

**Supplemental material**

**Table. Summary of Australian and Belgian studies of developmental outcomes associated with different neonatal TSH screening values.**

Study/ location	Lain et al., New South Wales, Australia		Trumpff et al., Belgium <sup>1, 2</sup>	
<b>Sample size/ years</b>	354,137 children born 1994-2002 and evaluated in 2008-2010 at grades 3, 5, 7, or 9	149,569 children born 2002-2008	284 children randomly selected from 88,741 born 2008-2010	311 children randomly selected from 88,741 born 2008-2010
<b>Exclusions</b>	Excluding very low birth weight infants (<1500 g) Sensitivity analysis: excludes preterm infants with Apgar score <7	Excluding very low birth weight infants (<1500 g)	Excluding children with low birth weight (<2500 g) or preterm (<37 weeks) or with congenital hypothyroidism or neurological diseases	
<b>Sample size calculation/ statistical power</b>	Population-based		315 children to detect correlation factor between TSH and IQ of 0.2; 19 newborns selected for each TSH/ gender stratum taking into account 20% drop-out (final sample size should have 15 girls and 15 boys in each TSH group)	
<b>Exposure measure</b>	Collected: day 2-4 (day of birth = day 0) TSH percentiles: 0 to <25th, 25th to <50th, 50th to <75th, 75th to <85th, 85th to <90th, 90th to <95th, 95th to <98th, 98th to <99.5th, 99.5th to <99.90th, 99.90th to <99.95th, and >99.95 <sup>th</sup>	Collected: day 2-4 (day of birth = day 0) TSH percentiles: 0 to <25th, 25th to <50th, 50th to <75th, 75th to <85th, 85th to <90th, 90th to <95th, 95th to <98th, 98th to <99.5th, 99.5th to <99.90th, 99.90th to <99.95th, and >99.95 <sup>th</sup>	Collected between 3-5 days after birth Stratified by gender and TSH interval (0.45–1 mIU/L, 1–2 mIU/L, 2–3 mIU/L, 3–4 mIU/L, 4–5 mIU/L, 5–6 mIU/L, 6–7 mIU/L, 7–8 mIU/L, 8–9 mIU/L and 9–15 mIU/L)	
<b>Outcome measures</b>	National School assessment: School NAPLAN test scores of reading and numeracy below national minimum standard	Teachers collect Early Development Instrument in 1st year school: 5 developmental domains: physical health and wellbeing, social competence, emotional maturity, language and cognitive skill, and communication skills and general knowledge. High-risk children were classified as vulnerable (bottom 10%) on 2 domains. Also assessment of special needs	Gross motor coordination using French version of the Charlop-Atwell Scale of Motor Coordination	Collected at child's home by psychiatrists blinded to TSH levels Weschler Preschool and Primary School Scale of Intelligence (Full Scale IQ, Performance IQ, Verbal IQ)

<b>Age at outcome</b>	age 7-9 years (36 %); 9-11 years (28%), 11-13 years (22%), 13-15 years (14%)	4-6 years in 2009 or 2012; median age 5 years	4-6 years (75% were 4 years; 22% 5 years old)	
<b>Lost to follow-up</b>	Linked to children at government schools (about 70% of schools in NSW) 3% absent or withdrew from test	Linked to 95% of children with developmental record in 2009 and 2012	In top 3 TSH stratum small sample size: TSH 8: 9 boys, 3 girls TSH 9: 6 boys, 7 girls TSH 10-15: 5 boys, 4 girls*	In top 3 TSH stratum small sample size: TSH 8: 10 boys, 4 girls TSH 9: 6 boys, 8 girls TSH 10-15: 7 boys, 4 girls*
<b>Covariates</b>	Collected from linked routinely collected birth data: Gestational age, maternal smoking, maternal age, maternal country of birth, gender, 5 min Apgar score, mode of delivery, gestational or maternal diabetes, parity, non-English speaking background, parental education, parental occupation, socioeconomic status at birth Age at NAPLAN test, NAPLAN year, and clustering of students within schools.	Collected from linked routinely collected birth data: Same as above Age at AEDC test, AEDC year, and clustering of students within schools.	Collected at home visit and questionnaire completed by mother: Gender, parity, age at test, height at test <i>Not significant:</i> number of miscarriages, 5 min Apgar, health problems at birth, neonatal hospital attendance, breast feeding, child food allergy, child dietary supplement intake, child's negative life events, previous cognitive assessment, school attendance, child custody, child's fish and milk consumption, rural or urban residency, type of delivery, Graves' disease or Hashimoto's thyroiditis during pregnancy, hypothyroidism during pregnancy, gestational diabetes, mother's social support, score of psychological distress and vitality index score	Collected at home visit and questionnaire completed by mother: Gender, monthly income, mother's education level, child dietary supplement, vitality index, household salt, home language, school language, mother's social support, parity <i>Not significant:</i> number of miscarriages, 5 min Apgar, health problems at birth, neonatal hospital attendance, breast feeding, child food allergy, child dietary supplement intake, child's negative life events, previous cognitive assessment, school attendance, child custody, child's fish and milk consumption, rural or urban residency, type of delivery, Graves' disease or Hashimoto's thyroiditis during pregnancy, hypothyroidism during pregnancy, gestational diabetes, score of psychological distress and vitality index score
<b>Results</b>	Higher risk of poorer numeracy performance from 85th percentile To <99.95.  -Children with TSH between the 99.5th and 99.90th percentile (< screening cutoff, values ranging from 9-14 mIU/L depending on the year of collection) have higher risk of:		- Neonatal TSH concentration was not associated with Full Scale and Performance IQ scores in children. - Lower Verbal IQ scores were found in children with neonatal TSH values comprised between 10–15 mIU/L compared to lower TSH levels in univariate analysis but these results did not hold when adjusting for confounding factors. - No significant association between TSH levels measured after birth and	

	<p>-Poor numeracy performance (aOR, 1.57, 1.29–1.90),          -Special needs (aOR, 1.68, 95% CI 1.23–2.30),          -Being developmentally high risk (aOR 1.52, 1.20–1.93).</p> <p>-TSH &gt;= 99.95th percentile (screened and treated in case of CH): Have similar results to infants with TSH &lt; 75th percentile for educational and developmental outcomes.</p>		psychomotor score measured at preschool age.	
<b>Strengths &amp; limits</b>	<p><b>Strengths</b>          Population based record linkage study. Representative sample.</p>	<p><b>Limits</b>          Questionnaires completed by the teacher VS clinically-based diagnostic tools.</p>	<p><b>Strengths</b>          -clinically-based diagnostic tools          -Assessment by blinded psychologist          -Sample size calculation &amp; Stratification          -Testing before entering primary school</p>	<p><b>Limits</b>          -Retrospective design          -Self-report covariates.          -73 % of the mothers had high education level (university degree or higher)          - Few subject in the interval 9-15 mU/L</p>
<b>Sample characteristics which may impact results</b>	<p><b>Population iodine status</b>          Mildly iodine deficient (6.5% of infants had TSH &gt;5);</p> <p><b>Exclusion of neurological diseases</b>          Included children with congenital anomalies</p> <p><b>SES of the population included</b>          Low SES, children included attended government school.</p>		<p><b>Population iodine status</b>          TSH: iodine sufficiency, with 2,6-3.3 % of infants had TSH &gt;5 for year 2009-2011(Vandevijvere et al. 2012a)          UIC: sufficient in mildly deficient pregnant women and iodine sufficiency in preschool children (year 2010-2011)(Vandevijvere et al. 2013; Vandevijvere et al. 2012b)</p> <p><b>Exclusion of neurological diseases</b>          Yes, parents were asked before the inclusion, medical record were checked</p> <p><b>SES of the population included</b>          87% had income &gt;2000 euros per month (high SES).          76% of the mothers have a university degree.</p>	

\*Manuscript does not state whether more children in top TSH groups were randomly selected but refused to participate or not randomly selected and asked to be part of study