

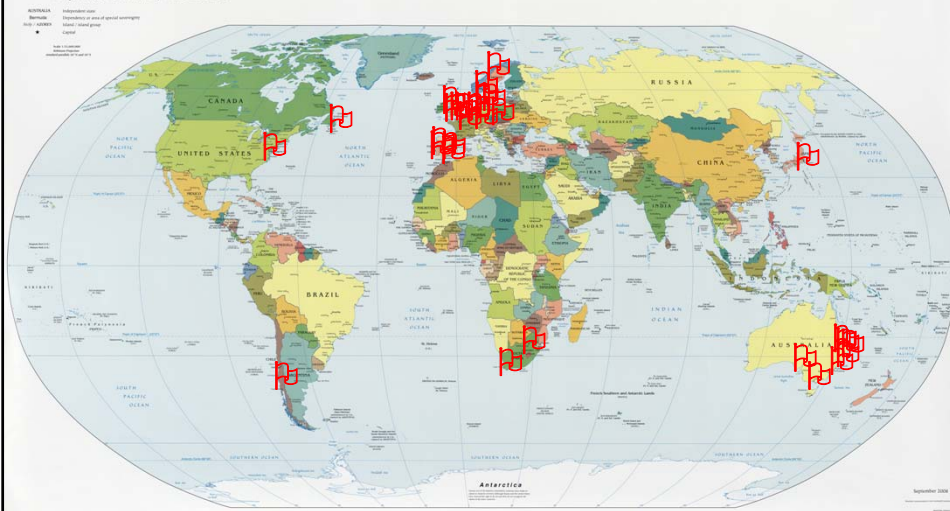


Using existing data for a better future. *Opportunities and challenges of harmonising activity data*

Esther van Sluijs, on behalf of the organising committee

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Map of the World. September 2008



Welcome to Trinity Hall College



MRC | Medical Research Council

Data harmonisation

Oxford Dictionary of English

Data:

Facts and statistics collected together for reference or analysis

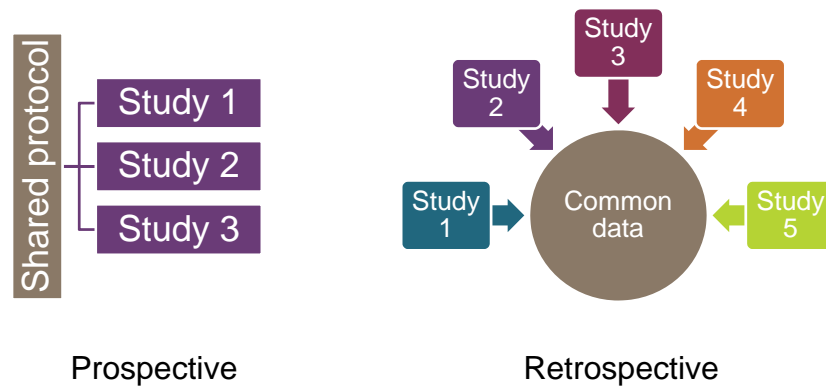
To harmonise:

1. To add notes to (a melody) to produce harmony.
2. Produce a pleasing visual combination.
3. Make consistent or compatible.

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Prospective vs. retrospective data harmonisation



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Advantages of retrospective data harmonisation

- Enables co-analysis of data that was acquired
 - Using diverse methods
 - In diverse settings or populations.
- Combining data in this way can provide:
 - Greater heterogeneity
 - Fair comparison between countries
 - Increased statistical power to investigate weak or complex associations, or in subgroups
 - Extended scientific impact relative to individual study analyses
 - Opportunity to study influence of context or national policy

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Key challenge of data harmonisation

Satisfactory harmonisation
Inferential equivalence

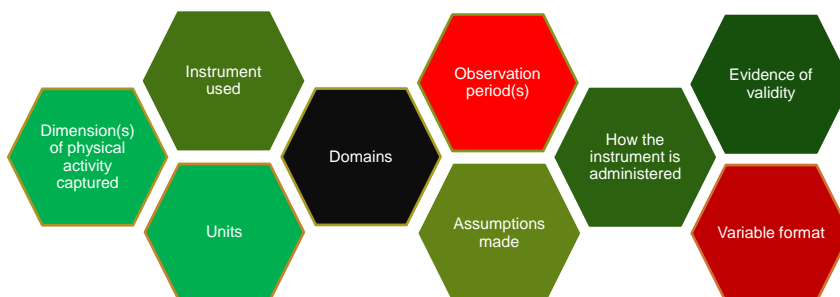
Include multiple sources



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Assessing harmonisation potential: meta-data



Important to not only record meta-data, but also to consider which aspects of the method affect **inferential equivalence**

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It is possible and impactful...



Moderate to Vigorous Physical Activity and Sedentary Time and Cardiometabolic Risk Factors in Children and Adolescents

Context: Sparse data exist on the combined association of sedentary time with cardiometabolic risk factors.
Objective: To examine the independent and combined association of objectively measured time in moderate- to vigorous-intensity sedentary time with cardiometabolic risk factors.
Design, Setting, and Participants: Pooled data from 2007 and 2009 comprising 20 871 children (aged 4-18 years) from the International Children's Accelerometry Database. Time spent in MVPA was measured using accelerometry after reanalyzing raw data between time in MVPA and sedentary time, with outlier analysis. Participants were stratified by tertiles of MVPA.

Goodman et al. *International Journal of Behavioral Nutrition and Physical Activity* 2014, 11:84
<http://www.ijbnpa.org/content/11/1/84>



RESEARCH Open Access

Daylight saving time as a potential public health intervention: an observational study of evening daylight and objectively-measured physical activity among 23,000 children from 9 countries

Anna Goodman^{1,2}, Angie S Page² and Ashley R Cooper^{1,3} for the International Children's Accelerometry Database (ICAD) Collaborators

Journal of Science and Medicine in Sport
 Contents lists available at ScienceDirect
 Journal homepage: www.elsevier.com/locate/jssm

Original research
Equating accelerometer estimates among youth: The Rosetta Stone 2
 Keith Brazendale^{1,2}, Michael W. Beets³, Daniel B. Bornstein⁴, Justin B. Moore⁵, Russell R. Pate⁶, Robert G. Weaver⁷, Ryan S. Falck⁸, Jessica L. Chandler⁹, Lars B. Andersen¹⁰, Sigmund A. Andersen¹¹, Greet Cardon¹², Ashley Cooper¹³, Rachel Davey¹⁴, Karsten Froberg¹⁵, Pedro C. Hallal¹⁶, Kathleen F. Janz¹⁷, Katarzyna Kordas¹⁸, Susi Kriemler¹⁹, Jardena J. Puder²⁰, John J. Reilly²¹, Jo Salmon²², Luis B. Sardinha²³, Anna Timperio²⁴, Esther M.F. van Sluijs²⁵. On behalf of the International Children's Accelerometry Database (ICAD) Collaborators

International Journal of Obesity (2016) 42:1639-1650
<https://doi.org/10.1038/s41366-016-0152-6>

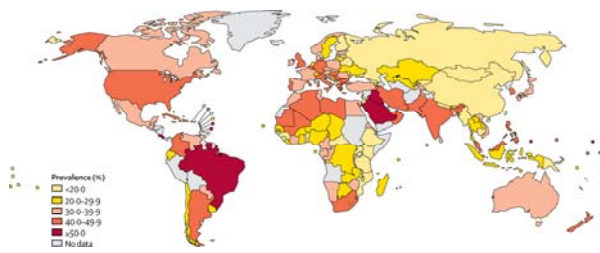
Physical activity intensity, bout-duration, and cardiometabolic risk markers in children and adolescents

Jakob Tarp^{1,2}, Abbey Child³, Tom White⁴, Kate Westgate⁵, Anna Bugge⁶, Anders Grantved⁷, Niels Wedderkopp⁸, Lars B. Andersen⁹, Greet Cardon¹⁰, Rachel Davey¹¹, Kathleen F. Janz¹², Susi Kriemler¹³, Kate Northstone¹⁴, Angie S. Page¹⁵, Jardena J. Puder¹⁶, John J. Reilly¹⁷, Luis B. Sardinha¹⁸, Esther M. F. van Sluijs¹⁹, Ulf Ekelund²⁰, Katrien Wijndaele²¹, Soren Brage²². On behalf of the International Children's Accelerometry Database (ICAD) Collaborators

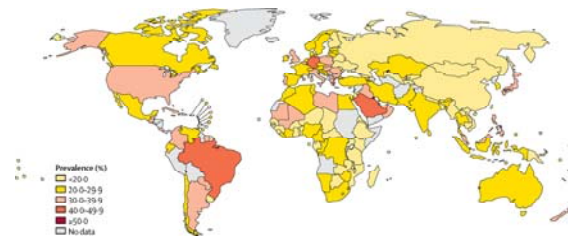
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Including for surveillance...

Women



Men



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Guthold et al, *Lancet* 2018

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...but it is also challenging

Open Access **Research**

BMJ Open Identifying and sharing data for secondary data analysis of physical activity, sedentary behaviour and their determinants across the life course in Europe: general principles and an example from DEDIPAC

Jeroen Lakerveld,¹ Anne Loyen,¹ Fiona Chun Man Ling,^{2,3,4} Marieke De Craemer,⁵ Hidde P van der Ploeg,⁶ Donal J O'Gorman,⁷ Angela Carlin,² Laura Caprinica,⁸ Joeri Kalter,¹ Jean-Michel Oppert,⁹ Sebastian Chastin,¹⁰ Greet Cardon,⁵ Johannes Brug,^{1,11} Ciaran MacDonncha²

Rumbold and Pierscionek *BMC Medical Ethics* (2017) 18:27
DOI 10.1186/s12910-017-0194-y

BMC Medical Ethics

DEBATE **Open Access**

A critique of the regulation of data science in healthcare research in the European Union

John M. M. Rumbold¹ and Barbara K. Pierscionek^{2*}

MRC Epidemiology Unit *Lakerveld et al. BMJ Open 2017; Rumbold & Pierscionek, BMC Med Eth 2017* #ispahDataCam18

ISPAH Data harmonisation satellite

Objective:

- To create a platform for discussions around retrospective harmonisation of activity data globally.

Aims:

- To introduce the research community to the value of, and need for, activity data harmonisation.
- To create an understanding of the opportunities and challenges through sharing best practice.
- To enable networking between those interested in activity data harmonisation.
- To discuss future opportunities.

Programme for today

9.00	<i>Refreshments and registration</i>
9.30	Welcome
9.45	Introduction (context and rationale) (WHO) (Fiona Bull)
10.15	Objectively-measured PA data (Ulf Ekelund)
11.00	<i>Break with refreshments</i>
11.15	Reported PA data (Andy Atkin)
12.00	Area-level PA data (Rahul Goel)
12.30	<i>Lunch followed by guided walking tour Cambridge City Centre (tours leave 13.00)</i>
14.15	Methodological challenges and potential solutions (Soren Brage)
15.00	Legal, ethical, and governance challenges and potential solutions (Esther van Sluijs)
15.30	<i>Break with refreshments</i>
16.00	New ways to collaborate - federated analysis (Tom Bishop)
16.45	Plenary discussion & summary
17.30	Close
19.00	<i>Optional dinner in Cambridge</i>