

EXCELLENCES OF
EMILIA-ROMAGNA IN
**HEALTH &
WELLNESS**



Maybe you don't know it, but probably when you think of Italian excellence, you're thinking of our Region. Cars and bikes such as Ferrari, Lamborghini, Ducati, and food such as Parmigiano-Reggiano, Parma ham, balsamic vinegar are proudly made in Emilia-Romagna. In arts Verdi, Pascoli, Ariosto, Fellini, Pavarotti, Armani were born in Emilia-Romagna.

What about science? Guglielmo Marconi, Luigi Galvani, Lazzaro Spallanzani, they are all from Emilia-Romagna. But Emilia-Romagna is much more: it is the 1st region in Italy for the efficiency of the health system (Demoskopika, 2020), with a network of cutting edge University Hospitals, including Istituto Ortopedico Rizzoli, 8° Best Hospital in the World (Newsweek, 2021) and many other excellences.

The biomedical district in Mirandola, Modena province, is the core of the Medtech sector in Italy, with around 5,000 employees.

Advanced therapies and regenerative medicine are top-level sectors; the first stem cell medical product authorized by EMA in Europe was developed in Modena. The production of orthopedic prosthetic products in the Bologna area is another regional excellence.

Emilia-Romagna is the first region in Italy for innovation according to the European Scoreboard 2021, and here is located more than 90% of the supercomputing resources for public research in Italy.

The Wellness Valley, in the Romagna area, relies on a widespread presence of spas and wellbeing centers and gives the chance to companies such as Technogym to start its own business.

The pharmaceutical sector is also strong, with giants such as Chiesi, Acme, or Alfasigma that have been operating in the territory for decades.

Regional innovation policy supports R&I activities carried out by enterprises, promotes the development of Industrial Research Laboratories and Innovation Centres located in the Technopoles and organized in the High Technology Network.

Clust-ER Associations are communities of public and private bodies (research centers, companies, training bodies) created to support the competitiveness of the most important production systems in Emilia-Romagna.

In 2020, Clust-ER Health, the Association focused on the development of strategic projects in the health sector, commissioned to EY an analysis of core assets in the region. You will find in this paper the results of this analysis and the assets in the health sector you can rely on if you are considering starting a new business, a new collaboration, or if you are looking for an emerging startup where to invest.

If you are not yet considering this, you can always visit us for food, motors, and arts...



EMILIA-ROMAGNA: A EUROPEAN REGION



**Emilia-Romagna is the 1st region in Italy for the efficiency
of the health system** (*Demoskopika, 2020*)

4.5

MILLION INHABITANTS

1

METROPOLITAN CITY
BOLOGNA

8

PROVINCES
FERRARA
FORLÌ-CESENA
PARMA
PIACENZA
RAVENNA
REGGIO EMILIA
RIMINI

7

UNIVERSITIES



A REGION OF EXCELLENCES



A REGION OF WELLBEING



A COMPETITIVE AND
INTERNATIONAL REGION



A REGION OF KNOWLEDGE
AND RESEARCH



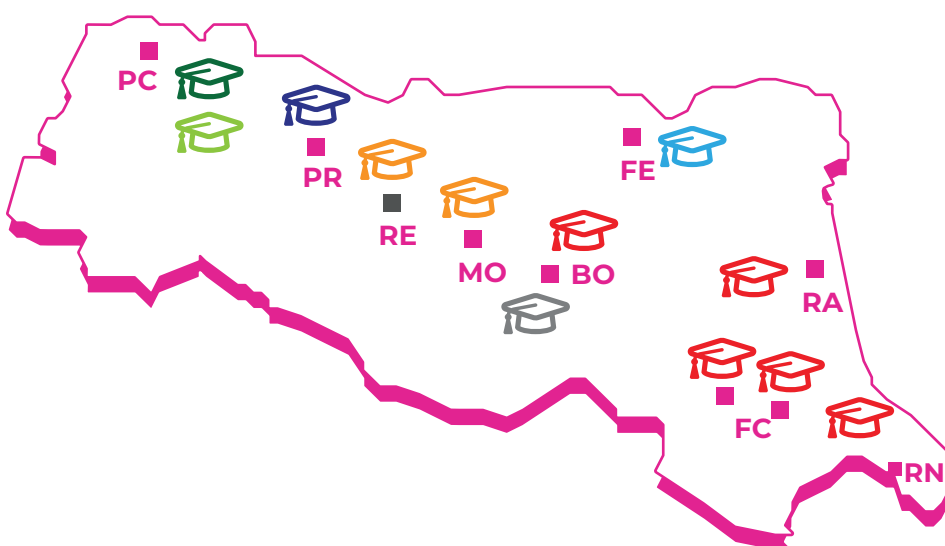
A SUSTAINABLE REGION










A WELL CONNECTED REGION

TRAINING AND EDUCATION

Universities of Emilia-Romagna



-  University of Bologna
-  University of Modena and Reggio Emilia
-  University of Ferrara
-  University of Parma
-  Cattolica University
-  Piacenza campus of "Politecnico di Milano"
-  Johns Hopkins

Health & Wellness education offer in Emilia-Romagna

5 Universities

7 Sites

2 ITS foundations

105 courses (three years and master degrees)

12 1st level master courses

18 2nd level master courses

16 PHD courses

9 specialization courses



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA



**UNIVERSITÀ
DI PARMA**



**Università
degli Studi
di Ferrara**



**UNIVERSITÀ
CATTOLICA
del Sacro Cuore**





RESEARCH AND INNOVATION

Research expenditure in Emilia-Romagna, including both the public and private sector, is the second highest in Italy and has increased steadily over the last years, with 45 thousand employees (full-time equivalent) in the public and private research system (Istat, 2019). Research activity is carried out by universities and research centres as well as by a network of industrial research labs and dynamic companies, both corporates and small and medium caps. About 1.3 thousand innovative startups complete the picture

+30.6%
EMILIA-
ROMAGNA

+19.3%
EU19

+22.4%
ITALY

INTRAMURAL
EXPENDITURE IN R&D
INCREASED MORE
IN EMILIA-ROMAGNA
THAN IN ITALY AND EU
IN THE PERIOD 2015-19
Source: Eurostat

SUPPORTED RESEARCH IN HEALTH RESULTS OF THE SMART SPECIALIZATION STRATEGY 2014-2020 (UPD. : JAN 2022)

269.75
million euros of
PUBLIC INVESTMENTS

605
funded
R&D PROJECTS

497
PATENTS

214
funds to
RESEARCH LABORATORIES

296
funded
INDUSTRIAL RESEARCH

162
NEW
START-UPS



INDUSTRIAL SECTOR

The health & wellness industry is widespread in the region with top companies and highly specialized SMEs, leaders in their respective niches. The main specializations and outstanding niches of the health & wellness industry are:

The Mirandola Biomedical District (Modena) with companies as Livanova, Gambro Baxter, Fresenius Hemocare, etc. The district is leader in the manufacture of dialysis, heart surgery, transfusion equipment, along with other top technology content products, as well of disposable plastic products for medical use.

A specialization in the production of medicines and pharmaceutical preparations in the province of Parma and in Bologna (e.g. Chiesi, Acme, Alfasigma, GSK).

The Regenerative Medicine Hub with its important research centres, companies and startups (Holostem, Finceramica, Greenbone) along with several advanced biomaterial centres (ISTEC, CNR,..).

Leading centres for the production of prostheses and rehabilitation in Budrio (Bologna), e.g. Inail centre.

The Wellness Valley in the Romagna area, with excellences as Technogym and a widespread presence of spas and wellbeing centres.

Packaging machinery/solutions for pharmaceuticals and biomedical products (e.g. IMA, Marchesini, Marposs).

Machinery, equipment and gears for electromedical as well as measuring, checking and surveying instruments (e.g. Cefla, GVS, Bellco).

INTERNATIONAL TRADE FAIRS IN EMILIA-ROMAGNA

EXPOSANITÀ

Health and health care services
Bologna, www.exposanita.it

B.T. EXPO

Biomedical technologies
www.bt-expo.it

COSMOPROF

Perfumery and cosmetics
Bologna, www.cosmoprof.com

COSMOFARMA

Health, wellbeing and beauty products and services for pharmacies
Bologna, www.cosmofarma.com

EXPODENTAL

Dental sector
Rimini, www.expodental.it

RIMINI WELLNESS

World of sport (sports and beauty equipment, clothing, footwear, sports medicine and nutrition, etc.)
Rimini, www.riminiwellness.com

131
thousand
employees
Small 2019

30
thousand
local units
Small 2019

3.3
billion euros
export
2019

1.5
billion euros
import
2019



INNOVATION ECOSYSTEM AND CLUST-ER ROLE

Regional innovation policy supports R&I activities carried out by enterprises, promotes the development of Industrial Research Laboratories and Innovation Centres mainly located in the Technopoles and organized in the High Technology Network, fosters the regional Clust-ERs along with innovative business ideas and initiatives.

THE EMILIA-ROMAGNA HIGH TECHNOLOGY NETWORK: *over 90 Industrial research Labs and Innovation Centres*

10
TECHNOPOLES

7 CLUST-ERs
and 1 Big Data Association with
450 public and private entities involved

20+
20 INCUBATORS and
STARTUP ACCELERATORS

MAK-ER
the first Association in
Italy for digital fabrication

10
OPEN LABS FOR DIGITAL
INNOVATION

ART-ER
ATTRACTIVENESS
RESEARCH TERRITORY



Clust-ER Health is a community of public and private bodies (research centers, companies, training bodies) created to support the competitiveness of the most important production systems in Emilia-Romagna. The Clust-ER Associations rely on the innovation capacity of the entire innovation system: within the Clust-ERs, research laboratories and innovation centres belonging to the regional High Technology Network team up with companies and higher education organisations to face common challenges, develop strategic projects and multiply opportunities.



more than 100 associates

The Clust-ER Health covers 4 different Value Chains, which are:



New Generation
Medtech and
Prothetics



Regenerative
and Restorative
Medicine



Pharmaceutical
and Omics
Sciences



Technologies &
Services for
Healthy Living
and Active Aging

HEALTH ASSET IN EMILIA-ROMAGNA

Clust-ER Health, in collaboration with EY, performed an analysis of the regional health sector. The analysis took in consideration:



Economic and occupational value



Quality of research



Distinctive aspects and uniqueness



Industries and key players



Excellences

Seven assets were identified for their relevance at international level, the potential and the capacity to attract scientific and business collaborations. The 7 healthcare assets of the Emilia-Region are:



PHARMA & ATPMs



BIOMEDICAL TECHNOLOGIES



BIG DATA & DIGITAL HEALTH



ORTHOPEDICS



NEUROSCIENCES



NUTRACEUTICALS



ANIMAL HEALTH



PHARMA & ATPMs

Some of the major Italian pharmaceutical industries are based in Emilia-Romagna, with a strong trend to invest in innovative research. Also, skills on the most modern methodologies for studying the genome and interpreting its variations are well developed.

Advanced therapies are a strategic asset for the region, with scientific excellences and entrepreneurial initiative. Today, it can rely on dedicated research centres, clinical structures, GxP facilities and networks at national and international level. This also generates important satellite activities in the equipment industry, combining competences with the medical device sector.



The turnover generated in Emilia-Romagna by the pharma industry is approximately 1.4 billion euros and generates more than 4,035 jobs.



In ATPMs research, out of a total of 160 universities and research centers identified at international level, the University of Bologna ranks 95 with 1,852 publications in this field



The world's first stem cell-based drug was created by Holostem, a spin-off of the Regenerative Medicine Center of the University of Modena and Reggio Emilia



KEY INDUSTRIES



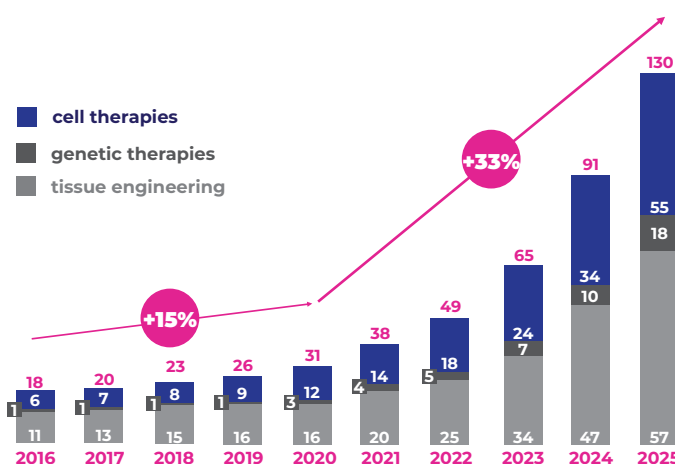
EXCELLENCES

Presence of internationally known excellences, such as the Centre for Regenerative Medicine «Stefano Ferrari» of the Modena University, hospitals able to perform clinical studies for ATPMs, biobank networks, centers focused on biomaterials and companies, such as Holostem and Rigenerand.

GLOBAL TREND

In 2019, the market value of the ATPMs was approximately 26 billion euros and was represented for 34% by cell therapies, 3% by gene therapies and 63% by tissue engineering.

In 2025, the market will see an increase in the importance of cell and gene therapies, at the expense of tissue engineering; it is estimated to hit 130 billion euros in 2025, with a rate of growth of 33% in the period 2020 - 2025.



SOURCE: EY based on Verified Market Research data (2020)



BIOMEDICAL TECHNOLOGIES

The biomedical sector represents an industrial excellence in Emilia-Romagna, for the presence of numerous foreign companies that allows the establishment of strong relationships both at a national and international level. The sector can rely on innovative design activities, from materials to processes, and on skills as clinical testing and validation that significantly shorten the path of new products to the market.



The biomedical sector generated 9,849 jobs in Emilia-Romagna in 2017, and the Mirandola and Bologna districts generated a turnover of over 1.6 billion euros in 2018.



Out of a total of 160 universities / research centers identified at international level, the University of Bologna ranks at 86th position with 1,164 publications in this field.



In the small town of Mirandola is located one of the biggest Medtech district of the world that counts over 100 companies, employing 4,900 people.



KEY INDUSTRIES

BRAUN
SHARING EXPERTISE

MEDICA

LivaNova
Health innovation that matters

Baxter

Elcam MEDICAL
Where everything connects

GVS
FILTER TECHNOLOGY

belco
Medtronic

ibd

FRESENIUS KABI
caring for life



EXCELLENCES

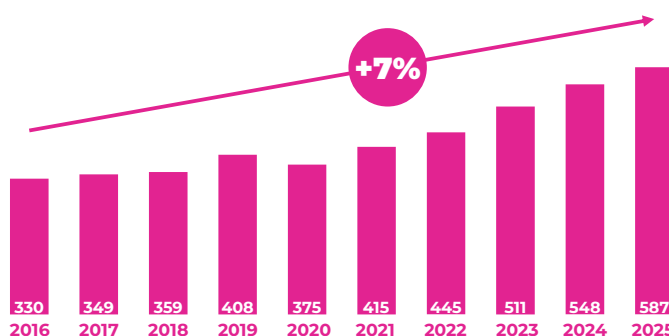
The Mirandola Biomedical District is a world leader in the production of disposable plastic materials for use in the field medical and high-tech equipment used for various branches of healthcare. It represents a pole of excellence, where the first artificial kidney, hemodialysis blood circuits and many other innovative products were devised. The Mirandola Biomedical District can rely on Mirandola Technopole (TPM), which support companies with medical device regulation, R&D projects and other services.

GLOBAL TREND

In 2019, the value of the biomedical market was 408 billion euros; it is expected to reach 587 billion in 2025, with a growth rate of 7% between 2016 and 2025.

Due to the Covid-19 pandemic, a decrease of -8.2% is expected between 2019 and 2020 (from 408 billions of euros to 375 billion euros)

The most important segment is prosthetics, which covers almost half of the total market value total




SOURCE: EY based on Verified Market Research data (2020)



BIG DATA & DIGITAL HEALTH

Emilia-Romagna is a highly dynamic and innovative region: in the last years, most sectors of excellence in the Region are moving towards a digitalization of processes, including health care data collection and management. Thanks to the investments and skills, the Region is considered as the "European Data Valley", with the best supercomputers in the world.

 The big data and digital health sector generates approximately 91 million euros in turnover and 1,303 jobs in Emilia-Romagna.

 More than 90% of supercomputing resources for public research in Italy are located in Emilia-Romagna.

 Emilia-Romagna owns one of the most complete EHR database in Italy, collecting data from patients for more than 30 years

KEY INDUSTRIES

CINECA **INFN** Istituto Nazionale di Fisica Nucleare

BigData
associazione
from volume to value

bi-r3x
Big Data Innovation & Research Excellence

DataRiver
contract research organization

iconsulting

oresult
Specific medical, personalized software solutions

lepoda



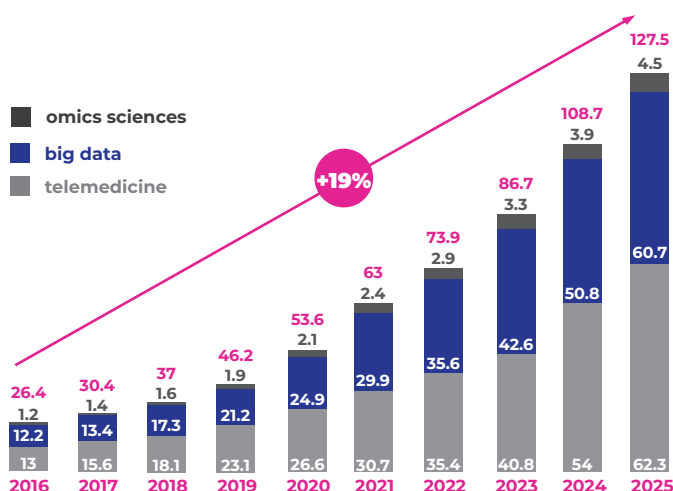
EXCELLENCES

The Big Data Technopole - Bologna Hub will be the international digital hub hosting HPC infrastructures, such as the world class pre-exascale HPC supercomputer that will be one of the three precursors to Exascale Supercomputer at European level.

GLOBAL TREND

In 2019, the total market for big data and digital health was equal to 46 billion euros, and will reach 127 billion euros in 2025, with a considerable growth rate and equal to 19%.

Telemedicine is the segment with the most expected growing over the period 2016-2025, that will be equal to half the market value in 2019.




SOURCE: EY based on Verified Market Research data (2020)





ORTHOPEDICS



The orthopedic sector, due to the presence of world-class companies, can rely on strong collaborations with universities and research centers, both at European and international level. Given the characteristics of the orthopedics products, the number of competitors and the growth rate, orthopedics is a highly competitive market, in which innovation and efficiency play a key role on the chance to be successful.

 The orthopedic devices sector and prosthesis generates around 94 million euros in turnover and around 500 jobs in Emilia-Romagna.

 Out of a total of 160 universities / research centers identified, the University of Bologna ranks 157th with a total of 713 publications.

 The Rizzoli Orthopedic Institute was the first hospital in the world to make a custom-made 3D-printed prosthesis.

KEY INDUSTRIES



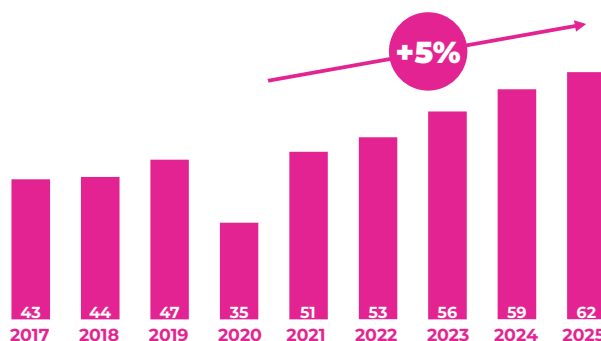
EXCELLENCES

Presence of excellences, such as the Rizzoli Orthopedic Institute (the 8th best hospital in the world according with Newsweek, 2021), the National Prosthesis Center of INAIL in Budrio and the CNR-ISTEC, the national institute for science and technology in ceramics.

GLOBAL TREND

In 2019, the market value of orthopedic devices and prostheses was estimated at 47 billion euros, with a expected reduction of 35 billion euros (-25.6%) in 2020, due to the Covid-19 pandemic.

The expected market value in 2025 is 62 billion euro, with a growth of 5% between 2021 and the end of period



SOURCE: EY based on Verified Market Research data (2020)



NEUROSCIENCES

The neuroscience sector in the Emilia-Romagna region has both significant infrastructures, including new laboratories and increasingly advanced instrumentation for research in the field of neurodegenerative diseases, and advanced know-how. New product introductions and technological advances have contributed to the diagnosis and treatment of neurovascular disorders, and research and development in neurostimulation devices will offer profitable growth opportunities for players in the global neurology devices market.



The neurological medical devices sector generates around 42 million euros in turnover and around 60 jobs in Emilia-Romagna.



Out of a total of 160 universities and research centers identified at international level, the University of Bologna ranks 157th with a total of 713 publications.



Professor Giacomo Rizzolatti, from the University of Parma, is the first Italian researcher in the field of neuroscience, known all over the world for the discovery of mirror neurons.



KEY INDUSTRIES

Theras GROUP

isnb
IRCCS Istituto di Ricovero e Cura
a Carattere Scientifico

circle
hobilitation
concept

MONTECATONE
REHABILITATION INSTITUTE S.p.A.

EMS SISTEMI ELETTROMEDICALI
SINERGIA

iit
@unife

Consiglio Nazionale delle Ricerche
ISTITUTO DI NEUROSCIENZE

Neuron
Guard

FONDAZIONE
IRET

vibre



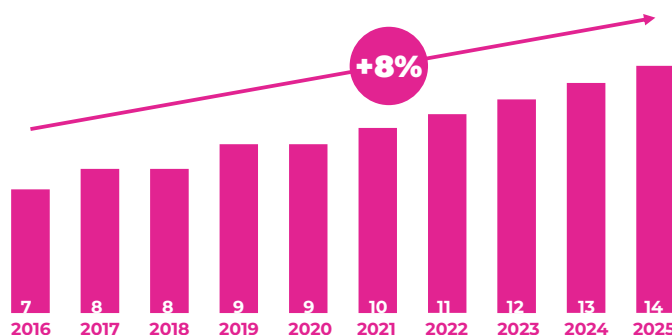
EXCELLENCES

Presence of excellent infrastructures, such as the IRCCS Bologna-Bellaria, Montecatone Institute, CNR, IRET Foundation. IRCCS Bologna-Bellaria is a promoter of the Italian IRCCS network for neuroscience and neuro-rehabilitation

GLOBAL TREND

In 2019, the market value of neurological devices is estimated at 9 billion euros. The expected value of the market in 2025 is 14 billion, with a growth of 8%.

The introduction of new products and the technological progress, especially related to devices for the diagnosis, contributed to the treatment of neuro vascular disorders, and they are expected to provide profitable opportunities for market expansion during the forecast period.



SOURCE: EY based on Verified Market Research data (2020)



NUTRACEUTICALS

The development and production of nutraceuticals in Emilia-Romagna has increased in the last years due to rising attention to lifestyles, to provide effective solutions for improving health and reducing the risk of disease through prevention.

Nutraceuticals represent a new consumer sector, in which the pharmaceutical and the food industry are investing heavily. Strong collaborations on research projects are in progress today, involving universities, manufacturing companies and technopoles of Emilia-Romagna, to ensure a new future for efficiency, quality and safety of nutraceuticals.



The turnover generated in Emilia-Romagna is approximately 1.4 billion euros and generates more than 4,035 jobs



On a total of 160 universities and research centers identified at international level, the University of Bologna ranks 32° with 366 publications



Emilia-Romagna is among the regions with a greater number of companies producing nutraceutical products



KEY INDUSTRIES

ALFASIGMA

Doppel

Valpharma
GROUP

ACEF

Nutraceutica

PharmExtracta

shedirpharma®
FEDERAZIONE ALLA SALUTE



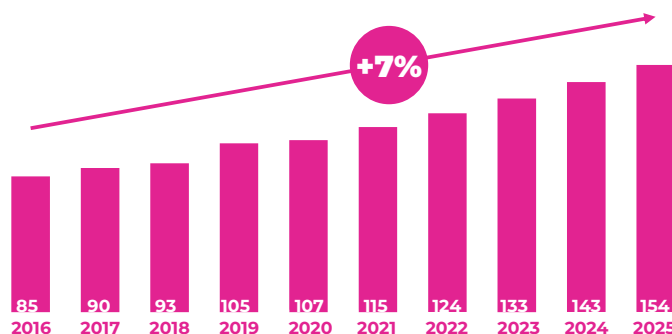
EXCELLENCES

Presence of excellent infrastructures such as the Microbiome Research Hub of the University of Parma, the Inderdipartimental Center on Agrifood of the Bologna University and the Technopole of Forlì-Cesena.

GLOBAL TREND

In 2019, the nutraceutical market value was 105 billion euros. It is expected to reach 154 billion euros in 2025.

Market growth of 13% between 2018 and 2019 will slow due to the effects of the pandemic from Covid-19 (+ 2% between 2019 and 2020), and will grow again in 2021 at a faster rate (+ 7% between 2020 and 2021 and overall on the whole period)



EY based on Verified Market Research data (2020)



ANIMAL HEALTH

The veterinary pharmaceutical market is competitive and many production sites for medicines manufacturing are based in Emilia-Romagna. The agri-food safety sector is one of the main application in Emilia-Romagna: it mainly includes vaccines, in addition to the monitoring of infectious diseases in livestock and recovery plans for the eradication of animal diseases.



The veterinary pharmaceutical sector in Emilia-Romagna generates around 250 million euros turnover and 780 jobs.



Out of a total of 160 universities and research centers identified at international level, the University of Bologna ranks 85th with a total of 488 publications.



13 production sites for veterinary pharmaceutical, out of a total of 81 throughout Italy, are located in Emilia-Romagna



KEY INDUSTRIES



EXCELLENCES

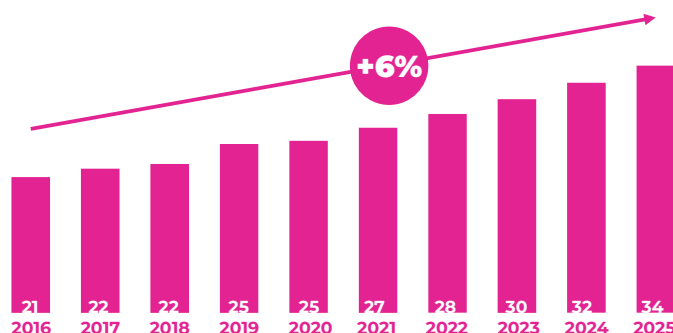
Presence of Excellence such as the Experimental Zooprophyllactic Institute of Lombardia and 'Emilia-Romagna "Bruno Ubertini" (IZSLER) and the Animal Production Research Center S.p.A. (CRPA).

IZSLER is currently managing the largest veterinary biobank facility in Italy for the storage of animal biological resources. CRPA participates as coordinator and partner in numerous European research projects.

GLOBAL TREND

In 2019, the veterinary pharmaceutical market was worth 25 billion euros, and will reach 34 billion euros in 2025, with a growth rate of 6% between 2016 and 2025

The producing animal segment is leading the veterinary pharmaceutical market, representing 50% of the value in 2019. The remaining 50% is represented by drugs for pets, 40% of which is the share of drugs for dogs.



SOURCE: EY based on Verified Market Research data (2020)



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