

# Disclosures

**Speaker's bureau:**

**Servier International, Bayer, Merck  
Serono, Novartis, Boehringer Ingelheim,  
Lupin**

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**Advisory Board:**

**Servier International, Novartis, Amgen  
Boehringer Ingelheim**

# **Cardiology: *a story of success!***

- **Life expectancy has recently increased by 10 years**
- **Cardiology has contributed to at least 7 years!**
- **Oncology only a couple of months, at the best (*3,1 months!*)**

# Why?

- **Some (*few*) good enlightenments and ideas, both in Cardiology and Surgery**
- **Tested with (*many*) appropriate clinical trials**
- **A bit (*a lot!*) of luck.**

# Few ideas/enlightenments

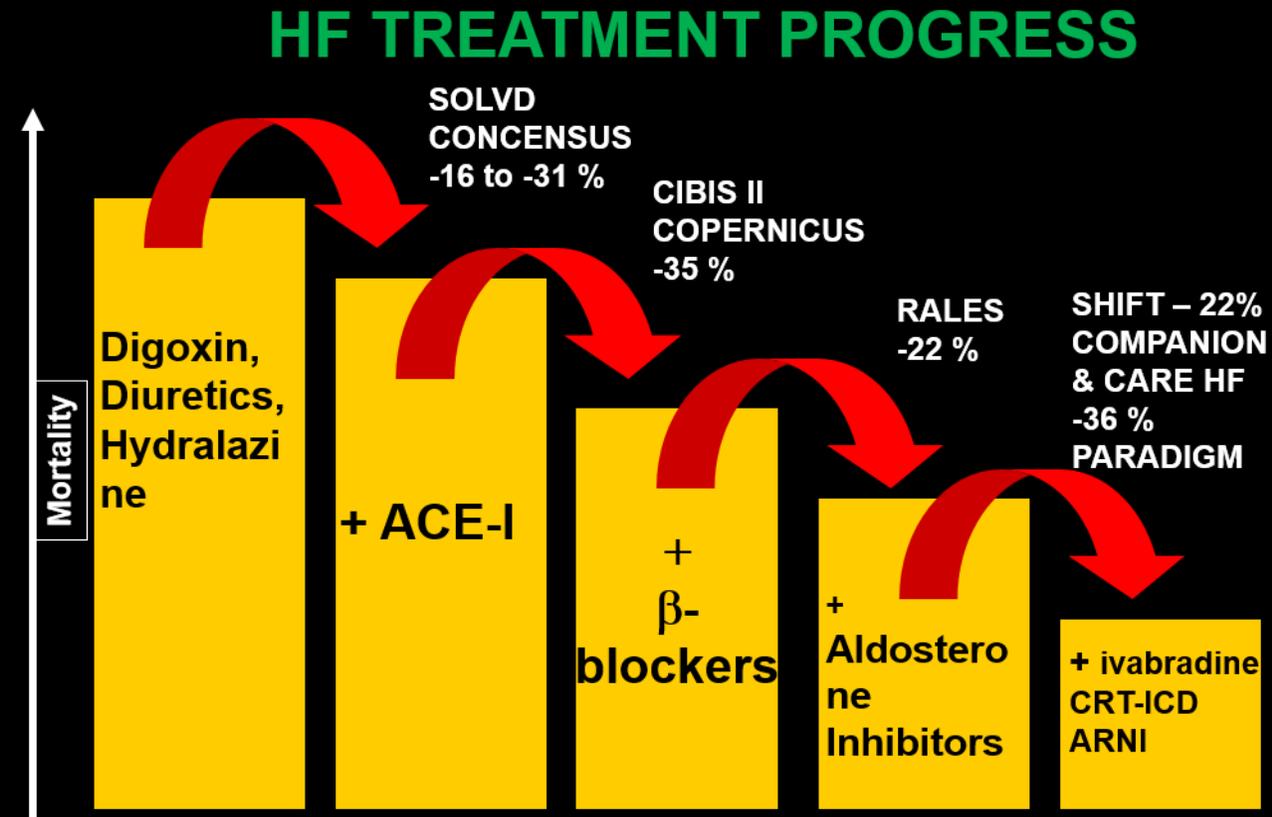
- The thrombus is the cause and not the consequence of infarction → *thrombolytics and mechanical reperfusion of AMI*

Here is where we have won!



# Few ideas/enlightenments

- The difference between short term (*good!*) and long term (*bad!*) neuroendocrine response → ACEi, BB, MIRNA, IVAB, ARNI, RESYNCHRONIZATION, and ASSISTANCE DEVICES

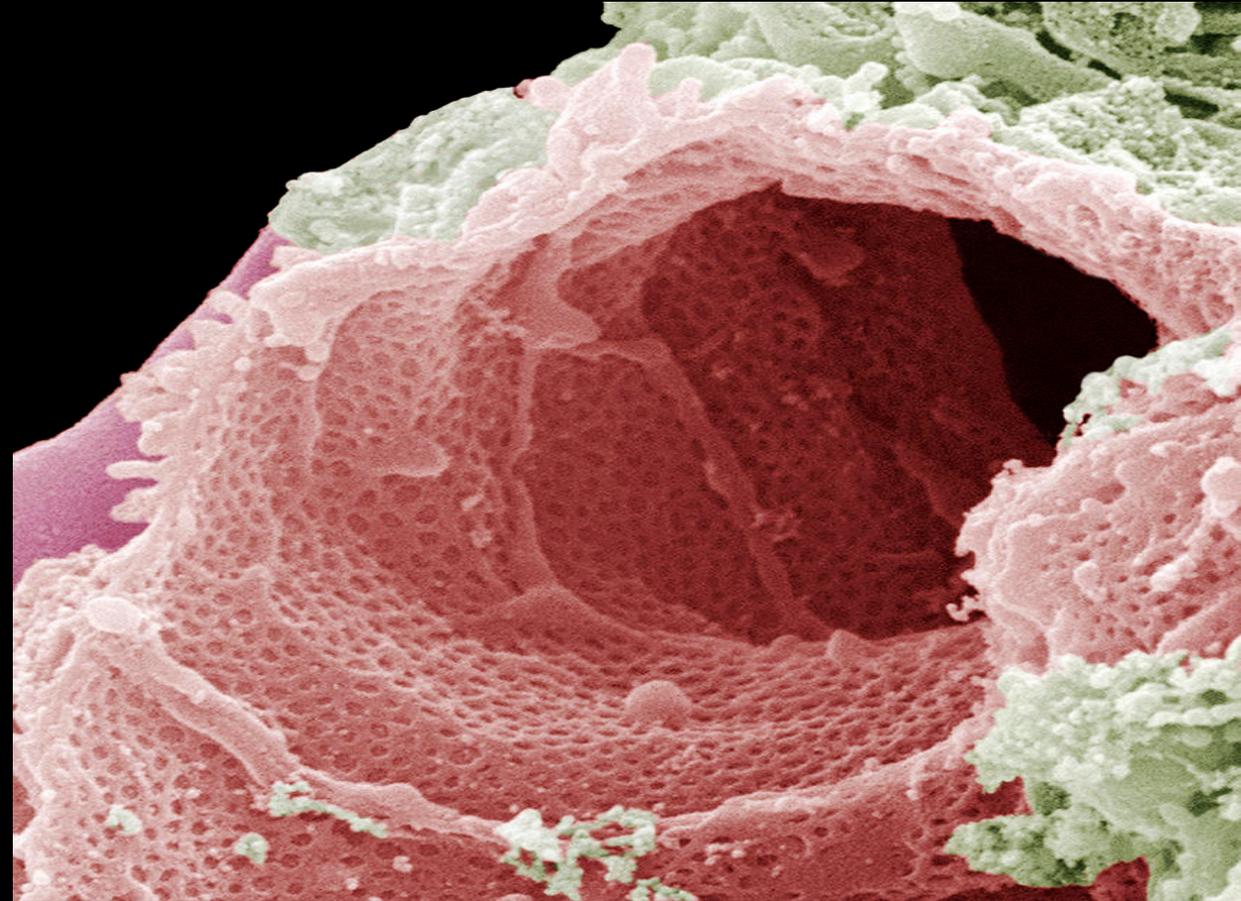


Ellenbogen KA, J Am Coll Cardiol 2005; 46: 2199-203

# Few ideas/enlightenments

Here is where we have won

- The deleterious role of cholesterol, LDL, hypertension – *and now-inflammation* in the CV continuum → **STATINS, ACEi and DIFFERENT ANTIBODIES**



# Enlightenments and ideas in Cardiac Surgery

- From stone heart to cardioplegia
- From conventional to minimally invasive, robotic and other surgeries
- From surgical to hybrid rooms, to suture-less valve, to personalized biomaterials, etc



# Cardiology: *A success.....but!*

# But...*A partial success*

- In Europe, a heart attack every 26 seconds
- A CV death per minute
- 1,9 million deaths per year
- We have not reduced CV death
- We have postponed it
- We have transformed an “*acute*” into a “*chronic*” pathology

# In practice

- **We have just contributed to population aging**
- **And to the increase of health care and research costs**



# The unsolved issue: public money spending



Health is priceless!  
**But**  
Health is costly!

- Health is a right, therefore it's a political issue
- Health system is a political and technical issue based on evidence (*Research*)



# Physiologic questions:

# Definition of the goal

- How long do we aim to improve (CV) life?
- Should we provide *Anni Vita (years of life)* or *Vita agli Anni (life to years!)*?
- We can beat pathology but not physiology!
- Actually there is no life without death
- Death (*apoptosis*) and regeneration is an integral part of Nature/Universe
- Life (*regeneration*) and death (*apoptosis*) cycle is neither good nor bad in Nature

**It is essential!**

# Economic issues

- With aging CV trials have grown in size, complexity, and cost
- 95% of failure, 10-15 years from idea to approval, > 2 billion dollars per drug
- Less drugs → more devices
- Health care costs will soon be unsustainable
- We need solutions: *which one?*



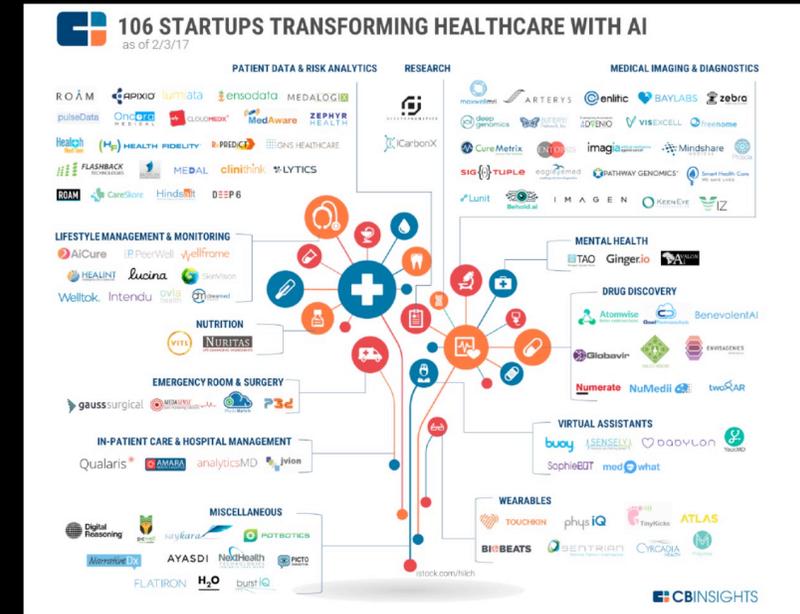
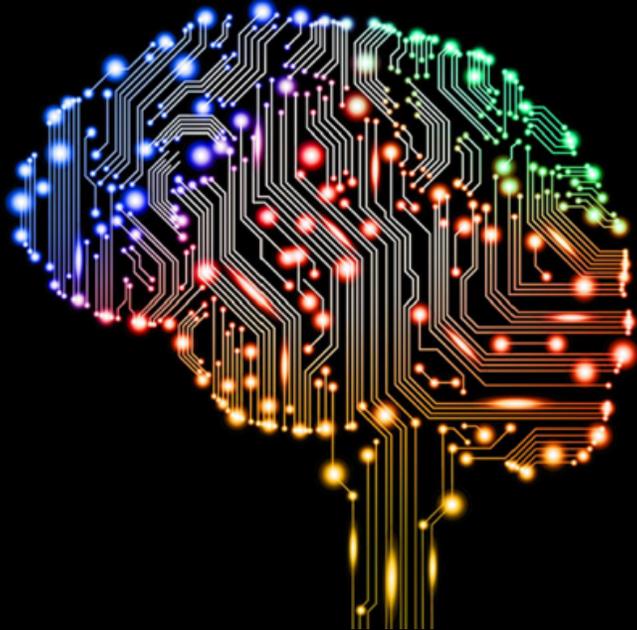


# Digital and precision health, monitoring, big data: *will they be the solution?*

Artificial Intelligence

Drug delivery

Already started



# Will this be the solution? Somebody thinks so

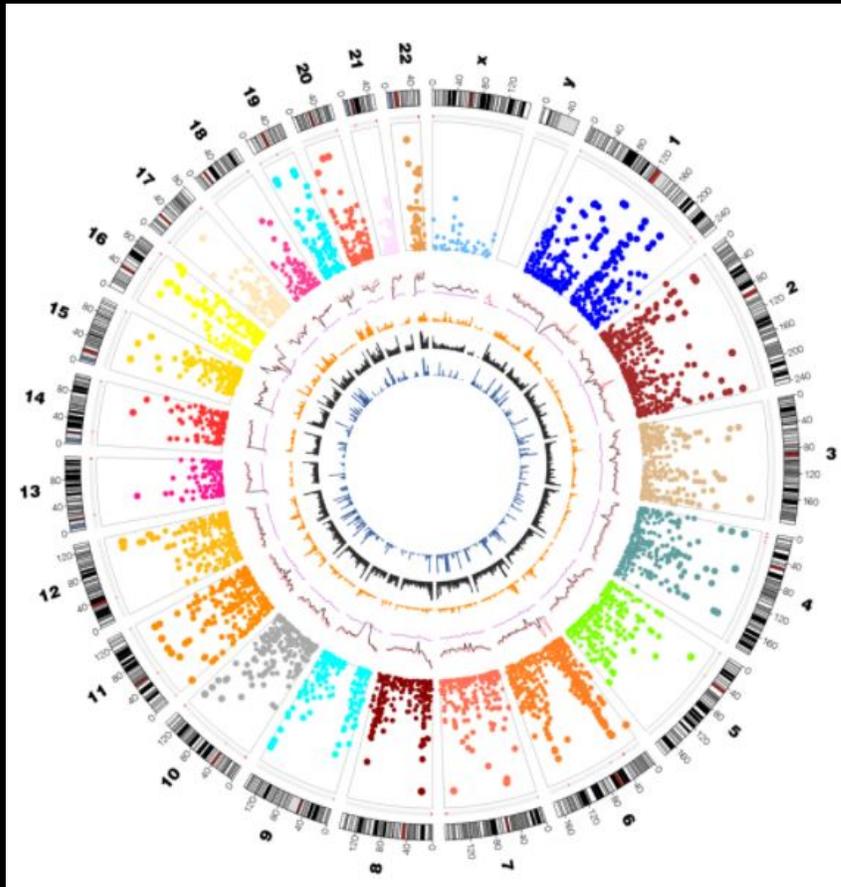
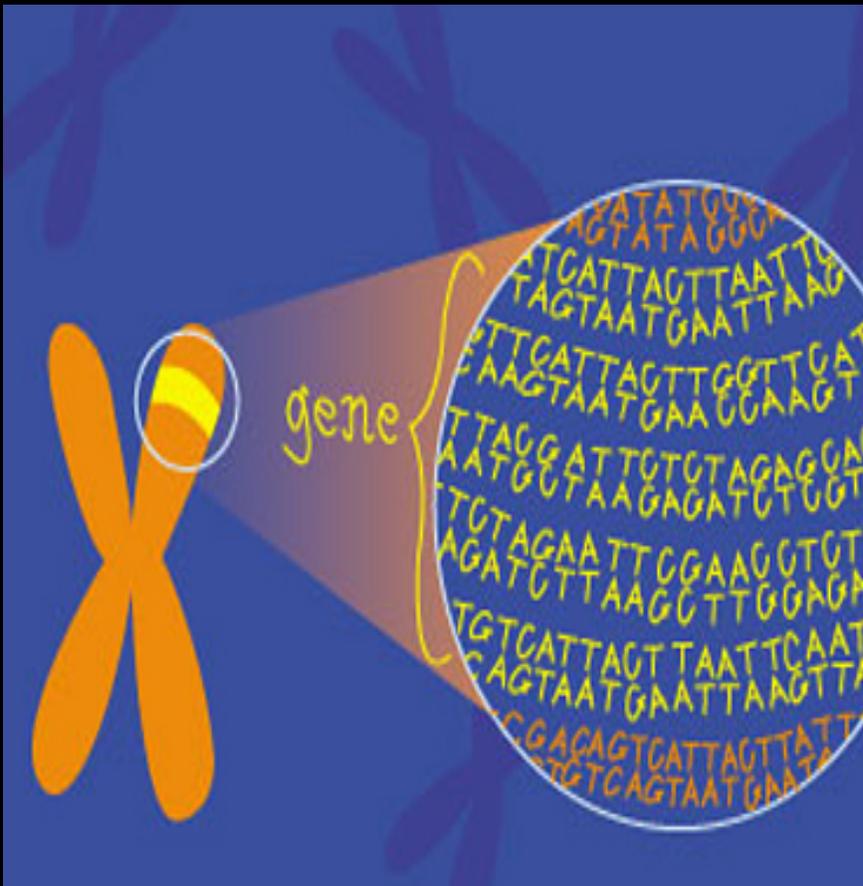
Politicians do see a grey world but believe in a tech “Savvy”



Ex-European Commission  
Vice-President

- e-Health will reduce costly visits to hospitals, help citizens take charge of their own health and wellbeing, and move towards prevention rather than cure
- It is also an opportunity for the booming app economy, for health, and for entrepreneurs

# Will the rapid advances of genetics, proteomics, personalized health be the solution?



- At present, Genotype-phenotype relationship is complex and environmental related, even for pathology with high genetic selection
- However, in 2017 the «*US Genetic Testing Registry*» has collected information on > 100,000 tests performed in 500 labs for 10,733 pathologies related to >26,000 genes!
- It follows that, evidence and Guidelines in Genetics are an *absolute priority*

# New models of patient care and Research

- Computers recognise small variation better than humans
- Patients directly participate/run research as a civic duty
- In Sweden, 1/5 of the population is in contact with “my healthcare contact system”. 435,000 contacts per month
- Today, patients have a voice (*Twitter/Facebook*) and create networks of communication, generating solidarity, and hopes



# All good but...In Europe chaos reigns

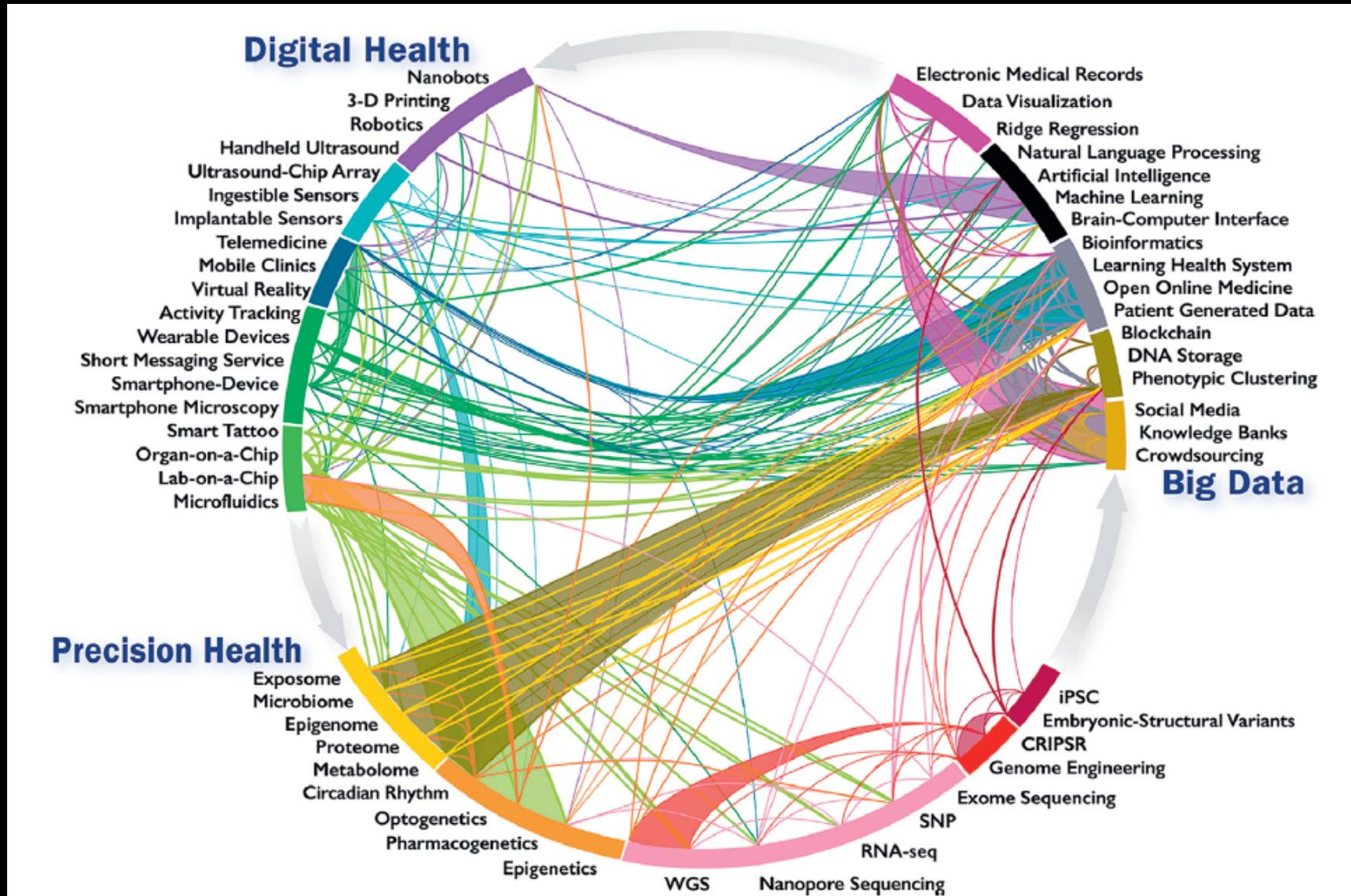
**73%** of member states **do not** have an entity responsible for the **regulatory oversight** of the quality, safety, and reliability of e-Health

**57%** **do not** have policies or legislation that defines **medical jurisdiction, liability**

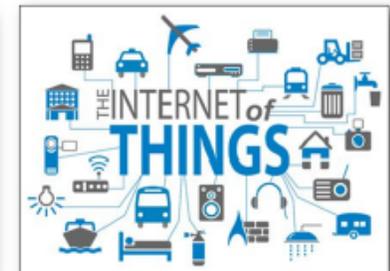
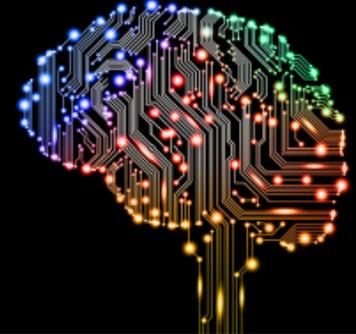
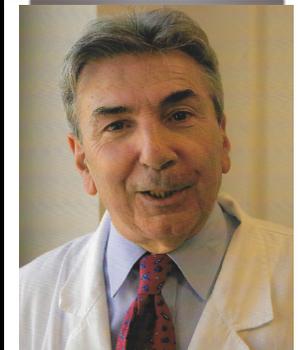
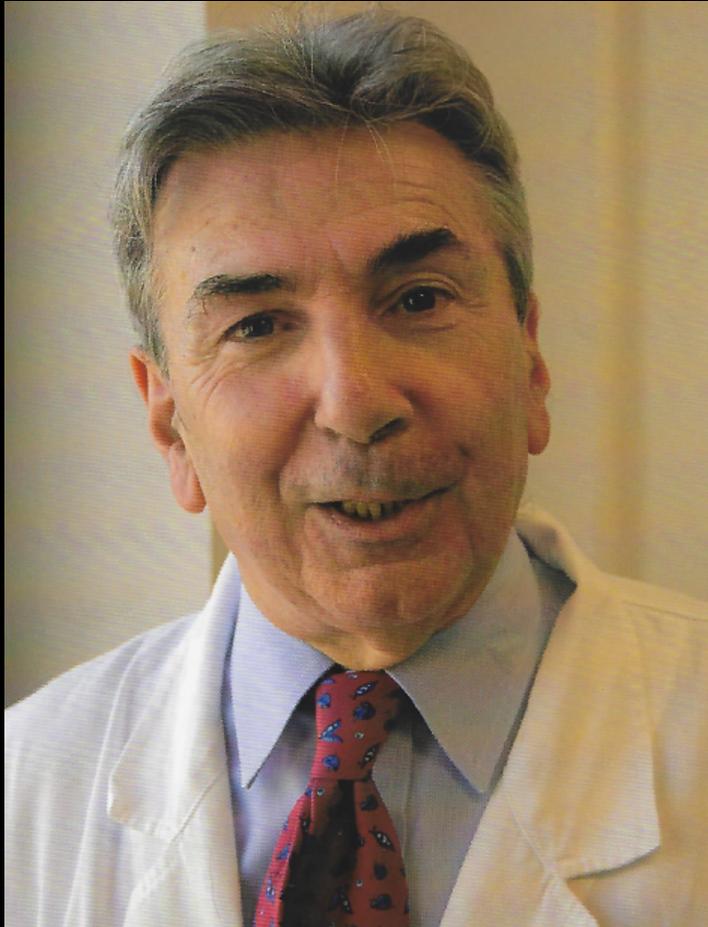
The “doctors” (*Medical Communities*) **are bypassed** and should “**wake up**”... “**quickly**”!



# New innovations in Healthcare



# Will I be the same cardiologist in 2050...?



<https://www.2me.nl/project/cardiosense/>



**In any case...I will not reach 2050!**

# The rapid cardiologist evolution...





# Transformation of Health Care and of the cardiologist profession

- **Less classical (*diagnostic*) cardiologists → more epidemiologists, genetists, imaging doctors, etc**
- **Still several but different “*acting*” cardiologists**

# The “*acting*” cardiologists: a fusion between interventionists and surgeons

- The opportunity is to have a future generation of heart surgeons with skills in interventional cardiology (*and not only*) and vice versa
- To have a real (*and better*) heart team where, instead of competing each other to perform a procedure, physicians will do it together!
- Tertiary care will shift from achievement of individual experts toward cooperation among individuals and groups

# Conclusions

- A new Medicine is just starting and Cardiology is part of it
- Health will integrate data analysis, artificial intelligence, sensor-based technologies, and big data
- This will transform:
  1. The medical profession (*medical art*)
  2. The Research (*culture*)
  3. Care delivery (*Health System*) and...
  4. The patient (*no longer passive*)

# Conclusions

- The future looks great for patients (*first*) and for us (*cardiologists, interventionalists, and surgeons*) if we – *and not others* – will lead the changes
- Imagine that we could:
  1. Capture the messages of the body
  2. Look into the body (*imaging*)
  3. Act inside the body in an integrated way

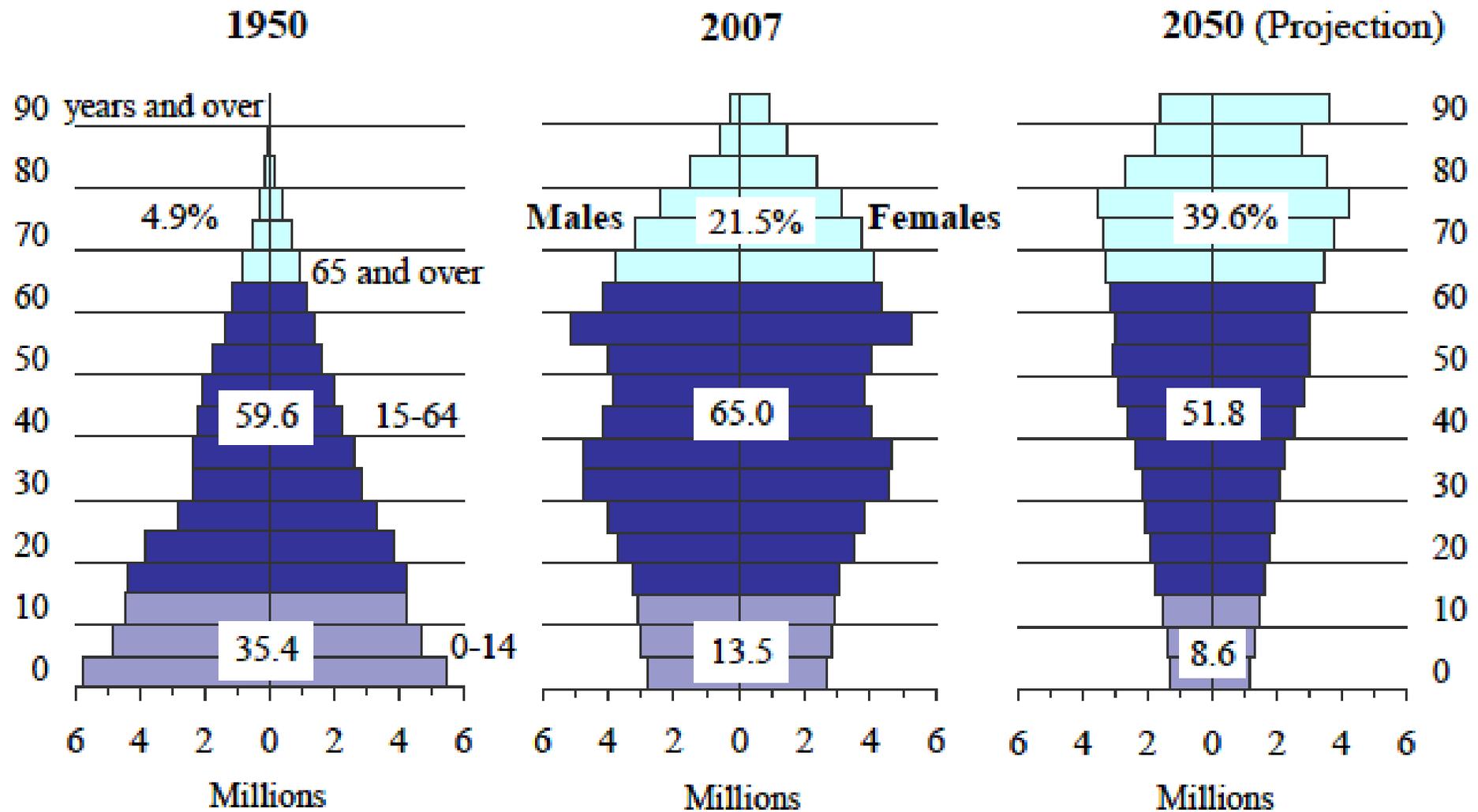
# Conclusions

**4. Repair broken parts of the body**  
*(Regeneration)*

**5. Re-programme the body** *(Genetics)*

- **This needs team building: group trust vs individual trust and ... new teachers for new cardiologists**
- **Let's be part of it!**

**Figure 2.3**  
**Changes in the Population Pyramid**



Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare.