Outcome after childhood stroke

Burden of disease for children and their families

Maja Steinlin

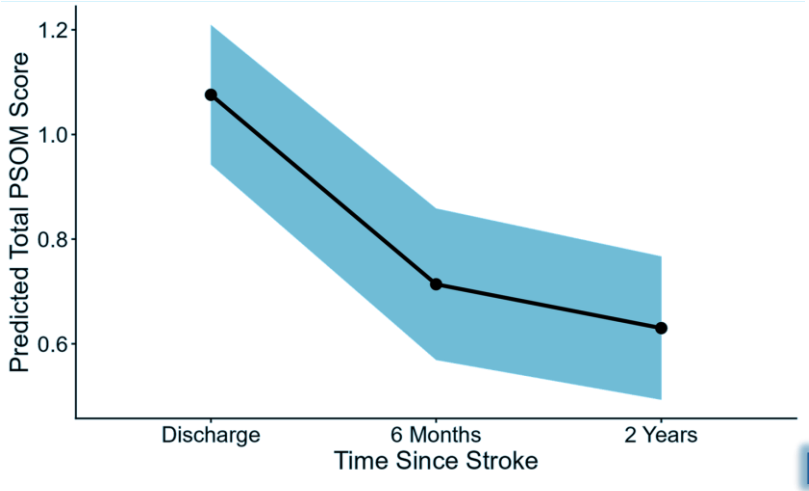
University Children's Hospital Bern

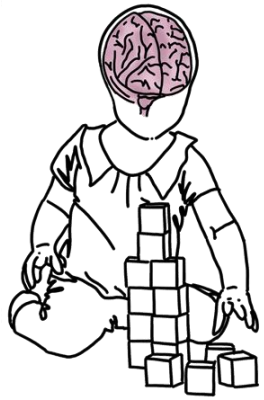
Switzerland

Little folks - little strokes?

SNPSR 2 years after stroke

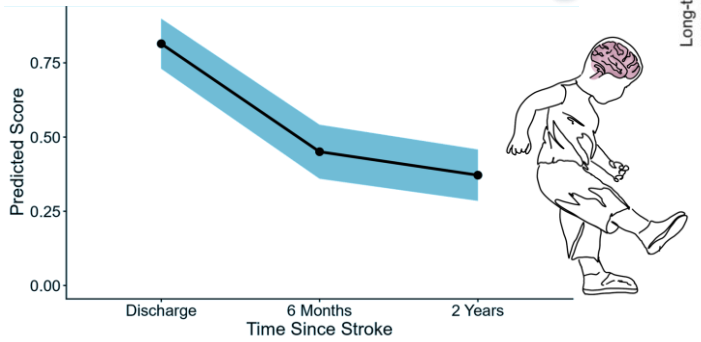
Total PSOM recovery





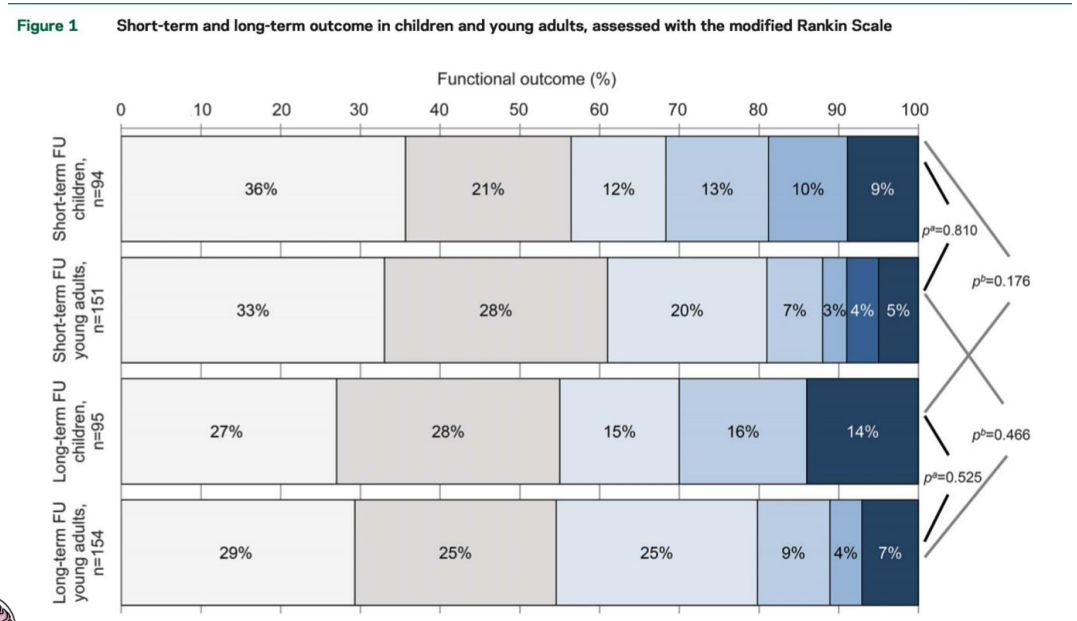
Mainly driven by motor recovery

Motor PSOM recovery



Salzman, in preparation

Children versus young adults

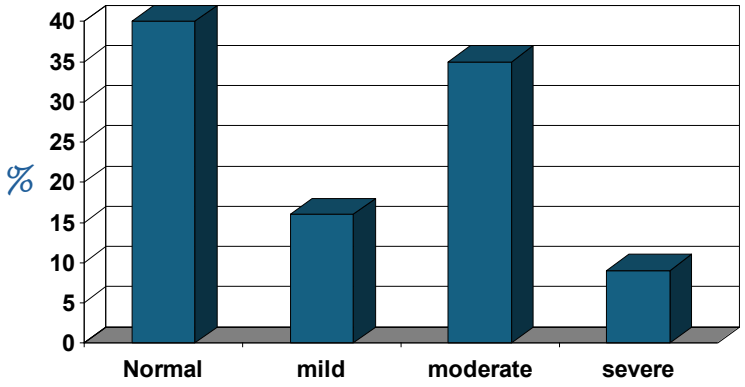


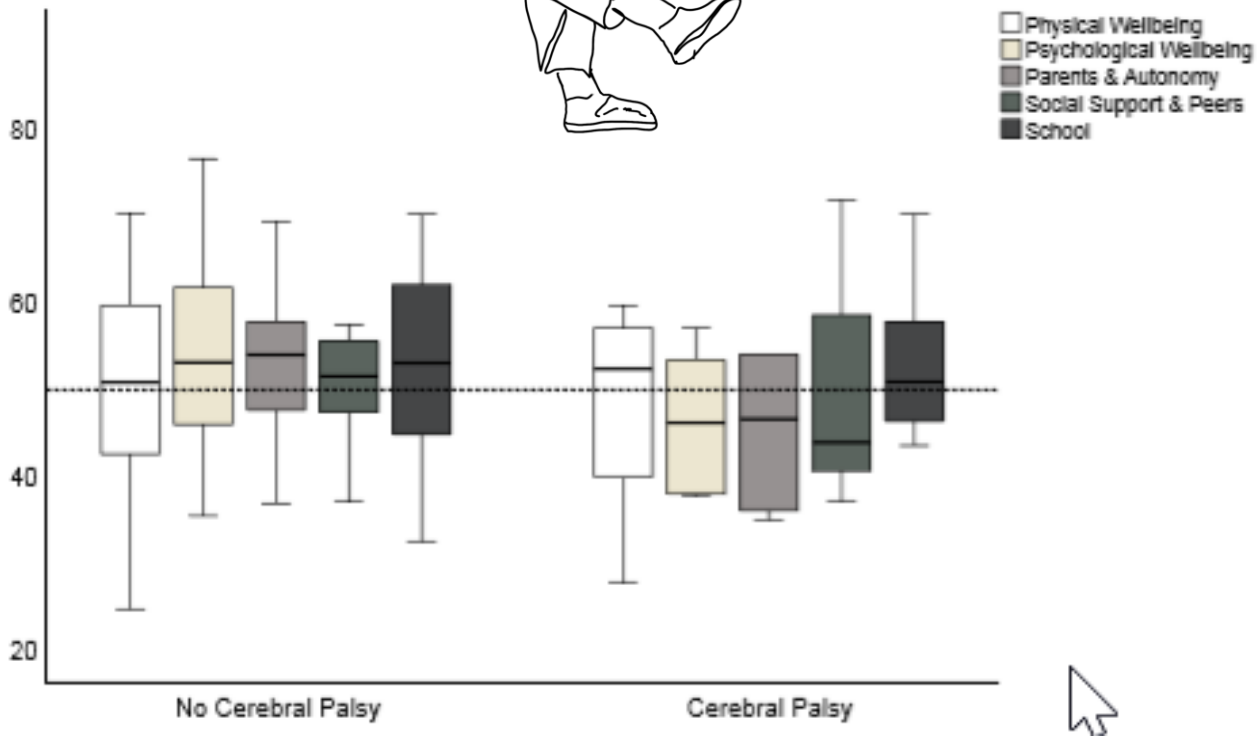
Goeggel et al, Neurology, 2015

Motor handicaps interfere with social well being

SNPSR 2 years after stroke

Neurologic sequelae (2 years)
(hemiparesis)





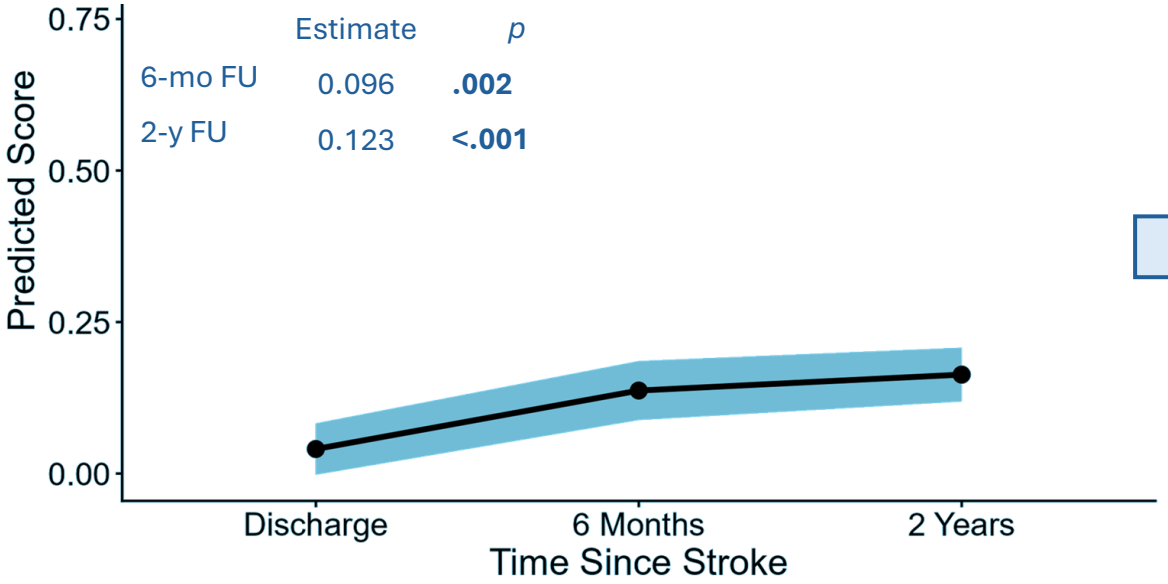
Studer et al, Neurology 2014

Teuscher et al, EJPN 2019

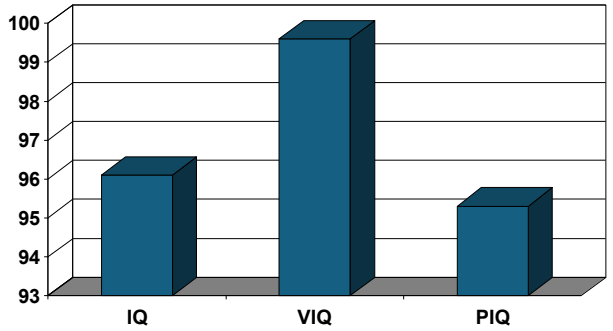
Neurocognition after stroke

SNPSR – 2 years after stroke

Cognitive / behaviour outcome



Neurocognitive outcome (2 years)



Δ p= 0.121

χ^2-test

0.037**

growing into deficit!!

co - problems as epilepy, OSAS

Most affectied:

Processing speed

Auditive and short term memory

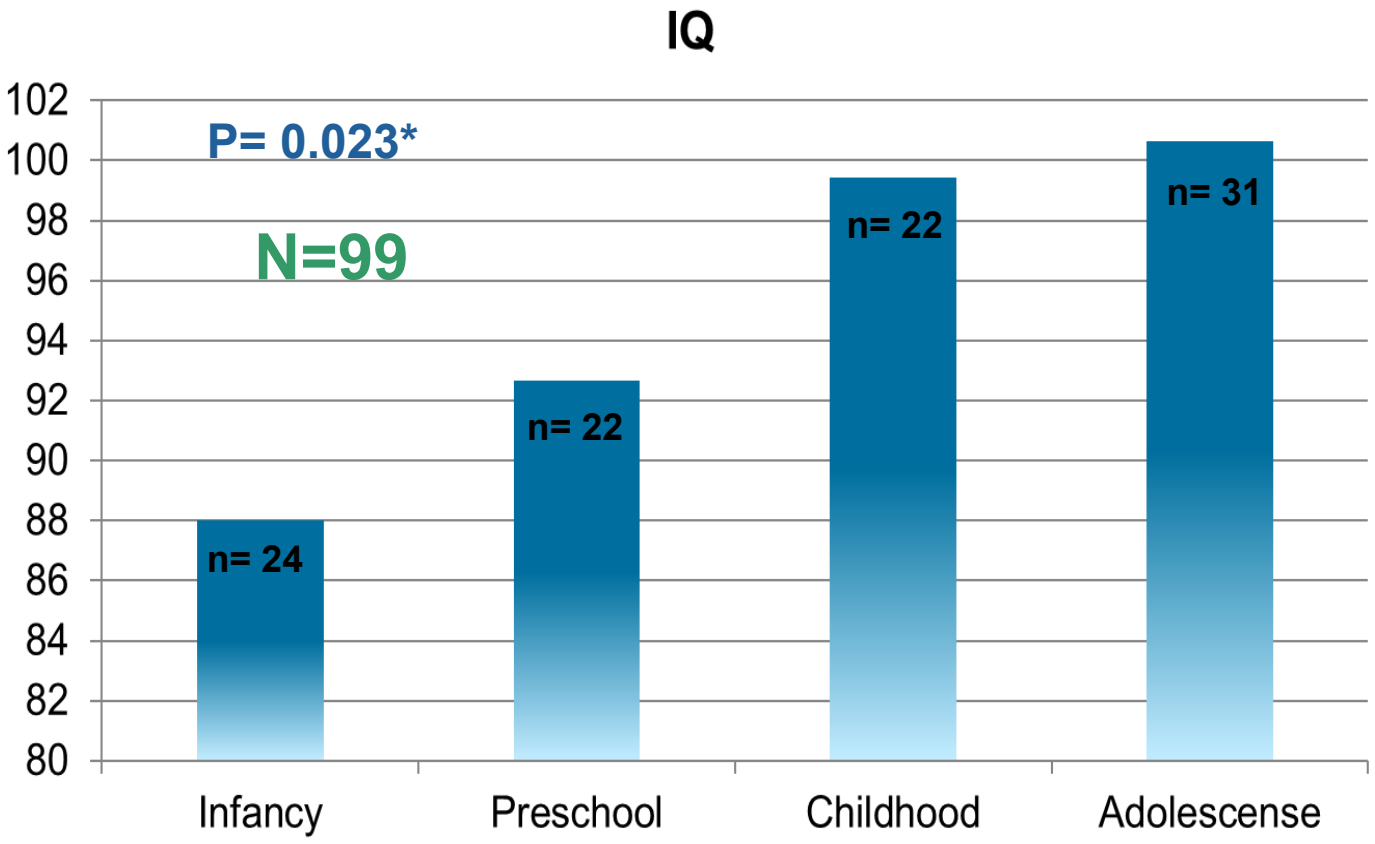
Visuospatial abilities

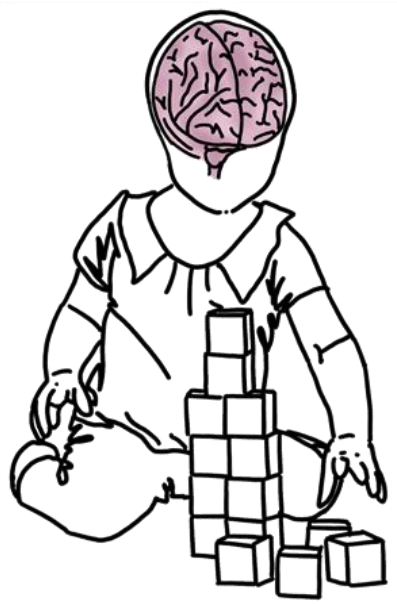
Salzman, in preparation

Studer et al, Neurology 2014, Westmacott et al Stroke 2009, Slin et al EJPN 2020

Little folks - little strokes?

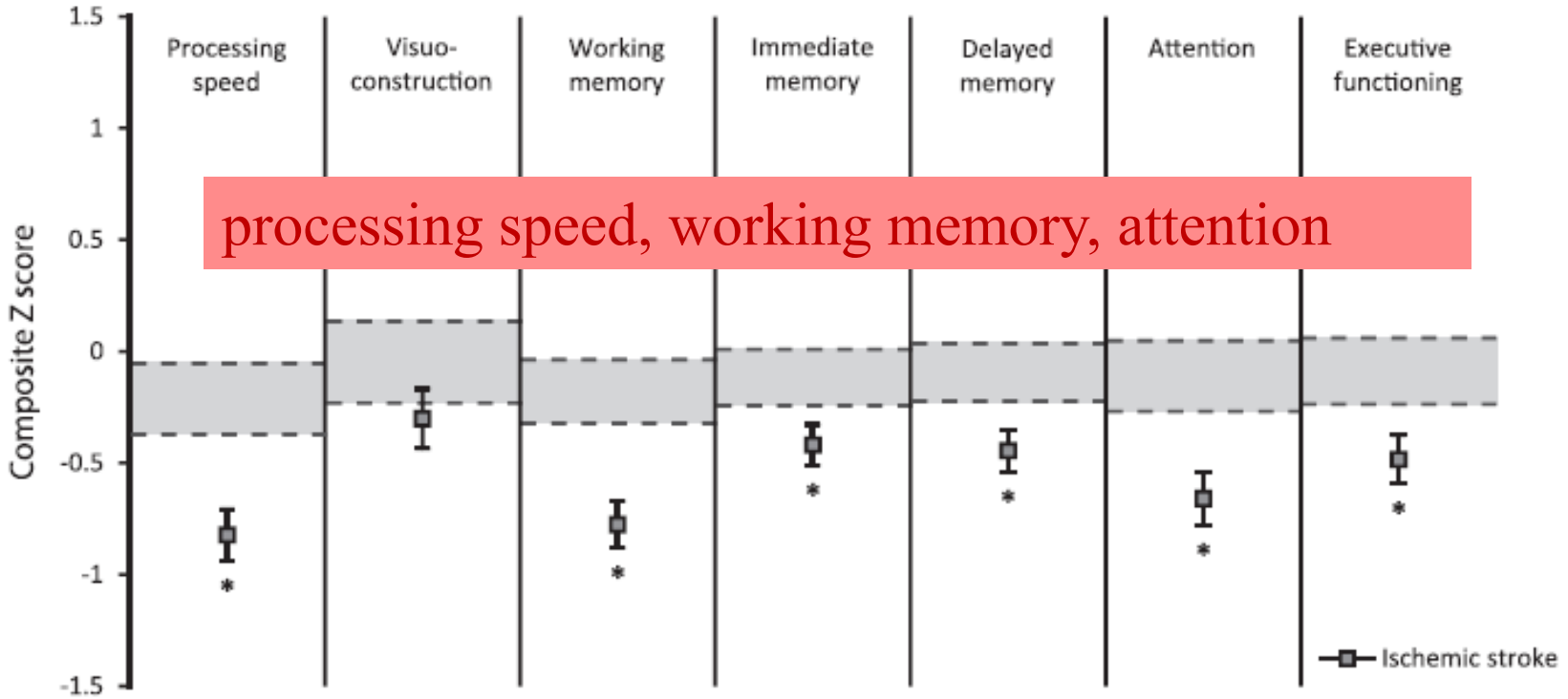
SNPSR 2 years after stroke





Studer , Neurology 2014; Scott 2013, Westmacott 2009

Young stroke and cognitive outcome



Longer follow up

↓immediate and delayed memory and executive functions

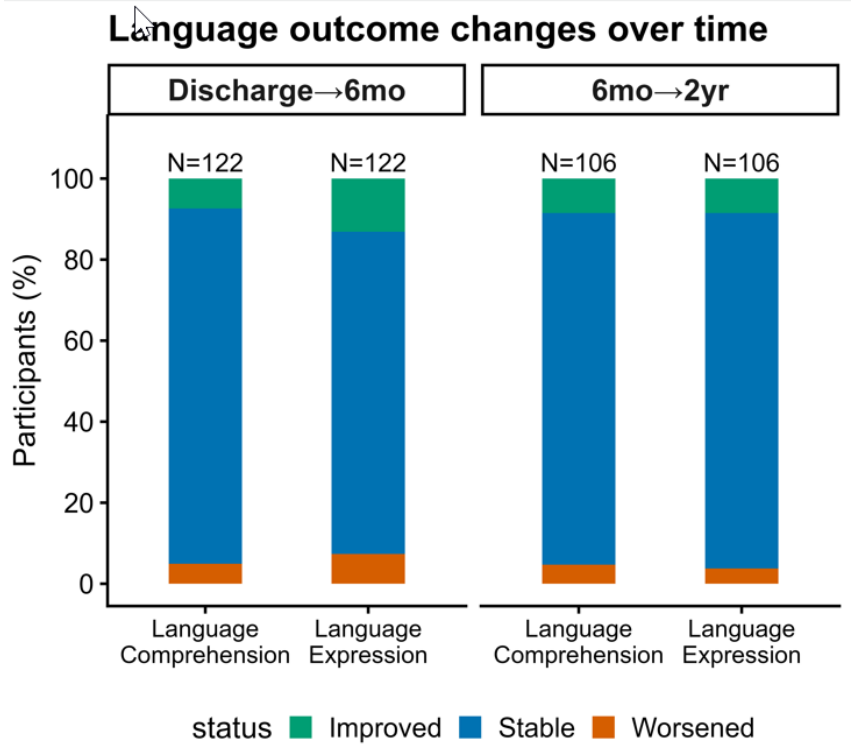
Schaapsmeerders et al Stroke 2013

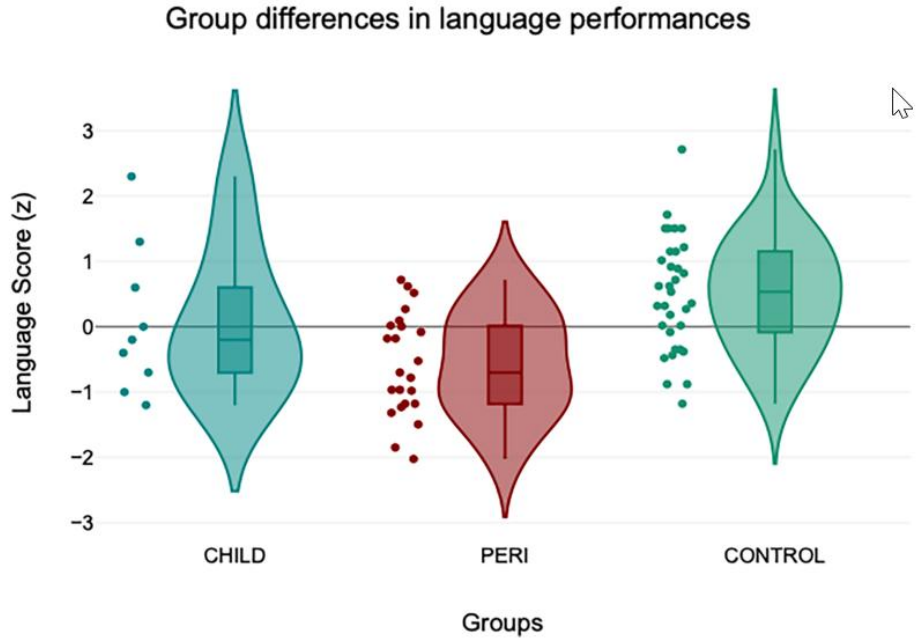
Language after stroke

Dysphasia
Aphasia

40-50%

Recovering
in acute phase

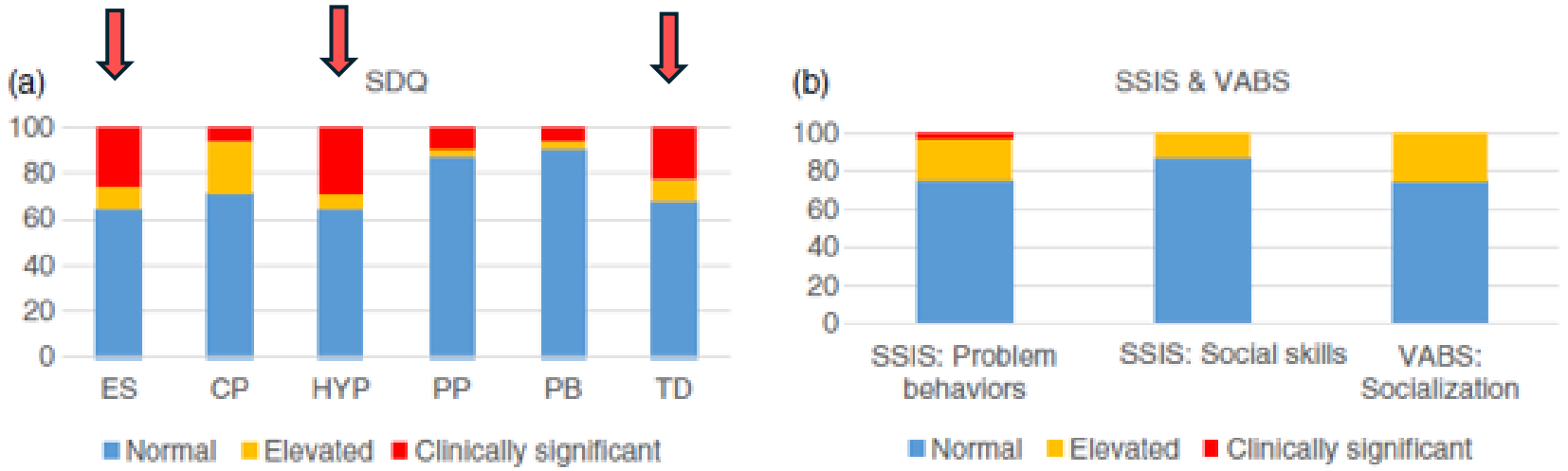




Steinlin and Mackay, Int J Stroke 2015

Frontiers in Paediatrics, Heimgärtner et al 2024

Psychosocial skills after childhood stroke



ES emotional problems
CP conduct problems
Hyp hyperactivity problems
PP peer problems
PB procsocial problems

Affecting family > school life

Greenham et al, Dev Med Child Neurol 2017

Fatigue in childhood stroke

Present in 80%

More pronounced when depression or anxiety

Negative effect on:
socialisaton
social skills
participation with peers

Table 3 Association between fatigue and cognitive impairment

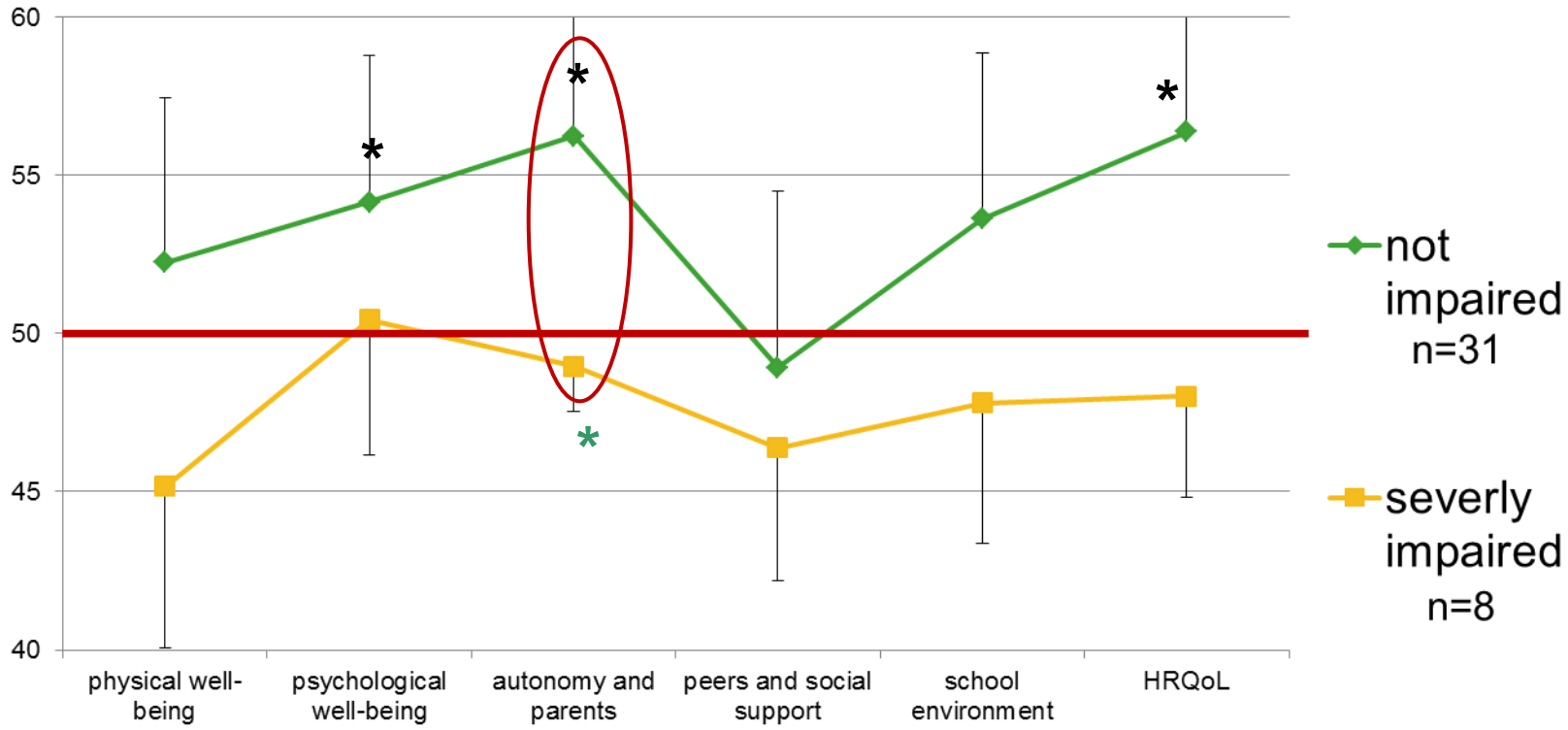
Cognitive domain	Association between impairment and fatigue; OR (95% CI)	p Value
Speed of information processing	2.2 (1.3 to 3.9)	0.006
Visuoconstruction	1.5 (0.8 to 2.8)	0.18
Working memory	2.3 (1.3 to 4.3)	0.007
Immediate memory	1.5 (0.8 to 2.9)	0.17
Delayed memory	0.7 (0.4 to 1.3)	0.25
Attention	1.6 (0.9 to 2.9)	0.12
Executive functioning	1.0 (0.6 to 1.9)	0.94

Greenham et al, 2017

Quality of life after stroke

2 years after storke – rated by children

SNPSR



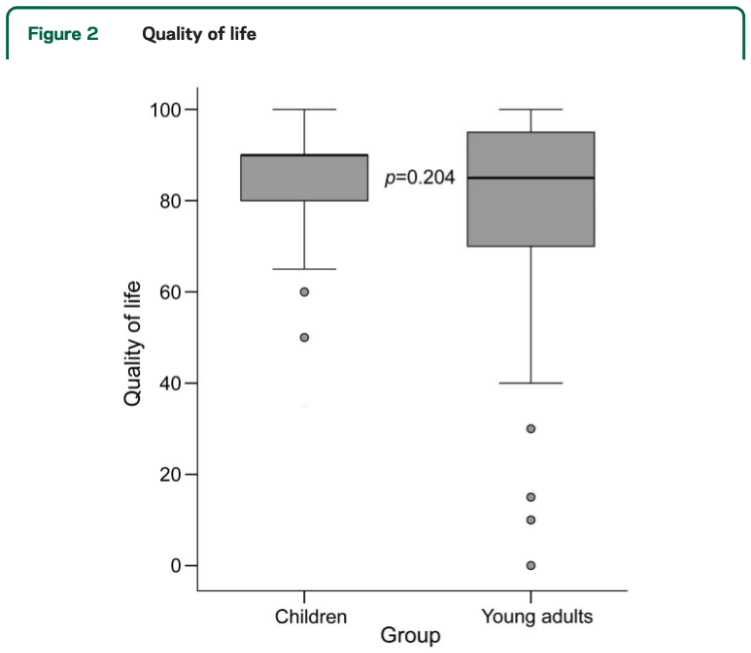
Canada lowest HRQOL and pedQOL in children with poor neurological outcome

Kofmel et al 2016, Friefield et al 2004

Quality of life in young adults

survivor of childhood stroke

Little folks - little strokes?



Quality of life (QoL) rated on a continuous scale from 0 (very poor) to 100 (optimal) was assessed in 82 (100%) surviving children and 137 (96%) young adults at long-term follow-up. Median QoL was 90 (interquartile range [IQR] 80–90) in children and 85 (IQR 70–95) in young adults ($p = 0.204$). p = Mann-Whitney U test, 2-sided significance.

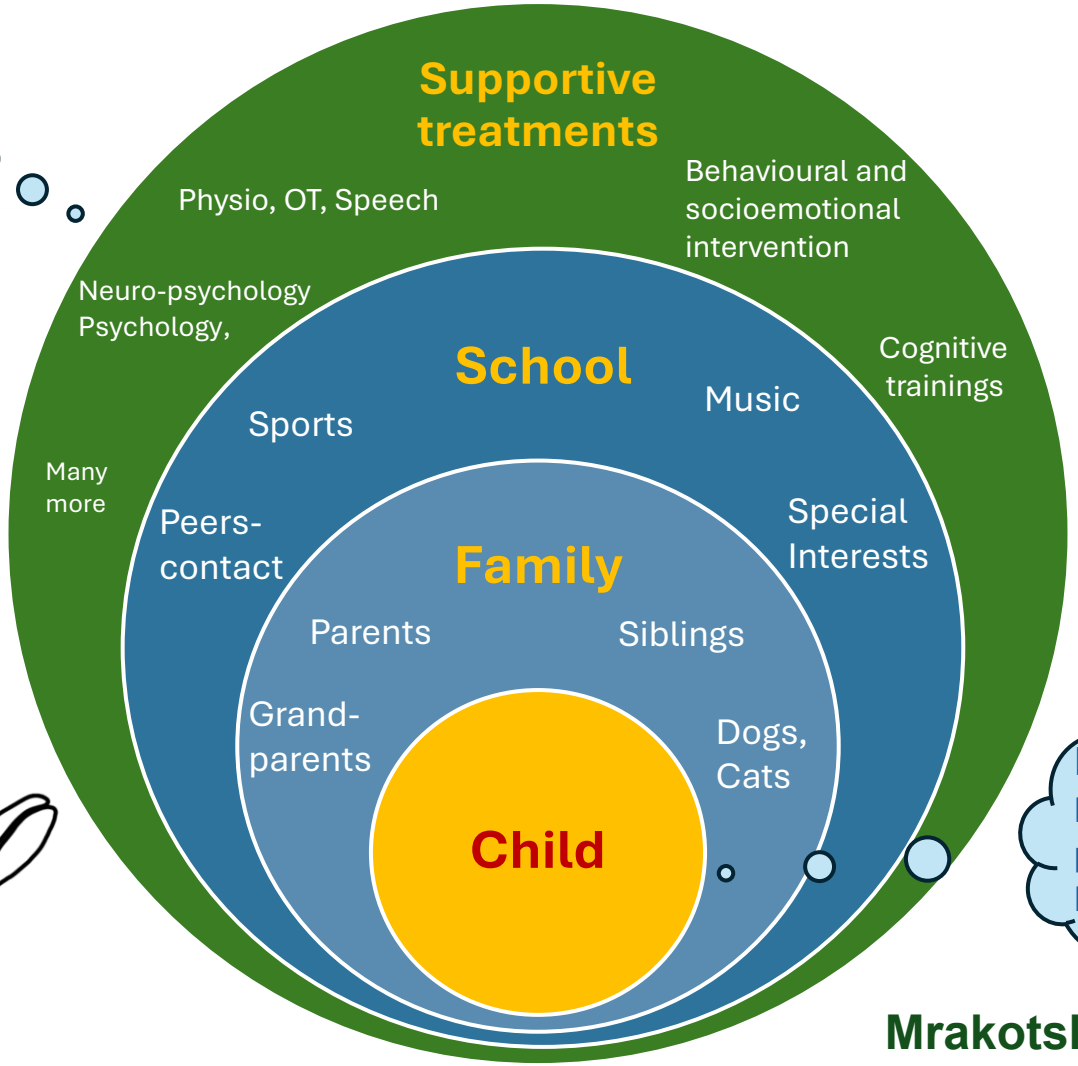
Neurology 2014, Goeggel et al

Difference to controls	P-value
SF 36: **HRQOL**	
Physical functioning	0.055
All subscores	No difference
FRSBe **Executive functions**	
Disinhibition	**0.049**
All other subscores	No difference
Total	0.057
BDI Depresssion	
Total	0.123
All levels	No difference
WEIMuS **Fatigue**	
Physical, cognitive	No difference
total	0.171

Bigi et al , Stroke 2020

Support till integration into adult life

Doctors as:
Neuro paediatrician
Paediatrician



Doctors as:
Neuro paediatrician
Paediatrician

Mrakotsky et al,
Seminars in Paediatric Neurology, 2022

Thanks to all who helped

Stroke team over the years
Regula Everts
Sandra Bigi
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Daniel Brechbühl
Robin Münger
Martina Studer
Salome Kofmel
Tatia Aprasadize
Salome Kofmel

And many more

All the children and parents participating in the SNPSR and the many related studies

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- Schweizerische Herzstiftung
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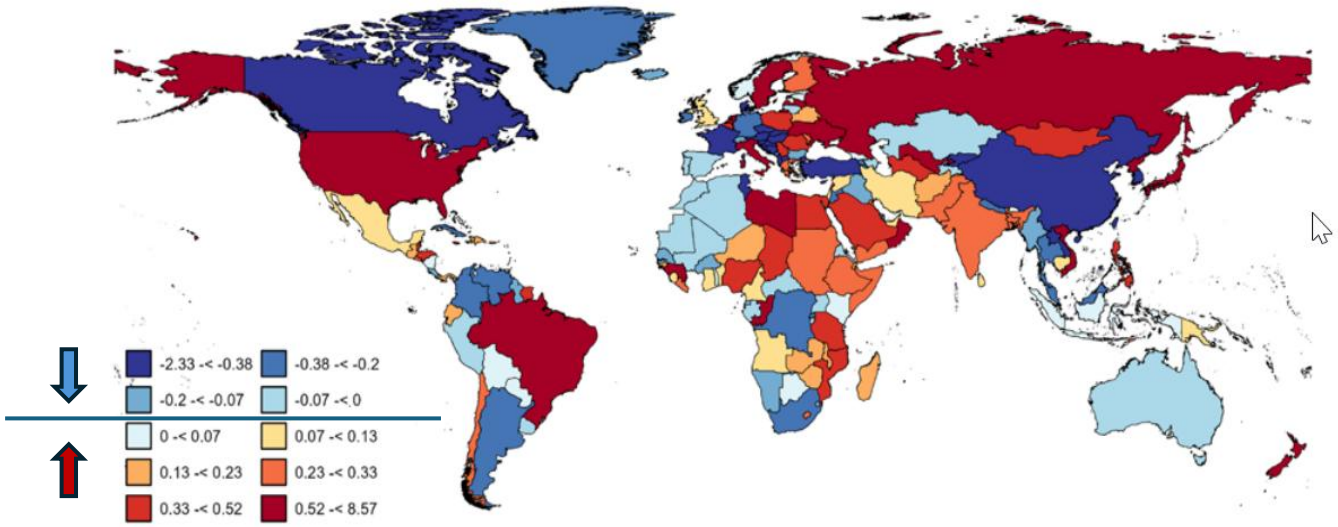
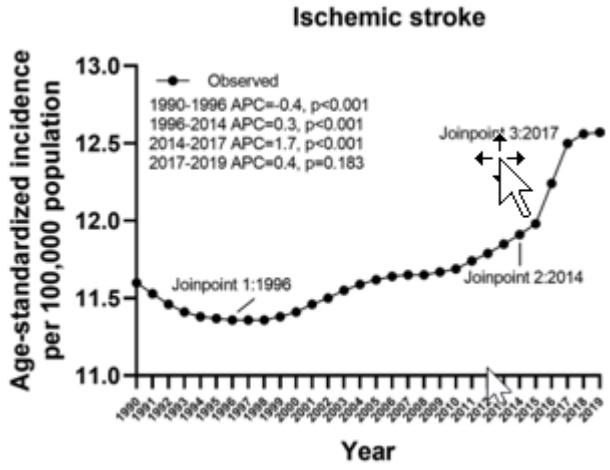
Maria Regenyi
Regula Everts
Daniel Brechbühl
Gabriela Oesch

all Swiss collaborators of the Swiss Neuropaediatric Society

Global Burden of disease

1990-2019



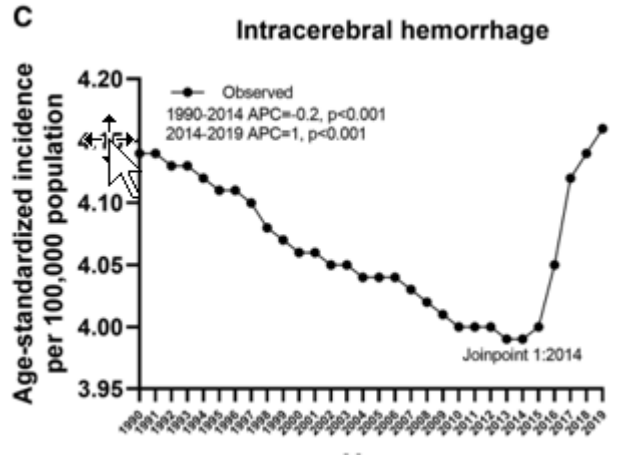


70% of all stroke

Children < 5y → higest incidence ischaemic stroke

Adolescents 15-19y → highest incidence haemorrhagic stroke

84% in low middle income countries → 93% of YLL

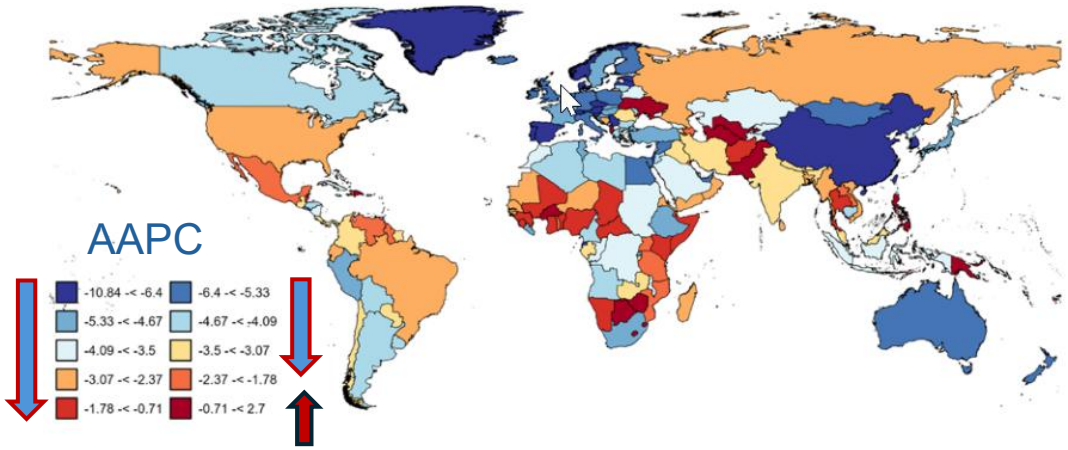


Stroke 2024, Hao Sun et al

Global Burden of disease

1990-2019

Year life lost YLL AAPC

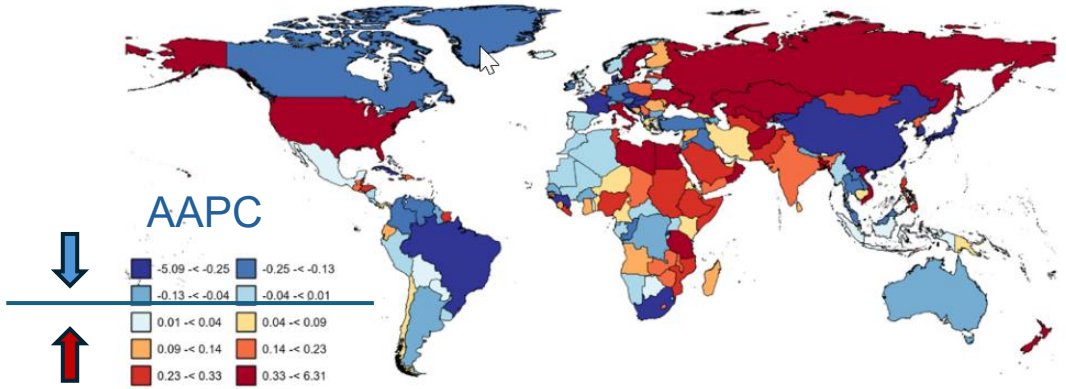


In total numbers (95% UI)

4’759’311 → 1’943’529 cases

63% : haemorhagic stroke

Year life with disability YLD AAPC



In total numbers (95% UI)

457’285 → 548 678 cases

20-21/100’000 children

Stroke 2024, Hao Sun et al