

# The Need for a Common Language in Non-Pharmacological Interventions (NPIs)

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University of Montpellier, France

CEPS Platform, Methodology Platform for NPIs

CEPS  
PLATFORM

[www.CEPSplatform.eu](http://www.CEPSplatform.eu)



## One example among many

The screenshot shows the Cochrane Library website interface. At the top, there is a navigation bar with the Cochrane Library logo, the tagline 'Trusted evidence. Informed decisions. Better health.', a search bar with the text 'Search title, abstract, keyword', and links for 'Cochrane.org', 'Log in / Register', 'Browse', and 'Advanced Search'. Below the navigation bar is a purple menu bar with links for 'Cochrane Reviews', 'Trials', 'More Resources', 'About', and 'Help'. The main content area displays the article title 'Psychological interventions for women with non-metastatic breast cancer' under the heading 'Cochrane Database of Systematic Reviews'. The article is categorized as a 'Review' and 'Intervention'. The authors listed are Ghufuran A Jassim, David L Whitford, Anne Hickey, and Ben Carter. The article was first published on 28 May 2015 and was assessed as up-to-date on 16 May 2013. The editorial group is the Cochrane Breast Cancer Group. The DOI is 10.1002/14651858.CD008729.pub2. There are icons for PDF and Info on the left, and a text size adjustment icon on the right.

*“These findings are open to criticism because of the notable heterogeneity across the included studies and the shortcomings of the included studies.”*

Jassim et al. (2015, Cochrane Database Syst Rev)

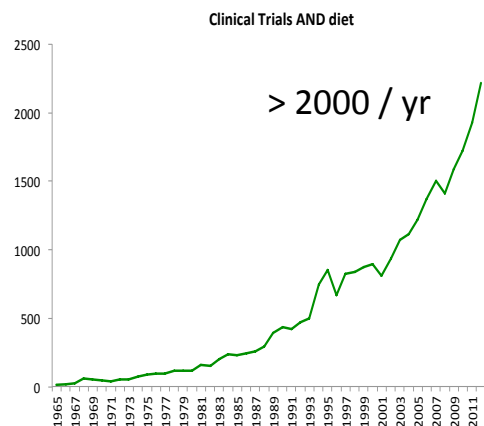
**I am a trialist**

ETP-BPCO RCT (disease management education / COPD / cost-efficacy): 2002-11	10 years
<i>Ninot et al. (2011, Respiratory Medicine)</i>	
APAC RCT (exercise / tobacco dependence / smoking cessation): 2009-14	5 years
<i>Bernard et al. (2015, Journal of Dual Diagnosis)</i>	
Actimarche RCT (exercise / elderly / fall): 2010-15	6 years
<i>Bernard et al. (2016, Aging Clinical and Experimental Research)</i>	
APAD RCT (exercise / breast cancer / fatigue): 2010-16	7 years
<i>Carayol et al. (2013, Contemporary Clinical Trials)</i>	
Challenge international RCT (exercise / breast / disease free survival at 10 years): 2014-30	17 years
<i>Courneya et al. (2014, Current Colorectal Cancer Reports)</i>	

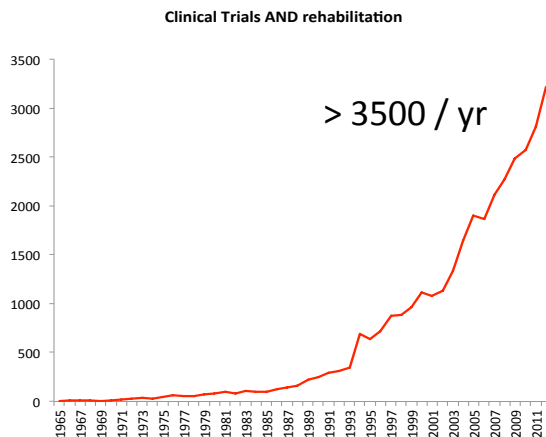
**I am a meta-analyst and reviewer**

Review (post-rehab interventions / COPD / health and HRQL): <10% trials included: 2006-07	2 years
<i>Moullec et al. (2007, Revue des Maladies Respiratoires)</i>	
Meta-analysis (exercise / breast cancer / fatigue and anx-dep): <1% trials included: 2012-13	2 years
<i>Carayol et al. (2013, Annals of Oncology)</i>	
Meta-analysis (theory based interventions / adults / exercise): <10% trials included: 2013-16	4 years
<i>Gourlan et al. (2016, Health Psychology Review)</i>	
Review (exercise / chronic disease / health and HRQL): <5% trials included: 2015-16	2 years
<i>Collective Expertise INSERM (2016, INSERM)</i>	

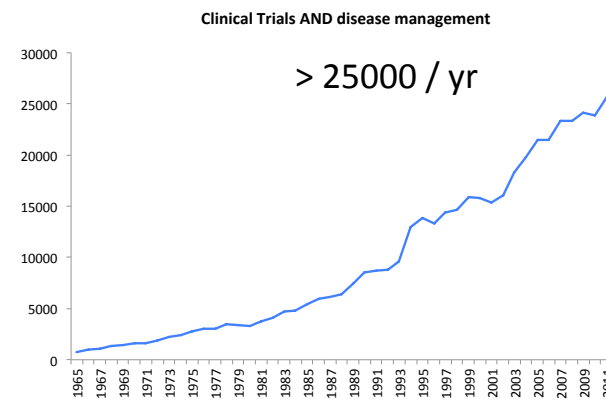
## As well as so many researchers in the world



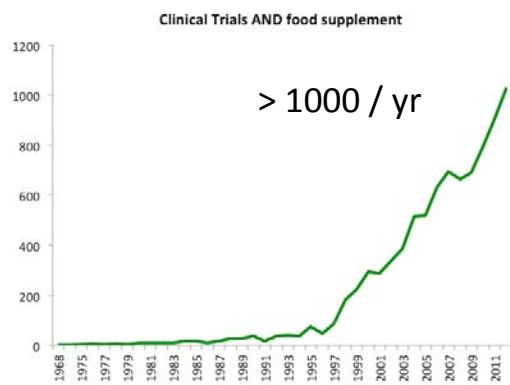
Diet



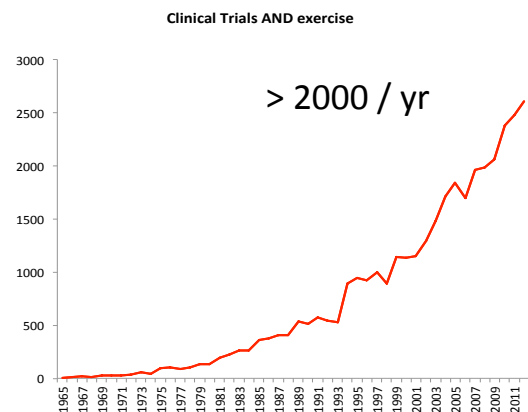
Physical Rehabilitation



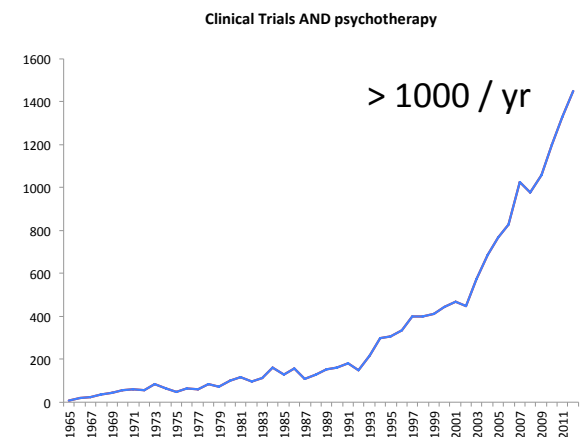
Therapeutic Education



Food Supplement



Exercise Program



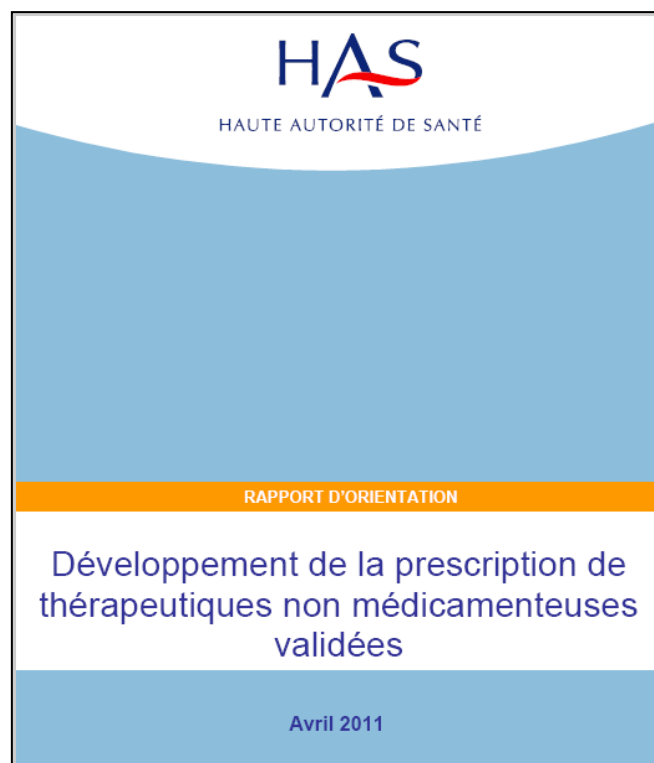
Psychotherapy

Since 2000, an exponential growth of publications citing clinical trial and a NPI categories

## Nevertheless, Health Authorities are still waiting for Evidence of NPI Efficacy.

« **In light of the standards usually applied to evaluate the efficacy of medical treatments**, most studies assessing the efficacy of non-pharmacological therapies [*hygiene and dietary practices, psychological treatments, physical therapies*] suffer from **methodological weaknesses**.»

French Health Authority – HAS (April 2011, p.40)



**Thus,  
as a clinical researcher, I am frustrated**

**But,  
as a citizen and patient...**

## Pharmacies



1986



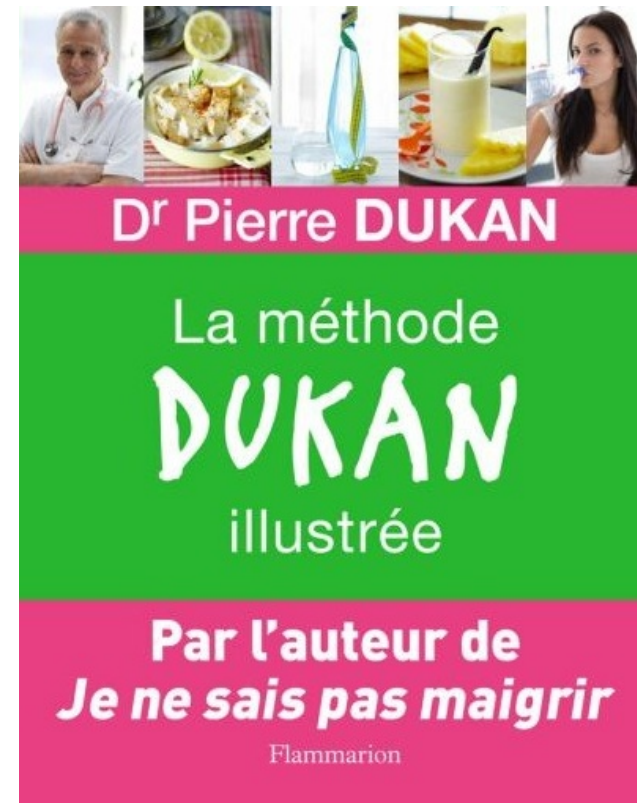
(e.g., supplementary food, e-health device)

2016

## Diets



1986



2016



## Health devices



1986



2016

## Psychotherapies



1986



2016

## Exercise programs

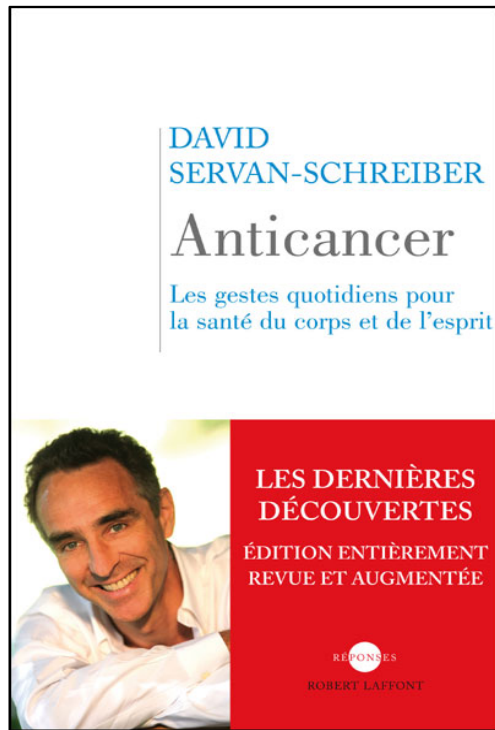


1986

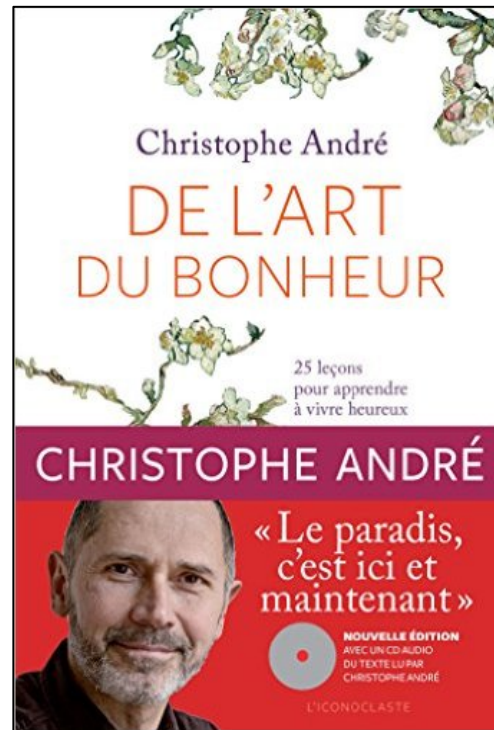


2016

## An Explosion of Self-help Health Best-sellers



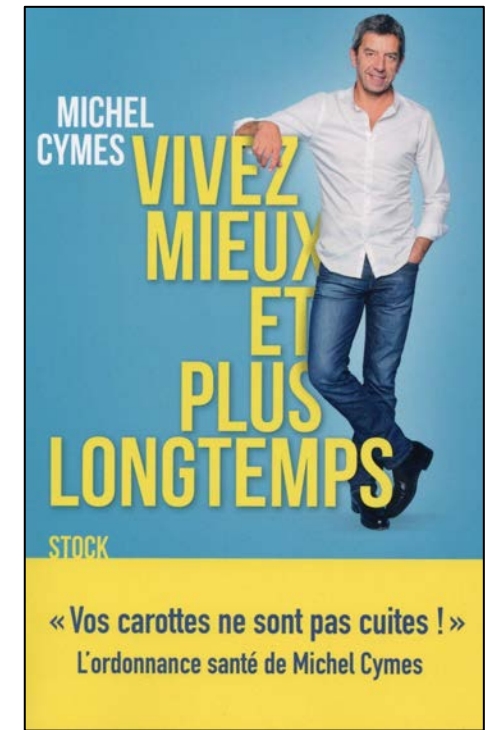
2010



2011



2013



2016

## Propagated Extensively by the Media and the Internet



Making patients more less naïve...

- ... but paradoxically, more vulnerable to:
- abuse (e.g., sects, dangerous practices, etc.),
- misinformation (e.g., Marketing vs. Science).

## Refusing to act for one's own health ("laissez faire")



## Acting for one's own health by putting it into the hands of others (God, gurus, etc.)



Oldest School of  
Medicine in Europe  
Montpellier  
France



Saint-Roch  
Church  
Montpellier  
France

## Acting for one's own health with Non-Pharmacological Interventions (NPIs)



Nutritional  
interventions

Body  
Interventions

Psychological  
Interventions

## Complementary or alternative to conventional treatments?

(e.g., drug, gene/cell therapy, surgery, implantable devices, radiotherapy)

In which goal? CURE, CARE or PREVENT

## Defining NPIs

- primary prevention actions
- secondary prevention actions
- tertiary prevention actions
- technical and technological aids
- health claims
- medical devices
- non-pharmacological interventions**
- alternative medicine
- Chinese medicine
- complementary medicine
- behavioral medicine
- natural medicine
- traditional medicine
- Internet of Things (IoT, mHealth)
- health products
- health services
- adjuvant therapy
- supportive care
- eHealth
- non-conventional therapy
- non-pharmacological therapy
- complementary therapy
- complementary treatments
- non-pharmacological treatments





## A Definition

*“NPIs are non-invasive **methods** of care (programs, products or services) whose **efficacy in improving the health and quality of life** of human beings has been proven. Their effects on health and quality of life markers are observable (with measured risks and benefits beyond mere user opinions) and can be linked to **identified biological and/or psychosocial processes**. They can also have a positive impact on health behaviours and socio-economic indicators.”*

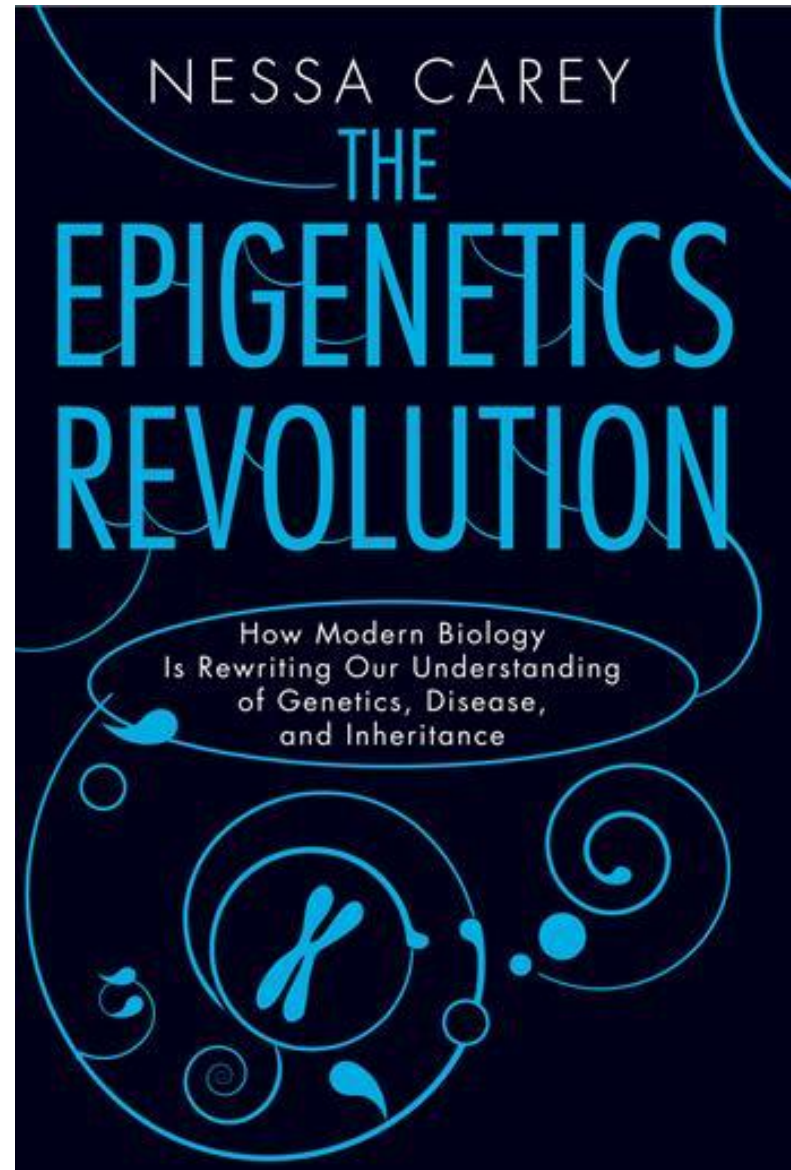
*CEPS Platform, April 2016*

CEPS  
PLATFORM

# **UNPRECEDENTED NPI GROWTH SINCE 2010:**

## **MAIN REASONS**

**1. Epigenetics research has evidenced the impact of the environment on human biology.**



## 2. The results of the first human cohorts over a 60-year period have shown the impact of behaviors on the advent of diseases and their related complications.

### Smoking and Food Behaviors



Minus 7 years of life expectancy

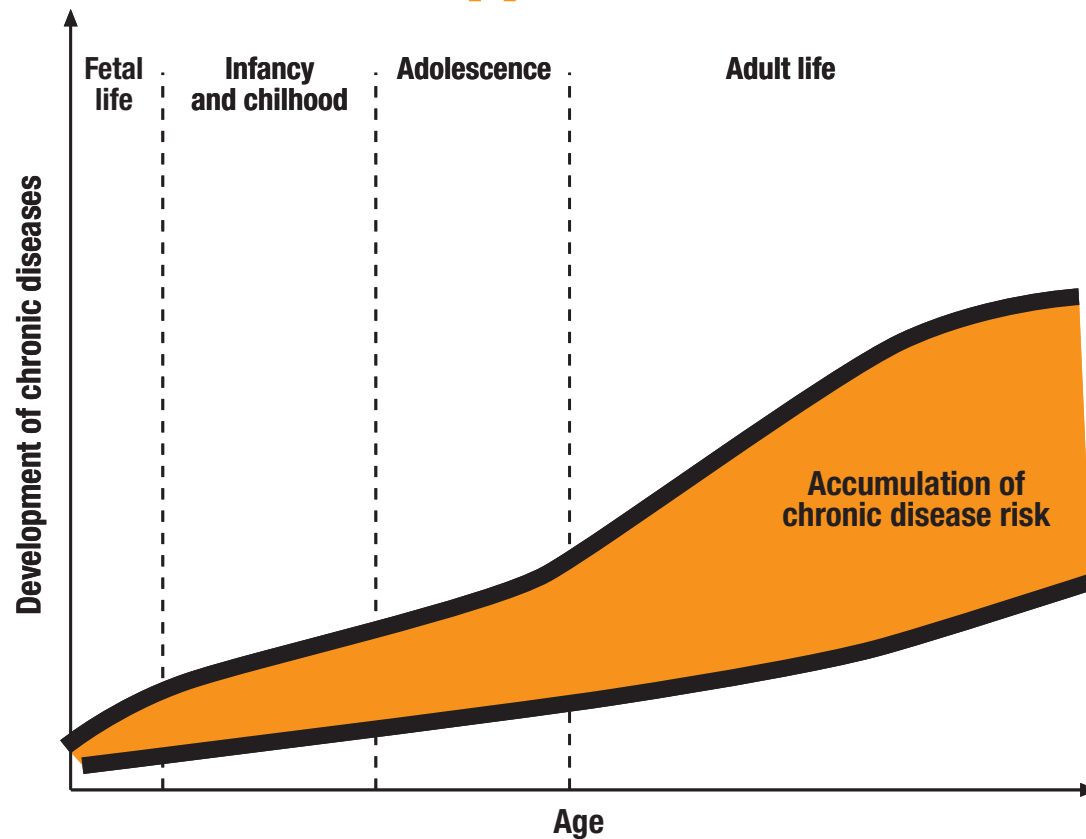
### Sedentary Behaviors



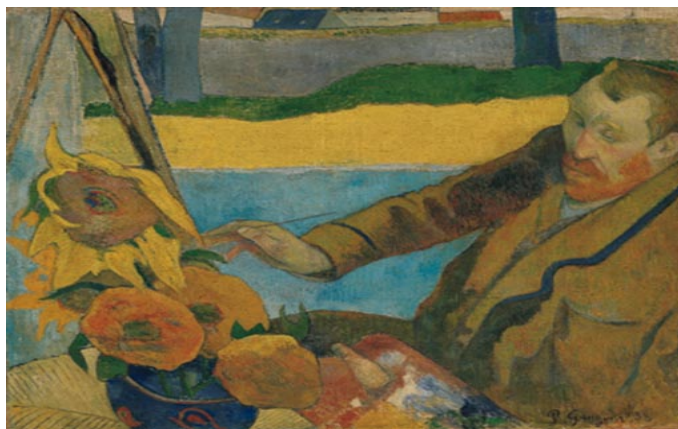
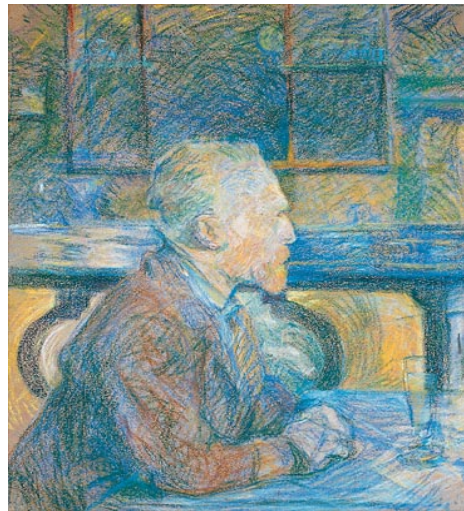
3-5 km per day in 2016 vs. 21-35 in 1900

### 3. Global population aging and therapeutic advances have led to the exponential growth of chronic diseases.

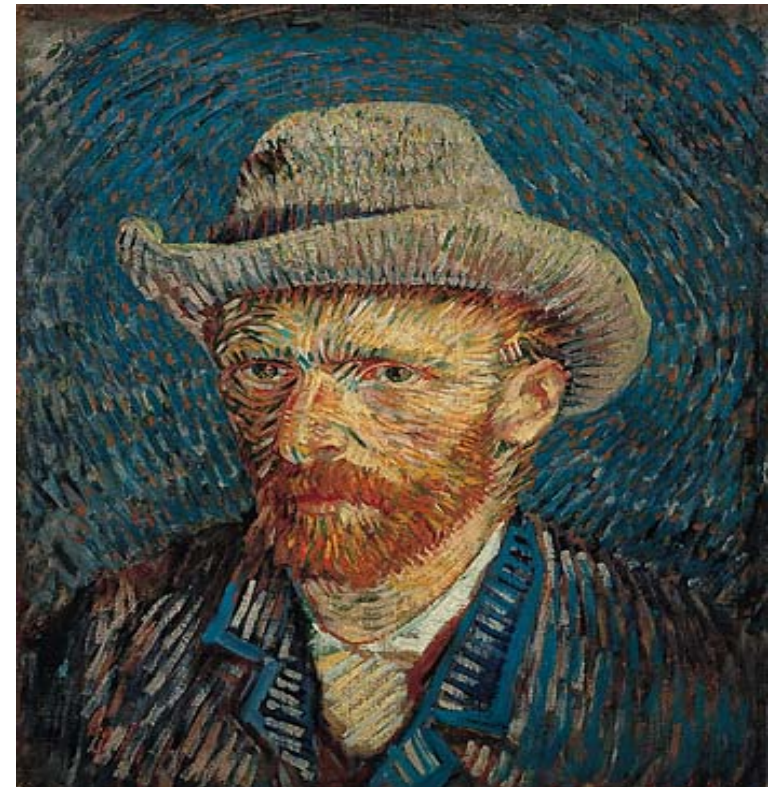
## A life course approach to chronic diseases



**4. Patients and relatives increasingly demand that patients' quality of life be improved – and not just genetic/cell/organ treatment performance.**



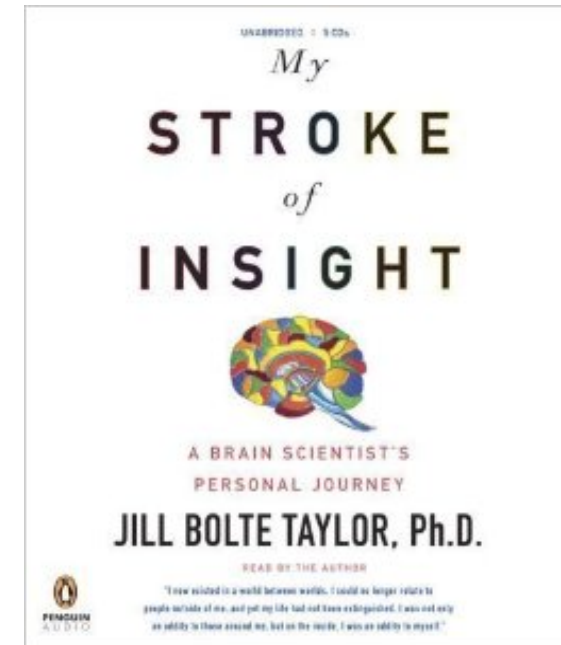
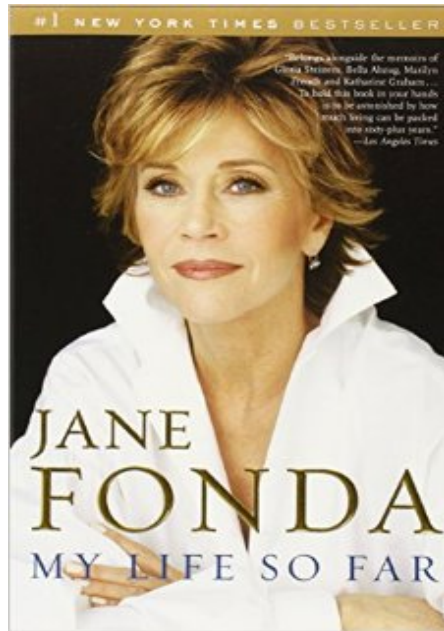
Expert opinion



Patient opinion

Addington-Hall et Kalra (2001, *Brit Med J*)

## 5. Resilience for healthy aging and better life with a chronic disease.



Robert Marchand, 102 years young, pedaled his bike around a velodrome a distance of 26.9 kilometers (16.7 miles) in one hour, establishing a centenarian record.



Bolte Taylor (2008)

## 6. Clinical studies have highlighted direct and indirect savings linked to the use of NPIs.

RCT assessing COPD case manager:

Improvement of health markers and quality of life

Cost savings

**Table 3—Health-Care Resources, Mean Costs per Patient\***

Items	Unit Cost, \$	Usual Care Group (n = 95)		Self-management Group (n = 96)		Difference per Patient, \$
		No.	Cost, \$	No.	Cost, \$	
Physician visits						
Family physician	44.3 (per visit)	112	47	46	19	− 28
Specialist	81.5 (per visit)	26	22	24	20	− 2
Emergency department visits						
For acute exacerbation	226 (per visit)	161	383 ± 540	95	224 ± 461	− 159
For other health problems	226 (per visit)	74	176 ± 313	57	134 ± 229	− 42
Hospitalizations						
For acute exacerbation	NIRRU index†	117	3,934 ± 5,919	71	2,099 ± 4,440	− 1,835
For other health problems	NIRRU index†	50	2,112 ± 4,490	20	840 ± 2,240	− 1,272
Total			6,674 ± 8,946		3,336 ± 5,435	

\*Data are presented as mean ± SD unless otherwise indicated.

†Index of hospital health resources utilization.<sup>18</sup>

# CHEST

Official publication of the American College of Chest Physicians

## Economic Benefits of Self-Management Education in COPD

Jean Bourbeau, Jean-Paul Collet, Kevin Schwartzman, Thierry Ducruet, Diane Nault, Carole Bradley and the COPD axis of the Respiratory Health Network of the Fond de la recherche en santé du Québec

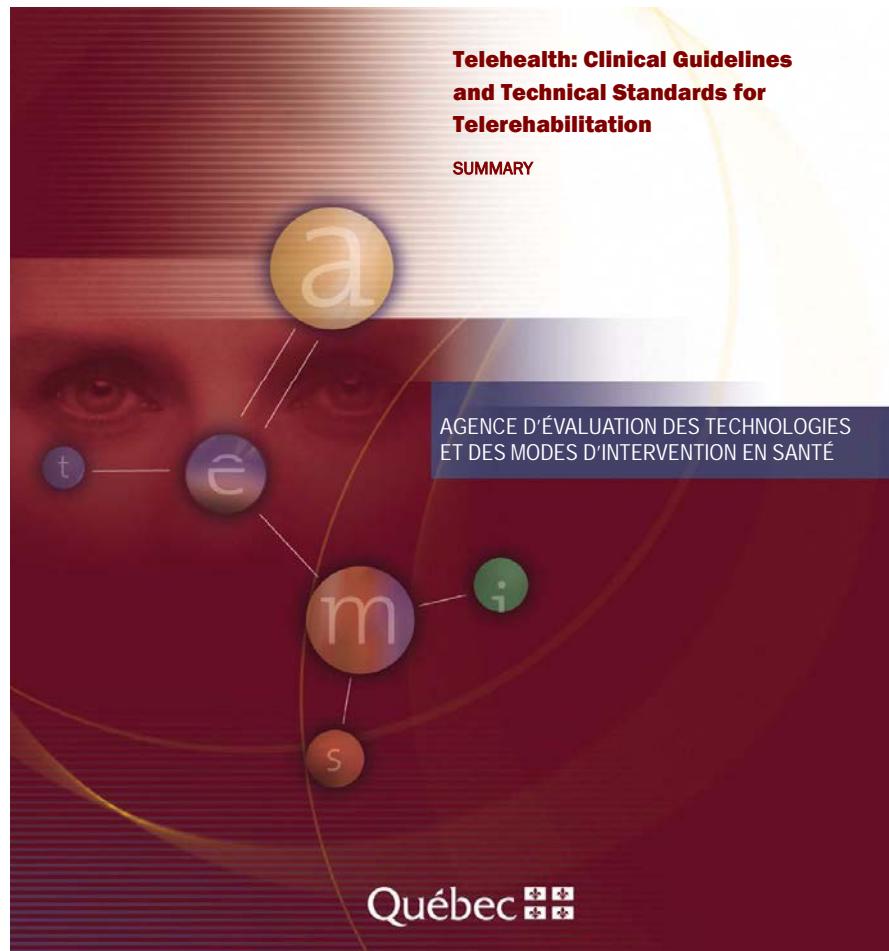
Chest 2006;130:1704-1711  
DOI 10.1378/chest.130.6.1704

The online version of this article, along with updated information and services can be found online on the World Wide Web at:  
<http://chestjournal.org/cgi/content/abstract/130/6/1704>

Bourbeau *et al.* (2011, *Chest*)



## 7. The advent of e-health facilitates NPI use and the monitoring of health behaviors.



Agence d'Evaluation des Tehnologies et des Modes d'Intervention en Santé (2006)

**8. The advent of *Evidence-Based Medicine/Prevention/Psychology* lays the foundations for best professional care practices.**



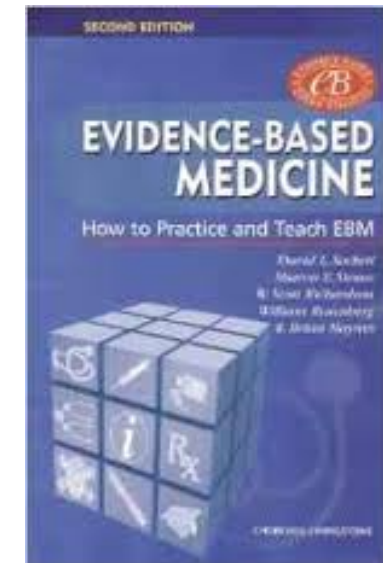
David L. Sackett  
American and Canadian

OC, FRSC, BA (Lawrence), MD (Illinois & Basel),  
MSc (Harvard), FRCP (Ottawa, London, Edinburgh)



Inspiring Innovation and Discovery

(November 17, 1934 – May 13, 2015)



Sackett *et al.* (2000)

## 9. The culture of prevention is gaining traction.

ACADÉMIE NATIONALE DE MÉDECINE  
16, RUE BONAPARTE – 75272 PARIS CEDEX 06  
TÉL : 01 42 34 57 70 – FAX : 01 40 46 87 55

### Rapport

Groupe de travail « Culture de prévention en santé »

#### La Culture de prévention en santé : des questions fondamentales

##### Introduction

1. La prévention en médecine est un humanisme (J.- F. Mattei)
2. Définition de la culture de prévention (C. Dreux)
3. Pourquoi et comment développer une culture de prévention en santé publique ? (A. Vacheron)



French Academy of Medicine (Dreux, 2013)



European Union (2014)

## 10. Paradigm shift from single for-pay medical service to overall care path management.

**Pasteur Model:** 1 problem => 1 mechanism => 1 therapeutic solution

**Chronic Disease Model:** 1(n) problem(s) => complex mechanism(s) => n solutions (complementary and coordinated treatment solutions), overall care and life path management



Pr. Jacques Bringer, Dean of Montpellier's Faculty of Medicine,  
iCEPS Conference 2015

**NPIs ARE USED EVERY DAY**

**AND YET**

**RCT EVIDENCE IS LACKING**

**MOST ARE NOT REIMBURSED**

## Coming out of the dark, just like they did 50 years ago for pharmaceutical drugs

“Until the 60’s, many therapeutic interventions only relied, we might say, on the strength of habit (routine), a naive belief in traditions, or on generalizations made on the basis of anecdotal and sporadic instances **abusively labeled as professional experience.**”

Bouvenot (2006, p. XIII)

### 4 phases for any Drug



## Pharmaceutical Drugs: a revolution with high quality of clinical trials began 50 years ago.

### A unanimous definition

Official definition



### A consensual paradigm of clinical investigation and surveillance evaluation (safety, efficacy, costs)

1 drug = 1 common procedure

### A clear process for reimbursement, production and patient information channels

Continental and National authorities: agreement with Social Security and Private Insurance Coverage

### Market players

**World companies**

Medium-sized companies  
and small businesses

Artisans

## Medical devices: an attempt with high quality of clinical trials begun 10 years ago.

### A definition in progress with some residual difficulties

Medical prescription or not

Implantable or not

Use only by patient or not (e.g., medical tool, family)

### A nonconsensual paradigm of clinical investigation (except safety) and surveillance evaluation

1 medical device = 1 trials = 1 protocol

### A challenging reimbursement, production and patient information procedures

National authorities discussions

### Market players

World companies

**Medium-sized companies  
and small businesses**

Artisans



## Behavioral interventions (included in NPIs): a dream of standardized high quality clinical trials

### No clear definition of NPIs

Prescription or not

Supervised or not

...

### No standardized paradigm of clinical investigation and surveillance more than safety at the moment

Efficacy/effectiveness: between health and well-being

Safety: few attention (e.g., interaction, sectarian abuses), few surveillance

### Heterogeneous procedure for production and patient information, no option for reimbursement

No demand

### Market players

World companies

Medium-sized companies  
and small businesses

**Artisans**

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**THE CHALLENGE:  
A CRITICAL NEED TO CLARIFY  
THE METHODOLOGICAL APPROACH  
TO ASSESS THE EFFICACY AND THE SAFETY  
OF NPIs**

## A need of high quality trials

OPEN ACCESS Freely available online

PLOS MEDICINE

Essay

### How to Make More Published Research True

John P. A. Ioannidis<sup>1,2,3,4\*</sup>

<sup>1</sup> Meta-Research Innovation Center at Stanford (METRICS), Stanford University, Stanford, California, United States of America, <sup>2</sup> Department of Medicine, Stanford Prevention Research Center, Stanford, California, United States of America, <sup>3</sup> Department of Health Research and Policy, Stanford University School of Medicine, Stanford, California, United States of America, <sup>4</sup> Department of Statistics, Stanford University School of Humanities and Sciences, Stanford, California, United States of America

Adoption of more appropriate statistical methods [38], standardized definitions and analyses and more stringent thresholds for claiming discoveries or “successes” [39] may decrease false-positive rates in fields that have to-date been too lenient (like epidemiology [40], psychology [41,42], or economics [43]). It may lead them to higher credibility, more akin to that of fields that have traditionally been more rigorous in this regard, like the physical sciences [44].

Ioannidis (2015, *Plos Medicine*)

## An Necessary Bottom Up Strategy

Define techniques

ann. behav. med. (2013) 46:81–95  
DOI 10.1007/s12160-013-9486-6

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ORIGINAL ARTICLE

# The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions

**Susan Michie, DPhil, CPsychol • Michelle Richardson, PhD • Marie Johnston, PhD,  
CPsychol • Charles Abraham, DPhil, CPsychol • Jill Francis, PhD, CPsychol •  
Wendy Hardeman, PhD • Martin P. Eccles, MD • James Cane, PhD •  
Caroline E. Wood, PhD**

*Michie et al. (2013, Ann Behav Med)*

## An Necessary Bottom Up Strategy

Defining techniques

Defining process/mechanism/theory

Defining dose and burden



### **Characterize intervention**

NPI = method = theory + techniques + material

Choosing design (e.g., decision tree)

Anticipating analyses (e.g., ITT)

Declaring (e.g., Clinical Trials, PROPERO)



### **Characterize design**

Guideline for researchers and authorities

Publishing (e.g., EQUATOR, PRISMA)

Explaining (e.g., patients notice)

Training (e.g., professional guideline)



### **Characterize results**

Recommendations for dissemination

## An Complementary Top Down Strategy

Keep in mind that behavioral interventions are not drugs

Excessive influence of the pharmaceutical standard validation phase (e.g., French Health Authority)

NPIs less dangerous therapy than “artificial” therapy especially for care and prevention

Accelerate time to market of NPIs innovations, because engineers have a different way of thinking

Behavioral intervention are also skills



## An Complementary Top Down Strategy

NPIs need to be compared and optimized, as well as targeted to the right health problem at the right time



Parachutes reduce the risk of injury after gravitational challenge, but their effectiveness has not been proved with randomised controlled trials

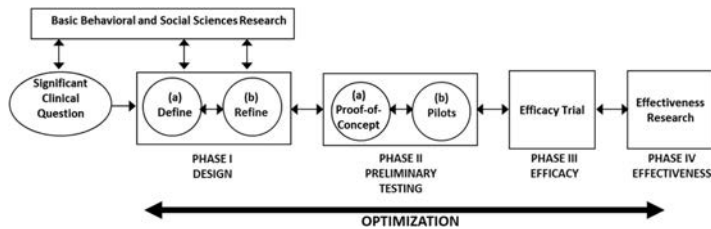
Smith and Pell (2003, *Brit Med J*)



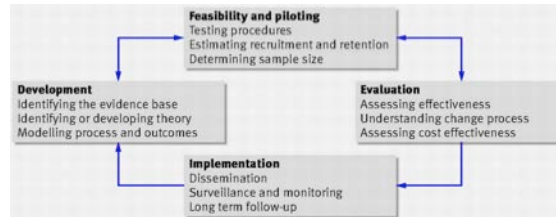
What is the most secure?

# An Complementary Top Down Strategy

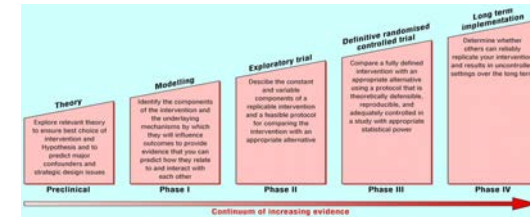
A need for a dedicated and consensual paradigm of validation and surveillance



NIH  
(Czajkowski *et al.*, 2015)



MRC  
(Craig *et al.*, 2008)



CONSORT  
(Boutron *et al.*, 2012)



In context of entropy of methods without comparability

And also in context of New Industrial Players in the Health Field Advocating to an Engineering Model



See François Carboneel IBTN 2016 poster



## An Complementary Top Down Strategy is needed

A need to assess direct and indirect costs in effectiveness trials and to use qualitative methods

# CHEST<sup>®</sup>

Official publication of the American College of Chest Physicians

### Economic Benefits of Self-Management Education in COPD

Jean Bourbeau, Jean-Paul Collet, Kevin Schwartzman, Thierry Ducruet, Diane Nault, Carole Bradley and the COPD axis of the Respiratory Health Network of the Fond de la recherche en santé du Québec

*Chest* 2006;130:1704-1711  
DOI 10.1378/chest.130.6.1704

The online version of this article, along with updated information and services can be found online on the World Wide Web at:  
<http://chestjournal.org/cgi/content/abstract/130/6/1704>



Case Manager for COPD  
[www.livingwellwithcopd.com](http://www.livingwellwithcopd.com)

Respiratory Medicine (2008) 102, 556–566



ELSEVIER

respiratoryMEDICINE

### An innovative maintenance follow-up program after a first inpatient pulmonary rehabilitation

G. Moullec<sup>a,\*</sup>, G. Ninot<sup>a</sup>, A. Varray<sup>b</sup>, J. Desplan<sup>c</sup>, M. Hayot<sup>d</sup>, C. Prefaut<sup>d</sup>



Post-rehab Network for COPD  
[www.airplusr.fr](http://www.airplusr.fr)

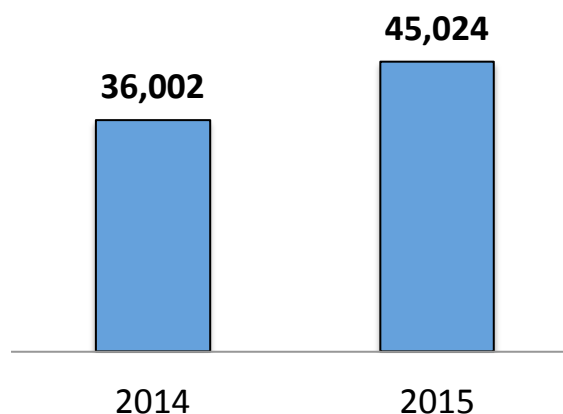
## Toward an Action Plan?

Create of an International Multilingual Glossary of NPI clinical trial concepts (with synonyms)

To decrease number of useless trials

BLOG EN SANTÉ<sup>®</sup>

[www.blogensante.fr/en/](http://www.blogensante.fr/en/)



40% of my Blog post views are Definitions

### Oxford



#### Glossary



Authors: Katherine Law and Jeremy Howick

Welcome to the CEBM Glossary. This is not a comprehensive glossary but it outlines some of the key terms that should be understood in relation to Evidence-Based practice.

**Absolute risk reduction (ARR):** The difference in the event rate between control group (CER) and treated group (EER): ARR = CER - EER.

**Bias:** Any tendency to influence the results of a trial (or its interpretation) other than the experimental intervention.

**Blinding:** A technique used in research to eliminate bias by hiding the intervention from the patient, clinician, and/or other researchers who are interpreting results.



### McMaster



Home / Glossary

#### Glossary

# - A - B - C - D - E - F - G - H - I - J - K - L - M - N - O - P - Q - R - S - T - U - V - W - X - Y - Z - View All

#

65 Pyramid



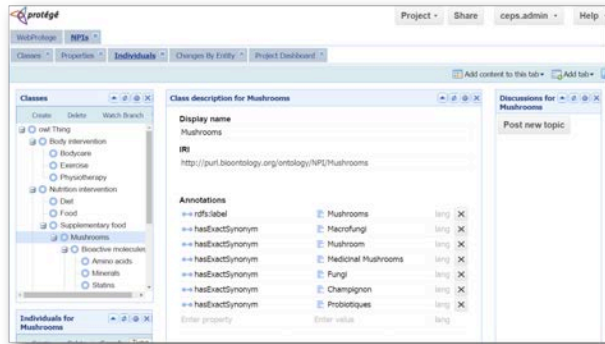
A guide for finding the best available research evidence quickly and efficiently. Each level of the pyramid draws on research evidence from the lower layers, therefore more synthesized evidence is found at the higher levels. It is recommended that searching for evidence begin at the top (or the highest possible level) of the pyramid.

**ibtn** ?  
international  
behavioural  
trials network

## Toward an Action Plan?

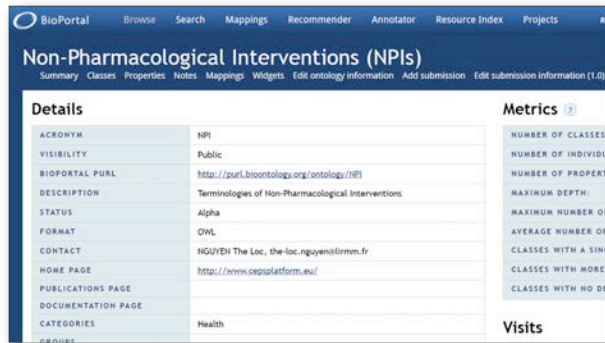
Build a collaborative NPI ontology

*for developing the ontology*



Category  
Subcategory  
Intervention

Psychological intervention (synonyms)  
Psychotherapy  
Mindfulness-Based Stress Reduction (MBSR)

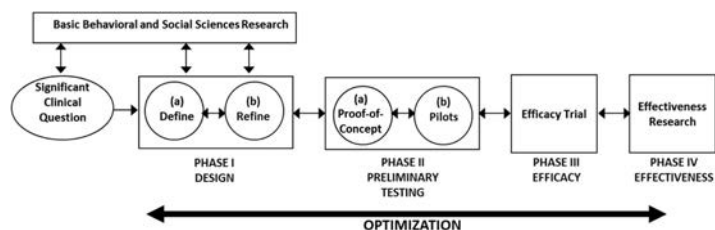


*for sharing the ontology*

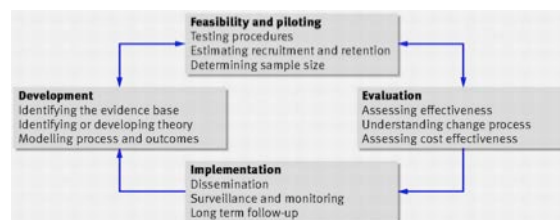
See Loc Nguyen IBTN 2016 poster

## Toward an Action Plan?

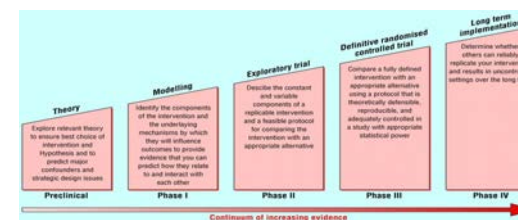
Create a consensual paradigm of NPI validation and surveillance



NIH  
(Czajkowski *et al.*, 2015)



MRC  
(Craig *et al.*, 2008)



CONSORT  
(Boutron *et al.*, 2012)

Curr Cardiovasc Risk Rep (2015) 9:427  
DOI 10.1007/s12170-014-0427-0

PHYSICAL ACTIVITY (D WARBURTON, SECTION EDITOR)

## An International Perspective on Improving the Quality and Potential of Behavioral Clinical Trials

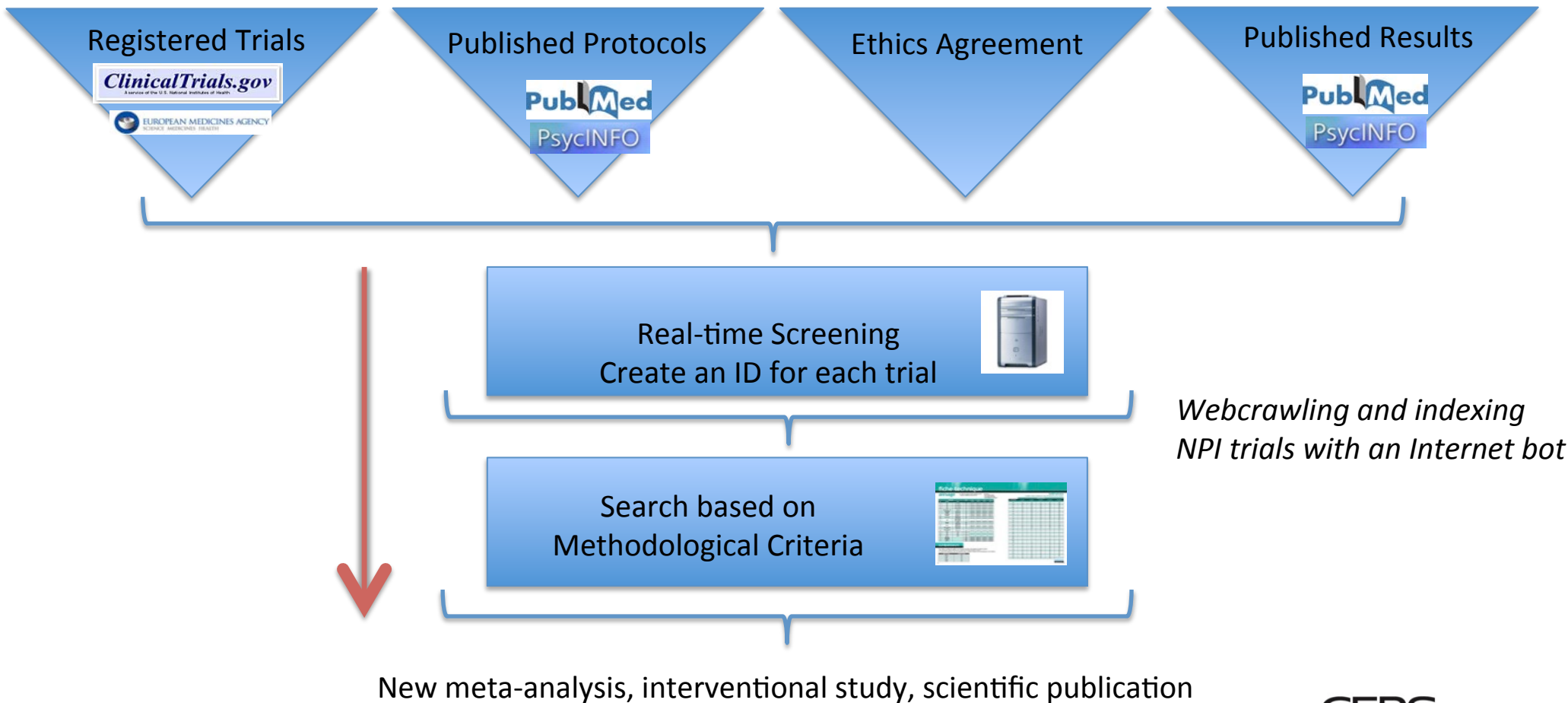
Simon L. Bacon • Kim L. Lavoie • Gregory Ninot • Susan Czajkowski •  
Kenneth E. Freedland • Susan Michie • Paul Montgomery • Lynda H. Powell •  
Bonnie Spring • for the International Behavioural Trials Network (IBTN)

**ibtn**  
international  
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trials network

Bacon *et al.* (2015, *Curr Cardiovasc Risk Rep*)

## Toward an Action Plan?

Create a Meta-Search Engine Dedicated to NPIs trials for 2018



## Toward an Action Plan?

An annual meeting alternating Montpellier and Montreal

1st Conference  
March 2011  
Montpellier, France

2<sup>nd</sup> Conference  
April 2013  
Montpellier, France

3rd Conference  
March 2015  
Montpellier, France

4th Conference  
May 2016  
Montreal, Canada

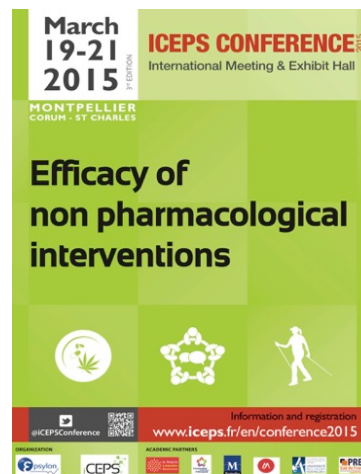
5th Conference  
May 18-20, 2017  
Montpellier, France



1-day event  
**320 participants**  
6 plenary lectures  
6 professional workshops



1-day event  
**610 participants**  
11 plenary lectures  
6 professional workshops



3-day event  
**1,030 participants**  
35 plenary lectures  
11 professional workshops  
68 scientific posters



3-day event  
**250 participants**  
8 plenary lectures  
10 professional workshops  
29 scientific posters



## Conclusion

An International Multilingual Glossary of non-pharm clinical trial concepts is needed,  
to decrease misunderstandings, biases, conflicts of interests and amalgams in NPIs clinical trials.

A rigorous and standardized methodological approach is needed,  
to identify NPI uses, compare effects and deliver more evidence to Policymakers, Professionals and Patients.

A shorter validation (because of low risk) and a better surveillance procedures are needed,  
to answer to Engineers of New industry in health and well-being.



Transhumanism

Yes, we can with

**ibtn**  
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behavioural  
trials network

[www.ibtnetwork.org](http://www.ibtnetwork.org)

# Thank you for your attention



**CEPS Platform**

Methodology Platform for NPIs  
Universities of Montpellier, France

**CEPS  
PLATFORM**

[www.CEPSplatform.eu](http://www.CEPSplatform.eu)

**BLOG EN SANTÉ<sup>®</sup>**

[www.blogensante.fr/en/](http://www.blogensante.fr/en/)

*"**preempt** disease before it occurs, utilizing the **participation** of individuals, communities, and healthcare providers in a proactive fashion, as early as possible, and throughout the **natural cycle of a disease process**"*

Elias Zerhouni (Director, NIH, 2008)



## The CEPS Platform: An Academic Methodology Hub for NPI Research

[www.CEPSplatform.eu](http://www.CEPSplatform.eu)

**Founder & Executive Director:** Pr. Gregory Ninot (University of Montpellier, France)

**Associate Director:** Raphael Trouillet (Paul Valery University, Montpellier, France)

**Director of Technology & Data Analysis:** Anne Laurent (University of Montpellier, France)

**General Manager:** Jerome Maitre (Paul Valery University, Montpellier, France)

The Center for the Evaluation of Health Prevention Programs and Non-Pharmacological Interventions (NPIs), known as the **CEPS Platform**, is an academic hub dedicated to the advancement of methodology expertise in clinical non-pharmacological research. This public platform aims to facilitate the work of European researchers who monitor, develop, carry out and publish clinical interventional studies on the efficacy of NPIs or of health prevention programs (safety, risks/benefits, impact on Quality of Life, costs/efficacy).

The **CEPS Platform** provides resources which help build and strengthen bridges between academic research and NPI innovations. These open-access resources include: scientific monitoring, methodology tools for non-pharmacological clinical trials, scientific events, information, and an interactive map of the field's key players.

Support for the **CEPS Platform** comes mainly from public funds, among which the French 2015-2020 National-Regional Plan ("Contrat de Plan Etat Région 2015-2020"). The Platform's headquarters are located at the Montpellier Maison des Sciences pour l'Homme (MSH) in Montpellier, France.

