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**Training for Medical education via innovative eTechnology / MediTec**

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# *Digital transformation of health services and systems*

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- **Digital**
- **Health care**
- **Health service**
- **Health system design**



[https://ec.europa.eu/health/expert\\_panel/sites/expertpanel/files/docsdire/022\\_digitaltransformation\\_en.pdf](https://ec.europa.eu/health/expert_panel/sites/expertpanel/files/docsdire/022_digitaltransformation_en.pdf)



# Digital transformation

What are the systematic methods available for **assessing the impact of the digital transformation of healthcare** with regard to **health objectives**?

What **impacts** of digitalisation of health services should be **assessed systematically** and in **which dimensions**?

How to **identify and characterize "tasks" suitable** for a "task shifting" process?

What are the main **enabling conditions and difficulties/risks** that have to be taken into account when defining "task-shifting" measures as part of a **health system reforms**?



# Task shifting

How to **identify and characterize** “tasks” suitable for a “task shifting” process?

What are the main **enabling conditions and difficulties/risks** that have to be taken into account when defining “task-shifting” measures as part of a health system reforms?

How to **measure** the impact of “task shifting” in contributing to the effectiveness of the health system using an **evaluation framework** to inform decision-making?



# Factors driving change

*Changing patterns of disease*

- **Multimorbidity, frailty, antimicrobial resistance**

*Technology*

- **Minimally invasive surgery, intravenous anaesthetics, diagnostic kits, artificial intelligence for image processing, telemedicine**

*Professional norms*

- **Rejection of traditional hierarchies, growing autonomy of non-physician staff (but still very variable in EU)**

*Shortage of health workers (Cost containment)*

*Decentralisation of organisational structures*



# Why is this important now?

## *Sustainability of the health workforce*

- **We don't have enough health workers so we need to use those we have as effectively as possible**

## *Financial sustainability of the health systems*

- **It is morally wrong to waste scarce resources unnecessarily**

## *Improved quality of care*

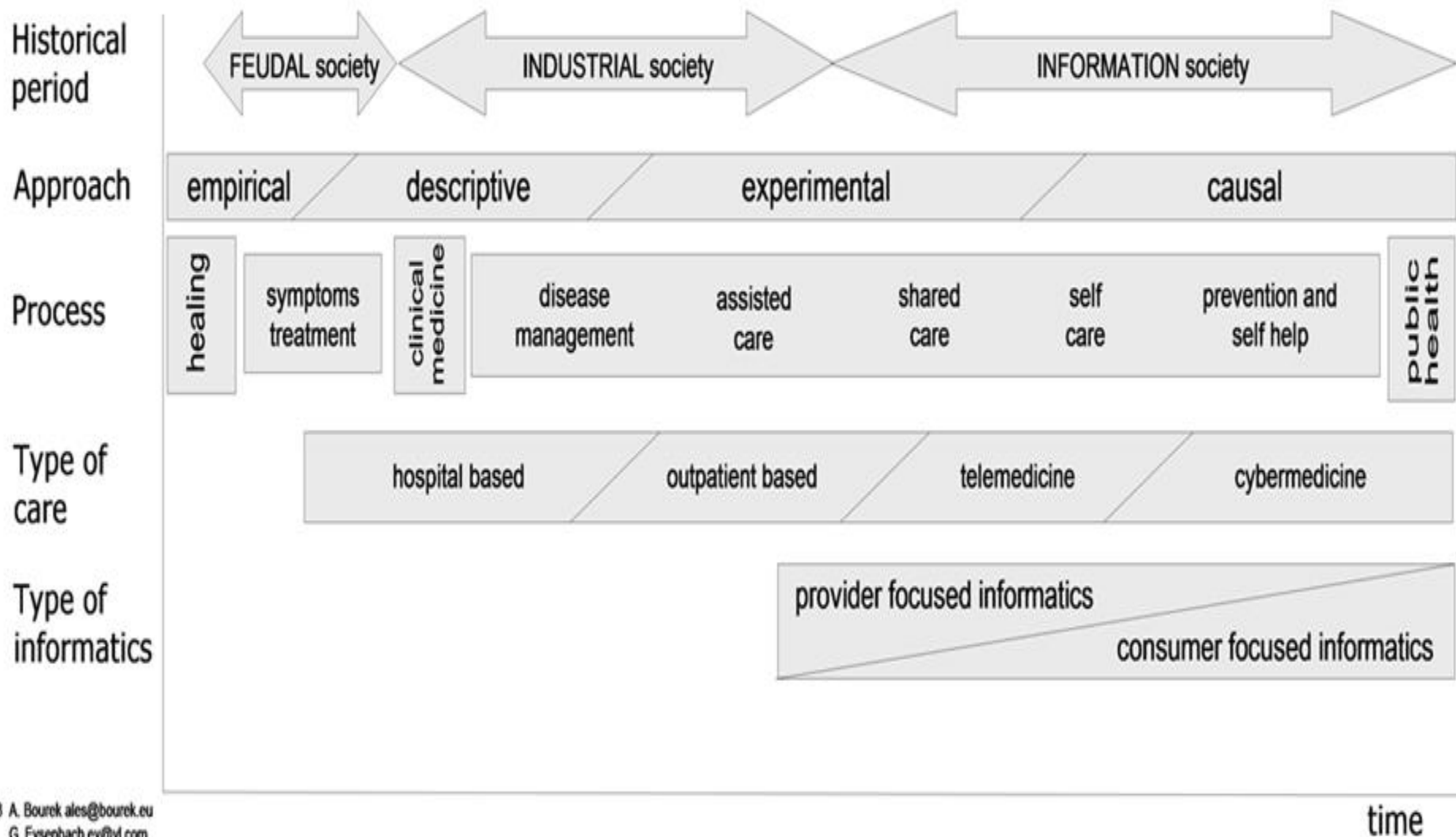
- **Those who do the job best should do it**

## *Resilience of the health systems*

- **In emergencies, may need different groups to cover for each other**



# Setting the scene – societal progress & health service







# First understand – then do

*The results / outcomes of digital transformation of health services will fully depend on the quality of reasoning of all stakeholders involved in this process.*

*The **quality of reasoning** (making the right decisions at the right time) depends on the level of understanding of the two basic interacting components – “the service” and “the digital”, both in the context of health.*



# Understanding progress

## Progress is a result of the joint interaction of people, processes, power and tools

The “power” has changed only four times in history (manpower, horsepower, steam, electric power).

Every new power needed the modification of tools, processes and behaviour of people to improve productivity.

In the last transition from industrial to information society the power has not changed, the only thing that has changed is the *potential* to more efficiently manipulate “objects” we were able to transform into a digital format.

Thus in some situations we are able to produce “artefacts” not by directly doing this with our hand in the place we are, but perform this digitally by means of an algorithm, and at a distance by means of the electromagnetic field.

This way of working requires :

- a) **digitisation** - changing the manipulated (data or information) into a digital format
- b) **digitalisation** - use of digital technologies for the production and delivery of a product or service

**Digital transformation** of health services encompasses the instrumented effort to meaningfully introduce new digital information and communication technologies and corresponding new processes and stakeholder behaviour into the health sector.



# Finding innovative ways

Tools "technologies" humans use can, in the most generic way, be divided into **four categories** based on how they complement or augment our natural human capabilities.

- 1. Increase our physical strength or skills (an example may be the needle, surgical instruments or operating robot),**
- 2. Broadens, enhances or complements our senses (microscope, compass, medical imaging)**
- 3. Technologies that help us to modify the nature in order to serve better our needs or satisfy our desires (contraceptive pills, genetically modified food)**
- 4. „Intellectual technologies,, - tools supporting our mental capacity, helping us to search and sort out information, formulate and voice thoughts, share of know-how and knowledge, help us to measure and evaluate and help to improve our mental capabilities (typewriter, calculator, library or Internet) fall into this category.**

In the order they have been named here ***each category offers a rising number of opportunities and hand in hand a rising amount of risks.***



*The „digital“ on it's own is NOT creative, only facilitates more efficient manipulation in situations where the process can be digitalised*



# Understanding „digital“ - real (natural) versus digital (virtual)

**Complexity and interaction of „health“ and „digital“ => LITERACY**

- in „*real / natural World*“ issues are evident (seen by eyes, accidents hurt physically – cause & effect directly seen)
- in „*digital / virtual World*“ issues are mediated (not so obvious, seen only with effort by „the brain“, accidents do not hurt physically, cause & effect not so noticeable)

**Interaction of two complex systems will inevitably lead to emergent properties that cannot be anticipated based on the behavior of each standalone systems (a whole is more than the parts)**

- |                     |                             |
|---------------------|-----------------------------|
| • <b>Advantages</b> | • <b>Disadvantages</b>      |
| – <b>Adaptable</b>  | – <b>Non-controllable</b>   |
| – <b>Evolvable</b>  | – <b>Non-predictable</b>    |
| – <b>Boundless</b>  | – <b>Non-understandable</b> |
| – <b>Novelty</b>    | – <b>Non-immediate</b>      |



## Understanding health - shifting „traditional“ view

*Health service is a helping profession not only helping people **to attain „A state of complete physical, mental and social well-being** and not merely the absence of disease or infirmity“ (WHO 1984) but also*

*„The **ability to adapt and self manage**, in the face of social, physical and emotional challenges“ (Huber et al. 2011)*



## Shifting the „traditional“ view

***Goal-oriented care** encourages and helps each individual to achieve the highest possible level of health as defined by that individual*

*Future health systems besides traditional areas defined and assessed since 1980 face the advent (partly as the effect of digitalization) of **proactive, predictive, prospective, preventive, participative and personalized** health care / health services*



# Health services are specific

- The reasoning, decisions and actions have a primary and direct effect on lives / health
- The reliability of the service must be as absolute as possible, safety must be of prime concern „primum non nocere“, errors must be avoided as they lead to loss of trust
- A doctor cannot meet the same „patient-client-service consumer“ twice (either another person, or the same person but at a different time) the situation that has to be addressed is always novel
- The population served is extremely vulnerable and ranges from pre-conception (assisted reproduction and genetics) through the whole life and beyond (pathology autopsy, organ donation) so there will always be the need to serve several generations of sick at the same time
- The correct reasoning, decision-making and collaboration depends vastly on signals and information that is out of the scope of the „digital environment“ (body language, tactile information, emotional information, olfactory information, information processed by mirror-neurons etc.)
- Introduction of new services must be done at a reasonable pace and with sufficient backups





# Health service vs. health care

## SERVICE

„**DIGITAL**“ domain (interaction machine-machine, human-machine) – supportive functions

biosignal  
processing  
(e.g. ECG)

digital imaging  
(e.g. US, CT, MRI, PET)

healthcare  
providers  
communication

prototyping  
modelling

access to medical  
information  
(especially lay population)

telemedicine

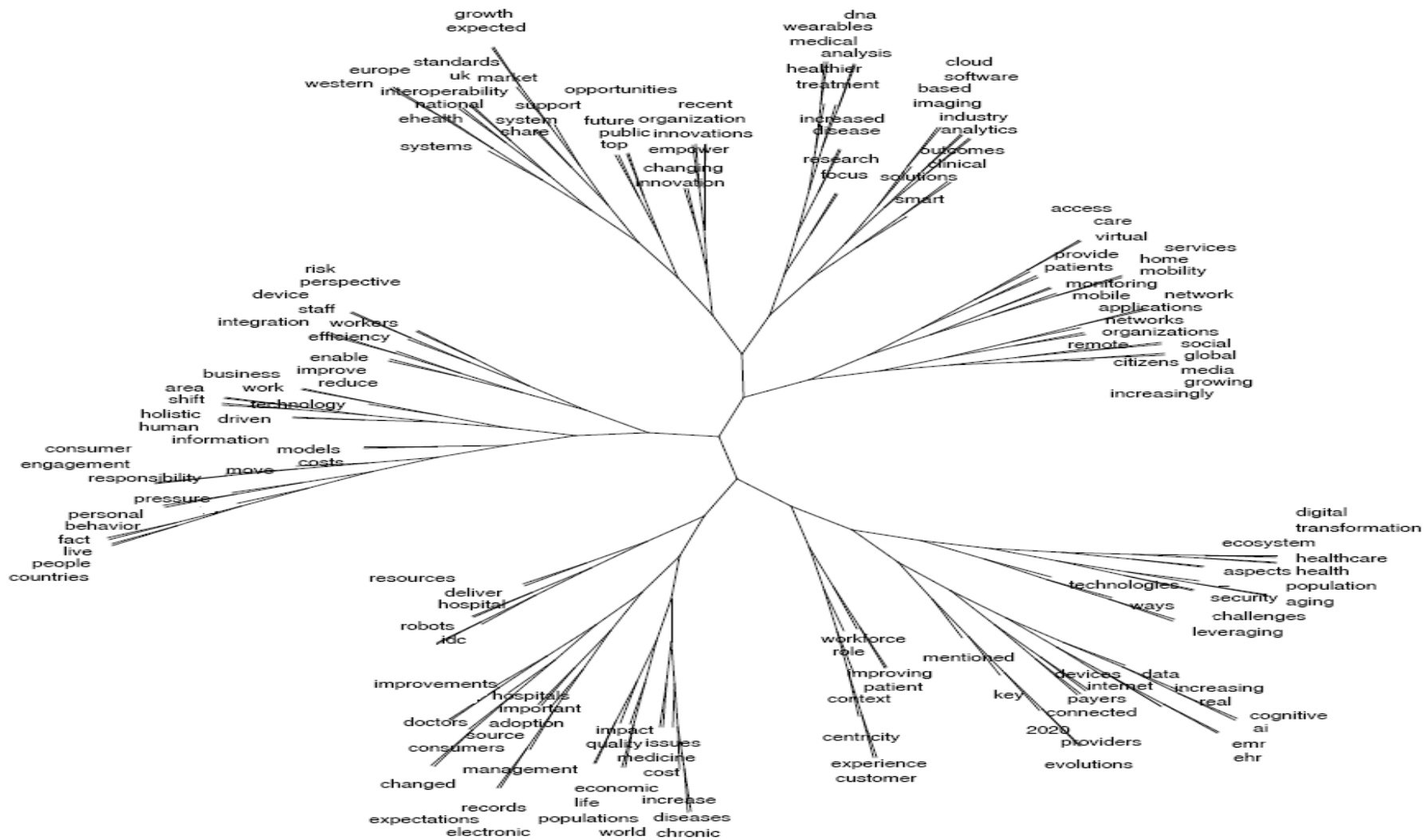
## CARE

„**ANALOGUE**“ domain (human-to-human interaction) natural communication, reasoning & decision making, wisdom, trust-worthiness, empathy, soft skills

Thinking (fast and slow), Games Theory, Collective Behavior (social dynamics, collective intelligence), Nonlinear Dynamics, Systems Theory...



# Complexity of the digital & health interaction





# Complexity of the digital & health interaction



information:	189
patients:	184
technology:	177
systems:	156
providers:	127
people:	125
technologies:	122
access:	109
innovation:	105
Mobile:	103
business:	103
medical:	102
delivery:	101
solutions:	93
better:	92
experience:	91
challenges:	90
network:	88
customer:	88
industry:	84
improve:	82
research:	79
quality:	79
social:	76
support:	69
management:	69
companies:	67
citizens:	67
impact:	66
change:	66
sector:	65
provide:	65
public:	64
needs:	63
system:	61
records:	61
population:	61
organisations:	61
example:	61
world:	60
clinical:	60
organizations:	59
customers:	58
Security:	56



# System goals unaltered

Importantly, the digital transformation is not seen as altering the overall goals of health care systems.

**Safe**—avoiding injuries to patients from the care that is intended to help them.

**Effective**—providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse).

**Patient-centred**—providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.

**Timely**—reducing waits and sometimes harmful delays for both those who receive and those who give care.

**Efficient**—avoiding waste, in particular waste of equipment, supplies, ideas, and energy.

**Equitable**—providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status

**Acceptable (Respectful)** - the extent to which care is delivered humanely and considerately

**Continuity assured** - connectedness between the stages along the patient care pathway

***Digitalisation may add new dimensions and meanings to existing goals.***



# Literacy and prudence (foresight)

ECRI Institute

*Better methods and attention for evaluating the contribution of digital health services to patients, care providers and health systems is of utmost importance.*

## 2019 Top 10 Patient Safety Concerns

1. **Diagnostic** Stewardship and Test Result Management **Using EHRs**
2. Antimicrobial Stewardship in Physician Practices and Aging Services
3. **Burnout** and Its Impact on Patient Safety
4. Patient **Safety Concerns** Involving **Mobile Health**
5. Reducing Discomfort with Behavioral Health
6. Detecting Changes in a Patient's Condition
7. Developing and Maintaining Skills
8. Early Recognition of Sepsis across the Continuum
9. Infections from Peripherally Inserted IV Lines
10. **Standardizing** Safety Efforts **across Large Health Systems**

Rethink needed over use of automated

**Healthcare**

UK minister says patients must be reassured over risks of algorithms in accessing data, writes Sarah Neville

A UK government minister has called for a "profound rethink" of the ethical frameworks around using health data and artificial intelligence as the technology begins to delve ever more deeply into patients' personal records.

Health officials are increasingly trumpeting the potential of machine learning to transform medicine, from speedier detection of eye disease to better care for those with complex health needs.

AI relies on vast stores of data to be effective, however, and Lord O'Shaughnessy, the health minister, says health-care providers face a challenge in convincing patients that they will benefit from sharing their information with algorithms.

"It really does involve quite a profound rethink on ethical frameworks, commercial strategies and so on," he says. "People increasingly view the data that is held about them as . . . a reflection of some part of their human capital and, therefore, if it is being invested to create something with economic value, there ought to be some return."

The UK's National Health Service has been an early adopter of AI technology, working, for example, in partnership with DeepMind, a subsidiary of Google.

The UK's single-payer health system provides an "extraordinary opportunity" to tap into data for early diagnosis and prevention of disease, Lord O'Shaughnessy says. It represents "a comprehensive, universal data set, potentially, on 60m people, which means that you cannot just test new things, but you can actually look for patterns in historical data."

However, the DeepMind partnership aroused controversy last year when the UK's information commissioner ruled that the Royal Free London NHS Foundation Trust had failed to comply with the Data Protection Act when it provided patient details to DeepMind.

Lord O'Shaughnessy in September published a new code of conduct intended to govern the use of AI in the NHS. This aims to deepen trust between patients and researchers and ensure patients share the benefits. "Every



Lord O'Shaughnessy: new code

opportunity carries risks . . . and AI is no different," he says.

Interviewed in his London office at the health department, he says that alongside "the traditional cyber risk" is "the risk to public trust [of] poor behaviour, or indeed, if the security is not done properly".

For politicians and regulators, the first priority "is to minimise risk and to provide that reassurance. I think of that as the foundation stone, and if you don't have that, then you can't really take advantage of these opportunities because you won't have the support — effectively, the permission — publicly, to do it. So, from a politician's point of view, as opposed to a data scientist or an entrepreneur, that for me is our first thing," he says.

The public discourse in the UK over health data is overshadowed by a failed attempt several years ago to persuade people to consent to data from their family doctors being used for research. Botched communication about the plan undermined public confidence in it.

Describing that initiative, known as Care.data, as "the ghost of the piece", he says: "I think it has created scars in the system at large, in the perception of those who felt that was a cavalier approach and want to make sure the government doesn't do it again."

Trust in data security was also undermined last year after the NHS suffered a major cyber attack when its systems became infected by the WannaCry virus. More than one in three health trusts and at least 595 family doctor practices were affected.

NHS Digital, the agency charged with cyber defences, has since increased security spending — by more than £200m — and opened a new security operations centre. It argues that, while AI and machine learning may introduce



# Data, monitoring and evaluation

**Evaluation** - is defined in this EXPH opinion as *“The systematic and objective assessment of an ongoing or completed intervention, with the aim of determining the fulfilment of objectives, efficiency, effectiveness, impact and sustainability.”* (WHO)

- **Tailored in such a way that they capture the relevant impacts of an intervention, both those intended and those unintended**

- **Performed to inform the relevant decision maker (at different levels of the health system)**

- **Fit for future use** and „future dimensions“ should be taken into consideration:

- **Predictive**
- **Prospective**
- **Preventive**
- **Participative**
- **Personalized**
- **Goals oriented**



# Data sources

**Evaluation and monitoring requires relevant data.** Much of the effort in evaluations is directed at obtaining such data.

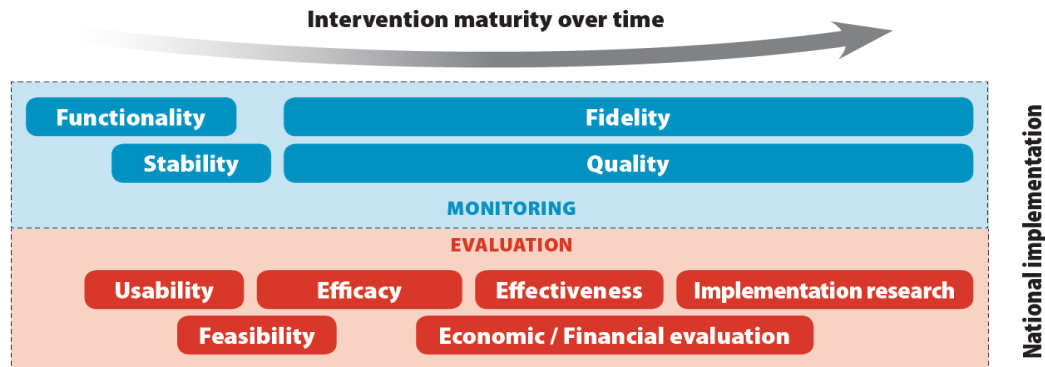
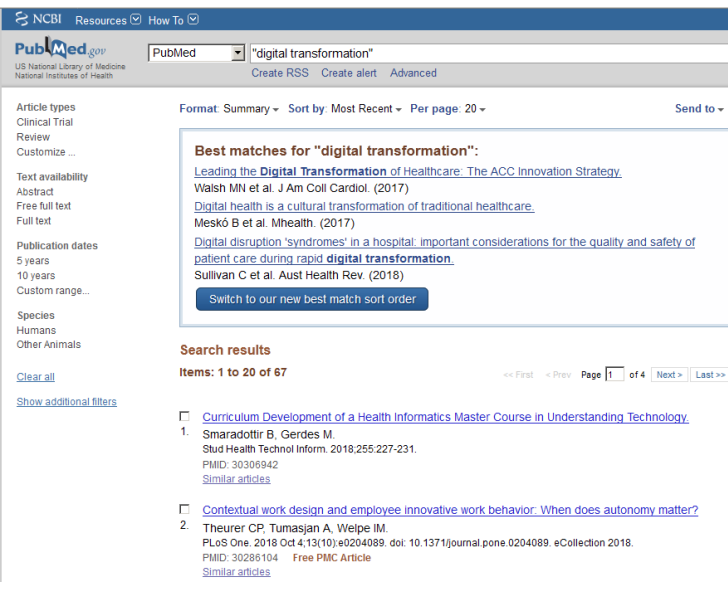
**Data must be gathered purposely,** be fit to address the questions intended to be answered and „gaming“ should be prevented. Different types of data is needed to address questions at different levels of HC system (treatment versus hospital versus system performance). In many cases, the use of real world data or big data, leads to new questions regarding analysis, interpretation and subsequent decision making.

As far as we are aware of, no large scale (European) registries exist for digital health services. Transferability of data is an issue (for reasons of privacy and generalisation). **Methodological guidelines for data gathering and use in the context of digital health services could be useful.**



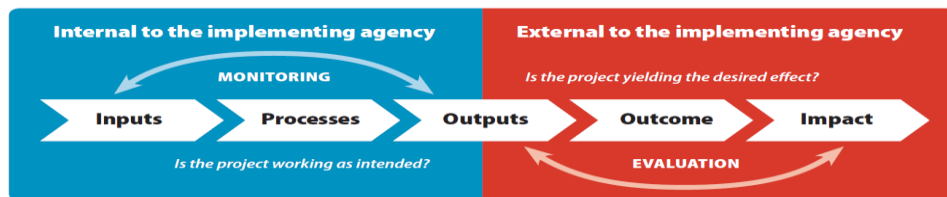
# Not much out there yet... but some frameworks emerging

**Figure 1.1. Intervention maturity life-cycle schematic, illustrating concurrent monitoring (blue/upper) and evaluation (red/lower) activities that occur as an intervention matures over time (left to right) from a prototype application to national implementation**



## Leading the Digital Transformation of Healthcare

- \_ Healthcare is not entertainment. The healthcare system is complex, ...
  - \_ The stakes in healthcare are actually high: these are sometimes truly life-or-death decisions...
  - \_ Many tech companies lack clinical insight...
  - \_ Electronic health records (EHRs) were a first step in the digital transformation of healthcare, but many consider this a misstep...
  - \_ Digital health companies have often been fearful of entering the healthcare regulatory process...
  - \_ Last—although certainly not least—there is the continued issue of nonaligned incentives from a health policy and payment perspective...
- JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY  
VOL. 70, NO. 21, 2017, ELSEVIER  
<https://doi.org/10.1016/j.jacc.2017.10.020>







We follow the broad **categorisation** recently proposed by the WHO (2016), which distinguishes between:

- **interventions for clients**
- **health care providers**
- **for health systems or resource managers**
- **for data services**

*It is expected the first two categories will be closest to technologies that are evaluated with common HTA methods more often, for which more specific evaluative frameworks have been developed.*

*HTA is "a multidisciplinary process that summarizes information about the medical, social, economic and ethical issues related to the use of a health technology in a systematic, transparent, unbiased, robust manner."*

We distinguish between **decision making:**

- **centralised** and
- **decentralised** (we mostly focus on the former)



# ***A Minimum HTA Inspired Framework to Assess the Value of National eHealth Projects***

*The objective of MAST is to provide a multidisciplinary assessment framework consistent with proper scientific standards and guidelines, which could be used by different decision-makers to select the most appropriate technologies that can be applied in the most cost-effective way*



# Methodology

**Feasibility:** Assess whether the digital health system works as intended in a given context.

**Usability:** Assess whether the digital health system is used as intended.

**Efficacy:** Assess whether the digital health intervention achieves the intended results in a research (controlled) setting.

**Effectiveness:** Assess whether the digital health intervention achieves the intended results in a non-research (uncontrolled) setting.

**Implementation research:** Assess the uptake, institutionalization and sustainability of evidence-based digital health interventions in a given context, including policies and practices.

## STEP 1 - Preceding consideration:

- Purpose of the application?
- Relevant alternatives?
- International/national/regional/local level of assessment?
- Maturity of the application?

## STEP 2 - Multidisciplinary assessment (domains):

1. Health problem and characteristics of the application
2. Safety
3. Clinical effectiveness
4. Patient perspectives
5. Economic aspects
6. Organisational aspects
7. Socio-cultural, ethical and legal aspects

## STEP 3 - Transferability assessment:

- Cross-border
- Scalability
- Generalizability



# Methodologies – tactics / strategies

## **Development phase:**

*What are the users' needs? (**needs assessment**)*

*Is the digital service free of errors? (**test runs**)*

*Was the digital service built as defined in the requirements? (**verification**)*

*Was the digital service built as wanted by the users? (**validation**)*

*Will the digital service work in practice? (**simulation studies**)*

## **Pilots and early use:**

*Is the technical quality adequate? (**performance measurements**)*

*Is the service user-friendly? (**usability tests**)*

*Is the service sufficiently integrated in clinical and broader health service processes? (**observations**)*

*Does the service work as intended? (**interviews**)*

## **Routine use:**

*Is the service adopted as intended? (**usage pattern analysis, documentation analysis**)*

*Are the users satisfied? (**user survey**)*

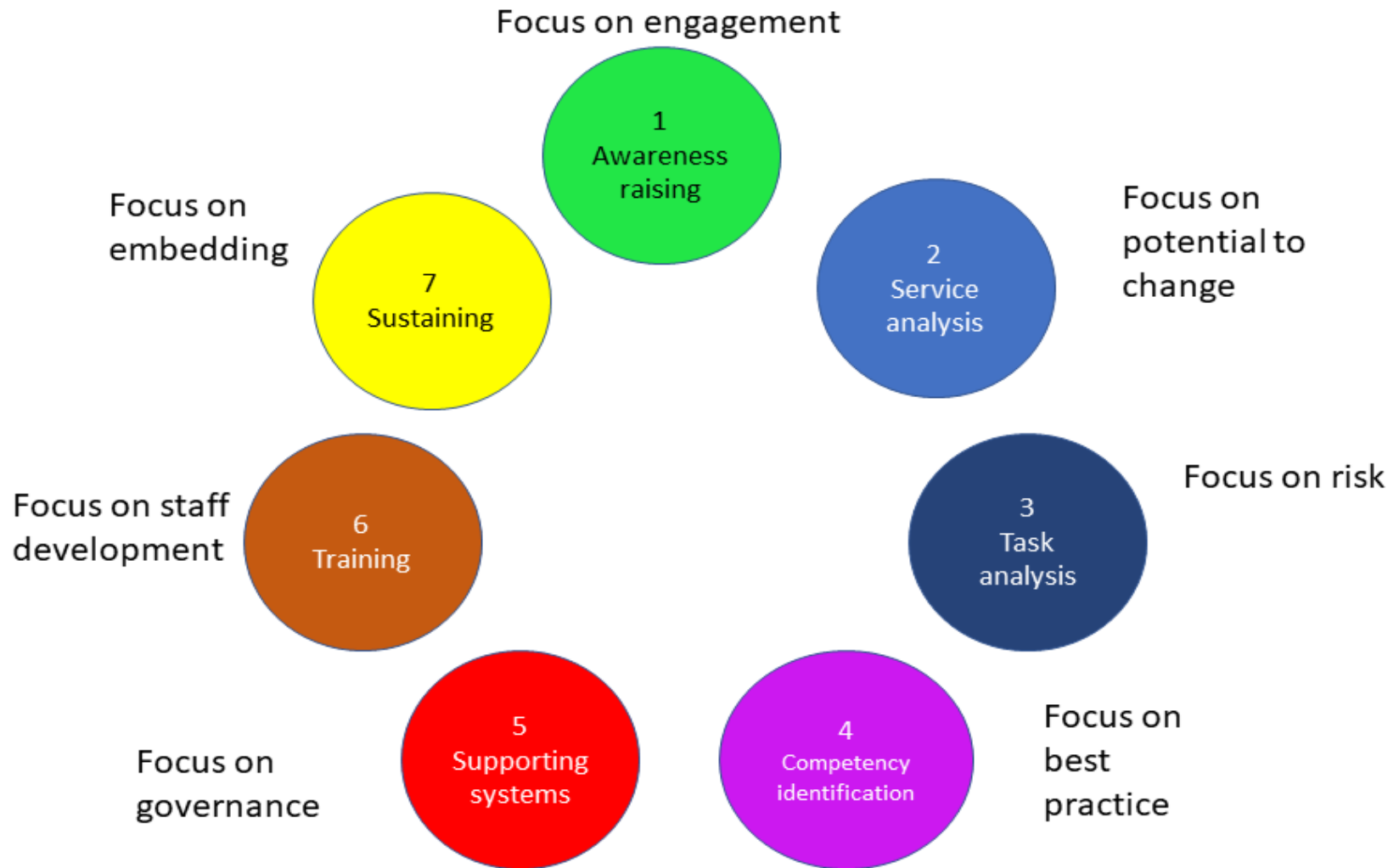
*Is the service cost-effective (**cost analysis**)*

*Does the service lead to errors? (**error report analysis**)*

*What is the impact of the digital health service on efficiency, appropriateness, organization, or outcome quality of care? (**experimental or quasi-experimental studies**).*



# Making it happen: The Calderdale Framework





# Changing roles

## **Enhancement**

Increasing the depth of the job by extending the role or skills of a particular group of workers

## **Substitution/ delegation**

Exchanging one type of work from one profession to another profession, breaking traditional professional divides

## **Innovation**

Creating new jobs by introducing a new type of worker (or technology)



## Task shifting between different types of health workers

*Nurses as good as doctors in routine pre-operative assessment*

*Pharmacists achieve better results than doctors in medicines reviews and add benefit to multidisciplinary teams*

*Prescribing by nurses and pharmacists in routine care often achieves greater adherence*

*Evidence on enhanced role of nurses is mixed*



# Summary of the evidence

*There is little evidence for the rigid demarcation that is between different health professionals, such as doctors and nurses, that exists in many countries*

*Groups other than physicians, and especially nurses and pharmacists, can undertake substantially expanded roles compared to what has traditionally been the case.*

*However, they must be adequately trained and supported and function in integrated teams with information-sharing.*

*There is a need to better understand the optimal combination or “package” of changes and additions that can act synergistically to improve the quality and safety of healthcare as well as patient experience.*

*While it is not necessary to evaluate every change, there is a strong argument for doing so where major changes are taking place, as there is scope for unintended consequences.*

*This should not, however, be an argument for doing nothing.*





# Barriers

- Staff shortages
- Increasing complexity of care
- Legal factors (Legal indemnity)
- Traditional professional associations
- Financial incentives
- Existing professional attitudes
- Pilot projects and experiments design
- Capacity to implement change
- Regulation of informal practices



# Education - literacy - task-shifting/sharing

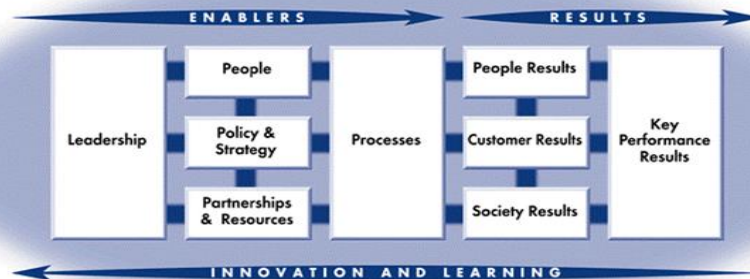
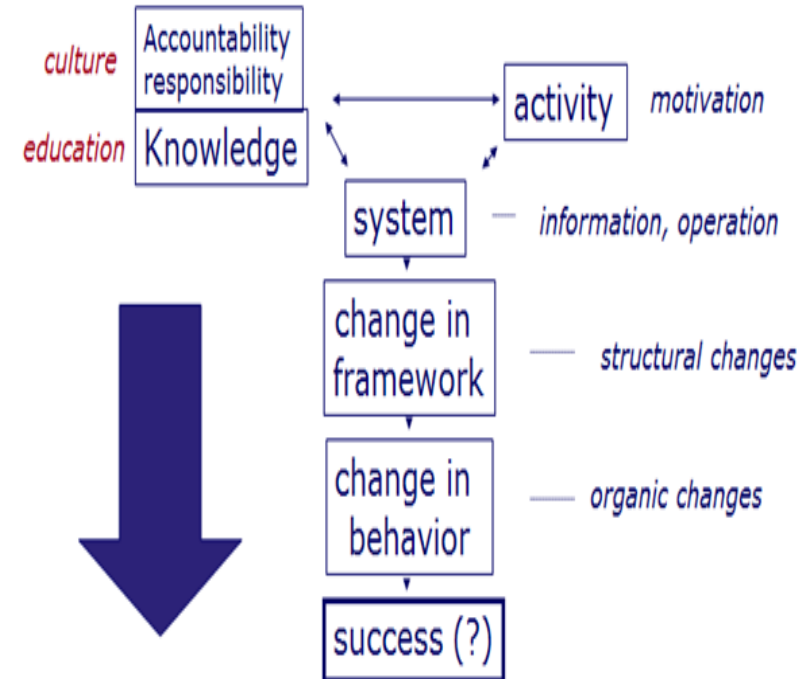
Vocational education must include also soft skills” (creativity, decision-making, communication, and collaboration) conveying an understanding of the rationale for change, the benefits of doing things differently, and a means of discussing fears and anxieties.



Existing curricula and training produce specialists capable performing their respective tasks but they then work together as a group and not as a team.



# Teams – culture – success



Bourek A. 2007: [www.med.muni.cz/~bourek](http://www.med.muni.cz/~bourek)



# Checklist assessment (EXPH)

## CHECKLIST FOR EVALUATION OF DIGITAL HEALTH SERVICES BEFORE and DURING THEIR INTRODUCTION

CRITERION	Yes	No	If yes, provide brief evidence/explanation:
Was the service previously properly evaluated?			
Is the previous evaluation relevant for current context and use of the digital health service?			
Has the new service been evaluated or benchmarked against relevant existing services and on all relevant dimensions?			
Were all relevant stakeholders involved in designing and evaluating the service?			
Has the introduced service been evaluated from the perspective of assuring equity and minimizing possible inequalities? Has there been sufficient attention for (vulnerable) subgroups?			
Has explicit attention been paid to avoid the effect of “de-humanizing medicine” if relevant (e.g. treating a human as a digital code)?			
Is a system in place for continuous monitoring and periodic evaluation of the service?			
Is attention given to the need for different assessment at different levels of systems (micro, meso and macro) use?			
Was the iterative and incremental approach in the design, implementation and evaluation of digitalisation (ICT processes) used?			
Are feedback loops in place (PDSA cycle) to further optimize the (use of the) service after implementation?			
Are investigations studying the socio-cultural impact of the service (e.g. changing roles and responsibilities of involved stakeholders, effects on work process and organisation of health care) relevant, available or being performed?			Are investigations studying the socio-cultural impact of the service (e.g. changing roles and responsibilities of involved stakeholders, effects on work process and organisation of health care) relevant, available or being performed?
Is there a good plan for the safe transition to the new			Is there a good plan for the safe transition to the new service for all relevant stakeholders? Is sufficient time provided to all users to adapt to the new service?
			Was the service piloted sufficiently to avoid failures in further use and implementation (leading to harm, problems, loss of confidence, etc.)? Is there a mechanism in place to prevent the use of the service by people who lack the necessary training, skills or attitude?
			Is funding for initial training and ongoing support of all involved stakeholders assured? Will the service require adjustments of training of new professionals (including the integration in the curricula for HC professionals)?



# Assess *before* deployment

EVALUATION PRIORITIZING MATRIX

IMPORTANCE of assessment to assure SAFETY (prevent “adverse effects” and “surprises”)	Activity involved (generic description)	Example of the “digital” version in HC	Ease of introduction into healthcare	Feasibility/ease of assessment
+	Services dominantly based on human physical capabilities	Automated dispensing of medication, Robots for manipulation	++++++	++++
++	Services dominantly based on use of human senses	Digital imaging, Telemetry, Augmented reality	+++	++
++++++	Services based dominantly on the use of human intellect, wisdom, soft skills, experience	Autonomous systems, “Artificial intelligence” – machine learning based systems, Virtual online agents, Decision support systems	+	+/-



# Conclusions

## **Monitoring**

*Even with a good functioning mechanism to select health services to be evaluated (either new ones to be funded or existing ones to be terminated), more is needed to monitor and evaluate health system performance. In that context, **we refer to the EXPH report on Quality of Care (EXPH, 2014) in which indicators for the overall performance of health systems, in line with the elements of quality deemed important, were suggested.** Such monitoring should not only be performed for evaluated programs and technologies, but also more general to monitor the development of quality of health care delivery in a region or country. Appendix A of the opinion provides an overview of indicators suggested by the Panel (EXPH, 2014)*

***In principle, where possible, “digital” and “non-digital” services should be benchmarked in all assessed areas***



# Conclusions

## **Combine frameworks**

*European repository in which existing frameworks, tools and methods may be collected, but subsequently also combined is strongly encouraged. Evaluation should include “three dimensions of **quality** (system, information and service), two dimensions of system **usage** (use and user satisfaction) and three dimensions of net **benefits** (quality, access and productivity)” and in that way, cover many aspects discussed in this opinion.*

## **Cover intended and unintended impacts and facts not promises**

*Evaluation should cover both intended (**positive**) outcomes as well as unintended (**negative**) outcomes (which tend to be under-reported). Evaluation needs to be **permanent** and best based on using data the systems are producing (data feedback to provide information)*



## Evaluation of digital transformation (indicators needed)

- Patient empowerment, shared decision making, goal-oriented care
- Safety
- Respect patient's privacy rights and data protection principles
- Ensure cyber-security and resilience
- Role of professionals
- Capital and labor
- Incentives for innovation and uptake
- Exercise of market power: short term and long term
- Steering development of digital services
- Fiscal and social policies





# EXPH recommendations for „digital“

- **Develop a strategy for the digital transformation**
- **Develop a coherent framework for monitoring and evaluating**
- **Invest in robust monitoring and evaluation methodology**
- **Invest in systematic evaluation procedures**
- **Invest in evidence informed policy measures**
- **Invest in decentralised / local level decision making**
- **Invest in aligning literacy with technology development and introduction into practice**
- **Create an environment that wants and can adopt innovations**
- **Set up European repository** for evaluation and monitoring methods, studies and results
- **Be progressive but with caution**



# EXPH recommendations for „task-shifting“

- **Objective is clearly specified, rationale for selecting task shifting is explained, evidence on which the decision is based is presented**
- **Consider contextual factors that determine what works in what circumstances**
- **Ensure that those being trained have opportunities for inter-professional learning**
- **Provide specific skills necessary for task shifting**
- **Have legislative and regulatory authorities review existing jurisdiction to avoid unjustifiable barriers to more flexible ways of working**
- **Decisions to engage in task shifting should be planned carefully, taking full account of the implications both for the individuals concerned and for the wider health sector with the ongoing monitoring and evaluation**



Digitally aided health service transformation should help **ordinary people to achieve extra-ordinary results** in providing health services rather than have extra-ordinary people achieve only ordinary results

We are managing our work with utmost effort, but if ICT would not be helping us, we would be managing without the need of such extreme effort!



# “BE PROGRESSIVE, BUT WITH CAUTION”

*Cautiousness requires continuous assessment (feedback). The seeming paradox of being progressive and conservative at the same time (necessary for successful digital transformation of health services) is achievable by respecting the following (identified, evidence supported) existing policies:*

*be **progressive** / proactive **in the continuous monitoring** of ICT technologies with a potential to improve healthcare*

*deploy the **iterative and incremental approach** in the design, implementation and evaluation of digitalization (ICT processes), use PDSA, feedback of data to correct / steer the behavior of a system*

*assure that **parallel systems running for different cultures** of stakeholders (young generation, old generation) temporarily co-exist*

*CAPITALIZE ON:*

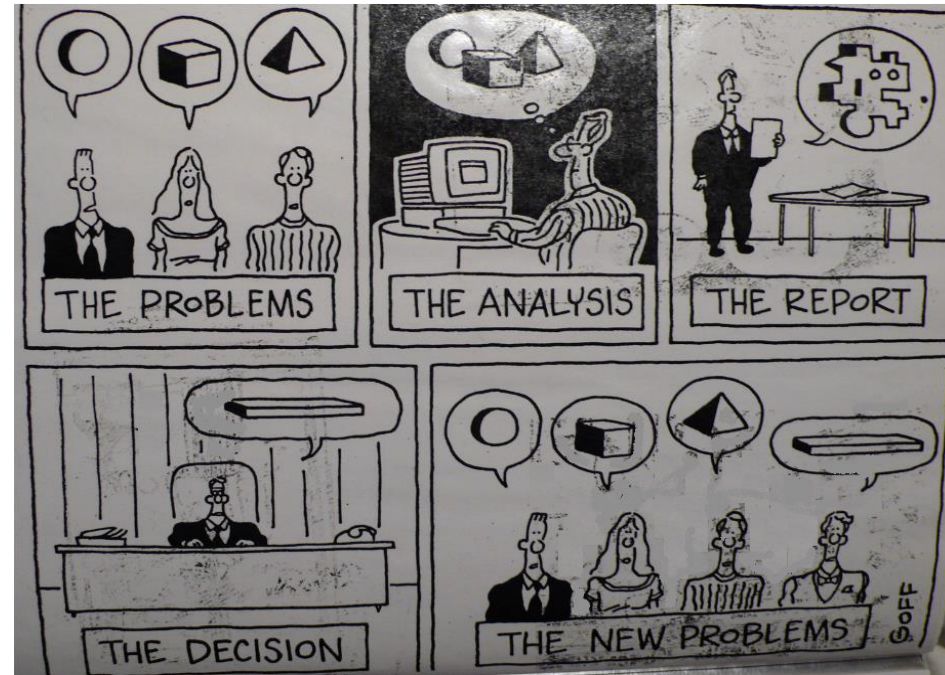
- 1. Decentralization**
- 2. Soft-skills**
- 3. Teamwork (not group-work)**
- 4. Digital literacy**
- 5. Continuing vocational education**



# Governance, steering – be progressive BUT with caution



**NOT creating problems while trying to do the best possible**



**NOT dehumanizing health services**



**Thank you for your attention  
and  
your dedication to help improve  
health service provision**

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