SMART SYSTEMS FOR PERSONALIZED AND CONNECTED HEALTHCARE

Session co-chairs:
Aydogan Ozcan (UCLA) and Leena Ukkonen (TUT)

FUTURE VISION

Personalized healthcare systems *connected to our everyday lives using modern communication platforms, including consumer devices and electronics.*

Multidisciplinary engineering approaches *required, including biomedical engineering, material science, mechanical engineering, electrical engineering, computer science, chemical engineering, industrial engineering, among many others.*

Democratization of future health-care systems

-- Can we convert patient's home into an advanced 24/7 laboratory for medical diagnosis, monitoring of patients, high-risk and aging populations, preventive & personalized medicine?

-- Manage costs better, early diagnosis, better treatment, better adherence, etc.?

- Today: 5% of Americans Make Up 50% of U.S. Health Care Spending

Democratization of future health-care systems

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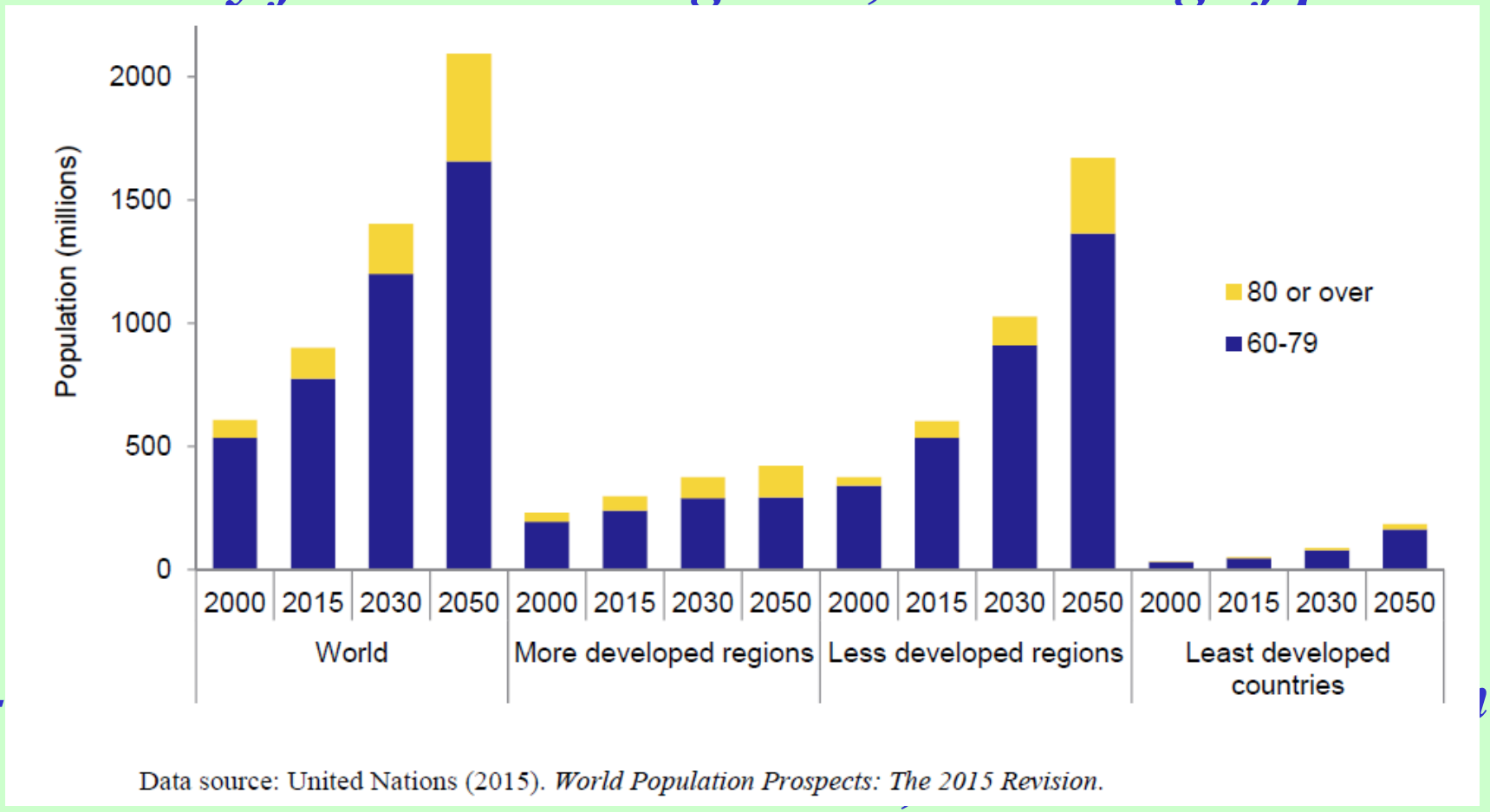


Data source: United Nations (2015). *World Population Prospects: The 2015 Revision.*

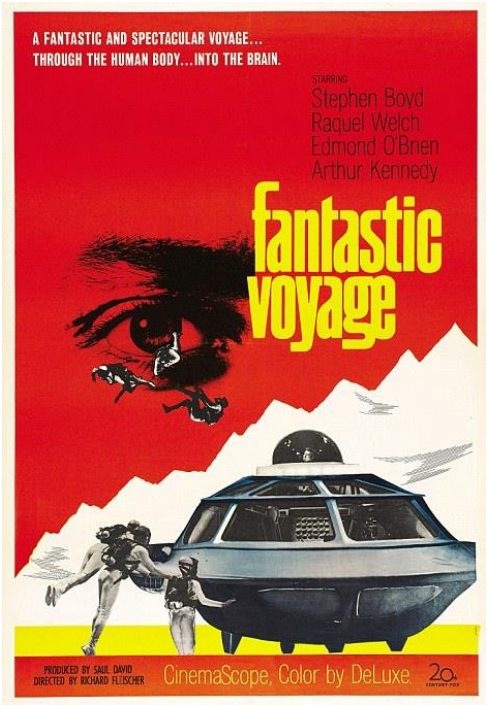
- Today: 5% of Americans Make Up 50% of U.S. Health Care Spending

Democratization of future health-care systems

-- Global health & under-served communities: Can medical diagnostics and care be practiced in resource limited settings using innovative and cost-effective technologies at massive scales?

-- Harnessing Big/Small Data for better patient outcomes

Imagine robotic microscopes and sensors that can image/sense autonomously and in their journey within your body or any complex sample find the locations of "real" interest/importance through their analysis and decisions within the body/sample.



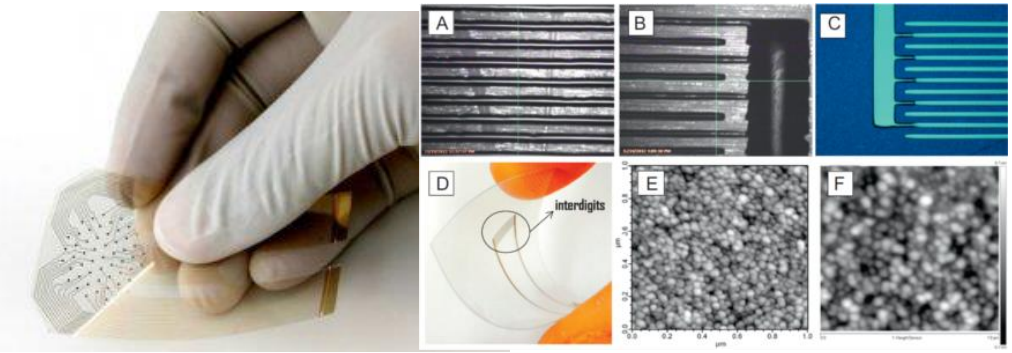
1966 Movie

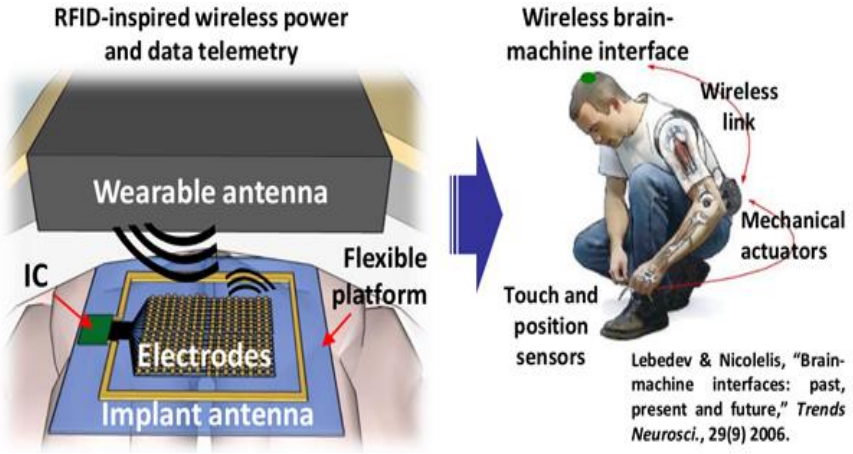
Image → Digitize & Transmit → Process & Analyze → Decision

Where to go and sample? Random!
Specificity? None or extremely limited!
Multi-modal or reconfigurable? No!

We need interdisciplinary teams

OUTLINE OF THE SESSION





The Role of Flexible Medical Devices in Health Monitoring and Diagnosis

- Ana Arias, University of California, Berkeley

Miniaturized and Minimally Invasive Interfaces to the Brain

- Rikky Muller, Cortera Neurotechnologies/University of California, Berkeley

Digital Microscopy Supported by Artificial Intelligence for Improved Access to Diagnostics

- Johan Lundin, University of Helsinki