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Prevention of recurrent respiratory tract infections in children with Down syndrome:

What could potentially be gained?

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Background

- Children with DS have
  - delayed development
  - frequently RRTI*
- In practice, parents and clinicians see the impact of RRTI on development
- Evidence: 2-year-olds with DS and recurrent lung and airway disease have delayed development[1]

* RRTI = Recurrent Respiratory Tract Infections

[1] Van Trotsenburg AS, Heymans HS, Tijssen JG, et al. Comorbidity, hospitalization, and medication use and their influence on mental and motor development of young infants with Down syndrome.Pediatrics. 2006;118:1633-9.


Aim of this study

- To investigate the effect of RRTI in 8-year-old children with DS on
  - developmental status
  - behavioural problems
  - health related quality of life (HRQoL)


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Methods

- Dutch population-based sample, born in 1992-1994
  - 337 children (52,0% boys)
  - Calendar age: 8.1 years (SD=0.15)
  - Developmental age: 3.9 years (SD=0.87)

- Parents were asked: "*Does your child suffer from chronic airway infections (i.e., often severe common colds or bronchitis)?*"
- Children were divided into:
  - children with RRTI (n=149, 46%)
  - children without RRTI (n=176)


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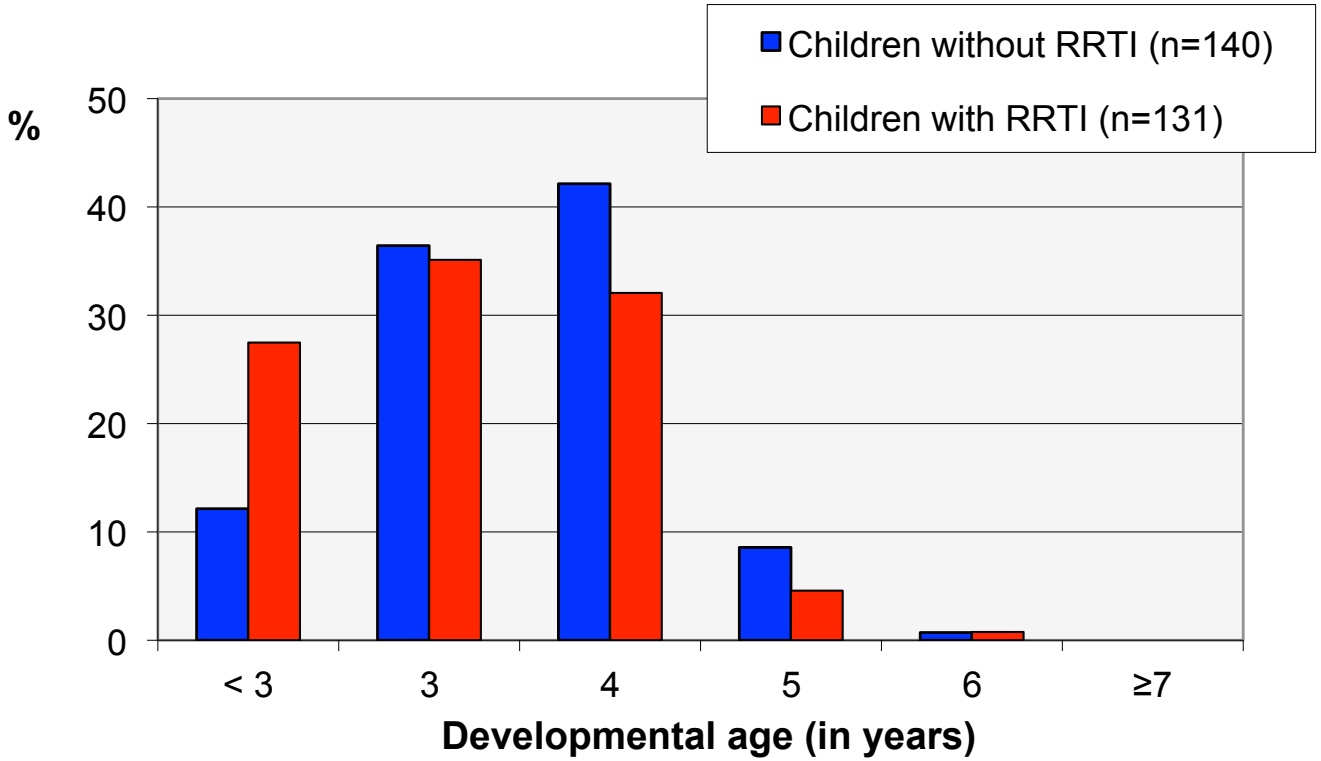
Methods

- Measurements:
  - McCarthy Scales of Children's Abilities (MSCA)
  - Child Behavior Checklist (CBCL)
  - TNO-AZL Children's Quality of Life questionnaire (TACQOL)
- Linear regression analyses and hierarchical regression analyses, adjusted for the effect of background, gender, and co-morbidity


Developmental age



- Mean developmental age:
  - RRTI- 4.0 years (SD=0.80)
  - RRTI+ 3.7 years (SD=0.91)

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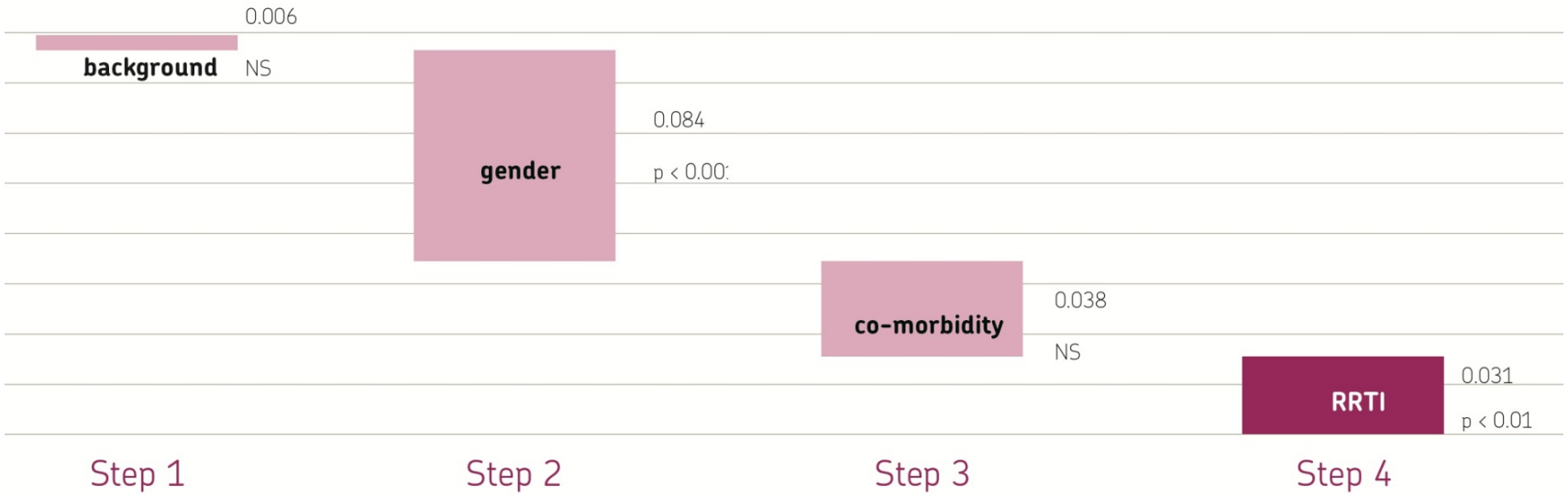
Developmental age – hierarchical regression analysis



Step 1		Step 2		Step 3		Step 4	
Background	NS	Gender	p<0.001	Co-morbidity	NS	RRTI	p<0.01
$\Delta R^2 = 0.006$		$\Delta R^2 = 0.084$		$\Delta R^2 = 0.038$		$\Delta R^2 = 0.031$	
SES	NS	Male gender	p<0.001	Cong. heart disease	NS	RRTI	p<0.01
Childcare	NS			Asthma	NS		
Breastfeeding	NS			Gastro-int. disease	NS		
Siblings	NS			Eye disease	NS		
				Impaired hearing	NS		
				Thyroid disease	NS		

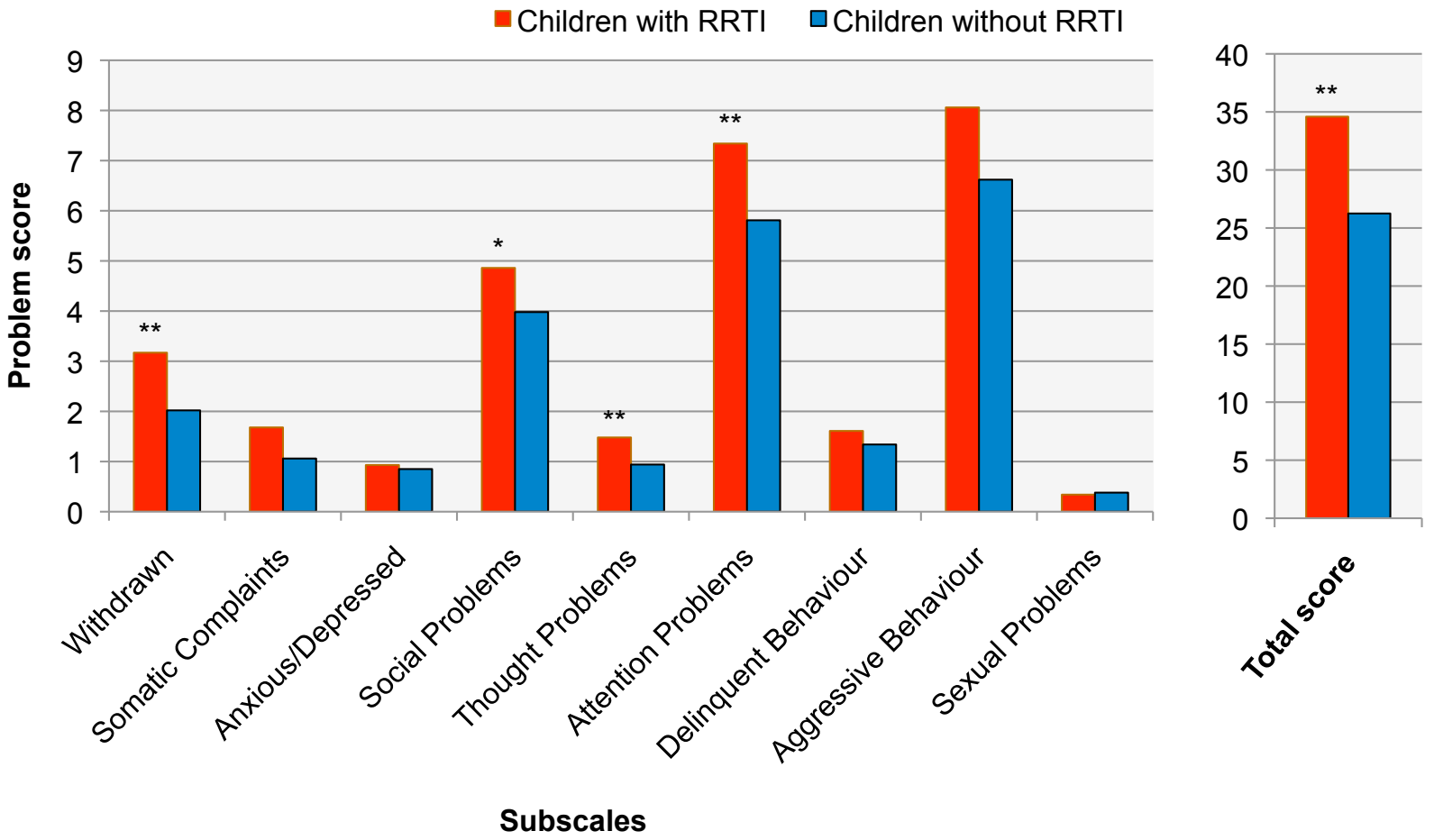

Development

- Children with RRTI have lower mean scale scores on all domains

Subscale	Regression coefficient (β)	Effect size (f^2)
Verbal	-7.33**	0.04
Perceptual-Performance	-5.67**	0.03
Quantitative	-2.61**	0.04
Memory	-3.12**	0.04
Motor	-4.63**	0.04
General cognitive score	-15.59**	0.04

*p<0.05, **p<0.01, ***p<0.001
β = unstandardized regression coefficient of the effect of RRTI
small effect: f^2=0.01-0.10, moderate effect: f^2=0.10-0.33, large effect: f^2>0.33

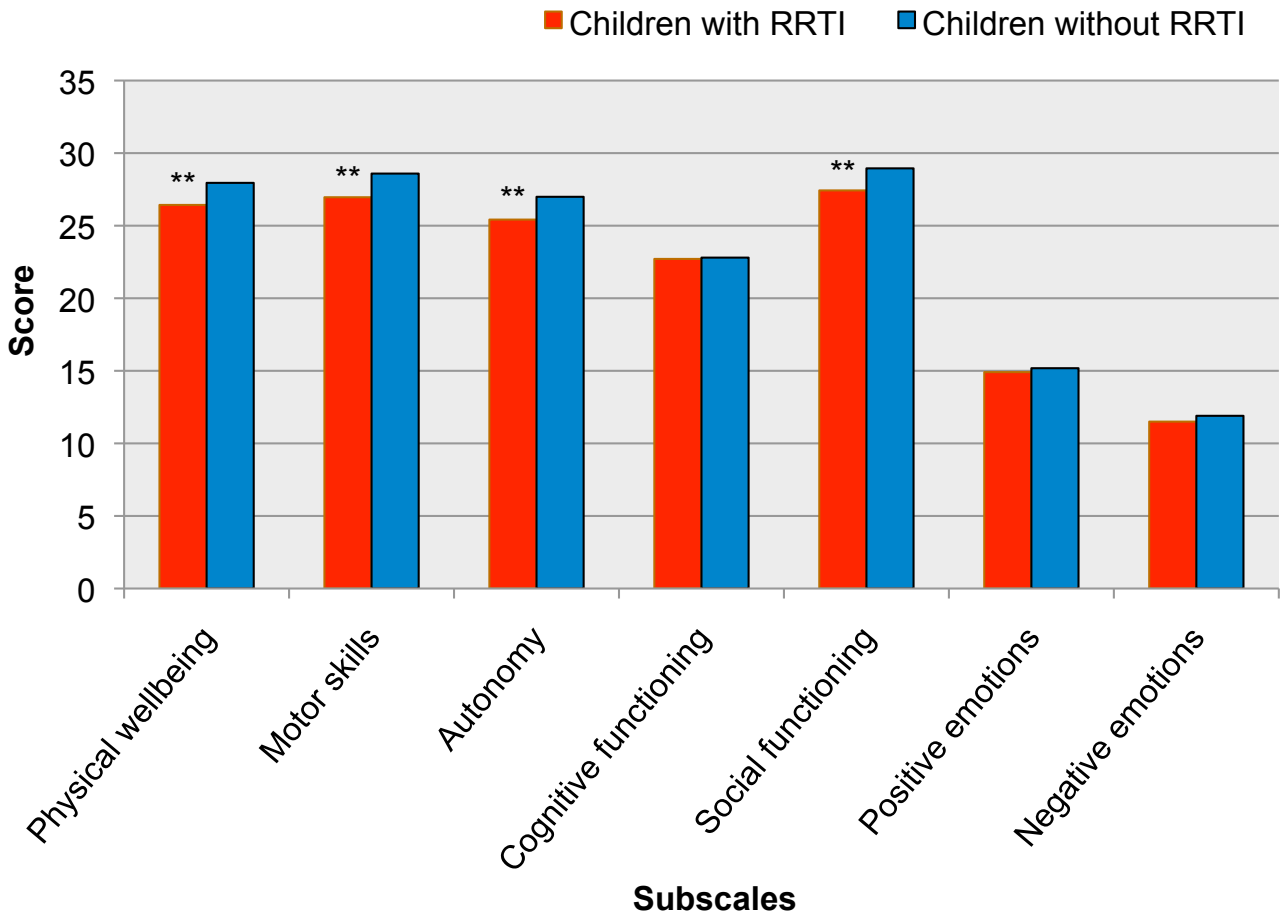
Emotional and behavioural problems



*p<0.05, **p<0.01, ***p<0.001

- Higher scores represent increased behavioural problems

Health-related Quality of Life (HRQoL)



*p<0.05, **p<0.01, ***p<0.001

- Higher scores represent better HRQoL


Conclusions and implications

- RRTI have significant impact in 8-year-old children with DS:
  - On average development is delayed more than 4 months
  - More behavioural problems
  - Lower HRQoL

- If RRTI could be prevented, improved care could stimulate development, prevent behavioural problems, and improve HRQoL

Thanks

- All parents and patients
- Dutch Down syndrome Foundation
- My colleagues at TNO and Jeroen Bosch Hospital

Reference:

- Van Gameren-Oosterom HBM, Fekkes M, Buitendijk SE, Mohangoo AD, Bruil J, et al. (2011) Development, Problem Behavior, and Quality of Life in a Population Based Sample of Eight-Year-Old Children with Down Syndrome. PLoS ONE 6(7): e21879. doi:10.1371/journal.pone.0021879