* Two things which are so different as to have no opportunity to unite. The phrase was used by Rudyard Kipling, in his *Barrack-Room Ballads*, 1892: "Oh, East is East, and West is West, and never the twain shall meet."

*Never the twain shall meet?

Implementation science and improvement science

Per Nilsen
KBH, 23 April 2018
LINKÖPING UNIVERSITY

- ✓ Defining the fields
- ✓ Brief histories of the fields
- ✓ Comparison of the fields
- ✓ So, what can we learn from each other?

Defining the fields

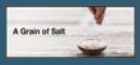
Implementation science

"…is the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice to improve the quality and effectiveness of health services and care." (Eccles & Mittman, *Implementation Science*, 2006).

The definition emphasizes…

"methods to **promote** the systematic **uptake**…"

→ **But** many studies are also conducted to understand, describe, analyze current practice, i.e. without specific "methods to promote…"



The definition also emphasizes…

"…uptake of **research** findings and other **evidence**-based practices…"

→ **But** many studies concern practices which lack evidence or research support, e.g. something being developed for the study or being based on "**justified belief**" that it will improve outcomes for practitioners, health care and (ultimately) patients or populations.

Improvement science

"… focuses on systematically and rigorously exploring **'what works' to improve quality** in **healthcare** and the best ways to measure and disseminate this to ensure positive change." (Health Foundation, 2011)

"The primary goal … is to determine which **improvement strategies work** as we strive to assure effective and safe patient care." (ISRN, 2017)

Quality

"doing the right thing, at the right time, in the right way, for the right person – and having the best possible results" (US Agency for Healthcare Research and Quality, 2007)

QI

"…systematic, data-guided **activities** designed to **bring about** immediate, **positive changes** in the delivery of health care." (Baily *et al*., 2006; S5)

"…systemic **changes aimed at improving the processes** and **outcomes** of health care…" (Alexander & Hearld, 2011)

QI vs. improvement science

- The importance of distinguishing between QI and IMPRO science has been emphasized by many scholars
  - QI concerns application of knowledge and IMPRO science the discovery of knowledge.
  - QI generates knowledge for local improvement; results are not intended to be generalizable beyond the specific setting or population.
  - The ambition of IMPRO science is to produce generalizable knowledge.

IMPRO science definitions emphasize…

…the study/evaluation of the **effectiveness** (i.e. "what works") of various **QI strategies** to achieve improved quality

→ Hmmm… so what are these **improvement/QI strategies**?

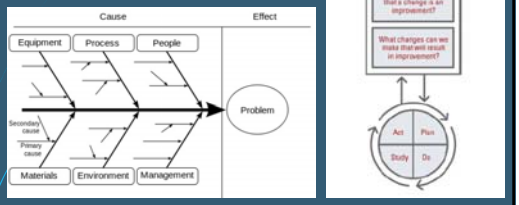
QI strategies
(Hughes, 2008)

QI strategies/interventions/activities (the terms are used interchangeably) = implementation strategies/interventions (both terms are used)

Various taxonomies exist, but the QI strategies are the same as/similar to the strategies described in impl. science!

Some scholars distinguish between **QI strategies** and **QI tools**, which are used to "define and assess problems"(Hughes, 2008) – see next slide!

QI tools



Brief histories of the fields

Developm ent science

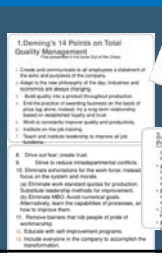
1920s-30s

1950s and onwards

1986

Shewhart studied quality as an industrial process

Influenced by Shewhart's work, Deming recognized quality as a primary driver for industrial success



Development of improvement science

1970s-90s

1996

Defects in processes and outcomes of care have long been known, but "students of medical quality were at first largely ignored" (Berwick, 2008; p. 1182)

The term "the science of improvement" first used by Langley et al.

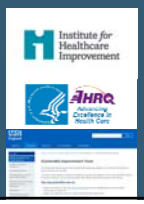
1999 and 2001

Landmark publications by Institute of Medicine (USA): *To Err is Human: Building a Safer Health System* and *Crossing the Quality Chasm: A New Health System for the 21st Century.*

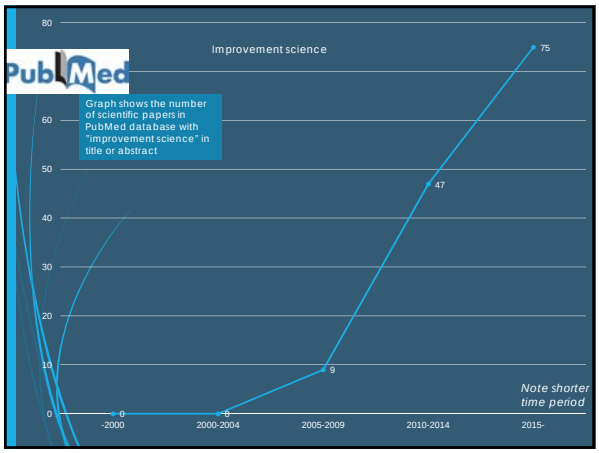
"The IoM's seminal report on the state of health care quality in the US and its subsequent calls for system redesign have elevated the importance and number of QI studies" (Alexander & Hearld, 2011; p. S6)

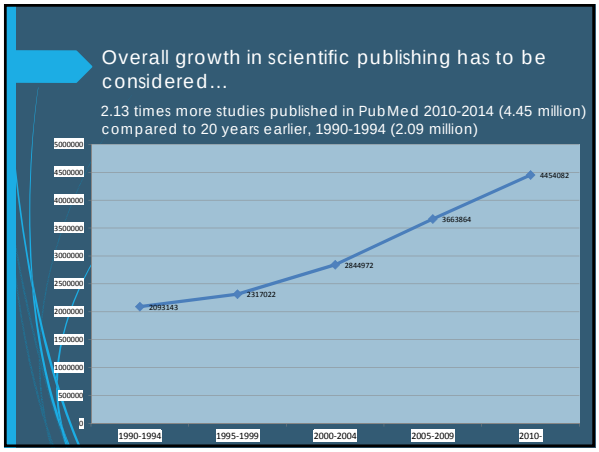
QI "is no longer the preserve of enthusiastic volunteers but **part of the daily routine** of all those involved in delivering health care…" (Campbell et al., 2004; p. 6)

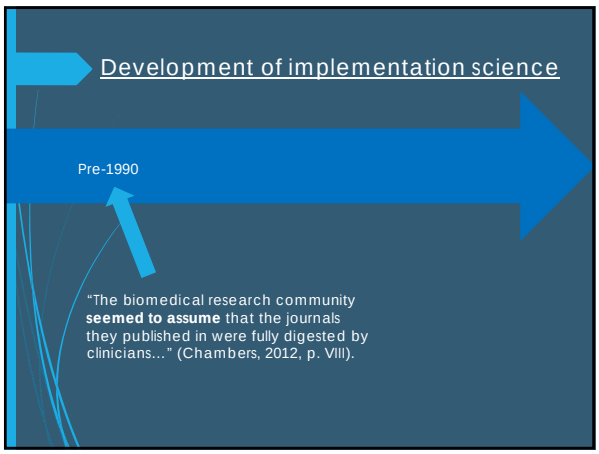
2000s

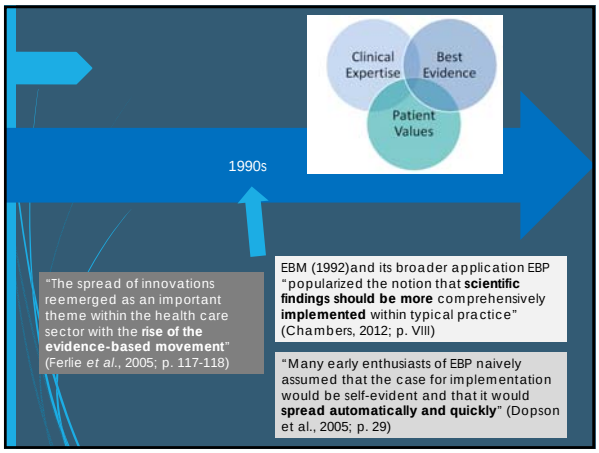


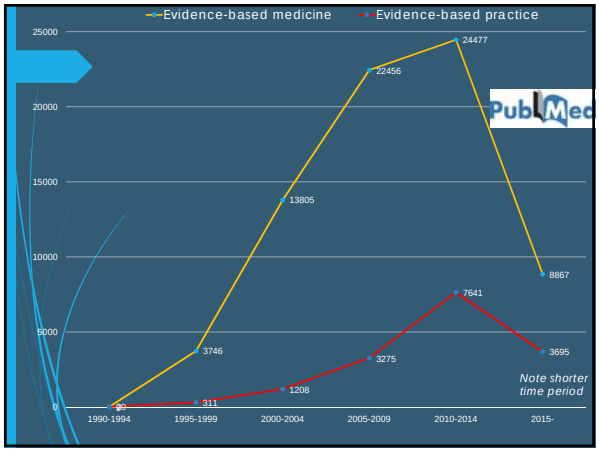
Institute for Healthcare Improvement (USA), **Agency for Healthcare Research and Quality** (USA) and **NHS Institute for Innovation and Improvement** (UK) have championed improvement science research and education.

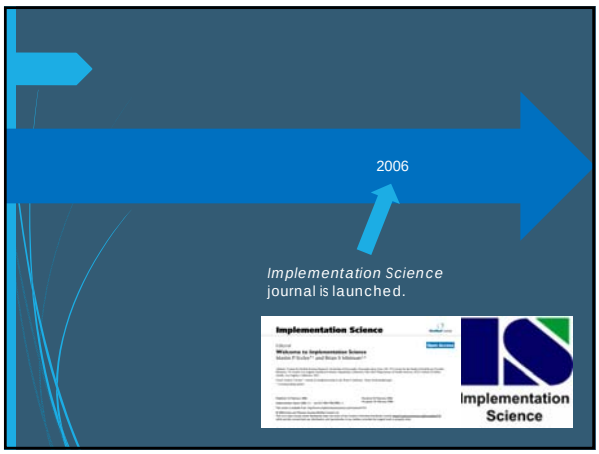

Improvement science
Graph shows the number of scientific papers in PubMed database with "improvement science" in title or abstract
80
60
50
40
30
20
10
0
0
0
9
47
75
Note shorter time period
-2000
2000-2004
2005-2009
2010-2014
2015-


Overall growth in scientific publishing has to be considered…
2.13 times more studies published in PubMed 2010-2014 (4.45 million) compared to 20 years earlier, 1990-1994 (2.09 million)
5000000
4500000
4000000
3500000
3000000
2500000
2000000
1500000
1000000
500000
0
2093143
2317022
2844972
3663864
4454082
1990-1994
1995-1999
2000-2004
2005-2009
2010-


Development of implementation science
Pre-1990
"The biomedical research community **seemed to assume** that the journals they published in were fully digested by clinicians…" (Chambers, 2012, p. VIII).


Clinical Expertise
Best Evidence
Patient Values
1990s
"The spread of innovations reemerged as an important theme within the health care sector with the **rise of the evidence-based movement**" (Ferlie *et al.*, 2005; p. 117-118)
EBM (1992)and its broader application EBP "popularized the notion that **scientific findings should be more** comprehensively **implemented** within typical practice" (Chambers, 2012; p. VIII)
"Many early enthusiasts of EBP naively assumed that the case for implementation would be self-evident and that it would **spread automatically and quickly**" (Dopson et al., 2005; p. 29)


Evidence-based medicine
Evidence-based practice
25000
20000
15000
10000
5000
0
24477
22456
13805
8867
7641
3746
3275
3695
1208
311
20
1990-1994
1995-1999
2000-2004
2005-2009
2010-2014
2015-
PubMed
Note shorter time period


2006
Implementation Science journal is launched.
Implementation Science
Implementation Science

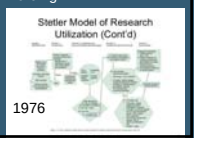
But research of relevance for implementation science existed long before EBM and EBP!

1962 1973 1970s-80s

Everett M Rogers' *Diffusion of Innovations* gathers research on diffusion and adoption of innovations

Pressman & Wildavsky *Implementation* – launches research on policy implementation

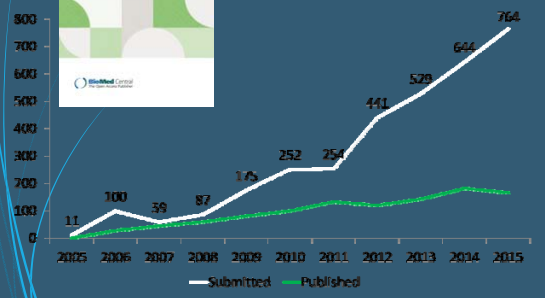
Research on research and knowledge use/utilization, in nursing



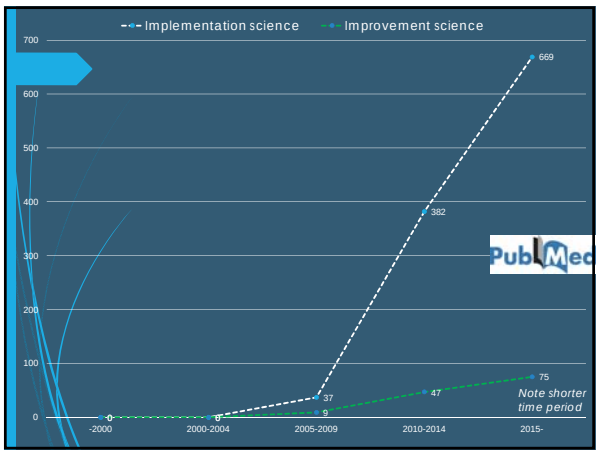
1976

Implementation Science

Submitted and published articles to *Implementation Science*



Courtesy Michel Wensing



Comparison of the fields (I)

Influences

IMPRO science draws on knowledge from fields/topics such as quality, measurement, management/leadership, organizational learning (i.e. the business and strategy literature).

IMPLE science is more influenced by **behavioural and social sciences** (e.g. psychology, organizational behaviour, sociology, political science).

Comparison of the fields (II)

Epistemology, ontology and methodology

The epistemology and ontology of both fields can be positioned as **positivist**:

They seek objectivity, use rational approaches to research, with the researcher being a detached, external observer, who has access to the real world.

It is possible to obtain "hard, secure, objective knowledge".

IMPRO science: emphasis on **measurement**

IMPLE science: measurement but also wide use of **qualitative** methods

However, the **methodology** is not entirely positivist:

Both fields acknowledge the importance of pre-understanding

IMPRO science: values the personal experience of those closest to the problem

IMPLE science: non-quantitative methods important

Comparison of the fields (III)

Knowledge production and use

Both fields aim to produce knowledge which is both applicable for **improved practice** and can contribute to **scientific knowledge**.

Both fields aim to produce **generalizable** knowledge.

Both fields involve researchers who do **research on** implementation/QI and/or are actively involved in **enabling** implementation/QI.

IMPRO science principles are **taught** in health care professionals' continuing education and **integrated** into health care practice.

Health care professionals are not expected to be proficient in IMPLE science.

IMPRO science has more of a practitioner-friendly and hands-on "how-to-do-it" orientation.

IMPRO science comes with an arsenal of **practical QI tools** to identify and assess problems – PDSA, Six-Sigma, Root Cause Analysis, etc.

IMPLE science also uses these tools, but they were not developed within the field.

IMPLE science: studies of **conditions** (barriers/facilitators) for achieving an EBP **and** studies of the **effectiveness of strategies** to achieve an EBP.

IMPRO science: more emphasis on studies of the **effectiveness of strategies** to achieve desired change/QI.

IMPRO science studies are predominantly carried out in **health care**.

IMPLE science studies go **beyond health care** (incl. community-based services, education, social work).

Comparison of the fields (IV)

What is the problem?

Both fields describe a similar **problem:** many patients do not receive optimal care or treatment – both fields assume that there is a gap/chasm between **current** and **optimal/desired** care and treatment

Comparison of the fields (V)

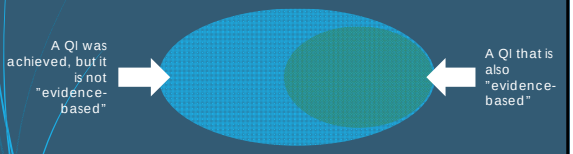
What is the solution?

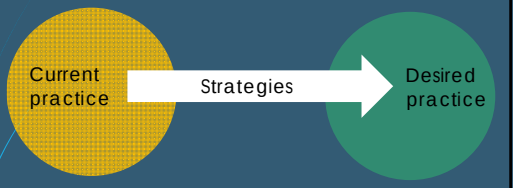
Although the fields describe a similar problem and ultimate goal, they propose partially different means:

IMPRO science: **QI of practice** (systems, processes and outcomes) can improve patient outcomes.

IMPLE science: **implementation of evidence-based practices** can improve patient outcomes.

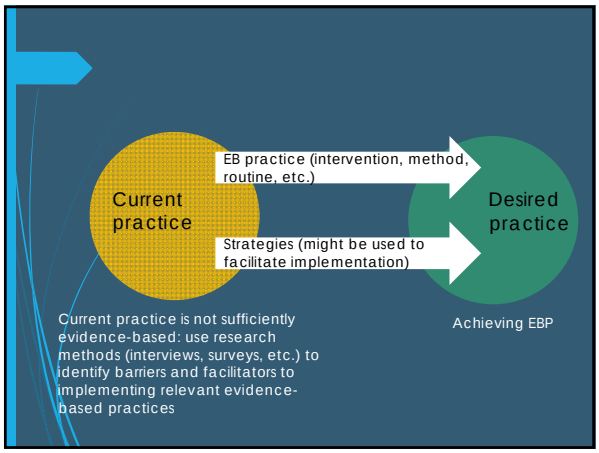
The scope of IMPROVE science is **broader** than that of IMPLE science, since a QI is not necessarily evidence-based.





Quality problems: use QI tools and research methods (interviews, surveys, etc.) to define and assess problems

Achieving QI



So, what can we learn from each other?

That's for our discussion ☺

LINKÖPING UNIVERSITY