DESDE 1902
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COMPREHENSIVE HEALTH RESEARCH CENTRE

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NOVA | RESEARCH & DEVELOPMENT UNIT FOR MECHANICAL AND INDUSTRIAL ENGINEERING

INSIGHTS FROM PORTUGAL ON HEALTH SYSTEM RESILIENCE:

FROM POLICY MEASURES TO DIGITAL SOLUTIONS

Luís Velez Lapão

Digital & Smart Health Care Laboratory

NOVA UNIVERSIDADE NOVA DE LISBOA

Wien, 23rd May 2022

FCT Fundação para a Ciência e a

DiSHC - DIGITAL & SMART HEALTHCARE LABORATORY

FCT Fundação para a Ciência e a

NOVA UNIVERSIDADE NOVA DE LISBOA

Decision-Making, Data Analysis

INFACT Joint Action on Health Information

Climate Change Impact

Healthcare Services

HAITooL

ePharmaCare

PHIRI Population Health Information Research Infrastructure

PHC COVID-19

eHealth for Balance Disorders in the Elderly

DIGITAL HEALTH

PEOPLE AND SKILLS

Monitoring: IoT & Gamification

Global Health & Telemedicine

PHC COVID-19

OSYRISH

METHIS

Value & Costs

HAITooL

Infomóvel PRODUTO DA FUNDAÇÃO ARIEL GLASER

Telemedicine Cape Verde
Telemedicine São Tome & Principe
Telemedicine Angola & Moçambiq

HEALTHCARE REFORMS ARE EXPECTED TO TRANSFORM HEALTH SERVICE ORGANIZATIONS... MOST OF THE TIME THIS IS NOT VERY SUCCESSFUL!

HEALTHCARE REFORMS MUST REMEMBER RESILIENCE…

Brown, C., Seville, E., & Vargo, J. (2017). Measuring the organizational resilience of critical infrastructure providers. *International journal of critical infrastructure protection*,

HEALTHCARE REFORMS MUST REMEMBER RESILIENCE…

PEOPLE

- **Foresight**
- **Preparedness**
- **Planning**
- **Organzing**
- **Talent**

PARTNERSHIPS

STRATEGY

Brown, C., Seville, E., & Vargo, J. (2017). Measuring the organizational resilience of critical infrastructure providers. *International journal of critical infrastructure protection*,

THERE ARE EMERGING PARADIGMS IN HEALTHCARE THAT SHOULD BE TAKEN IN CONSIDERATION

Complexity Theory
As a general framework

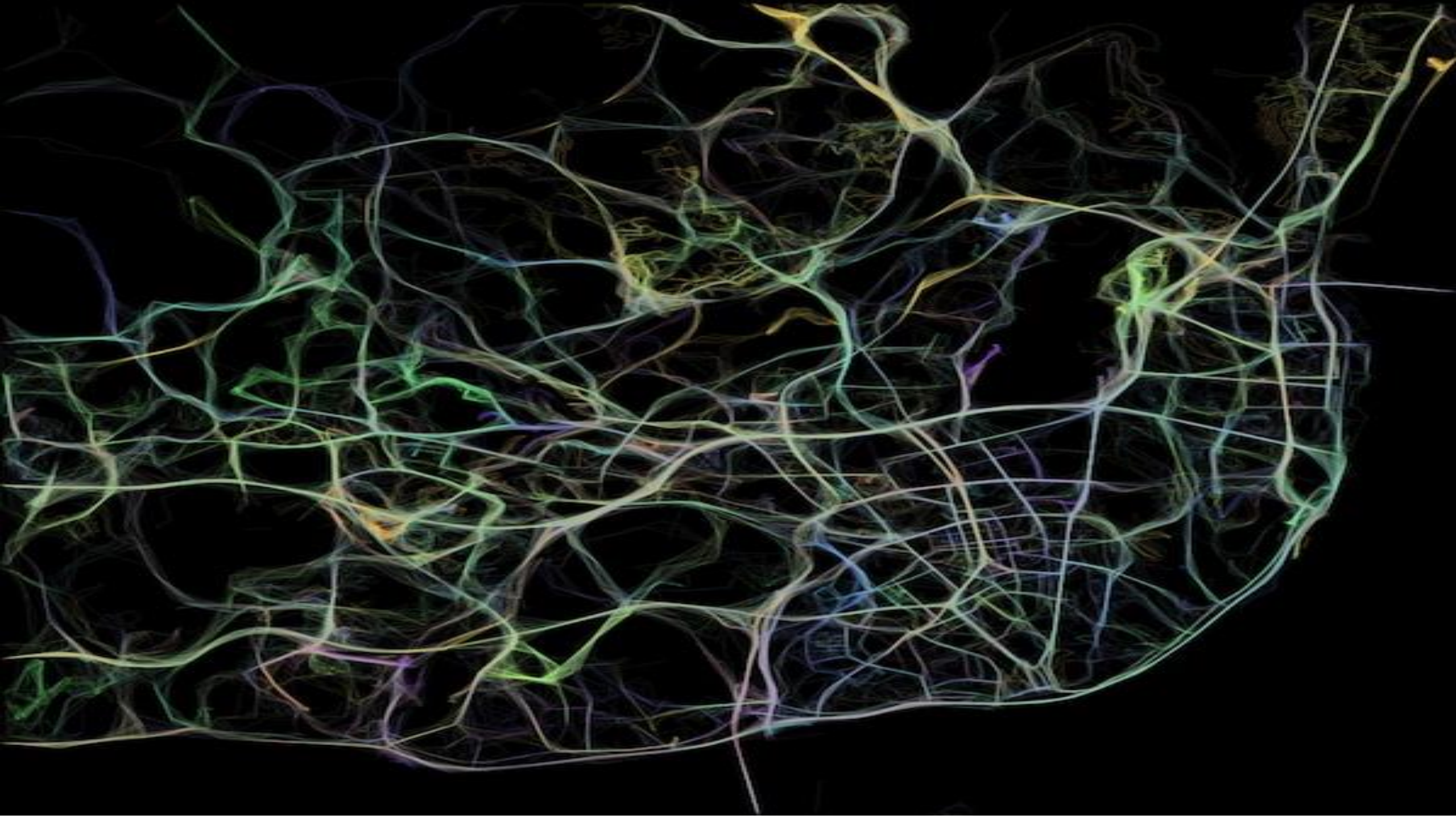
Salutogenic Principle/Planetary Health
Refocusing on health

Quality of life
As the main goal and benchmark

Sustainable Developing Goals/Digitalization
the organization of services logic

Plsek: and T. Wilson. 2001. “Complexity, leadership, and management in healthcare organizations”. BMJ

Lapão, L. V. (2008). The role of complexity dynamics in the innovation process within the new primary-care governance model in Portugal. *Innov J*

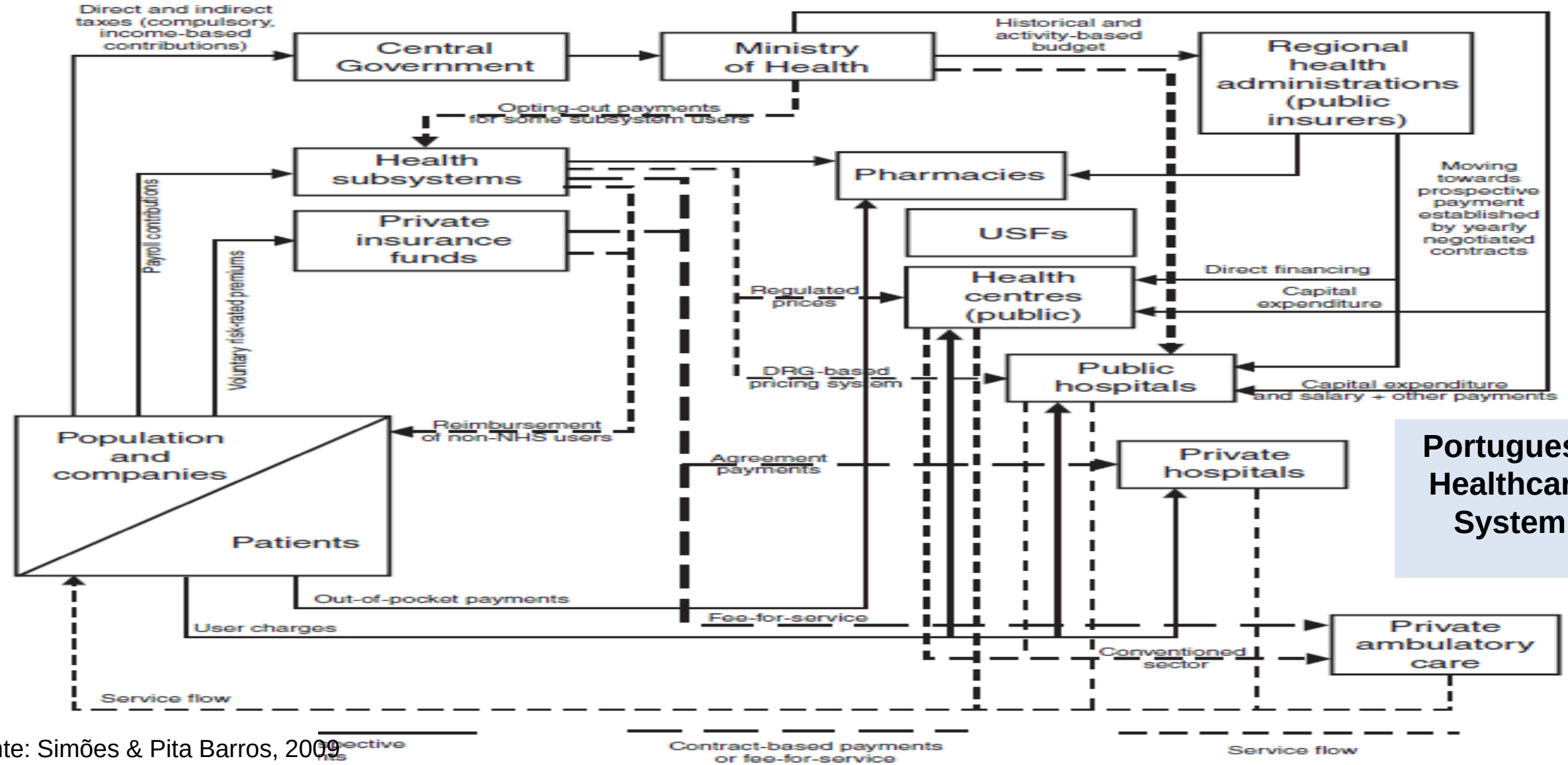


AGENDA

- **The Portuguese Health National Service**
- Primary care reform concepts towards resilience
- Management and Leadership for Resilience
- Digital Resilience
- COVID-19 Resilience

HEALTH CARE IN PORTUGAL

Public and Universal Services to all Population: Top 3 in terms of Primary Care Lead
PHC Gatekeeper to Hospital Services (12th on the 2000 WHO Ranking)

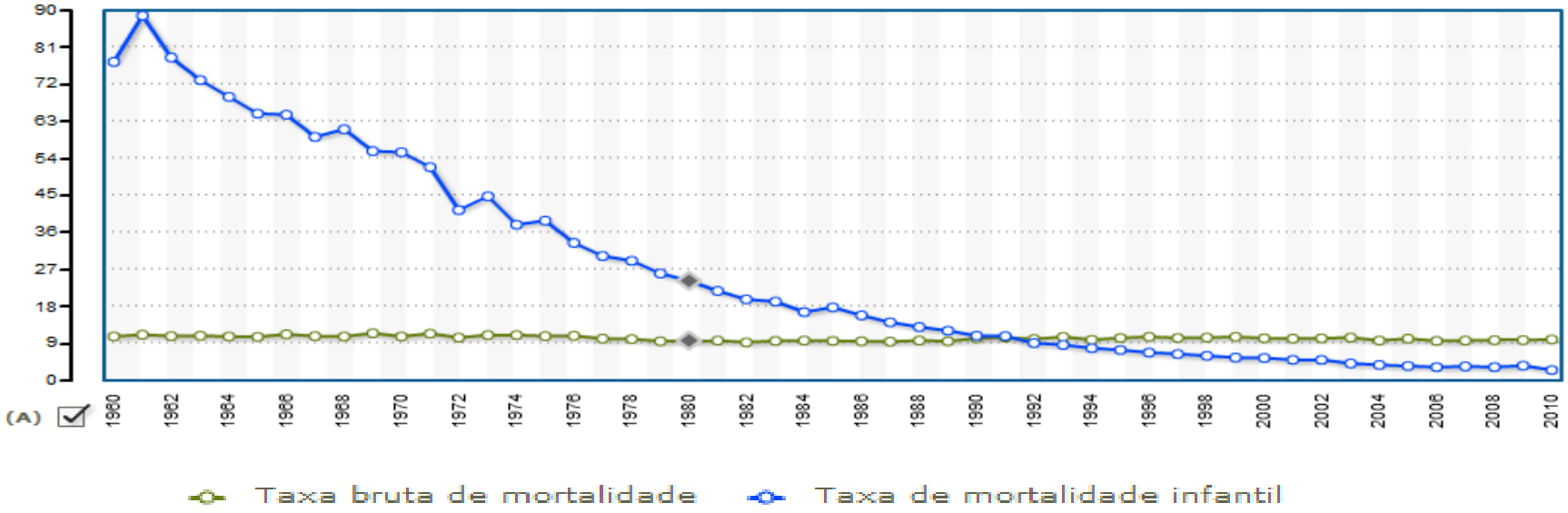


Portuguese Healthcare System

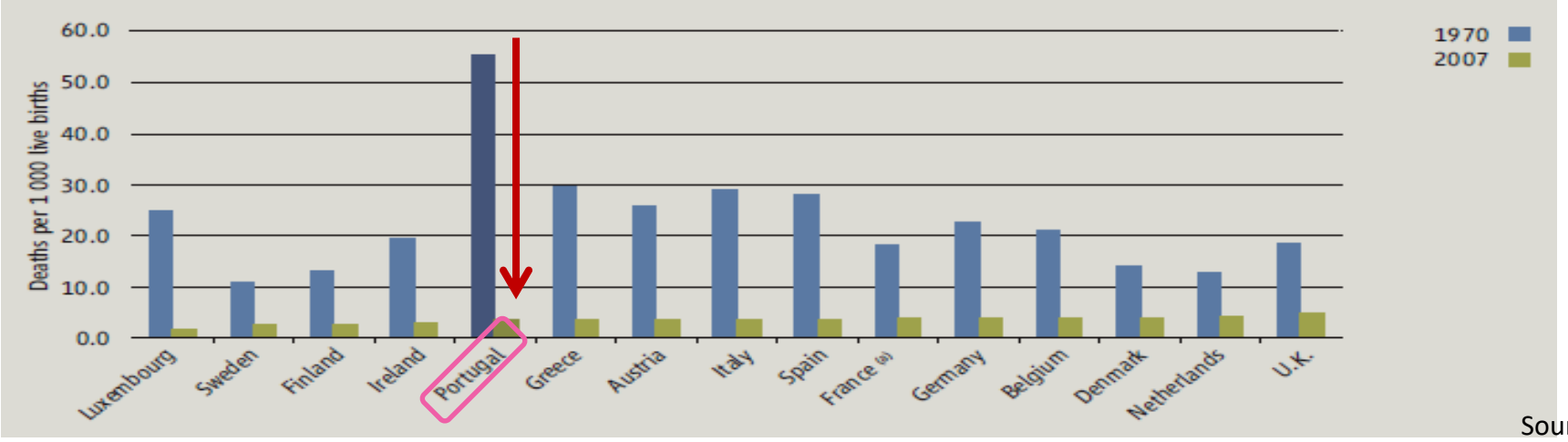
Fonte: Simões & Pita Barros, 2009

A SIGNIFICANT RESULT FROM THE COMPREHENSIVE EFORT, PORTUGAL HAS ONE OF THE LOWEST INFANT MORTALITY RATE IN EUROPE

Infant mortality rate (1960-2010)

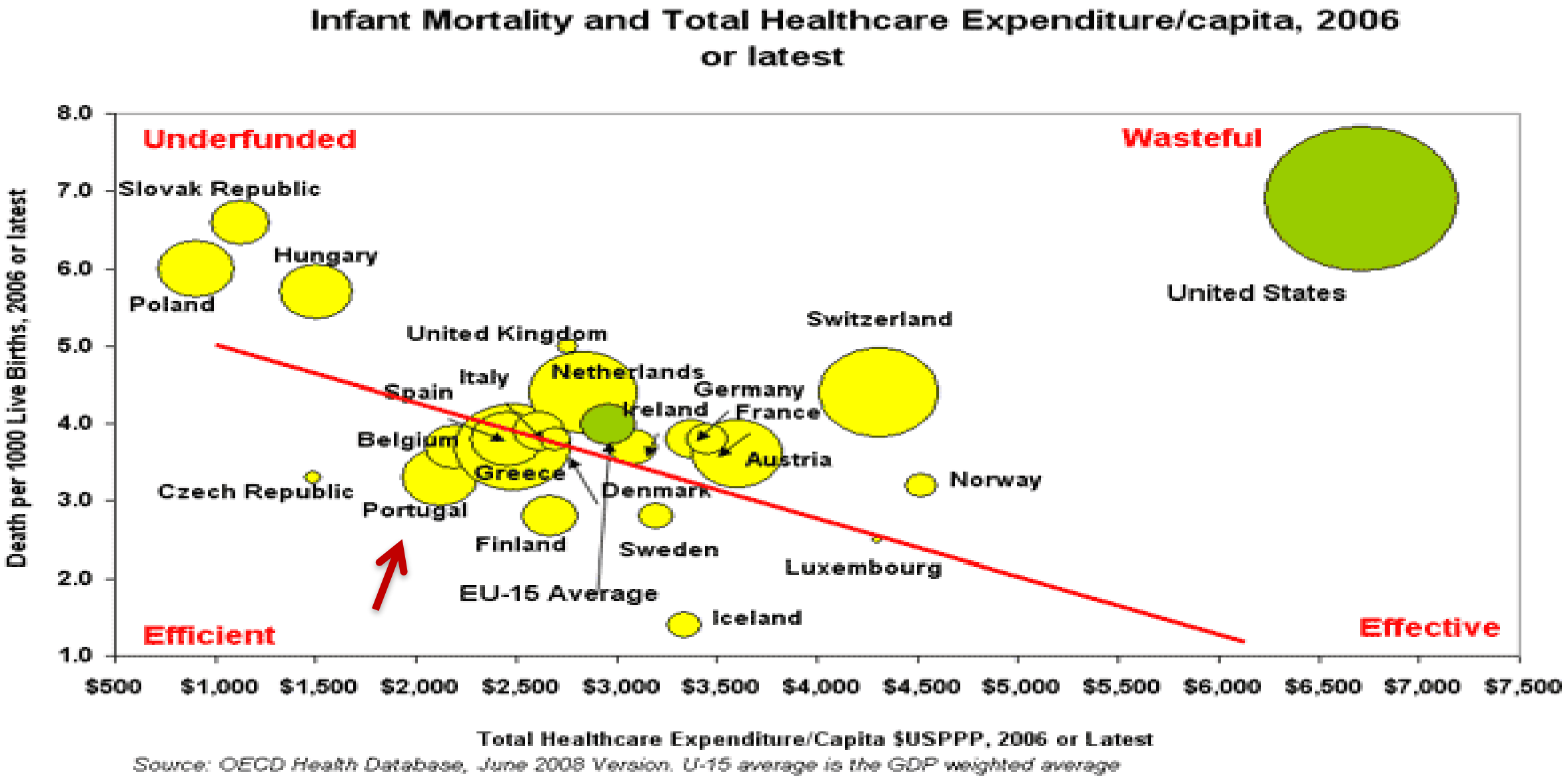


Comparison EU 15 (1970 & 2007)



Source: INE; WHO e OCDE

ALTHOUGH SOME ECONOMIC DIFFICULTIES, PORTUGAL HEALTH SYSTEM IS POSITIONED ON THE EFFICIENT SIDE



Source: OECD Health Database, June 2008 Version. U-15 average is the GDP weighted average

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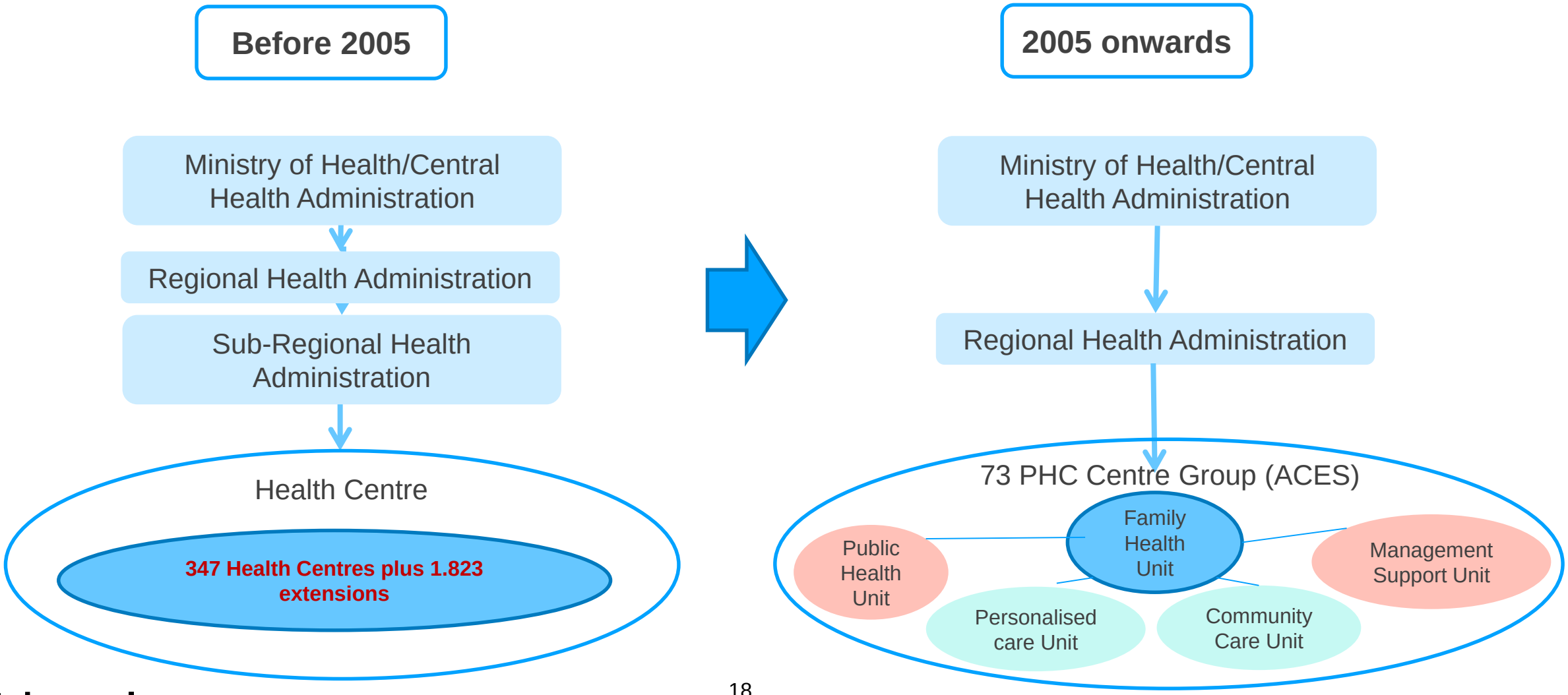
THE “3rd WAVE” OF PRIMARY HEALTHCARE REFORM IN PORTUGAL



Main goals:

- Clinical governance must have a central role

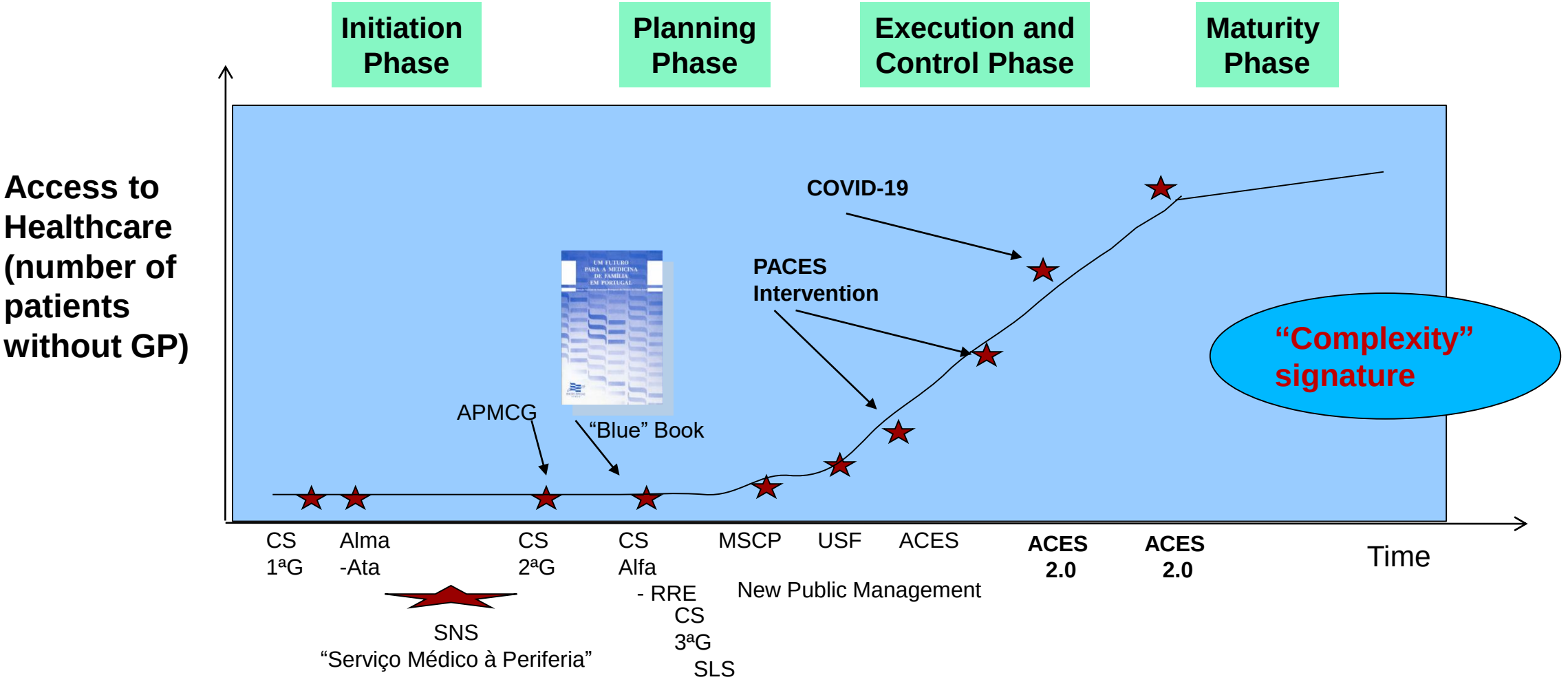
- Management efficiency through management teams – new management tools

FAMILY HEALTH UNIT IS BASED ON MULTI-PROFESSIONAL TEAM

UNIDADE DE SAÚDE FAMILIAR (USF)

Multiprofissional team of 4-12 Family physicians,
4-12 nurses and 3-10 administrative staff
covering 7-24 000 inhabit.

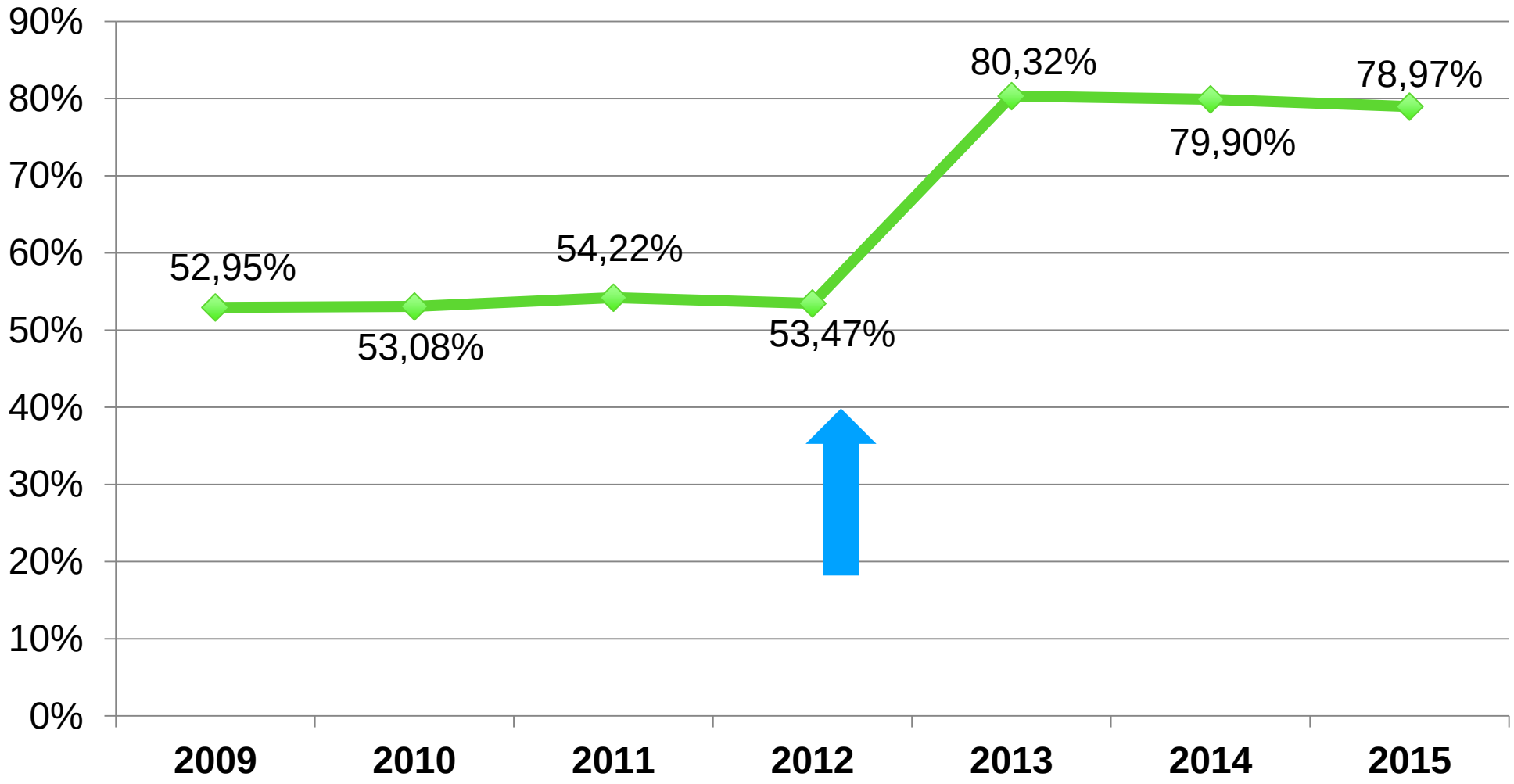
PRIMARY CARE REFORM COULD BE CONSIDERED AS THE INTRODUCTION OF AN INNOVATION



ANOTHER COMPLEXITY SIGNATURE: 2012 PHASE SHIFT

ARSLVT 2009-15

Access: Global rate of consultations use



Monteiro BR, Candoso F, Reis M, Bastos S. (2017) Indicadores de contratualização em cuidados de saúde primários no período de 2009-2015 em Lisboa e Vale do Tejo, Portugal. Ciência & Saúde Coletiva.

Source: SIARS, 2016

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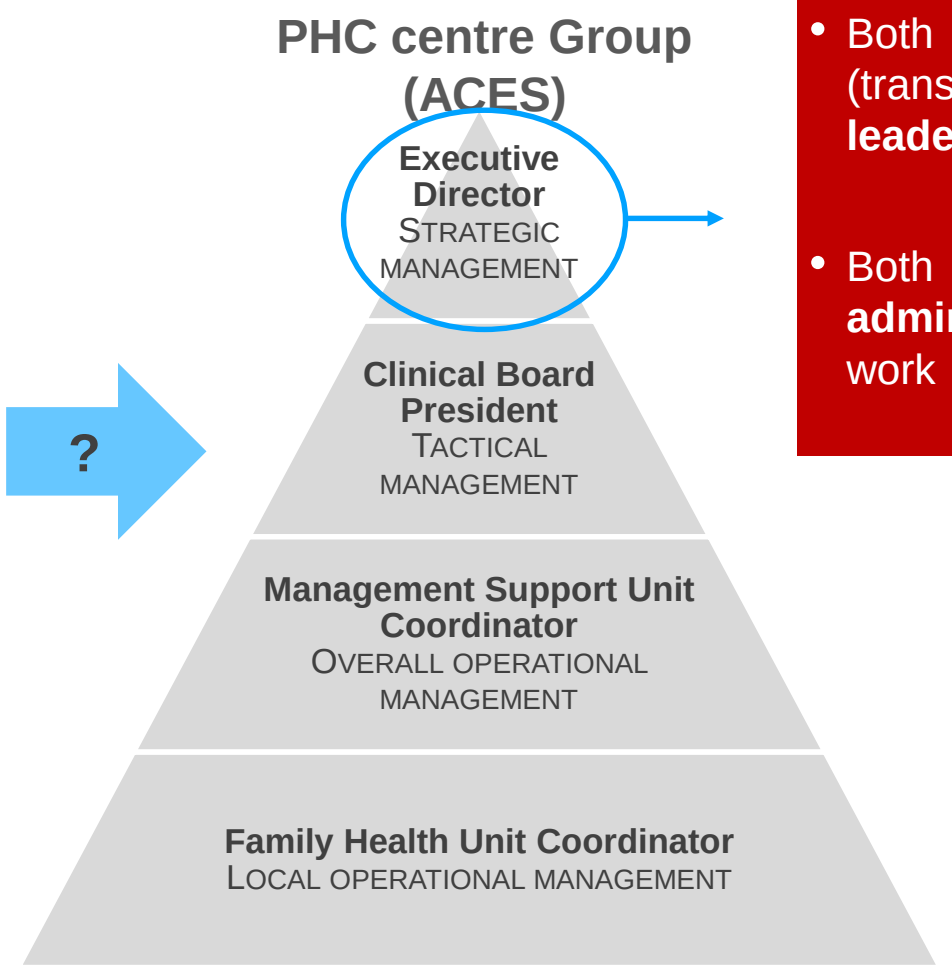
- COVID-19 Resilience

WHAT ARE THE COMPETENCES AND ROLES OF A (HEALTH) MANAGER FOR RESILENCE? HOW TO MANAGE AN ACES?

Exploratory study and Shadowing (McDonald, 2005)

1. Figurehead and **leader** of an organisational unit
2. Formation and maintenance of **contacts**
3. Monitoring, filtering and disseminating **information**
4. Allocating **resources**
5. Handling **disturbances** and maintaining workflows
6. **Negotiating**
7. **Innovating**
8. **Planning**
9. Managing **human resources**/coordinating teams and professionals

Sources: Hales, 1986; Hales, 2001; Mintzberg, 2009

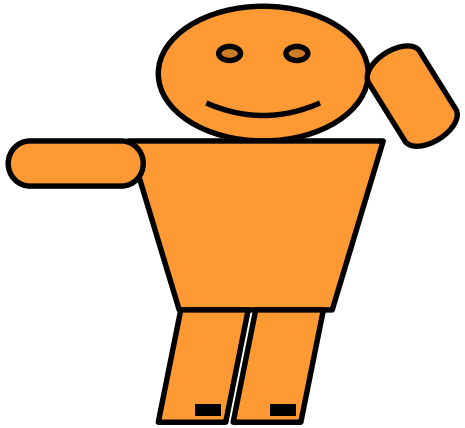


- Both **manager** & (transformational) **leader**
- Both **strategic** & **administrative** work

PACES CAPACITY BUILDING INTERVENTION 2010-11
FOCUSED ON NEW SKILLS TOWARDS LEADERSHIP AND RESILIENCE

REFORM
(Transformation)

ACTIONS
(Organizational Change Projects)



PEOPLE
Prepared
For
Action

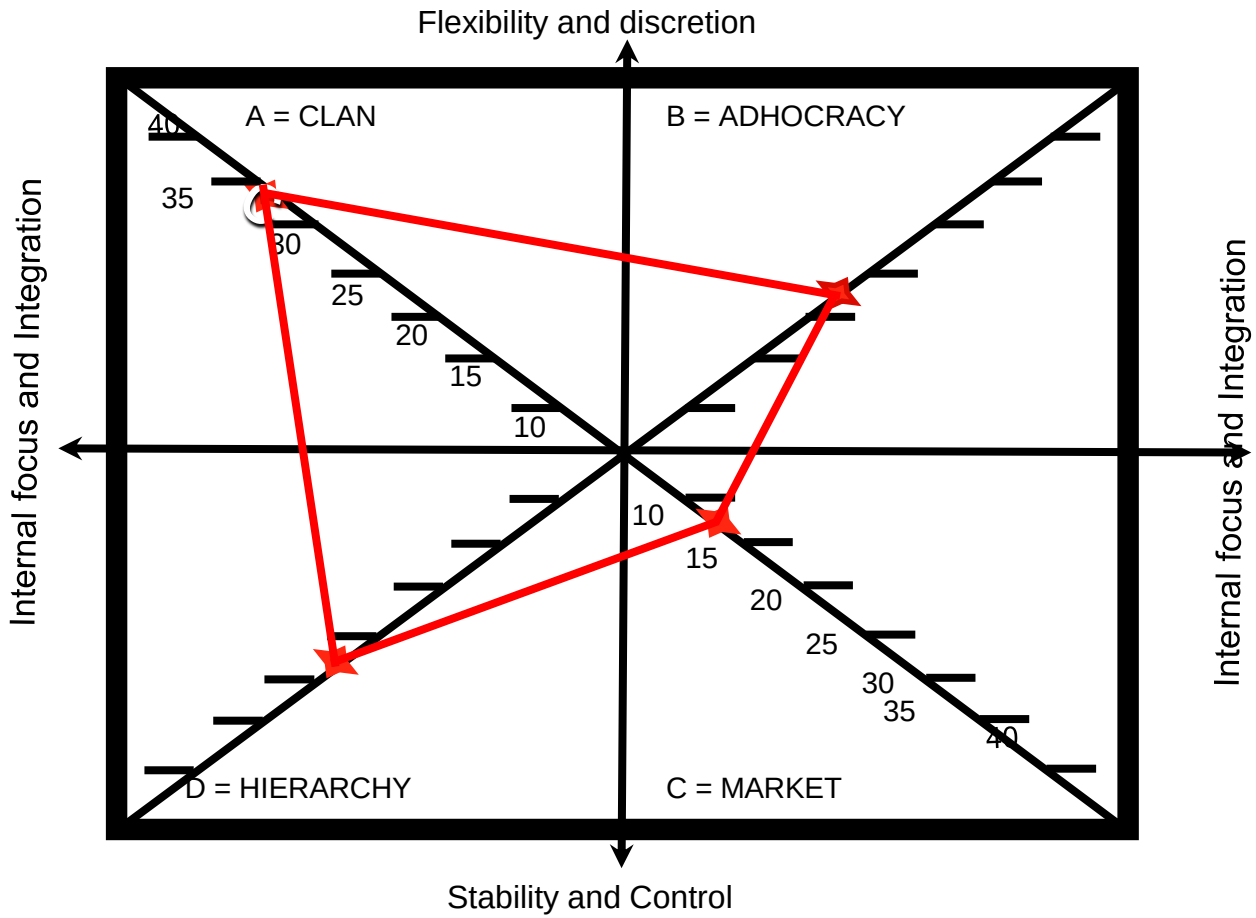
Where do we find them?
How do we train them?

AFTER INTERVENTION, “HIERARCHY” CHANGES TO “ADHOCRACY”

The Competing Values Framework

Organization Culture Assessment Instrument (*OCAI*)*)

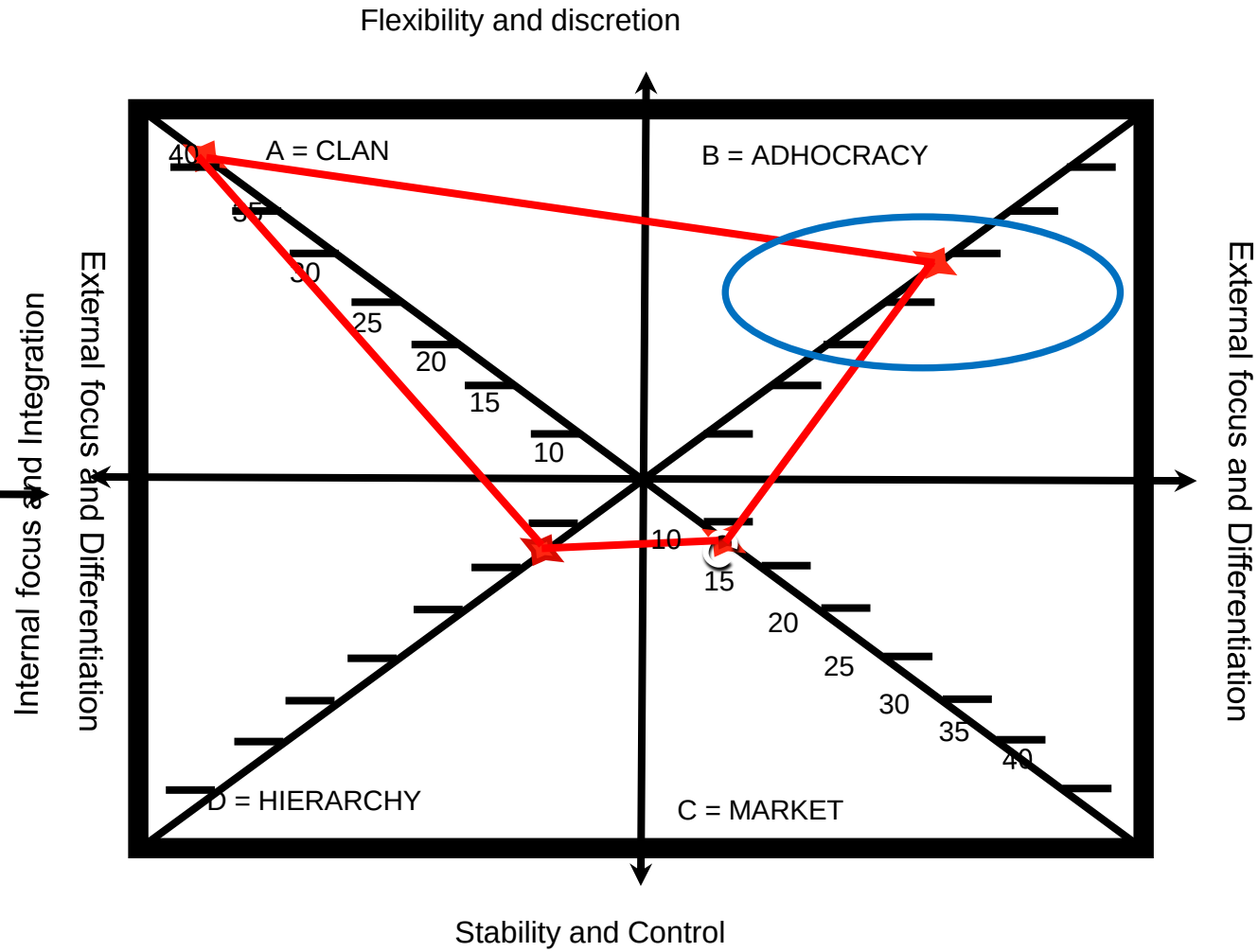
- Aggregated Analysis 2008 -



1st Dominant Culture: Clan

2nd Dominant Culture: Hierarchy

- Aggregated Analysis 2009 and 2012-



1st Dominant Culture: Clan

2nd Dominant Culture: Adhocracy

*Cameron e Quinn (2006)

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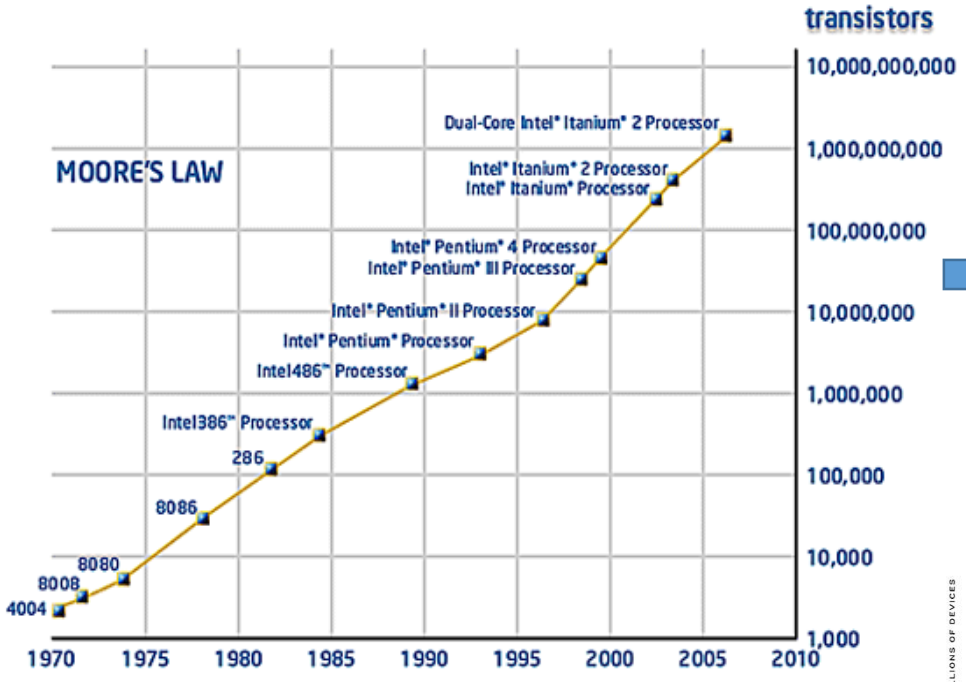
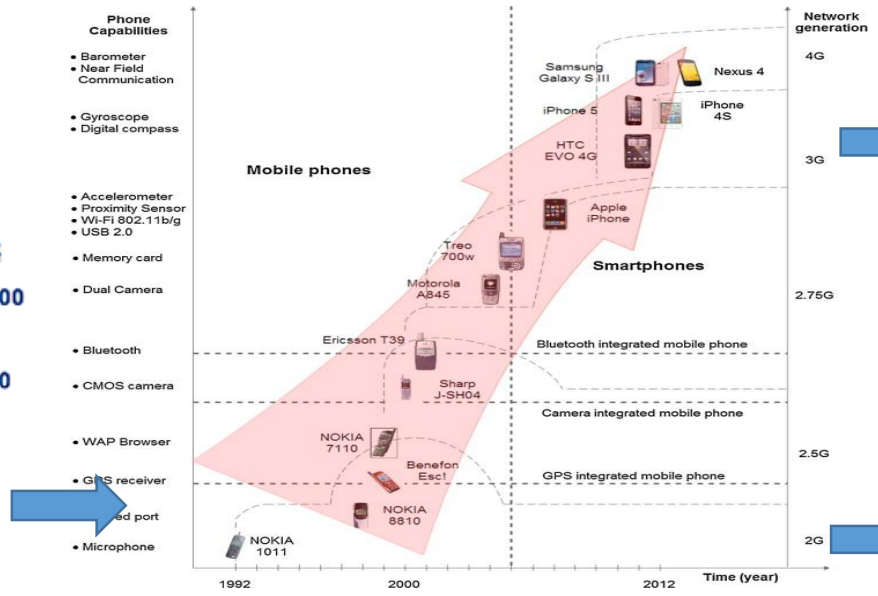
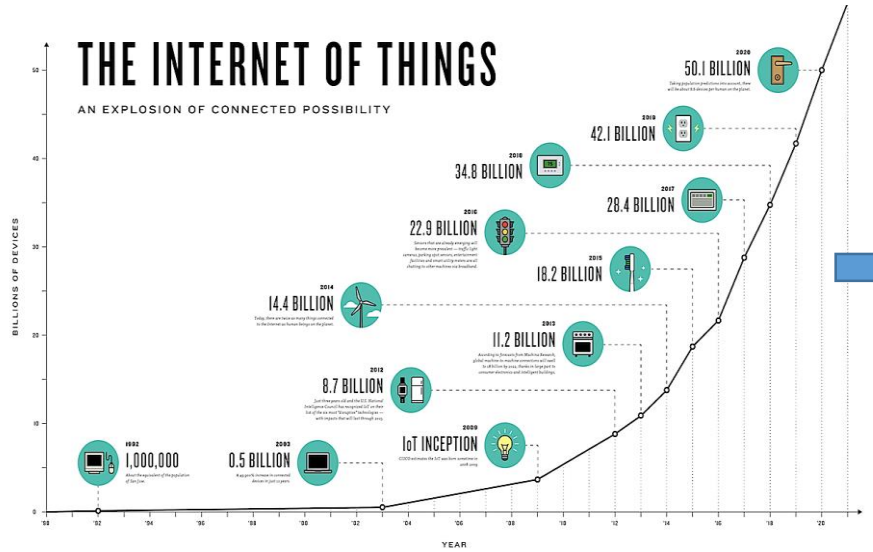
THE OPPORTUNITY TO LEVERAGE DIGITAL TRENDS

CHANGE WILL FOLLOW…SOON

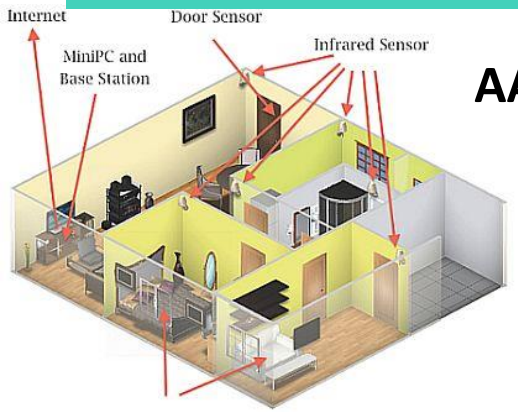




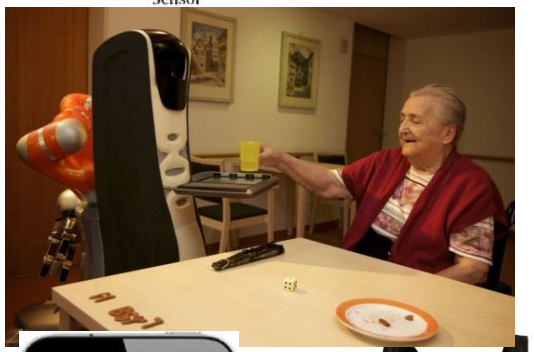


AI

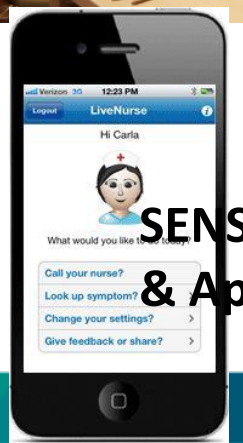
AAL



ROBOTICS

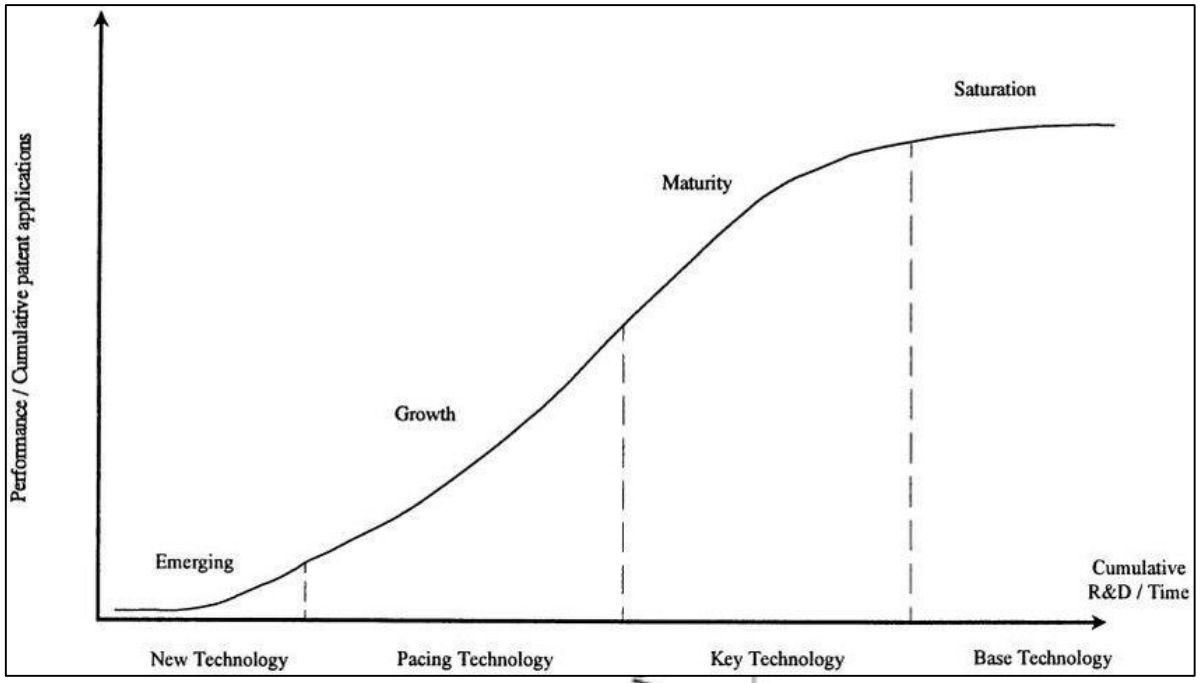


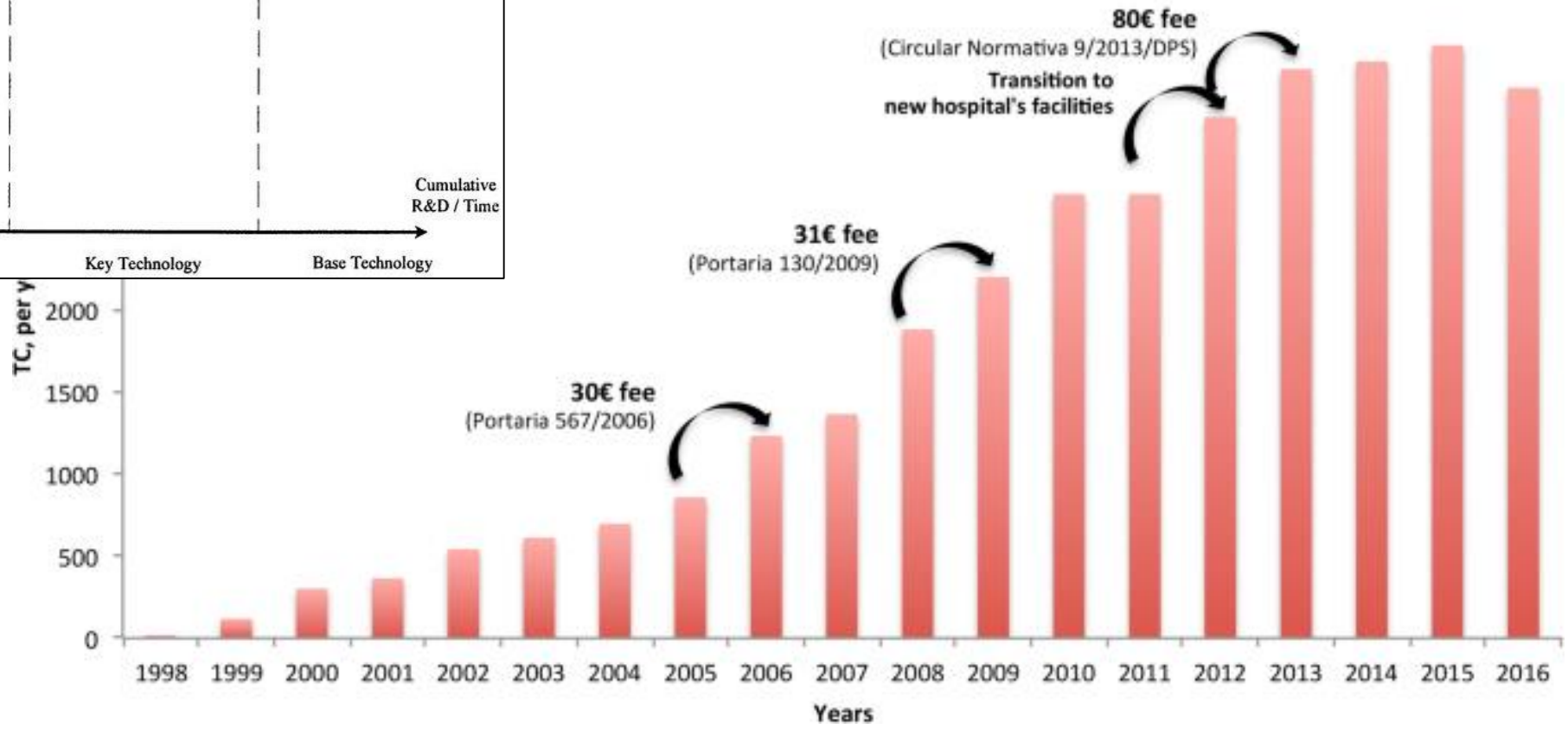
SENSORS & Apps



HAITooL

DIGITALIZATION IS NON-LINEAR “S CURVE” PHENOMENA – INNOVATION…LEARNING…BUILDING UP RESILIENCE





Maia et al. BMC Health Services Research (2019) 19:681
https://doi.org/10.1186/s12913-019-4511-5

BMC Health Services Research

RESEARCH ARTICLE Open Access

How to develop a sustainable telemedicine service? A Pediatric Telecardiology Service 20 years on - an exploratory study

Mélanie Raimundo Maia[1*], Eduardo Castela[2], António Pires[2] and Luís Velez Lapão[1]

Abstract

Background: Telemedicine services are promoting more access to healthcare. Portugal was an early adopter of telemedicine to overcome both its geological barriers and the shortage of healthcare professionals. The Pediatric Cardiology Service (PCS) at Coimbra University Hospital Centre (CHUC) has been using telemedicine to increase access and coverage since 1998. Their Pediatric Telecardiology Service has been daily connecting CHUC with 13 other Portuguese national hospitals, and regularly connecting with Portuguese-speaking African countries, through a teleconsultation platform.

Methods: This study aims at exploring the Pediatric Telecardiology Service's evolution, through a comprehensive assessment of the PCS's development, evolution and impact in public health, to better understand the critical factors for implementation and sustainability of telemedicine, in the context of healthcare services digitalization. A case study was performed, with cost-benefit, critical factors and organizational culture assessment. Finally, the Kingdon's framework helped to understand the implementation and scale-up process and the role of policy-making.

Results: With the total of 32,685 out-patient teleconsultations, growing steadily from 1998 to 2016, the Pediatric Telecardiology Service has reached national and international recognition, being a pioneer and an active promotor of telemedicine. This telemedicine service has saved significant resources, about 1.1 million euros for the health system (e.g. in administrative and logistic costs) and approximately 419 euros per patient (considering an average of 1777 patients per year).
PCS presents a dominant "Clan" culture. The Momentum's critical factors for telemedicine service implementation enabled us to understand how barriers were overcome (e.g. political forces). Willingness, perseverance and teamwork, allied with partnership with key stakeholders, were the foundation for professionals' engagement and service networking development. Its positive results, new regulations and the increasing support from the hospital board, set up a window of opportunity to establish a sustainable telemedicine service.

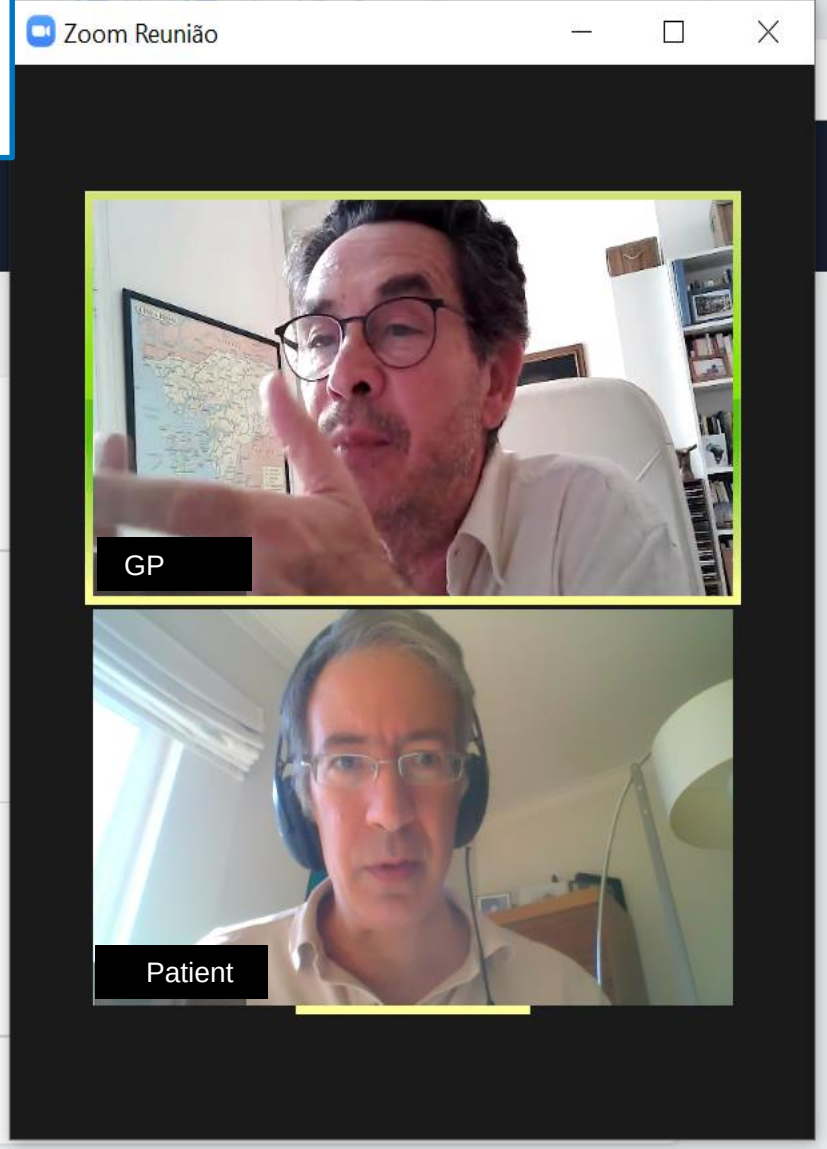
Conclusion: The Pediatric Telecardiology Service enables real-time communication and the sharing of clinical information, overcoming many barriers (from geographical ones to shortage of healthcare professionals), improving access to specialized care both in Portugal and Africa.

METHIS – DIGITAL PHC MONITORING

PHC | Dashboard | Consultas | Dados bioquímicos | Dados fisiológicos | Gráficos

As minhas consultas

Segunda-feira 29 de junho	**Consulta de medicina** URGENTE 17h00 / Garcia de Orta	
Sexta-feira 26 de junho	**Consulta de medicina** URGENTE 17h00 / Garcia de Orta	



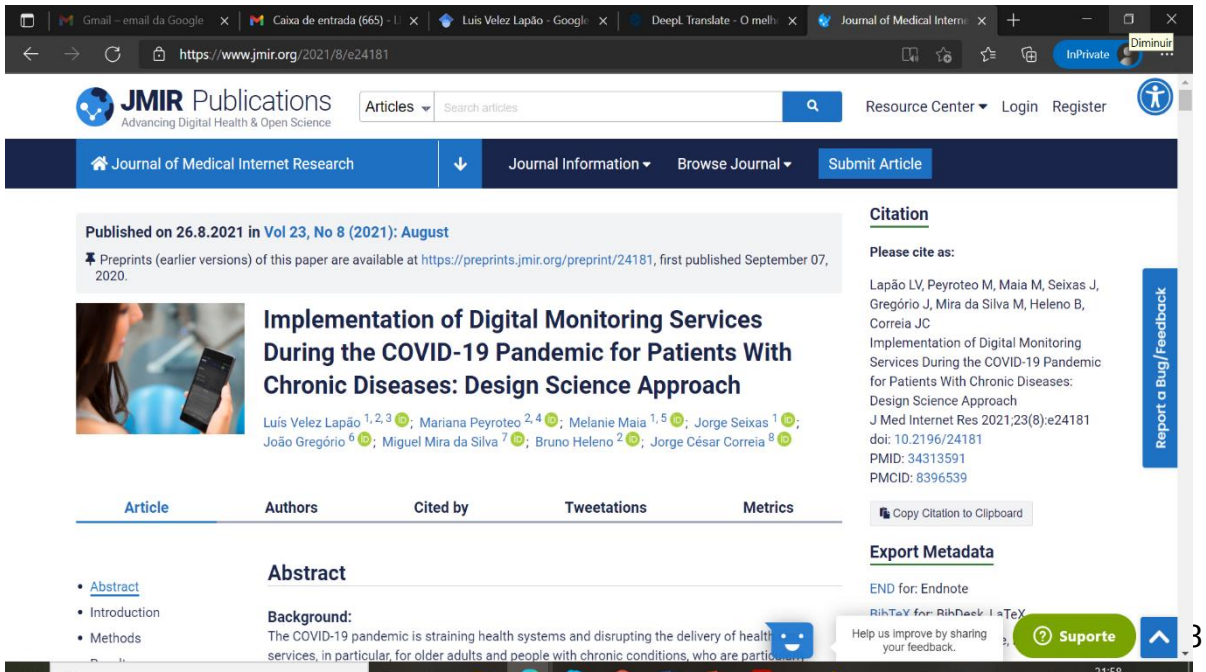
REDUCING BURDEN AND IMPROVING CARE

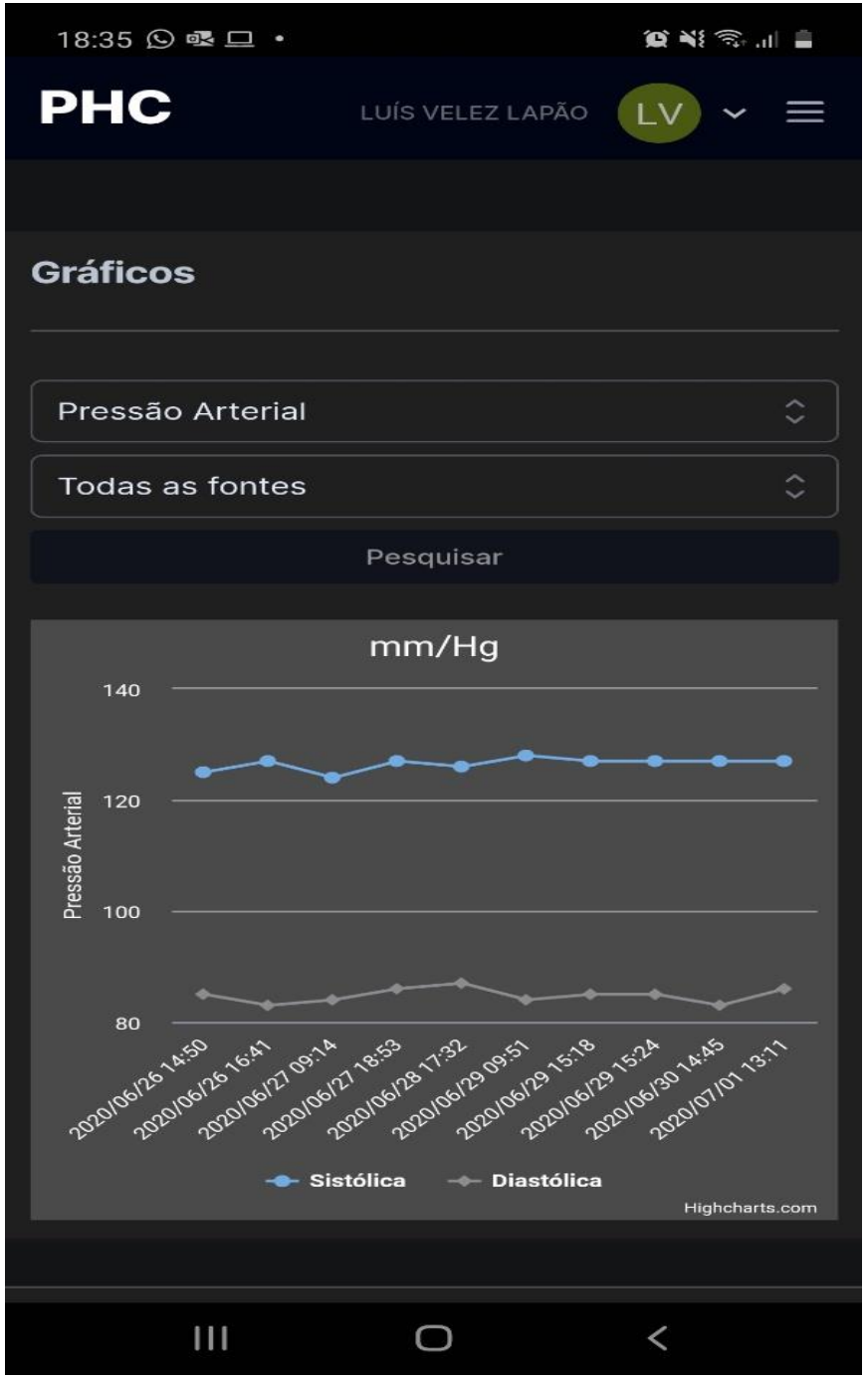
© 2020 - IHMT-UNL Instituto de Higiene e Medicina Tropical.

With Smartphone…

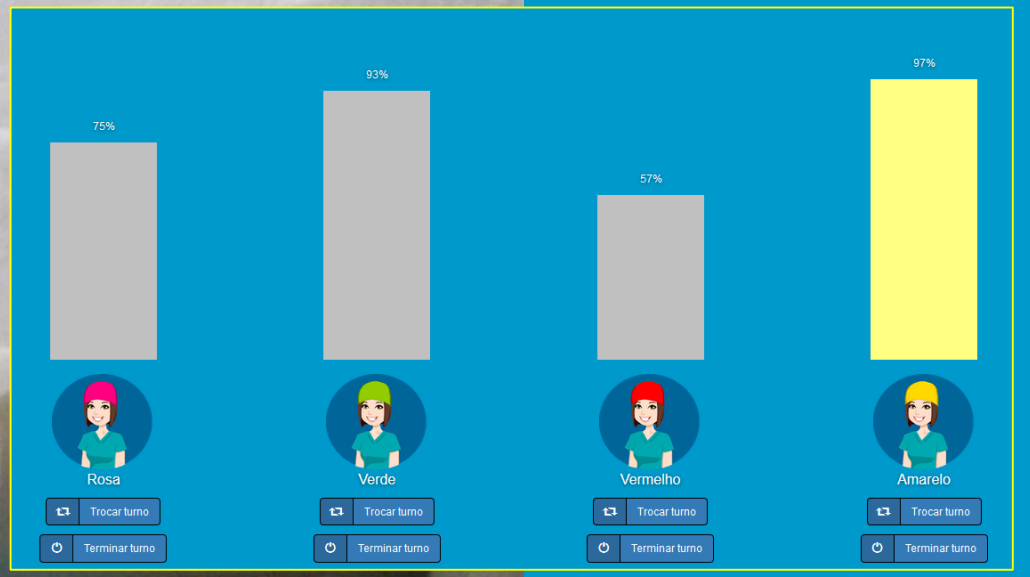
Anywhere…

Anytime…





REAL-TIME HOSPITAL HYGIENE:Gamification with Indoor Location



SENSEFINITY SENSORS DISPLAY (hanrub)

WE NEED A BETTER PREPARED WORKFORCE!
And Digital Leadership Skills Can Make a difference

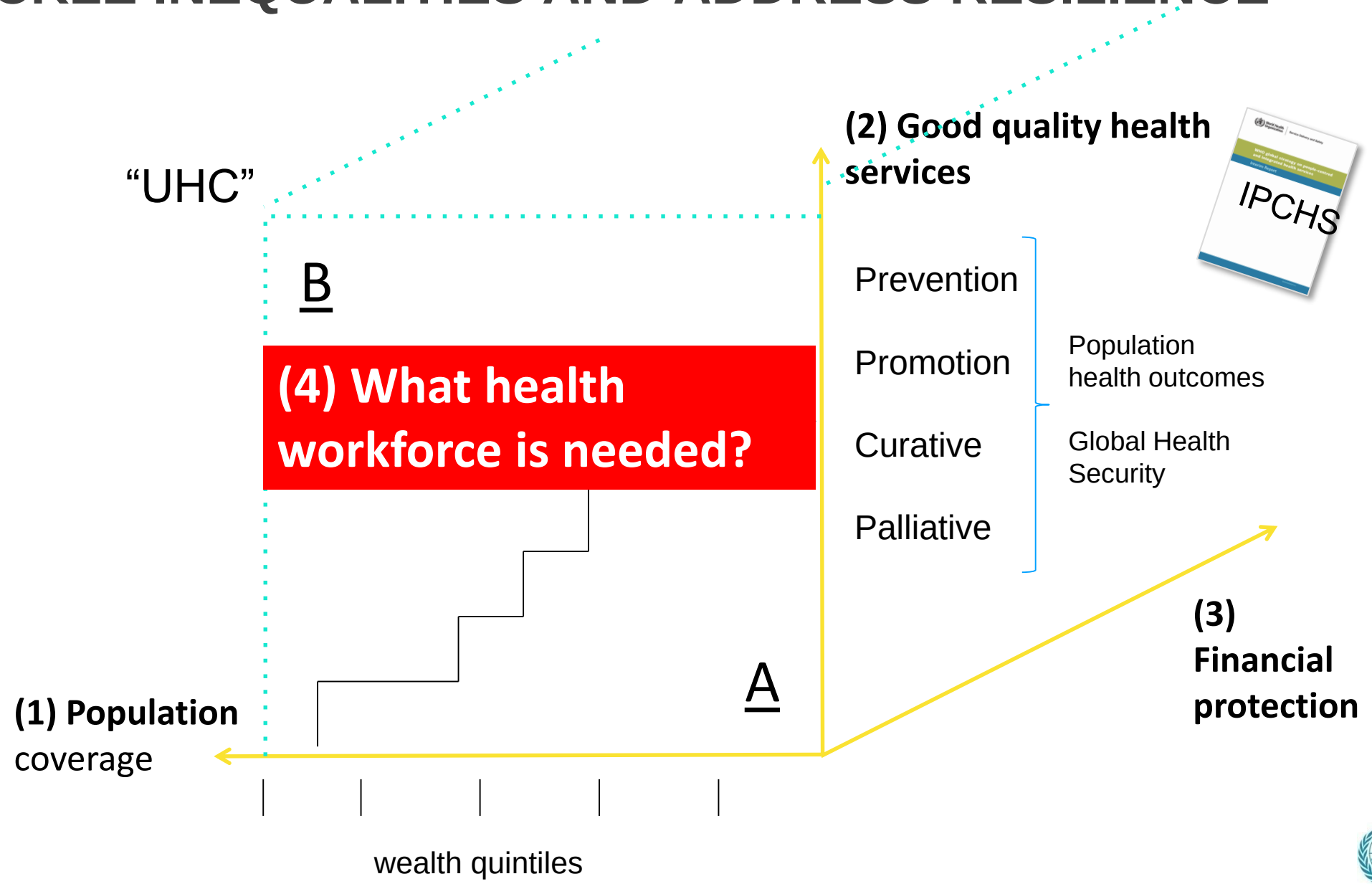
SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

SUSTAINABLE DEVELOPMENT GOALS

World Health Organization

WHO PROMOTING UNIVERSAL HEALTH COVERAGE BY 2030 TO TACKLE INEQUALITIES AND ADDRESS RESILIENCE



World Health Organization

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- Digital Resilience
- **COVID-19 Resilience**

“We are not ready for the next pandemic”

Bill Gates, 2015

"It is 100% certain that pandemics will be a part of our future. The uncertainties are: when, how often and how severe.”

Frederik Kristensen, CEO of CEPI, 2021

UNIVERSIDADE NOVA DE LISBOA

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

Supplement article

PanAfrican Medical Journal

Research

Ebola impact on african health systems entails a quest for more international and local resilience: the case of african portuguese speaking countries

Luís Velez Lapão[1,&], Andreia Silva[2], Natália Pereira[2], Paula Vasconcelos[2], Cláudia Conceição[1]
[1]Global Health and Tropical Medicine, Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Portugal, [2]Direcção Geral da Saúde, Ministério da Saúde, Portugal

[&]**Corresponding author:**
Luís Velez Lapão, Global Health and Tropical Medicine, Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Portugal

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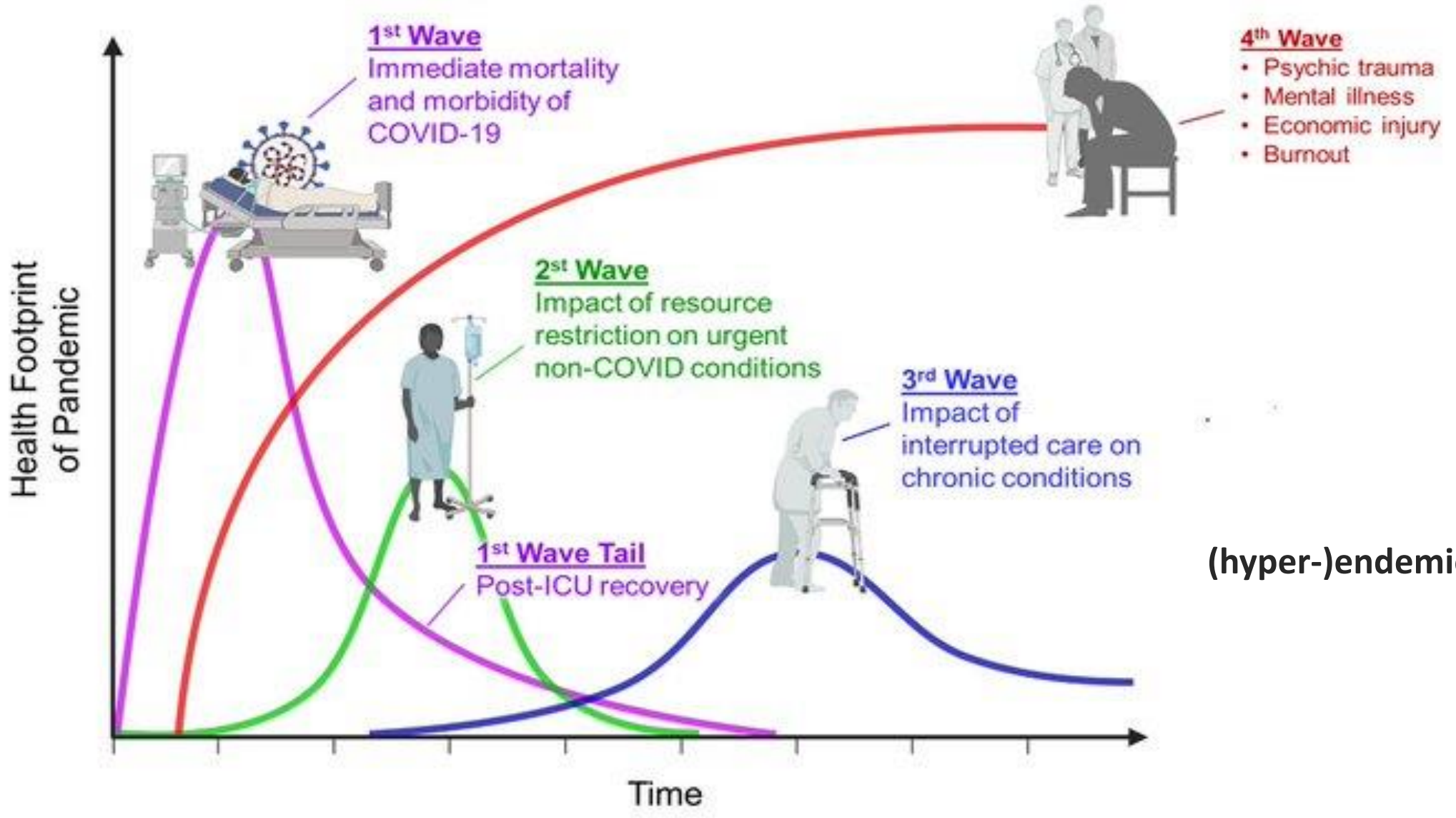
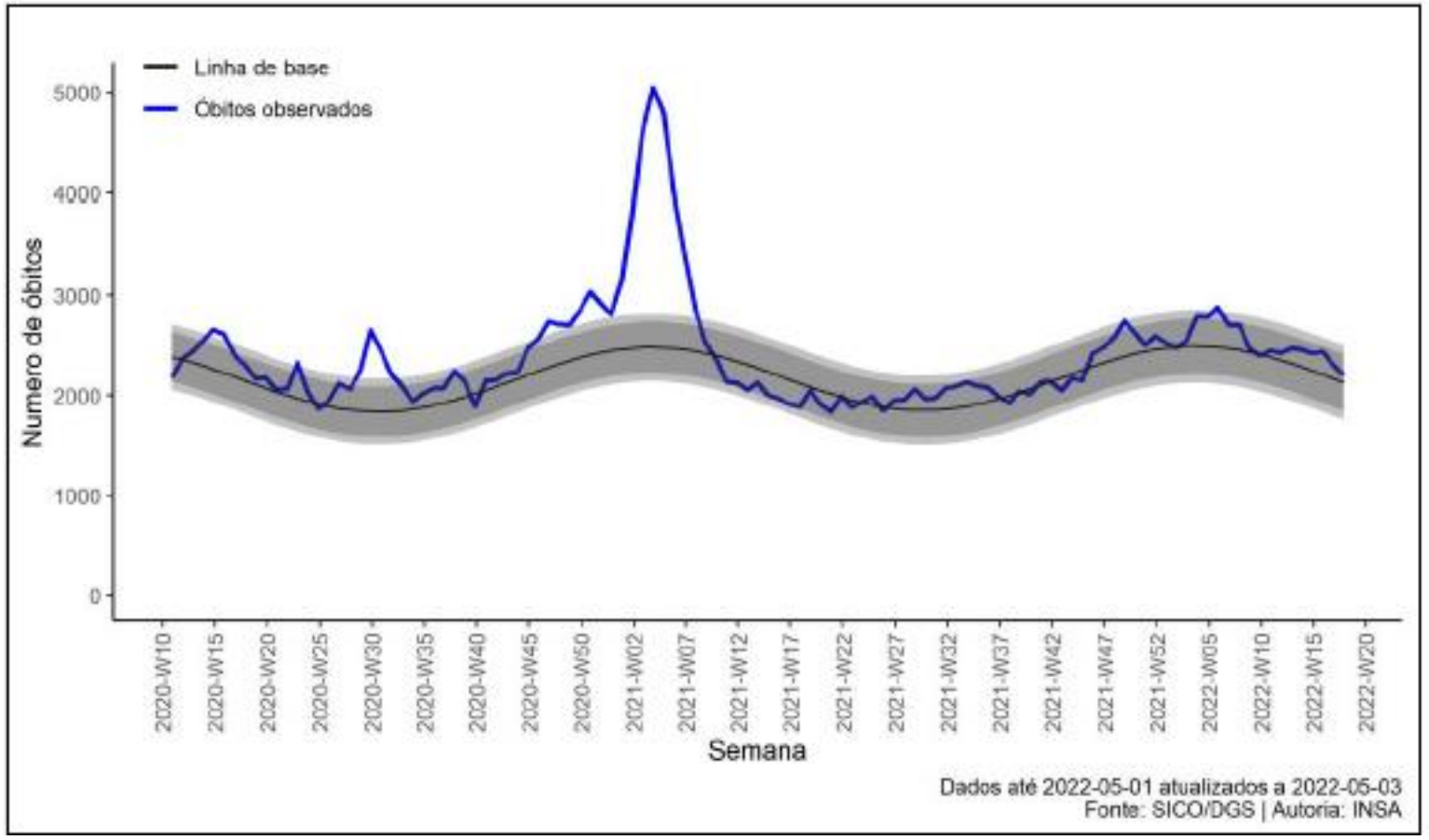


(hyper-)endemic

Fonte: Twitter post 7:04 PM · Mar 30, 2020 Victor Tseng

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

PORTUGAL: ALL CAUSES MORTALITY



COVID-19 specific mortality

This figure shows all causes mortality in Portugal since 17/02/2020 until now.
The blue line are deaths is the the number of deaths and the black line and its shade corresponds to the baseline with a 95 and 99% confidence interval.

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://covid19.min-saude.pt/wp-content/uploads/2022/05/20220504_Monitorizacao_COVID-19_pdf-2980kb.pdf

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

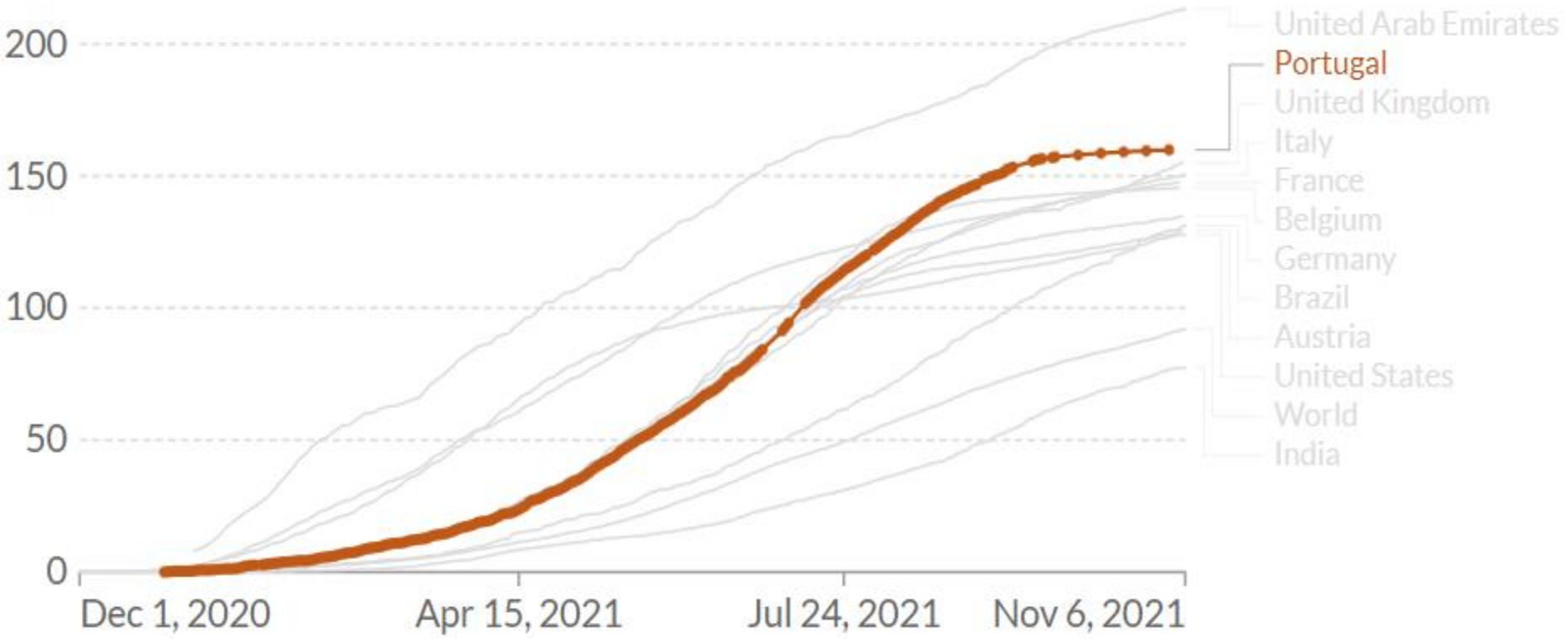
COVID-19 vaccine doses administered per 100 people

Our World in Data

All doses, including boosters, are counted individually. As the same person may receive more than one dose, the number of doses per 100 people can be higher than 100.

LINEAR | LOG

Add country



Source: Official data collated by Our World in Data – Last updated 7 November 2021, 08:40 (London time)
OurWorldInData.org/coronavirus • CC BY

Dec 1, 2020 — Nov 6, 2021

CHART | MAP | TABLE | SOURCES | DOWNLOAD

FACTORS CONTRIBUTING TO COVID-19 VACCINATION SUCCESS

- Large experience and large vaccination covering
- Excellent Population Response
  - Vaccination is well accepted in Portugal/historic reasons/1965
- The role of the NHS/Public Primary care Network Covering the whole country/Physicians and Nurses Resilience
- Strong epidemiologic vigilance mechanisms
- DGS/MoH technical Decision-Making
- Roll-out of vaccination by the Task Force

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

ENGAGING THE MILITAIRES (e.g. RESILIENCE)

- Admiral Henrique Melo Coordinator/ Ministry of Defense/General Staff of Armed Forces
- Full dedication and collaboration to roll-out the vaccination task force
- Precise and clear communication with the population and the staff
    - Regular visits to sites
- Multidisciplinary team
- Good Information System
- Negotiation and Logistics

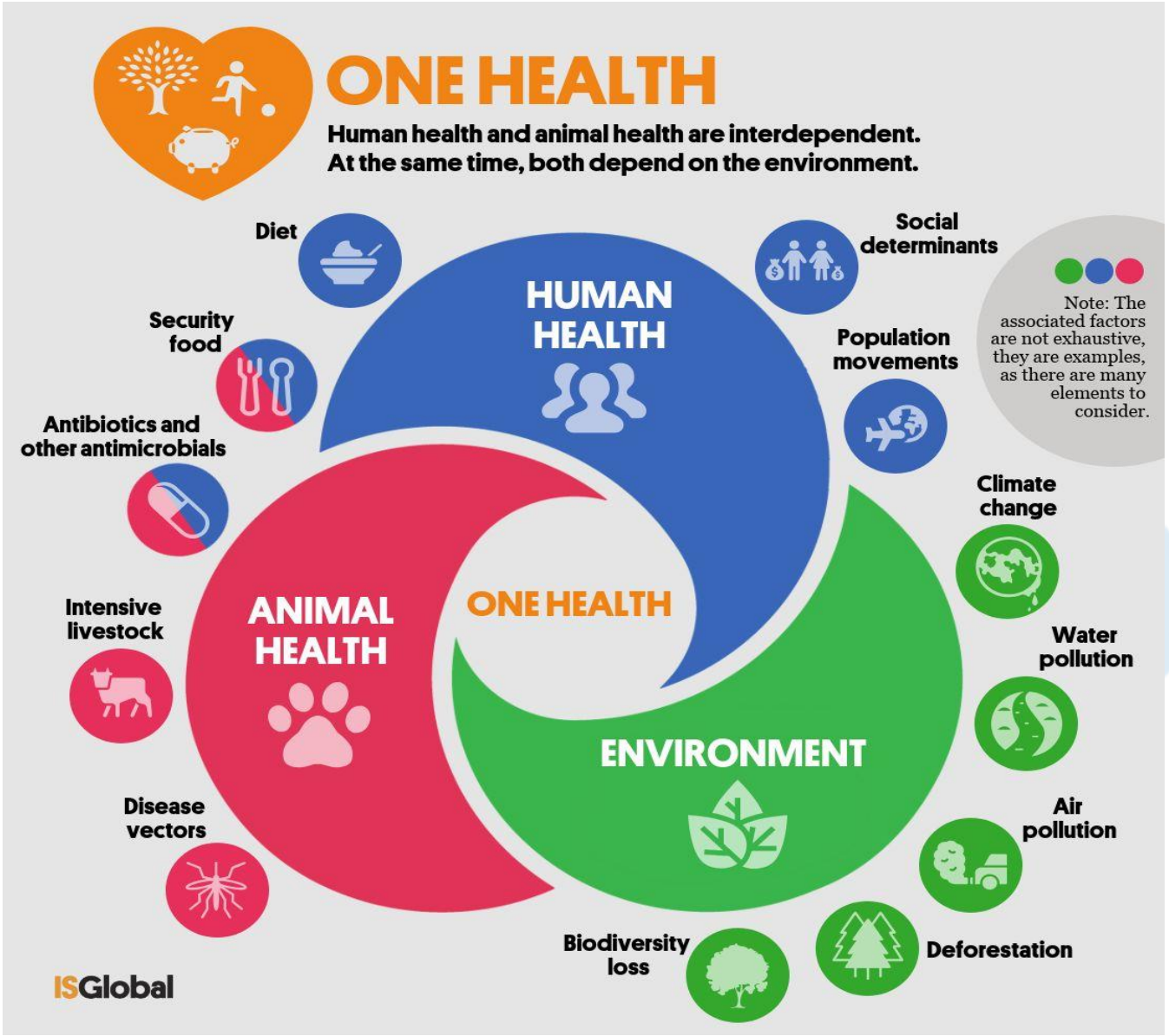
UNIVERSIDADE NOVA DE LISBOA

Not the last pandemic

ZOONOSES

Scientist from all over the world have been warning on the threat posed by other viruses!

NOW IS THE NEXT TIME TO PREPARE FOR THE NEXT PANDEMIC



ONE HEALTH APPROACH IS IMPORTANT FOR RESILIENCE

UNIVERSIDADE NOVA DE LISBOA

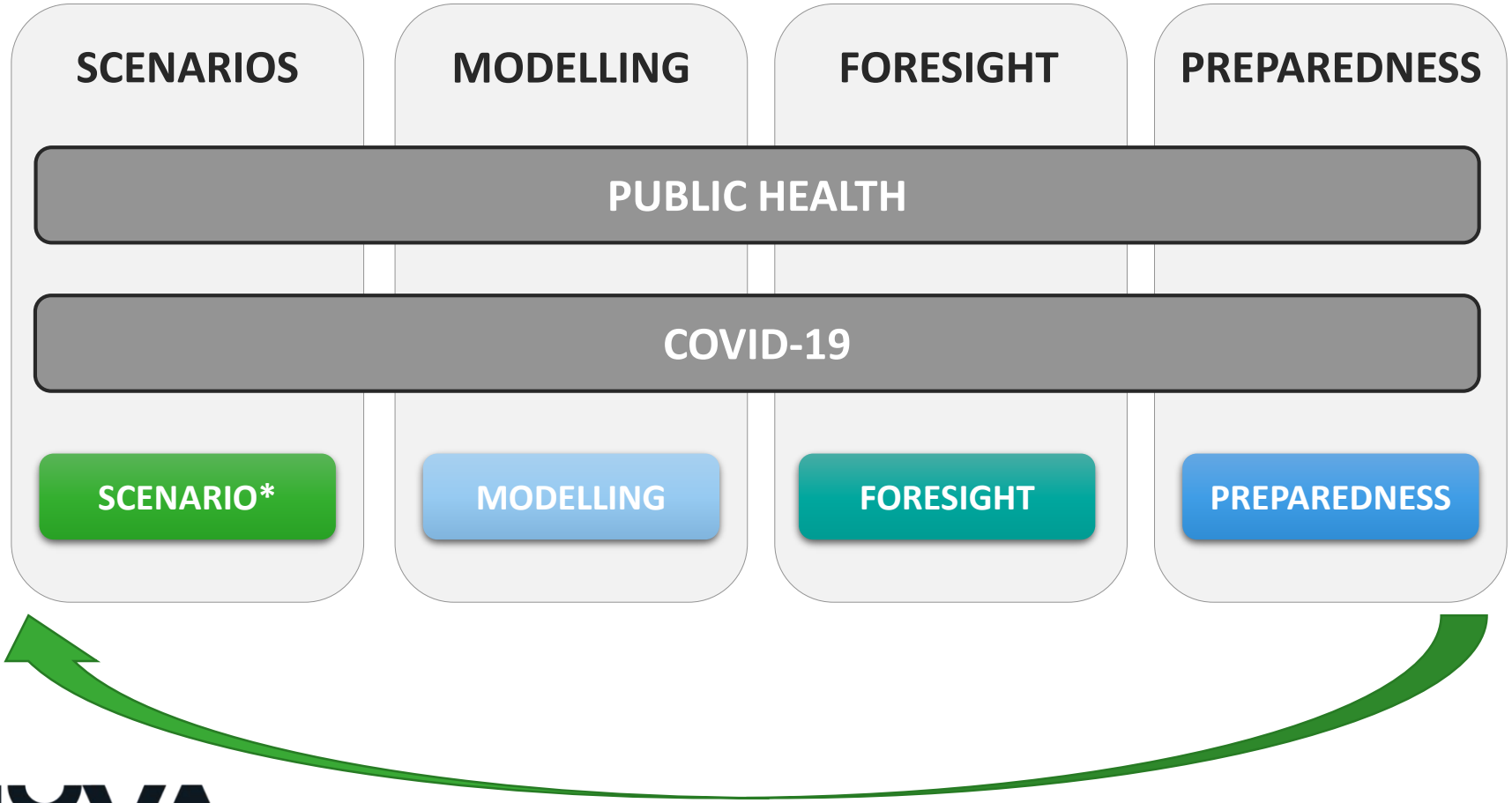
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101018317

MAY 2022 WORLD HEALTH ASSEMBLY

4 Main Topics:

- **PREPARING FOR THE NEXT PANDEMIC: Collaboration/Information**
- **CLINICAL TRIALS: COORDINATION OF RESEARCH PRIORITIES**
- **WHO Funding**
- **Ukraine**

CRISIS PREPAREDNESS AND RESPONSE IS A COMPLEX PROCESS – IT REQUIRES SKILLED PROFESSIONALS



PHIRI
Population Health Information Research Infrastructure

HOME > CAPACITY BUILDING ACTIVITIES
CAPACITY BUILDING ACTIVITIES

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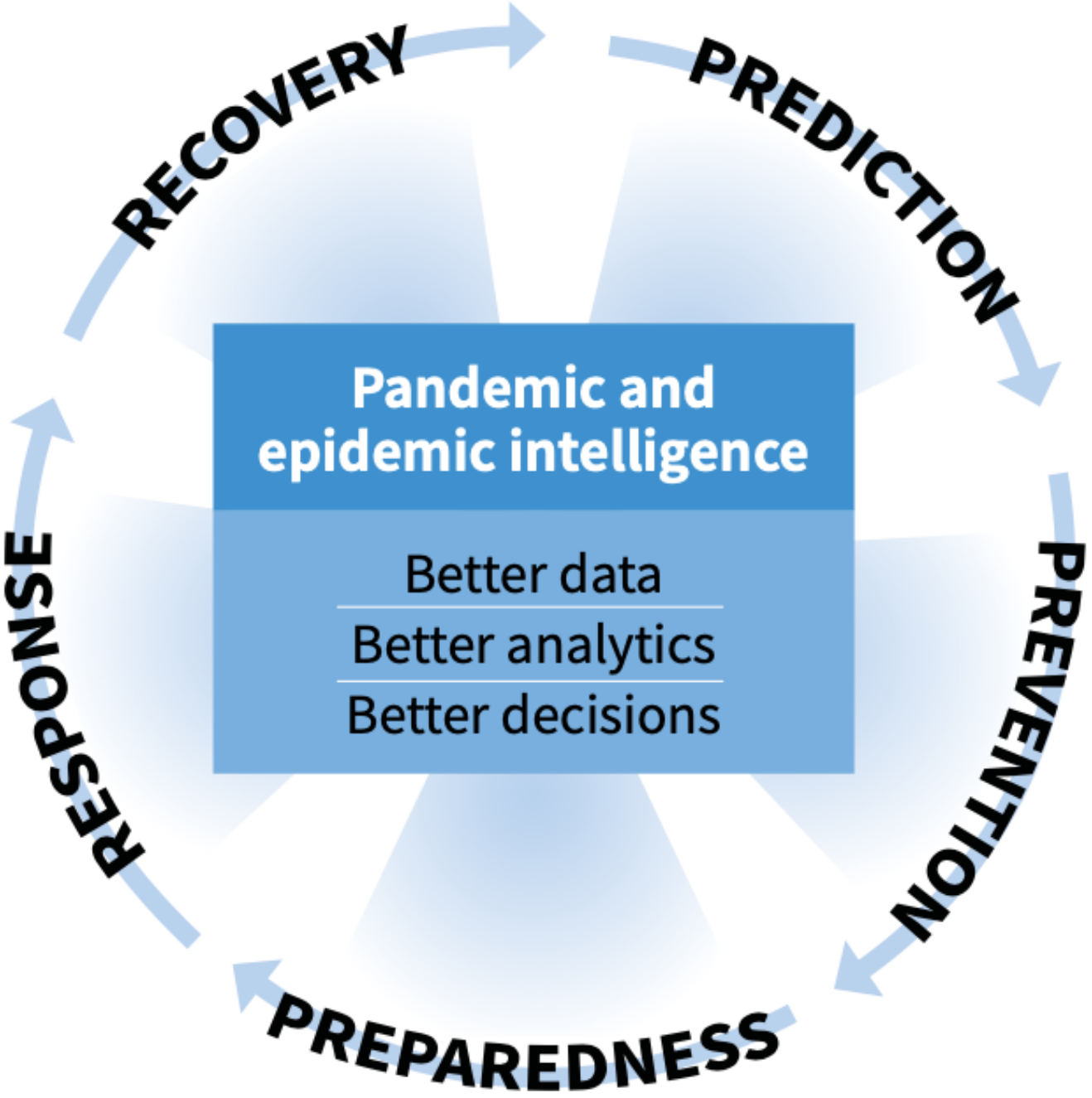
INFORMATION MANAGEMENT IS ANOTHER CRITICAL ISSUE TO ESTABLISH A MORE SUSTAINABLE AND RESILIENT HEALTH SYSTEM



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Summary

- Health systems's strategy and planning should include Resilience
- Its about PEOPLE and ORGANIZATION
- Key factors: Primary care, Lessons learned and Human resources training;
- Digital health tools and infrastructure improve resilence;
- More importantly, resilience depends on good partnerships that enable sharing of experience and resources (within the SDGs framework)

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Thank you! Obrigado!
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