

# Datos de la práctica real para la ETS

---

**Enrique Bernal-Delgado MD, PhD**  
Health Services and Policy Research Unit  
**[ebernal.iacs@aragon.es](mailto:ebernal.iacs@aragon.es)**

**IACS** Instituto Aragonés de  
Ciencias de la Salud

# DISTRUST

DISTRUST



**INSURERS & PAYERS vs. PHARMA, TECH & BRICK**



# THE TRADITIONAL APPROACH... DOES NOT HELP MUCH

**Tons of Systematic reviews,  
and...**

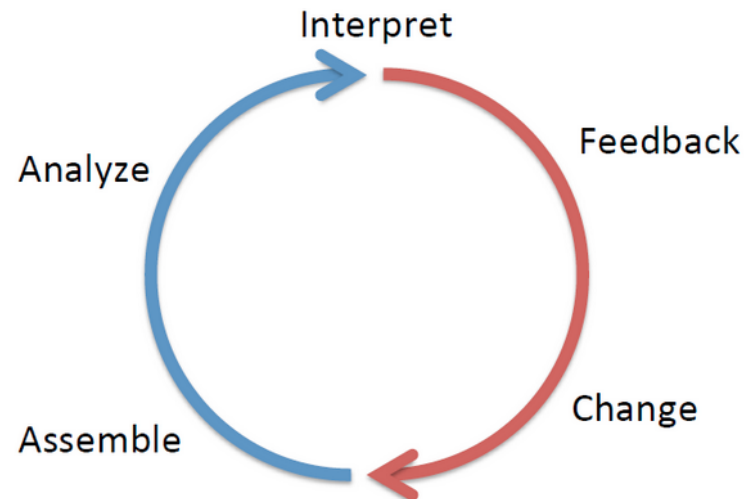
- a) Oesophageal biodegradable stent in benign conditions;
- b) Endobronchial valve in the treatment of persistent air leaks;
- c) Mitral clip percutaneous insertion in patients with severe mitral insufficiency refractory to usual treatment;
- d) Left atrial occlusion in patients with atrial fibrillation...



# AIMING COMMON TRUST

AIMING COMMON TRUST

A **Learning Healthcare System** is defined as a system in which, “**science, informatics, incentives, and culture are aligned for continuous improvement and innovation**, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral **by-product of the delivery experience**.”



# Value & Science-driven health care

- ▶ improve disease monitoring and tracking;
- ▶ better target medical services for improved health outcomes and cost savings;
- ▶ help inform both patients and clinicians to improve how they make decisions during clinical visits;
- ▶ avoid harm to patients and unnecessary costs associated with repeat testing and delivery of unsuccessful treatments; and
- ▶ accelerate and improve the use of research in routine medical care to answer medical questions more effectively and efficiently.

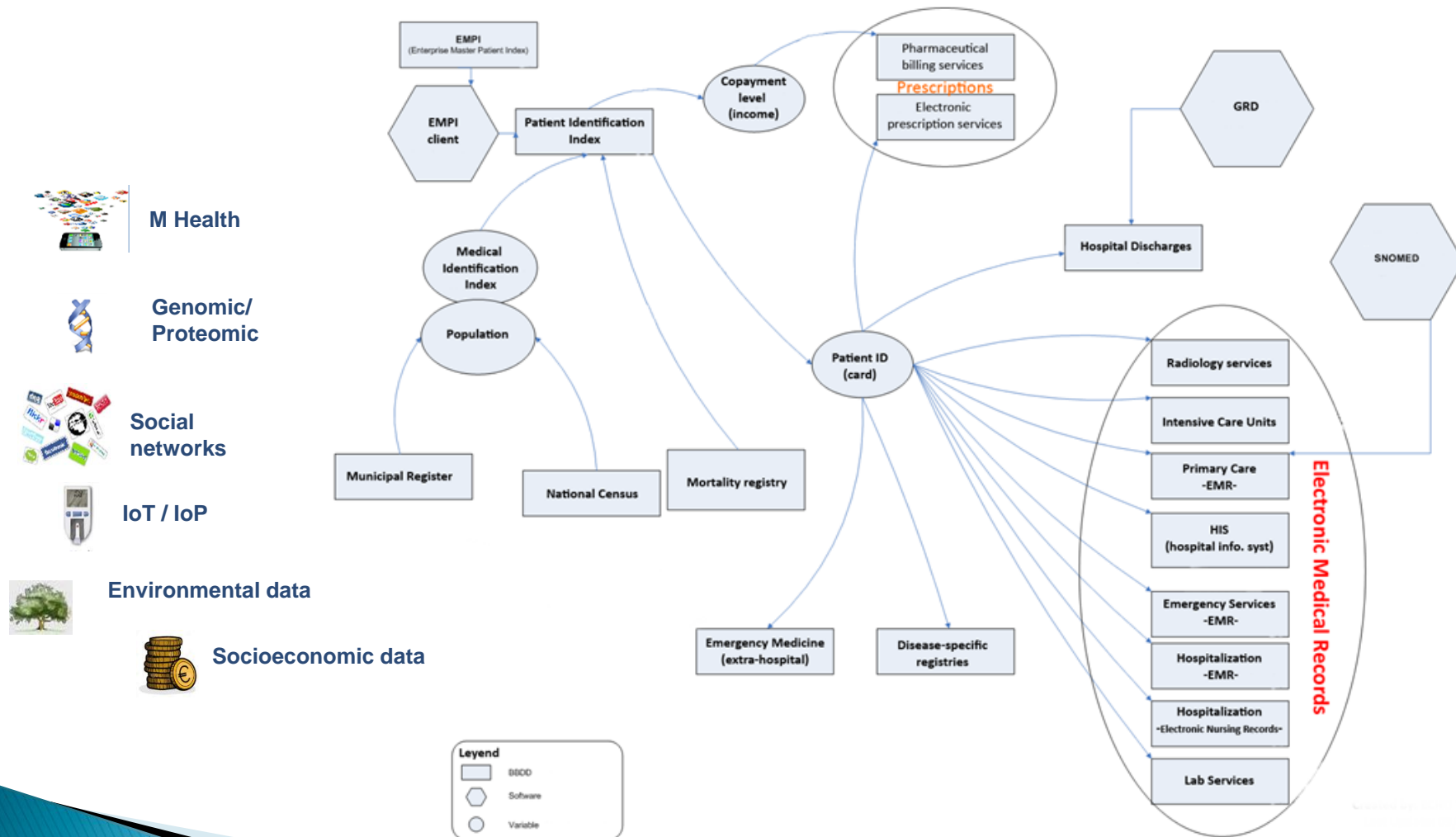
**IOM, 2015**

**REAL LIFE DATA LAKES ARE  
TRULY AN OPPORTUNITY**





# TYPICAL RW HEALTH DATA LAKE IN SPAIN



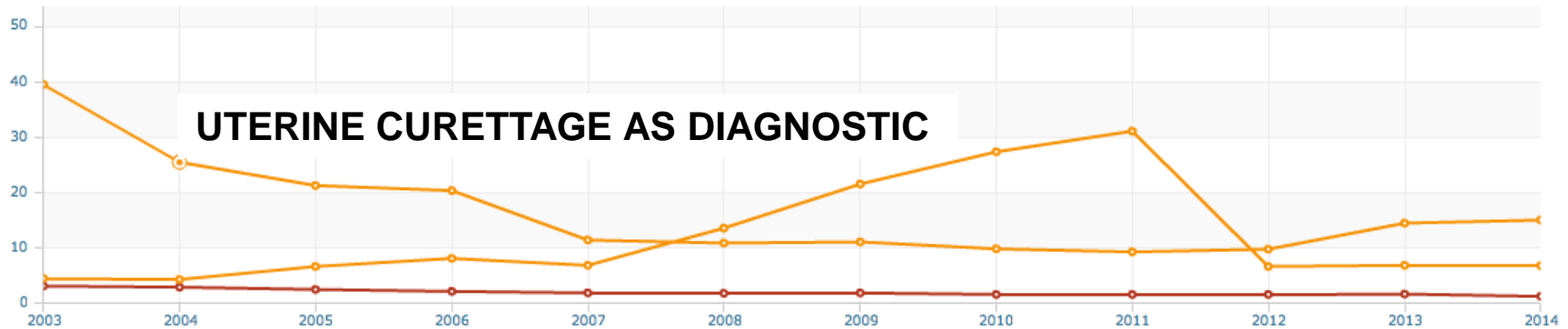
# MONITORING & BENCHMARKING, AND EVALUATIVE RESEARCH

TWO STRAIGHTFORWARD UTILITIES





# MONITORING & BENCHMARKING



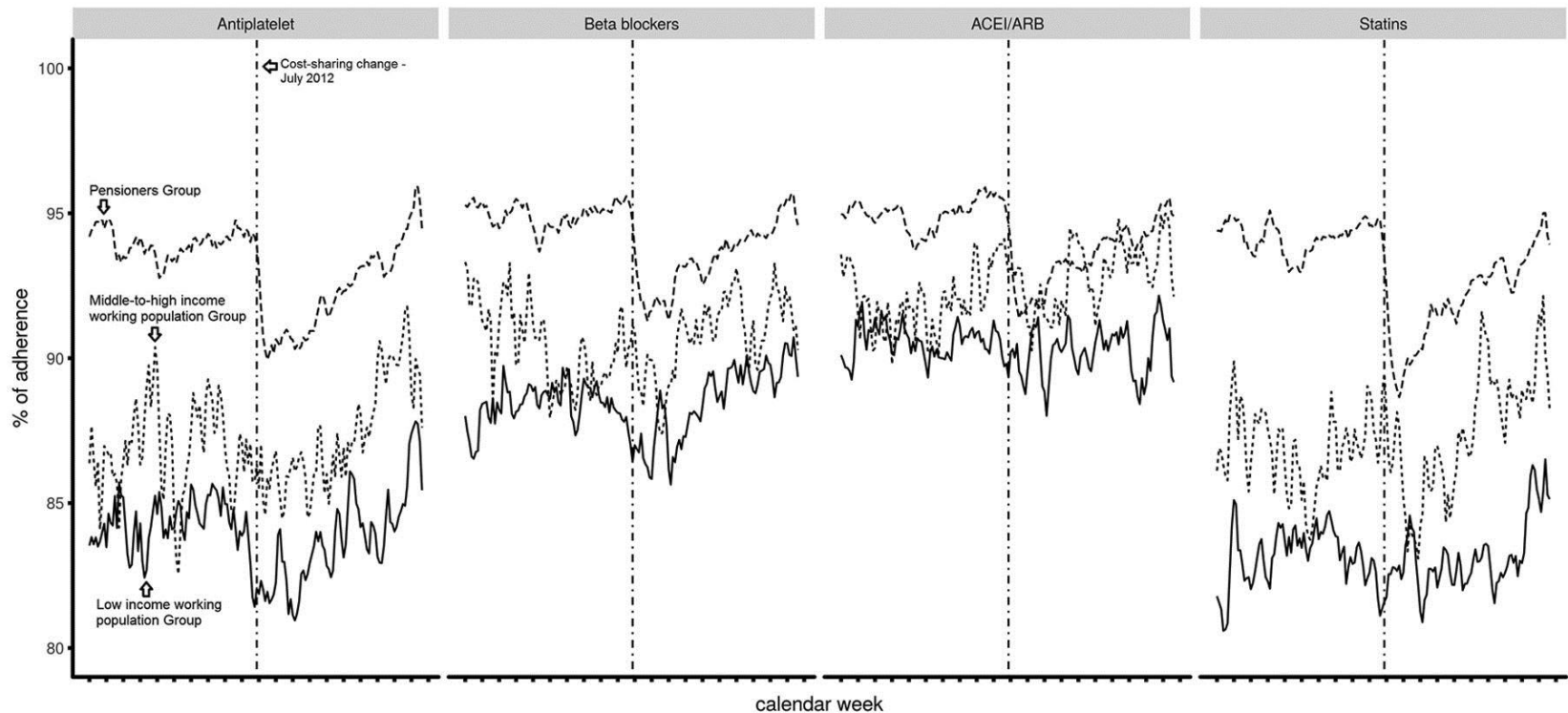
## LOWER-VALUE SURGICAL PROCEDURES: PROVIDERS PROFILING

▼ OBSTETRICIA						
Cesáreas en condiciones de bajo riesgo obstétrico sobre partos de bajo riesgo	Aragón-Zara...	12,75	36	10,79	2,02	48,52
Episiotomías sobre el total de partos vaginales en 2014	Aragón-Zara...	43,28	566	17,41	2,36	73,03
▼ PEDIATRÍA						
Adenoidectomía en niños en el 2014	Aragón-Zara...	9,03	21	8,05	1,82	46,32
Amigdalectomía con/sin adenoidectomía en niños en el 2014	Aragón-Zara...	7,7	0	9,81	0,89	69,23
Drenaje timpánico (Grommets) en niños en el 2014	Aragón-Zara...	0,97	0	6,31	0,82	42,95
▼ CIRUGÍA DE LA MANO						
Liberación del túnel carpiano en 2014	Aragón-Zara...	11,43	178	6,61	0,06	33,74
Cirugía del dedo gatillo en 2014	Aragón-Zara...	2,93	64	0,92	0,03	9,74
▼ GINECOLOGÍA						
Legrado como diagnóstico en 2014	Aragón-Zara...	1,21	0	1,24	0,07	45,85
▼ CARDIOLOGÍA						
Ablación cardiaca en 2014	Aragón-Zara...	0,22	0	0,68	0,04	4,27

# EVALUATIVE RESEARCH



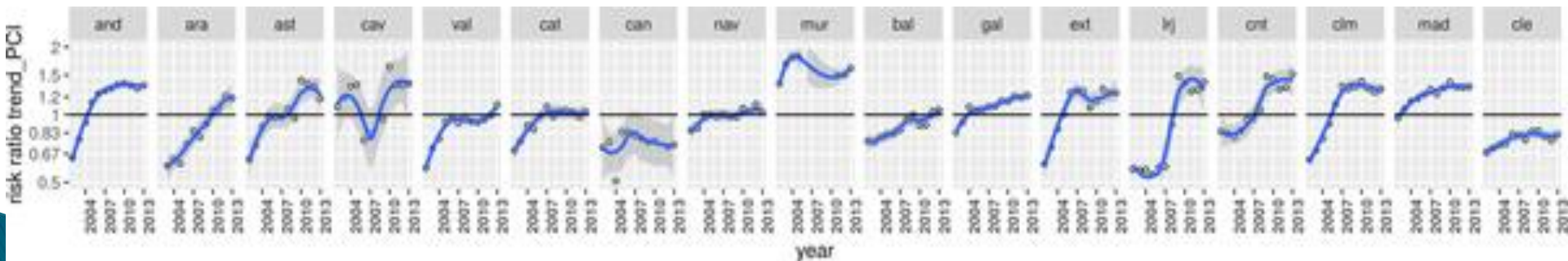
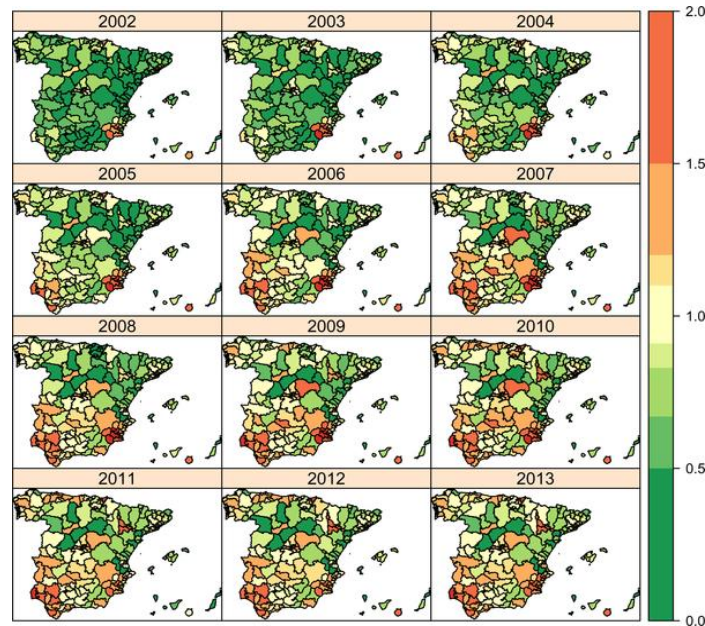
# CONTEXTUAL INTERVENTIONS EFFECT ON THE APPROPRIATE USE OF TECHNOLOGIES



CER Weekly rates of adherence for the drugs considered for the three cohorts. ACEI, ACE inhibitor; ARB, angiotensin II receptor blocker; IN Beatriz González López-Valcárcel et al. Heart doi:10.1136/heartjnl-2016-310610

# DIFFERENTIAL ADOPTION OF NEW TECHNOLOGIES

Space-time relative utilization for Percutaneous Coronary Intervention (PCI)



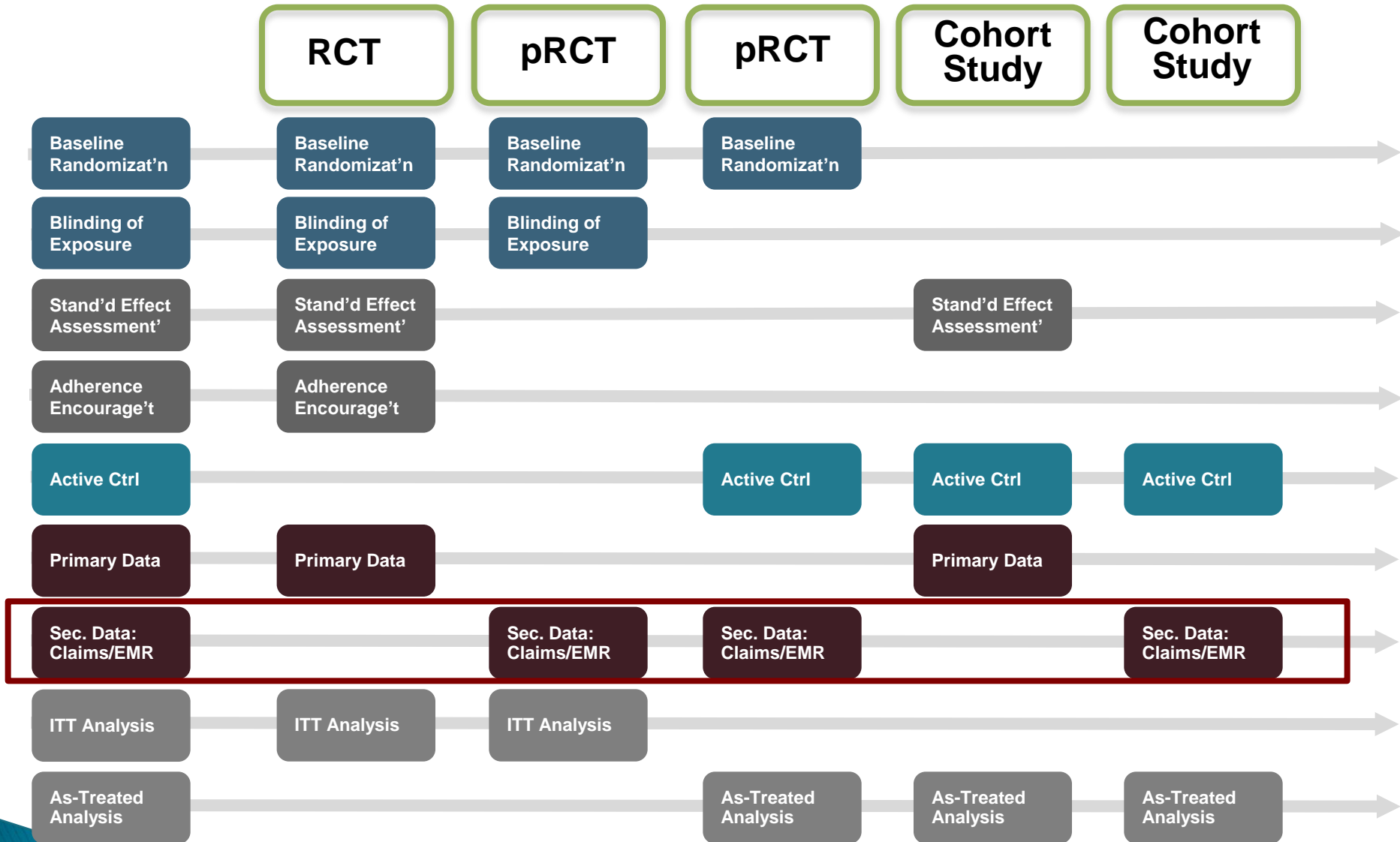
Librero J, Ibañez B, Martínez-Lizaga N, Peiró S, Bernal-Delgado E, et al. (2017) Applying spatio-temporal models to assess variations across health care areas and regions: Lessons from the decentralized Spanish National Health System. PLOS ONE 12(2): e0170480.  
<https://doi.org/10.1371/journal.pone.0170480>

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0170480>

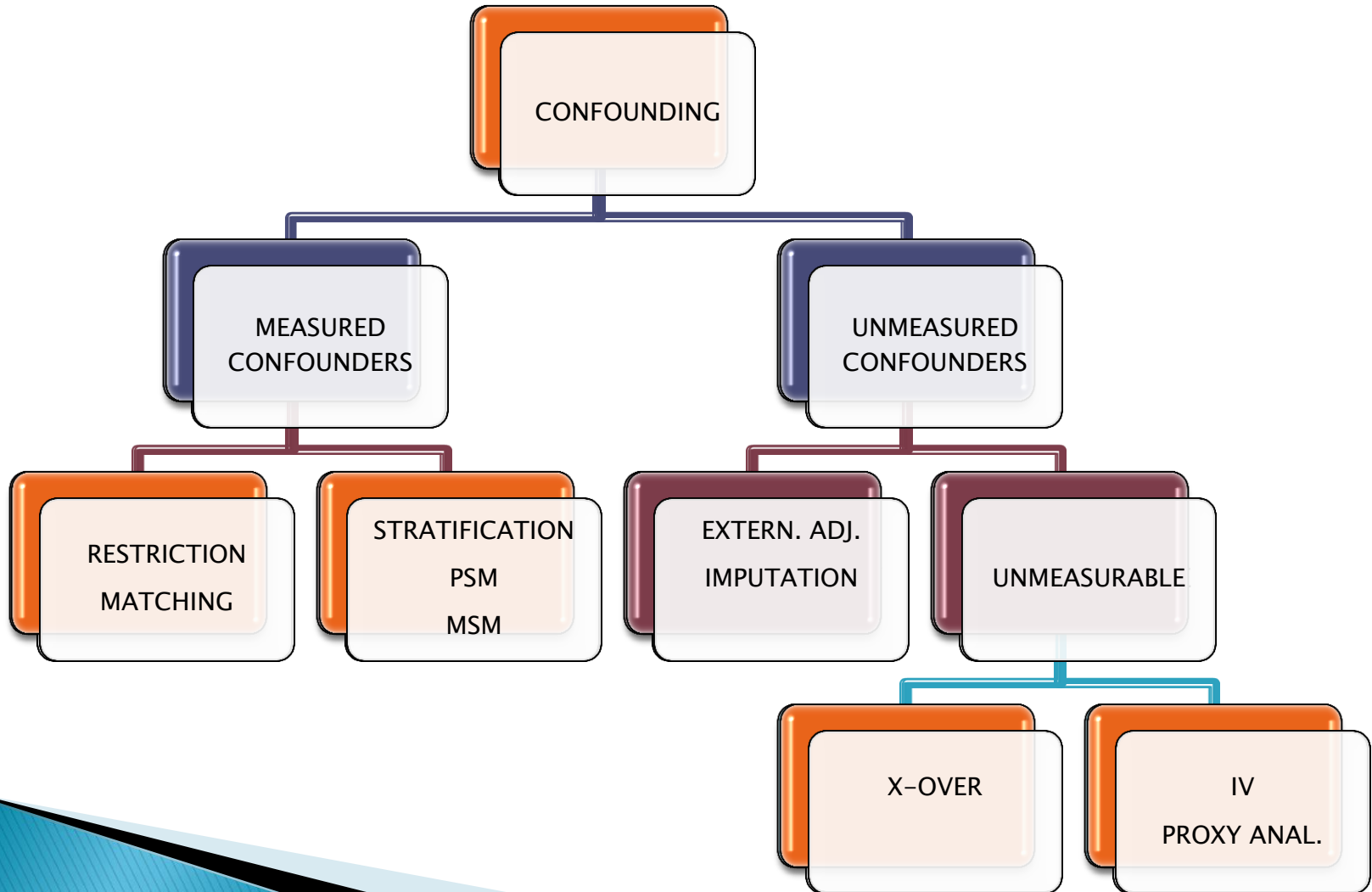


# METHODOLOGICAL CHALLENGES

REAL DATA DESIGNS  
FLAWS AND REMEDIES



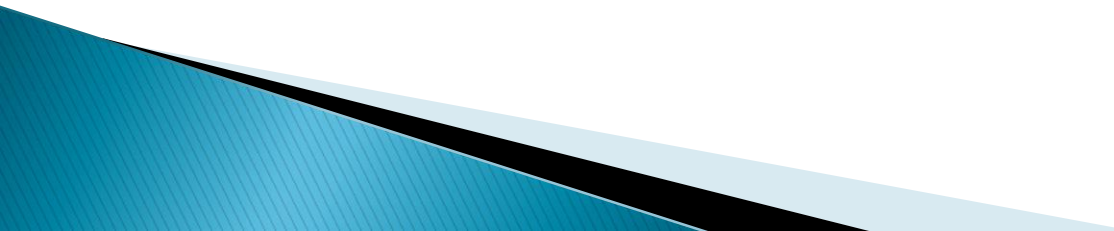
# FLAWS & REMEDIES

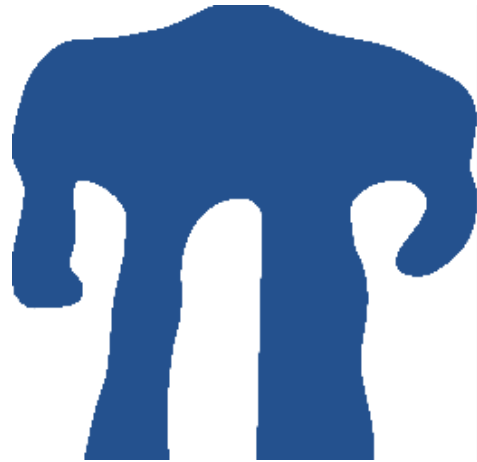


**BUT...**



# Providing high-value out of real life data to enrich health systems ALSO requires:

- ▶ High-speed processing and rapid-cycle reporting
  - ▶ Actionable feedback to end users.
  - ▶ Incentives alignment:
    - Joint learning culture
    - Psychological safety
    - Learning-why, learning how activities
    - Senior leadership
- 

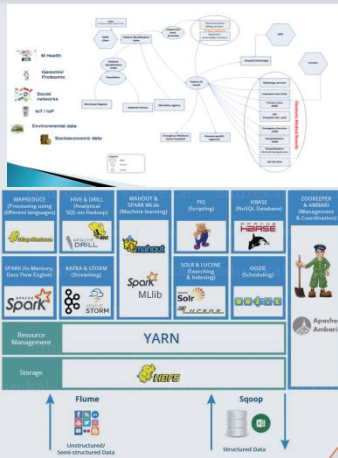


# BIGAN

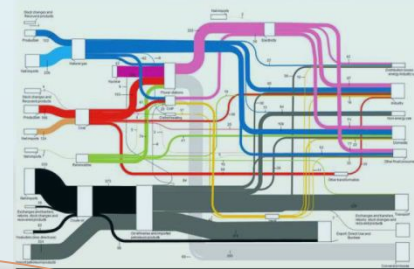
THE IACS BIG DATA COLLABORATIVE  
FOR THE DEVELOPMENT OF A  
LEARNING HEALTH SYSTEM

# BIGAN IS

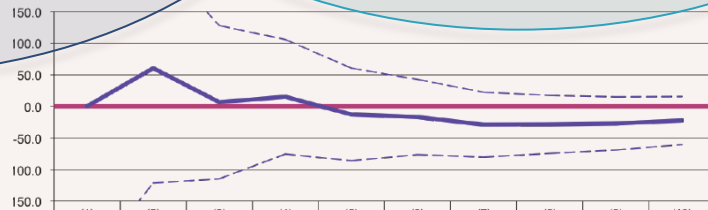
## DATA MOTION



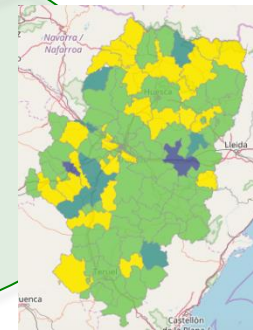
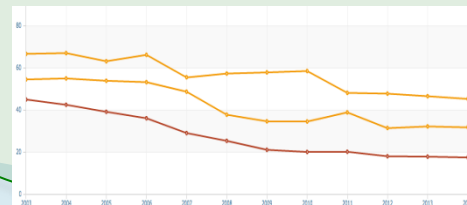
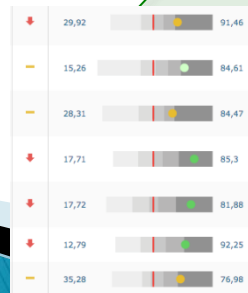
## PROCESS MINING



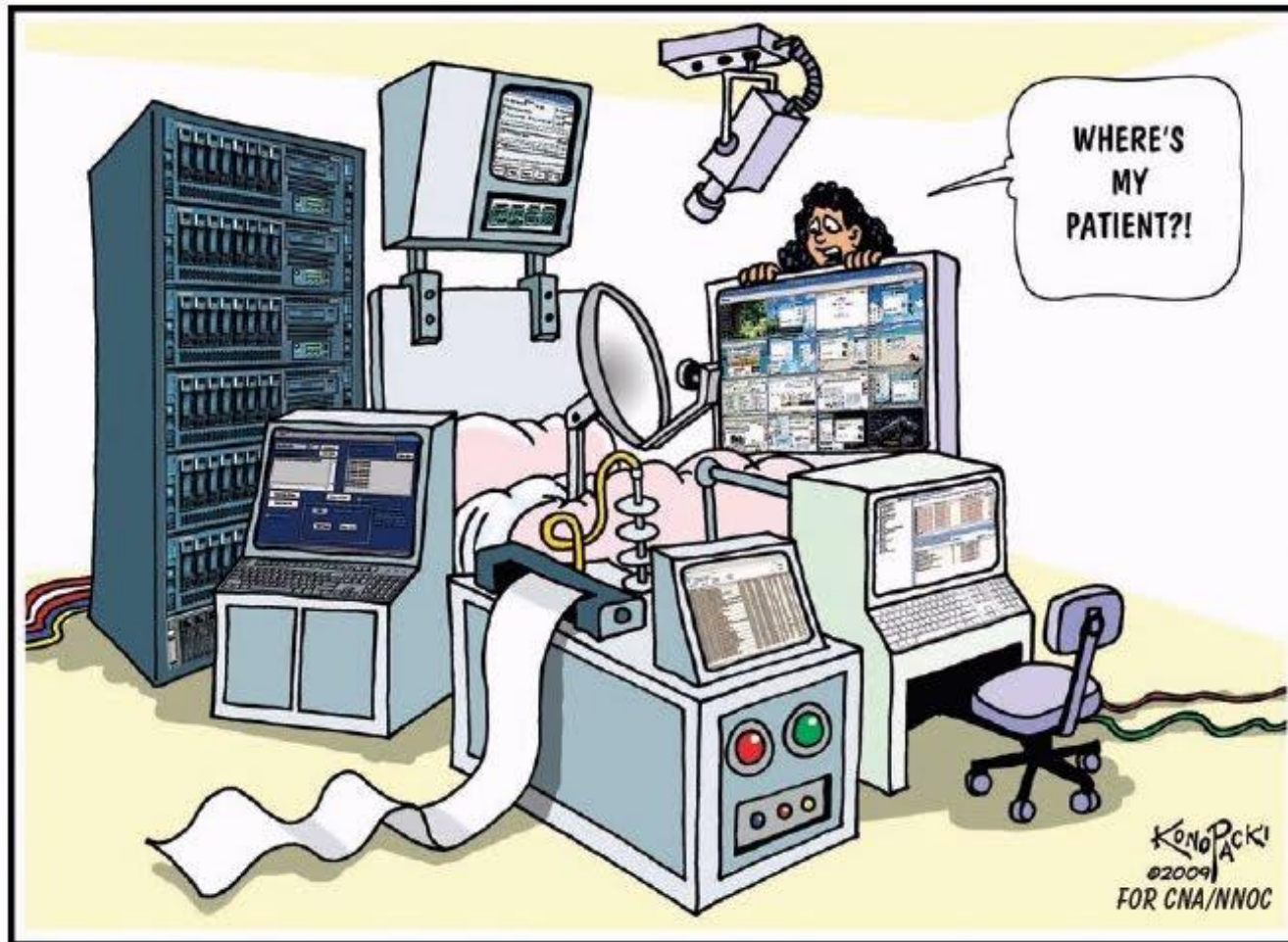
## DATA SCIENCE



## CONTINUOUS INTERACTIVE REPORTING



# Where is my patient?







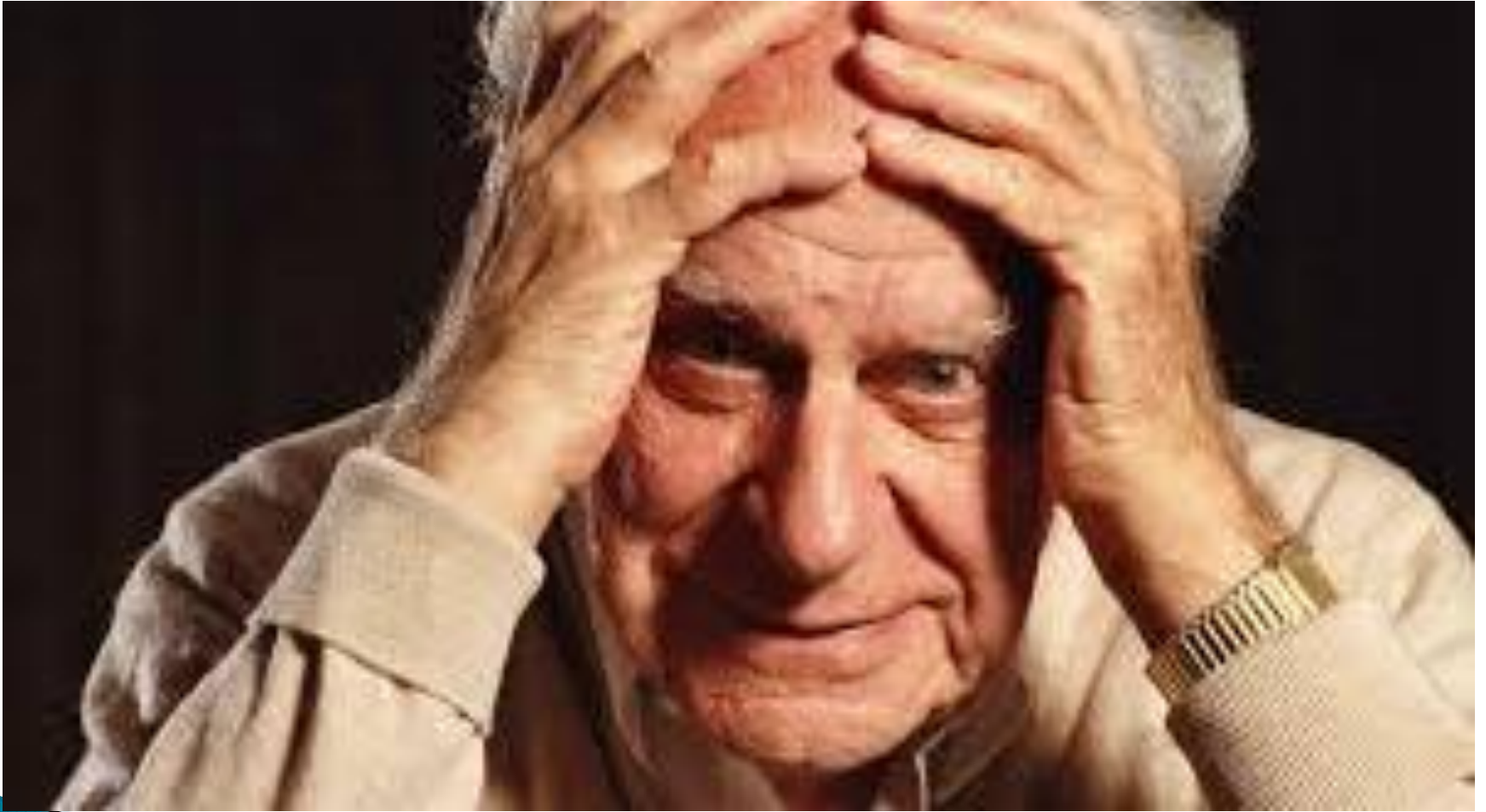
YOU

CAN

TRUST

GOVERNMENT!

# Popper's headache





# Big Data & Health in H2020

---

**Enrique Bernal-Delgado MD, PhD**  
Health Services and Policy Research Unit  
**[ebernal.iacs@aragon.es](mailto:ebernal.iacs@aragon.es)**

 **Instituto Aragonés de  
Ciencias de la Salud**