Welcome to the international **AESIS** *course on*

Integrating societal impact in a research strategy

27-29 November, OsloMet, Oslo, Norway

EARMA
EUROPEAN ASSOCIATION OF RESEARCH MANAGERS AND ADMINISTRATORS

AESIS
NETWORK FOR ADVANCING & EVALUATING THE SOCIETAL IMPACT OF SCIENCE

researchfish by interfolio

OSLOMET

WORD OF WELCOME

ANIKA DUUT VAN GOOR
DIRECTOR OF THE AESIS NETWORK

OPENING OF THE COURSE

IVER B. NEUMANN
NORWEGIAN SOCIAL RESEARCH, OSLOMET

DAY 1

WELCOME
FROM THE DIRECTORS

BAREND VAN DER MEULEN

KATHRYN GRAHAM

OUR PRESENTATION TODAY

- Introductions and learning about you
- Overview of AESIS, the course, and presenters
- Enjoy the journey!

General introductions by the participants

- Why are you here, what do you want to take away?
- Where do you sit in the ecosystem of research activity?
- What are we talking about and why is it important?

ABOUT YOU

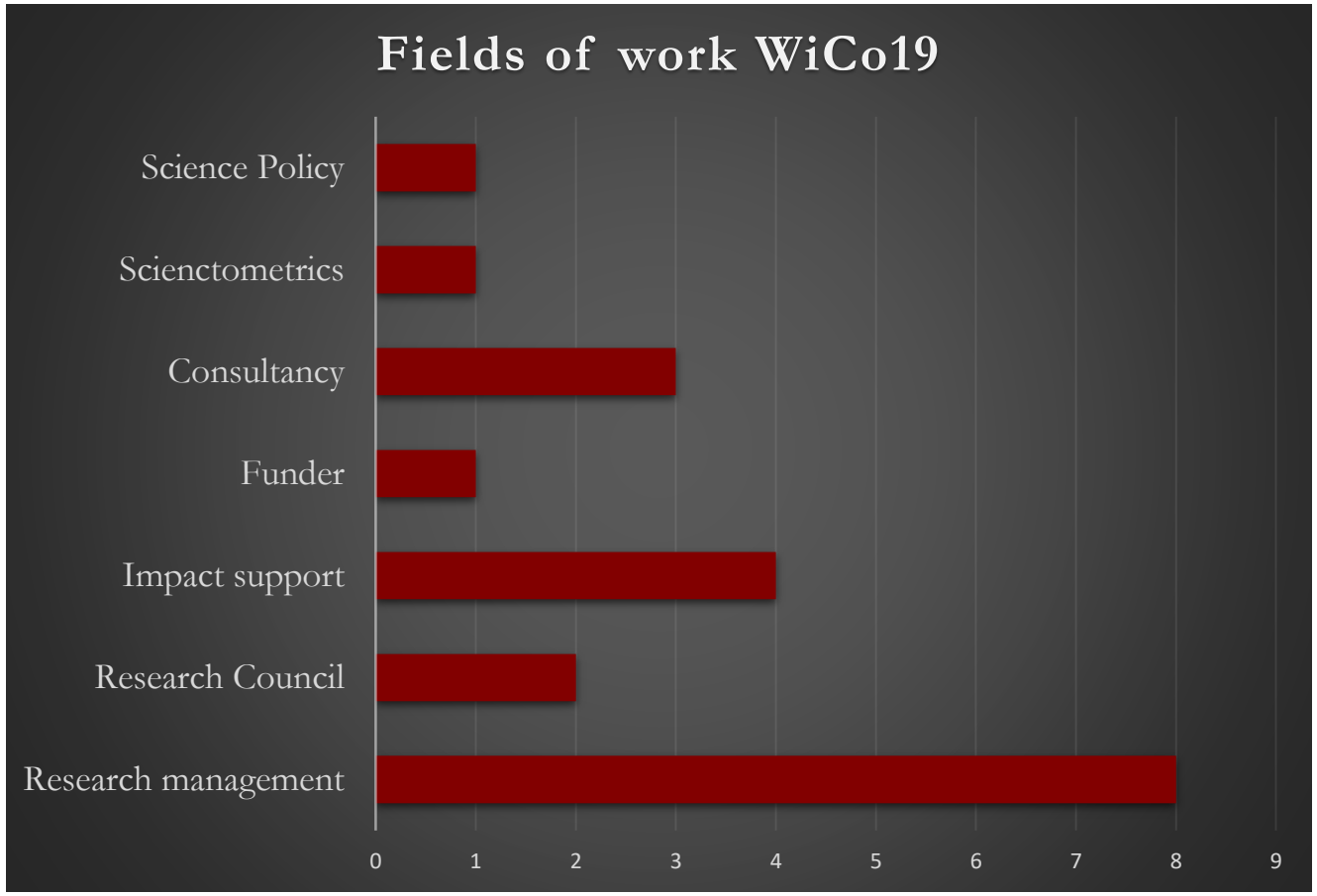
- **8 different countries.**
- **60% Female, 40% Male**

Positions & interests WiCo19 attendees

MOST OF YOU

Are directly engaged in

Research



GENERAL INTRODUCTIONS

- Briefly state your name, organization, role and where you are from
- Reasons for attending the course

GROUP EXERCISE

- Imagine you are part of the team building and managing the Snowhotel Kirkenes next season

What is your role at the Snowhotel?

Why did you choose this role?

This the fifth annual Winter course:

OVERVIEW OF AESIS

The AESIS network was founded in 2015 with the aim of creating an international, open community for various types of professionals working on stimulating and demonstrating the impact of science on economy, culture and well-being

2019

2018

2016

2017

2015

AIM OF THE COURSE

- **To bring together:**
  - Experiences of experts and organisations in managing societal impacts of research
  - Insights into strengthening societal impacts of research
  - Lessons learned and opportunities to improve the science and practice
- **We do not present fit-for-all-tools, but suggested frameworks and approaches that can be "fit-for-purpose" for your organizational strategies**
  - Impact strategies must be customized according to your context, purpose for impact and address stakeholders needs

OVERVIEW OF 3 DAY PROGRAMME

Day 1 **Introductions (presenters and yourselves)**
Introduction to your Case Study
Presentations

Day 2 *Presentations*
Work on your Case Study and prepare your presentation

Day 3 Feedback, main issues & questions, close

SPEAKERS

BAREND VAN DER MEULEN
Director of the Center for Higher Education Policy Studies at the University of Twente & Prof Evidence for Science Policy CWTS, Leiden University NL

KATHRYN GRAHAM
Executive Director of Performance Management and Evaluation Alberta Innovates CA

IVER B. NEUMANN
Director NOVA
Norwegian Social Research
OsloMet NO

MIKE SMITH
Emeritus Professor of Medical Science, Managing Partner at Harper Keeley (LLP), Chair of Medipex & former Chair of the UK Institute of Knowledge Transfer UK

DAVID SWEENEY
Executive Chair of Research England England UK

LIV LANGFELDT
Director R-QUEST & Research Professor NIFU Oslo NO

DAVID BUDTZ PEDERSEN
Director of the Humanomics Research Centre, University of Copenhagen & former Strategic Adviser to the Danish Ministry of Higher Education and Science DK

UP NEXT....

CASE STUDY SESSION 1:

INTRODUCING THE CASE STUDY

GROUP FORMING

AIM OF CASE STUDY EXERCISE

- Apply the theories, best practices, and insights taught in the course to a case study
- Relate individual experiences to the case study
- Enhance cross boundary learning through comparison and contrast of individual experiences
- Today's aim: share your experiences of creating AND integrating impact strategies

EXERCISE AESIS WINTERCOURSE 2019

Proposal

LEARNING OBJECTIVES

1) Apply the theories, best practices, and insights taught in the course to a case study
2) Relate individual experiences to a case study
3) Enhance cross boundary learning through comparison and contrast of individual experiences

THE CASE STUDY

Ecosystem Demand Analysis

Background

The current economy of YouropeLand is heavily reliant on natural resource extraction and on manufacturing. Technology developments globally as well as external factors such as globalisation and resource scarcity have made YouropeLand's economic future uncertain. For example, disruptive technologies (e.g., Internet of Things, artificial intelligence, digital strategies) are significantly and rapidly changing how industries operate. By 2025, the total economic impact of disruptive technologies alone is estimated to be between 14 and 33 trillion Euros per year. Disruptive technologies have the potential to address complex issues in many sectors, from education and health, to infrastructure and climate change and to result in both social and economic impacts. For instance, increased use of autonomous vehicles may lower incidence of traffic accidents and in turn, reduce healthcare costs, mortality rates, time out of work due to injury, and insurance premiums.

The government of YouropeLand aims to strategically invest in technology and talent in order to diversify its economy, improve its competitiveness and productivity, and support a sustainable social market economy to lead to long-term benefits for the citizens of YouropeLand.

Table 1. YouropeLand Economic Strategy

Promote smart, sustainable, and economic growth to diversify YouropeLand's economy, improve its competitiveness and productivity, and support a sustainable social market economy		
Smart Growth – a knowledge-based economy	**Sustainable Growth** – a resource-efficient society	**Economic Growth** – a high-employment economy
Research and Innovation	Clean technology	Employment and Skills
Education		Competitiveness
Digital Society		

Funding Opportunity

The government of YouropeLand has a budget of 100 M€ available to fund a number of five-year initiatives aligned to its economic strategy to promote **smart, sustainable, and economic growth** in the

1 | Page

CASE STUDY INTRODUCTION (Cont'd)

- The government of Youropeland will fund a 5-year initiative with a maximum budget of 500M€ to support **smart, sustainable, and economic growth**
- The initiative must be embedded in the knowledge ecosystem and linked to research and innovation areas of strength
- Your organisation, Youropeland University, has brought stakeholders together (i.e., the Smart Strategy Group) to develop a funding proposal focused on **smart public services** and **education and training on smart technology**.

CASE STUDY INTRODUCTION (Cont'd)

- Your group is supporting the Smart Strategy Group in preparing their funding proposal to the government of Youropeland
- Prepare a presentation of how the Smart Strategy Group will create impact through the initiative, including an **impact vision** and an **impact strategy**
- Make it a clear and convincing presentation!
- Add a reflection on the process at the end

CASE STUDY INTRODUCTION (Cont'd)

- Familiarize yourself with the material and your group members
- Exchange and use your own experiences, knowledge, and, of course, the lectures today and tomorrow.
- Enjoy!

Coffee/tea break

We will start again at 11.00

Pragmatic approach to understanding and integrating societal impact

- What is societal impact of research and who is impacted?
- A review of global impact frameworks
- Contextualizing research
- Setting the foundations for integrating and implementing societal impact

WHAT IS SOCIETAL IMPACT OF RESEARCH AND WHO IS IMPACTED?

INTEREST IS NOT NEW
IN THE IMPACT OF RESEARCH

As long as [universities] are vigorous and healthy and their scientists are free to pursue the truth wherever it may lead, there will be a flow of new scientific knowledge to those who can apply it to practical problems in Government, in industry, or elsewhere."

Vannevar BushScience the Endless Frontier

1945

1620

"There is another powerful and great cause of the little advancement of the sciences, which is this: it is impossible to advance properly in the course when the goal is not properly fixed. But the real and legitimate goal of the sciences is the endowment of human life with new inventions and riches."

Francis Bacon Novum Organum

1993

"The understanding and application of science are fundamental to the fortunes of modern nations. Science, technology and engineering are intimately linked with progress across the whole range of human endeavour: educational, intellectual, medical, environmental, social, economic and cultural."

Chancellor of the Duchy of Lancaster Realising our potential White Paper

Source: Jonathan Grant, ISRIA

WHAT IS IMPACT?

THERE ARE MANY DIFFERENT DEFINITIONS.....

- "… Positive and negative, primary and secondary long-term effects produced by a development intervention, directory or indirectly, intended or unintended" (OECD, 2002)

- "An effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia" (REF, UK)

WHY INTEGRATE SOCIETAL IMPACT?

THE 4A'S

BE CLEAR ON PRIMARY PURPOSE

- **ACCOUNTABILITY**
  To promote responsible management of funds to taxpayers, donors, etc.
- **ADVOCACY**
  "Make the case" for research funding
- **ANALYSIS**
  What works in research funding?
- **ALLOCATION**
  What to fund (institution, field, people, etc.)

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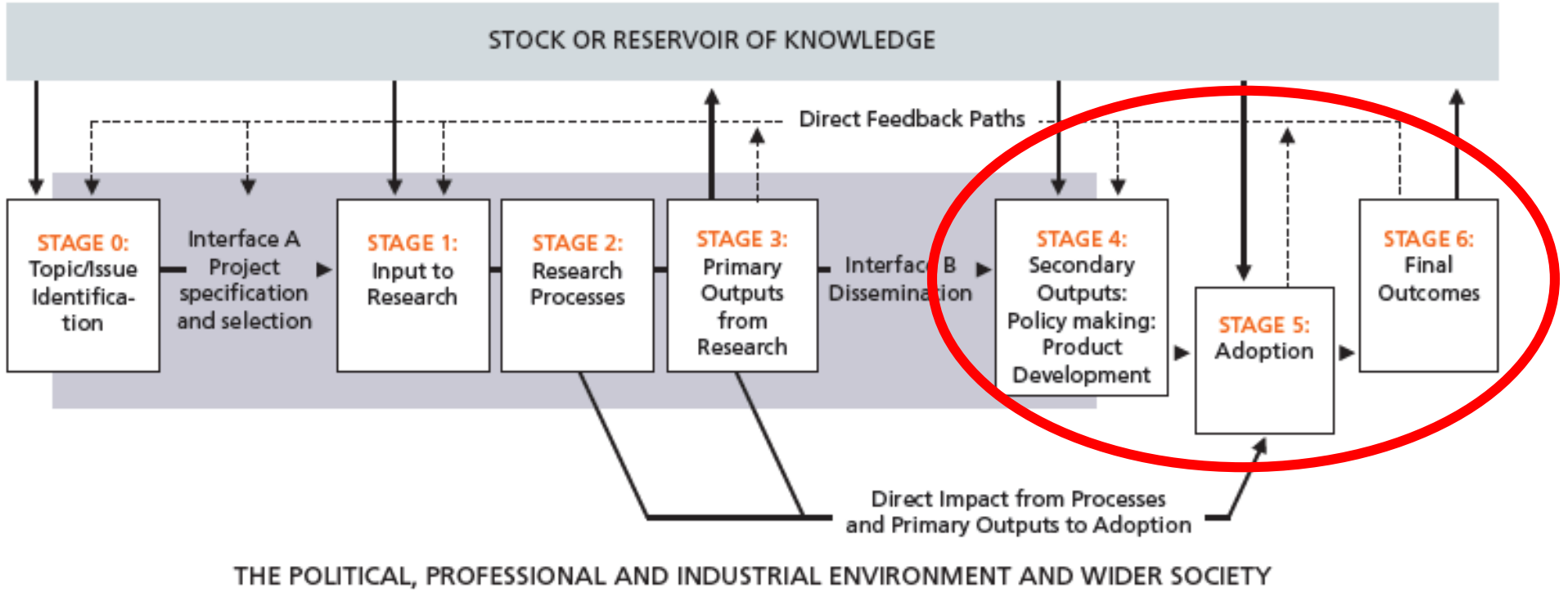
Source: Morgan Jones, M., Grant, J. Making the Grade: Methodologies for assessing and evidencing research impact *in Dean et al (Eds) (2013) 7 Essays on Impact. DESCRIBE Project Report for Jisc. University of Exeter.*

ULTIMATELY

IMPACT
IS ABOUT THE
NON-ACADEMIC
BENEFITS TO
SOCIETY



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LEARNING ACTIVITY

10 MINUTES

IN SMALL GROUPS

CREATING *IMPACT* WITHIN A WIDER RESEARCH

ECOSYSTEM: Where are you positioned?

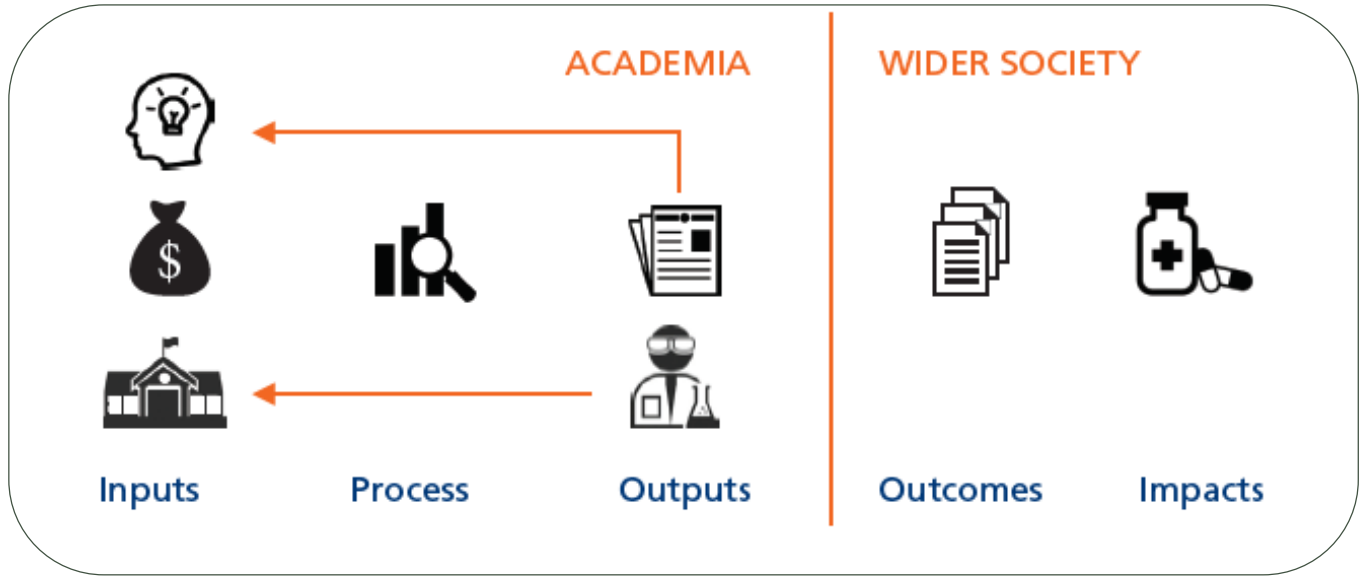
Funding process

Making funding available

Applying for funding

Distributing funds

Research process



Funding
Knowledge
Space

Research
Engagement
Dissemination & Writing
Report back to funder

Non-academic comms
Stakeholder engagement
Capturing impact (REF)
Report back to funder

WHO IS IMPACTED?

Public, Policy Makers, Patients, Community Groups.....

LEARNING ACTIVITY

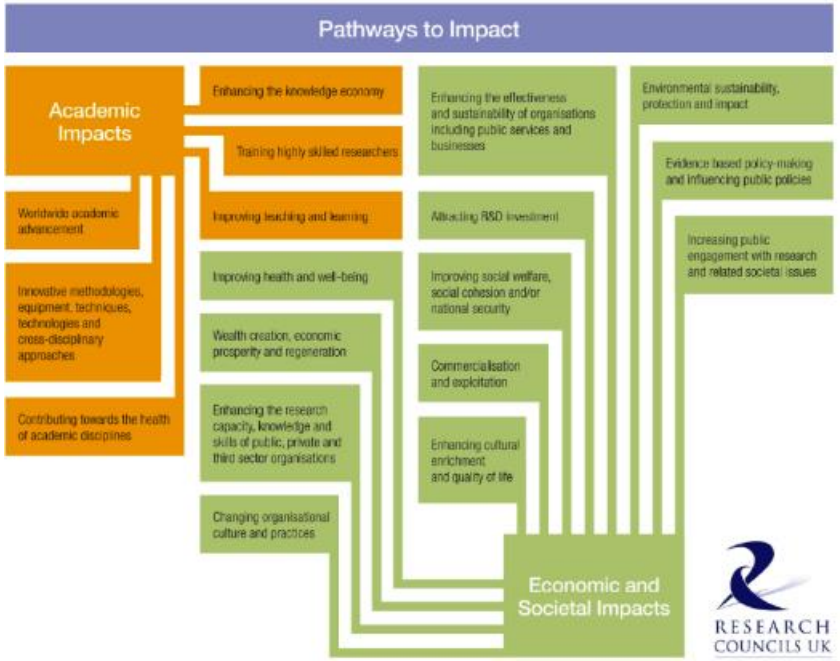
15 MINUTES

IN SMALL GROUPS

1. At your table, review the 4A's for integrating impact.
2. Individually read the case study.
3. In your group, discuss the primary purpose of integrating societal impact in the SSG initiative.
4. Might the purpose vary for other stakeholders? If so, how?

REVIEW OF IMPACT FRAMEWORKS

MANY FUNDING BODIES
ARE ASKING FOR PATHWAYS TO IMPACT



- Europe: Horizon 2020 Framework
  - Wider, societal, economic, environmental
  - Impact is on the application forms
  - Impact assessment reports – PF9
  - Horizon 2020 indicators
- UK: Research Excellence Framework
  - Primarily at grant proposal stage
  - Also in final reporting in some cases
- Move to impact strategies (planning) and desired impacts
- Focus on impact assessment

HOW DIFFERENT FRAMEWORKS CAPTURE IMPACT

- Research Excellence Framework (REF), UK – assesses performance of UK universities to determine funding allocation

- National Science Foundation, US – assesses intellectual merit (advancing knowledge) as well as the broader impacts (societal benefits)

- Excellence in Research for Australia (ERA), AU – uses bibliometrics, and other quantitative indicators, to map R&D output

- Canadian Academy of Health Science (CAHS), CA – aims to provide consistency and comparability while retaining flexibility

- The **Standard Evaluation Protocol** (SEP), NL - describes the methods used to assess research conducted at Dutch universities and Netherlands Organisation for Scientific Research (NOW) and Academy institutes every six years, as well as the aims of such assessments.

REF USED CASE STUDIES TO ASSESS IMPACT

PANELS JUDGED THE OVERALL QUALITY OF EACH SUBMISSION

65%	20%	15%
Quality of research OUTPUTS	IMPACT of research on society	The research ENVIRONMENT
191,150 research outputs by 52,061 staff were reviewed	16,975 impact case studies were reviewed	The review was based on data and information about the environment

Impact case studies were assessed on the Reach and Significance of the impacts

Impact was assessed on how far the strategy and approach were conductive to achieving impact

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CASE EXAMPLE OF REF CASE STUDY

ELEPHANT AND THE BEES EXAMPLE

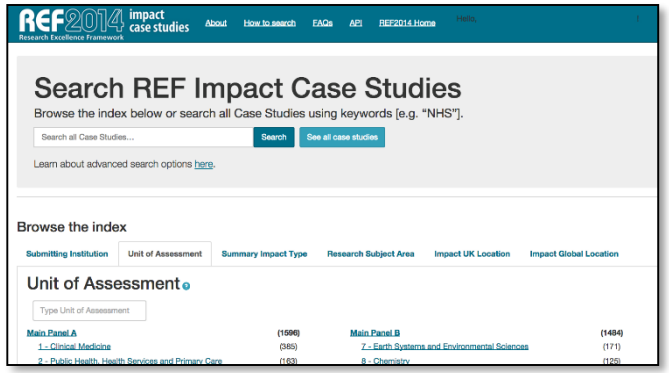
While increasing African elephant numbers in the last 20 years has been a success for conservation efforts, it creates problems for farmers when the elephants raid their crops.

Building on local anecdotal evidence, zoologists from the University of Oxford published a study in 2002 reporting that elephants avoided feeding on acacia trees hung with beehives. Partnering with a bio acoustician from Disney's Animal Kingdom, the team went on to show that the buzz of aggressive bees caused elephants to emit a low frequency rumble, causing other nearby elephants to retreat.

Using honey bees as an effective deterrent for crop-raiding elephants', REF 2014 IMPACT CASE STUDYhttp://impact.ref.ac.uk/CaseStudies/CaseStudy.aspx?Id=17588

They went on to develop and test a novel elephant-deterring beehive fence, built using low-tech, easy to maintain materials. The fences reduced raids on farmers' crops, improving their food security. In tandem, sales of 'elephant friendly' honey from the beehives offset the costs of building the fence.

UNESCO and the World Bank have since backed the use of beehive fences as a means to reduce human-elephant conflict. Projects are now running in farms across Kenya, Botswana, Tanzania, Mozambique and Uganda.



http://impact.ref.ac.uk

THREE KEY LESSONS ON GETTING A 4* RATING

- Articulate and evidence significant impact
- Provide evidence that impacts are far-reaching
- Submit the impact not [just] the pathway to impact

*"To ensure you are submitting the actual impact, and not just the pathway to impact, keep asking "what was the benefit and why was this important?" and describe the benefits.....If you don't know why it was important, ask the **beneficiaries** to tell you what was meaningful or valuable to them"*

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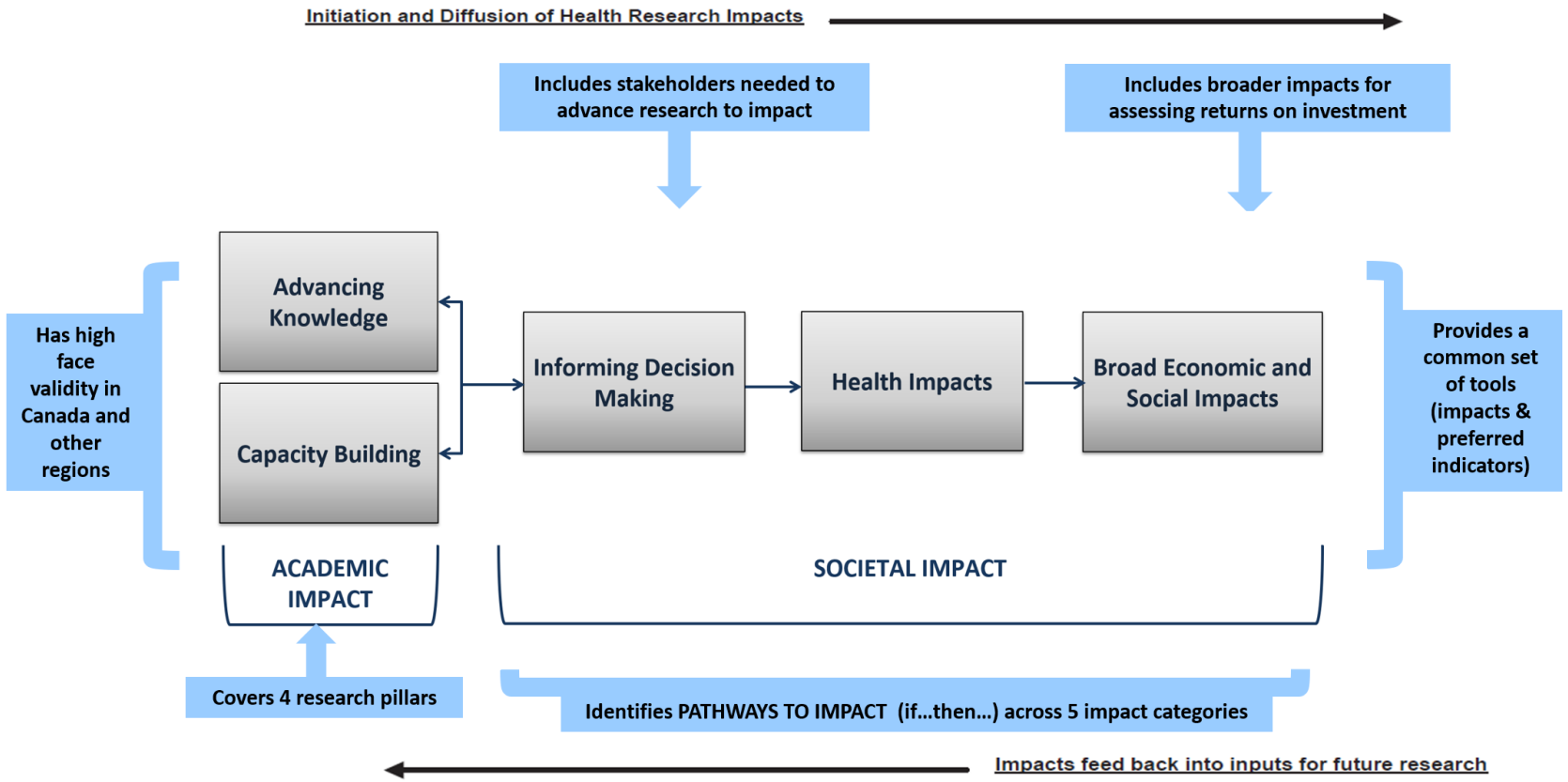
Source: What makes a 4 research impact case study for REF2021? Mark Reed, 2017*

CANADIAN ACADEMY OF HEALTH SCIENCES (CAHS)



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*Canadian Academy of Health Sciences (2009) Making an Impact http://www.cahs-acss.ca/wp-content/uploads/2011/09/ROI_FullReport.pdf

CAHS OFFERS A MENU OF INDICATORS - SAMPLE

Academic Impact

Advancing Knowledge

- Relative citation impact
- Highly cited publications
- Publications in high quality outlets
- Co-author analysis
- Field analysis of citations

Capacity Building

- Graduated research students in health related subjects
- Number of research and research related staff in Canada
- Levels of additional research funding
- Infrastructure grants ($)

Wider Impact

Informing Decision Making

- Use of research in guidelines
- Consulting to policy
- Number of patents licensed

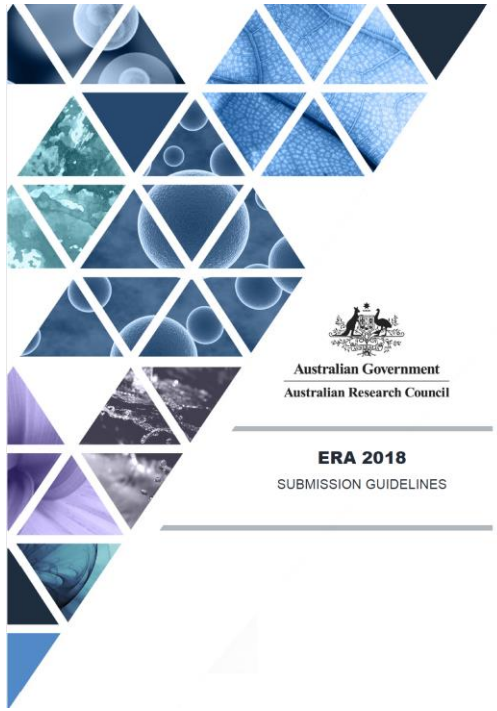
Health Impacts

- Adherence to clinical guidelines
- QALYs
- PROMs
- Wait times

Broad Economic & Social Impacts

- Licensing returns ($)
- Product sales revenues ($)
- Valuation of spin out companies ($)
- Happiness
- Socio-economic status

EXCELLENCE IN RESEARCH FOR AUSTRALIA



- An assessment system, administered by the Australian Research Council, which evaluates the research quality of all Australian universities
- Defines Impact as: the contribution that research makes to the economy, society, environment and culture beyond the contribution to academic research
- Will use both narrative statements, impact case studies and a small set of indicators

Sample of Engagement Indicators

- Cash support from end-users
- Research commercialization income
- Patents granted
- Proportion of total research outputs available via open access

ERA PILOT 2017 – ENGAGEMENT AND IMPACT

Unit of Assessment
Pilot FoRs: 03, 11, 21, 22

Engagement

- Suite of Metrics/ Indicators
- Narrative

→ Rating for Engagement

Unit of Assessment
Pilot FoRs: 05, 07, 09, 13, 19, 20, interdisciplinary and Indigenous

Impact

- Impact Studies

→ Rating for Impact

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FFG
Austrian Research Promotion Agency

Standard Evaluation Protocol (SEP)| Netherland

- Research Evaluation Protocol developed to assess academic research on a regular base
- Combination of “self evaluation reports” and “evaluation panel”
- Impact defined as “relevance to society”, indicated by
  - Outputs and outreach activities for society
  - Uses of research by societal groups
  - Marks of recognition by society groups
- Indicators should be supported by a narrative of 3-5 pages which indicates the relevance, or even impact or added value the group had during the assessment period.

SEP Assessment Criteria and Categories

Category	Meaning	Research quality	Relevance to society	Viability
1	World leading/ excellent	The research unit has been shown to be one of the few most influential research groups in the world in its particular field.	The research unit makes an outstanding contribution to society.	The research unit is excellently equipped for the future.
2	Very good	The research unit conducts very good, internationally recognised research.	The research unit makes a very good contribution to society.	The research unit is very well equipped for the future.
3	Good	The research unit conducts good research.	The research unit makes a good contribution to society.	The research unit makes responsible strategic decisions and is therefore well equipped for the future.
4	Unsatisfactory	The research unit does not achieve satisfactory results in its field.	The research unit does not make a satisfactory contribution to society.	The research unit is not adequately equipped for the future.

IN SUMMARY

- A review of how national impact frameworks integrate societal impact with research excellence
- Need to consider such frameworks in terms of requirements in your organization and research ecosystem

- CONTEXTUALIZING RESEARCH
- SETTING THE FOUNDATIONS FOR INTEGRATING AND IMPLEMENTING SOCIETAL IMPACT

INTEGRATING SOCIETAL IMPACT

Ecosystem Demand Analysis

RESEARCH STRATEGY

Integrate Societal Impact:

- Implementation Pathways to Impact
- Assess and measure societal impact
- Communicate Societal Impact

Engage Stakeholders

The proposal is that integrating an impact strategy upfront will increase the likelihood of achieving intended societal impacts

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Ecosystem Demand Analysis

- Completion of a market push/pull analysis that provides strategic information regarding ecosystem gaps, opportunities, industry demands and needs, drivers for value-added change and fore-sighting trends.

- Consider the stability of the current system and implications of potential future system changes (e.g. elections, regulatory changes) and constraints (social, political etc.).

It is critical to understand your market and the needs of your stakeholder/clients to inform your impact strategy

Engage Stakeholders

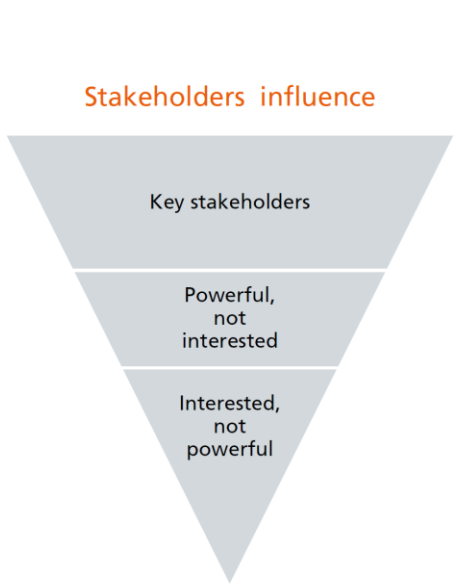
IDENTIFY STAKEHOLDERS

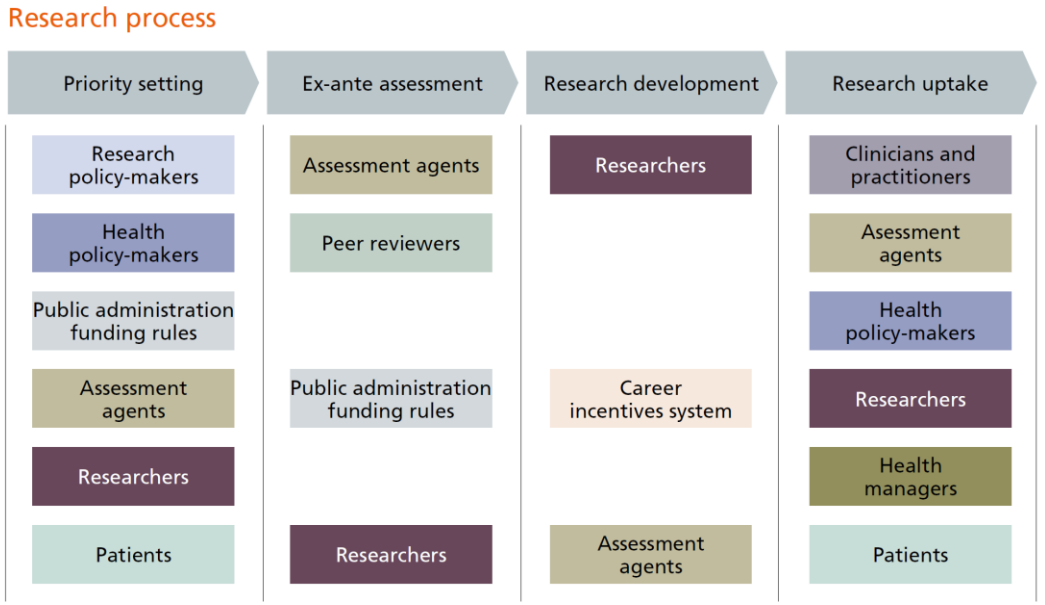
ENGAGE STAKEHOLDERS TO UNDERSTAND PERSPECTIVES

Types of Stakeholders	Perspectives
Funders of research • the public; government; research funding bodies; universities/institutes	• Demonstrate money well spent; make the case for more money; learning how to improve outcomes through allocation
Doers of research • Universities/institutes; departments; teams; researchers	• Demonstrate research effort and career well spent; make the case for more money; demonstrate personal achievement for career advancement
Beneficiaries • Patients; professional organizations; policy analysts; citizens	• Demonstrate benefits of research and impacts

ENGAGE STAKEHOLDERS TO ACHIEVE IMPACT

EXAMPLE HEALTH RESEARCH ASSESSMENT IN SPAIN





Source: Paula Adam ISRIA

STAKEHOLDER QUESTIONS

EXAMPLE OF QUESTIONS

- Is the research strategy achiveing anticipated societal impacts?
- What is the economic impact of the University to the region?
- Are there any unintended impacts as a result of the research strategy?

LEARNING ACTIVITY

10 MINUTES

IN SMALL GROUPS

In your groups, discuss who the Smart Strategy Group needs to engage to achieve:

- smart public services?
- smart technology education and training programs?

From your experience, what challenges do you anticipate in engaging these stakeholders? what has worked well?

RESEARCH STRATEGY

Integrate Societal Impact:

TYPICAL COMPONENTS OF AN ORGANIZATIONAL RESEARCH STRATEGY

- VISION
- MISSION
- GOALS/OBJECTIVES
- STRATEGIC FOCUS/PRIORITY AREAS
- PRINCIPLES/VALUES

CASE ILLUSTRATION – RATHENAU INSTITUUT ORGANIZATIONAL STRATEGY

VISION

Science, Technology and Innovation (STI) are essential for society, for our well-being, prosperity and innovativeness. The Rathenau Instituut connects science technology and society.

MISSION

The Rathenau Instituut encourages public and political opinion formation and decision-making on the social aspects of STI

OBJECTIVES

The Rathenau Instituut

1. puts the social aspects of emerging STI on the agenda.
2. encourages public and political debate on disputed STI within society
3. provides expertise and information in support of political decision-making and policy-making regarding STI

LEARNING ACTIVITY

10 MINUTES

INDIVIDUALLY

- On the handout provided Individually. Describe your organization's/program's:
- Vision
- Mission
- Goals/Objectives

IMPACT STRATEGY

Rathenau Instituut Impact Statement:

"Well considered, democratic decision-making on STI within Society"

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IMPLEMENTATION PATHWAYS TO IMPACT

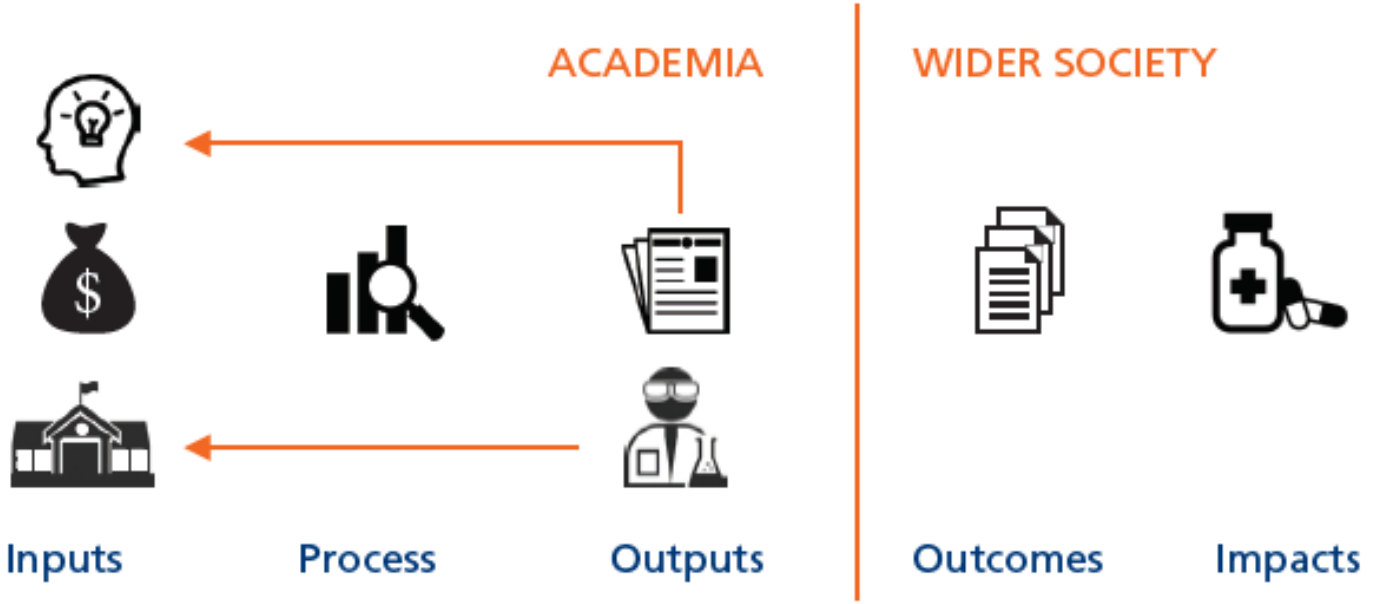
LEARNING OUTCOMES

- Describe components of pathways to impact (aka logic model)
- Using the components to link research to impact
- Know what to consider when creating your impact strategy

TRACING RESEARCH IMPLEMENTATION IMPACT PATHWAYS

- A tool that describes the theory of change underlying strategy
- A picture of how your strategy works from the point of linking inputs to achieving desired impacts
- It characterizes your strategy through a system of components with context being important
- Used to identify causality and expose gaps in a strategy
- Serves as a guide for your impact strategy, assessment and communicating (desired) impacts

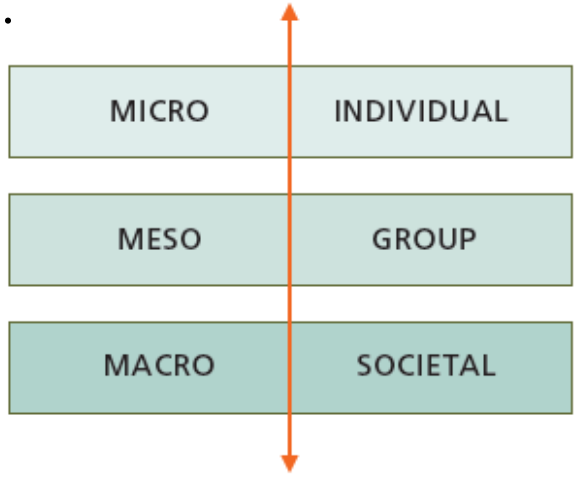
MAPPING RESEARCH TO SOCIETAL IMPACT



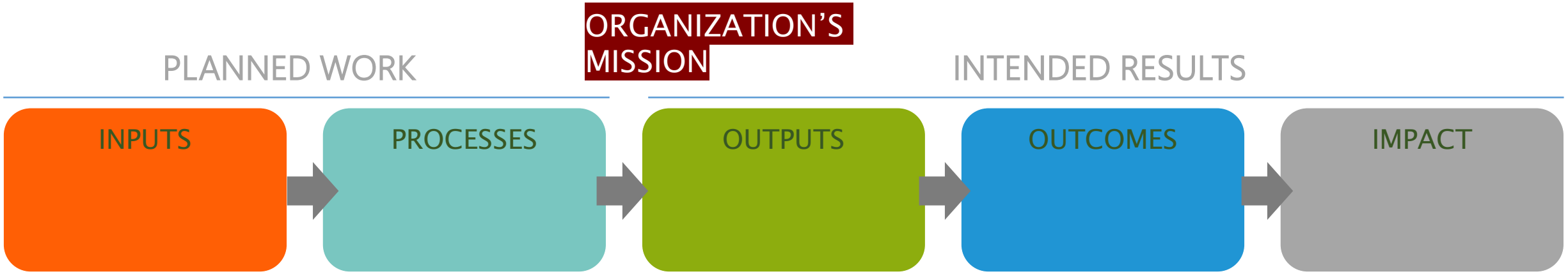
Source: Jonathan Grant, ISRIA

STRATEGIC ALIGNMENT CONSIDERATIONS

- Align societal impact strategy with your organization's mission and research strategy
- Identify the level(s) of aggregation you are interested in:



THE SIMPLE PATHWAYS TO IMPACT



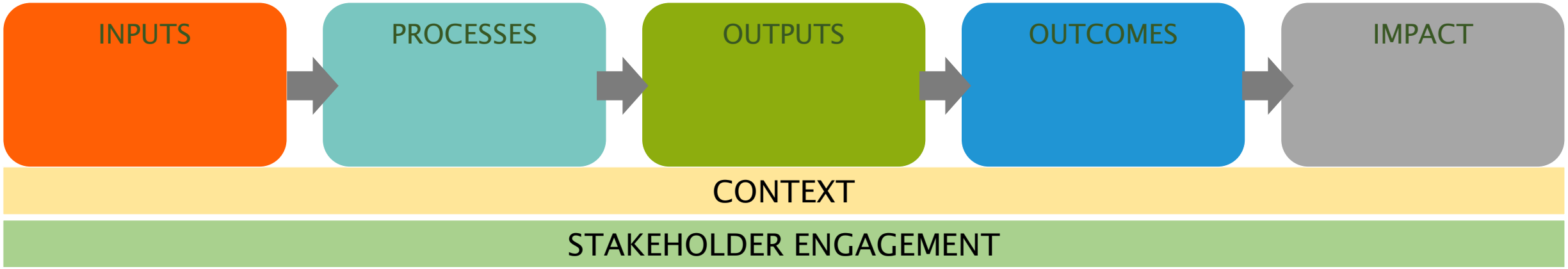
Inputs are the resources (human, financial) needed to execute the strategy, meaning to undertake the activities

Processes describe the actions undertaken to attain the outcome (to reach the strategic purpose)

Outputs are directly linked to the activities and illustrate immediate results of one or several activities

Outcomes describe the change the strategy intends to produce, if the theory of change is appropriate. You may distinguish between short-term, medium-term, and long-term outcomes

ORGANIZATION'S MISSION



Context considers the important features (social, political, economic aspects) of the environment where a strategy is undertaken. Context is important if one wants to generalise findings of a specific intervention

Engagement interaction between researchers & research end-users (e.g. individual, organization) in achieving of impact

Impact describes "the effect of the strategy on a larger system" "Impact is the fundamental intended or unintended change occurring in organizations, communities or systems as a result of program activities within 7 to 10 years. Impact often occurs after the conclusion of program funding

THE "IF . . . THEN" APPROACH AS A USEFUL TOOL

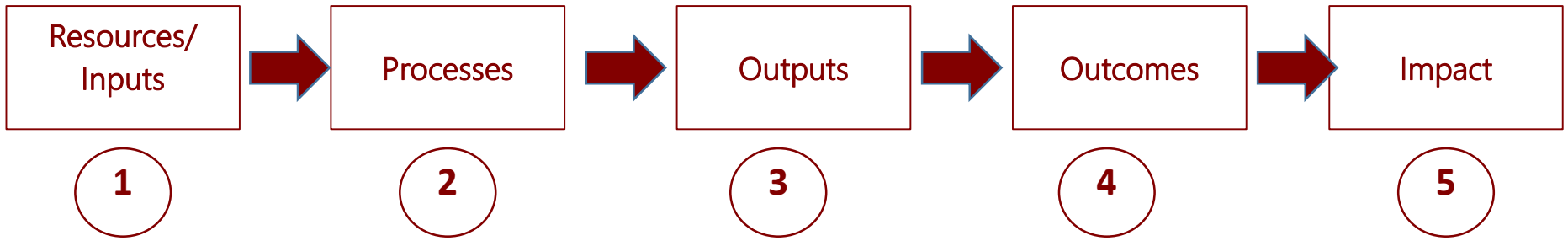
Certain resources are needed to operate your program

If you have access to them, *then* you can use them to accomplish your planned processes/activities

If you accomplish your planned processes/activities, *then* you will hopefully deliver the amount of product and/or service that you intended

If you accomplish your planned activities to the extent you intended, *then* your participants will benefit in certain ways

If these benefits to participants are achieved, *then* certain changes in organizations, communities, or systems might be expected to occur



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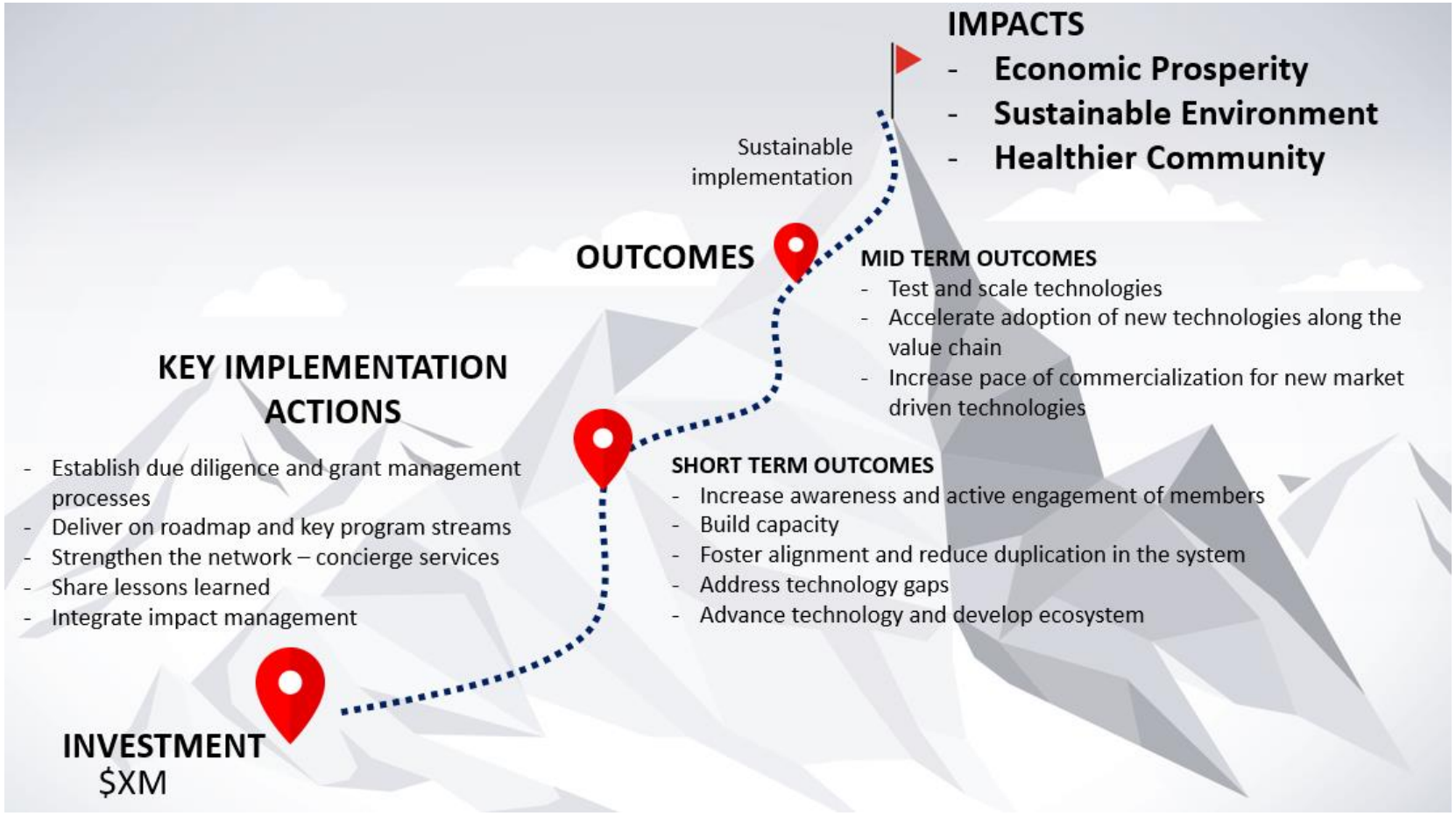
ILLUSTRATIVE EXAMPLE



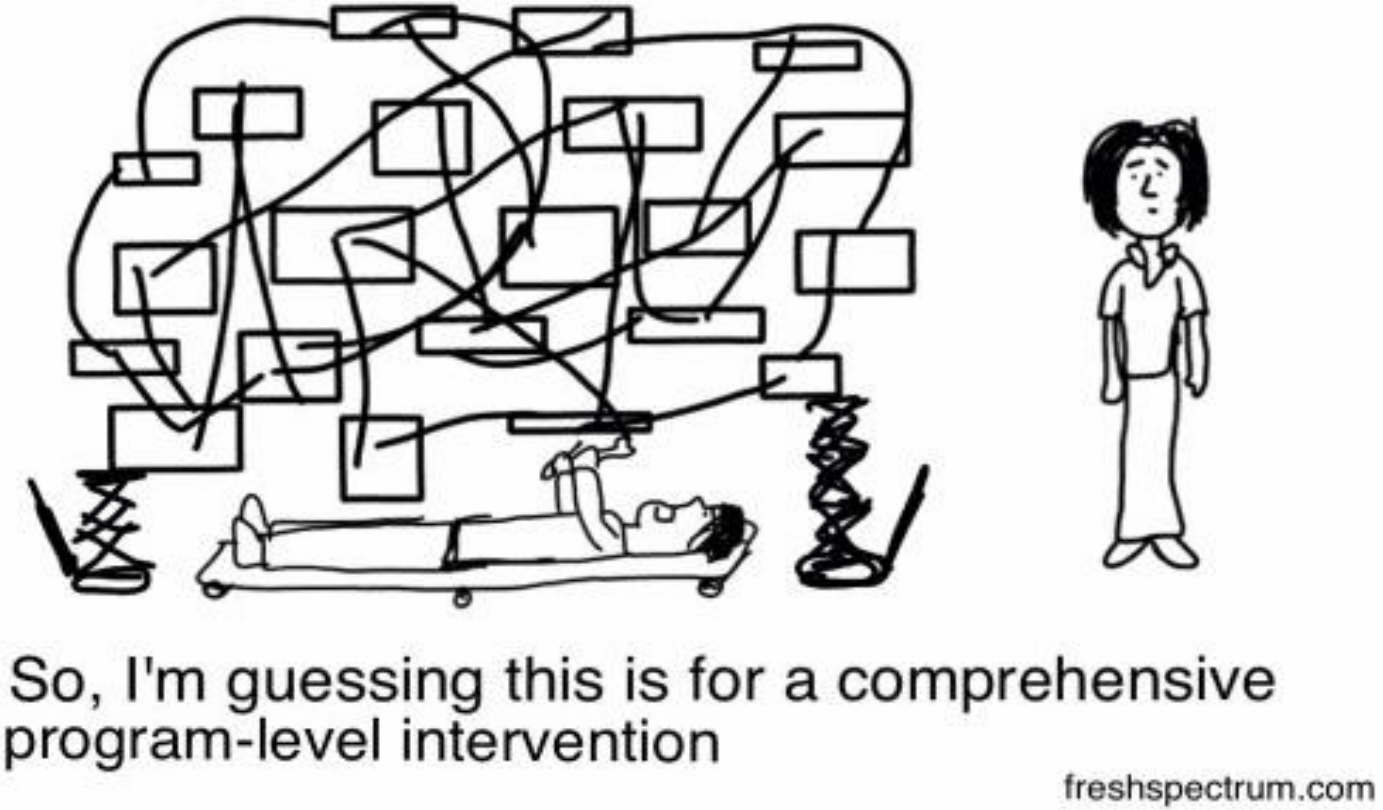
LIMITATIONS

"Don't fall in love with your pathways to impact"

- Tricky to apply to turbulent strategies and programs
- Cannot capture the counterfactual
- Dynamic and time-limited
- Must be continually updated or it becomes obsolete
- Might miss feedback loops
  - Capture these somehow, but do not complicate it!

AT THE IMPACT PATHWAYS

REPAIR SHOP



LEARNING ACTIVITY

10 MINUTES

INDIVIDUALLY

- On the handout provided. Individually describe your organization's/program's Intended Impacts.

KEY MESSAGES

- Know the motivations for integrating societal impact
- Impact frameworks and pathways are tools for:
  - Organizing information and concepts
  - Clarify thinking about strategy linkages
  - Identifying desired societal impacts
- Tradeoffs and choices need to be made for developing your impact strategy. Need to consider:
  - Research eco-system context
  - Purpose for integrating societal impact
  - Engaging stakeholders to achieve impact (understand their perspectives and questions)

FURTHER READING

- Greenhalgh, Trisha, and Nick Fahy. "Research impact in the community-based health sciences: an analysis of 162 case studies from the 2014 UK Research Excellence Framework." BMC medicine 13.1 (2015): 1
- Bornmann, L. (2013) What is societal impact of research and how can it be assessed? a literature survey. Journal of the American Society for Information Science and Technology, 64(20:217-233).
- Guthrie, S, Wamae, W, Diepeveen, S, Wooding, S and Grant, J (2013). Measuring research: a guide to research evaluation frameworks and tools. RAND Europe, Cambridge (MG-1217-AAMC)
- King's College London and Digital Science (2015). The nature, scale and beneficiaries of research impact: An initial analysis of Research Excellence Framework (REF) 2014 impact case studies. Bristol, United Kingdom: HEFCE.
- Logic model development guide (by Kellogg foundation) http://www.smartgivers.org/uploads/logicmodelguidepdf.pdf

THANK YOU

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Lunch break

We will start again at 13.30

Impact oriented research and management

Mike Smith

Emeritus Professor of Medical Science, Managing Partner of Harper Keeley LLP & former Chair of the UK Institute of Knowledge Transfer, UK

Impact Oriented Research

Professor Mike Smith
Emeritus Professor of Medical Science
Managing Partner, Harper Keeley LLP
Chair, Medipex Ltd

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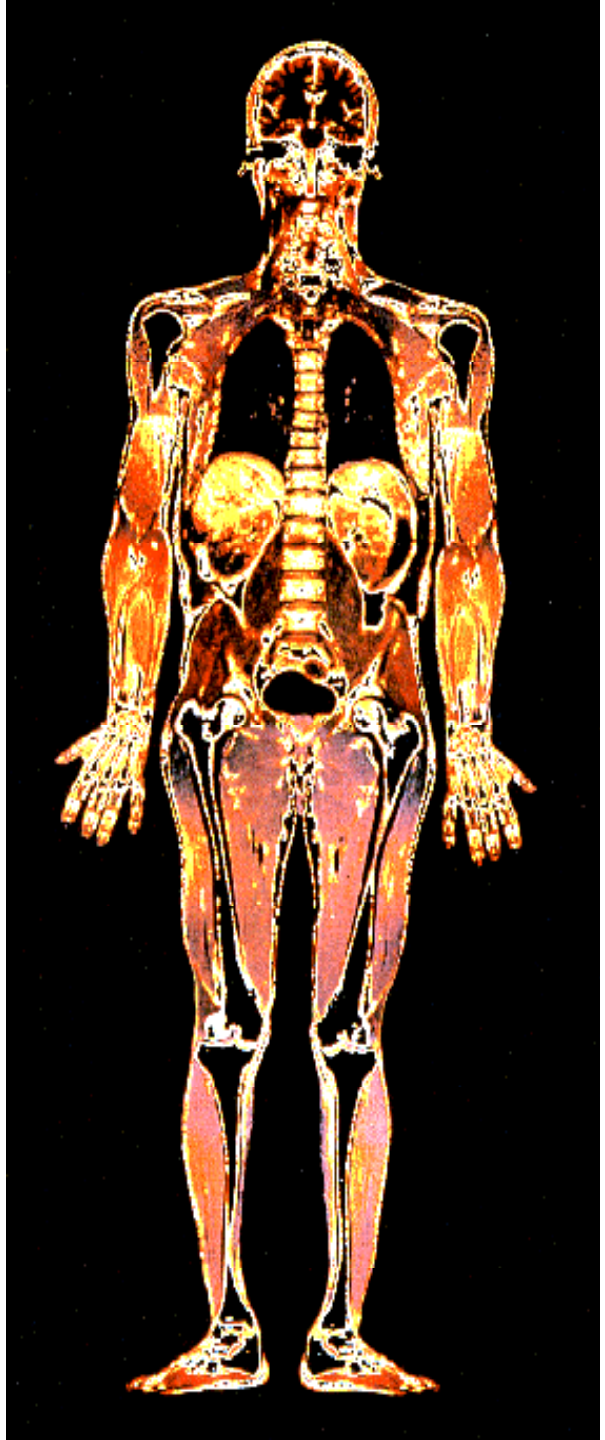
EUROPEAN ASSOCIATION OF
RESEARCH MANAGERS AND ADMINISTRATORS



Research, Innovation & Commercialisation

First 20 years:

- Medical scientist working on new medical technology, working in University Hospital Medical Schools, the NHS and with industry
- Published extensively and raised large amounts of grant funding and investment
- Partnership working internationally and with commercial companies
- Researched and developed ideas and solutions that were available for patient benefit and of commercial interest
- Patented and licenced ideas
- Formed two companies to commercialise research and sold one to the US

Research, Innovation and Commercialisation

Recent 25 years:

- Continued impact oriented research plus licensing, start-ups, spin-outs & commercialisation opportunities
- Extended personal commercial innovation activity into a range of technologies and businesses that was wider than medical and health technology
- Panel member for two rounds of the UK research assessment exercise
- Corporate role as Pro Vice Chancellor in Universities and Director in the NHS, developing policy
- Non-Executive Director in a range of commercial ventures
- Chair and Founder of Medipex Ltd, a company to commercialise IP emerging from the health sector
- Chair of the Institute of Knowledge Transfer
- Formed an investment funds to support the commercialisation of Medical Technology

Societal Impact

More

- Stronger economy
- New companies
- Exports
- Jobs
- Stronger society
- Better Health
- Better Education
- Independence in old age

Less

- Inequalities
- Poverty
- Sickness and disease
- Unemployment
- Social care burden
- Crime/violence/terrorism
- Pollution
- Climate change

Personal perspective of impact (1)

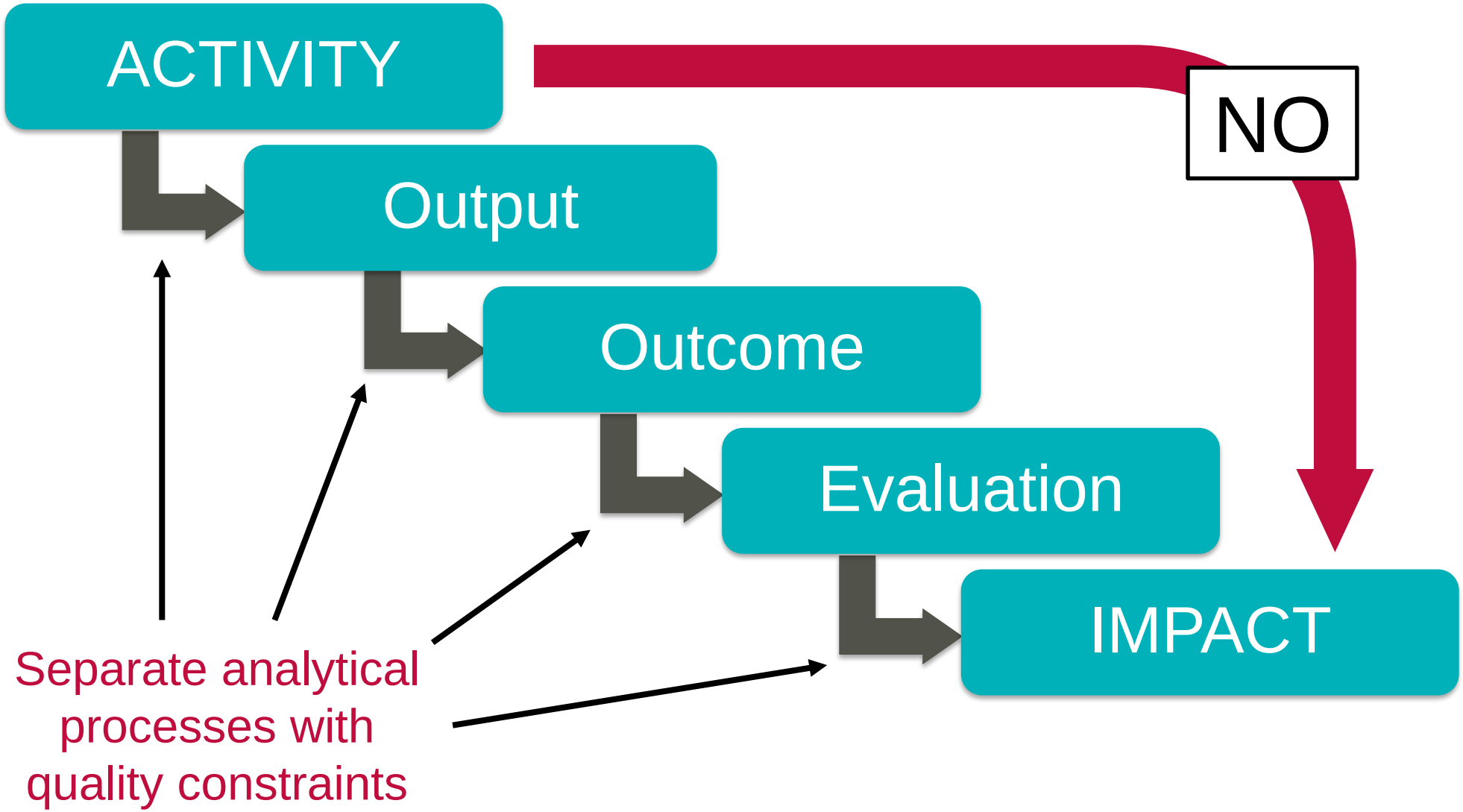
- Impact had been used in research for many years, since the 1970s - terms like ‘impact factor’ were embedded in the vocabulary of research
- In my own research I wanted to improve the health of patients (help them get better quicker or stop them becoming ill) – in the 1970s to 1990s I wasn’t aware that I was focussing on impact
- As an assessor for the UK research assessment exercises in 1996 and 2001, and a University lead for submissions, I experienced the then strategy, and problems, of focusing on research *outcome*, as it was called then, rather than impact

Personal perspective of impact (2)

- From the early 2000s the word impact increased in usage – and over-usage
- Narratives and indicators associated with the impact on Economic Transformation particularly in relation to regional/national/European structural funding
- Narratives but fewer indicators around Social Transformation, often presented to counter or complement the emphasis on economic impact
- Increase use of the term in driving wider funding decisions, only in some cases with an increased understanding and acceptance of the difference between impact and evaluation

Personal perspective of impact (3)

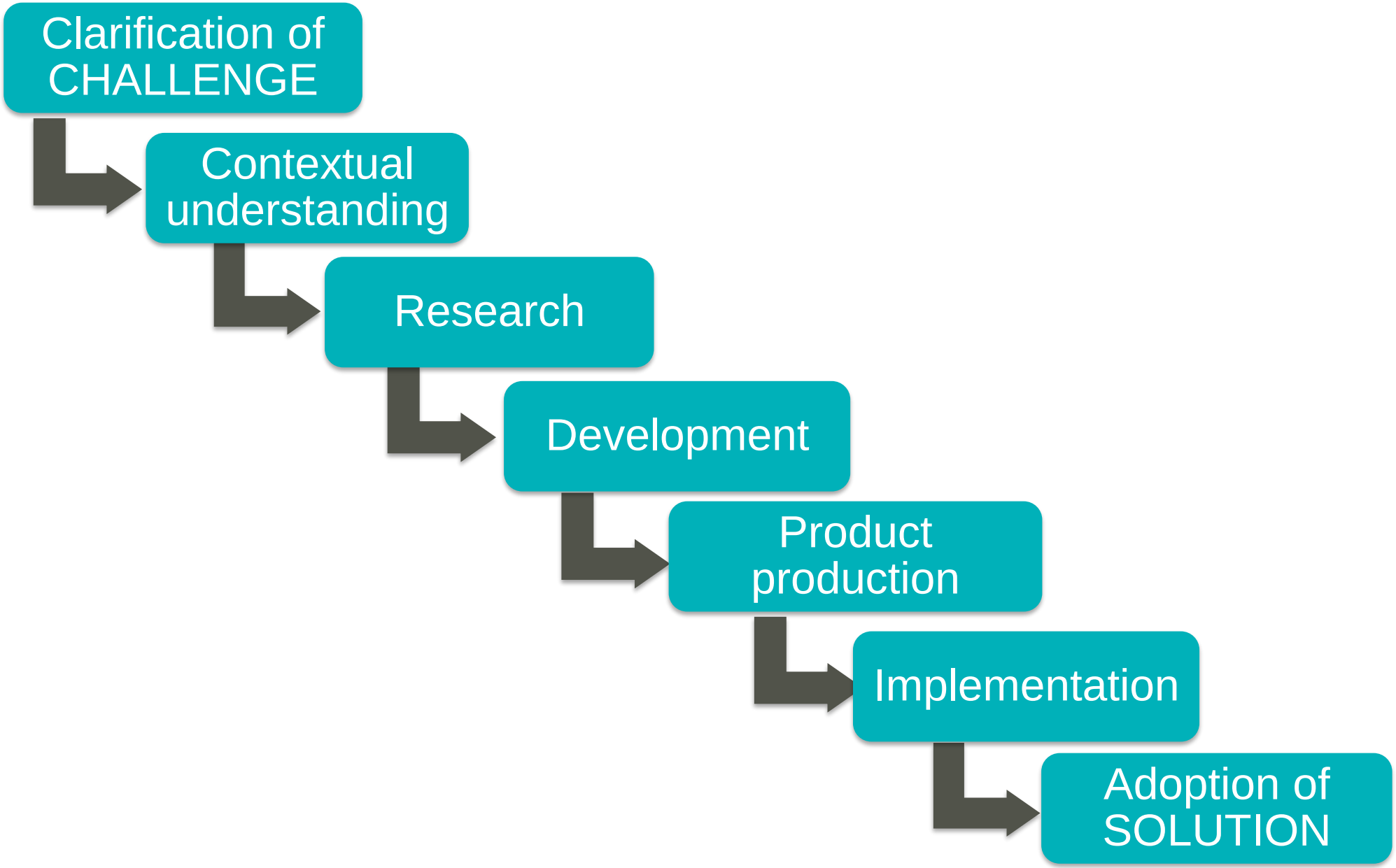
- Tendency to concentrate on ‘impression management’ to convince people of impact, particularly the reliance on good news stories
- Funded organisations and individuals comply with or object to the measurement of impact – but rarely considered changing what they do or how they do it, to *increase* impact
- Generally little awareness that funding bodies might be wanting to use the measurement of impact as a lever for change and to support their policy agendas

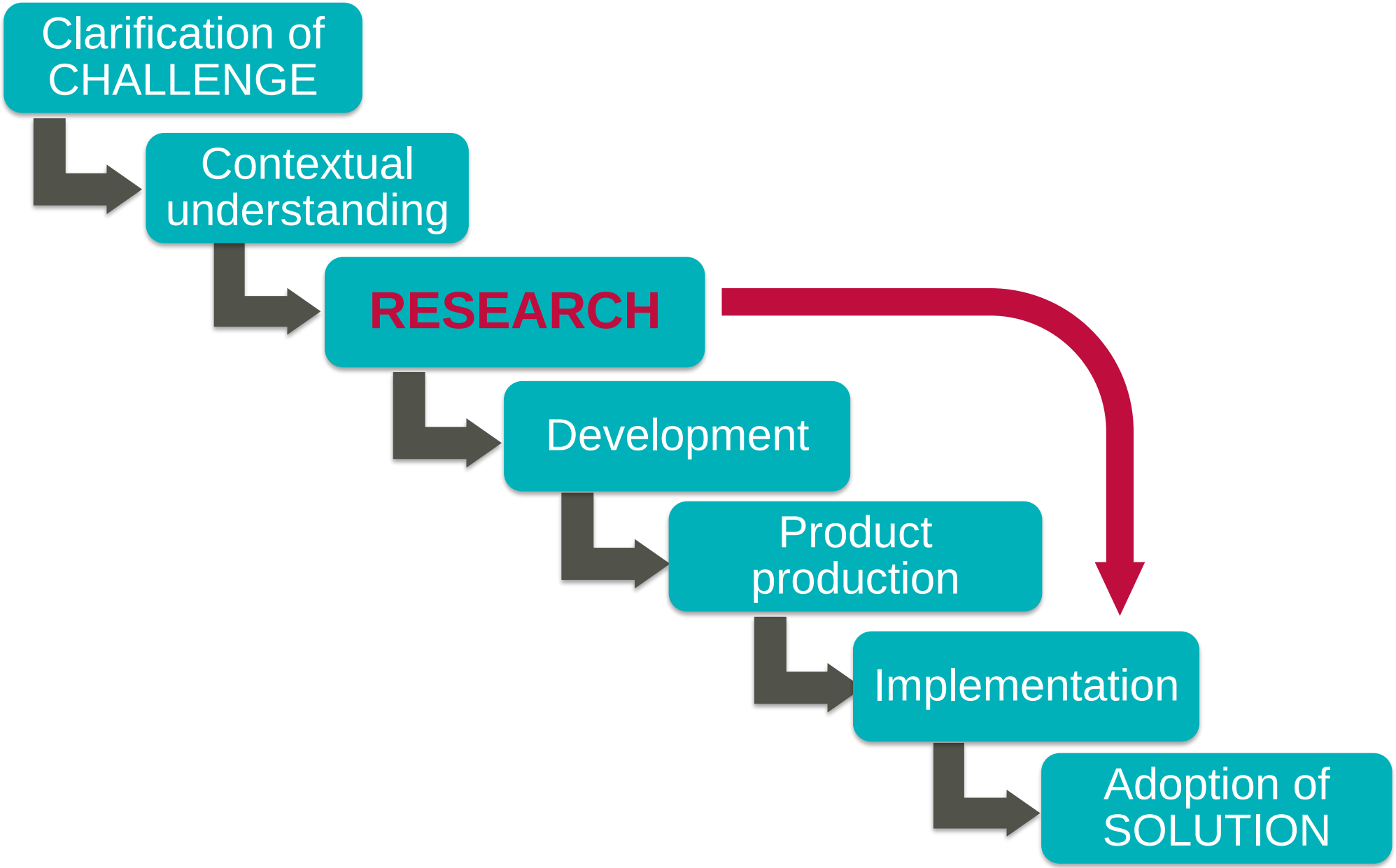

ACTIVITY
Output
Outcome
Evaluation
IMPACT
NO
Separate analytical processes with quality constraints

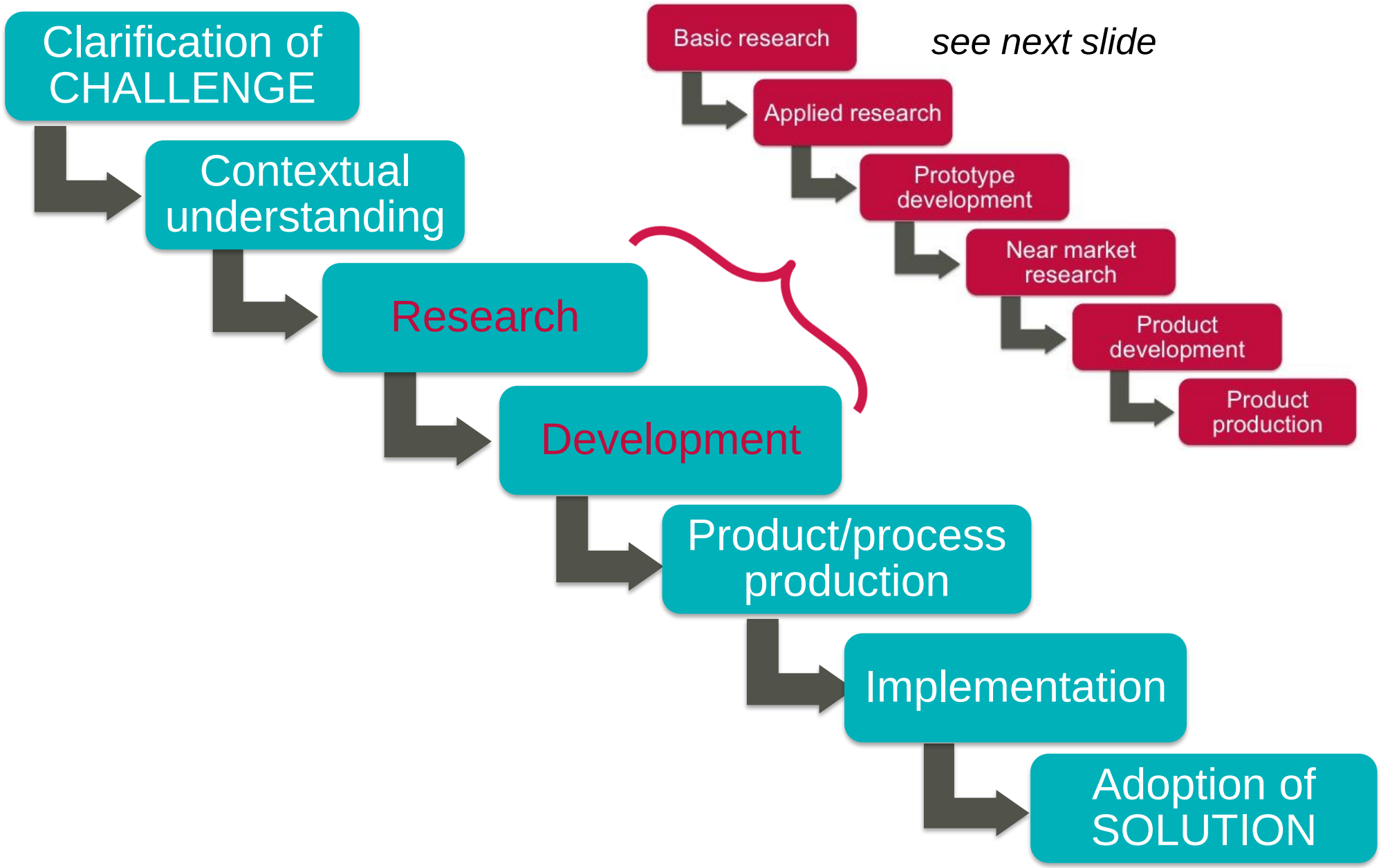
Impact Dichotomies

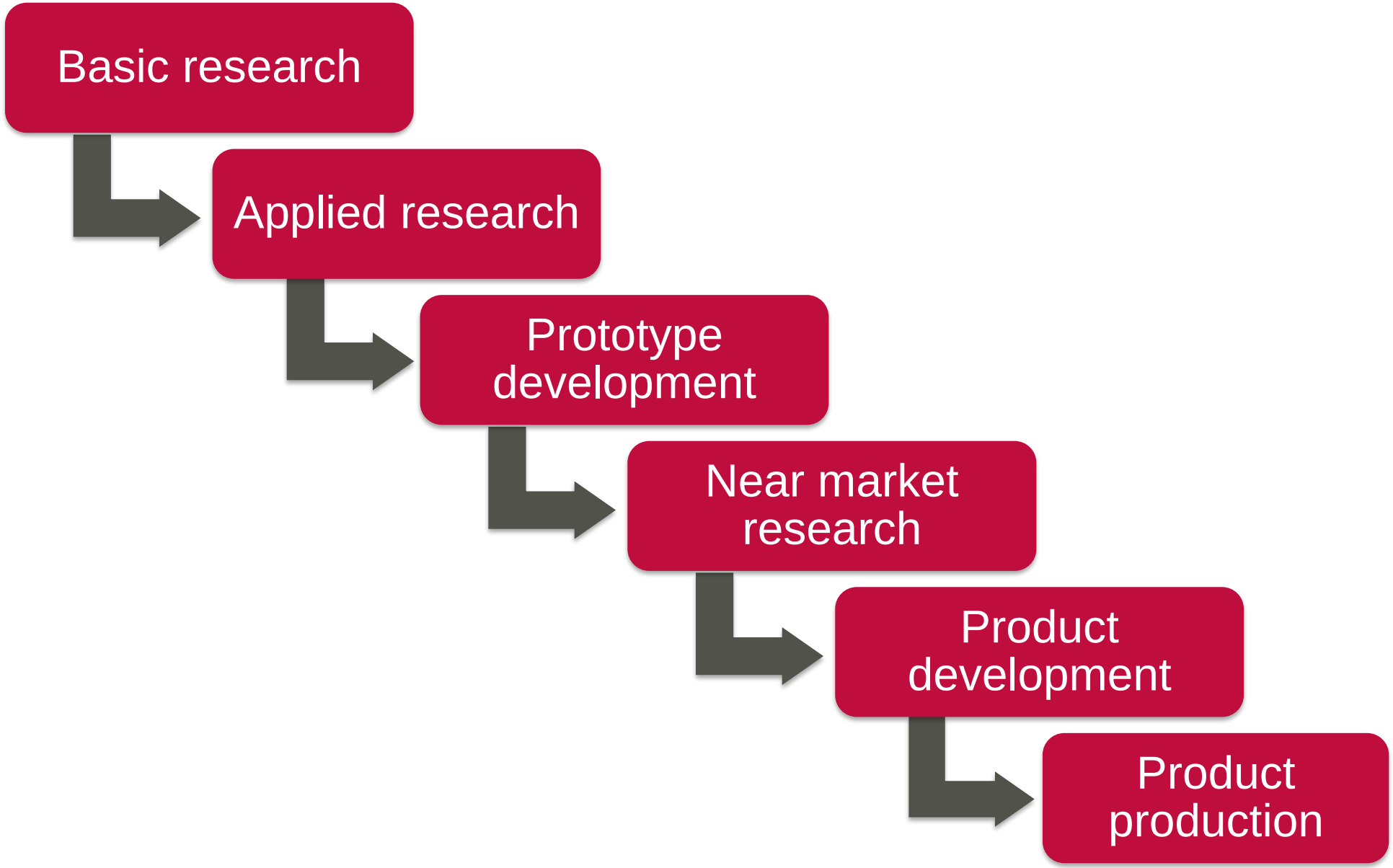
Research	or	Education
High quality research	or	Any innovative activity
Economic impact	or	Social impact
Short term impact	or	Long term impact
Quantitative indicators	or	Qualitative indicators
Unbiased assessment	or	Marketing information
Rigorous	or	Impression focused
Objective	or	Subjective (opinion lead)
Transparent	or	Defensive
Funded	or	Unfunded

- What is the challenge that needs to be resolved?
- How could this challenge be resolved?
- Is there new or emerging understanding, science, methodology or technology which indicates than *now* is the time ?
- Who else is interested; are they partners or competitors?
- What would success look like ? Essentially what parameters would you measure to demonstrate success (and show the impact)?
- If you identify a solution, do you need to undertake further work to ensure it is implemented and becomes widely adopted, to achieve maximum impact ?
- What is the end point and exit strategy?

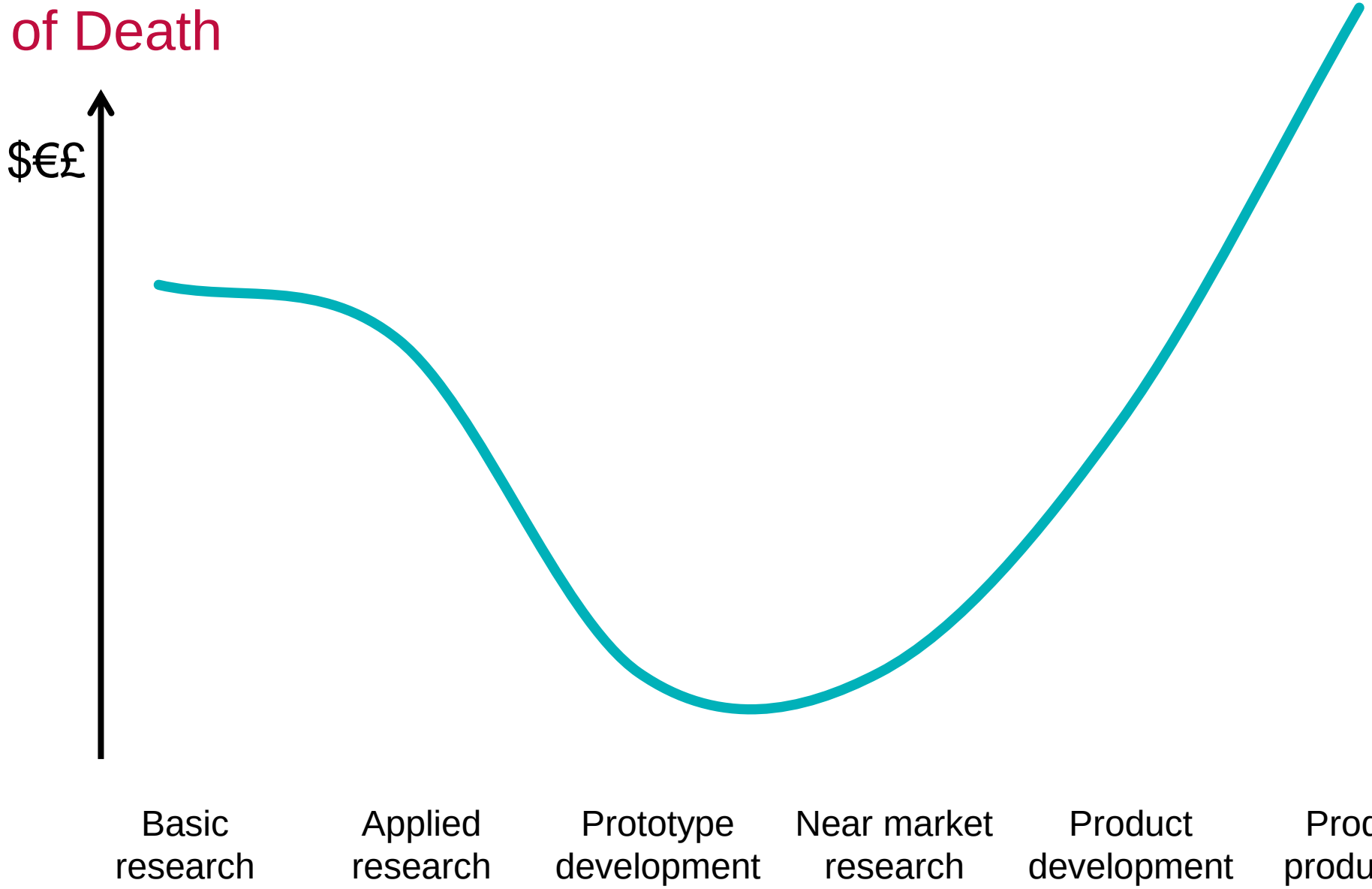








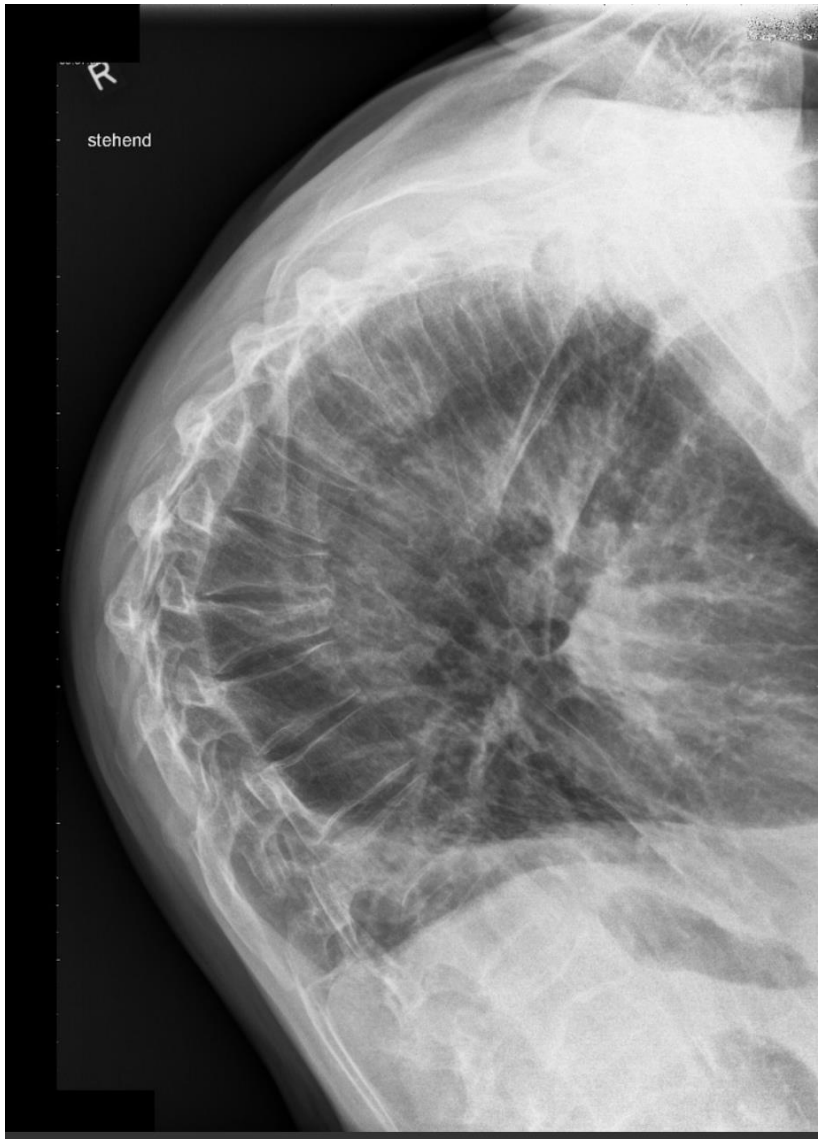
Valley of Death

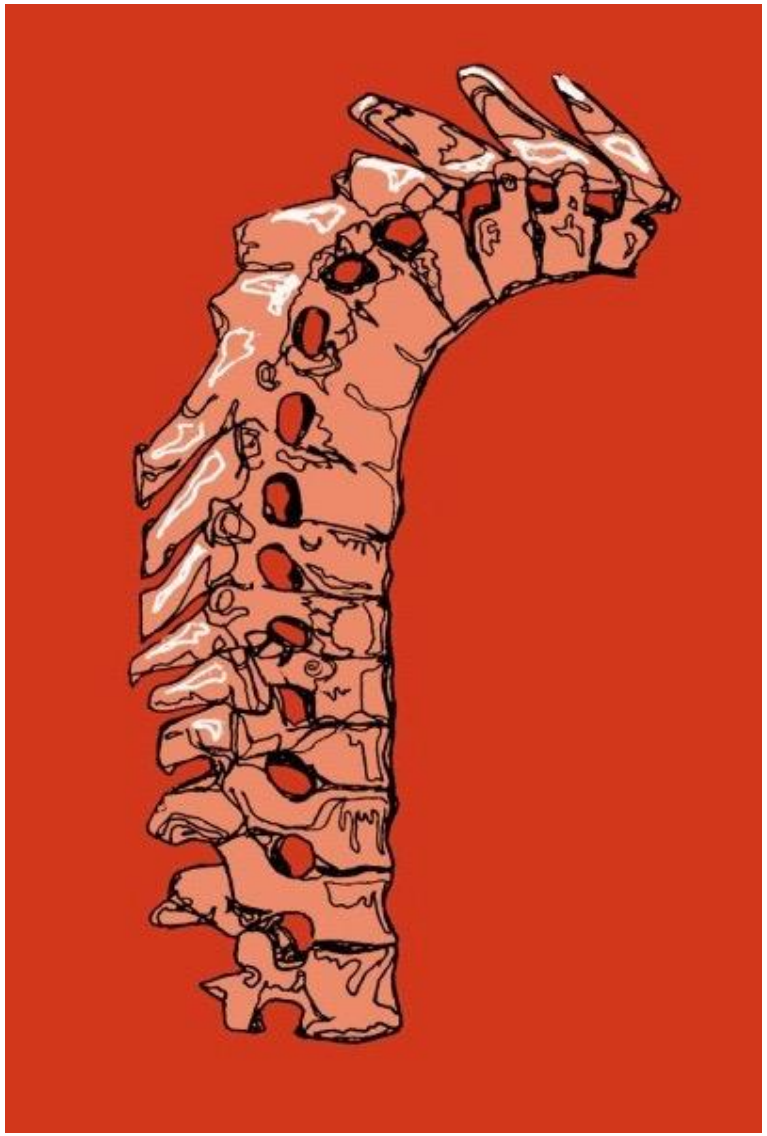


Case Study 1:
Research, Development and Implementation

Non-invasive bone mineral measurement and the development of bone scanners for osteoporosis

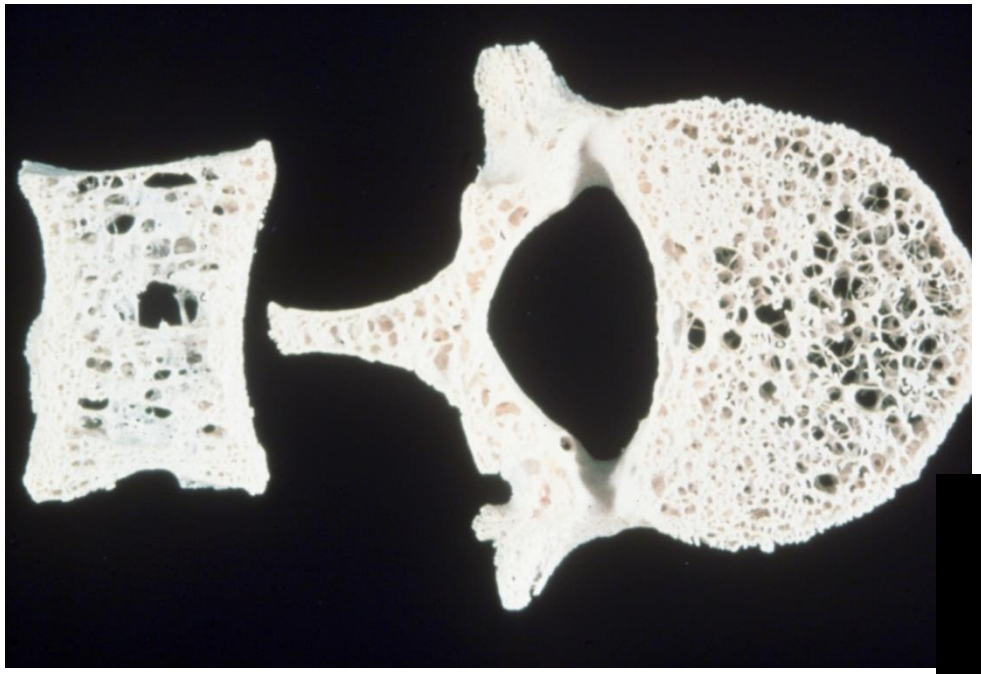
Dowager's hump

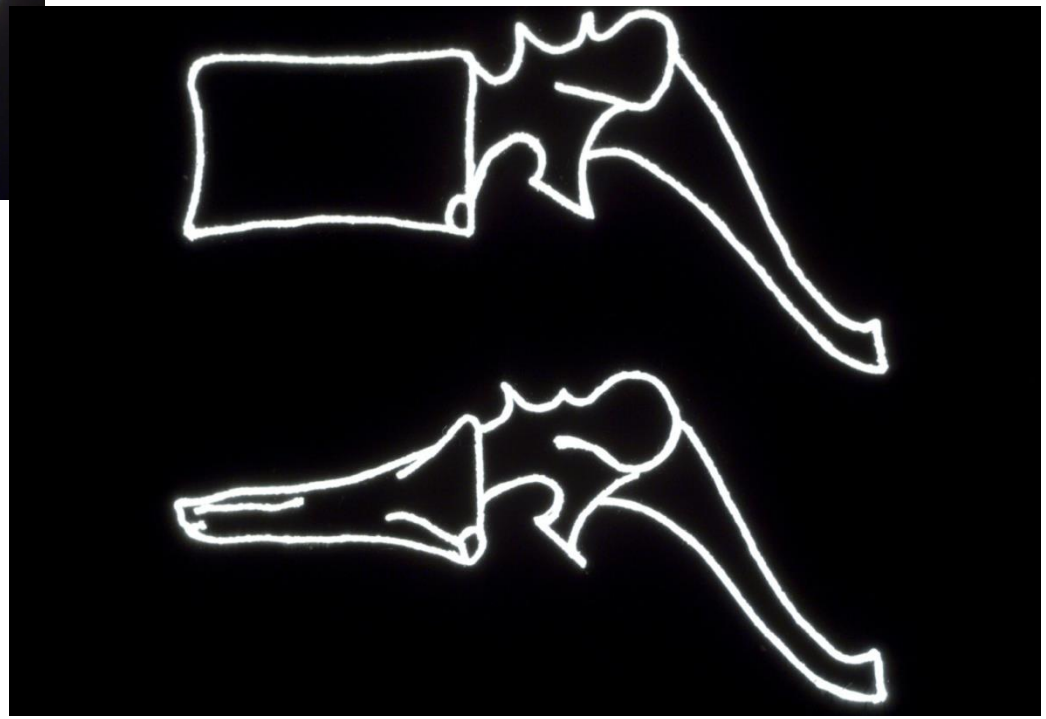


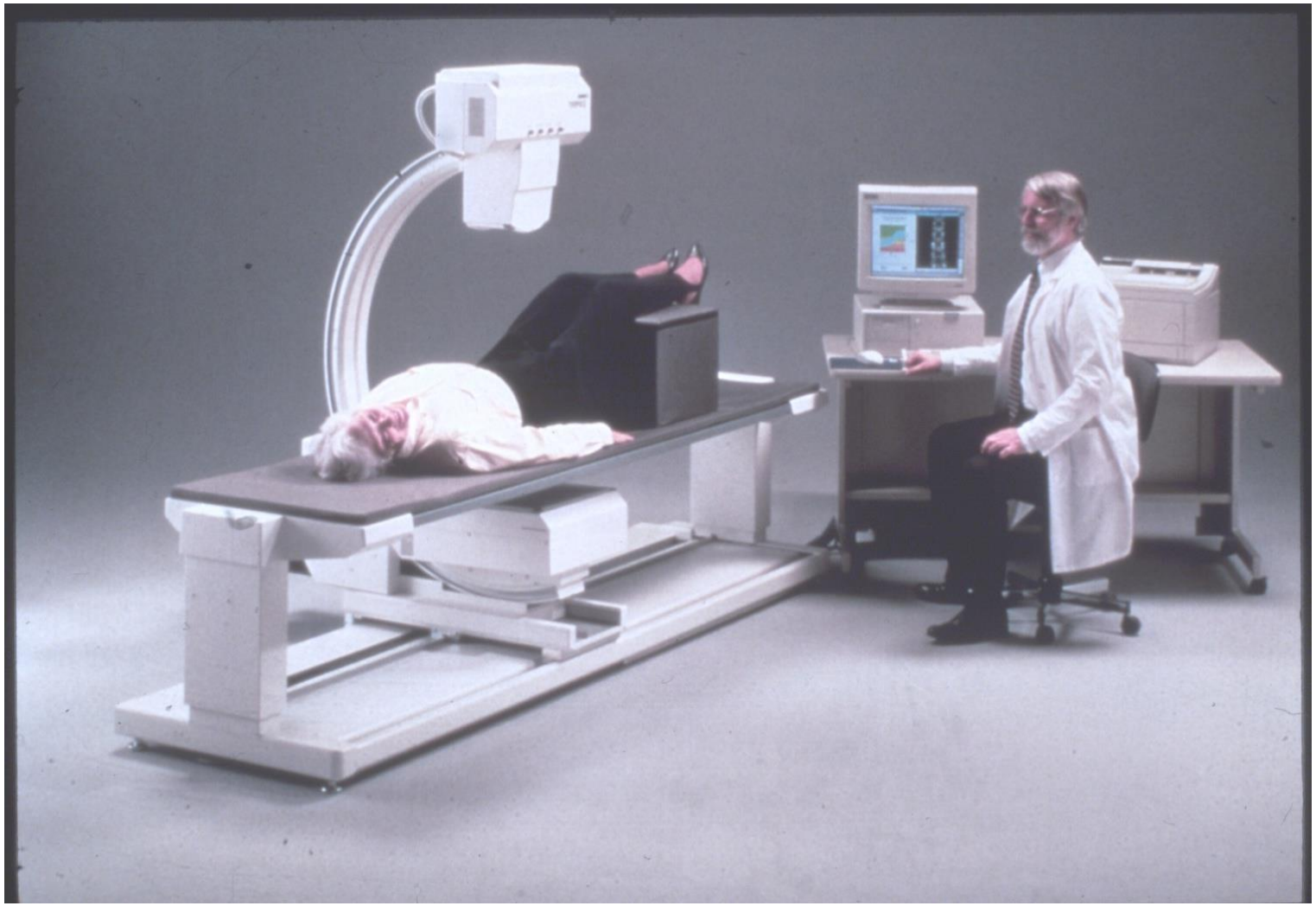


Osteoporosis - Incidence and burden

- Osteoporosis affects ~75 million people in Europe, USA & Japan.
- Worldwide, 1 in 3 women over age 50 will experience osteoporotic fractures, as will 1 in 5 men aged over 50.
- In Europe, disability due to osteoporosis is greater than most cancers and is comparable or greater than rheumatoid arthritis, asthma and high blood pressure related heart disease.
- In women over 45 years of age, osteoporosis accounts for more days spent in hospital than many other diseases, including diabetes, myocardial infarction and breast cancer.
- A 10% loss of bone mass in the vertebrae can double the risk of vertebral fractures, and similarly, a 10% loss of bone mass in the hip can result in a 2.5 times greater risk of hip fracture .

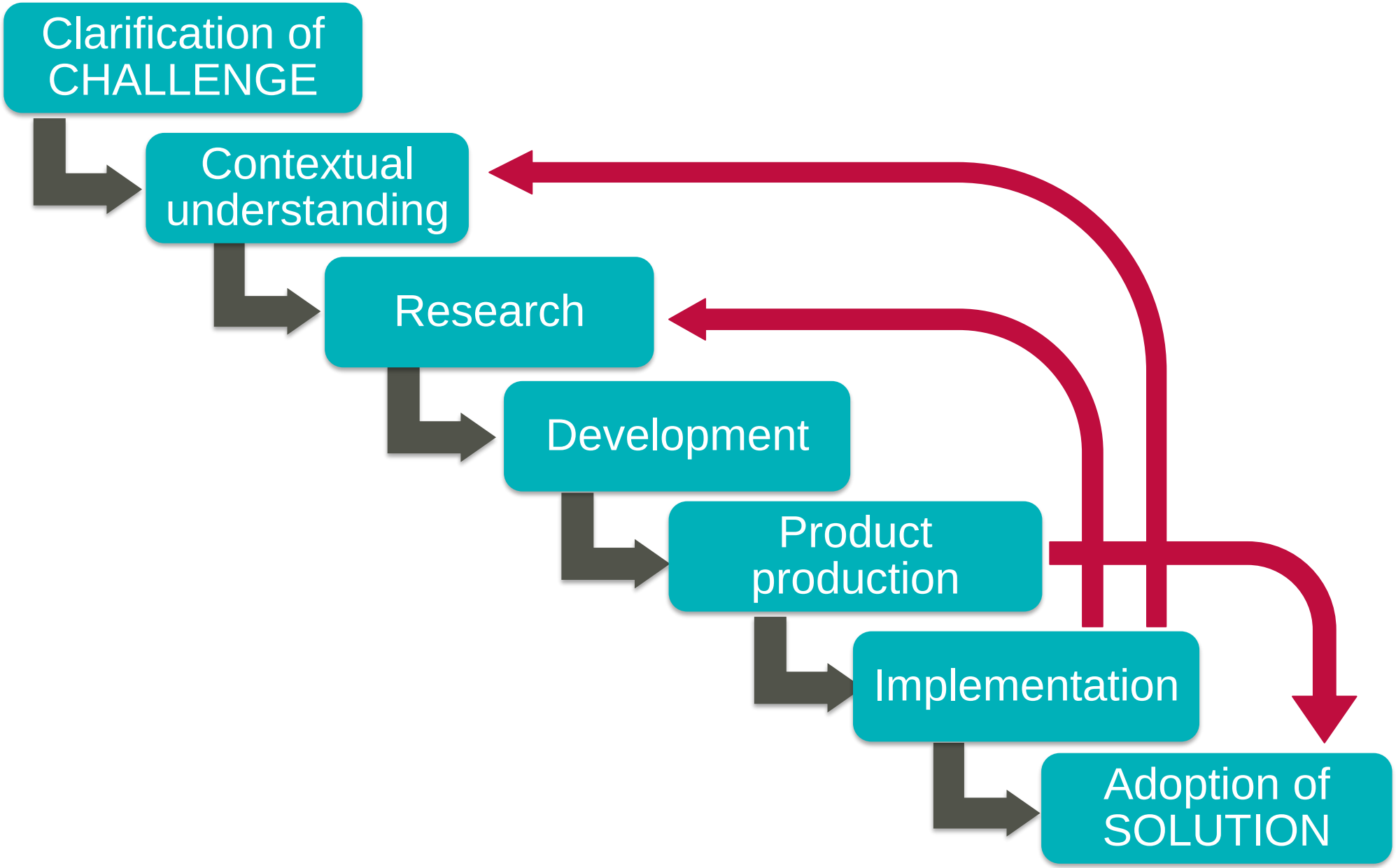






Bone Scanners for Osteoporosis (UK)

First research abstract published	1963
Development of equipment	1974 - 1980
Commercial equipment available	1978 - 1982
Purchased by research groups	1978 - 1988
Initial purchase by health systems	~1990
Questions about cost effectiveness	1994
Advocacy campaign	1995 - 1998
Widespread medical and health use	2000
Impact on societal health	?



Case Study 2:
Research through to Commercialisation
Magnetic Resonance Imaging

Computerised Tomography (CT)

Tomo~ From the Greek meaning ‘a slice’

~graphy adapted from the English/American and meaning:

‘a machine for a hospital costing a load of money which will make its manufacturers a fortune’

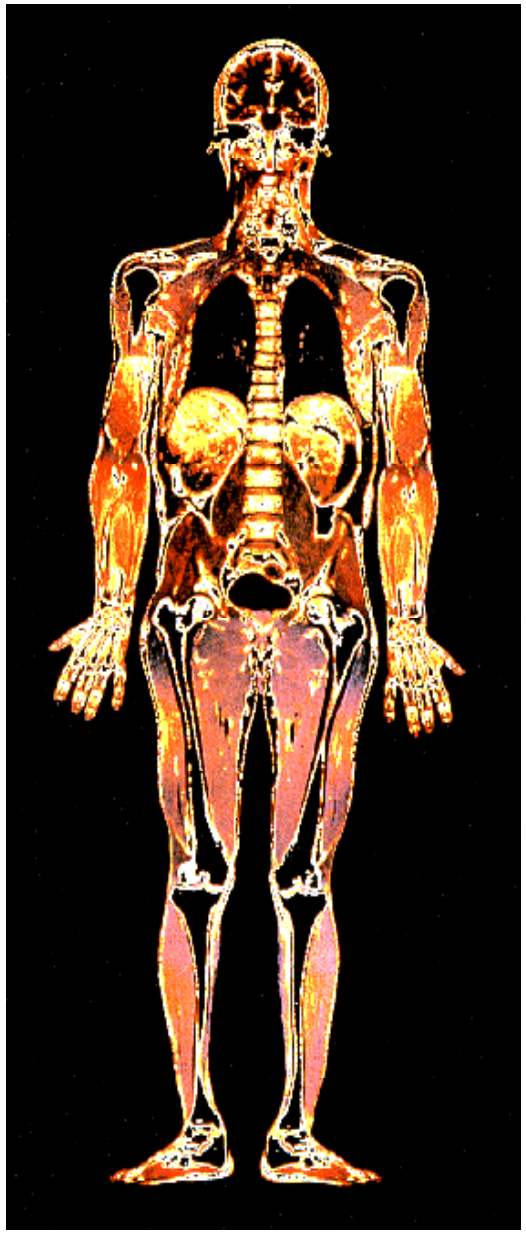
Computerised Tomography (CT)

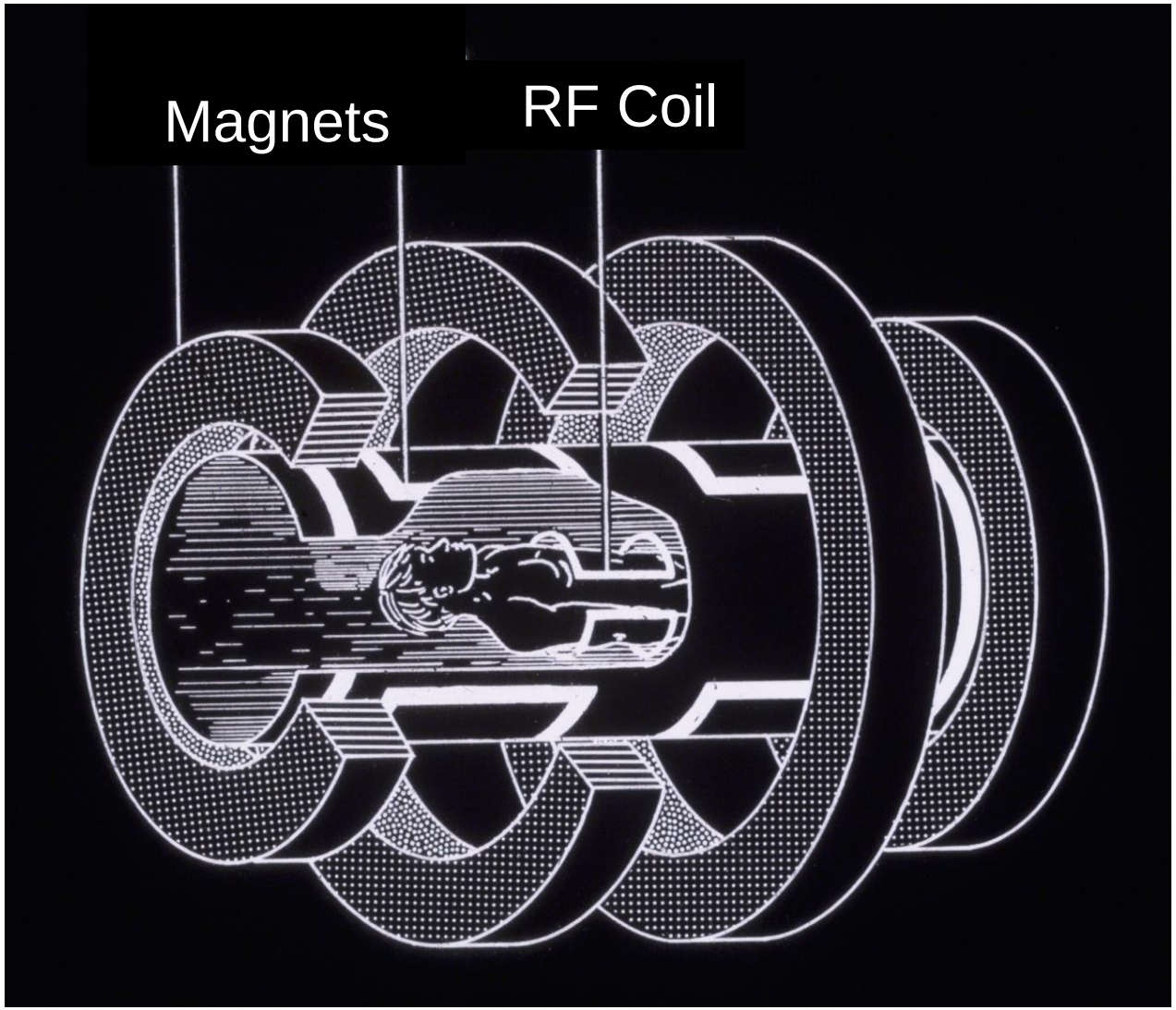
Developed by EMI in the early 1970s, systems were quickly installed many hospitals. Changed the attitude towards ‘scanners’.

- Back-projection mathematics (1917)
- Semiconductors (1960s)
- Mini-computers (1970s)

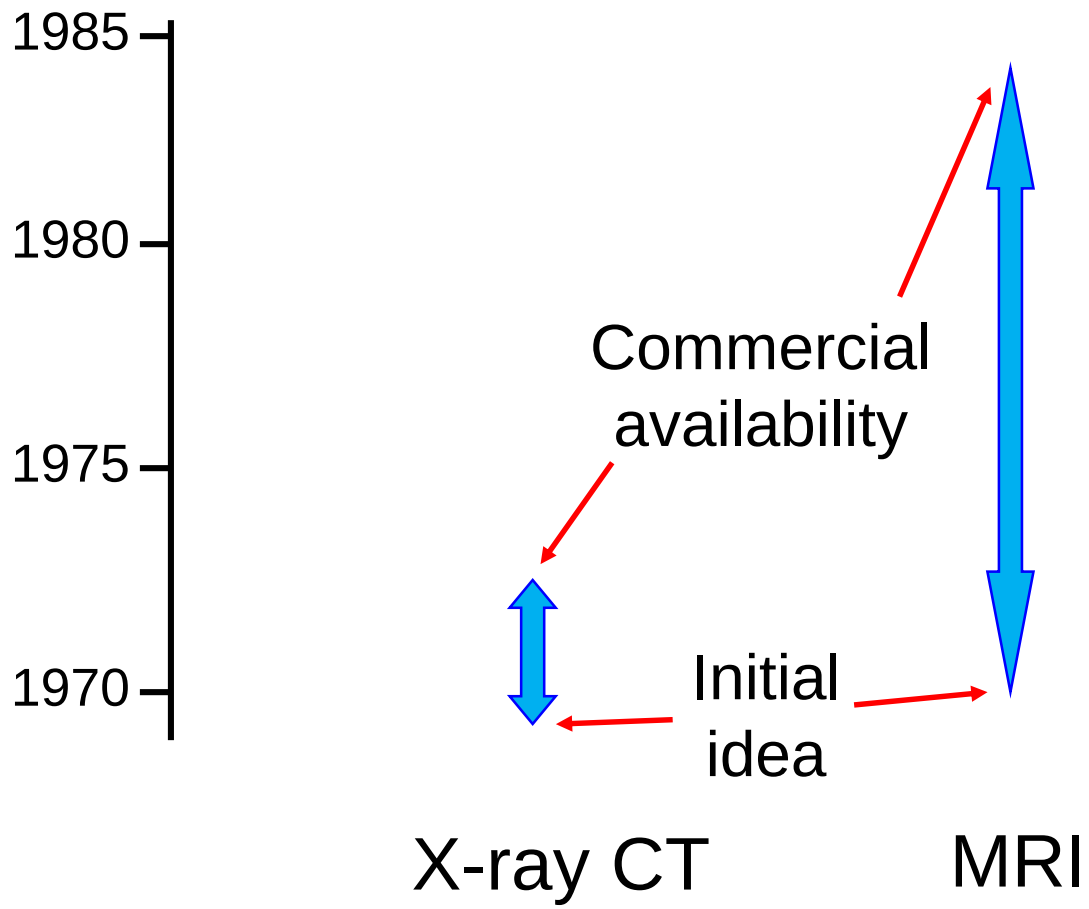
Legislation introduced in the USA to restrict their use.

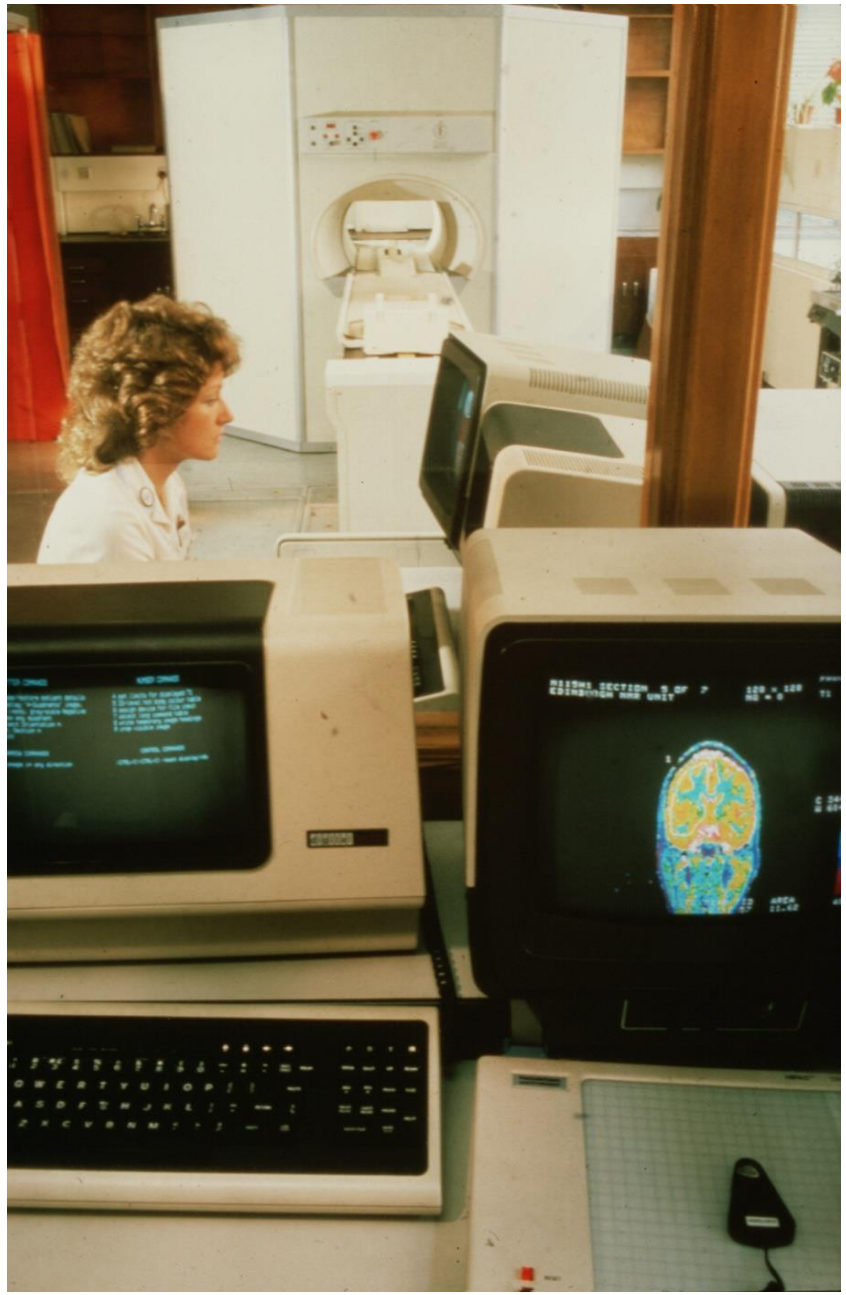
Magnetic Resonance Imaging

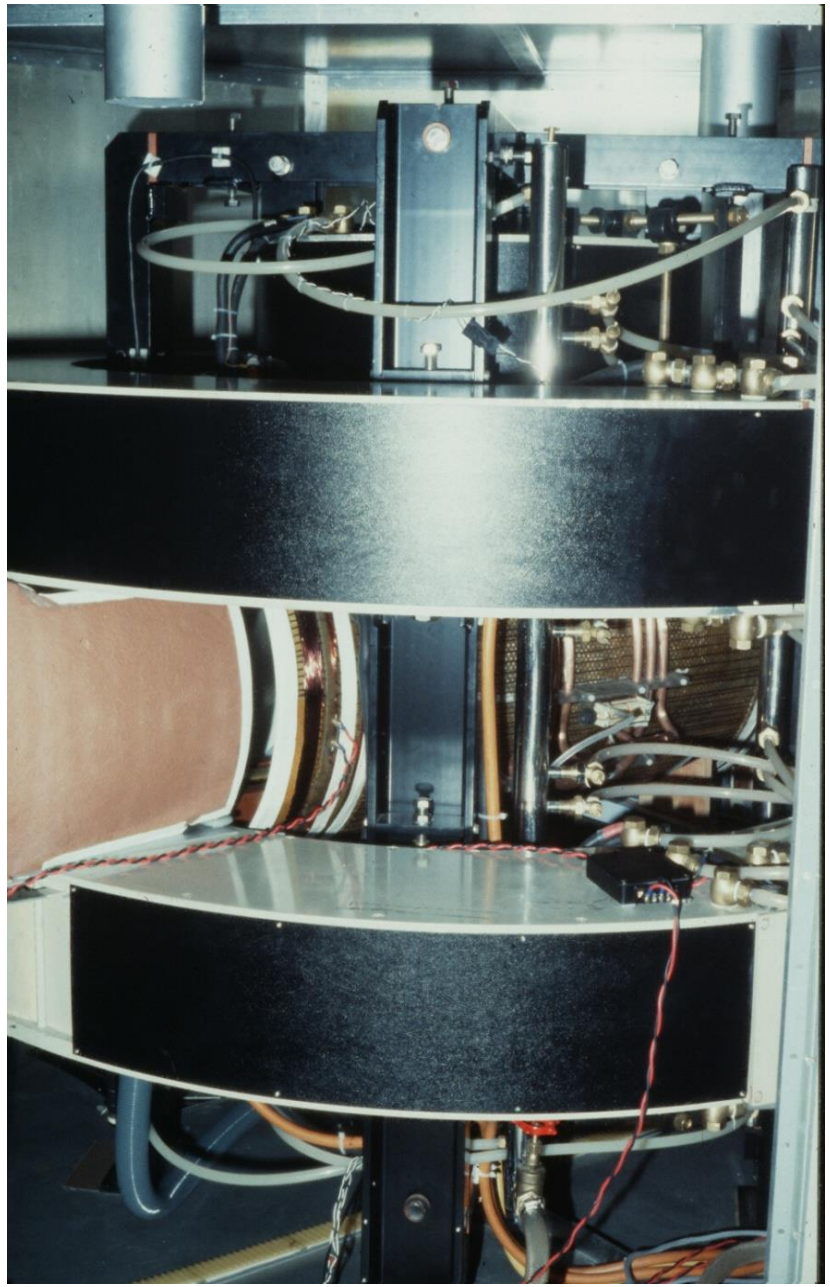


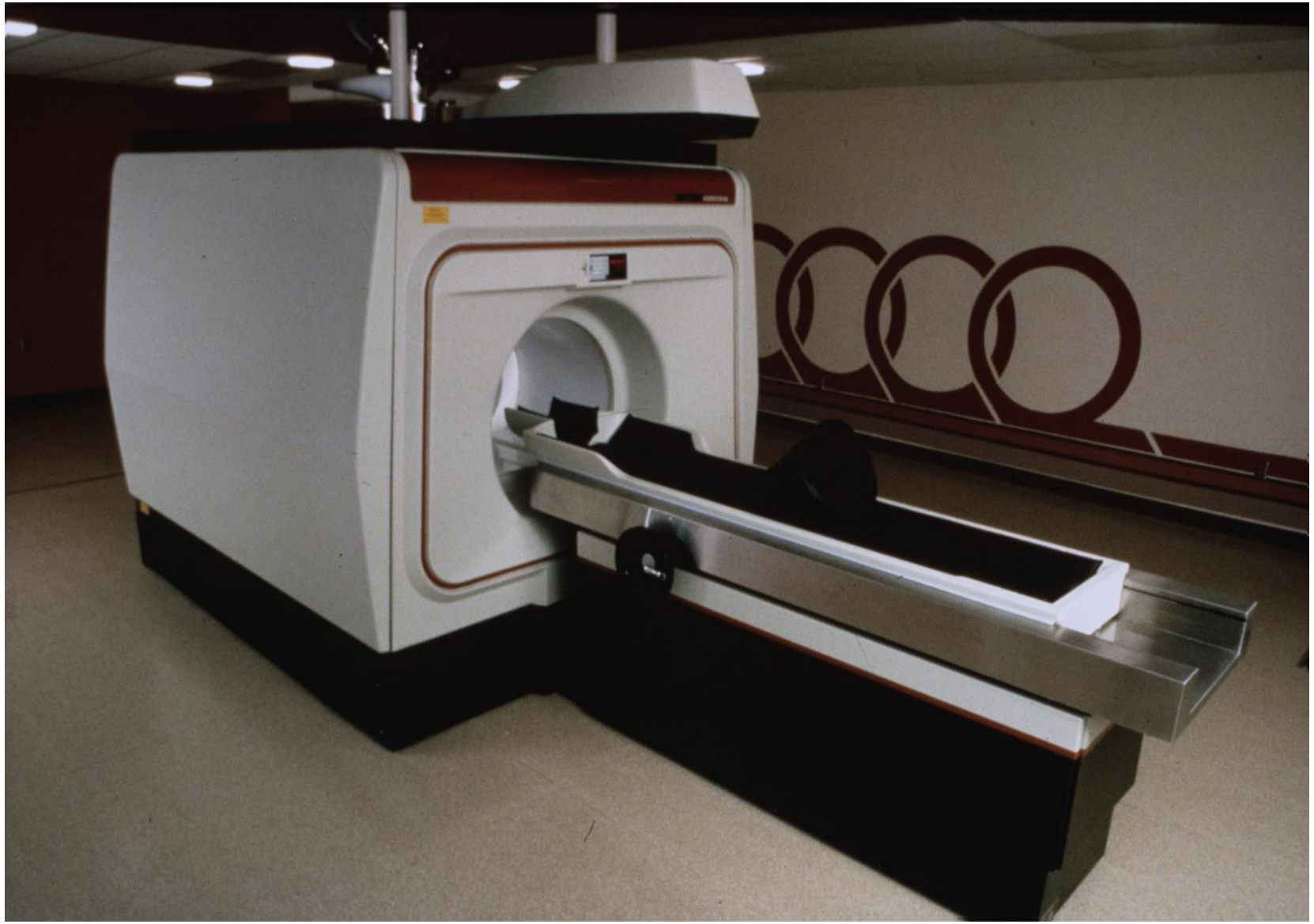


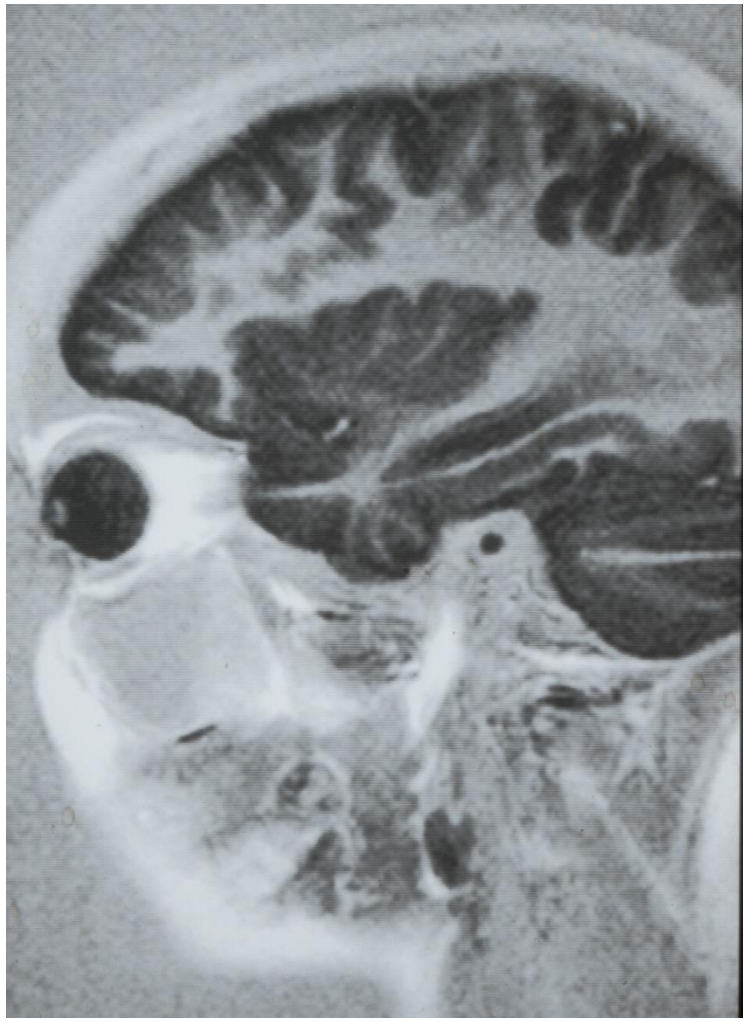
Development of X-ray CT and MRI











Magnetic Resonance Imaging (1)

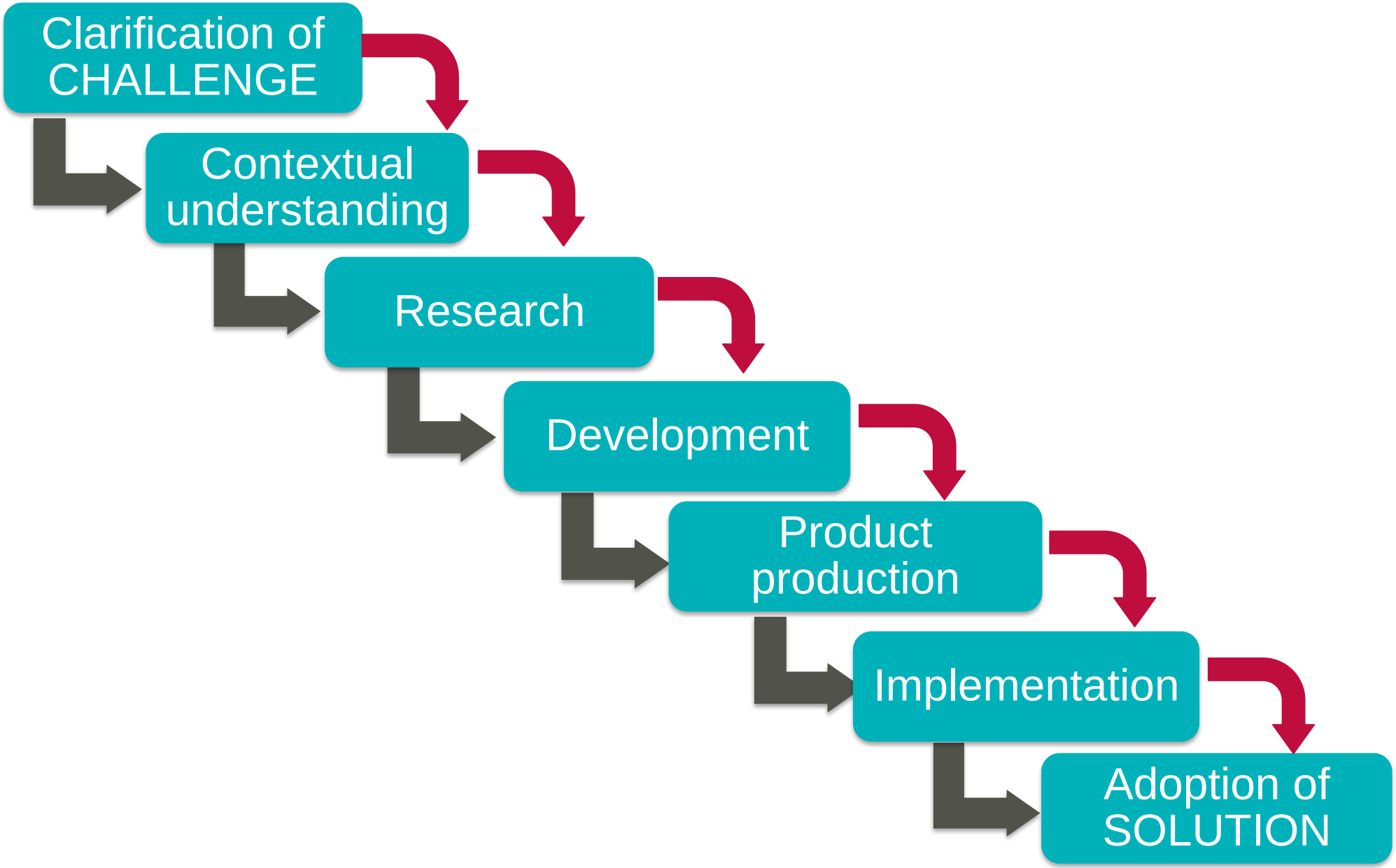
Following the impact and financial success of CT, the science/engineering of MRI was funded and developed	1974 – 1982
Paper which underpinned the practical approach to clinical MRI	1980
Development of low field commercial system from UK company (University spin-out)	*1982 - 1985*
Development of low field commercial systems from global imaging companies	1983 > 1989
Forced sale of UK company	*1986*

Magnetic Resonance Imaging (2)

Development of high field MRI systems by global imaging companies	1987 > 2010
Wide availability in health systems with an ‘impact’ on health care and patient management	1995 >
Clinical and cost effectiveness (ie everyday use in non-selected patients) started to become clearer	2005 >

Which impact is important?

- Commercial impact
- Health system impact
- Individual patient impact
- Economic impact
- Societal impact



Case Study 3: Contextual understanding, implementation and adoption

Kangaroo Care

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Babies and families in neonatal units

- ~10% of babies admitted to neonatal units; about 70,000 annually in UK
- Numbers and length of stay increased almost threefold since mid-1990s
- This is due to improved survival at lower gestation, increased multiple births, increased maternal age

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Kangaroo/skin-to-skin care

Significant improvements in the following

- Breastfeeding
- Head circumference growth
- Oxygen saturation
- Hypothermia
- Serious morbidity at two and six months

With no adverse effects

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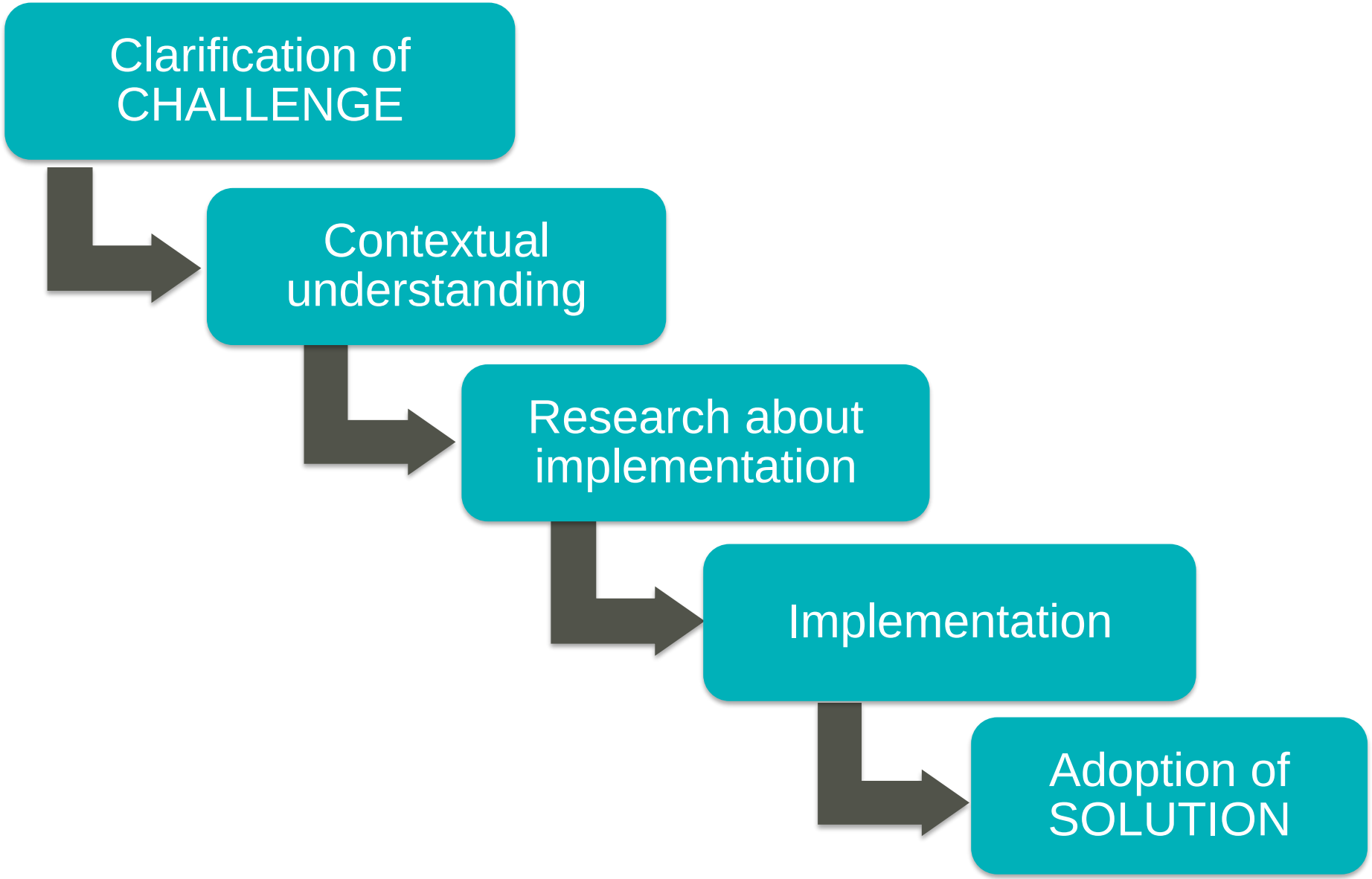
Health research and impact

- This is much wider than medical research
- Not only can it have a significant impact on population health it can have a greater impact per unit cost than medical research
- A health dividend produces an economic dividend
- Can produce conflict with technological/commercially focussed interventions which could have a commercial/economic impact



Case Study 4:
Long-Term Strategic Research

Thin film nanoscience - High Power Impulse Magnetron Spluttering (HIPIMS) Research Group

Engineering Research

500,000 researchers

Materials Research

100,000 researchers

Thin Film Research

10,000 researchers

Plasma Vapour Deposition (PVD)

3,000 researchers

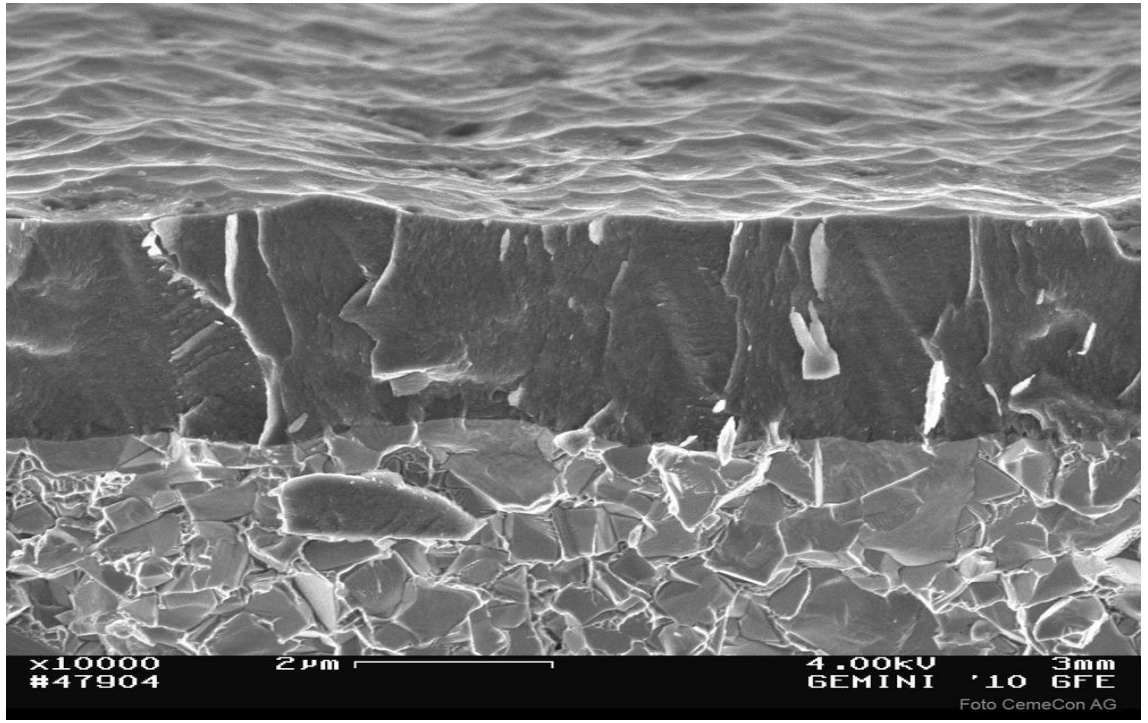
High Power Impulse Magnetron Spluttering (HIPIMS)

200 researchers

High Power Impulse Magnetron Spluttering (HIPIMS)

- Sheffield Hallam University
- Prof Papken Hovsepian
- Prof Arutiun ‘Harry’ Ehiasarian

Thin film deposition
with structural integrity



High Power Impulse Magnetron Sputtering Research Group

- First joint UK/Fraunhofer Centre
- Partnerships with major German and UK global companies
- Extensive patent portfolio

HIPIMS Research Group – 20 years old

- University investment in the best equipment and infrastructure
- Prestigious international quality publications and significant patent portfolio
- The group has raised major funding from EU, Government and Industry
- International leaders in the science and technology of HIPIMS and run the Global Conference on HIPIMS
- First joint UK / Fraunhofer Research Centre
- Major international industrial partners

Case Study 5:
Contextual understanding and implementation

Contract from an SME to review a manufacturing process in order to improve business efficiency

- Business School identified ways to streamline the company's processes
- Materials Engineering identified way to improve the manufacturing process

Consequences:

- Positive response from company and good PR for University ✓
- Income to the University and justification for government funds ✓
- Improved cost-effectiveness for the company ✓
- Staff redundancies so negative job creation ✗
- Company did not re-invest savings to grow company ✗
- Overall economic and societal impact – more ✗ than ✓

Concluding Remarks

Distorting impact

- Increase in ‘impression management’ by institutions
  - PR and marketing require ‘good’ news stories as opposed to stories about strong impact
  - Proof by example of good impact rather than a comprehensive overall assessment of impact
  - Reticence about using rigorous quantitative indicators
- Focus on ‘academic impact’
  - Profile on academic social media sites
  - Commercial internet sites set up to ‘increase impact’
  - ‘Cyber loafing’

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Impact – General

- Impact can take a long time to become apparent
- Impact is not static – it continues to change with time
- Impact is not always positive – also it can move from positive to negative
- The narrative and presentation of impact has become an industry and may distort actual impact

Impact – Measurement

- Measurement of impact needs to be prospective not retrospective
- Parameters of impact should be determined prospectively to enable measurement and the creation of evidence
- Impact needs to be evidenced, often quantitatively - this may require some cultural adjustment in some academic areas
- Impact requires external independent validation - this often needs to be sought out

Impact – Resource Implications

- The measurement of impact is time consuming
- The accurate measurement of impact is expensive
- Funding is generally not available to demonstrate or measure impact - if it is, too much is expected for too little funding
- The production of evidence to demonstrate impact needs funding to find it and measure it properly
- Everyone thinks its everyone else's responsibility to fund the cost of impact assessment

Impact - Planning

- Choose research problems that *a priori* you expect to have an impact - potential impact could influence an early research strategy
- Impact should be part of the plan

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Harper Keeley

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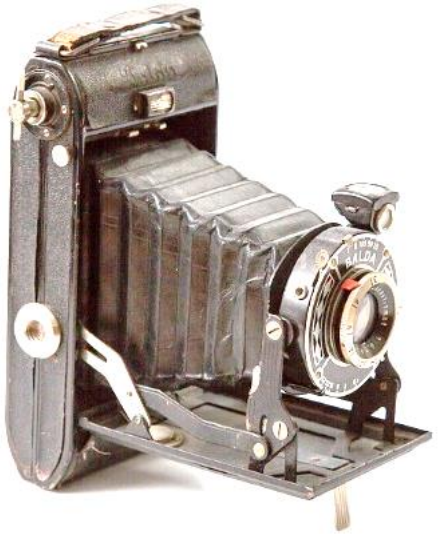
Integrating societal impact in a research strategy

27 November – 29 November 2019, Oslo



Coffee/tea break

We will start again at 15.45

UP NEXT....

Connecting Excellence and Impact in Research Management

Liv Langfeldt

Director R-QUEST and Research Professor NIFU, Norway

AESIS International Winter Course
Oslo, 27.11.2019

Scientific quality and societal impact

Liv Langfeldt

NIFU

My talk

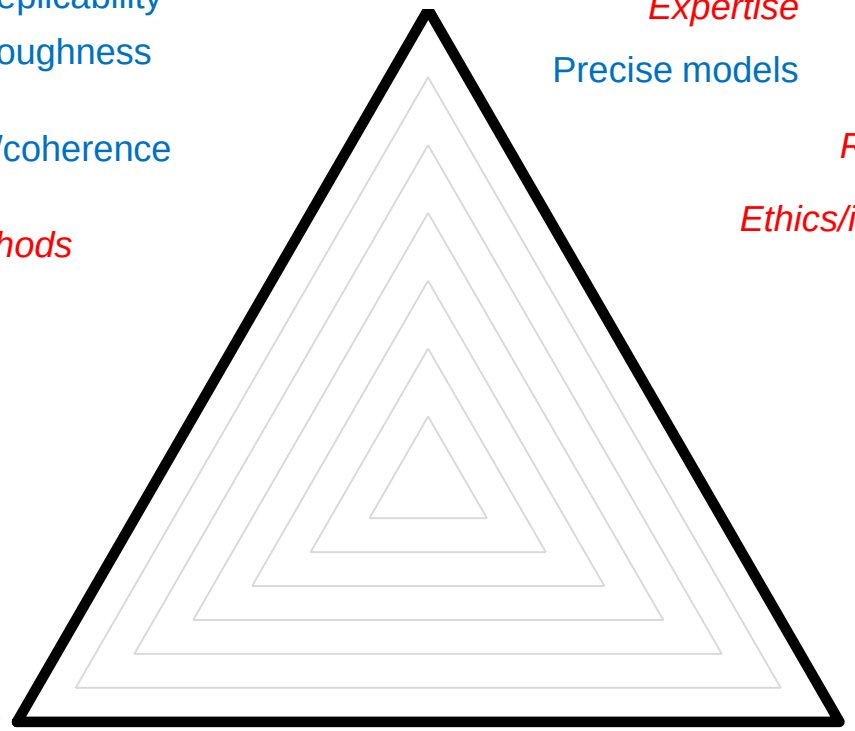
- A framework for understanding ‘research quality’
  - Scientific quality/excellence
  - Societal impact
- How research quality notions are formed
  - Links and tensions between scientific quality and societal impact
  - Field differences
- Implications
  - Handling complexity

Types of research quality notions

	Field-type Quality notions (within fields)	**Space-type Quality notions** (across fields)
Subject (who forms quality notions)	Specialised knowledge communities	Knowledgeable lay groups, incl. researchers in neighbouring fields
Judgement anchor	Knowledge pools and conditions to advance scientific knowledge	Exogenous considerations incl. social and economic concerns
Enforcement	Peer judgement and peer review practices	National, regional and local evaluation regimes
Judgement standards	Substantive judgment of*:* properties of knowledge; professional competence; conditions for research	Proxy(ies) based judgment of*:* properties of knowledge; professional competence; conditions for research

Source: Langfeldt, Nedeva, Sörlin, Thomas. 2019. Co-existing Notions of Research Quality. *Minerva*,10.1007/s11024-019-09385-2

Attributes of ‘good research’



Plausibility /reliability

Replicability

Rigor/stringency/thoroughness

Clarity/coherence

Methods

Hypotheses

Sound

Expertise

Precise models

Results

Ethics/integrity

Originality

Research questions

Theory

Path-breaking theory

Value

For society

Environment/ Sustainability

Econ.growth

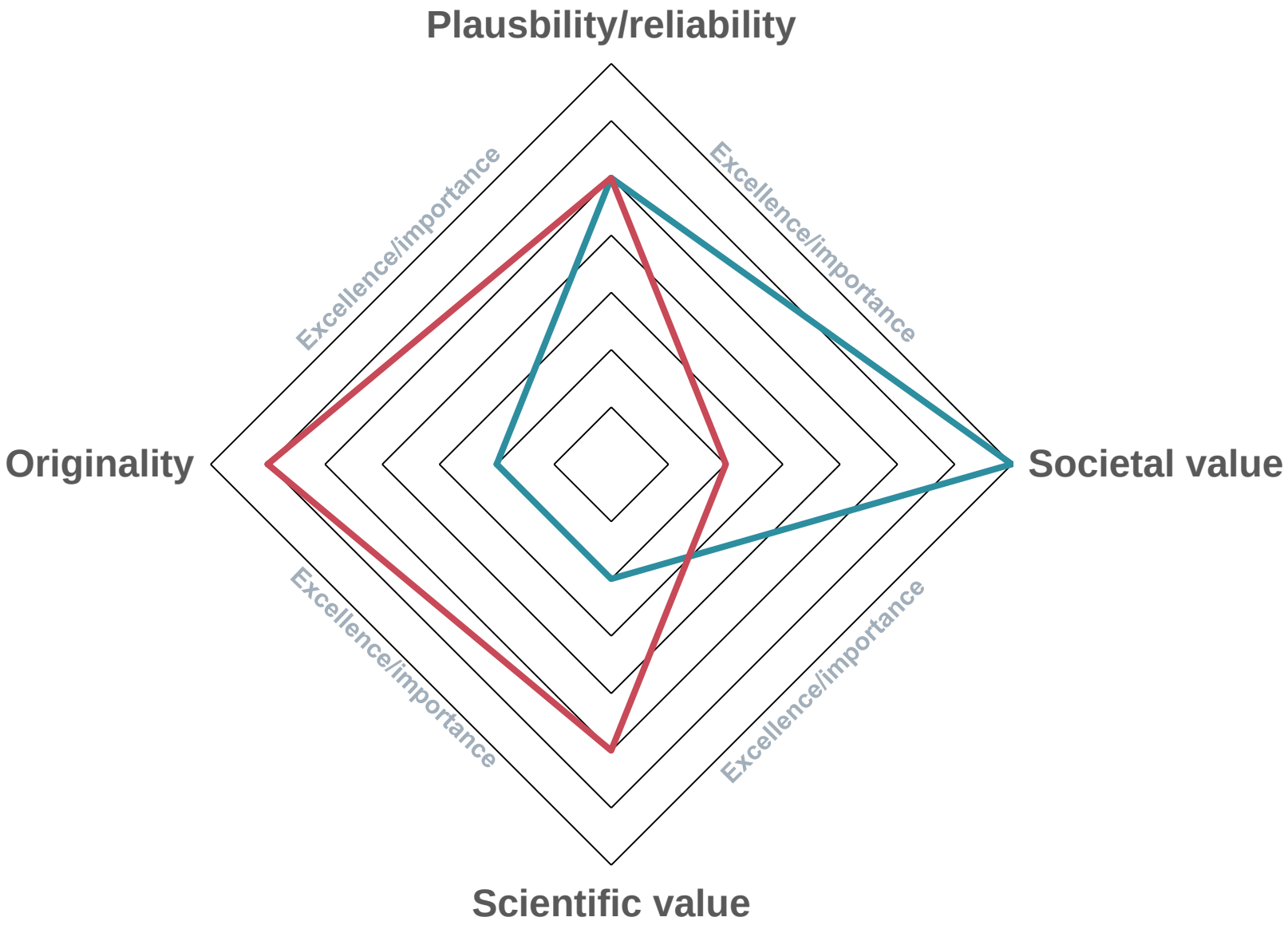
Health, welfare

For science/the field

Generalizable results

Advancement of knowledge / solve key questions in the field

Polanyi 1962. The republic of science.
Hemlin 1991. Quality in science.
Gulbrandsen 2000. Research quality and organisations factors.
Lamont 2009. How professors think.


Plausbility/reliability
Excellence/importance
Excellence/importance
Originality
Societal value
Excellence/importance
Excellence/importance
Scientific value

‘Research quality’ means different things in different fields and contexts

Sites where notions of research quality are formed

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PUBLISHED WEEKLY

VOLUME I

FEBRUARY–JUNE 188

CAMBRIDGE MASS.
THE SCIENCE COMPANY
MOSES KING PUBLISHER
188

UNIVERSITAS BERGENSIS

eua EUROPEAN UNIVERSITY ASSOCIATION

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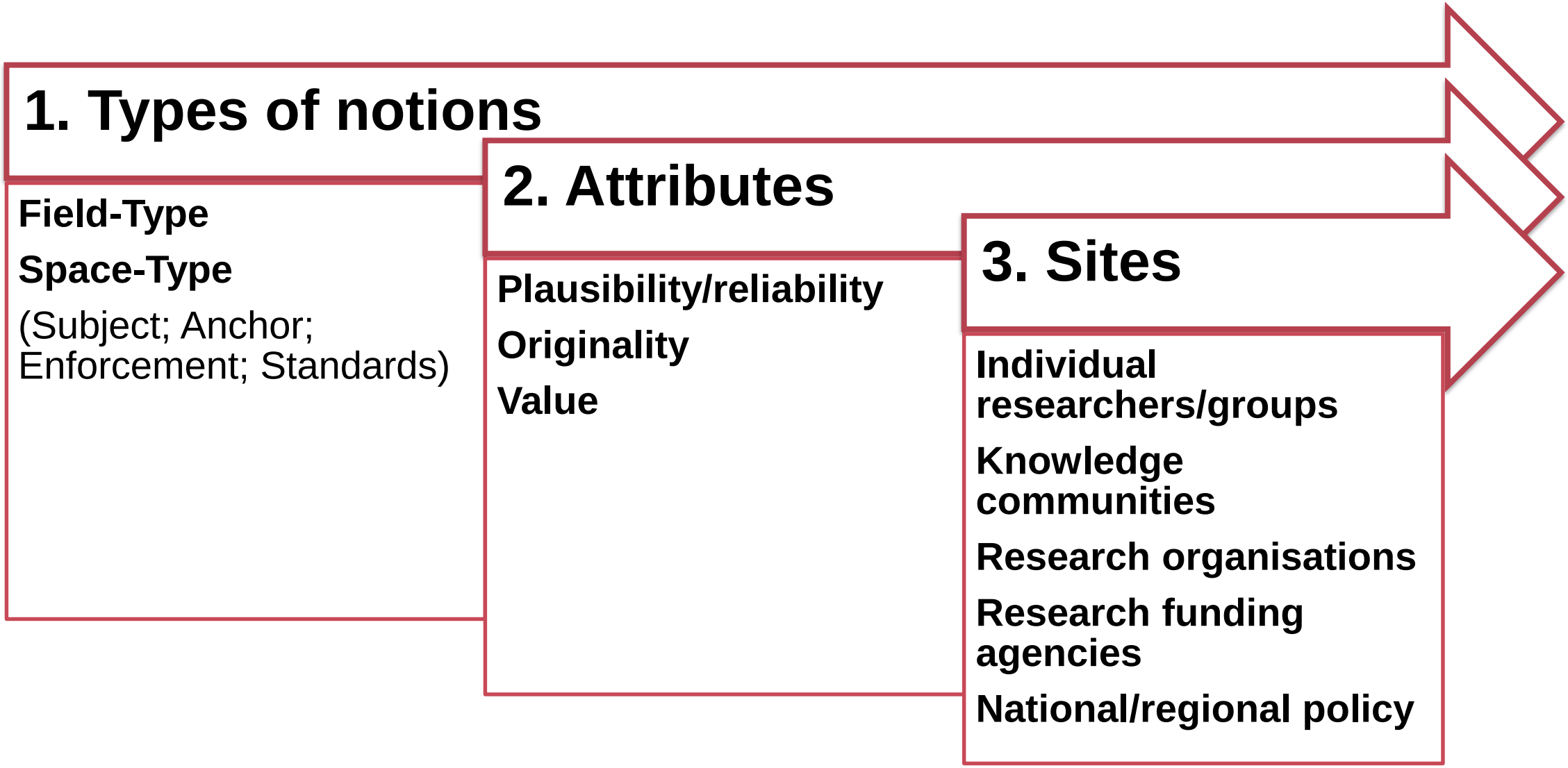


Langfeldt, Nedeva, Sörlin, Thomas. 2019. Co-existing Notions of Research Quality. *Minerva*,10.1007/s11024-019-09385-2

Discussion 1

Is societal impact part of the notion of good research in your org./fields involved?

Why/why not?

NIFU

Understand how policy impacts research

Funding and governance:
Control research resources; evaluation regimes; national agenda

Research organisations:
Control recruitment/careers; local infrastructure/resources

Research practises

- **Content** (topic, questions, methods, theoretical approach)
- **Organization** (e.g. collaboration, user interaction)
- **Writing and publication practices** (length, outlet, language)

Types of effects

- **Superficial/instrumental adaption** (e.g. window dressing)
- **Changed norms**: perceptions of what are valuable topics/activities/collaboration/approaches/methods
- **Goal displacement**

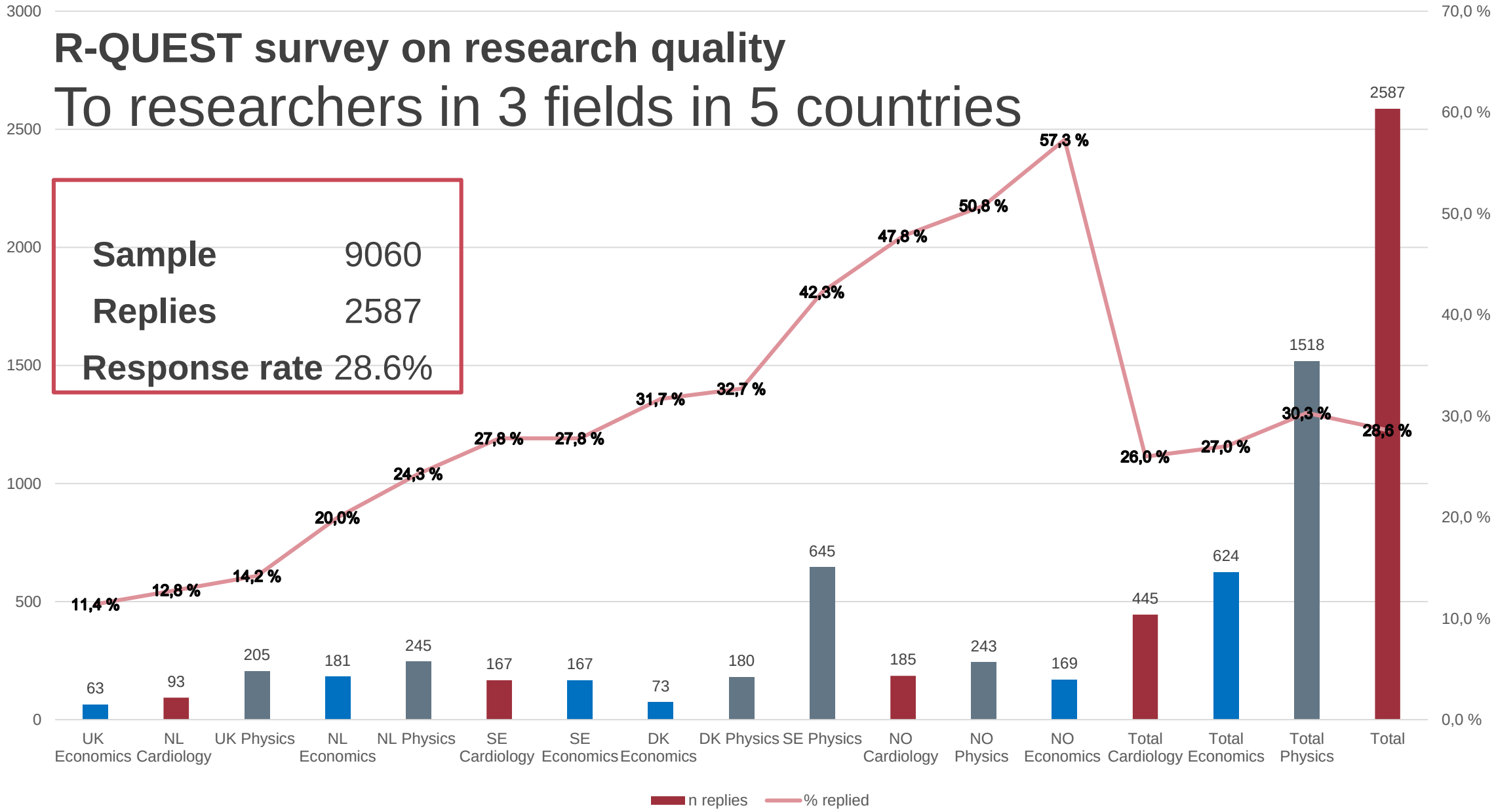
Knowledge communities (research fields, journals, conferences)**:** Control dominant approaches/ theories/methods

Users/stakeholders: May control research resources; important relations/legitimacy

R-QUEST survey on research quality

To researchers in 3 fields in 5 countries

Sample	9060
Replies	2587
Response rate	28.6%



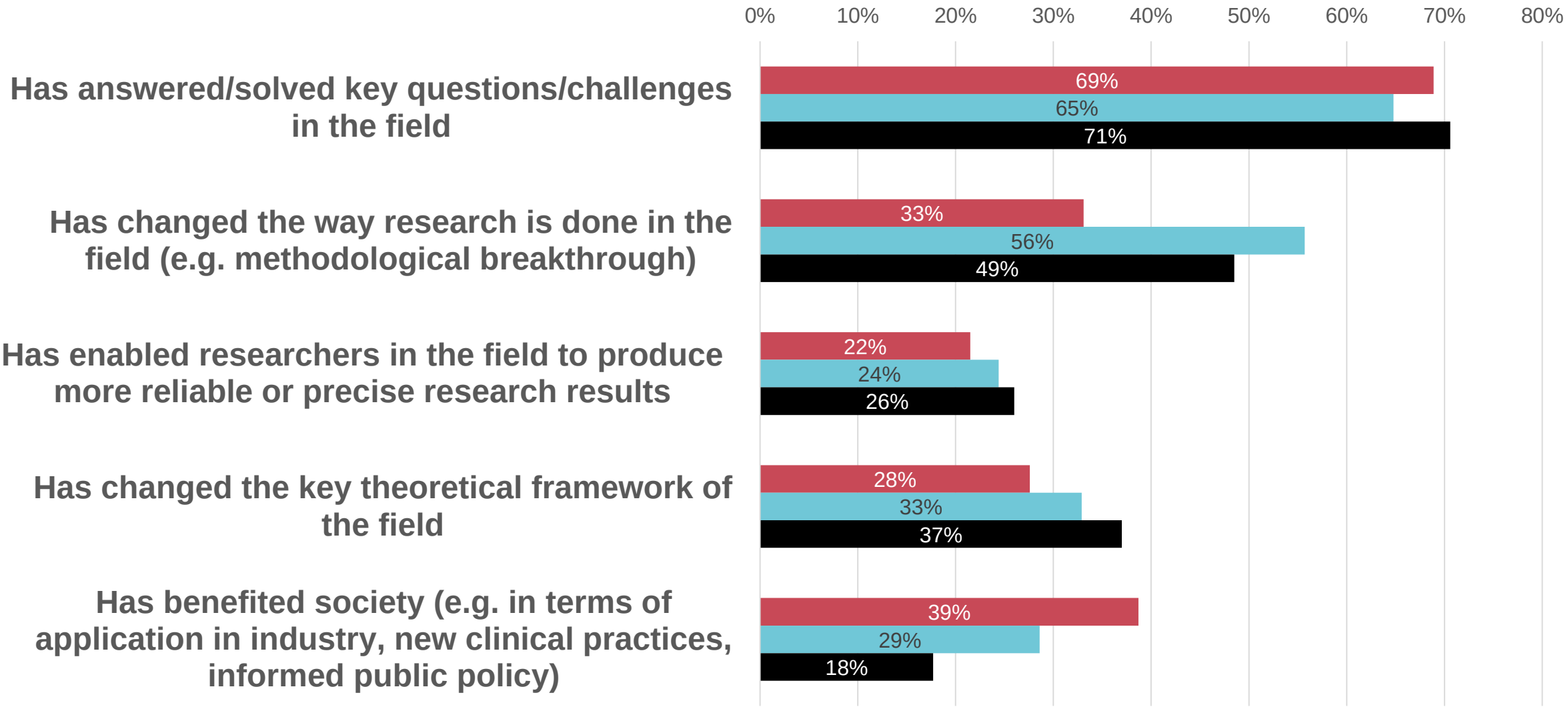
Ability to evaluate the quality of your research:

relative rank based on average scores (1=very low ability; 5 = very high ability)

	Cardiology	Economics	Physics
1	**Myself** (3,94)	**My scholarly network outside dept** (4,21)	**Myself** (4,10)
2	**Colleagues in my group/unit** (3,82)	**Myself** (4,01)	**My scholarly network outside dept** (3,95)
3	**My scholarly network outside dept** (3,70)	**Reviewers of papers** (3,83)	**Colleagues in my research group/unit** (3,91)
4	**Reviewers of papers** (3,69)	**Colleagues in my research group/unit** (3,81)	**Reviewers of papers** (3,70)
5	**Reviewers ERC** (3,39)	**The head of my department/unit** (3,00)	**Reviewers ERC** (3,27)
6	**Panels that have evaluated my unit** (3,37)	**Reviewers ERC** (2,95)	**The reviewers H2020** (3,12)
7	**Reviewers national funding source** (3,36)	**Reviewers national funding source** (2,93)	**Reviewers national funding source** (3,10)
8	**The reviewers H2020** (3,23)	**Panels that have evaluated my unit** (2,90)	**Panels that have evaluated my unit** (3,06)
9	**The head of my department/unit** (3,11)	**The reviewers H2020** (2,66)	**The head of my department/unit** (2,95)
10	**My partners outside academia** (2,93)	**My partners outside academia** (2,44)	**My partners outside academia** (2,70)

R-QUEST survey 2018

The best in your specific field/speciality. **Why do you consider this the best research?**



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Cardiology Economics Physics

R-QUEST survey 2017-18

‘The best research in your field’ – free text replies, examples

Cardiovascular

- ‘is based on sound research and facts, rather than on opinions, authorities’
- ‘Able to address issues fast and get studies done first’
- ‘Has changed clinical practise’
- ‘changed way of thinking’

Physics

- ‘They are changing the way we approach scientific problems, by addressing overarching questions rather than solving special cases’
- ‘Game changing, thinking outside the box - i.e., really innovative’
- ‘inspires public to new views of reality’

Economics

- ‘I found it interesting. The very best research always makes me think: "I would be really proud to have done that“’
- ‘Was really committed to solving really existing problems rather than hypothetical, model-generated questions, and, moreover, was not glued to established formats like neoclassical formats.’
- ‘it was hard work and researchers are really bright and gifted’
- ‘It has changed the way we think about things’

‘Best research’

- Characteristics of the best research
  - Much similarity between the fields
  - Much variation within the fields
    - Disciplines are heterogenous
- Notions reflect the different organisation and aims of research
  - At university: theoretical framework
  - At research institute: benefit society

Key differences ‘best research’

- **Cardiology** (aims at applications; employer and state influence over priorities):
  - value research that benefits society
- **Physics** (subfields compete over significance within a dominant theoretical framework):
  - contributions to the theoretical core
  - methodological breakthroughs
- **Economics** (theoretical work is highly valued and knowledge production is organised around a hierarchy of key journals):
  - contributions to the theoretical core
  - methodological breakthroughs
  - citations and journal impact factors

Implications

- The role of research policy
  - General criteria/indicators that can be used for priorities/allocating resources
  - Form mutual criteria (and understanding?) across different disciplines and fields
- Criteria and procedures that are broad/flexible enough to cover the diversity of quality notions?
  - Those (subfields/organisations) who have definitory power/shape the criteria,
  - define winners and losers in the competition for public funding
- Need a nuanced understanding of research quality

Discussion 2

Who defines what is important and valuable research in your organisation/involved fields?

Does a common strategy across fields make sense?

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Thank you for the attention!

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R-QUEST Policy Brief no. 1.
Identifying and facilitating high quality research.
www.r-quest.no

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R-QUEST
Centre for Research Quality and Policy Impact Studies

RECAP AND REMAINING QUESTIONS

Up next

17.00	OsloMet	Reception
18.00	Walk to…	Christmas marktet (if you like)

Tomorrow

8.30	OsloMet	Coffee and Tea
9.00	OsloMet	Start of the course – day 2