The Netherlands

A leading hub for MedTech innovations

June 2020

The Netherlands is known for close collaboration within the quadruple helix (citizens, researchers, government and entrepreneurs). This is extremely powerful in innovation in the MedTech domain, where the success of breakthrough products is highly dependent of the involvement of all these stakeholders.

CARMEN VAN VILSTEREN

Chair of Top Sector Life Sciences & Health

DEFINITION

Medical Technology (MedTech)

Medical technologies are products, services or solutions used to save and improve people's lives. In their many forms, they are with you all the time, from prevention, to diagnosis to cure. There are three main categories of medical technologies:

- Medical devices (MDs) are products, services or solutions that prevent, diagnose, monitor, treat and care for human beings by physical means.
- In vitro diagnostics (IVDs) are non-invasive tests used on biological samples (for example blood, urine or tissues) to determine the status of one's health.
- Digital health and care refers to tools and services that use information and communication technology (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of health and lifestyle.

Source: MedTech Europe 2019

HEALTHCARE

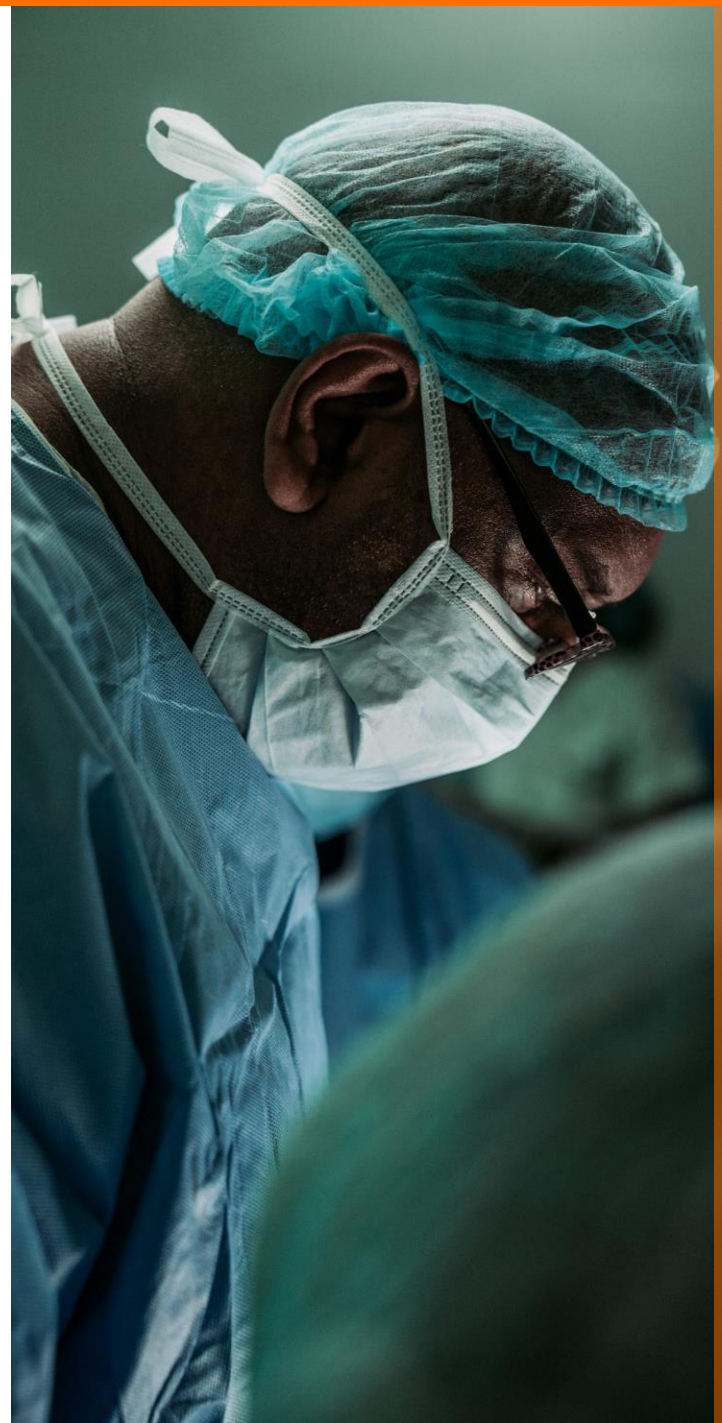
Future sustainability?

Costs
31% GDP in 2040

Population
25% of population 65+ in 2040

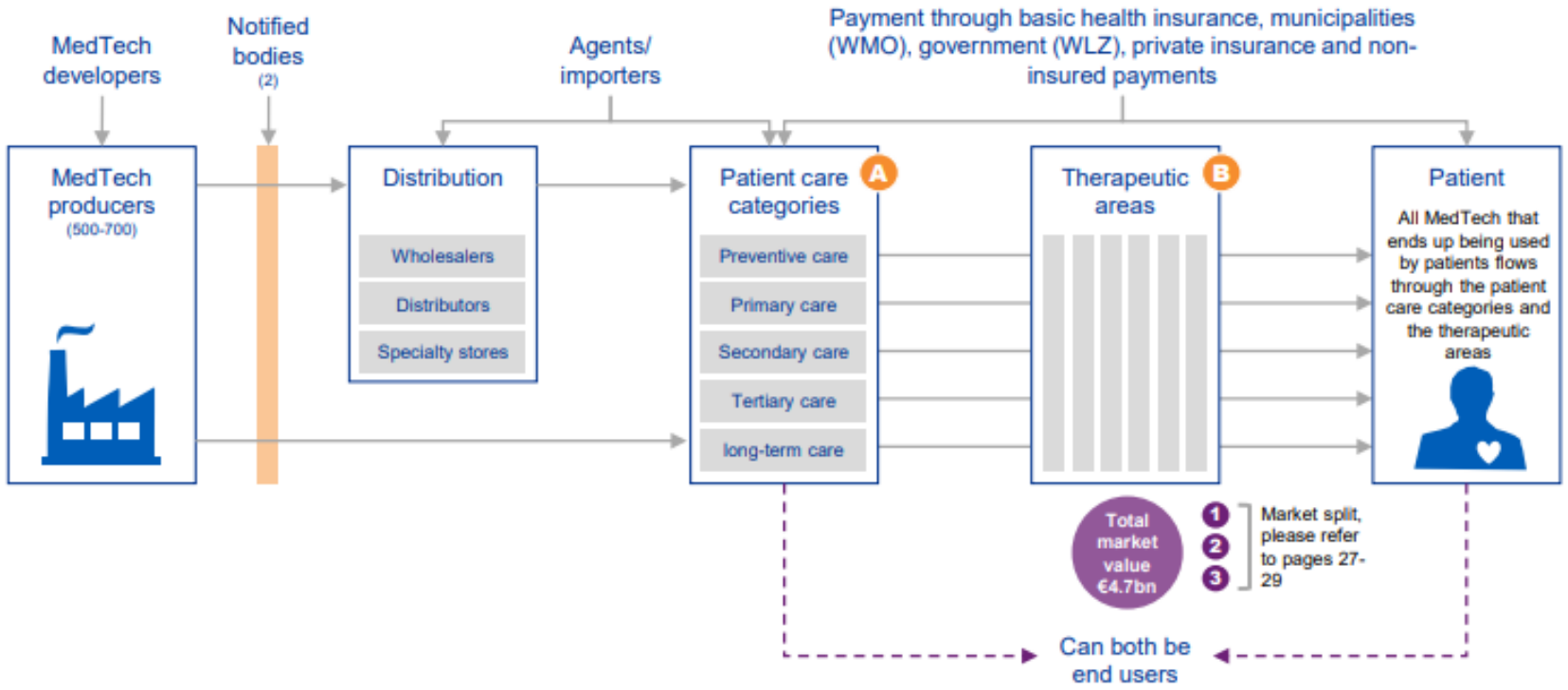
Professionals
Shortage of 100.000-125.000 in 2022

Necessity
For MedTech innovations



MEDICAL TECHNOLOGY

Dutch value chain from bench-to-bedside



Source: The MedTech market in the Netherlands, KPMG (2017)

MEDICAL TECHNOLOGY

Trends

- Artificial Intelligence
- Digital Health & Data
- Medical Imaging
- Minimally Invasive Surgery
- Regenerative Medicine
- Robotics

WHO IS HERE

You'll be in good company

REASONS WHY

You should join our medtech hub

Gateway to the medical devices market
Number 1 importer and exporter in Europe

Innovative thinkers
Number 4 in medtech patent applications

Qualitative regulatory landscape
Three MDR-selected notified bodies are Dutch

Collaborative initiatives
Shared facilities and public-private partnerships

THE NETHERLANDS

Gateway to the medical devices market

Importer of medical devices in Europe
The largest next to China

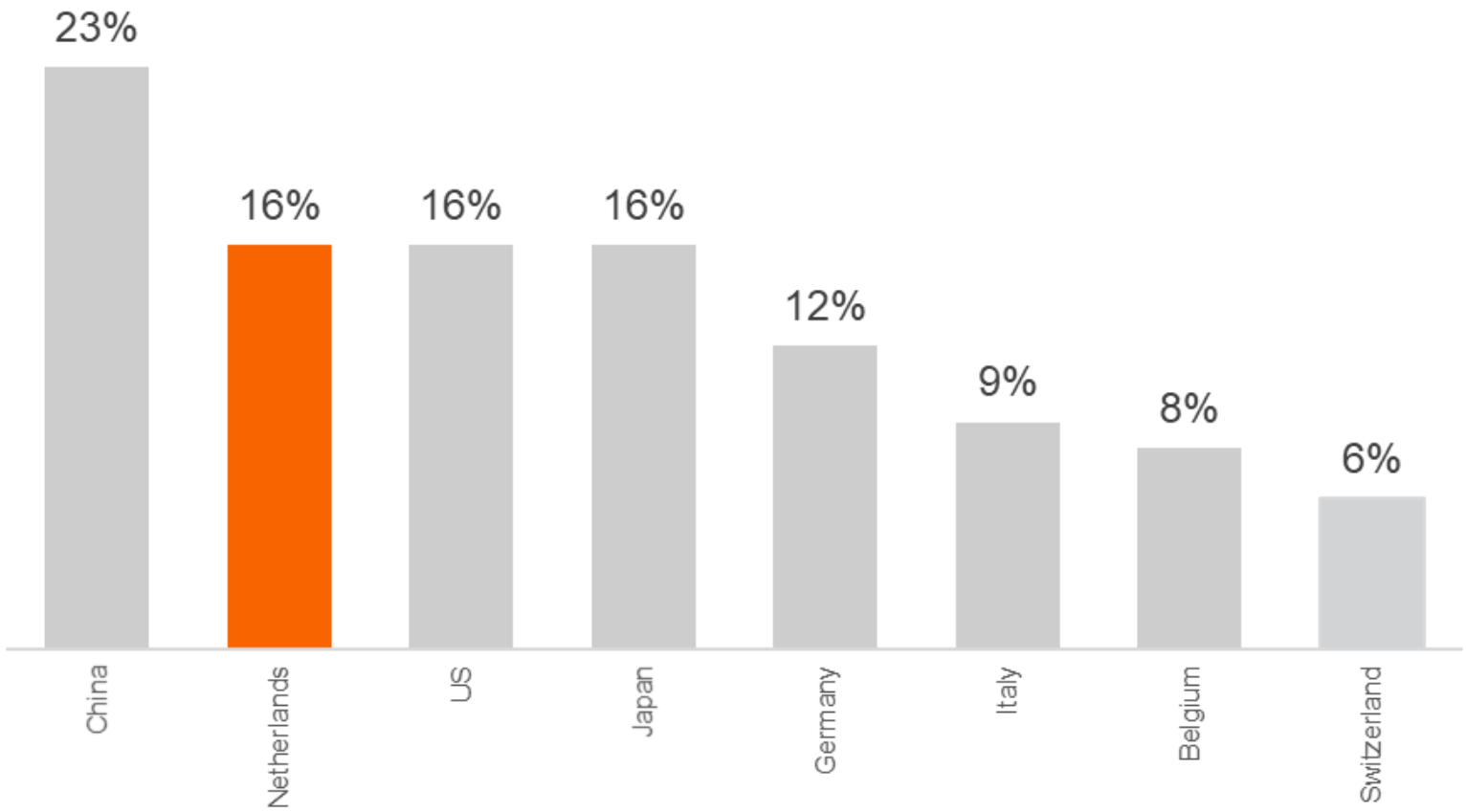
Exporter of medical devices in Europe
The largest next to the US and China

54% of the world’s respirators and ventilators
Are exported by the Netherlands, together with Singapore, the US and China

Source: World Trade Organization, 2019.

MEDICAL EQUIPMENT

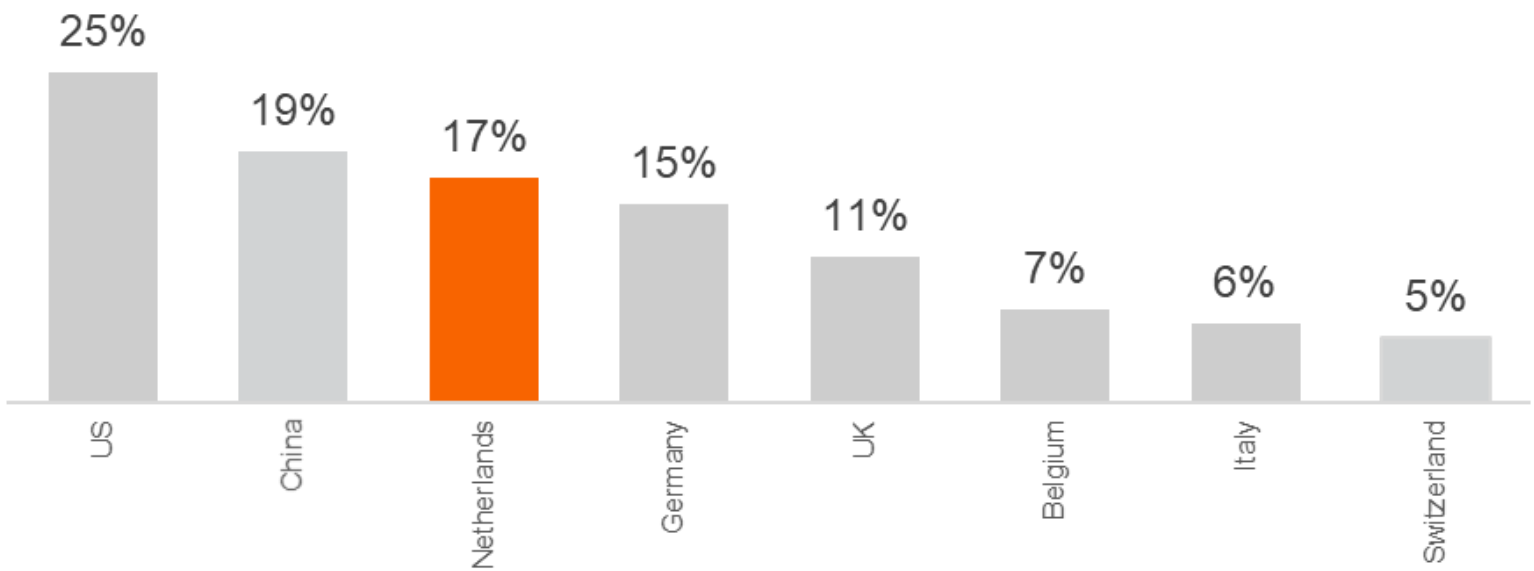
Top importers in the world



World Trade Organization, 2019.

MEDICAL EQUIPMENT

Top exporters in the world



World Trade Organization, 2019.

EUROPE

A market worth billions

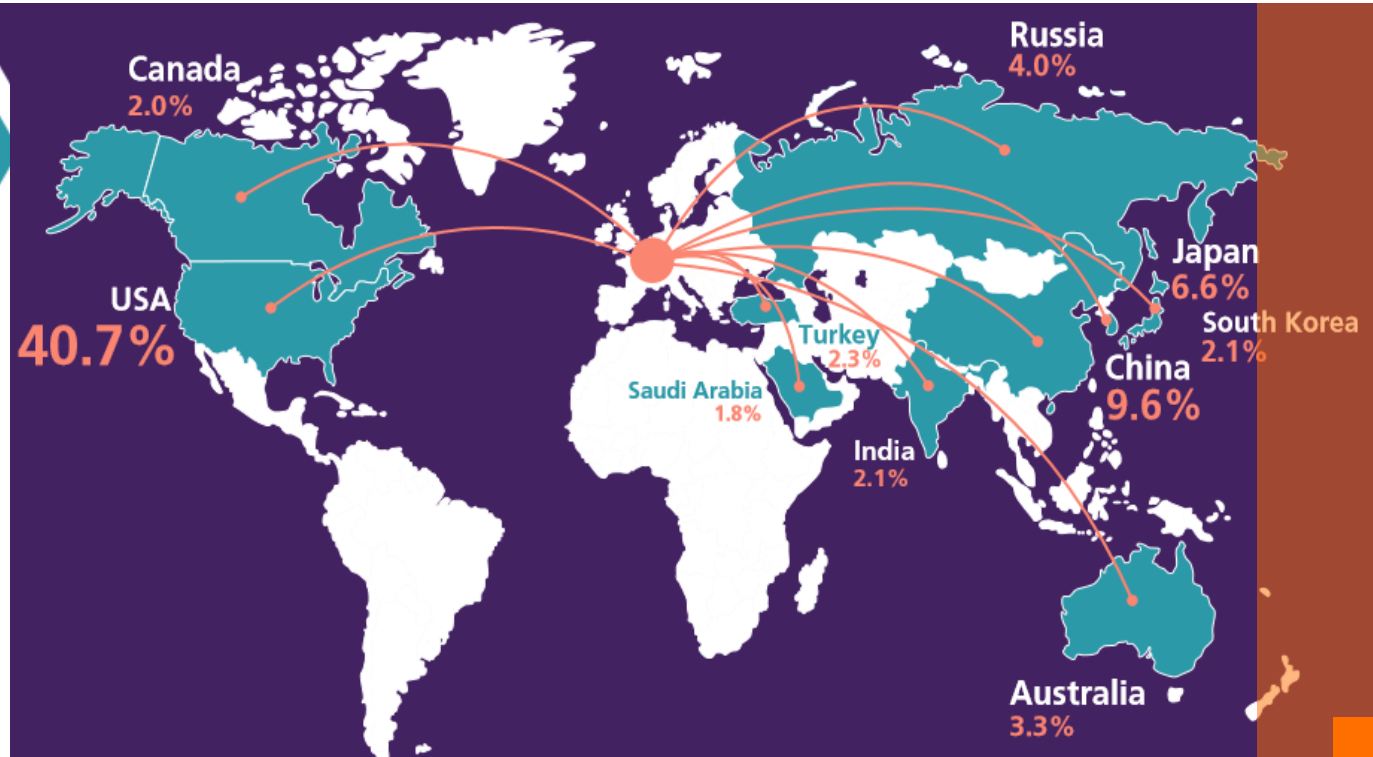
27,000 medical technology companies in Europe

95% SMEs

2nd largest market after US

27% of the world market

€115 billion market



Source: MedTech Europe 2019

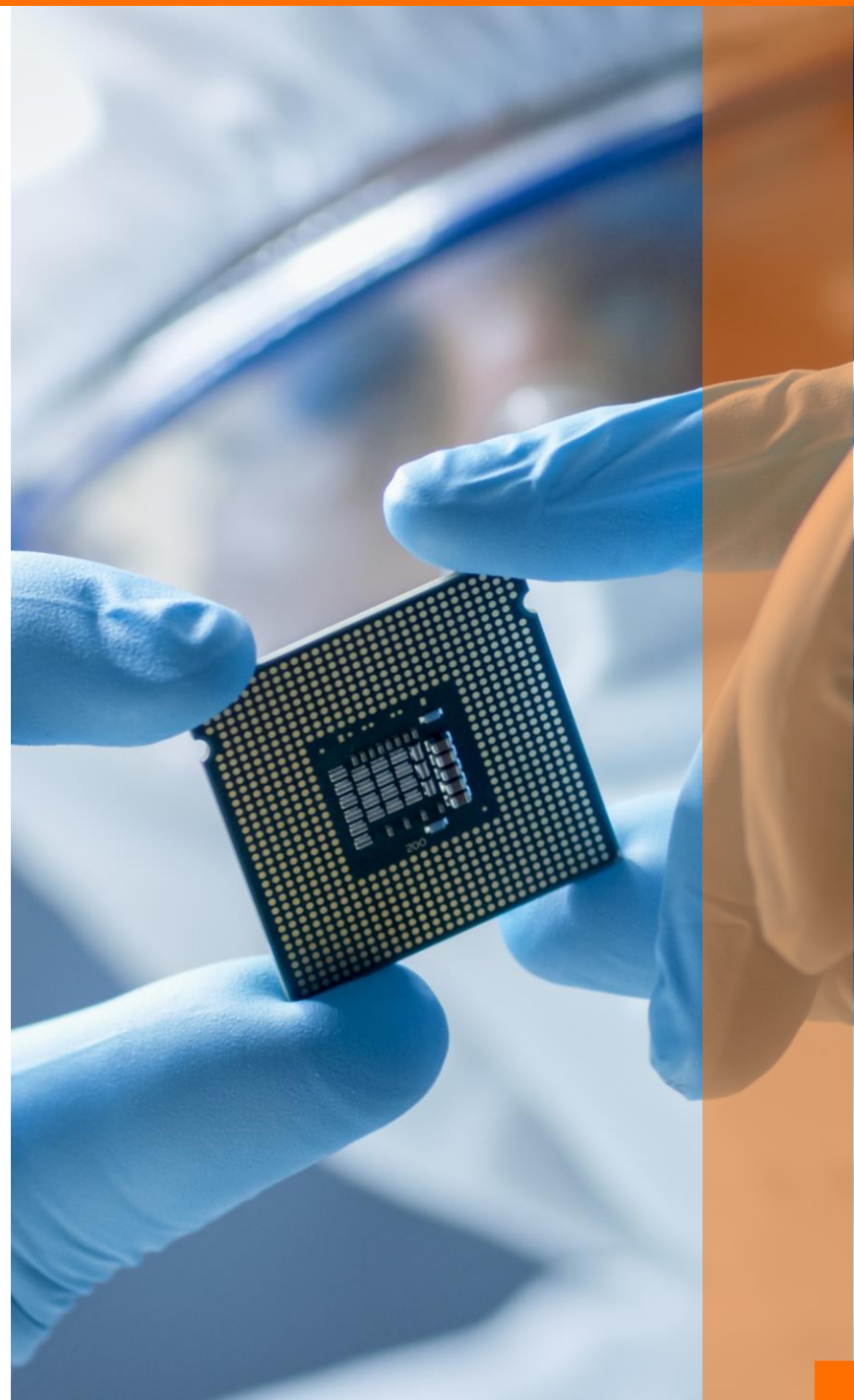
KEY ADVANTAGES

Innovative thinkers

A history of medtech breakthroughs
The microscope, ECG, Artificial kidney

Global medtech patent applications
And second in Europe

Outstanding technical universities
Working at the interface of tech & health



A RICH HISTORY

Innovation is in our nature

The invention of the microscope
1590 – Hans and Zacharius Jansen

Nobel prize for the invention of the ECG
1924 – Willem Einthoven

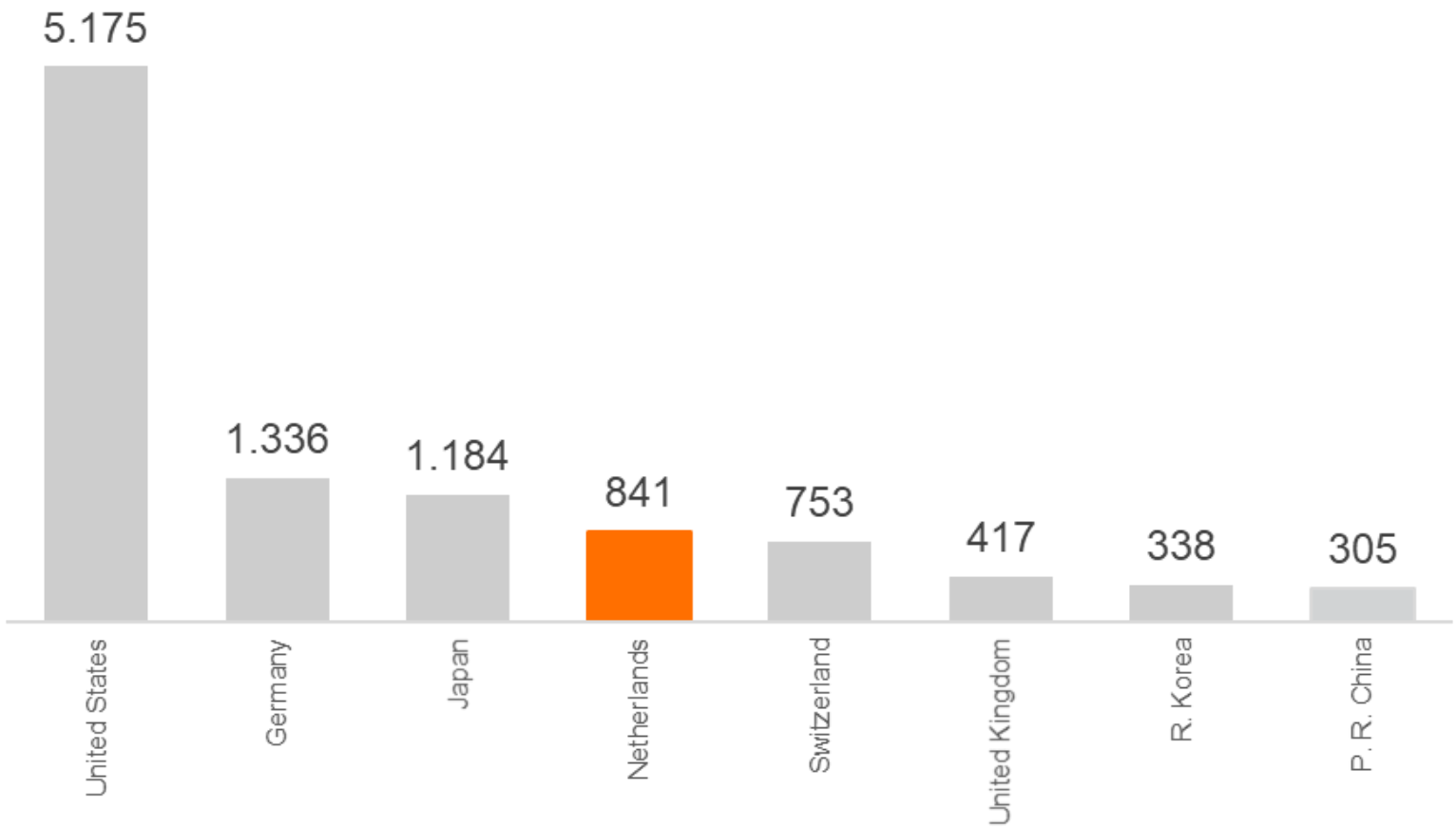
The first successful artificial kidney
1943 – Willem Kolff

Nobel prize for oncology applications
2016 – Ben Feringa

Ben Feringa Nobel-prize winner in 2016

MEDICAL TECHNOLOGY

Patent applications



EPO1 patent applications, 2018

EXCELLENT CLUSTERS

With outstanding research & education

We are well known for the level of higher education:

- 291,277 students enrolled in a bachelor’s or master’s program, with over 34,478 in health programs and over 43,701 doing technological studies.
- 456,633 students enrolled in applied sciences program, with over 48,702 in health programs and over 95,134 doing technological studies.

3 **The OECD's top 10 highest performing graduates**

6 **INSEAD’s Global Talent Competiteveness Index 2020**

KEY ADVANTAGES

Qualitative regulatory bodies

- Medical device regulation (MDR) across the European Union (EU)
- CE marking by MDR certified notified bodies (NBs)
- Large and of high quality MDR EU certified NBs are present in the Netherlands
- Effective as of May 2021

PUBLIC-PRIVATE PARTNERSHIPS

Collaborative initiatives

300 Public-Private-Partnerships
Collaboration between government, companies and research institutes

Financial means and shared best practices
Possibilities for funding and coaching

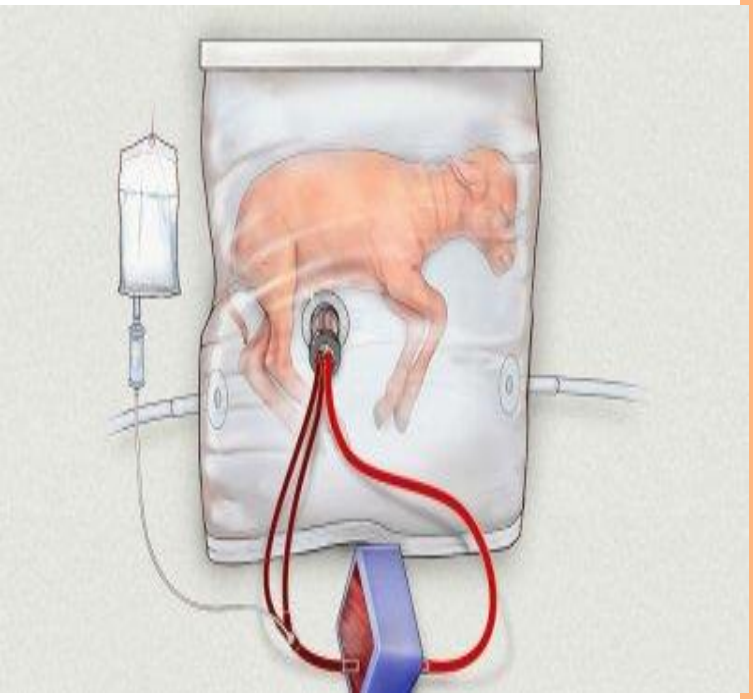
Worldwide acclaim
High-quality research collaborations

The Health~Holland brand
Uniform point of contact

KEY ADVANTAGES

Collaborative initiatives

Example 1: Artificial womb



Area: Neonatal care

Research

The consortium aims to develop an artificial womb, which is an adequate substitute for the protective environment of the maternal womb in case of premature birth, preventing health complications. The artificial womb and placenta will provide a natural environment for the baby with the goal to ease the transition to newborn life. The perinatal life support (PLS) system will be developed using breakthrough technology: a manikin will mimic the infant during testing and training, advanced monitoring and computational modeling will provide clinical guidance.

Funding

The project received a Future and Emerging Technologies grant of the European program Horizon 2020 of almost 3 million euros. In this project the researchers plan to finish a proof-of-principle in 5 years.

Partners

TU/e Technische Universiteit Eindhoven University of Technology

LifeTec Group

POLITECNICO MILANO 1863

nemo HEALTHCARE

Source: tue.nl/en/research/research-groups/cardiovascular-biomechanics/artificial-womb/

KEY ADVANTAGES

Collaborative initiatives

Example 2: imaging Biomarkers for Early Diagnosis of Neurodegenerative Disease

Area: Neurology, AI, Imaging

Research

In this project Erasmus Medical Center in Rotterdam and Quantib will develop quantitative image analysis methods optimally making use of MRI brain data for diagnosing dementia. Especially early in the disease process changes in the brain are subtle, and tools to support the accurate, objective, quantitative interpretation of MR brain imaging data are needed.

Since these are currently largely lacking, the main aim of this project is to develop and validate tools to achieve the full potential of quantitative neuroimaging in research and daily clinical practice. It will achieve this by extracting quantitative features from multimodal MR imaging data, and providing reference data derived from a unique large population study (The Rotterdam Study) to support their objective interpretation.

Partners

Erasmus MC
University Medical Center Rotterdam

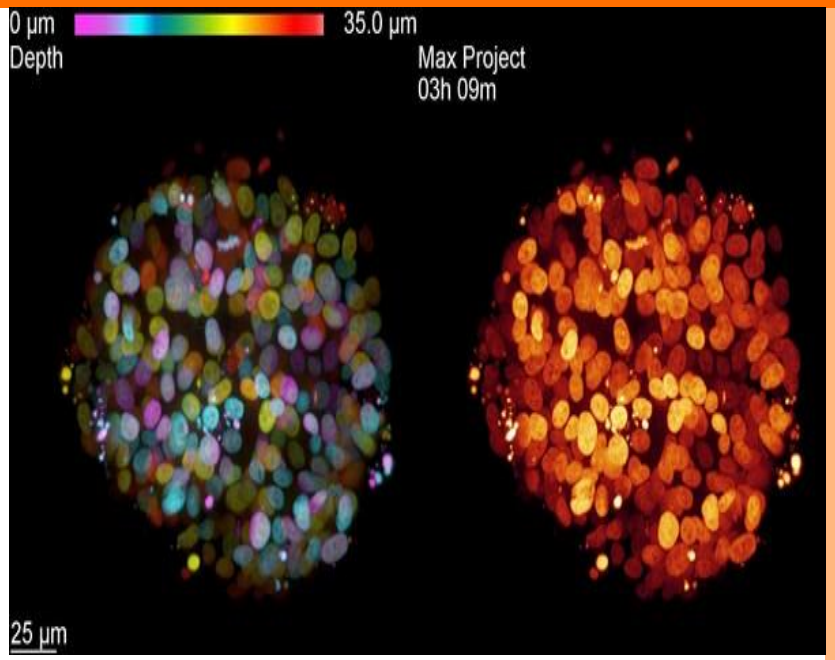
Quantib

Source: health-holland.com

KEY ADVANTAGES

Collaborative initiatives

Example 3: Capture tumor evolution on chip



Area: Oncology

Research

To improve our understanding of tumor evolution, a new microfluidic platform based on VyCAP's proprietary technology will be developed and tested, to combine live-cell imaging of growing tumor organoids with single-cell genomic analysis of all the individual cells that originate from said imaged tumor.

With C-TECH, a new microfluidic platform based on VyCAP's proprietary technology will be developed and tested that fulfils two unmet demands for organoid technology. C-TECH will create a unique opportunity to superimpose single-cell mutational datasets on the complete cellular lineage tree that is inferred from live-imaged tumor organoids to delineate how environmental pressures (e.g. chemotherapies) shape the course of tumor evolution with cell-cycle resolution.

Partners

VyCAP

UMC Utrecht

Oncode Institute

Source: health-holland.com

KEY ADVANTAGES

Collaborative initiatives

Example 4: AbcdeSIM e-learning simulation

The Award winning e-learning simulation AbcdeSIM is an online simulated emergency department with virtual patients. The simulation has been developed by the Rotterdam-based company Virtual MedSchool.

AbcdeSIM, Erasmus University Medical Center, Technical University of Twente, IJsfontein and the Dutch national primary care residency program are improving training in emergency medicine in a cost-efficient manner, using gaming and simulation technology and a high fidelity model of human physiology. In 2013 and 2014 AbcdeSIM won the Dutch national E-learning Award.

VirtualMedSchool
THE NEXT LEVEL IN MEDICAL EDUCATION

Partners

sam
THE SOCIETY FOR ACUTE MEDICINE

Erasmus MC

UNIVERSITY OF TWENTE.

LeQuest

Resuscitation Council (UK)

Source: health-holland.com

REASONS WHY

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THE DUTCH MEDTECH SECTOR

Be part of a growing community

3,100
R&D Life Sciences Companies

700
MedTech companies

8
University Medical Centers

13
Universities

12
Research Universities

4
Specialized in technology and engineering

65,000
Employees in the pharmaceutical sector

4.7
Billion market in MedTech

26
Campuses

INVEST IN HOLLAND NETWORK

We roll out the orange carpet

Invest in Holland is the national network of the Netherlands Foreign Investment Agency (NFIA), an operational unit of the *Dutch Ministry of Economic Affairs and Climate Policy*, and our regional and local partners. Together we support foreign companies to set up and expand their business in the Netherlands.

We connect you
with local networks, regulators, clusters and consultants.

We inform you
about incentives, business locations, regulations and procedures.

We organize
custom-made fact finding trips for your investment project.

We provide
confidential and free support.