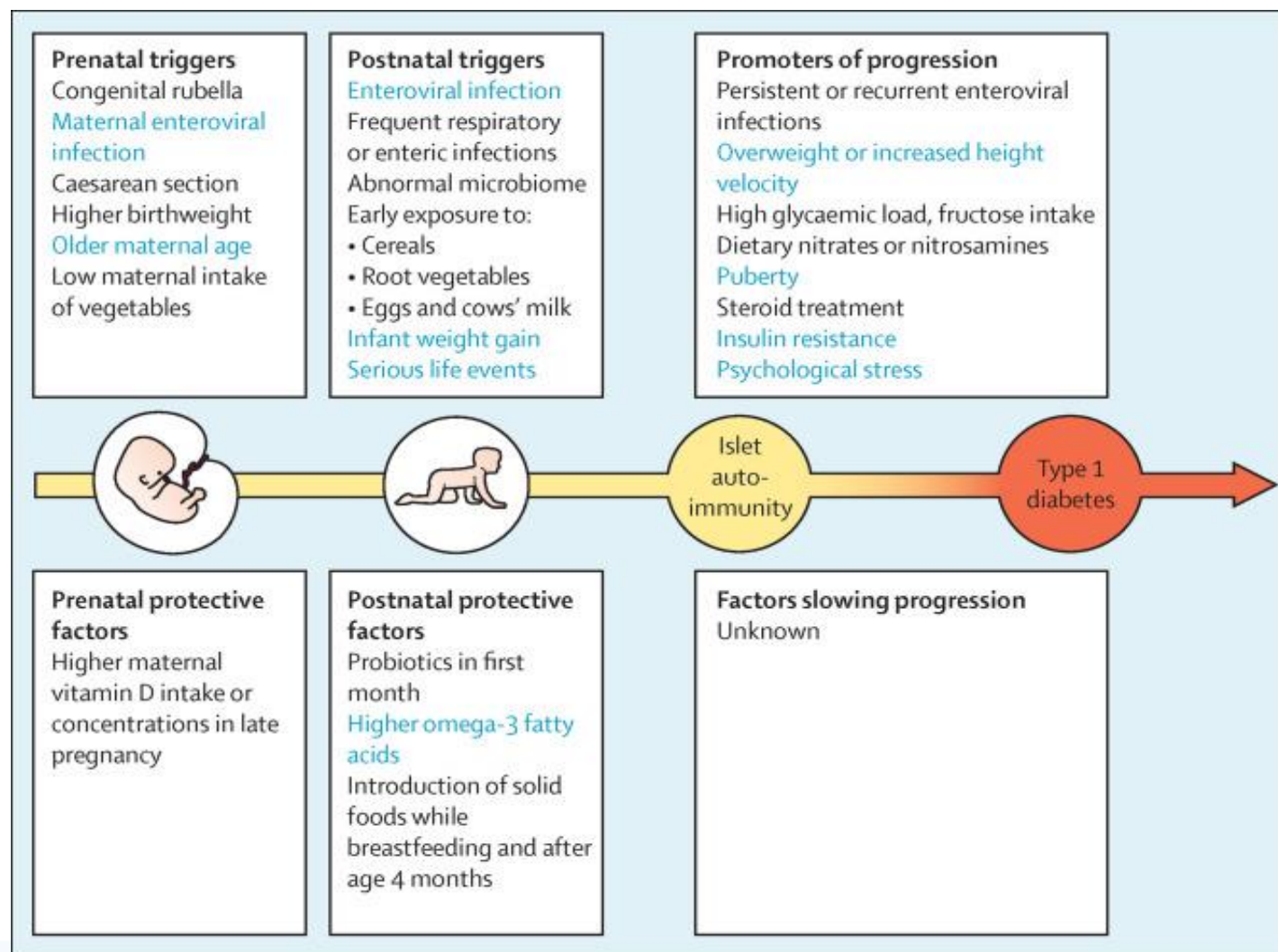


WHAT environmental factors are implicated?

- bacterial communities that live in or on our bodies,
- viral infection during pregnancy and early childhood,
- inflammation,
- environmental pollutants e.g. chemicals,
- nutrition,
- body composition.



WHAT environmental factors are implicated?



Rewers & Ludvigsson, Lancet, 387(10035), 2016

Professor Jennifer Couper-Lead Investigator

- <http://www.endia.org.au/whats-involved/>

AIMS of the ENDIA Study



ENDIA is the only prospective study to explore the environmental triggers of type 1 diabetes from **pregnancy** into childhood... in the **WORLD**

- To recruit and follow 1400 babies from the pregnancy who have a first degree relative with T1D
- To identify the environmental exposures that promote the development of T1D
- To explore how a person's genes can make different environmental exposures important
- To identify factors in the environment which may protect against T1D development

WHO can participate in ENDIA?



Who can participate?

Do you fit into one of the four categories below? If the answer is YES then your family may be eligible to participate in ENDIA – Australia's only pregnancy/birth cohort study looking at the causes of Type 1 Diabetes:

**1400 babies
required**



1

A pregnant woman with Type 1 Diabetes



2

A pregnant woman whose unborn baby's father has Type 1 Diabetes



3

Pregnant women with an existing child that has Type 1 Diabetes who will be a sibling of the expectant baby



4

A baby less than 6 months of age that has a parent or sibling with Type 1 Diabetes

WHERE is ENDIA happening?



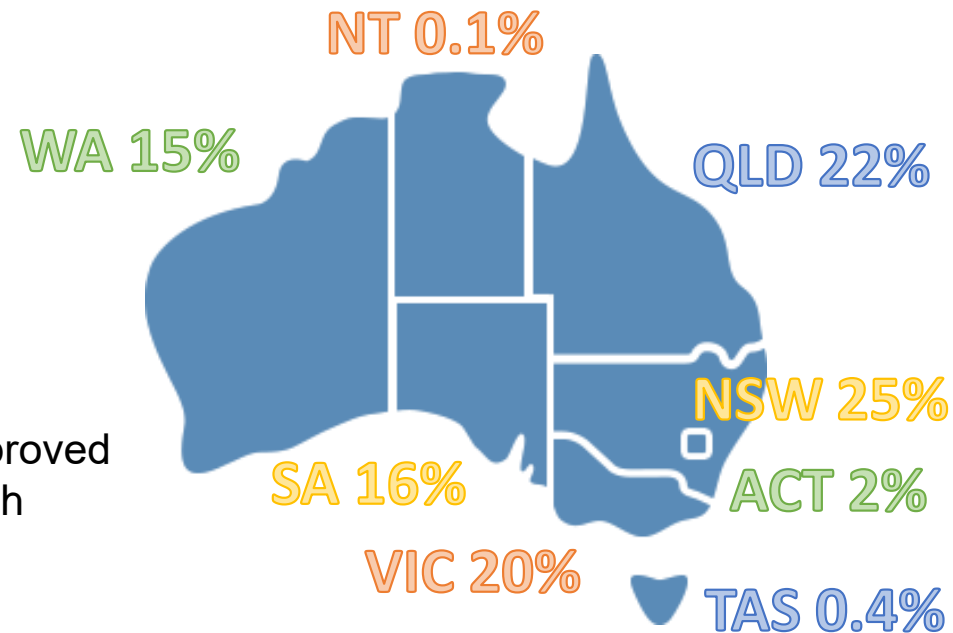
ENDIA lead sites include:

- Women's and Children's Hospital, SA
- Princess Margaret Hospital, WA
- Royal Melbourne Hospital, VIC
- Monash Health, VIC
- Barwon Health, VIC
- Children's Hospital at Westmead, NSW
- Royal Hospital for Women, NSW
- St George Hospital, NSW
- Mater Health Service, QLD

Around 30 additional 'satellite sites' approved across Australia for recruitment and birth activities.

Regional participation program (anywhere else in Australia!) where participants join from home by phone, e-mail, online apps, reply-paid post and courier.

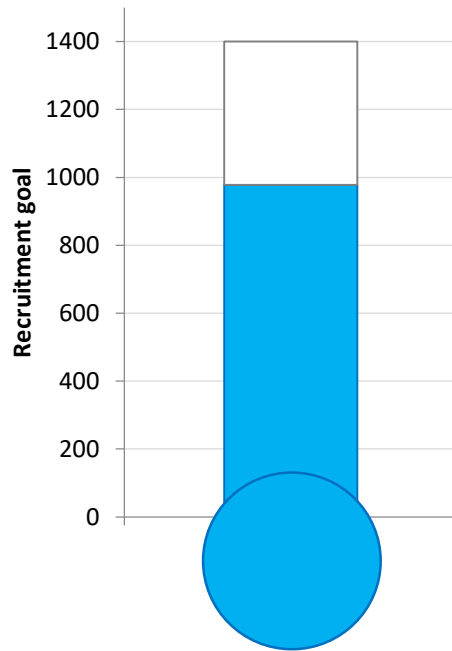
Where do our ENDIA families live?



WHERE is ENDIA happening?

Recruitment as of 5th April 2018

121 families with
2 or more
children enrolled
(5 with 3!)
14 pairs of twins



TOTAL	NSW	VIC	QLD	SA	WA	Regional
987	215	217	186	144	138	87

70%
of target



HOW families in ENDIA are being followed



HOW families in ENDIA are being followed



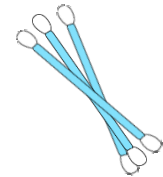
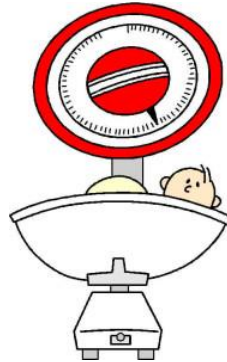
Questionnaires

*Preconception
Family demographics & medical history
Diet (pregnancy, breastfeeding & baby)
Lifestyle during pregnancy & early life
Infant health*



Assessments

*Mother & Father's BMI
Baby's weight, length/height, waist*



Samples

*Mother – Urine, Stool, Saliva, Breast milk,
Swabs (mouth, nose, skin, vagina)*

Baby – Urine, Stool, Saliva, Swabs (mouth, nose, skin)

Placenta & Cord Blood

Other family members – Saliva, Blood, Stool

Benefits of the study

- Regular Autoantibody screening
- Coeliac Screen
- FBC
- Vitamin D
- Discount with Cell Care once consented-stores cord blood
- Children in a screening/monitoring program diagnosed with T1D (ENDIA,TRIALNET) have a less severe onset and a milder clinical course.
- the incidence of ketoacidosis is less than 5% currently we are seeing up to 40%

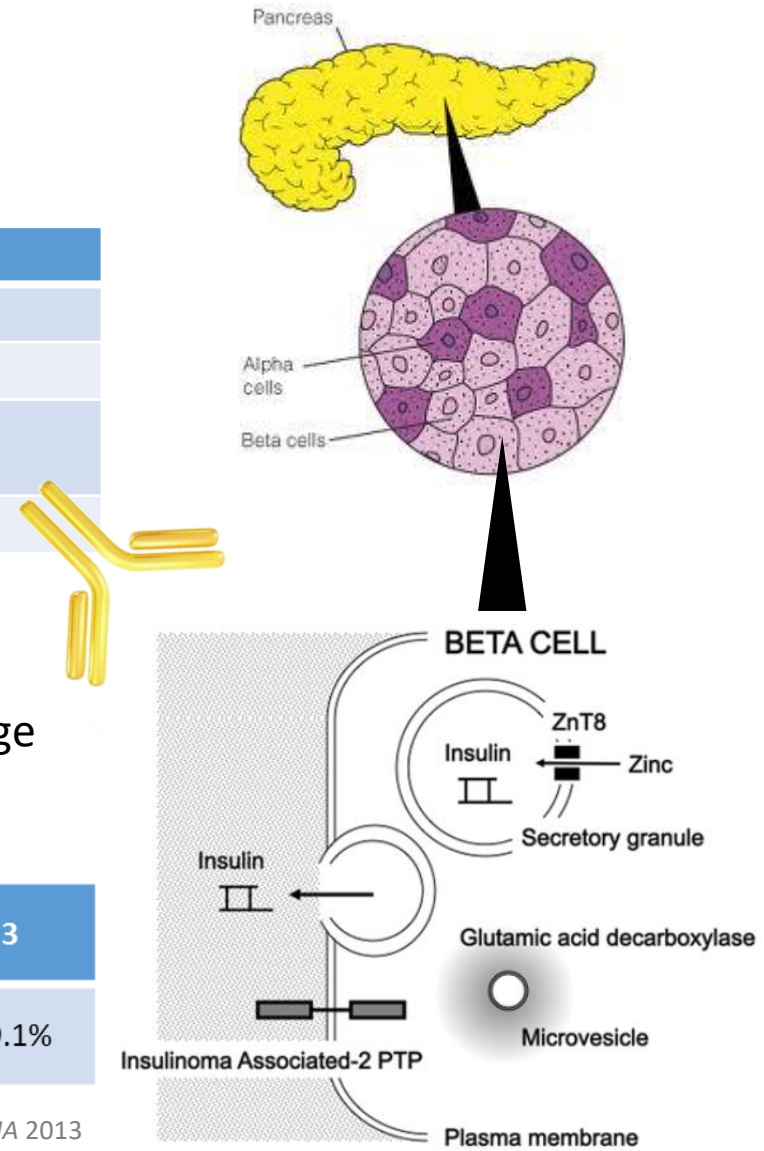
- Primary outcome: ≥ 2 detectable islet autoantibodies over two consecutive visits

Antibody Acronym	Full protein name
IAA	Insulin antibody
GADA	Glutamic acid decarboxylase antibody
IA-2A	Insulinoma associated-2 antibody (a protein tyrosine phosphatase)
ZnT8A	zinc transporter 8 antibody

- Based on Australian BabyDiab study, ~8% of participating children will develop IA with average onset at 2.2 years [Couper, *Diabetes Care* 2009]

Number of islet autoantibodies	0	1	2	3
Risk of developing T1D by 15 years	0.4%	12.7%	61.6%	79.1%

Ziegler, *JAMA* 2013



When will we have all the answers?

The **ENDIA Study** has been ongoing for over 5 years since 2013.

- The median age of children followed up is around 19 months; but we are still in recruitment phase.
- Once recruitment is complete (some time in 2019), we will be able to report on the full complement of pregnancy data around 12 months on.
- We aim to follow all participants until they reach at least 10 years of age.
- The most common age of diagnosis is around 10-14 years old.



Longer than a pregnancy,
longer than a PhD, longer
than the course of
primary school...

What have we found so far?

Microbiome (bacteria inhabiting our body)

- Stool samples in pregnancy and from baby have shown **for the first time** that mothers with T1D have different bacteria in their guts, that the baby shares, after the first year of their life (compared to mums without T1D)

Virome (viruses co-inhabiting our body)

- stool samples in pregnancy and from the baby show that **for the first time** mothers with T1D have different types of viruses and these are transmitted to the baby (compared to mums without T1D).



Children of mums with T1D have the lowest risk (2%) of getting diabetes, so are these gut bacteria and viruses in some way beneficial for the baby??

Resources/referral

website:www.endia.org.au

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Julianne Wilson and Emma Brownrigg

Make it a family affair.

Get screened for risk of type 1 diabetes today.



[Learn More >>](#)

**Type 1
Diabetes
TrialNet**

TrialNet

Who has heard of TrialNet?

Who has referred to Trial Net?

What is TrialNet?

Type 1 Diabetes **TrialNet** is an international group of researchers who are exploring ways to prevent, delay and reverse the progression of type 1 diabetes

TN01 Pathway to Prevention Study

- What causes type 1 diabetes and what might predict the development of the disease?
- Provides close monitoring to individuals "at risk" for developing type 1 diabetes
- Clinic visits located at Mater Campus, South Brisbane
- Remote screening offered state-wide.
- Individuals at greater risk may be offered an opportunity to participate in a prevention study

TN01 Pathway to Prevention – Screening

Two parts:

Screening – involves a blood test for diabetes related autoantibodies. If negative, participants can be screened annually until 18yrs. Once 18, if ab negative, considered ‘low risk’ for life

Monitoring – if ab positive at screening, pt offered participation in monitoring phase. Baseline visit (OGTT) conducted to determine how regularly participant will be followed up

Make it a family

affair.

Get screened for
risk of type 1 diabetes
today.



[Learn More >>](#)

Type 1 Diabetes TrialNet

TrialNet QLD Study Co-Ordinator

Angela Schmidt: Study Co-Ordinator

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The 2018 ENDIA Team THANK YOU for your time.....





ENDIA



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www.endia.org.au

Participating Researchers:



Supported by:

