

# The 1<sup>st</sup> 1000-2000 days: what the science suggests is important

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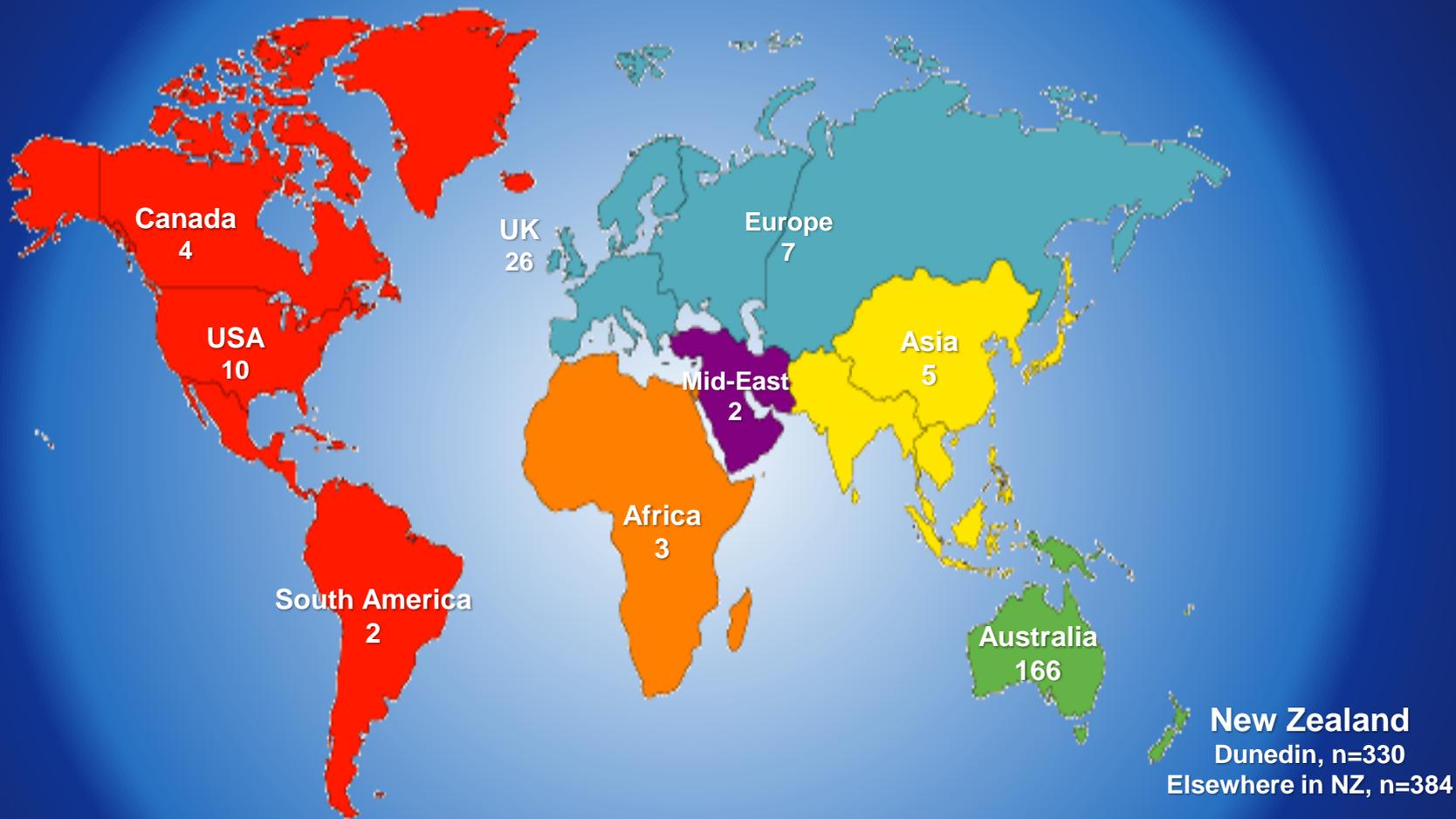
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# Retention in the Dunedin Study

Age	Year	Number	Percent*
<b>Birth</b>	<b>1972-73</b>		
<b>3</b>	<b>1975-76</b>	<b>1037</b>	<b>100%</b>
<b>5</b>	<b>1977-78</b>	<b>991</b>	<b>96%</b>
<b>7</b>	<b>1979-80</b>	<b>954</b>	<b>92%</b>
<b>9</b>	<b>1981-82</b>	<b>955</b>	<b>92%</b>
<b>11</b>	<b>1983-84</b>	<b>925</b>	<b>90%</b>
<b>13</b>	<b>1985-86</b>	<b>850</b>	<b>82%</b>
<b>15</b>	<b>1987-88</b>	<b>976</b>	<b>95%</b>
<b>18</b>	<b>1990-91</b>	<b>993</b>	<b>97%</b>
<b>21</b>	<b>1993-94</b>	<b>992</b>	<b>97%</b>
<b>26</b>	<b>1998-99</b>	<b>980</b>	<b>96%</b>
<b>32</b>	<b>2004-05</b>	<b>972</b>	<b>96%</b>
<b>38</b>	<b>2010-12</b>	<b>961</b>	<b>95%</b>
<b>45</b>	<b>2017-19</b>	<b>938</b>	<b>94%</b>

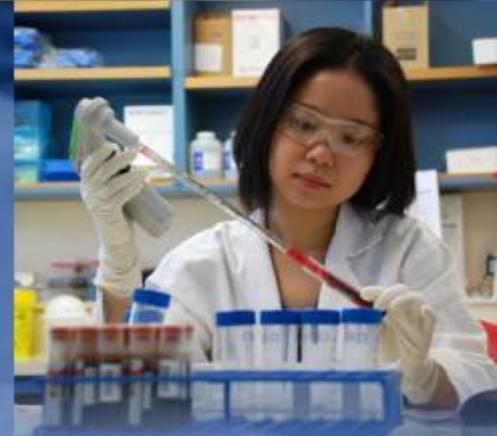
\* *Percentage seen of those who were eligible (i.e. alive) at each age*



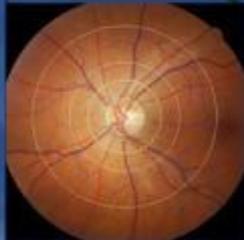


# Childhood Self-Control

*Health, Wealth and Public Safety*



Adult Health Outcome (Z-Score)



# What is Self-control?

**Self-control is the ability to regulate one's emotions, desires, and behaviours in the service of later rewards.**

- **Think before you speak or act**
- **Resist temptations**
- **Give considered response instead of an impulsive one**
- **Resist saying something inappropriate (or hurtful)**
- **Resist 'tit for tat' (hurting someone because that person hurt you)**
- **Resist jumping to conclusions**

# Self-control: More necessary today than it used to be?

- **AVOID OBESITY** in an era of ready food availability
- **MAINTAIN FITNESS** in an era of sedentary jobs
- **SUSTAIN MARRIAGES** in an era of easy divorce
- **PREVENT ADDICTION** in an era of access to substances
- **RESIST SPENDING** in an era of sophisticated marketing
- **SAVE FOR OLD AGE** in an era without guaranteed pensions

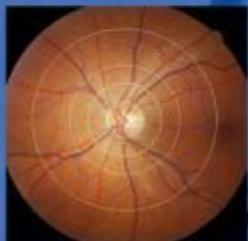
# Measuring Childhood Self-control

- **Predictor: A composite of ratings**
- **Persists across ages 3, 5, 7, 9, 11 years**
- **Agreed upon by multiple reporters**
  - *Staff observations of child's self-control in the clinic*
  - *Parents' reports*
  - *4 different teachers' reports*
  - *Child's self-reports*



# Health Measures

*Assessments of Physical Health*



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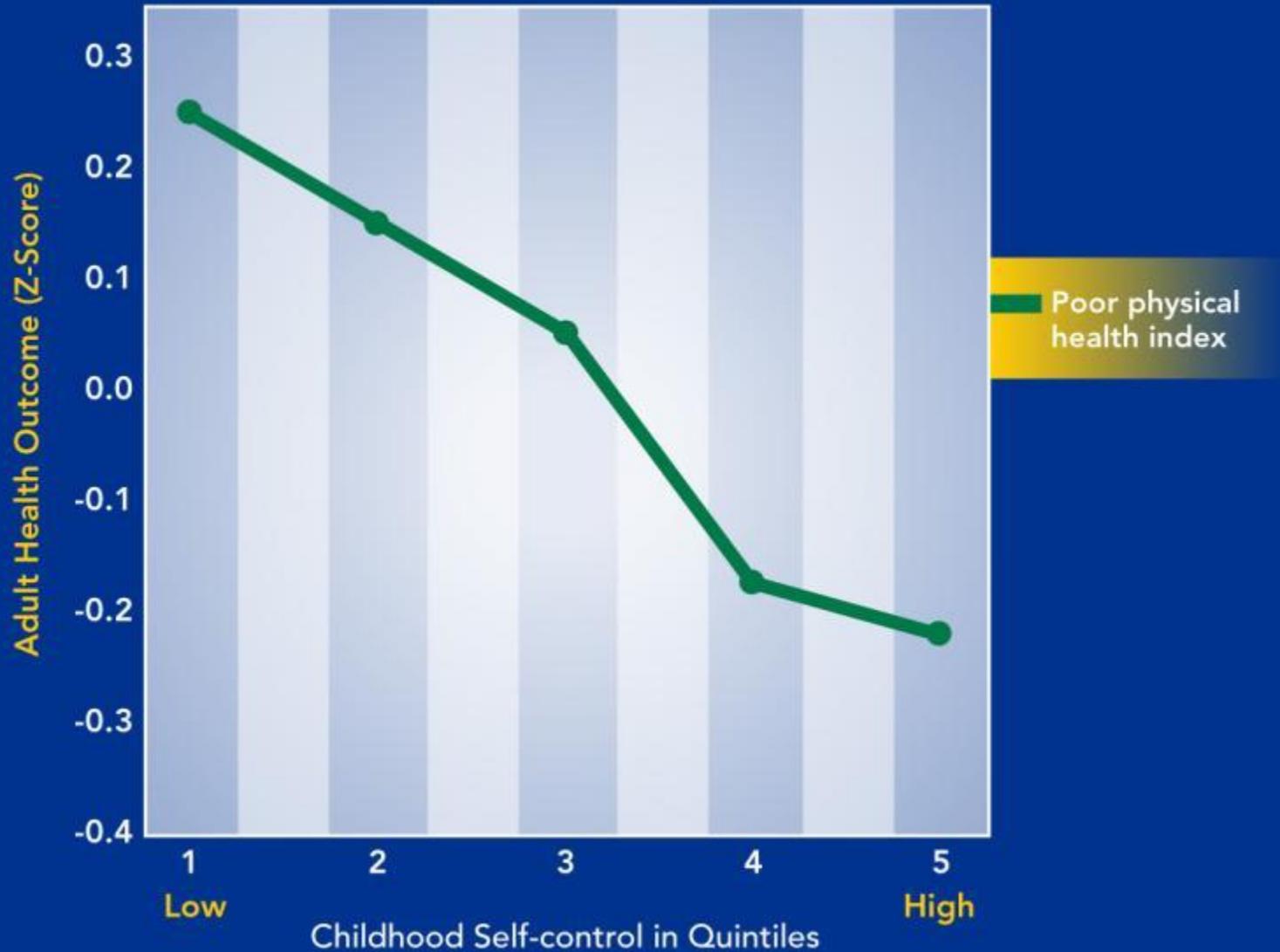
# Health Outcomes:

A count of clinical measures in adulthood

- **Cluster of metabolic abnormalities (17%)**  
- *E.g. obesity, blood pressure, cholesterol*
- **Periodontal disease (20%)**
- **Sexually-transmitted infection serology (18%)**
- **Inflammation biomarkers abnormal (20%)**
- **Respiratory airflow obstruction (17%)**

## Self-control gradient:

*Children with low self-control had poorer health than those with high self-control*



## ***Personal Interviews (drug and alcohol dependence or addictions)***



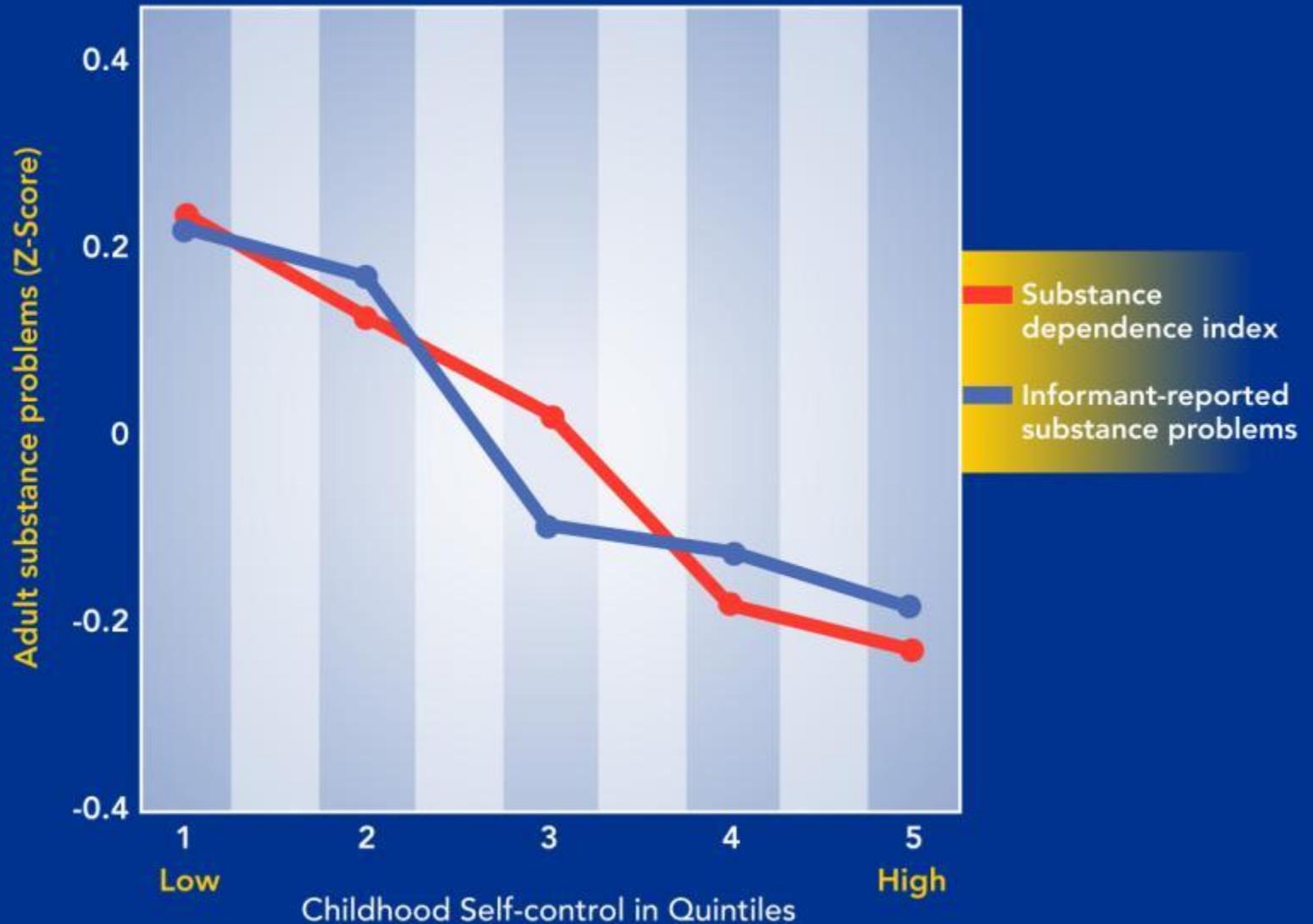
# Health Outcomes:

## DSM-IV substance dependence diagnoses in adulthood

- **Tobacco dependence (19%)**
- **Alcohol dependence (8%)**
- **Cannabis dependence (5%)**
- **Harder Drug dependence (3%)**
- **Corroborated by informant reports**

# Self-control gradient:

*Children with low self-control had more substance-use problems than those with high self-control*



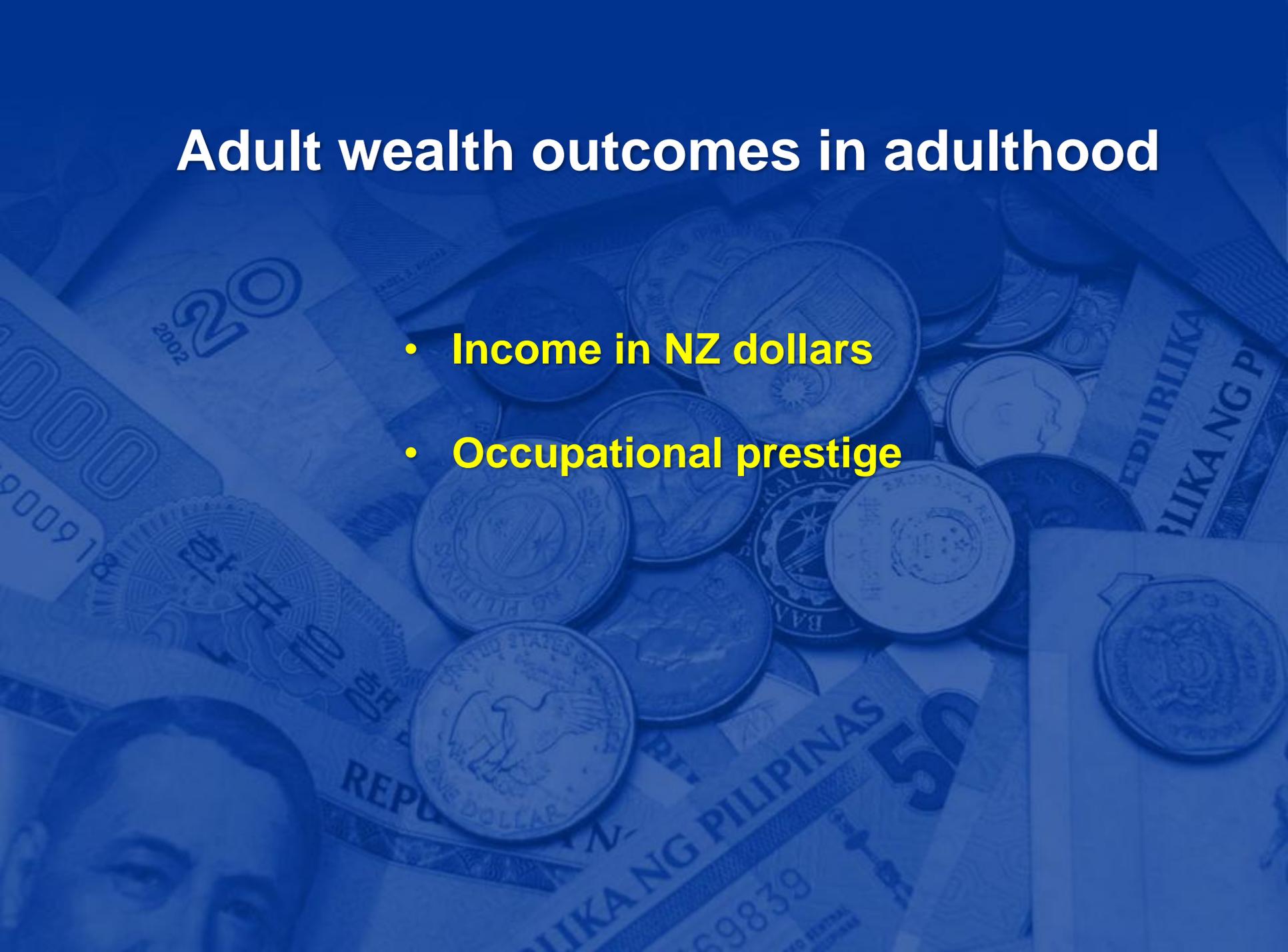


# Wealth Measures

*Assessments of Financial Success*



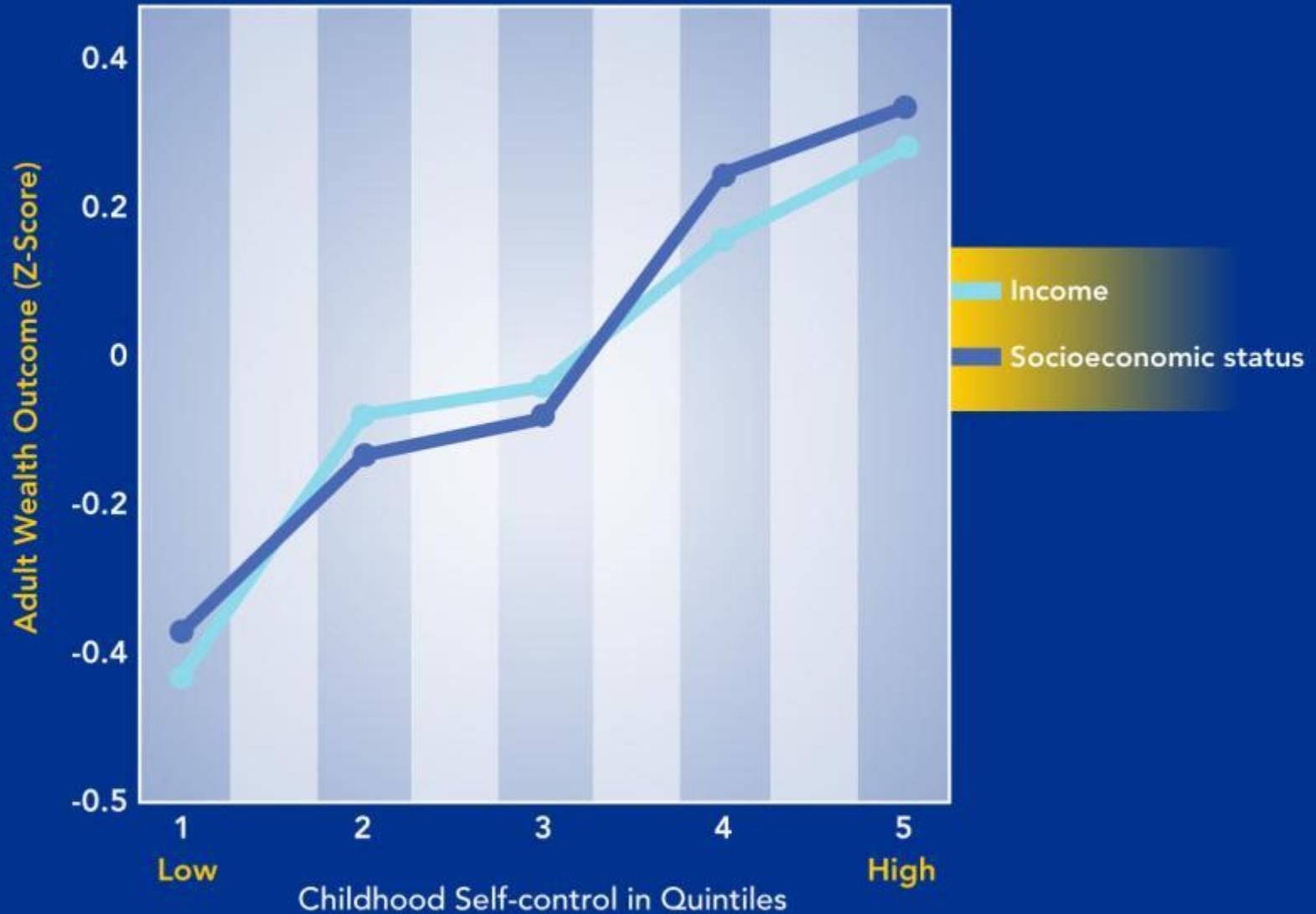
# Adult wealth outcomes in adulthood



- Income in NZ dollars
- Occupational prestige

# Self-control gradient:

*Children with low self-control had less wealth than those with high self control*



# Financial planfulness in adulthood

- **Attitudes toward saving and saving behaviour**

**E.g.**

- *Is saving for the future important to you?*
- *Do you save money by putting money away and not touching it?*

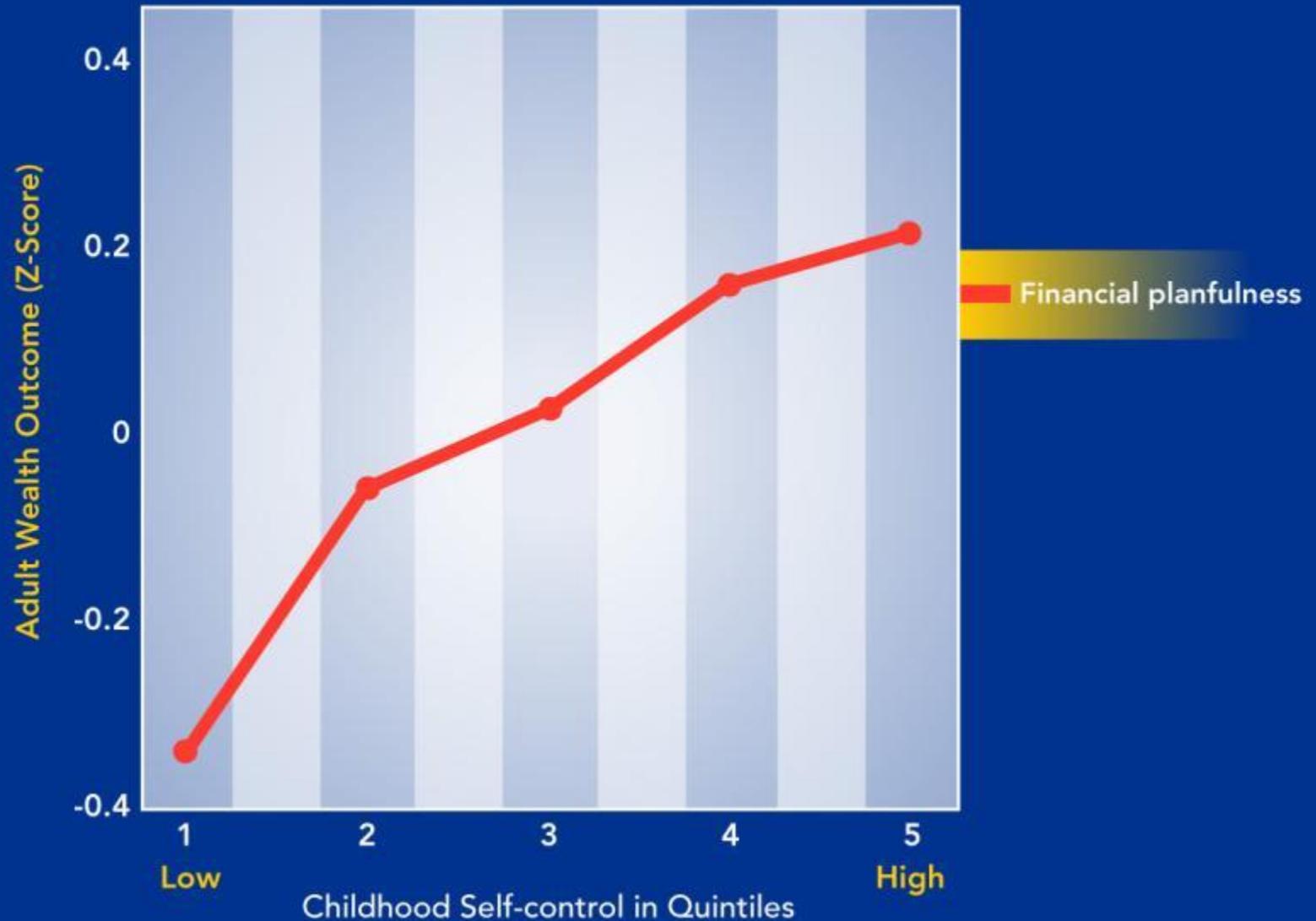
- **Financial building blocks**

**E.g.**

- *Home ownership*
- *Investments*
- *Retirement plan*

## Self-control gradient:

*Children with low self-control had not begun planning for the future*



# Financial struggles in adulthood: *self & informant reports*

## ▪ Money-management difficulties

**E.g.**

- *Do you find it difficult to meet the cost of...*
  - *Rent, mortgage*
  - *Phone or heating bills*
  - *Major repairs to car or house*
  - *Do you find yourself living paycheck to paycheck?*

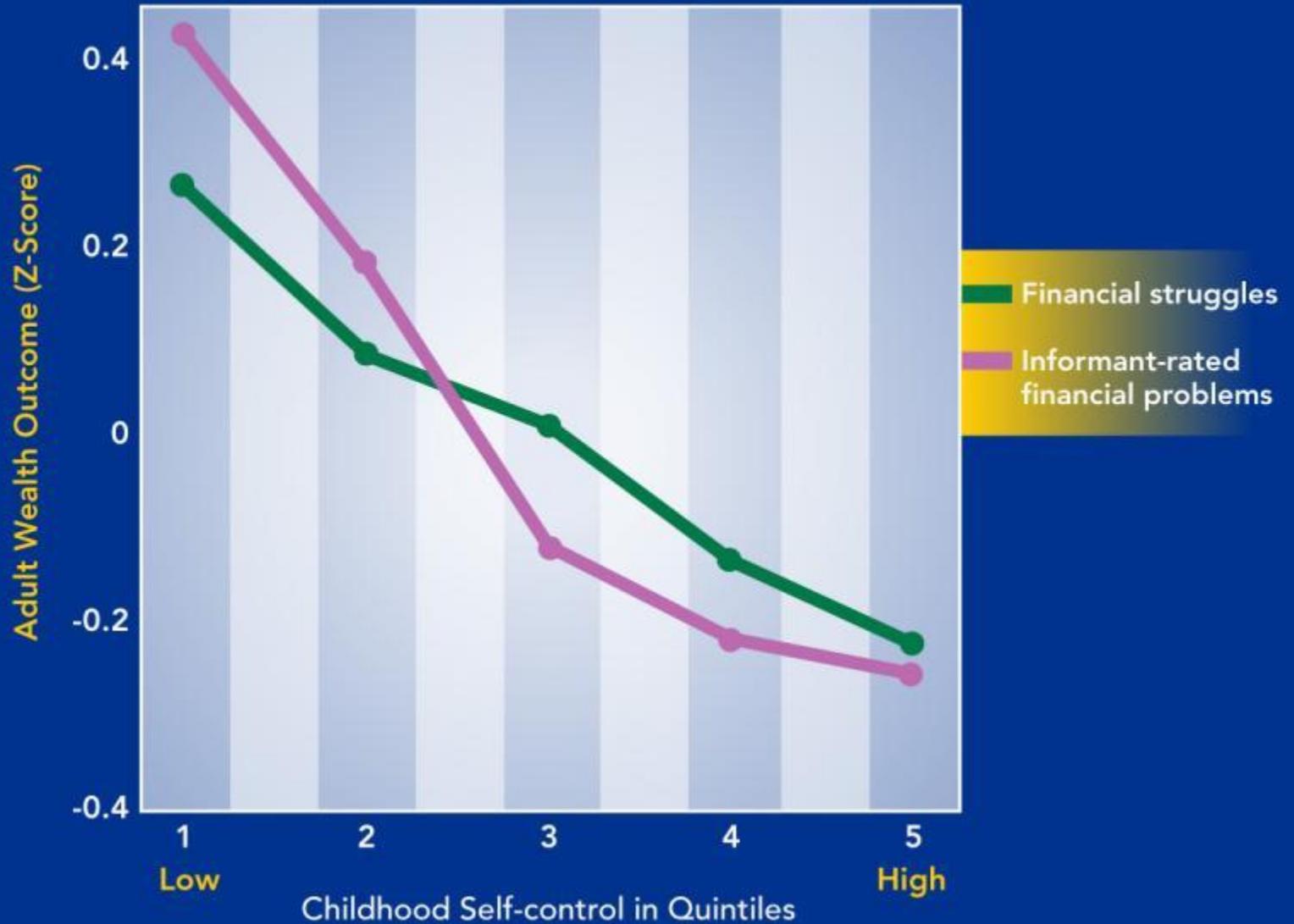
## ▪ Credit problems

**E.g.**

- *Turned down for a credit card*
- *Sold belongings to a pawnbroker*
- *Declared bankrupt*

# Self-control gradient:

*Children with low self-control had more financial problems than those with high self-control*





# Crime Measures

*Assessments of Criminal Outcomes*



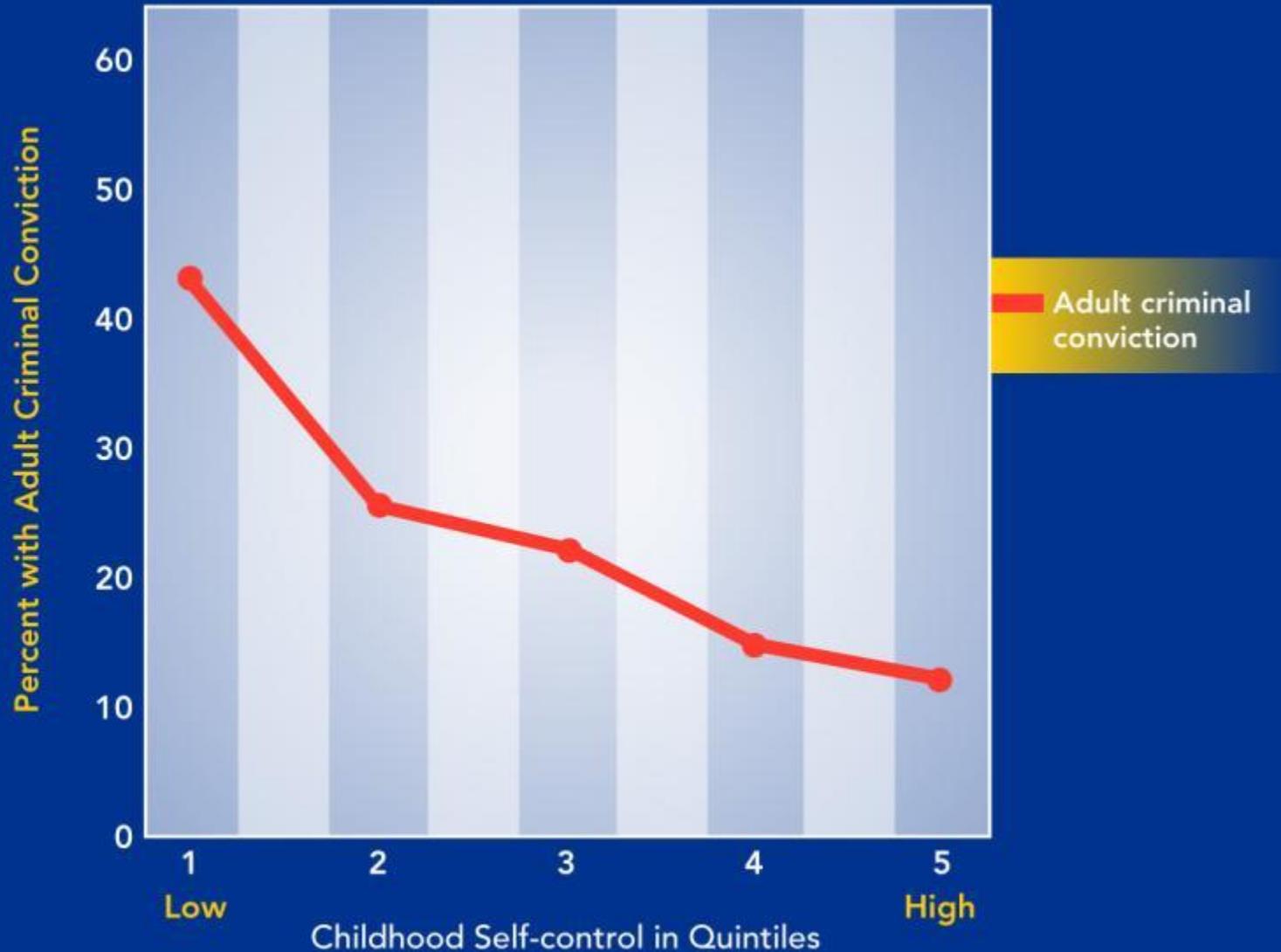
# **Criminal court convictions, age 18 to adulthood**

**New Zealand and Australian Police**



## Self-control gradient:

*Children with low self-control had more crime conviction than those with high self-control*





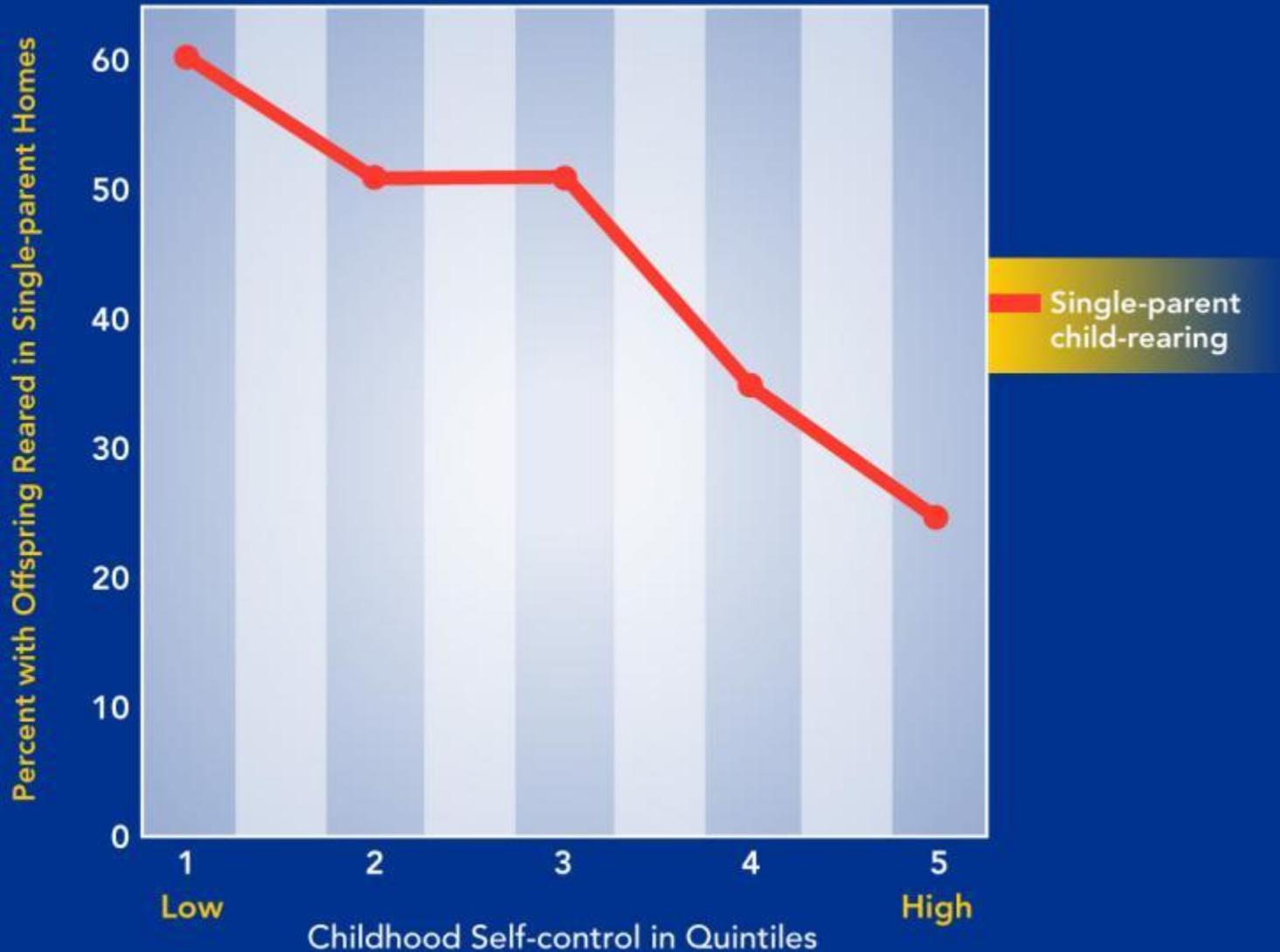
# Parenting Measures

*Assessments of Parental Involvement*



# Self-control gradient:

*Children with low self-control had more single-parent child-rearing than those with high self-control*



# Self-control gradient:

*Children with low self-control were less warm/sensitive/stimulating parents with their own child*



# All analyses shown today controlled for four main alternative explanations...

## Gradients looked the same in

- Children from high-income families
- Children with above-average IQ
- Girls
- Children without ADHD diagnoses



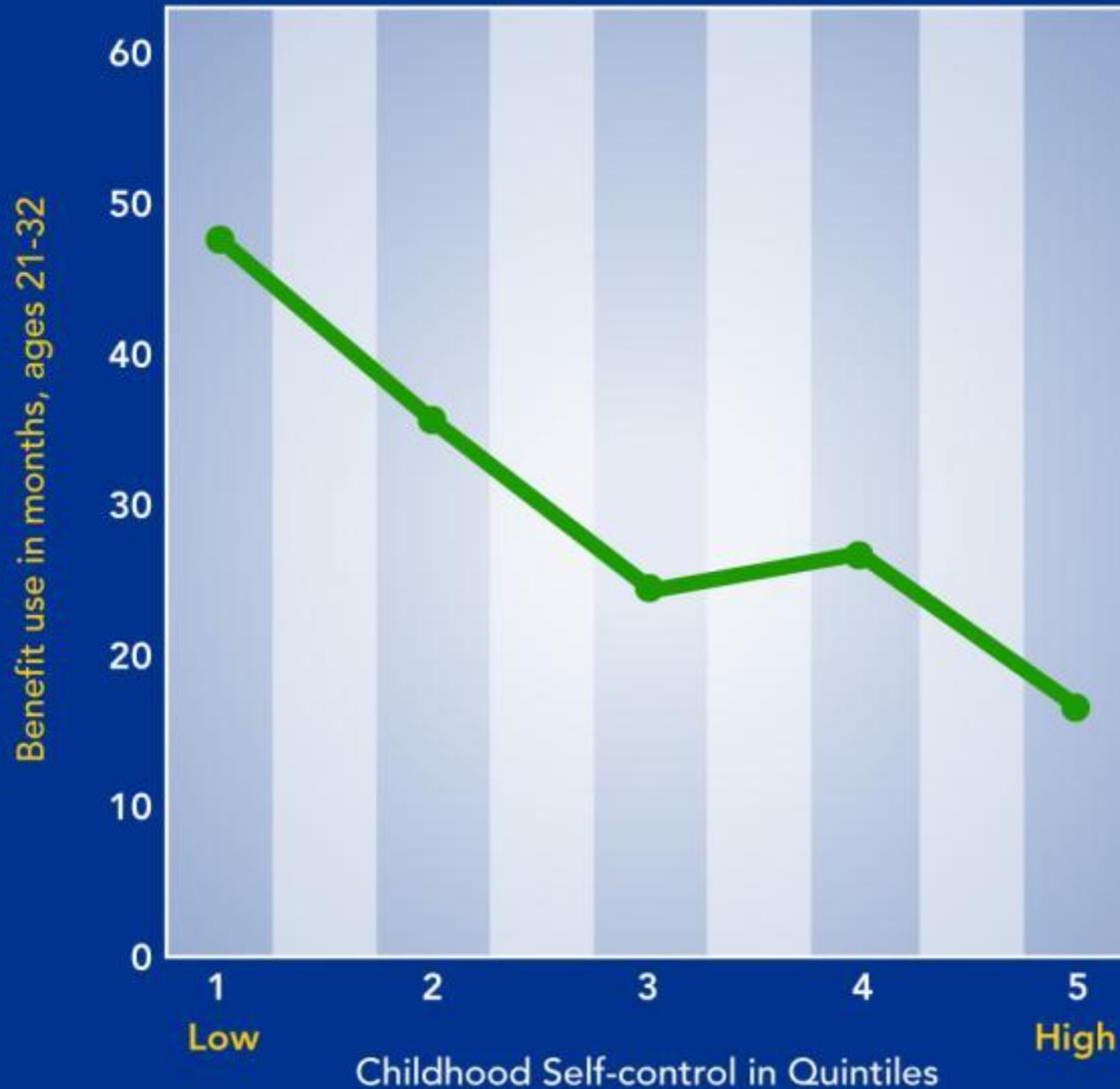
# Economic Measures

*Costs to government*



# Costs to Government

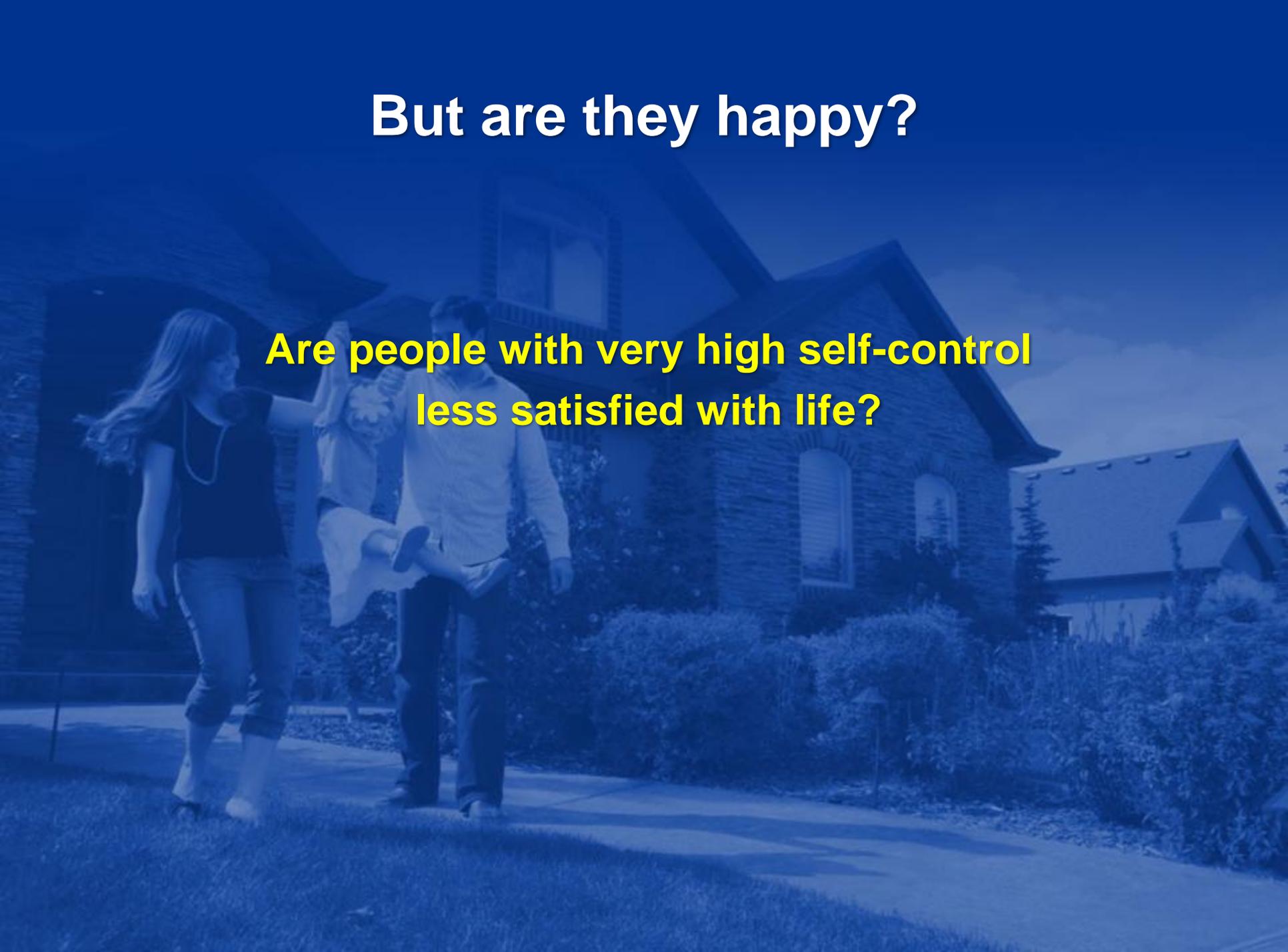
*Poor childhood self-control predicts duration of welfare-benefit use in adulthood*



*Welfare-benefit use records are from the New Zealand Ministry of Social Development*

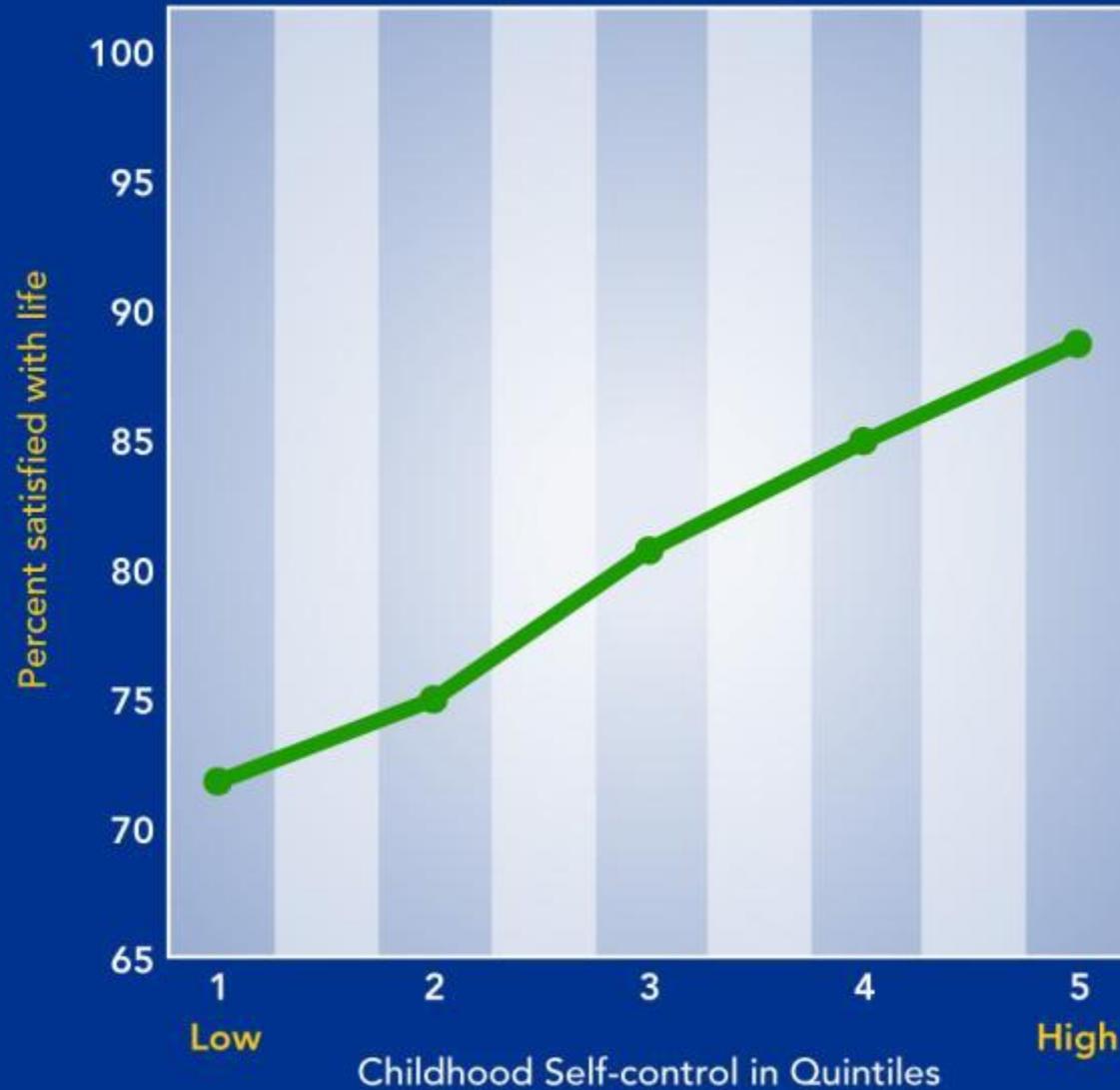
**But are they happy?**

**Are people with very high self-control  
less satisfied with life?**



## Life satisfaction

*Children with high self-control were more satisfied with life*



# Multiple outcomes: Implications

## Enhancing self-control might reduce costs of...

- crime control
- health care
- social welfare
- a healthy and financially secure old age
- improve the life chances of the next generation

Moffitt, et al (2011). A gradient of childhood self-control predicts health, wealth, and public safety . *PNAS (Proceedings of the National Academy of Sciences of the USA)*, Vol. 108(7), 2693-2698.

Moffitt, Poulton & Caspi (2013). Lifelong Impact of Early Self-Control. *American Scientist*, Vol. 101(5), 352-359.

# Early intervention: how much return can be expected?

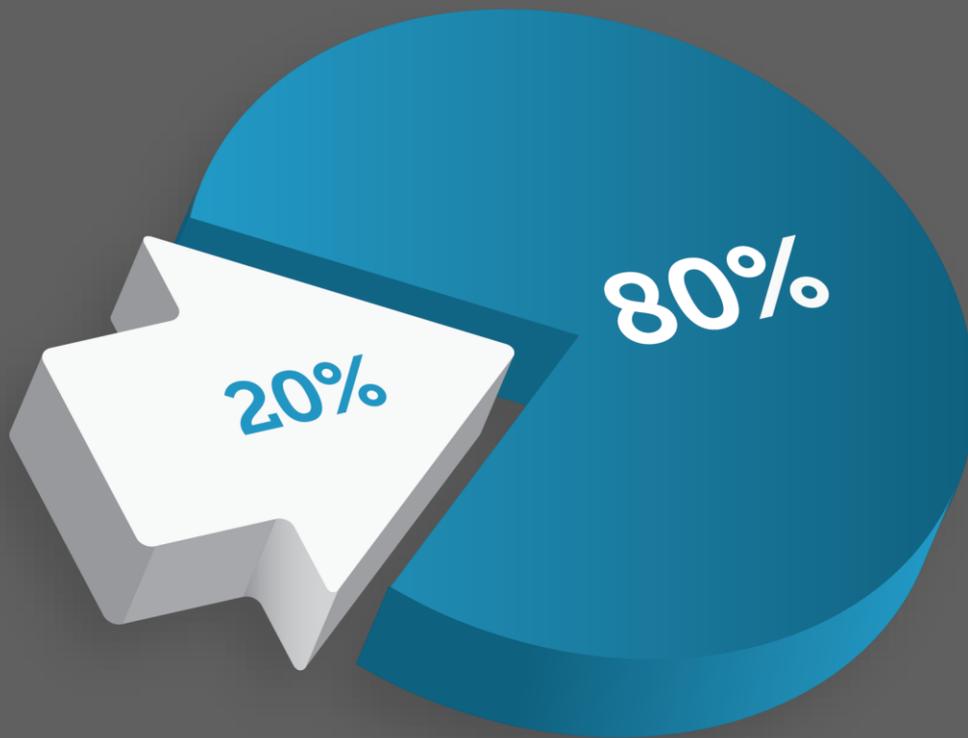
**Empirical support for the importance of investing early for practitioners, policy-makers and politicians alike.**

Caspi A, Houts R, Belsky D, Harrington HL, Hogan S, Ramrakha S, Poulton R, and Moffit TE. Childhood forecasting of a small segment of the population with large economic burden *Nature Human Behavior*, 1, 0005, 2017.

# New Zealand's Admin Data Bases and Electronic Medical Records

- The 1,000 cohort members have used....
- 24,997 monthly social welfare benefit payments
- 8,958 bed-nights in NHS hospitals
- 66,811 pharmacy prescriptions
- 6,919 insurance claims for injuries paid
- 2,141 convictions in criminal courts
- 5,760 tobacco pack-years (42,076,800 cigarettes)
- 2,924 kilograms of excess weight over obese BMI
- 2,755 fatherless child-years among cohort members' offspring

# The Pareto Principle



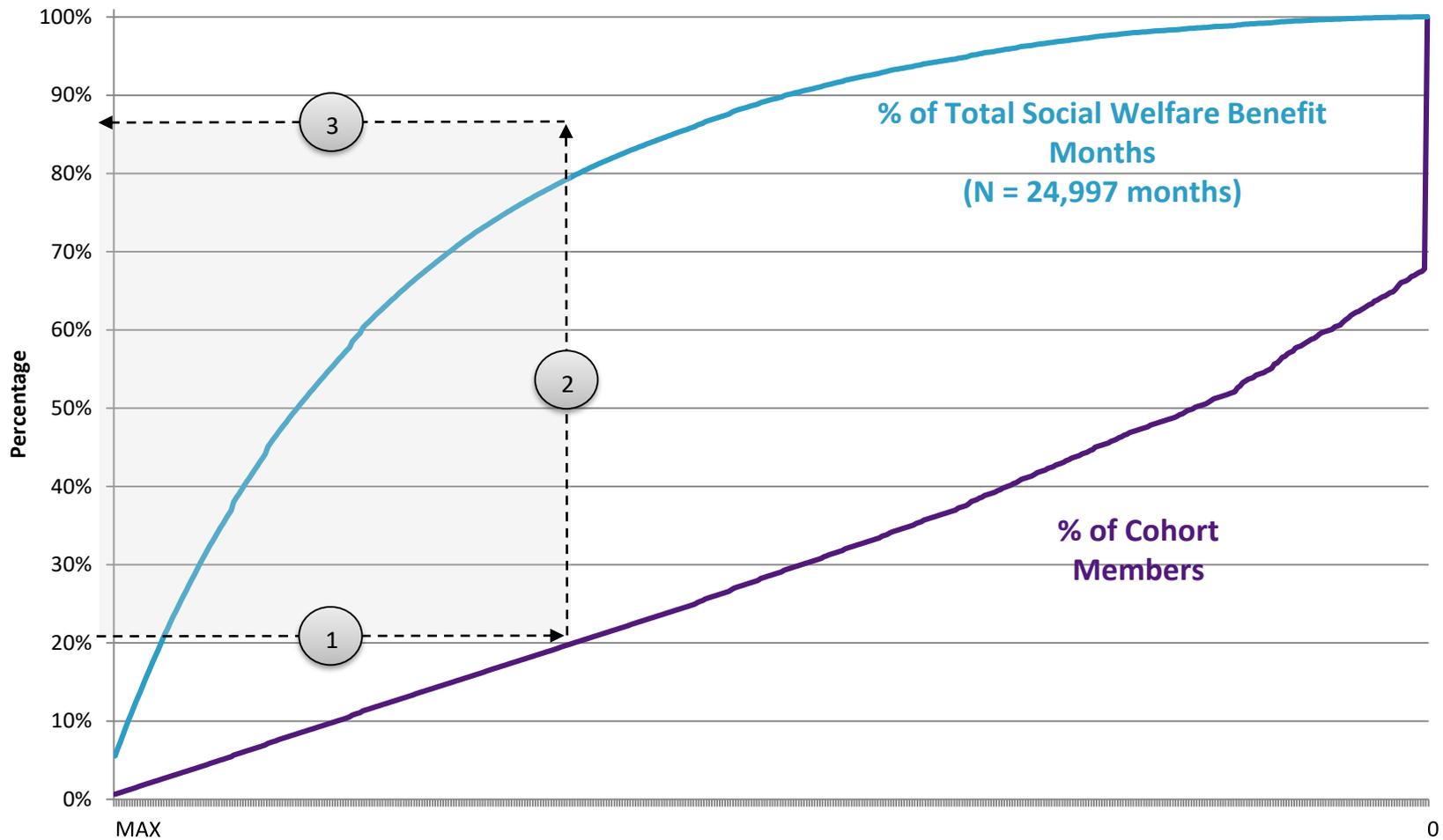
**20%** of actors account for **~80%** of outcomes.

*Vilfredo Pareto, 1848-1923*

fits each of the Dunedin administrative outcomes

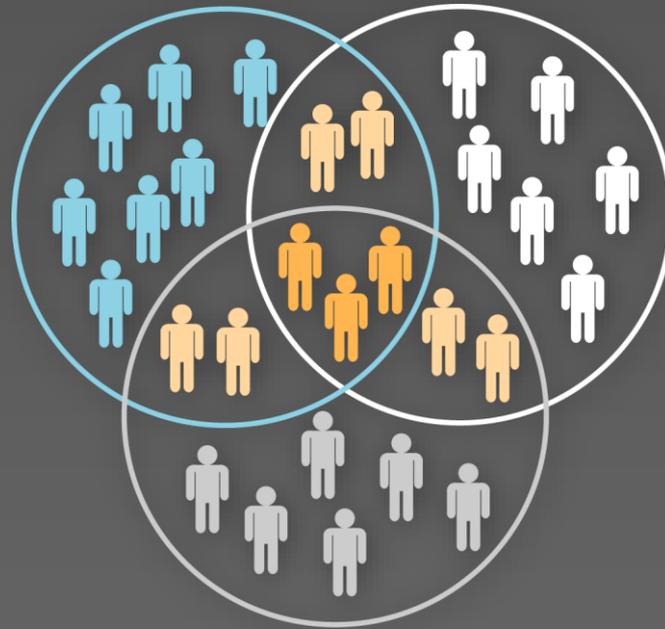
# For example.....social welfare benefits:

**20% of Cohort Members = 81% of Social Welfare Benefit Months**

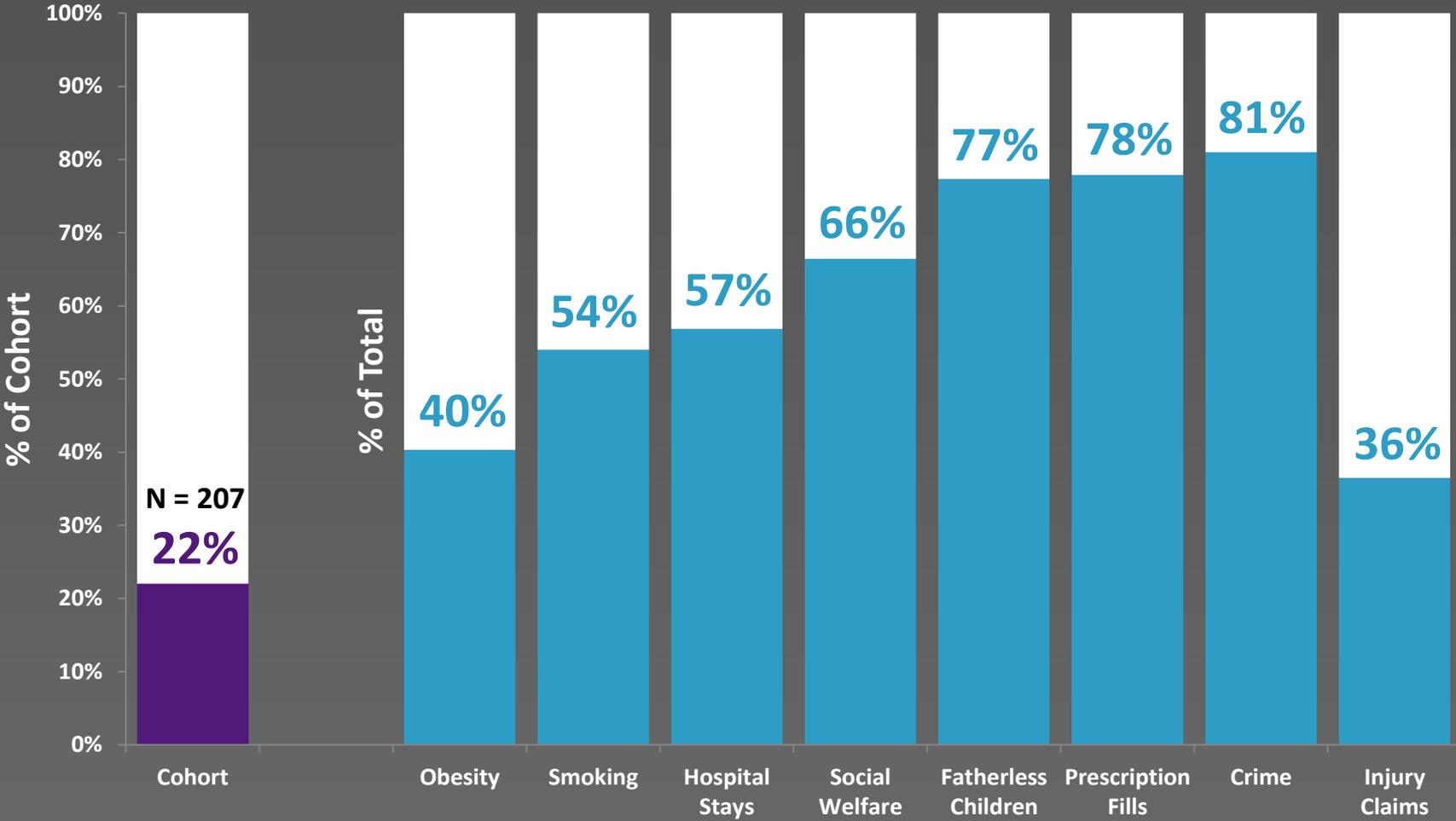


High-cost 20% groups are not independent sets of individuals, their membership overlaps.

Ultra-high-cost segment is the center.



# The Ultra-High-Cost population segment: How many health and social services do they use?



# 45-min assessment at age three predicted the ultra-high-cost segment



BRAIN HEALTH ASSESSMENT at 3:  
Pediatric neurology exam  
Peabody Picture Vocab test  
Reynell Receptive Language test  
Bayley Motor Skills test  
Examiner-rated poor behavior control

Cohen's d effect size = .6  
ROC area under curve = .80  
Good sensitivity/specificity balance

# Acknowledgements

- This on-going research would not have been possible without the co-operation and commitment of the Study members, their families and friends over a long period of time.
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For copies of research articles referred to in this presentation or other information on the Study, contact:



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<http://dunedin.study.otago.ac.nz>