

# What International Large-Scale Assessments can tell policy makers – and what not

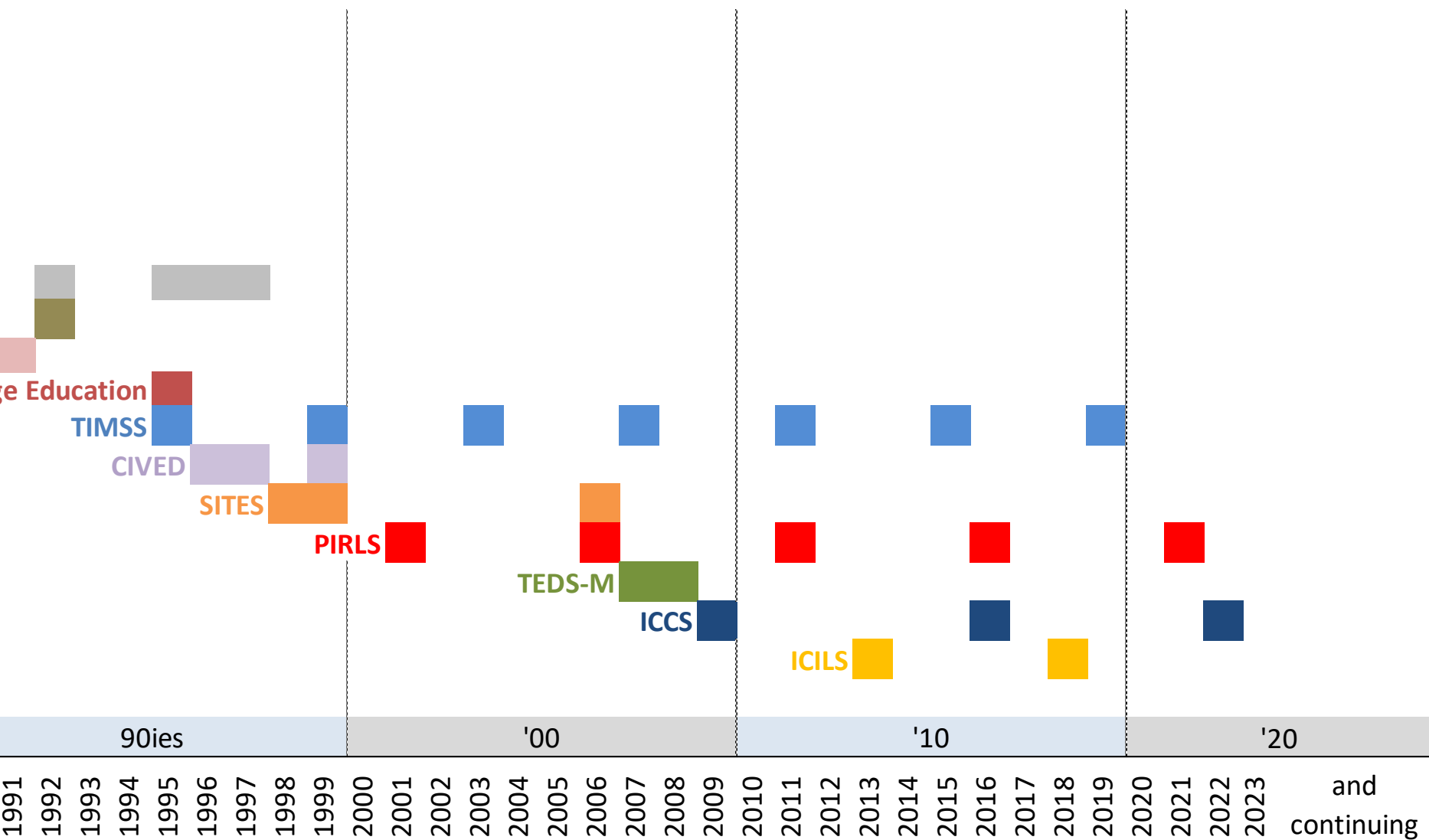
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[www.iea.nl](http://www.iea.nl)

# The International Association for the Evaluation of Educational Achievement (IEA)

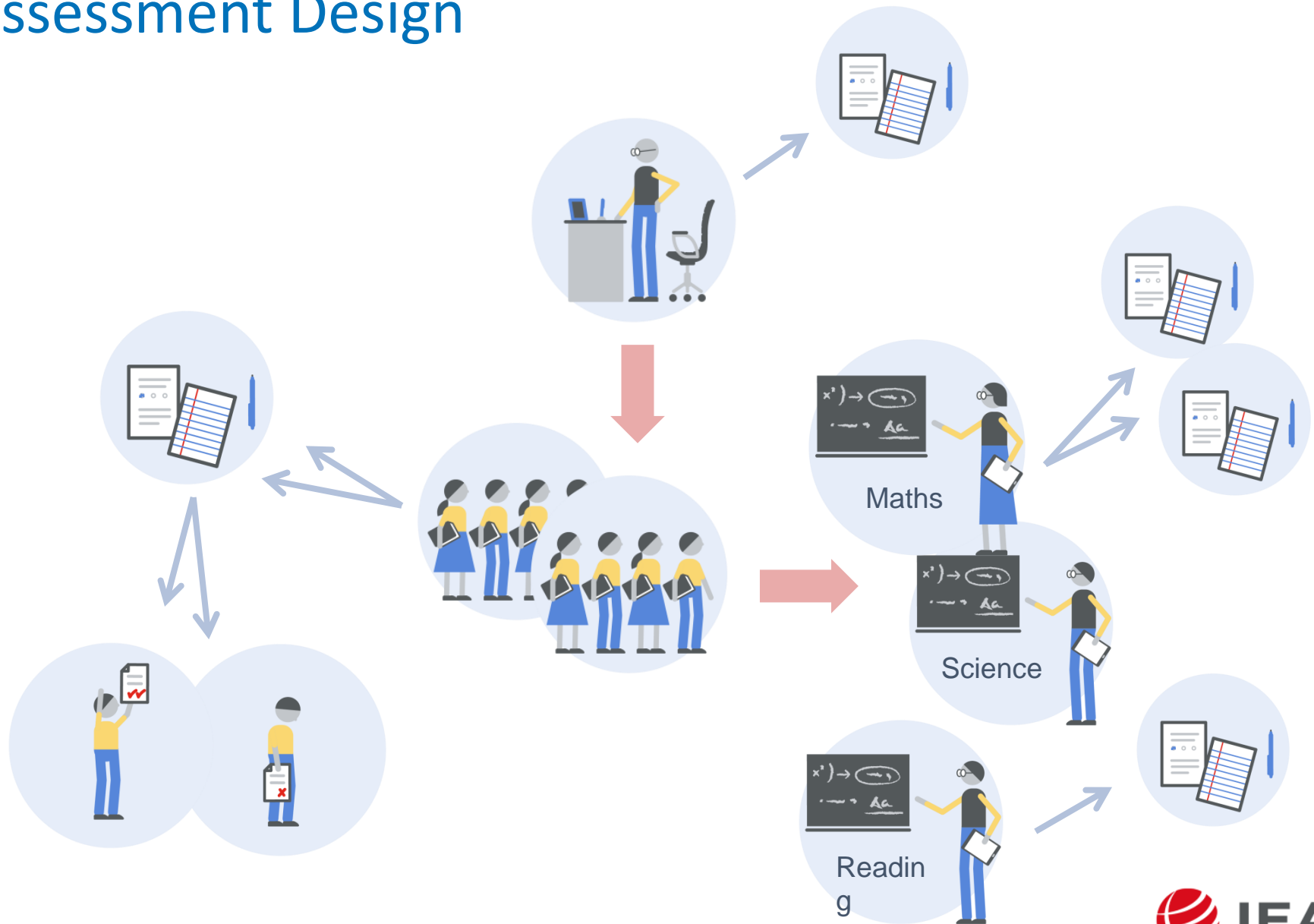
- Non-governmental research organization
- Independent, international cooperative of national research institutions and governmental research agencies
- Founded in 1958, more than 30 research studies of cross-national achievement
- Large-scale comparative studies of educational achievement and other aspects of education
- More than 60 institutional members, nearly 100 participating countries in IEA studies

# Overview of IEA Studies



# Assessment Design

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# Assessment Design

- All International large-scale assessments (ILSAs) are cross sectional studies
- Collecting big amounts of background data
- Most of them conducted repeatedly
  - over a 3, 4 or 5 year cycle

# Limitations

Be wary of ... !

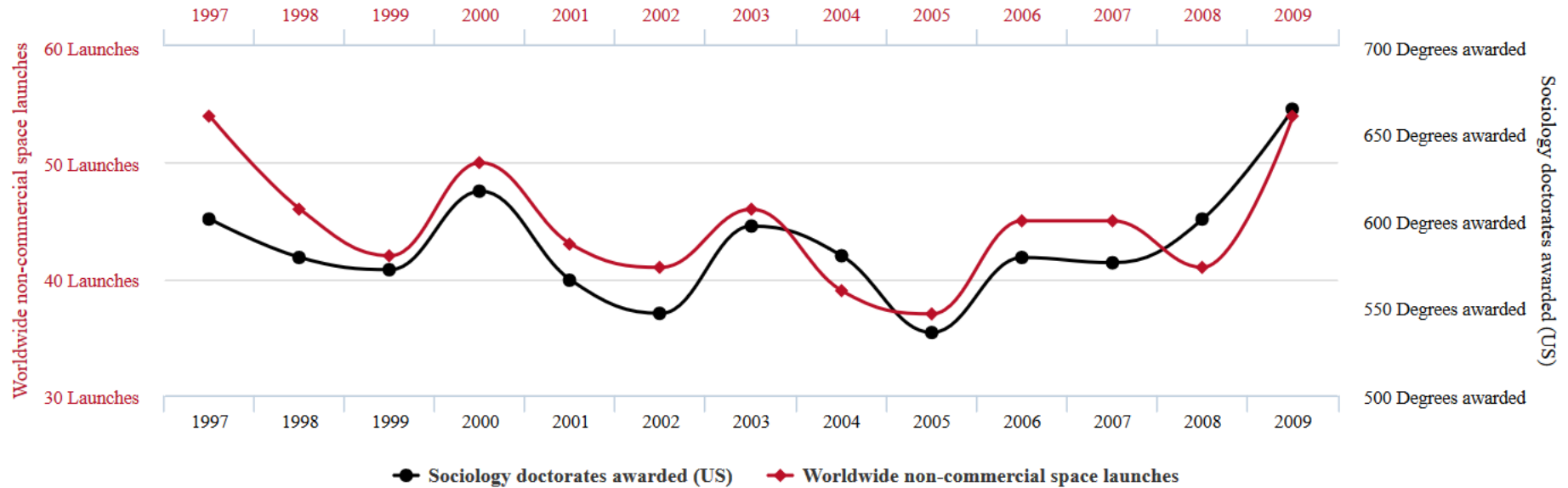
# Be careful with correlations

## Worldwide non-commercial space launches

correlates with

## Sociology doctorates awarded (US)

Correlation: 78.92% ( $r=0.78915$ )



Data sources: Federal Aviation Administration and National Science Foundation

tylervigen.com

# Causality

## ➤ We see correlations, but not causal relationships!

Countries spending more money on education perform better.

If countries spend more money on education, the higher the achievement of their students?!

If you increase spending on education, your students' achievement will increase?!

Students with better educated teachers perform better at mathematics.

Higher levels of education of teachers, impact higher math achievement of their students?!

Maybe better students and better educated teachers are both in urban schools

Higher maths achievement of students attracts better educated teachers?!

Better teachers select better schools



# Causality

- Correlation does not equal causation!
- To claim causality we need experimental data
- There are causal modelling technics ...



**BUT** they all depend on very strong assumptions

Be wary of causality!

Check what are the assumptions!

# Causality



# Causality

- But sometimes there is simply a misunderstanding
  - **Researchers say:** “Increasing number of lessons has an effect of an increase in achievement of 20 score points” (...in their model).
  - **Policy-makers understand:** “If you increase the number of lessons the achievement of their students will increase”.

**But** “effect” and “effect size” are statistical terms describing relationships in a statistical model – not the real world!



- All statistics come with some uncertainty – also called standard error.
- Usually a country is not first or seventh or x in the ranking but within a certain range

[illegible]

# Ranking Trends

- Ranking – or changes of ranks – are influenced by who is taking part ... and their trends

TIMSS 2015 grade 8 Country		Average Scale Score
Singapore	621 (3.2)	
Korea, Rep. of	606 (2.6)	
Chinese Taipei	599 (2.4)	
Hong Kong SAR	594 (4.6)	
Japan	586 (2.3)	
Russian Federation	538 (4.7)	
Kazakhstan	528 (5.3)	
Canada	527 (2.2)	
Ireland	523 (2.7)	
United States	518 (3.1)	
England	518 (4.2)	
Slovenia	516 (2.1)	

TIMSS 2011 grade 8 Country		Average Scale Score
Korea, Rep. of	613 (2.9)	
Singapore	611 (3.8)	
Chinese Taipei	609 (3.2)	
Hong Kong SAR	586 (3.8)	
Japan	570 (2.6)	
Russian Federation	539 (3.6)	
Israel	516 (4.1)	
Finland	514 (2.5)	
United States	509 (2.6)	
England	507 (5.5)	
Hungary	505 (3.5)	
Australia	505 (5.1)	



So, what **can** we say?

## What ILSAs **can** provide

- International comparison of achievement
- National results in an international frame
- Comparison of subgroups within countries
- Trends in achievement and background  
(student, teacher, school, country)
- Correlations indicating where to research further



Country	policy implication after analyzing IEA data
Belgium	Special support policies for low SES and immigrant students
Botswana	Curriculum changes: including topics from TIMSS that were not covered, teacher support programs with an emphasize on student centered learning approaches, guidelines for classroom testing
	Curriculum reforms: early introduction of science in schools from grade 1; more emphasize on
Sources:	
Aggarwalla, N.K. (2004):	Evaluation Report: Quality assessment of primary and middle education in mathematics and science (TIMSS); Report to the United Nations Development Programme and the United Nations Office of Project Services, New York, USA
Elley, W.B. (2002):	Evaluating the Impact of TIMSS-R (1999) in Low- and Middle-Income Countries - An independent report on the value of World Bank support for an international survey of achievement in mathematics and science; New York, USA
Gilmore, A. (2005):	The Impact of PIRLS (2001) and TIMSS (2003) in Low- and Middle-Income Countries. An evaluation of the value of World Bank support for international surveys of reading literacy (PIRLS) and mathematics and science (TIMSS), Report to the World Bank, New York, USA
Schwippert, K. (2003):	Progress in Reading Literacy - The Impact of PIRLS 2001 in 13 countries; Waxmann, Münster, Germany
Schwippert, K., Lenkeit, J. (2012):	Progress in Reading Literacy in National and International Context - The Impact of PIRLS 2006 in 12 countries; Waxmann, Münster; Germany
Slovak Republic	low SES background
Slovenia	Establishment of the "State Commission for Literacy"
South Africa	Harmonizing the number of school days per year and lessons per day; special support programs for school and classroom libraries, Welcome packages for students entering the school system to encourage participation
Spain	Project LEER.ES to promote reading; emphasizing school libraries
Syria	Foundation of an Education Research Center
United Arab Emirates	Programs for Sharing best practices of teaching
Yemen	Reforms in teaching methodology and the the format and style of school tests



# Thank you!

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*Researching education, improving learning*

