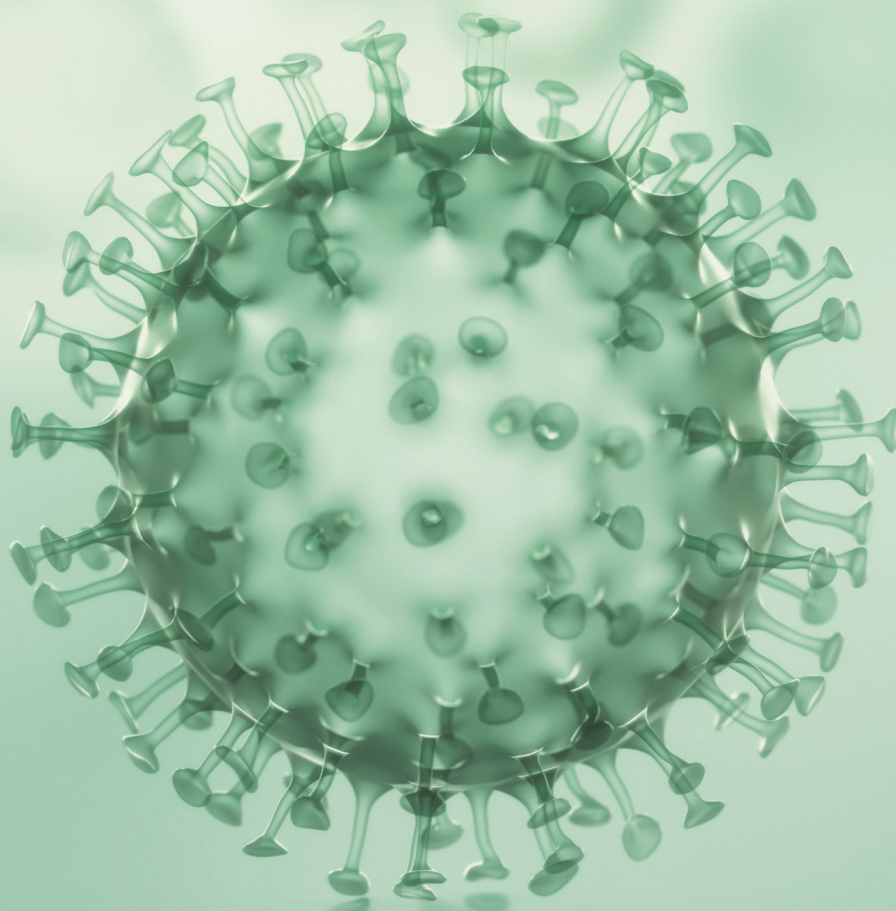


2020

Annual Report



Instituto
de Salud
Carlos III





Edited by:

Ministry of Science and Innovation



Acknowledgments:

To all staff of ISCIII Centers, Areas and Units, for their active participation and effort in preparing this report.

NIPO: 834210012

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Design and layout:

DCI Punto y Coma

General catalog of official publications:

<http://publicacionesoficiales.boe.es>

Publication included in the editorial program of the Ministry of Science and Innovation.

Free version of this report on Internet (PDF format):

<http://publicaciones.isciii.es>



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1

Presentation of the ISCIII



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The year 2020 will forever be etched in our collective memory for the devastating effects of the SARS-COV-2 pandemic. The profound health, social and economic consequences are still very much present at the time of writing this report. At the same time, however, the extraordinary response of all the professionals of the Institute of Health Carlos III (ISCIII) and the entire scientific and health community connected with our institution continues to shine with its own light. Faced with the greatest challenge in its history, the ISCIII has risen to the occasion thanks to the experience of its professionals and their solid lines of research. Therefore, in addition to being a report of activities, this document aspires to be a recognition of and a tribute to the women and men of the ISCIII who dedicated endless days, nights and months to trying to alleviate the terrible impact of the pandemic, and also to all those who did not let themselves be discouraged and continued their research in different areas in spite of the difficulties.

Each year, this report allows us to look back and take stock. This document presents the work carried out and the results obtained by the ISCIII during the year 2020 and reflects the professionalism, competence and generosity shown by its more than 900 workers in a global crisis, in which science has been a central element. The information included in this document aims to give visibility to the daily work carried out by the people of the ISCIII. However, this year indicators and words fall short. After the immense collective effort, the verb to remember takes on an ancient meaning: to remember is to pass through the heart again. We will always remember in a very special way their dedication and commitment to society as a whole; this document captures only a small sample.



For yet another year we have, true to our mission, continued to work to protect the health of all citizens through science and the generation of knowledge. At the ISCIII, science has always been conceived as a vector for the transformation and progress of society, as a tool to generate health. Throughout these dark months, this idea has been strongly conveyed to society. It has been clearly shown that science is the only path to the recovery of health, economic and social conditions. Science and innovation have become central to the solutions, not only as regards the pandemic but also for the reconstruction of the country. Scientific advances and innovation must also be considered indispensable elements to prepare for future health emergencies. Now, more than ever, science and health must be considered as an inseparable pair.

Without wanting to downplay the importance of ISCIII activity not directly related to the pandemic, it is essential to begin with a brief description of the activity undertaken in response to the health crisis. From the first days of the pandemic, the Institute engaged in a very intense activity to confront the threat through science and knowledge. Thus, the ISCIII played a central role in the increase of microbiological diagnostic capabilities in Spain, in the generation of epidemiological parameters to monitor the evolution of the pandemic, and in providing scientific and technical advice to public administrations for the design of public health measures. Likewise, in accordance with its role as a funding agency and coordinator of biomedical research, the ISCIII has been instrumental in promoting the development of research and innovation projects throughout the country aimed at fighting COVID-19.

One of the first tasks of the National Microbiology Center (CNM) was to implement the PCR techniques necessary for the diagnosis of the first cases of COVID-19 in our country, following the recommendations of the World Health Organization (WHO) and the European Centre for Disease Prevention and Control (ECDC), and adapting them to the needs of our National Health System (SNS). In a very short time, the CNM went from being the laboratory that confirmed the diagnosis of the first cases to assuming the primary diagnosis of thousands of cases to support the hospitals with the greatest demand. At the managerial level, one of the critical aspects of success was the reorganization of the 13 CNM laboratories, which usually operate independently, into a single large, networked laboratory. Furthermore, the researchers worked to increase the diagnostic capacity of the Spanish hospitals and to facilitate the implementation of commercial techniques produced by Spanish biotechnology companies: a program was established to validate commercial PCR techniques for the detection of SARS-CoV2 in clinical samples so that they could be rapidly supplied to health centers. A system was also set up to carry out reliability studies of rapid COVID-19 detection techniques in collaboration with Spanish hospitals and at the request of the Ministry of Health. This program was crucial, especially in the early months of the pandemic, to ensure the quality of antibody and antigen diagnostic tests used in Spain. In addition, advisory services were provided for the training of research centers and universities, and veterinary and military centers, as support laboratories for the analysis of clinical samples, coordinated by the health authorities of each Autonomous Community.

The National Epidemiology Center (CNE) has also played a fundamental role in the management of the pandemic. From the beginning, it provided epidemiological information through the publication of COVID-19 reports, which compile the analysis of the cases reported to the National Network for Epidemiological Surveillance (RENAVE) on an individual basis, and through continuous updates of the COVID-19 panel, which shows the situation and evolution of the pandemic in Spain with geographic information and evolution indicators. In addition, at an early stage, it activated the Daily Mortality Monitoring System (MoMo), which publishes periodic estimates of excess mortality, including all causes. Other studies, such as COSMO-Spain, allow a dynamic evaluation of the social perception of the pandemic. Among the emblematic projects that demonstrate the ability to combine science, public health and healthcare coordination, mention must be made of the National Study of Sero-Epidemiology of SARS-Cov-2 Infection in Spain, known as the ENE-COVID study, which the ISCIII conducted in collaboration with the Ministry of Health and all the Autonomous Communities and Cities. This study was internationally acclaimed, and it placed Spain among the few countries in the world with sufficiently rigorous and representative seroprevalence data to offer a reliable estimate of the true dimension of the first pandemic wave. But it also shows us, and the whole world, Spain's capacity to face enormous logistical and scientific challenges through collaboration. Undoubtedly, this is one of the most valuable lessons we have learned at the ISCIII and we hope to be able to take advantage of it to successfully face other great challenges before us.

With respect to the coordination and promotion of research, on March 19, 2020, only 5 days after the declaration of the State of Emergency, the call for expressions of interest for the funding of research projects on SARS-COV-2 and COVID-19 was approved by Resolution of the Institute's Management, with an extraordinary endowment of 24 million Euros, to contribute to improving the public health response and to develop new preventive, diagnostic and therapeutic tools adhering to the principles of social need, emergency and efficacy. In just a few weeks we received more than 1,500 proposals, which were analyzed by a Scientific and Technical Evaluation Committee. This Committee selected 129 projects based on their capacity to increase knowledge about the new virus and its impact on infected people, intending to contribute to efficient patient management and/or public health preparedness and response, always from the perspective of urgency and with the clear intention of generating specific, early results that could be applied in clinical practice.

In addition, as a necessary instrument for the combined analysis of many of the data generated by different research projects with complementary epidemiological and/or clinical-biological perspectives, the ISCIII created the COVID-19 Registry. The aim of this registry is to collect, store, organize, preserve, analyze and exploit, institutionally and collaboratively, data from research projects funded by the COVID-19 Fund.

On the other hand, it should be kept in mind that in a global epidemic such as the one caused by the new coronavirus, the international arena is essential for understanding and channeling efforts. The ISCIII has closely followed the European and global activity related to the different projects and initiatives related to SARS-CoV-2 and COVID-19, and has encouraged Spanish participation. These initiatives include the European Commission's ERA vs. Corona action plan, the various European calls for projects, the European COVID-19 data platform, the creation of the European health information infrastructure, the 1 million genomes initiative, the European network for the acceleration of clinical research in vaccines (VACCELERATE), and the proposal for the new European network of contact points for the new EU4HEALTH program.

In addition, applying principles of responsible research and innovation (RRI), ISCIII professionals went a step further and became involved in the difficult task of transferring the science that was being generated at high speed around the world to society. It is worth mentioning the more than 200 information news releases published on the ISCIII website throughout the year 2020, many of them related to SARS-COV-2. This also gave rise to the Coronavirus Scientific Analysis Group, conceived as a multidisciplinary team of ISCIII professionals, composed of scientists, physicians, experts in bibliographic searches and a journalist, who participated on a voluntary basis. The group was active throughout the State of Emergency at a time when citizens were facing confusion and noise on the one hand, and the genuine need to know more about a virus that had invaded their lives on the other. In the face of this, ISCIII professionals found the energy to produce more than 20 dissemination reports, as well as weekly videos with the latest scientific news, and offer them publicly and free of charge through our dissemination channels and the coNprueba project (<https://www.conprueba.es>), developed by the Ministry of Science and Innovation to fight against disinformation and hoaxes.

But, besides the all-pervasive presence of COVID-19, throughout 2020 all ISCIII centers and units continued to work in other areas and contributed in a very important way to preserving the health of all citizens. As the implementer of the Spanish Science, Technology and Innovation System, the ISCIII continued to make important contributions through its centers, institutes and research units. In addition to the CNM and the CNE, the National Environmental Health Center (CNSA), the Research Institute for Rare Diseases (IIER), the Functional Unit for Research into Chronic Diseases (UFIEC), the National Center of Tropical Medicine (CNMT), the Digital Health Research Unit (UITES), the Health Care Research Unit (Investén), the Central Scientific and Technical Units, the Biological Alert Laboratory Network and the Health Technology Assessment Agency (AETS), as well as the National Schools of Public Health (ENS) and Occupational Medicine (ENMT) and the National Library of Health Sciences (BNCS), have continued to effectively carry out their three functions of providing scientific and technical reference services for the NHS, research and teaching in 2020. Reading this scientific report offers the opportunity to gain a better understanding of the main lines of action of these centers and their impact on society, always aimed at improving health and focused on the needs of the citizens.

As a funding agent and coordinator of health R&D, in 2020 we continued our firm commitment to the growth and regeneration of the scientific matrix in the NHS through the management of the Health Research and Development Strategy (AES), incorporating important innovations such as the transition of leadership, the representation of patient associations in the evaluation process, the commitment to creating permanent jobs after finishing Miguel Servet II contracts, and the incorporation of new criteria to continue protecting the careers of specifically women researchers.

Through the AES 2020, 688 research projects and 525 grants in human resources were funded, with a funding of more than 127 million Euros. To all this, three additional actions within the framework of AES 2020 must be added. Firstly, a new call for independent clinical research in which 34 projects were funded with a total amount of 18,926,287 Euros. Secondly, a call for the creation of 3 platforms to support R&D and Innovation (R&D&I) in biomedicine and Health Sciences: a Biobanks and Biomodels platform, a platform for the dynamization and innovation of the industrial capacities of the SNS and their effective transfer to the productive sector, and a platform to support clinical research, with a total funding of 27,439,980 Euros. These platforms, which are collaborative and transversal in nature, will provide services to the R&D&I system to promote

the generation and transfer of knowledge of the highest quality in the SNS, ensuring scientific and technical excellence as well as equity and efficiency in the use of available resources. Finally, within the framework of the Shock Plan for Science approved by the Government in June 2020, the call for proposals for the Precision Medicine Infrastructure Associated with Science and Technology (IMPACT) was launched, with a funding of 25,799,367 Euros, as a facilitator of the implementation of Precision Medicine in the SNS. IMPACT is made up of three programs focused on Predictive Medicine, Data Science and Genomic Medicine, which individually and as a whole will provide services to the R&D&I system to facilitate the implementation of Precision Medicine approaches, and strengthen the generation and transfer of knowledge of the highest quality in the SNS, ensuring scientific and technical excellence as well as equity and efficiency in the management of resources.

In 2020, the ISCIII continued to reinforce and strengthen its commitment to internationalization, both through participation in various joint initiatives and European and international calls, and by promoting the participation of the SNS in European programs, chiefly Horizon 2020. In this regard, Spanish participation in the H2020 Social Health challenge was very successful in 2020, with returns of more than 10% and a leadership of projects by Spanish groups of around 15%. Consequently, Spain has surpassed the target set for the 2014-2020 period in health research. Furthermore, the ISCIII has been participating in 4 of the main European research infrastructures in health, which in turn are developed through the platforms and initiatives coordinated by the ISCIII in these same areas. No less important is the intense activity in International Joint Programming, mobilizing in the last year 11 Transnational Calls through which 31 Spanish projects were selected with a total funding of almost 4.6 million Euros. It is worth mentioning that we are currently immersed in the launching process of the new European R&D&I (Horizon Europe) and Health (EU4HEALTH) related programs, with intense activity, to coordinate the participation of the ISCIII as well as to promote them in the field of the SNS.

Other key elements of the ISCIII strategy to promote research and contribute to the cohesion of the SNS are the cooperative research structures that facilitate collaboration between the best groups in the country. In addition, as part of its mission to promote excellence in research, three research foundations are affiliated to the ISCIII: the CNIC, the CNIO and the CIEN Foundation, focused on research in cancer, cardiovascular diseases and neurodegenerative diseases, respectively. Both the CNIC and the CNIO are considered to be among the world's top research centers in their areas of expertise.

Finally, I would like to highlight the approval of our Strategic Plan 2021-2025 (https://www.isciii.es/QueHacemos/Paginas/PlanEstrategico2021_2025.aspx) by the Governing Board of the ISCIII in December 2020, which represents an opportunity to continue improving the efficiency and solvency of the organization, and to address new challenges to improve the health of citizens and fight against diseases. It was drawn up in accordance with the lines of action of the Spanish Science, Technology and Innovation Strategy 2021-2027 and the new European Framework Program for Research and Innovation, Horizon Europe. The Plan is based on four strategic axes and four transversal strategic lines, in addition to the strategic objectives included in each one of them. The strategic axes are the promotion, coordination and execution of health research and innovation; disease surveillance, prevention and control based on scientific excellence; science teaching and documentation; and governance and strategic participation. The Transversal Strategic Lines are transparent, agile and responsive management; orientation towards society and SDGs; digital transformation; and internationalization.

I conclude by once again thanking all the staff of the ISCIII for their work, efforts, commitment and dedication, which are essential for the fulfillment of the aims and functions of the Institute, and which throughout 2020 have been essential in contributing to the fight against the pandemic, demonstrating their capacity to adapt and respond to the most urgent needs. To all of you, my most sincere gratitude and appreciation for your daily work. Thank you very much.

Raquel Yotti
General Director Institute of Health Carlos III



The ISCIII in numbers 2020



**ISCIII
Staff Total 908**

630 women (69%)
278 men (31%)



Budget

€382,627,210

Financing and Coordination of R&D&I in the National Health System

**Health Research and
Development Strategy
2020**

€127,417,640

688 funded
projects

525 contracts

€83,082,623

€44,335,017



31 participations in
international projects
co-funded with
€4,598,134

**Support platforms for R&D&I
in Biomedicine and Health
Sciences**



95
groups

including their three coordinators
that make up the 3 platforms

€27,439,980



1,474 Grants
funded

€223,320,320

COVID-19 Fund

129 funded
projects

€23,737,045

**Precision Medicine Infrastructure Associated
with Science and Technology (IMPACT)**

3 funded
projects

€25,799,367

**Call for Independent Clinical
Research**

34 funded
projects

€18,926,287

Collaborative Research and accreditation of Health Research Institutes (IIS)

14 Thematic Networks for
Cooperative Research

12 Thematic Areas of Biomedical Research
Networking Centers (CIBER)

32 Accredited Health Research
Institutes

4 Participation in 4 European research
infrastructures



ERDF funds

2,150

certified grants

€70,600,000

declared expenditure



ESF funds

116

certified grants

€2,400,000

declared expenditure

**Intramural scientific
activity at ISCIII**



513

indexed
publications

50



projects awarded
with

€4,789,140 of funding

9 international projects with
€614,505 of funding

202



ongoing projects,
with a total funding of

€26,203,266

52 international projects with
€9,232,915 of funding

Scientific and technical services

37 specific epidemiological reports

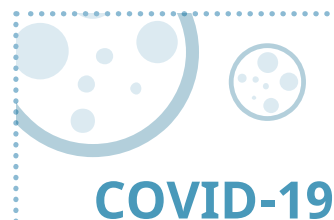
35 influenza surveillance reports

57 editions of the Weekly Epidemiological Bulletin

882 cases included in the **Rare Diseases Registry** and **48** cases of rare diseases without diagnosis

58 outbreaks of pathogenic microorganisms characterized with **58,480** assays

362 microbiological analysis techniques with **62,865** assays



75,000 serological analyses of the ENE-COVID study and coordination of the laboratories of the Autonomous Communities



4,000 analyses in the clinical trial to evaluate treatment of COVID-19 patients with hyperimmune serum

929 SARS-CoV-2 genomes sequenced for detection of variants

60 ENE-COVID-19 reports, including reports for Autonomous Communities.

365 updates of the **COVID-19 panel in Spain**
<https://cnecovid.isciii.es/>

82 MoMo reports (Daily Mortality Monitoring System)

68 reports on the "COVID-19 situation in Spain"

9,443 operations in SiViEs

Inclusion of **49,459,203** records

Preparation of **82** data transformers for Autonomous Communities



44,741 measurements of atmospheric contamination



50,909 tests carried out by the radiation protection service



27,221 microbiological diagnostic assays and laboratory surveillance programs



843 genetic diagnoses of rare diseases



12,212 environmental toxicology assessments

National Schools of Public Health

ENS



425 students



3,869 teaching hours

ENMT



719 students



2,168 teaching hours

National Library of Health Sciences



42,803 publications (bibliographic resources)



209,133 database searches

More than **46.5 million** visits to **SciELO** España

Communication

19 popular-scientific reports of the ISCIII Coronavirus Scientific Analysis Group

More than **6 million** visits to the ISCIII web site

210 information news releases and **30** outreach news releases

Highlights Coronavirus 2020

January

- 23 First informative news release on the new coronavirus.
- 31 The CNM diagnoses the first case of COVID-19 in Spain.

- 03 Organization of a webinar on the H2020 Flash Call on SARS-CoV-2.
- 11 The CNE starts the publication of the COVID-2019 Reports with the information of cases declared in the National Network for Epidemiological Surveillance RENAVE.

February

March

- 16 Emergency reorganization of CNM capabilities to support the diagnostic needs of SARS-CoV-2 infection in the Spanish National Health System (SNS).
- 19 Publication of call FONDO COVID-19 for research projects.
- 19 The CNE starts publishing the MoMo (Daily Mortality Monitoring System) Reports at the national and Autonomous Community levels.
- 20 Launch of the COVID-19 Panel, which graphically shows the course of the pandemic and RENAVE data.
- 23 Clinical validation of PCR kits developed by Spanish companies with the aim to increase diagnostic capacity.
- 25 MoMo (Daily Mortality Monitoring System) detects first excess mortality at the national level.
- 27 Development of SARS-Cov-2 genome sequencing and analysis protocols by the Genomics and Bioinformatics Units and the CNM.

April

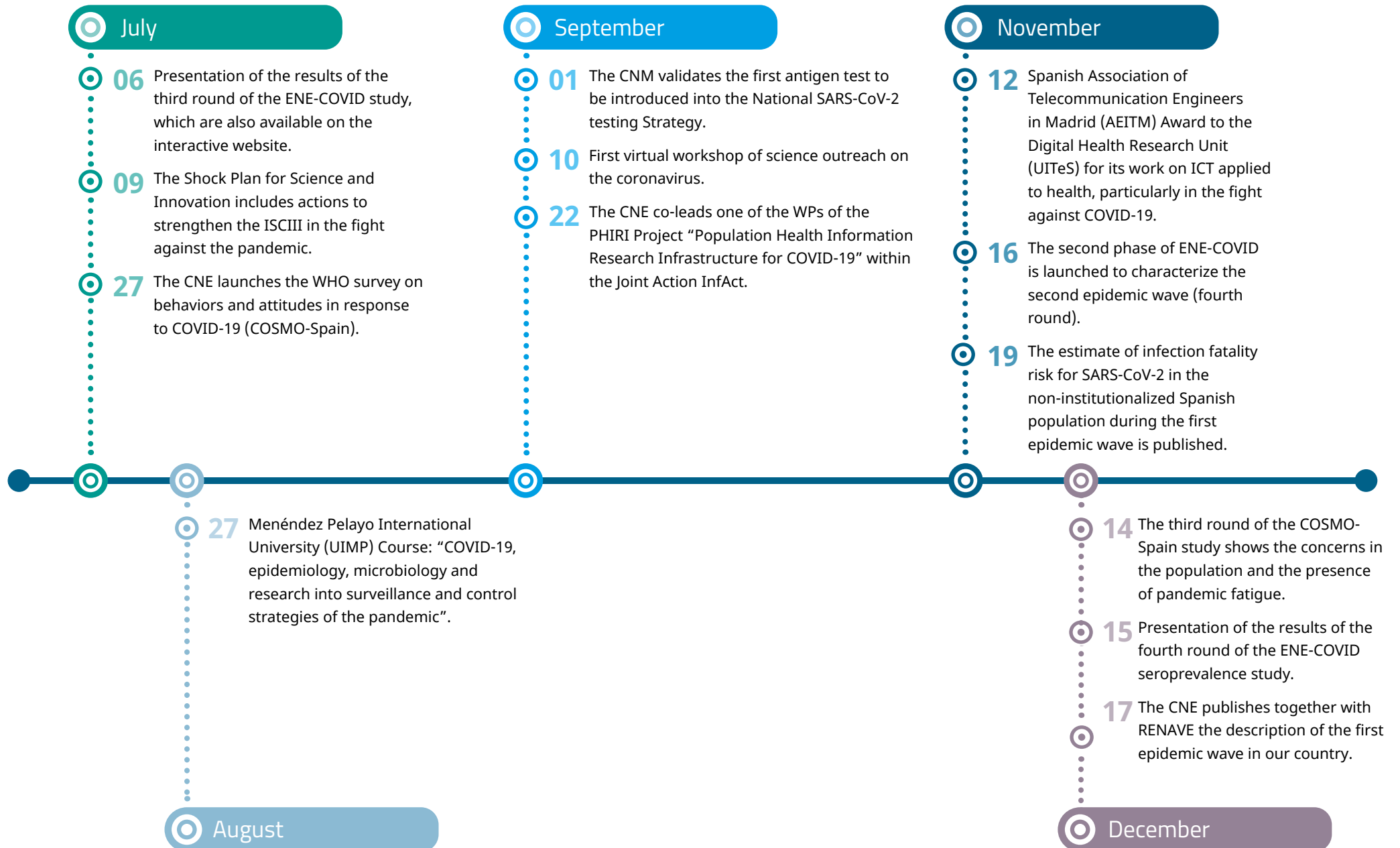
- 02 Signing of the European Project I-MOVE-COVID-19, with the joint participation of the CNE and the CNM.
- 07 Launch of the European ERAVsCorona action plan with the participation of the ISCIII.
- 08 Creation of the COVID-19 Scientific Analysis Group, which publishes its first popular-scientific reports.
- 27 Start of the National Study of SARS-CoV-2 Sero-epidemiology (ENE-COVID).
- 30 The CNE publishes the first Status Report on Health Professionals.

May

- 13 Presentation of the results of the first round of the ENE-COVID study, which are also available on an interactive website.
- 20 Resolution of the creation of the ISCIII-COVID-19 Registry.

June

- 04 Presentation of the results of the second round of the ENE-COVID study, which are also available on an interactive website.
- 19 Investén develops the SANICOVI project to analyze the possible causes of infection of healthcare professionals.
- 30 The project "COVID-19 Transmission Factors in Spain" of the CNE disseminates its results on an interactive website.



Highlights General 2020

January

- 20 Second Meeting "Getting to know the ISCIII".

- 02 ISCIII-ITEMAS USA Mission under the International Visitors Leadership Programme (IVLP).
- 04 Update of the ISCIII Code of Good Scientific Practice, 10 years after its publication.
- 12 Participation of ISCIII, ITEMAS and CNIO in TRANSFIERE 2020.
- 24 Publication of an interactive map of mortality due to rare diseases in Spain.

February

March

- 04 The MELTIC project, developed by ISCIII researchers, wins a European open call for funding developed by the ORION program.
- 06 Start of the 'Chronohospi' project led by INVESTEN, which will help to gain a better understanding of the quality of sleep of hospitalized patients.

July

- 07 Approval by the Council of Ministers of the call for independent clinical research.
- 16 The CNSA coordinates the establishment of a European network of laboratories for human biomonitoring.
- 16 Participation in the 6th Edition of the 'Science by Women' Program led by the Women for Africa Foundation.
- 23 Responsible Research and Innovation Awards Ceremony (ORION project).
- 30 Date of the first provisional resolution of the AES (Health Research and Development Strategy) 2020 award.
- 31 The Spanish National Accreditation and Certification Entity (ENAC) approves that the CNM changes all its accreditations from fixed to flexible scope.

- 15 The Spanish Influenza Surveillance System draws a map of the behavior of influenza epidemics since the beginning of this century.
- 26 The collaboration with the Spanish Federation of Rare Diseases (FEDER) is reinforced to continue promoting research on rare diseases through the IIER.

June

- 01 ENS researchers develop a plan to address the health effects of climate change, which is published in Environmental Research.
- 04 The Council of Ministers approves the call for grants for ISCIII Platforms to support R&D&I in Biomedicine and Health Sciences.

August

September

- 15 The Council of Ministers approves the call for proposals for the Precision Medicine Infrastructure Associated with Science and Technology (IMPACT).
- 23 Tribute to and presentation of the book by Dr. Rafael Nájera, a pioneer virologist in Spain and the first Director of the ISCIII.

November

- 01 Start of the digital transformation process of the ENS and the ENMT.
- 19 National Workshop on European Project CHRODIS PLUS.
- 24 Resolution of the Health Research and Development Strategy (AES) 2020 grants.
- 25 Plenary Meeting of the Network of Health Technology Assessment Agencies.
- 26 The WHO reaccredits the CNM as a reference laboratory for measles and rubella for 2021.

- 16 The CNMT initiates a new line of research on nutrition and global health.
- 20 Meeting of the Spanish "mirror groups" of the European initiative "1+Million Genomes".
- 26 The CNM is the first Spanish laboratory accredited by the Spanish National Accreditation and Certification Entity (ENAC) to study transmissible spongiform encephalopathies in human samples.
- 30 Launch of the first PhD program of the ISCIII, in collaboration with the UNED, through the joint Research Institute-National School of Public Health (IMIENS).

October

- 01 The ISCIII Environmental Management Plan 2021-2024 is approved.
- 10 Signing of the ISCIII-AEMET contract through the CNSA National Reference Laboratory of Air Quality for the evaluation of transboundary air pollution for the period 2021-2023.
- 15 First meeting of the ISCIII Scientific Board.
- 18 The Governing Board approves the ISCIII Strategic Plan 2021-2025.
- 22 The Council of Ministers approves the Health Research and Development Strategy (AES) call 2021, with a 33% higher budget than in 2020 and important new features.
- 30 The General State Budget Law for 2021 is approved, which provides the ISCIII with the largest funding in its history.

December



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2.

Organization

2.1. Governance

The ISCIII is a Public Research Entity and an autonomous legal entity (General Health Act 14/1986, Spanish Budget Act 37/1988, and Act 13/1986 for the Promotion and General Coordination of Scientific and Technical Research).

In accordance with the fourth additional provision of Royal Decree 404/2020, which implements the basic organic structure of the Ministry of Science and Innovation, the ISCIII depends organically on this Ministry, although it also functionally depends on the Ministry of Health (third additional provision of Royal Decree 735/2020), due to its functions within the health sector. Therefore, the ISCIII has a twofold functional dependence on both Ministries, in the sphere of their respective competencies. Specifically, the ISCIII depends functionally on the Ministry of Health for its health planning and healthcare activities and, in coordination with the Ministry of Science and Innovation, for its applied research activities when they are translated to the Spanish National Health System (SNS). For its remaining activities, it functionally depends on the Ministry of Science and Innovation, specifically on the General Secretariat for Research.

The Management Bodies of the ISCIII are the Board of Governors and the Directorate General, as stated in the bylaws of the ISCIII (Royal Decree 375/2001, of April 6), which also defines the functions, objectives and the organizational structure of the entity.

Among the ISCIII's objectives are the promotion, development and provision of scientific and technical support to the SNS and to health research, through basic and applied research, evaluation, scientific and technical accreditation, health monitoring, scientific and technical advice, and health education and training in biomedicine and health sciences. Its functions indicate the special characteristics of the ISCIII, since in addition to providing advice and services to the SNS, it is a Public Research Entity (OPI) that performs the twofold function of producing science and financing the science and technology system, by taking on the planning, promotion and coordination of biomedical and health research and innovation, in accordance with the guidelines and objectives proposed by the Government regarding scientific policy. This function is carried out mainly through management of calls for grants associated with the Health Research and Development Strategy (AES). It also participates in the research programs of the European Union and the Autonomous Communities, through appropriate agreements and contracts.

Figure. Functions of the ISCIII



Royal Decree 375/2001, of April 6. Bylaws of the Institute of Health "Carlos III"; Spain's official state gazette: BOE-A-2001-8157, Article 4

In relation to this mission, the **objectives** of the ISCIII are:

- **To promote research aimed at protecting and improving health**, by funding research excellence and highly competitive research through the Health Research and Development Strategy of the National R&D and Innovation (R&D&I) Plan, and by enabling greater national participation in international R&D&I programs and projects.
- **To develop**, through the centers and institutes directly managed by the ISCIII, **research of the highest level** aimed at solving health problems.
- **To structure research within the SNS**, through the centers managed by the ISCIII, research institutes, foundations, networks, consortia and platforms providing services.
- To manage, develop and offer Spain **state-of-the-art scientific and technical services** for the prevention and control of communicable and non-communicable diseases and for environmental health.
- To offer **scientific and technical advisory services** to inform decision-making regarding health technologies, biological products and health services of the SNS.
- To develop **teaching programs** aimed at the whole of the SNS, and to provide **health information services and scientific documentation services**.

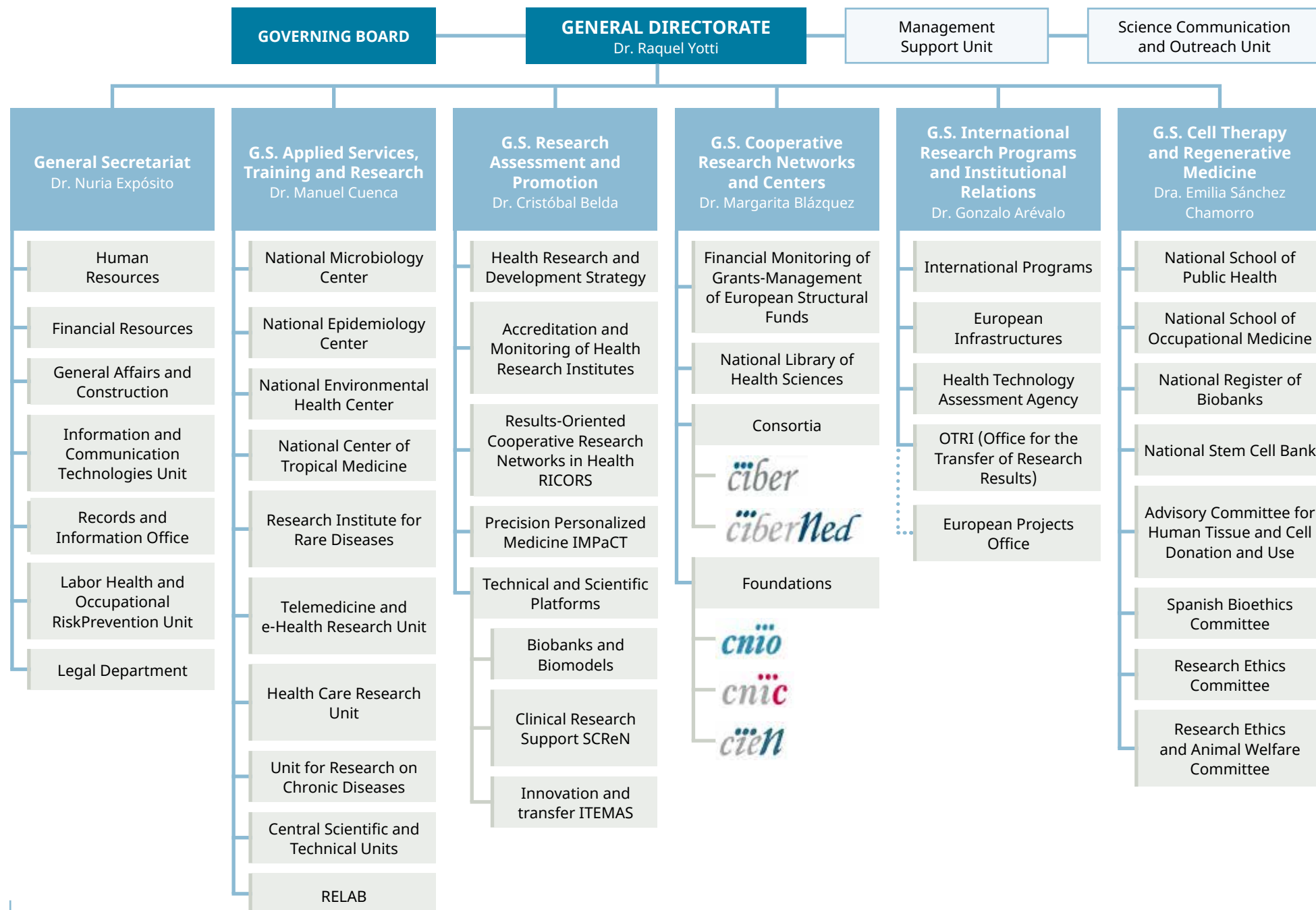
The main **values** on which the activity of the ISCIII is based are:

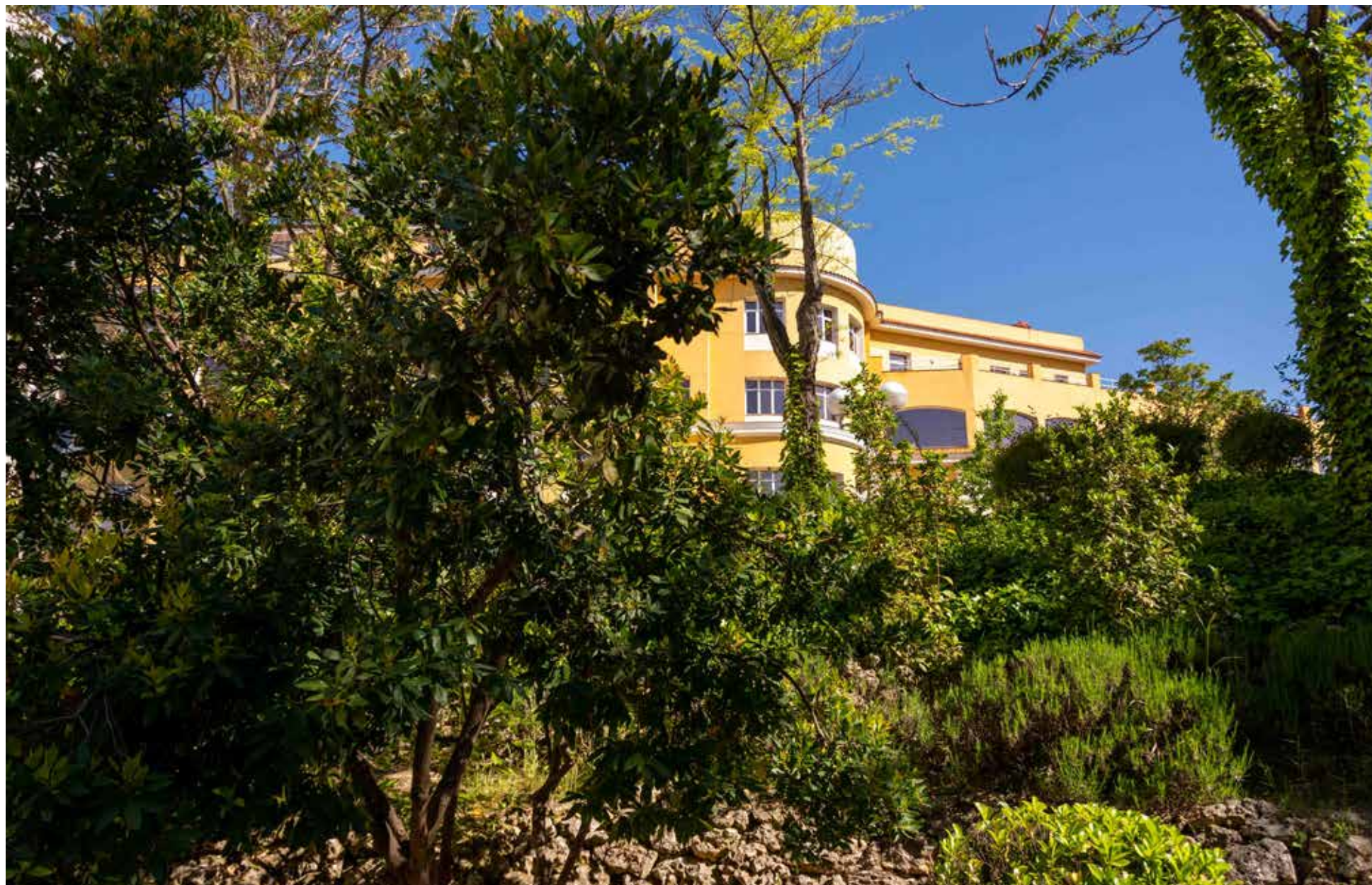
- **Social, health and environmental commitment**, understood as the application of science to achieve sustainable development goals (SDGs) for all mankind, with special attention to the goals related to health, gender equality and protection of the environment.
- **Public responsibility**, understood as an ethical commitment toward the citizens and that is put into practice in transparent management, citizen participation, gender equality, citizen education, the promotion of the scientific culture, and open science available to the whole community (**RRI principles: Responsible Research and Innovation**).
- **Scientific integrity**, which ensures compliance with all bioethical aspects of research, confidentiality, control of conflicts of interest, veracity of results, and respect for authorship and intellectual property.
- **Professionalism**, which implies a commitment to continuing education, responsibility for the quality of our services and openness to innovation and continuous improvement.
- **Collaboration and teamwork**, by forming and proactively participating in multidisciplinary, multi-centric, national and international teams.

The **mission** of the ISCIII is to contribute to improving the health of all citizens through science and the generation of knowledge.



The **vision** of the ISCIII is to be a national and international benchmark organization in public health and in the development and funding of biomedical research in Spain.



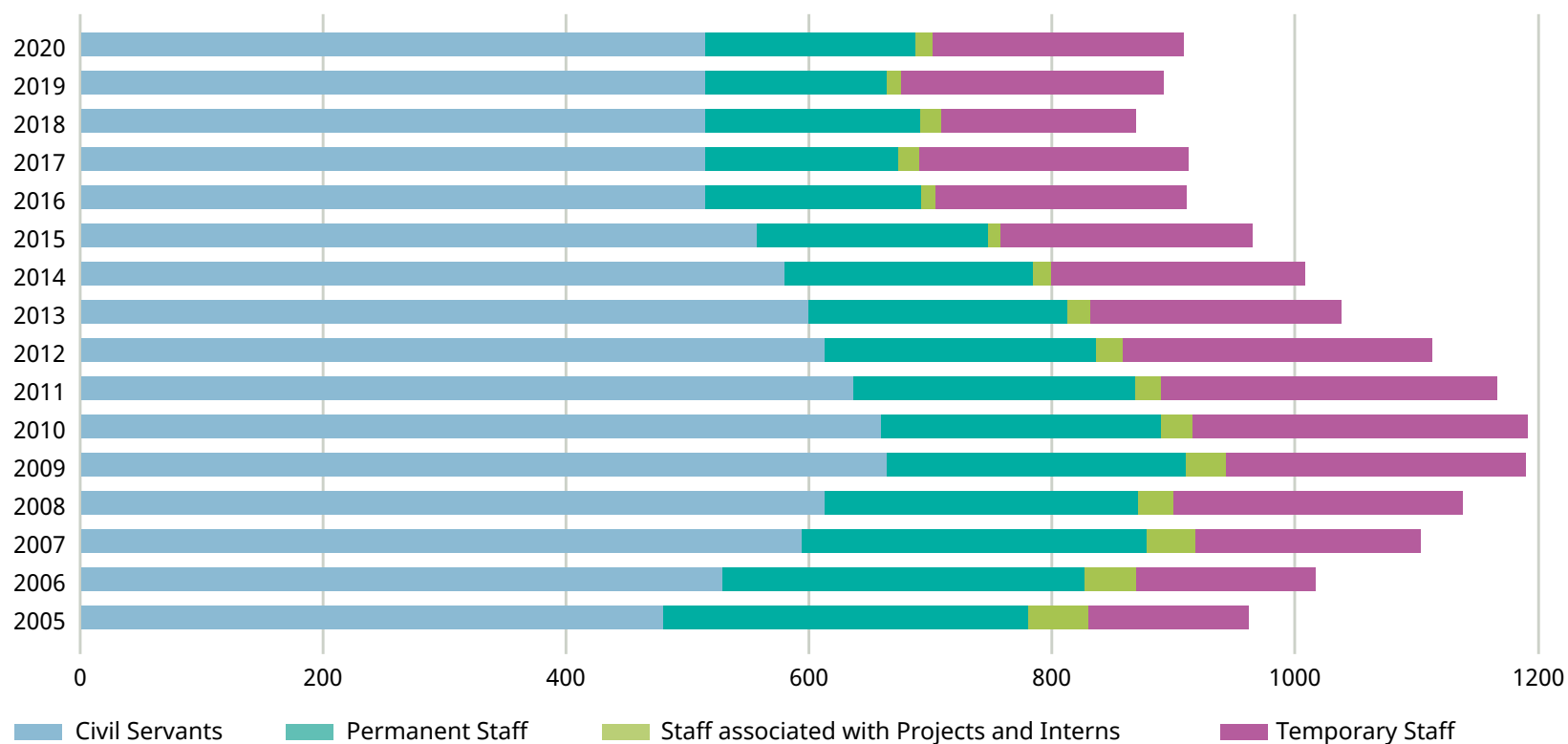


2.2. Human Resources

In 2020, the downward trend in ISCIII staff numbers observed in the past few years has changed. The total number of employees on December 31, 2020, increased by 22 employees since the same date of the previous year, to reach a total number of 908. The employees are distributed over the following groups by relationship, qualification group and gender, as detailed in the table below.

Table. List of ISCIII staff in 2020 distributed over collectives, groups and sex

31/12/20		CIVIL SERVANTS	%	PERMANENT STAFF	%	TEMPORARY STAFF	%	TOTAL STAFF	%
A1/G1	WOMEN	184	62 %	22	79 %	100	68 %	306	65 %
	MEN	111	38 %	6	21 %	46	32 %	163	35 %
	TOTAL	295		28		146		469	
A2/G2	WOMEN	58	81 %	4	80 %	1	33 %	63	79 %
	MEN	14	19 %	1	20 %	2	67 %	17	21 %
	TOTAL	72		5		3		80	
C1/G3	WOMEN	80	78 %	47	72 %	46	82 %	173	77 %
	MEN	23	22 %	18	28 %	10	18 %	51	23 %
	TOTAL	103		65		56		224	
C2/G4	WOMEN	32	71 %	17	63 %	0		49	68 %
	MEN	13	29 %	10	37 %	0		23	32 %
	TOTAL	45		27		0		72	
E/G5	WOMEN	0		30	64 %	0		30	61 %
	MEN	1	100 %	17	36 %	1	100 %	19	39 %
	TOTAL	1		47		1		49	
WOMEN		354	69 %	120	70 %	147	71 %	621	69 %
MEN		162	31 %	52	30 %	59	29 %	273	21 %
TOTAL		516	58 %	172	19 %	206	23 %	894	
FGIN	WOMEN							9	64 %
INTERNS	MEN							5	36 %
TOTAL								14	
TOTAL								908	

Figure. Changes in number of ISCIII staff in recent years

As a consequence of the 2017, 2018 and 2019 Public Employment Offers (OEP), an increase in the number of employees is foreseen; the point of inflection was in July 2020, with the incorporation of the first civil servants from the 2017 OEP. The following table details the increase in vacancies, both for external recruitment and for internal promotion, derived from the OEP in 2017, 2018 and 2019.

Table. Executive summary OEP 2017-2019 ISCIII

OEP 2017 EXTERNAL RECRUITMENT							
LEVELS (7)	C1 5024 RESEARCH ASSISTANTS	A2 6156 SPECIALIST TECHNICIANS OPIS	A1 6155 SENIOR SPECIALIST TECHNICIANS	A1 6152 TENURED SCIENTISTS	A1 6151 SCIENTIFIC RESEARCHERS	A1 6150 RESEARCH PROFESSORS	TOTAL
No. of positions offered	16	16	17	10	3	1	63
OEP 2017-2018 INTERNAL PROMOTION							
LEVELS (7)	C1 5024 RESEARCH ASSISTANTS	A2 6156 SPECIALIST TECHNICIANS OPIS	A1 6155 SENIOR SPECIALIST TECHNICIANS	A1 6152 TENURED SCIENTISTS	A1 6151 SCIENTIFIC RESEARCHERS	A1 6150 RESEARCH PROFESSORS	TOTAL
No. of positions offered	9	11	17	5	13	2	57
OEP 2018-2019 EXTERNAL RECRUITMENT							
LEVELS	C1 5024 RESEARCH ASSISTANTS	A2 6156 SPECIALIST TECHNICIANS	A1 6155 SENIOR SPECIALIST TECHNICIANS	A1 6152 TENURED SCIENTISTS	A1 6151 SCIENTIFIC RESEARCHERS	A1 6150 RESEARCH PROFESSORS	TOTAL
No. of positions offered	28	18	42	20	1	1	110
OEP 2019 INTERNAL PROMOTION							
LEVELS	C1 5024 RESEARCH ASSISTANTS	A2 6156 SPECIALIST TECHNICIANS	A1 6155 SENIOR SPECIALIST TECHNICIANS	A1 6152 TENURED SCIENTISTS	A1 6151 SCIENTIFIC RESEARCHERS	A1 6150 RESEARCH PROFESSORS	TOTAL
No. of positions to be covered	2	4	8	5	5	2	26

2.3. Financial Resources

The budget approved for the ISCIII in 2020 was €271,339,180. This amount was increased by various budgetary modifications that resulted in an increase of €111,288,030, so that **the final budget for 2020 amounted to €382,627,210**. Thanks to these modifications, higher numbers have been achieved than in recent years. In the fiscal year 2019, the actual revenue budget execution in percentage terms was 116.81%, after excluding from the calculation the increase in the final forecasts of the Treasury Surplus, derived from the financing of credit modifications for the amount of 37.5 million Euros. In the fiscal year 2020, the actual revenue budget execution in percentage terms was 97.68%, after excluding from the calculation the increase in the final forecasts of the Treasury Surplus, derived from the financing of credit modifications for the amount of 48.4 million Euros.

The following table shows the evolution of the ISCIII's budget since 2010.

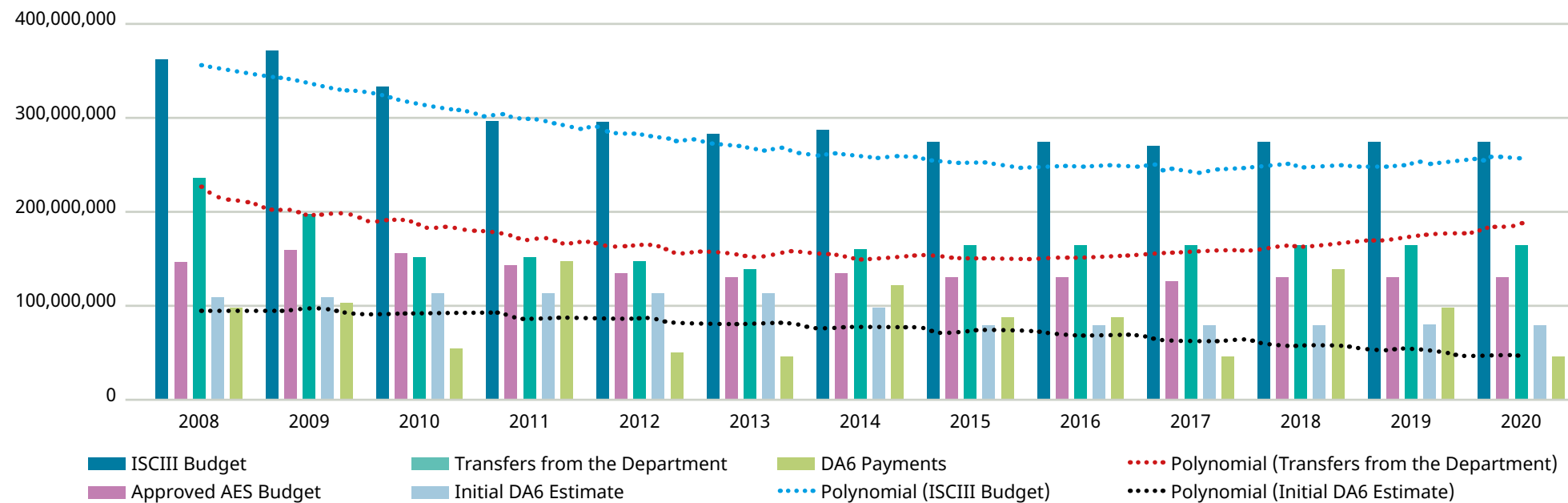
Table. Evolution of the ISCIII budget from 2010-2020 (thousands of Euros)

Expenditure	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Initial credit	332,412.38	300,052.03	293,446.46	279,965.92	286,762.84	273,820.83	272,128.90	269,957.38	271,339.18	271,339.18	271,339.18
Amendments	1,457.00	1,000.00	57.65	10,550.16	7,909.44	5,279.46	4,632.11	4,279.80	4,541.63	43,346.19	111,288.03
Final Credit (FC)	333,869.38	301,052.03	293,504.11	290,516.08	294,672.28	279,100.29	276,761.01	274,237.18	275,880.81	314,685.37	382,627.21
Net liabilities recognized (NLR)	315,322.57	290,551.31	272,760.22	273,278.58	271,977.10	271,730.91	262,716.23	257,642.51	260,825.88	292,962.15	363,418.82
% NLR/FC	94.44%	96.51%	92.93%	94.07%	92.30%	97.36%	94.93%	93.95%	94.54%	93.10%	94.98%
Income	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Initial forecasts	332,412.38	300,052.03	293,446.46	279,965.92	286,762.84	273,820.83	272,128.90	269,957.38	271,339.18	271,339.18	271,339.18
Amendments	1,457.00	1,000.00	57.65	10,550.16	7,909.44	5,279.46	4,632.11	4,279.80	4,541.63	43,346.19	111,288.03
Final forecasts (FF)	333,869.38	301,052.03	293,504.11	290,516.08	294,672.28	279,100.29	276,761.01	274,237.18	275,880.81	314,685.37	382,627.21
Net assets recognized (NAR)	230,697.78	315,736.61	226,552.63	224,278.53	354,107.01	283,753.13	275,272.66	222,471.91	365,432.15	323,781.63	326,429.52
% NAR/FF	69.10%	104.88%	77.19%	77.20%	120.17%	101.67%	99.46%	81.12%	132.46%	102.89%	85.31%

Table. Evaluation of the ISCIII's Budget 2008-2020 broken down according to the main sources of funding

Year	ISCIII budget	Approved budget AES	Departmental Transfers	Initial DA6 Estimate	DA6 Payments
2008	367,246,840.00	145,403,450.00	233,767,000.00	105,000,000.00	96,605,326.98
2009	369,704,330.00	158,549,270.00	197,793,860.00	105,000,000.00	102,246,921.34
2010	332,412,380.89	153,560,832.09	150,575,000.00	110,000,000.00	51,659,904.81
2011	300,052,030.00	141,259,770.00	150,575,000.00	110,000,000.00	144,992,848.18
2012	293,446,460.00	133,347,770.00	143,969,430.00	110,000,000.00	47,409,319.33
2013	279,965,920.00	126,547,770.00	138,187,490.00	110,000,000.00	43,761,910.01
2014	286,762,840.00	132,886,010.00	156,187,490.00	100,000,000.00	120,677,198.42
2015	273,820,830.00	127,027,790.00	162,245,480.00	75,000,000.00	83,673,870.60
2016	272,128,900.00	126,207,790.00	163,692,200.00	75,000,000.00	85,525,823.98
2017	269,957,380.00	125,907,790.00	161,394,470.00	75,000,000.00	42,135,582.88
2018	271,339,180.00	126,511,690.00	162,776,270.00	75,000,000.00	137,131,641.90
2019	271,339,180.00	126,511,690.00	162,776,270.00	75,000,000.00	97,948,743.82
2020	271,339,180.00	126,511,690.00	162,776,270.00	75,000,000.00	43,749,282.06
	3,859,515,450.89	1,750,233,312.09	2,146,716,230.00	1,200,000,000.00	1,097,518,374.31



Graph. Evolution of the ISCIII budget 2008-2020 and main sources of funding





3.

Promotion
and coordination
of research
and innovation

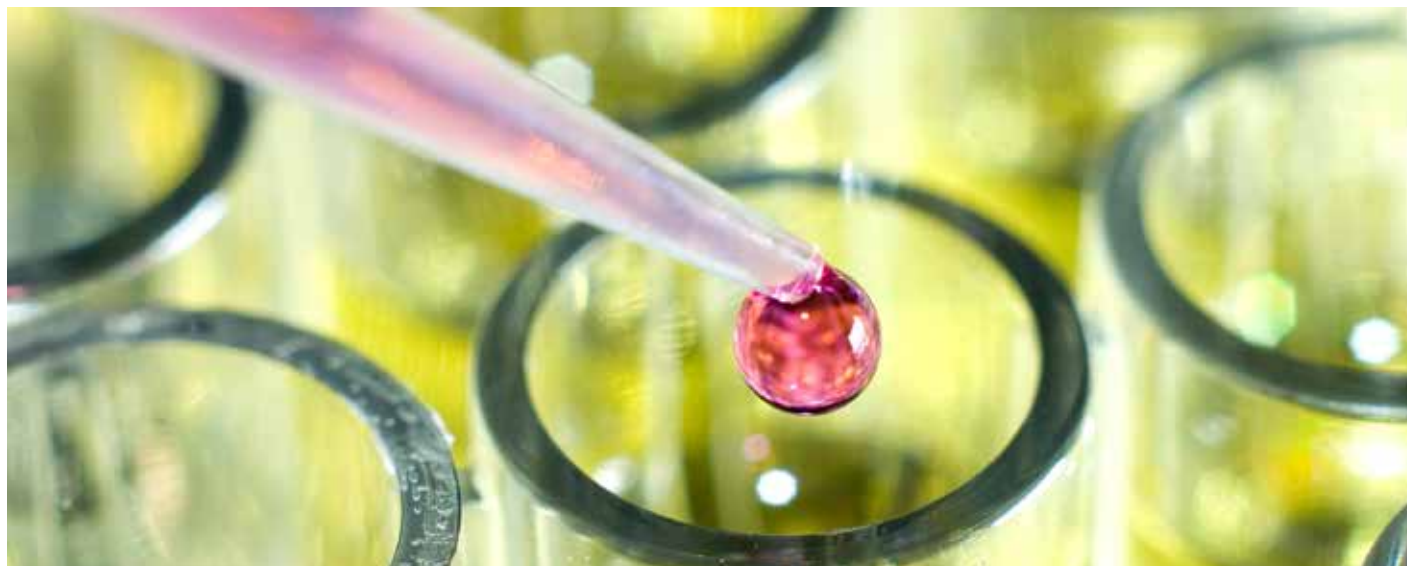
3.1. Health Research and Development Strategy

To achieve these objectives, the AES 2020 proposes a set of synergistic and complementary instrumental actions that are part of the National Subprograms for Training, Incorporation and Mobility of the National Program for Training Talent and its Employability in R&D&I, and the National Subprograms for Institutional Reinforcement and for Knowledge Generation; these latter Subprograms form part of the National Program for Knowledge Generation and for Reinforcement of the Spanish R&D&I System.

The **Health Research and Development Strategy** (hereinafter, AES) is part of the Spanish National Plan for Scientific and Technical Research and Innovation for the period 2017-2020 (hereinafter, the Spanish National R&D&I Plan).

The Spanish National R&D&I Plan 2017-2020 comprises four National Programs, divided into Subprograms, and two R&D Strategies that are integrated into the fourth of these programs: the National R&D&I Program devoted to the Challenges of Society.

The first of the indicated challenges is the Health, Demographic Change and Well-being Challenge, which includes, as a specific programmatic action, the Health Research and Development Strategy 2017-2020. This strategy aims to contribute to promote the health and well-being of the citizens and to develop preventive, diagnostic, therapeutic, rehabilitative and palliative aspects of disease by reinforcing and increasing the international competitiveness of R&D&I of the Spanish National Health System (SNS) and healthcare sector-related companies, with the aim of placing Spain in an avant-garde scenario in which health acts as a fundamental axis of economic and social development.



National Program for Training Talent and its Employability in R&D&I

• National Subprogram for Training:

- ▶ Predoctoral contracts for training in health research
- ▶ Grants for Training in Health Research Management (FGIN)
- ▶ Río Hortega contracts

• National Subprogram for Incorporation:

- ▶ Contracts for health research management in Health Research Institutes (IIS)
- ▶ Miguel Servet contracts
- ▶ Sara Borrell contracts
- ▶ Juan Rodés contracts
- ▶ Contracts for the reinforcement of research activity in the SNS
- ▶ Bioinformatics technical research support staff contracts at the ISS

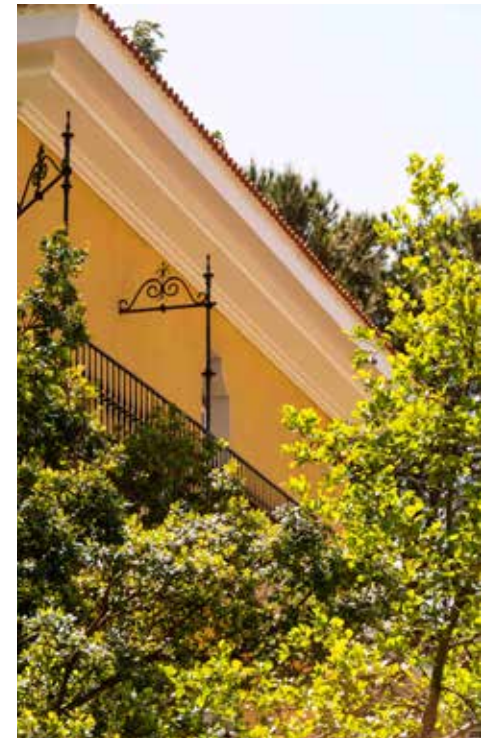
• National Subprogram for Mobility:

- ▶ Mobility grants for research staff

National Program for Knowledge Generation and Reinforcement of the Spanish R&D&I System

• National Subprogram for Knowledge Generation

- ▶ Research Projects in Health
 - A. Research Projects in Health
 - B. Technological development projects in health
- ▶ International joint programming projects
- ▶ Independent clinical research projects



The General Sub-Directorate for Research Assessment and Promotion of the ISCIII was the body competent for managing this procedure, and the ISCIII was the managing body for the activities arising from the AES, which are carried out through a single competitive call.

3.1.1. National program for training talent and its employability

National Subprogram for Training:

The **predoctoral contracts for training in health research** are intended for the initial training of researchers in health sciences and technologies through the completion of a doctoral thesis. There are two modalities:

PFIS Contracts: predoctoral contracts for training in health research.

Aimed at researchers whose group leaders obtained an AES health research project through the 2019 call.

Through the 2020 call, 117 PFIS contracts were funded.

AUTONOMOUS COMMUNITY	PREDOCT. CONTRACTS FOR TRAINING IN HEALTH RESEARCH (PFIS) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	15	8	23	8	5	13	1,071,200	56.52%
Aragón	3	1	4	2	0	2	164,800	50.00%
Asturias	3	0	3	3	0	3	247,200	100.00%
Baleares	2	1	3	0	1	1	82,400	33.33%
Canarias	1	0	1	1	0	1	82,400	100.00%
Cantabria	3	0	3	1	0	1	82,400	33.33%
Castilla y León	4	2	6	2	2	4	329,600	66.67%
Cataluña	42	26	68	27	11	38	3,131,200	55.88%
C. Valenciana	11	5	16	7	4	11	906,400	68.75%
Galicia	8	2	10	6	0	6	494,400	60.00%
Madrid	26	15	41	15	13	28	2,307,200	68.29%
Murcia	3	1	4	2	1	3	247,200	75.00%
Navarra	5	4	9	3	2	5	412,000	55.56%
País Vasco	2	1	3	1	0	1	82,400	33.33%
TOTAL	128	66	194	78	39	117	9,640,800	60.31%

Success rate is the ratio of funded and eligible applications, expressed in %.

i-PFIS Contracts: IIS-Enterprise doctor fellowships in health sciences and technology. This initiative is aimed at **promoting public-private collaboration** by carrying out part of the training programs in workplaces of private companies and accredited Health Research Institutes (IIS).

AUTONOMOUS COMMUNITY	IIS-ENTERPR. DOCT. FELLOWSHIPS IN HEALTH SCIENCES & TECHN. (I-PFIS) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	5	1	6	1	0	1	82,400	16.67%
Aragón	2	0	2	0	0	0	0	0.00%
Cataluña	6	2	8	4	1	5	412,000	62.50%
C. Valenciana	2	1	3	0	0	0	0	0.00%
Madrid	3	1	4	0	0	0	0	0.00%
País Vasco	2	0	2	0	0	0	0	0.00%
TOTAL	20	5	25	5	1	6	494,400	24.00%

Success rate is the ratio of funded and eligible applications.

For both modalities, these amounts correspond to the total duration of the grant. The financial allocation is €20,600 per year for a maximum of 4 years.



Río Hortega contracts. These contracts are meant for hiring professionals who have successfully completed Specialized Healthcare Training (FSE), **exclusively in public healthcare institutions:**

The financial allocation for the Río Hortega contracts was €20,600 per year for trained nurses and €26,866 per year for the other trained professionals during two years.

Through the 2020 call,
132 contracts were funded.

AUTONOMOUS COMMUNITY	RÍO HORTEGA CONTRACTS (CM) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	27	11	38	18	8	26	1,384,500	68.42%
Aragón	2	2	4	2	2	4	214,928	100.00%
Asturias	2	0	2	2	0	2	107,464	100.00%
Baleares	0	1	1	0	0	0	0	0.00%
Canarias	0	1	1	0	0	0	0	0.00%
Cantabria	3	0	3	3	0	3	161,196	100.00%
Castilla y León	2	2	4	2	2	4	214,928	100.00%
Castilla-La Mancha	1	1	2	0	0	0	0	0.00%
Cataluña	37	24	61	19	17	36	1,921,820	59.02%
C. Valenciana	9	3	12	7	3	10	537,320	83.33%
Galicia	9	3	12	8	3	11	591,052	91.67%
Madrid	27	16	43	21	10	31	1,653,160	72.09%
Murcia	1	3	4	1	2	3	161,196	75.00%
Navarra	1	0	1	1	0	1	53,732	100.00%
País Vasco	3	1	4	1	0	1	53,732	25.00%
Rioja (La)	0	0	0	0	0	0	0	-
TOTAL	124	68	192	85	47	132	7,055,028	68.75%

Success rate is the ratio of funded and eligible applications.

With regard to the **grants for Training in Health Research Management (FGIN)**, 19 eligible applications were received and 7 were granted; the gross financial allocation is €21,000 per year for a duration of 36 months.

National Subprogram for Incorporation:

Contracts for Health Research Management (GIS) in accredited Health Research Institutes are aimed at managers so that they may carry out support activities for managing R&D&I activities in Health Research Institutes (IIS).

IIS who had an active Health Research Management Contract granted in the 2018 or 2019 AES were not allowed to participate in this call.

AUTONOMOUS COMMUNITY	HEALTH RESEARCH MANAGERS IN IIS (GIS) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	2	1	3	1	1	2	161,196	66.67%
Castilla y León	1	0	1	0	0	0	0	0.00%
Cataluña	3	2	5	0	2	2	161,196	40.00%
Galicia	1	0	1	1	0	1	80,598	100.00%
Madrid	6	1	7	2	0	2	161,196	28.57%
Navarra	0	1	1	0	0	0	0	0.00%
País Vasco	1	2	3	0	0	0	0	0.00%
TOTAL	14	7	21	4	3	7	564,186	33.33%

Success rate is the ratio of funded and eligible applications.

The financial allocation for these contracts is €26,866 per year during 3 years.



Miguel Servet contracts are meant for doctors who obtained their PhD degree between January 1, 2008 and December 31, 2015 and who finished or are in the last (third) year of a Sara Borrell contract, or who finished a Río Hortega contract or are in its last (second) year and obtained a PhD degree.

The financial allocation for these contracts is €40,500 per year during five years. They are complemented by an additional aid of €40,000 to cover expenses directly related to carrying out their research activities.

As a **new element** of the AES 2020 call, these contracts are endowed with €66,100 for the creation of permanent jobs, with the aim of promoting the stable incorporation of translational researchers into SNS centers. This aid will be granted to R&D Centers that are beneficiaries of one of these contracts and that create and fill the position on a permanent basis.

44 Miguel Servet contracts were funded.

AUTONOMOUS COMMUNITY	MIGUEL SERVET CONTRACTS (CP) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	9	9	18	3	3	6	1,455,000	33.33%
Aragón	2	2	4	0	0	0	0	0.00%
Asturias	1	1	2	1	1	2	485,000	100.00%
Baleares	1	3	4	0	1	1	242,500	25.00%
Canarias	0	1	1	0	1	1	242,500	100.00%
Castilla y León	2	3	5	0	0	0	0	0.00%
Cataluña	19	17	36	7	7	14	3,395,000	38.89%
C. Valenciana	9	6	15	3	2	5	1,212,500	33.33%
Galicia	2	2	4	2	1	3	727,500	75.00%
Madrid	18	7	25	5	5	10	2,425,000	40.00%
Murcia	3	2	5	1	0	1	242,500	20.00%
País Vasco	6	1	7	1	0	1	242,500	14.29%
TOTAL	72	54	126	23	21	44	10,670,000	34.92%

Success rate is the ratio of funded and eligible applications.

The Miguel Servet type II contracts are meant for doctors with still active Miguel Servet type I contracts granted in the 2015 or earlier AES calls, with an outstanding research track record during their contract period.

AUTONOMOUS COMMUNITY	MIGUEL SERVET CONTRACTS (CPII) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	2	2	4	2	2	4	405,000	100.00%
Canarias	0	1	1	0	1	1	101,250	100.00%
Cataluña	4	3	7	4	3	7	708,750	100.00%
C. Valenciana	2	1	3	2	1	3	303,750	100.00%
Galicia	0	1	1	0	1	1	101,250	100.00%
Madrid	5	0	5	5	0	5	506,250	100.00%
Navarra	0	1	1	0	1	1	101,250	100.00%
Rioja (La)	1	1	2	1	1	2	202,500	100.00%
TOTAL	14	10	24	14	10	24	2,430,000	100.00%

Success rate is the ratio of funded and eligible applications.

The financial allocation for these contracts is €45,000 in the first year. They are co-funded at 75% and 50% in the following years. They have a duration of 3 years.



The **Sara Borrell contracts** are meant for recently-qualified doctors in the field of health sciences and technologies, in centers with clinical healthcare activity.

62 contracts were funded



AUTONOMOUS COMMUNITY	SARA BORRELL CONTRACTS (CD) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	18	5	23	11	4	15	1,208,970	65.22%
Aragón	0	2	2	0	1	1	80,598	50.00%
Asturias	0	2	2	0	2	2	161,196	100.00%
Baleares	2	0	2	2	0	2	161,196	100.00%
Canarias	3	0	3	0	0	0	0	0.00%
Cantabria	0	1	1	0	0	0	0	0.00%
Castilla-La Mancha	3	0	3	0	0	0	0	0.00%
Cataluña	28	14	42	14	5	19	1,531,362	45.24%
C. Valenciana	9	3	12	7	0	7	564,186	58.33%
Galicia	4	1	5	3	1	4	322,392	80.00%
Madrid	15	9	24	8	3	11	886,578	45.83%
Navarra	2	1	3	0	0	0	0	0.00%
País Vasco	5	0	5	1	0	1	80,598	20.00%
TOTAL	89	38	127	46	16	62	4,997,076	48.82%

Success rate is the ratio of funded and eligible applications.

The financial allocation for these contracts is €26,866 per year during 3 years.

Juan Rodés Contracts are intended for Specialist medical staff with experience in research in health sciences and technologies, who hold a PhD degree or have previously completed a Rio Hortega contract or hold a 2018 Rio Hortega contract. They are implemented in public SNS healthcare facilities that are part of an accredited IIS.

The healthcare-related part must be carried out in a hospital and the recipient of the contract must simultaneously carry out the research activity according to the proposal submitted. The financial allocation for these contracts is €45,000 per year during 4 years.

25 Juan Rodés contracts have been funded with the following distribution.

AUTONOMOUS COMMUNITY	JUAN RODÉS CONTRACTS (JR) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	4	3	7	3	2	5	900,000	71.43%
Aragón	1	1	2	0	1	1	180,000	50.00%
Cataluña	8	6	14	7	5	12	2,160,000	85.71%
C. Valenciana	4	2	6	2	1	3	540,000	50.00%
Galicia	3	1	4	2	0	2	360,000	50.00%
Madrid	4	3	7	1	1	2	360,000	28.57%
TOTAL	24	16	40	15	10	25	4,500,000	62.50%

Success rate is the ratio of funded and eligible applications.



The objective of the **contracts for the intensification of research activity in the SNS** is to hire specialist physicians or professionals who hold a degree in nursing or physiotherapy in public SNS centers, so that they may perform part of the clinical care activities of professionals who are simultaneously carrying out research activities. These grants will allow the recruitment of staff in 2021 and, where appropriate, in 2022 to free up time equivalent to 50% of the clinical care activities in annual calculation of the staff who will replace the candidate.

The financial allocation for these contracts is €30,000 for physicians and €20,000 for nursing, odontology and/or physiotherapy staff.

A total of 58 contracts have been funded for the intensification of research activities, with the following distribution.

AUTONOMOUS COMMUNITY	CONTR. FOR THE INTENSIFIC. OF RESEARCH ACTIVITY (INT) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	0	10	10	0	9	9	450,000	90.00%
Aragón	1	2	3	1	2	3	180,000	100.00%
Asturias	0	1	1	0	1	1	30,000	100.00%
Baleares	1	0	1	0	0	0	0	0.00%
Canarias	0	1	1	0	0	0	0	0.00%
Castilla y León	2	3	5	2	2	4	210,000	80.00%
Cataluña	10	14	24	8	12	20	1,110,000	83.33%
C. Valenciana	2	2	4	2	2	4	210,000	100.00%
Galicia	2	2	4	1	2	3	180,000	75.00%
Madrid	10	9	19	5	8	13	760,000	68.42%
Murcia	1	1	2	0	1	1	30,000	50.00%
Navarra	1	0	1	0	0	0	0	0.00%
País Vasco	0	1	1	0	0	0	0	0.00%
TOTAL	30	46	76	19	39	58	3,160,000	76.32%

Success rate is the ratio of funded and eligible applications.

Bioinformatics technical support staff contracts for research at the IIS. The purpose of these contracts is to hire staff for two years to carry out scientific and technical activities in the IIS.

The financial allocation for these contracts is €26,866 per year during two years.

AUTONOMOUS COMMUNITY	BIOINFORM. TECH. SUPPORT STAFF FOR RESEARCH AT IIS (CA) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Aragón	0	1	1	0	0	0	0	0.00%
Cataluña	1	1	2	0	1	1	53,732	50.00%
TOTAL	1	2	3	0	1	1	53,732	33.33%

Success rate is the ratio of funded and eligible applications.





National Subprogram for Mobility:

The objective of these grants is to fund stays in one of the following modalities:

Mobility of SNS healthcare professionals and researchers (M-BAE) for funding stays of SNS healthcare professionals and researchers in prestigious national or foreign institutions.

The financial allocation for these contracts ranges from €80 to €115 per day of the stay at the center, according to whether it is a Spanish or a foreign center, and its duration varies between 60 and 365 days.

AUTONOMOUS COMMUNITY	MOB. OF SNS HEALTHCARE PROF. + RESEARCHERS (M-BAE) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Aragón	1	0	1	0	0	0	0	0.00%
Cataluña	2	6	8	2	6	8	157,550	100.00%
Madrid	0	1	1	0	1	1	14,030	100.00%
Murcia	1	1	2	0	1	1	7,360	50.00%
TOTAL	4	8	12	2	8	10	178,940	83.33%

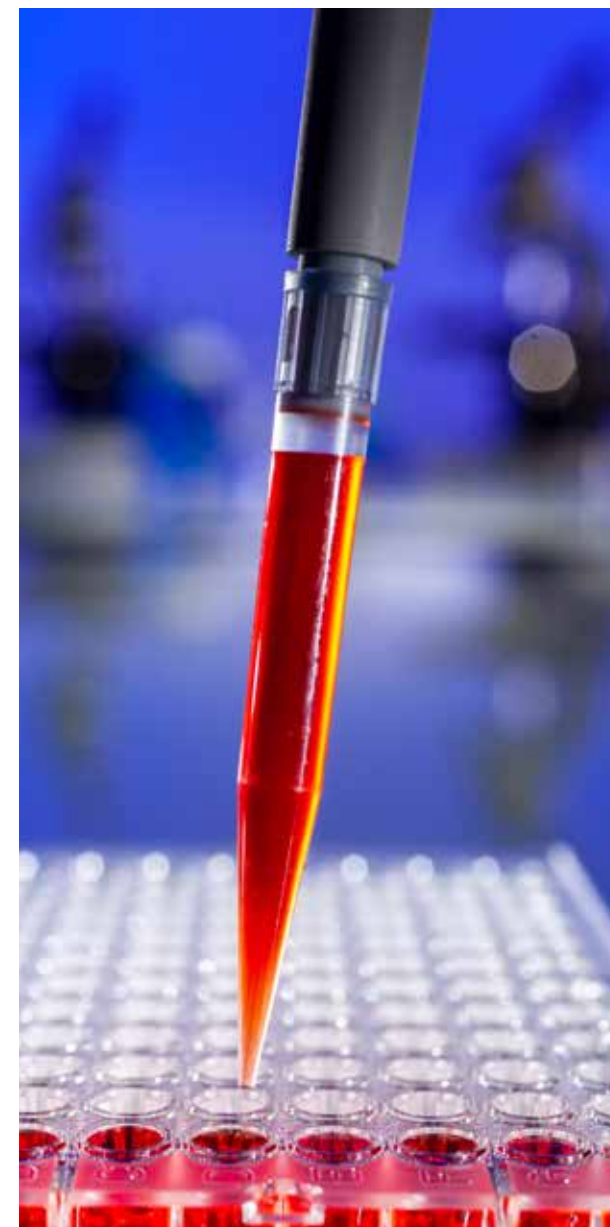
Success rate is the ratio of funded and eligible applications.

Mobility of research staff contracted within the framework of the AES (M-AES). This grant is aimed at those who hold a PFIS, i-PFIS, Rio Hortega, Sara Borrell, Juan Rodés, or Miguel Servet (both types) contract. It is meant for R&D stays abroad or in Severo Ochoa Centers of Excellence and María de Maeztu Units of Excellence.

The financial allocation is €80 or €115 per day during the placement at the center, depending on whether the stay is at a Spanish or a foreign center, for a duration between 60 and 180 days in the case of PFIS, i-PFIS, Rio Hortega, Juan Rodés, and Miguel Servet contract holders, and up to 365 days for Sara Borrell contract holders.

AUTONOMOUS COMMUNITY	MOB. OF RES. STAFF CONTR. IN FRAMEWORK OF AES (M-AES) - 2020							
	ELIGIBLE APPLICATIONS			FUNDED				SUCCESS RATE
	Women	Men	Total	Women	Men	Total	Amount (€)	
Andalucía	9	6	15	3	1	4	82,110	26.67%
Aragón	1	0	1	1	0	1	10,465	100.00%
Canarias	0	1	1	0	1	1	11,040	100.00%
Cantabria	1	0	1	1	0	1	7,015	100.00%
Cataluña	20	9	29	17	6	23	331,200	79.31%
C. Valenciana	2	2	4	2	1	3	47,020	75.00%
Galicia	1	0	1	0	0	0	0	0.00%
Madrid	10	5	15	4	2	6	102,005	40.00%
Murcia	1	0	1	0	0	0	0	0.00%
TOTAL	45	23	68	28	11	39	590,855	57.35%

Success rate is the ratio of funded and eligible applications.



3.1.2. National Program for Knowledge Generation and Reinforcement of the Spanish R&D&I System

National Subprogram for Knowledge Generation:

The Health Research and Development Strategy 2020 included a set of instrumental activities framed within Subprograms. Each of the subprograms involved one or several actions.

Within the Subprogram for Knowledge Generation, calls were launched for Research Projects in Health (both for Research Projects in Health and for Technological Development Projects in Health), for complementary actions to international joint programming initiatives, and for Independent Clinical Research Projects.

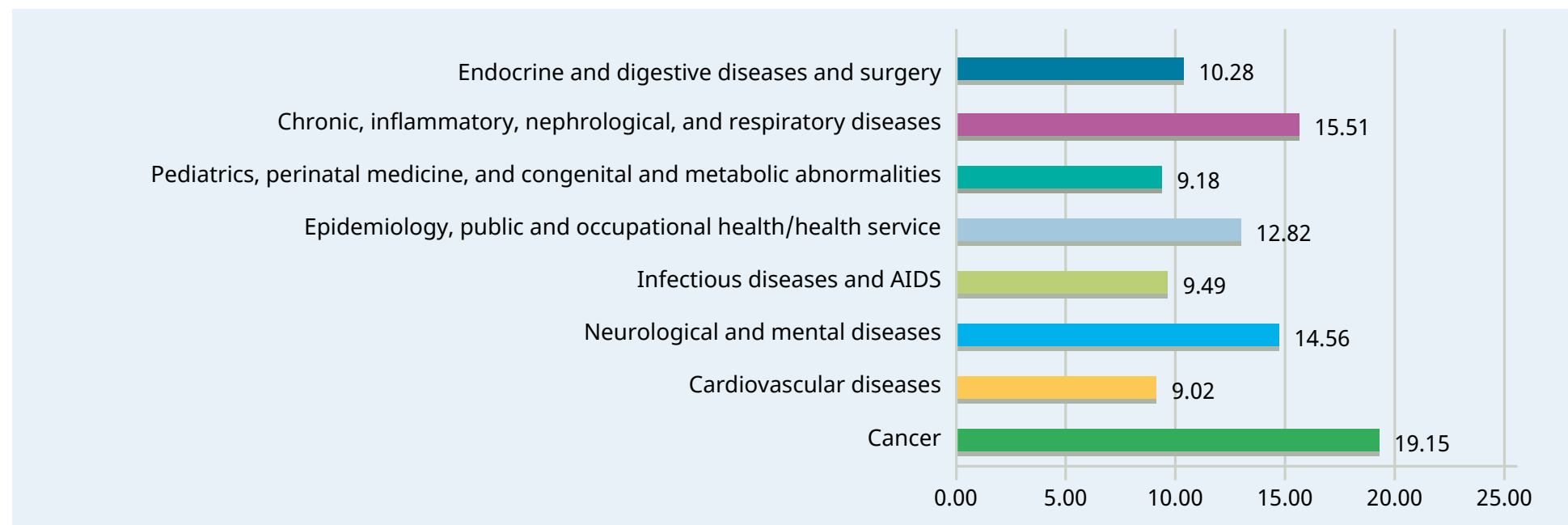
RESEARCH PROJECTS IN HEALTH

The objective of this call was to fund projects in any of the following types:

- **Research projects in health.** Projects of proven quality whose principle objectives were to: a) transfer and apply scientific and technical knowledge in order to improve the prevention, diagnosis, and treatment of diseases as well as activities promoting public health and health services; b) foster synergies, promote talent and employability, and strengthen the governance structures that add scientific and technical skills to SNS healthcare facilities; c) promote the funding of emerging researchers' first research projects that are of proven quality.

A total of 1,501 applications were received and 632 were funded for a total of €76,284,295.128. The regions that requested most projects were Cataluña (34.44%), Madrid (23.05%), and Andalucía (11.33%). This was also the case in terms of funding: 36.08%, 23.89%, and 10.13%, respectively.



Graph. Funding for research projects (RP) in health: % Concession according to thematic area

- **Technological development projects in health.** These are applied projects that have the objective of promoting innovation in SNS healthcare centers and the transfer of innovative solutions as well as the generation of benefits for the community. At the same time, they allow for alliances to be established between research bodies and companies in the pharmaceutical, biotechnology, and medical and healthcare technology sectors.

A total of 112 applications were received and 25 were funded for a total of €2,200,193.60. Grants were distributed in Andalucía, Aragón, Cataluña, Comunidad Valenciana, Madrid and País Vasco.



COMPLEMENTARY ACTIONS TO INTERNATIONAL JOINT PROGRAMMING INITIATIVES

The objective of this action is to fund research projects participating in calls launched by the international joint programming initiatives in health. These projects are carried out within the framework of transnational consortia for which ISCIII has committed to support relevant collaborative projects and in which Spanish research teams participate together with teams from other countries.

The public international calls within the framework of the complementary actions are detailed in the following table:



Table. Name and characteristics of the Complementary Actions to International Joint Programming Initiatives

Name of the initiative (Acronym)	Type of call	Topic of the call
Active and Assisted Living Programme (AAL)	Co-funded call for three-year projects	Healthy Ageing through Digital Solutions and Ecosystems
Active and Assisted Living Programme (AAL)	Co-funded call for one-year projects	Healthy Ageing through Digital Solutions and Ecosystems
ERA-Net cofund in Personalized Medicine (ERAPerMed)	Call for three-year projects	Personalized Medicine: Multidisciplinary Research towards Implementation
Joint Programming Initiative on Antimicrobial Resistance Research (JPI-EC-AMR)	Call for networks for up to 2 years	JPIAMR Network Plus 2020
ERA-Net cofund on Aquatic Pollutants	Co-funded call for three-year projects	Risks posed to human health and the environment by pollutants and pathogens present in water resources
European Research Area Network on Cardiovascular Diseases (ERA-CVD)	Call for three-year projects	Prevention of Brain Damage through Early Detection of Cardiovascular Diseases
Collaborative Research in Computational Neuroscience (CRCNS)	Call for three-year projects	Collaborative Research in Computational Neuroscience: Innovative Approaches to Science and Engineering Research on Brain Function
The Network of European Funding for Neuroscience Research (NEURON)	Call for three-year projects	Multinational Research Projects on Sensory Disorders
The Network of European Funding for Neuroscience Research (NEURON - ELSA)	Call for three-year projects	Research Projects on Ethical, Legal, and Social Aspects (ELSA) of Neuroscience



A total of 106 applications were received and 31 were funded for a total of €4,598,134.31.

Name of the initiative (Acronym)	Type of call	Topic of the call
ERA-Net Cofund to support the Joint Programming in Neurodegenerative Diseases (JPco-fuND-2)	Call for three-year projects	Novel methods and technologies on imaging and brain stimulation techniques related to Neurodegenerative Diseases
European Joint Program cofund on Rare Diseases (EJP RD)	Co-funded call for three-year projects	Pre-clinical Research to Develop Effective Therapies for Rare Diseases
Joint Programming Initiative "A Healthy Diet for Healthy Life" ERA-Net cofund on HDHL (ERA HDHL)	Call for three-year projects	Development of targeted nutrition for prevention and treatment of undernutrition in elderly
European Network for translational collaborative RTD projects on Nanomedicine (EuroNanoMed)	Call for three-year projects	European Innovative research & technological development projects in Nanomedicine
Interest Group of the European Union and Community of Latin American and Caribbean countries (EU-CELAC IG)	Call for three-year projects	Infectious diseases
Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo [Ibero-American Program on Science and Technology for Development] (CYTED)	Call for three-year projects	Research on ND diseases in Ibero-America, with emphasis on the development of Technologies for Prevention, Diagnosis and Treatment

Table. Programs awarded

PROGRAM	AWARDED
CRCNS	1
EJP RD	6
ERA PerMed	7
ERA-CVD	3
EuroNanoMed-3	6
JPI HDHL - 3 years	2
JPI-EC-AMR	1
JPND-JPco-fuND	3
NEURON ELSA	2
TOTAL	31

INDEPENDENT CLINICAL RESEARCH PROJECTS

The objective of this action is to promote independent clinical research involving medicinal products for human use and/or advanced therapies, by funding projects not supported by the pharmaceutical industry. This action is aimed at the promotion of translational research and the transfer and application of scientific and technical knowledge to improve the treatment of diseases. As a **novelty**, non-scientific reviewers were included for the first time, to evaluate aspects related to the social relevance of the research objectives and the adequacy of the results dissemination plan. This is a step forward in the implementation of the principles of Responsible Research and Innovation.

Table. Independent clinical research projects applied for and awarded by sex of the principal investigator

AUTONOMOUS COMM.	ELIGIBLE			AWARDED			AMOUNT (€)
	Women	Men	Total	Women	Men	Total	
ANDALUCÍA	6	11	17	1	2	3	1,882,870
ARAGÓN	3	0	3	1	0	1	82,500
ASTURIAS	2	0	2	0	0	0	0
BALEARES	0	3	3	0	1	1	82,500
CANARIAS	0	1	1	0	0	0	0
CANTABRIA	0	2	2	0	1	1	593,163
CASTILLA-LA MANCHA	0	2	2	0	1	1	371,500
CASTILLA Y LEÓN	1	0	1	1	0	1	86,900
CATALUÑA	4	21	25	1	8	9	5,185,192
COM. VALENCIANA	2	6	8	1	2	3	1,346,019
GALICIA	0	4	4	0	1	1	795,300
MADRID	4	22	26	1	11	12	8,281,443
MURCIA	0	3	3	0	1	1	218,900
NAVARRA	0	3	3	0	0	0	0
PAÍS VASCO	1	5	6	0	0	0	0
TOTAL	23	83	106	6	28	34	18,926,287.27

A total of 106 applications were received and 34 (32.08%) were funded for a total of **€18,926,287.27**.

A summary of all data on the National Subprogram for Knowledge Generation is detailed below.

Table. Amount granted and success rate by grant and by sex

ACTION	ELIGIBLE	AWARDED	SUCCESS RATE %	AMOUNT (€)	Average fund-ing per project (€)
Technological development projects in health					
Total	112	25	22	2,200,194	88,008
Women	40 (36%)	8 (32%)	20	665,005	83,126
Men	72 (64%)	17 (68%)	24	1,535,189	90,305
Research Projects in Health					
Total	1,501	632	42	76,284,295	120,703
Women	729 (49%)	295 (47%)	40	33,476,406	113,479
Men	772 (51%)	337 (53%)	44	42,807,889	127,026
Complementary actions to international joint programming					
Total	106	31	29	4,598,134	148,327
Women	37 (35%)	9 (29%)	24	1,437,176	159,686
Men	69 (65%)	22 (71%)	32	3,160,958	143,680
Independent Clinical Research Projects					
Total	106	34	32	18,926,287	556,656
Women	23 (22%)	6 (18%)	26	2,512,825	418,804
Men	83 (78%)	28 (82%)	34	16,413,463	586,195
National Subprogram for Knowledge Generation					
Total	1,825	722	40	102,008,910	141,287
Women	829 (45%)	318 (44%)	38	38,091,412	119,784
Men	996 (55%)	404 (56%)	41	63,917,499	158,212

Table. Distribution of Grants Funded According to Autonomous Community

AUTONOMOUS COMMUNITY	DTS		PI		AC		ICI		TOTAL	
	No.	Amount (€)	No.	Amount (€)	No.	Amount (€)	No.	Amount (€)	No.	Amount (€)
ANDALUCÍA	8	692,890.00	64	7,105,417.66	0	0.00	3	1,882,870	75	9,621,177.66
ARAGÓN	1	47,300.00	8	625,207.00	0	0.00	1	82,500	10	755,007.00
ASTURIAS	0	0.00	9	940,049.00	1	222,035.00	0	0	10	1,162,084.00
BALEARES	0	0.00	8	596,245.65	1	168,949.88	1	82,500	10	847,695.53
CANARIAS	0	0.00	8	789,041.00	0	0.00	0	0	8	789,041.00
CANTABRIA	0	0.00	8	1,012,528.00	0	0.00	1	593,163	9	1,605,690.81
CASTILLA - LA MANCHA	0	0.00	0	0.00	1	49,394.62	1	371,500	2	420,894.62
CASTILLA Y LEÓN	0	0.00	13	1,688,990.60	0	0.00	1	86,900	14	1,775,890.60
CATALUÑA	5	543,400.00	228	28,540,820.55	10	1,376,312.08	9	5,185,192	252	35,645,724.51
COM. VALENCIANA	1	145,068.00	35	3,914,883.61	1	169,097.50	3	1,346,019	40	5,575,068.19
EXTREMADURA	0	0.00	4	559,020.00	0	0.00	0	0	4	559,020.00
GALICIA	0	0.00	34	4,378,118.80	3	584,564.31	1	795,300	38	5,757,983.11
MADRID	8	593,175.00	151	17,504,525.50	10	1,714,963.25	12	8,281,443.50	181	28,094,107.25
MURCIA	0	0.00	10	1,522,149.75	0	0.00	1	218,900	11	1,741,049.75
NAVARRA	0	0.00	37	5,130,763.00	3	231,868.67	0	0	40	5,362,631.67
PAÍS VASCO	2	178,360.60	13	1,714,570.00	1	80,949.00	0	0	16	1,973,879.60
RIOJA (LA)	0	0.00	2	261,965.00	0	0.00	0	0	2	261,965.00
TOTAL	25	2,200,193.60	632	76,284,295.12	31	4,598,134.31	34	18,926,287.27	722	102,008,910.30

DTS: Technological development projects in health; PI: research projects in health; AC: complementary actions to international joint programming initiatives; ICI: independent clinical research projects; No.: Number of projects funded.

3.2. COVID-19 Fund

On March 18, 2020, the Official State Gazette published Royal Decree-Law 8/2020 on urgent and extraordinary measures to confront the economic and social impact of COVID-19. The decree-law includes measures to support research on COVID-19, including the authorization of an extraordinary fund for direct grant subsidies for projects and programs for research on the virus and the disease. This fund is called the **COVID-19 Fund**.

Table. Distribution of grants funded according to Autonomous Community

AUTONOMOUS COMMUNITY	APPLICATIONS	AWARDED	SUCCESS RATE %	FUNDING (€)
ANDALUCÍA	132	10	7.6	2,237,665.16
ARAGÓN	40	4	10.0	691,500.00
ASTURIAS	28	2	7.1	158,465.00
BALEARES	21	2	9.5	99,000.00
CANARIAS	20	3	15.0	194,224.00
CANTABRIA	22	3	13.6	157,752.00
CASTILLA - LA MANCHA	20	1	5.0	80,000.00
CASTILLA Y LEÓN	43	2	4.7	197,017.00
CATALUÑA	317	30	9.5	6,038,866.22
COM. VALENCIANA	136	8	5.9	751,829.00
EXTREMADURA	9	1	11.1	110,000.00
GALICIA	69	7	10.1	532,593.00
MADRID	466	44	9.4	11,547,314.00
MURCIA	45	4	8.9	217,400.00
NAVARRA	31	2	6.5	232,000.00
PAÍS VASCO	65	5	7.7	418,000.00
PORTUGAL	2	0		
REINO UNIDO	1	0		
RIOJA (LA)	15	1	6.7	73,400.00
TOTAL	1,482 (*)	129	8.7	23,737,045.38

(*) 22 proposals were cancelled because they were duplicated.

Within this framework, the ISCIII launched a call for expressions of interest to develop **research projects on SARS-CoV-2 and COVID-19, which contribute to improving the public health response and developing new preventive, diagnostic and therapeutic tools.**

A total of 1,504 proposals were received, of which 129 projects were funded with a total amount of €23,737,045.38.

3.3. Precision Medicine Infrastructure Associated with Science and Technology (IMPACT)

This call aims to establish a structure that coordinates existing capacity in genomics, data science and predictive medicine to make them available to the scientific community for the coordinated development of R&D&I, with criteria of quality, efficiency and equity.

The programs included in IMPaCT are **Predictive Medicine**, **Genomic Medicine** and **Data Science**. In each of the three programs, professionals from different academic and health institutions participate; all Autonomous Communities are represented and each program is led by a person who acts as coordinator and is in charge of the action plan. The governing body of the IMPaCT Infrastructure is the **IMPaCT Steering and Monitoring Committee**, with the participation of the Ministry of Science and Innovation and the Ministry of Health.

The provision of these grants is an important step towards the implementation of Precision Medicine in the National Health System through a strategy based on science and innovation.

6 applications were submitted and 3 of them were funded, for a total amount of €25,800,000.

Table. Distribution of applications and grants awarded by program

PROGRAM	APPLICATIONS	AWARDED	BUDGET RE-QUESTED (€)	BUDGET AWARDED (€)
Genomic medicine	2	1	17,731,340.00	7,249,990.00
Data science	2	1	16,067,951.79	4,549,380.00
Preventive medicine	2	1	26,243,901.75	13,999,997.00
TOTAL	6	3	60,043,193.54	25,799,367.00



3.4. Thematic networks for cooperative research

- The thematic networks for cooperative research in health (RETICS) are structures formed by a variable group of biomedical research centers and groups. They are of a multidisciplinary nature and their objective is to carry out cooperative research projects of general interest.
- They promote collaboration between SNS research groups that work on related subjects while facilitating the structuring of research carried out in the SNS. There are currently 14 thematic networks for cooperative research in health.

Table. Annual funding per network and composition of the research team by sex

NETWORK	Principal Investigator		Co-workers		Total	2020 Funding (€)
	Man	Woman	Man	Woman		
Prevention activities and health promotion in primary care (REDIAPP)	12	0	69	113	194	353,999.80
Infectious diseases (REIPI)	14	1	105	149	269	919,949.80
Eye diseases (OFTARED)	19	4	116	105	244	353,000.00
Kidney diseases (RED-INREN)	23	6	109	153	291	668,999.10
Tropical diseases (RICET)	14	4	51	83	152	476,999.60
Cerebrovascular diseases (INVICTUS+)	17	5	79	112	213	477,999.50
Multiple sclerosis (REEM)	16	6	58	74	154	428,997.80
Inflammation and rheumat-ic diseases (RIER)	12	3	42	64	121	550,999.90
Adverse reactions to aller-gens and drugs (ARADy-AL)	14	12	50	87	163	474,000.00
Maternal and child health and development (SAMID)	6	7	54	106	173	485,999.80
Chronic disease-oriented health services (REDIS-SEC)	6	11	98	120	235	432,999.60
AIDS (RIS)	26	5	113	153	297	1,438,999.10
Cell Therapy (TERCEL)	26	5	136	204	371	1,242,750.30
Addictive Disorders (RTA)	14	3	49	67	133	641,565.10
TOTAL	219	72	1,129	1,590	3,010	8,947,259.40

Table. Annual funding of ISCIII units participating in Networks and composition of unit members by sex

ISCIII GROUPS IN NET-WORKS	Principal Investigator		Co-workers		Total	2020 Funding (€)
	Man	Woman	Man	Woman		
Infectious diseases	1	1	8	10	20	90,491.68
Tropical diseases	2	2	10	21	35	214,712.00
Chronic disease-oriented health services	0	1	7	5	13	36,555.61
AIDS	4	2	17	36	59	411,976.84
TOTAL	7	6	42	72	127	753,736.13

Information on scientific and other activities of the Networks can be accessed through the following link [RETICS](#).



3.5. Scientific and technical service platforms

The purpose of this call for proposals was to fund three platforms to support R&D&I in biomedicine, which will provide the backbone for the existing capacity in Spain; they are aimed at providing the highest quality services to research groups in order to consolidate the capacity to respond to health needs and increase Spain's competitiveness and leadership in the international environment.

Table. Distribution of applications and grants awarded by platform

ISCIII PLATFORM	UNITS				COORDINATION			
	APPLICATIONS		AWARDED		APPLICATIONS		AWARDED	
	No.	Budget (€)	No.	Budget (€)	No.	Budget (€)	No.	Budget (€)
Biobanks and biomodels	74	28,939,145.66	40	9,966,154	2	703,106	1	406,500
Dynamization and innovation of the industrial capacity of the SNS and its transfer to the productive sector	42	13,334,689.07	18	5,086,125	2	1,534,000	1	890,000
Support for independent clinical research	47	21,162,919.79	34	10,409,201	3	2,903,950	1	682,000
TOTAL	163	63,436,754.52	92	25,461,480	7	5,141,056	3	1,978,500

A total of 169 requests for incorporation into one of the platforms were received, in addition to 7 proposals for coordination. This resulted in the **funding of 92 units that make up the 3 platforms, including the coordination of each one of them, for an amount of €27,439,980.**





Table. Distribution of applications and grants awarded by Autonomous Community

AUTONOMOUS COMMUNITY	APPLICATIONS	AWARDED	FUNDING (€)
ANDALUCÍA	19	11	3,761,835
ARAGÓN	5	3	625,350
ASTURIAS	3	1	257,400
BALEARES	3	3	436,161
CANARIAS	1	1	217,800
CANTABRIA	4	3	846,120
CASTILLA LA MANCHA	1	0	
CASTILLA Y LEÓN	6	2	570,900
CATALUÑA	42	28	8,899,249
COM VALENCIANA	16	6	1,398,650
EXTREMADURA	1	1	235,950
GALICIA	10	7	1,663,200
MADRID	42	21	6,238,650
MURCIA	4	2	407,550
NAVARRA	3	1	148,665
PAÍS VASCO	9	6	1,732,500
TOTAL	169	95	27,439,980



3.6. Health Research Institutes

Table. Procedures carried out according to type

PROCEDURE	IIS	DATES OF APPLICATION/ RESOLUTION	STATUS
ACCREDITATION (n=2)	IIS GALICIA SUR	18-02-2019/31-01-2020	WITHDRAWN
	ISABIAL	04-03-2019/22-02-2020	FAVORABLE
RENEWAL OF ACCREDITATION (n=13)	IIS BIOCRUCES	15-07-2019/17-03-2020	FAVORABLE
	IBIMA	12-07-2019/19-02-2020	FAVORABLE
	IMIB	15-07-2019/17-03-2020	FAVORABLE
	IDIVAL	09-09-2019/22-06-2020	FAVORABLE
	INIBIC	09-09-2019/17-03-2020	FAVORABLE
	IIS LA PAZ	15-11-2019/06-07-2020	FAVORABLE
	IIS ARAGÓN	15-11-2019/06-07-2020	FAVORABLE
	IDIS	18-11-2019/06-07-2020	FAVORABLE
	Ibs GRANADA	27-05-2020/00-03-2021	PENDING
	IIS FJD	04-06-2020/00-03-2021	PENDING
	IIS-LA PRINCESA	07-09-2020/00-00-2021	PENDING
	IIB SANT PAU	04-09-2020/00-00-2021	PENDING
	i+12	11-09-2020/00-00-2021	PENDING
SIGNIFICANT CHANGE (n=5)	IMIM	02-09-2020/10-11-2020	FAVORABLE
	BIOCRUCES	12-11-2020/11-06-2019	FAVORABLE
	BIOCRUCES	26-11-2020/00-03-2021	PENDING
	IIS-FJD	10-12-2020/00-03-2021	WITHDRAWN
	IMIB	28-12-2020/03-02-2021	WITHDRAWN

Evaluation, accreditation and monitoring program

During the year 2020, the total number of Health Research Institutes (IIS) accredited by the ISCIII reached 32. As part of its competencies in evaluation, accreditation and monitoring of the IIS, the General Sub-Directorate for Assessment and Promotion of Research developed the following activities:

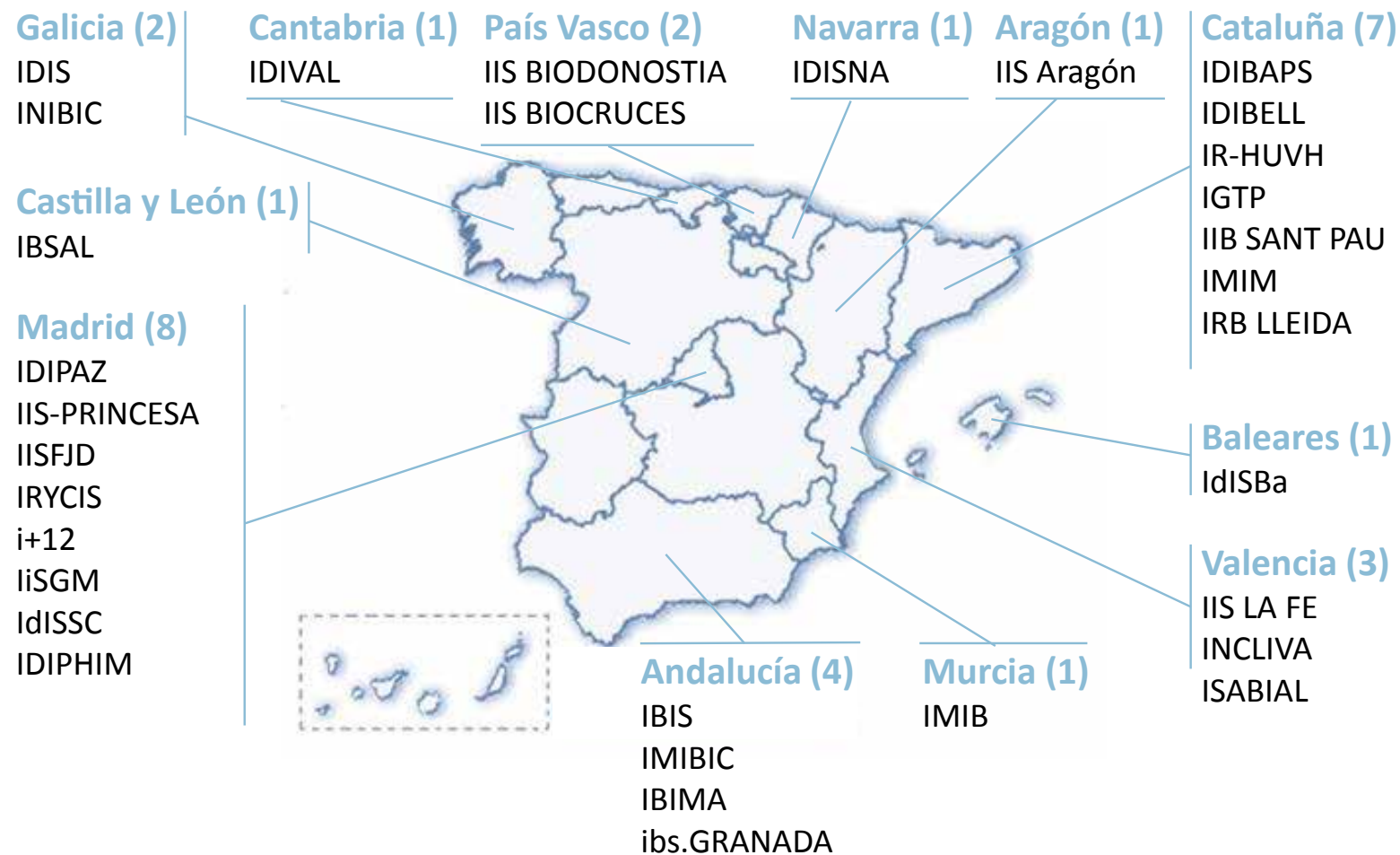
- a) Consolidation of the **system of indicators for annual monitoring** of accredited IIS.
- b) **Support** to institutions with a non-accredited Health Research Institute in the preparation of the application for accreditation.
- c) **Procedures for accreditation, renewal of accreditation and authorization of significant changes**, according to Royal Decree 279/2016, of June 24.

IIS ACCREDITED

32 IIS

165 centers

> 24,000 researchers



3.7. Financial monitoring of the AES (Health Research and Development Strategy) and management of European funds

Financial monitoring of the AES

The Monitoring Unit of the General Sub-Directorate for Networks and Cooperative Research Centers monitors the research grants and subsidies assigned to it and the control of the financial justification, which includes the verification and qualification of the expenses reflected in the justification submitted by the recipient entities, including the procedures for the return of unused funds, interest on late payment, and reimbursement, if applicable.

- Total number of dossiers monitored financially: 7,068
- Number of grant dossiers that presented financial justification in 2020: 3,425
- Number of dossiers closed: 1,181



Management of European funds (ERDF and ESF)

The ISCIII participates as an Intermediate Organization both in the Spanish Pluri-regional Operational Program 2014-2020 (POPE) of the European Regional Development Fund (ERDF), and in the 2014-2020 Employment, Training and Education Operational Program (POEFE) of the European Social Fund (ESF).

Through these two Operational Programs, grants from the Health Research and Development Strategy of the National Subprogram for Knowledge Generation and the National Subprogram for Institutional Reinforcement are co-funded, in the case of the ERDF, and from the State Program for the Promotion of Talent and its Employability in R&D&I, in the case of the ESF.

The General Sub-Directorate for Networks and Cooperative Research Centers ensures compliance with the conditions, objectives and expected results derived from the designation of the ISCIII as Intermediate Organization in these Operational Programs. This entails centralizing the administrative and on-site verification procedure of the operations co-funded by each of the Funds in the ISCIII, the collection of mandatory indicators for each of the grants, acting as a point of contact with the corresponding Managing Authorities, representing the ISCIII in the Monitoring Committee of each of the Programs and contributing to the Implementation Reports submitted periodically to the European Commission, together with the contribution and response to the appropriate audit controls.

Table. Management of European funds (ERDF and ESF)

	No. of grants certified	Amount of expenditure declared (€)
European Regional Development Fund (ERDF)	2,150	70,600,000
European Social Fund (ESF)	116	2,400,000
TOTAL	2,266	73,000,000

Specifically, during the year 2020, the General Sub-Directorate for Networks and Cooperative Research Centers carried out the necessary procedures to achieve ERDF certification of 2,150 research projects aimed at promoting research and innovation in health, for an expense amount of €70,600,000; in the case of the ESF, the total number of grants submitted for co-funding to the Managing Authority for subsequent certification to the European Commission was 116, for an amount of €2,400,000, in accordance with the assigned financial path.

4.

Scientific and technical activities



4.1. Intramural research and publications

Intramural research refers to research carried out at ISCIII's own centers and associated joint units through competitive research projects, management assignments, and collaboration agreements. Sources of funding for these competitive projects are varied in nature. They include programs of the Spanish National R&D&I Plan 2017-2020; Health Research and Development Strategy programs within that Plan; ISCIII's Intramural Research Program; and other regional, national, and international public and/or private calls.

The information presented in this section brings together the results of scientific production of the ISCIII's centers and National Schools based on studies and indicators: analysis of research projects and the hiring of research and research support staff. This information was collected and analyzed through the Research Coordination Area (ACI).

The objective of the ACI is to manage and coordinate activities related to research carried out at ISCIII within the framework of national and international calls. Reporting to the General Sub-Directorate for Applied Services, Training, and Research, the ACI's main tasks are:

- Disseminating calls from public and private funding agencies for grants to fund projects and human resources, and advising researchers on the preparation and submission of proposals.
- Management, monitoring and justification of national and international projects, agreements, contracts, and assignments.
- Monitoring and justification of the grants for the recruitment of research staff.
- Financial monitoring and statistical analysis of the state of intramural research.
- Promotion and handling of management agreements, contracts and assignments of the General Sub-Directorate for Applied Services, Training and Research.



Table. Projects granted in 2020 by program

Funding	Program	Research Area	No. of Projects	Total Funding €
External funding	INTERNATIONAL (*)		9	614,505.63
		INFECTIOUS DISEASES	4	245,615.00
		EPIDEMIOLOGY AND PUBLIC HEALTH	1	39,375.00
		HEALTH TECHNOLOGY ASSESSMENT	1	50,000.00
		DIGITAL HEALTH, CHRONICITY AND CARE	1	42,234.38
		OTHERS	2	237,281.25
	NATIONAL R&D&I PLAN		5	1,219,495.05
		INFECTIOUS DISEASES	4	977,495.05
		EPIDEMIOLOGY AND PUBLIC HEALTH	1	242,000.00
	AUTONOMOUS COMMUNITIES		1	6,037.50
		DIGITAL HEALTH, CHRONICITY AND CARE	1	6,037.50
	OTHERS		3	390,930.20
		INFECTIOUS DISEASES	1	300,000.00
		DIGITAL HEALTH, CHRONICITY AND CARE	2	90,930.20
ISCIII Funding	AESI Projects		22	1,613,100.00
		INFECTIOUS DISEASES	11	639,000.00
		EPIDEMIOLOGY AND PUBLIC HEALTH	4	105,100.00
		RARE DISEASES	5	580,000.00
		DIGITAL HEALTH, CHRONICITY AND CARE	2	289,000.00
	OTHERS (**)		8	945,071.68
		INFECTIOUS DISEASES	3	702,879.38
		EPIDEMIOLOGY AND PUBLIC HEALTH	3	169,192.30
		DIGITAL HEALTH, CHRONICITY AND CARE	2	73,000.00
TOTAL			50	4,789,140.06

(*) 2 sub-projects (EU, ECDC, etc.), which added to the 48 projects in the Table make a total of 50 projects awarded in 2020

(**) 7 COVID-19 projects

Table. Current projects for 2020 by research program/area

Funding	Program	Research Area	No. of Projects	Funding €	
				Total	2.020
External funding	INTERNATIONAL (*)		52	9,232,915.61	1,943,662.52
		EPIDEMIOLOGY AND PUBLIC HEALTH	10	709,824.42	395,993.10
		INFECTIOUS DISEASES	12	1,911,501.45	356,436.41
		RARE DISEASES	2	461,457.50	96,048.82
		DIGITAL HEALTH, CHRONICITY AND CARE	3	650,130.52	244,089.92
		ENVIRONMENT AND HEALTH	3	1,850,469.14	248,650.35
		HEALTH TECHNOLOGY ASSESSMENT	3	377,650.00	79,595.56
		OTHERS	19	3,271,882.58	522,848.36
	NATIONAL R&D&I PLAN		24	3,748,617.93	547,498.68
		EPIDEMIOLOGY AND PUBLIC HEALTH	1	242,000.00	31,460.00
		INFECTIOUS DISEASES	12	2,081,215.05	448,127.45
		RARE DISEASES	4	332,796.48	10,991.23
		DIGITAL HEALTH, CHRONICITY AND CARE	5	786,500.00	38,720.00
		OTHERS	2	306,106.40	18,200.00
	MINISTRY OF HEALTH		1	73,460.00	54,573.00
		EPIDEMIOLOGY AND PUBLIC HEALTH	1	73,460.00	54,573.00
	AUTONOMOUS COMMUNITIES		6	589,912.39	205,260.21
		INFECTIOUS DISEASES	4	480,544.71	174,723.21
		RARE DISEASES	1	103,330.18	27,777.00
		DIGITAL HEALTH, CHRONICITY AND CARE	1	6,037.50	2,760.00
	OTHERS		7	651,992.24	129,992.34
		EPIDEMIOLOGY AND PUBLIC HEALTH	2	143,859.57	29,417.30
		DIGITAL HEALTH CHRONICITY AND CARE	3	425,930.20	68,000.00
		ENVIRONMENT AND HEALTH	1	68,150.08	32,575.04
		OTHERS	1	14,052.39	0.00

Funding	Program	Research Area	No. of Projects	Funding €	
				Total	2.020
ISCIII Funding	AESI Projects		87	6,954,840.41	1,517,643.44
		EPIDEMIOLOGY AND PUBLIC HEALTH	20	1,079,972.56	185,108.00
		INFECTIOUS DISEASES	45	4,181,648.23	985,245.44
		RARE DISEASES	10	988,200.00	197,650.00
		DIGITAL HEALTH, CHRONICITY AND CARE	10	669,619.62	135,740.00
		OTHERS	2	35,400.00	13,900.00
	NETWORKS		12	3,779,180.65	753,736.13
		EPIDEMIOLOGY AND PUBLIC HEALTH	3	1,397,314.25	280,362.85
		INFECTIOUS DISEASES	9	2,381,866.40	473,373.28
	OTHERS		13	1,172,347.46	857,534.76
		EPIDEMIOLOGY AND PUBLIC HEALTH	3	169,192.30	137,092.30
		INFECTIOUS DISEASES	7	883,010.64	647,442.46
		RARE DISEASES	1	47,144.52	0.00
		DIGITAL HEALTH, CHRONICITY AND CARE	2	73,000.00	73,000.00
TOTAL			202	26,203,266.69	6,009,901.08

(*) 7 subprojects





Table. Human Resources Calls 2020; number of contracts awarded per center (excluding calls pending resolution)

CENTER	NATIONAL R&D&I PLAN	AUTONOMOUS COMMUNITIES	AESI-HR	TOTAL
CNM	2	6	5	13
CNE			1	1
CNMT			1	1
ENS			1	1
IIER	1	3		4
SGSAFI	2			2
UFIEC		2		2
TOTAL	5	11	8	24

CNM: National Microbiology Center

CNE: National Epidemiology Center

CNMT: National Center Of Tropical Medicine

ENS: National School of Public Health

IIER: Research Institute for Rare Diseases

SGSAFI: General Sub-Directorate for Applied Services, Training and Research

UFIEC: Functional Unit for Research into Chronic Diseases

Publications of the Centers and Units

The General Sub-Directorate for Applied Services, Training and Research collected and analyzed all information related to the publications of all ISCIII Centers and Units.

Researchers from ISCIII Centers and Units published 513 articles in journals indexed in the Journal Citation Report during 2020, an increase of 19.6% with respect to the 429 publications in 2019.

Of these articles, 26.1% (134) were published in journals located in the first decile of their subject category and 35.5% (182) were in the first quartile. The cumulative impact factor reached a value of 2,964.955 points, an increase of almost 50% compared to the 1,976.966 points of 2019. This increase is reflected in the average impact factor per article, which was 5.78 points - more than one point above the average impact factor of last year which amounted to 4.61 points.

The table shows the most prominent indicators of the indexed scientific publications by ISCIII staff in 2020

SGSAFI, SGITCMR, SGPIIyRI	No. OF INDEXED PUBLICATIONS	CUMULATIVE IF	AVERAGE IF	% D1	% Q1*	% INTERNATIONAL COLLABORATIONS	% SENIOR AUTHOR	% OPEN ACCESS
CNM	220	1,267.937	5.76	26.4	38.2	45.9	44.5	57.3
CNE	132	696.266	5.27	22.0	40.9	37.9	25.8	63.6
UFIEC	39	264.229	6.78	38.5	30.8	23.1	30.8	43.6
IIER	38	200.713	5.28	23.7	36.8	55.3	34.2	60.5
CNSA	9	49.217	5.47	0.0	44.4	44.4	22.2	66.7
CNMT	4	11.382	2.85	0.0	50.0	50.0	75.0	75.0
UITeS	6	19.509	3.25	0.0	33.3	50.0	33.3	83.3
Investén	5	9.440	1.89	0.0	60.0	40.0	0.0	40.0
UCCTs	14	72.431	5.17	21.4	42.9	42.9	14.3	71.4
AETS	10	22.065	2.21	0.0	0.0	20.0	50.0	70.0
ENS	76	685.900	9.03	37.0	23.7	70.0	65.0	75.0
ENMT	5	15.217	3.04	0.0	60.0	60.0	20.0	80.0
TOTAL **	513	2,964.955	5.78	26.1	35.5	46.0	42.1	60.6

IF: Impact factor; D1: first decile; Q1: first quartile

*Journals in the first quartile do not include those in the first decile.

**In the total number of publications (558), those in which two or more Centers or Units participated have been discarded.

SGSAFI: General Sub-Directorate for Applied Services, Training and Research; SGITCMR: General Sub-Directorate for Research on Cell Therapy and Regenerative Medicine; SGPIIyRI: General Sub-Directorate for International Research Programs and Institutional Relations; CNM: National Microbiology Center; CNE: National Epidemiology Center; UFIEC: Functional Unit for Research into Chronic Diseases; IIER: Research Institute for Rare Diseases; CNSA: National Environmental Health Center; CNMT: National Center of Tropical Medicine; UITES: Digital Health Research Unit; Investén: Healthcare Research Unit; UCCTs: Central Scientific and Technical Units; AETS: Health Technology Assessment Agency; ENS: National School of Public Health; ENMT: National School of Occupational Medicine.

4.2. Highlighted Activities of the Centers and Units

Table. Distribution of Sub-directorate General for Applied Services, Training and Research staff and activities by centers/units

	CNM	CNE	CNMT	CNSA	IIER UIAC	UFIEC	UITES	INVESTEN	UCCTs	RE-LAB
STAFF	242	49	14	72	23	18	6	2	26	2
* ONGOING AND AWARDED PROJECTS	130	51	5	5	19	20	9	5	13	
** ONGOING/AWARDED (HR) CONTRACTS	104/33	31	2	18	40	27	2	6	4	
PATENTS		1				2	1			
No. OF INDEXED AND NON-INDEXED PUBLICATIONS	228	134	4	10	40	41	7	14	14	
BOOKS	2	3					1	1		
THESES DEFENDED	9	3			4	8		0		
TFG AND TFM (PRESENTED)	63	11	5	3	7	24	3	3	5	
No. OF STAYS AND STUDENTS RECEIVED	51/62	38	8	13	15	29	4	2	9	

* The projects listed in the table are the sum of the projects managed by the ISCIII shown in the foregoing table plus the active projects managed by other organizations.

** The HR contracts listed in the table are the sum of the contracts of the 2020 HR calls in the foregoing table plus the contracts associated with research projects and agreements.

CNM: National Microbiology Center; CNE: National Epidemiology Center; CNMT: National Center Of Tropical Medicine; CNSA: National Environmental Health Center; IIER: Research Institute for Rare Diseases; UIAC: Research Unit on Congenital Anomalies; UFIEC: Functional Unit for Research into Chronic Diseases; UITES: Digital Health Research Unit; INVESTEN: Healthcare Research Unit; UCCTs: Central Scientific and Technical Units; RE-LAB: Biological Alert Laboratory Network; HR: Human Resources; TFG / TFM: Bachelor's Theses / Final Master's Degree Projects, respectively.

4.2.1. National Microbiology Center (CNM)

The National Microbiology Center (CNM) has the specific **mission** of providing scientific and technical support to the General State Administration, the Autonomous Communities, and the Spanish National Health System (SNS) in the field of infectious diseases (ID). Its activity is based on prevention and control, diagnosis, advice and research in this field. One of its main strengths is the ability to combine biomedical research with quality support activities for the SNS in such a way that they reinforce each other.

Highlighted activities

- The key role of the CNM in the **fight against the COVID-19 pandemic** during 2020, with different interventions adjusted to the needs of each phase of the evolution of the disease in our country. In the first weeks, the CNM fine-tuned the methodology for the molecular diagnosis of this new disease and confirmed or ruled out the diagnosis of the first real and suspected cases. In the middle of the first pandemic wave, the CNM undertook an emergency reorganization of its capacities to support the diagnostic needs of the National Health System for COVID-19. Simultaneously, validation activities were initiated for commercial PCR prototypes developed by Spanish companies, as well as for different serological techniques for the detection of specific SARS-CoV-2 antibodies, with the aim of increasing diagnostic capabilities at the national level. Culturing the virus to support different research projects and to establish a virus bank with the different circulating variants, as well as complete sequencing of their genomes have also been key activities in 2020, which will reach their full development in 2021. The CNM has been actively involved in the four rounds of the National Sero-epidemiological Study ENE-COVID-19 by coordinating the microbiology laboratories and carrying out the serological determinations. The CNM has promoted, designed and coordinated validation studies of rapid antigen detection tests for their incorporation into the national diagnostic strategy for SARS-CoV-2 infection.



- Interventions of the Rapid Response System (RRS) of the CNM in alerts activated by the health authorities, and also at the request of the RE-LAB. In 2020, it was actively involved in SARS-CoV-2 diagnosis by providing support to the Respiratory Viruses Laboratory, and in the establishment and coordination of the essential working groups formed for SARS-CoV-2 diagnosis in the CNM COVID-19 Operation during the State of Emergency. It also participated in 7 alerts related to the diagnosis of viruses causing Hemorrhagic Fevers and 1 of bioterrorism alert due to suspicion of *Bacillus anthracis* spores.
- Characterization of the first outbreak of West Nile virus (WNV) detected in humans in Spain. Seventy-seven cases were reported (40 confirmed and 37 probable): 71 in Andalucía and 6 in Extremadura. Neurological symptoms were present in 93.5% of the cases and 94.8% required hospitalization. More than 300 groups of samples of *Culex modestus*, *C. perexiguus* and *C. pipiens* mosquitoes from the Doñana Biological Station, captured in 15 localities in the provinces of Sevilla and Huelva, were also analyzed. The characterization of the outbreak, conducted by the CNM Serology and Arbovirus laboratory, consisted of serological confirmation of human cases and analysis of the virus genome by complete sequencing in human and mosquito samples.
- The use of massive sequencing in the study and surveillance of outbreaks, in accordance with the recommendations of the European Center for Disease Prevention and Control (ECDC). In 2020, progress was made with the technological development activities of the previous year and these were implemented for the characterization of viruses such as West Nile, SARS-CoV-2, Dengue, Crimean Congo, Chikungunya, Toscana, Rabies, Enterovirus, Measles, Mumps, Hepatitis A, E, C and D, bacteria of the genera *Francisella*, *Klebsiella*, *Pseudomonas*, *Haemophilus*, *Acinetobacter*, *Serratia*, *Streptococcus*, and fungi of the genera *Aspergillus* and *Candida*.
- Coordination and implementation of the National Network of Laboratories for the surveillance of resistant microorganisms (RedLabRA).
- Expansion of the quality management system, based on ISO 15189, 17025 and 9001 standards, to 19 more tests and 3 more Units, totaling 171 tests and 21 Units accredited by ENAC, in addition to the services certified by AENOR. More importantly, a flexible scope of accreditation was obtained for the whole system, which authorizes, within this scope, the incorporation of new tests or modifications of tests to the accreditation without requiring prior evaluation by ENAC. The CNM is the only accredited body in Spain with a flexible scope of accreditation for its entire set of procedures.

Scientific and technical activities

- The scientific and technical activities of the CNM cover the following topics: RRS in biological alerts, scientific and technical advice to the SNS, service portfolio for microbiological diagnoses, study and control of outbreaks, microbiological surveillance programs, and participation in research networks and projects.
- The CNM operates 25 Microbiology Surveillance programs relevant to Public Health, which are reviewed and renewed annually. This surveillance allows us to become aware of evolutionary patterns, study the circulating clones and detect early changes in trends, both in Spain and as in comparison to the rest of the European countries. This knowledge sets the basis for the implementation of health measures that favor the control and prevention of infectious diseases.
- The CNM service portfolio consists of 370 techniques for diagnosis and/or reference of infectious diseases.
- In 2020, 123,942 samples/strains associated with requests for diagnosis and/or reference were studied, and 160,694 tests were done. In addition, molecular characterization of a total of 63 outbreaks produced by different pathogens was completed.
- In 2020, 85 research projects and 36 agreements were active. In addition, the CNM participated in 2 CIBERs and 9 RETICS, and coordinated one of them.



Microbiological
Surveillance
25 programs

370 techniques
for infectious
diseases

85 research
projects



Participation in international committees, consortia and networks

In 2020, six CNM professionals served as National Focal Points (two) or Alternates (four) of the ECDC for different health problems.

CNM professionals participate in a large number of transnational initiatives, up to 54 in 2020. These include collaborations with the ECDC, the WHO and International Committees. Some examples are:

- Participation in ECDC Networks for Antimicrobial Resistance Surveillance (EARS-Net), Food- and Waterborne Diseases (FWD-Net), Tuberculosis, Invasive Meningococcal Disease (EU-Ibis), Invasive Bacterial Disease (EU-IBD), Vaccine-Preventable Diseases, Gonococcal Antimicrobial Resistance (Euro-GASP), Listeriosis, and Hepatitis B, C and E.
- Collaboration in other ECDC initiatives such as the Antibiotic Resistance Genes Surveillance Network, Groups for the Analysis of Antimicrobial Resistance (EURGen-Net) through its Carbapenem-resistant and/or colistin-resistant Enterobacteriaceae survey (CCRE-Survey), or in the European Reference Laboratory Network for Tuberculosis (ERLTB-Net).
- Participation as a reference laboratory in the WHO European Measles and Rubella Reference Laboratory Network, as well as in the European Network of Laboratories for Rabies surveillance.
- Participation in the *Insthoviricetes* study group of the International Committee on Taxonomy of Viruses, and in the European Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI).
- Participation in WHO Networks, Committees and Groups on Polio and other enteroviruses (WHO European Regional Polio Laboratory Network, European Non-polio Enterovirus Network), on the Diagnosis of Neglected Tropical Diseases, on the European Laboratory Initiative (ELI) on Tuberculosis, HIV and Viral Hepatitis, and on the identification of priority fungal pathogens.

Especially noteworthy are the designations of the Parasitology Reference and Research Laboratory (RRL) as a WHO collaborating Center and of the Respiratory Viruses RRL as a National Influenza Center of the WHO.

4.2.2. National Epidemiology Center (CNE)

The **mission** of the CNE is to generate information and new evidence for public health decision-making. About 80 professionals work in this center in multidisciplinary teams (physicians, mathematicians, statisticians, biologists, environmentalists, etc).

The **objectives** of the center are:

- Public health surveillance, epidemiological study of diseases and their determinants, quantification of their impact and monitoring their evolution.
- To investigate risk factors related to major health problems.
- To contribute to the training of experts in epidemiology and public health.

Highlighted activities

- **Management of the information provided by RENAVE**

- ▶ Center in charge of the SiViEs platform, where information on diagnosed cases of COVID-19 is collected on a daily basis
- ▶ Analysis and diffusion of this information
- ▶ Calculation of R_t (average number of secondary cases that each infected subject can infect in a given time t)

- **Generation of periodic reports on the status of the pandemic**

- ▶ National reports and reports for each Autonomous Community
- ▶ Specific reports on healthcare personnel

- **Daily Mortality Monitoring System MoMo**

Initially created to monitor possible excess mortality during heat waves, it was divided into two complementary systems (MoMo and MoMo heat)

- ▶ Calculation of excess mortality at the national level and per Autonomous Community
- ▶ Periodic situation reports



- **Scientific coordination of the ENE-COVID National Seroprevalence Study**

ENE-COVID is a collaborative effort with multiple participants; the executive coordination of the study is undertaken by the Ministry of Health and the ISCIII Directorate. The CNE provides scientific coordination and is responsible for study design, questionnaire development, database purging, statistical analysis, and preparation of periodic reports.

Recently, we estimated the lethality of SARS-CoV-2 infection.

- **FDD-COVID Project: factors of COVID-19 spread in Spain**

Project awarded in the special COVID-19 call of the ISCIII. It analyzes the contextual factors (demographics, use of public transport, population health and economic activities) and dynamics (evolution of the pandemic, mobility within and outside the region) that determine the intensity and speed of the first wave of the pandemic.

- **COSMO-Spain Project**

Study proposed by the WHO to monitor behaviors and attitudes of the Spanish population in response to COVID-19 through several rounds of surveys.

- **Participation in international research projects**

- ▶ **I-MOVE-COVID** project that constitutes a multidisciplinary European network for research, prevention and control of COVID-19.
- ▶ The **PHIRI** Project **Population Health Information Research Infrastructure for COVID-19** within the Joint Action InfAct, co-leading one of the WPs (work packages).
- ▶ Collaboration in the **Janssen Phase III Study of the Ad26.COVS.2 vaccine** helping to identify hot-spots and collaborating with the Polytechnic University of Barcelona.



- **Participation in national research projects**

- ▶ Participation in the **EPICOS study** (Trial for the Prevention of Coronavirus Infection in Healthcare Workers) of the Ministry of Health: a randomized clinical trial for the prevention of SARS-CoV-2 (COVID-19) by means of pre-exposure prophylaxis with Tenofovir disoproxil/Emtricitabine and Hydroxychloroquine in healthcare professionals.
- ▶ Participation in the **MIND/COVID-19 study: Mental Health Impact and Needs Associated with COVID-19: a Comprehensive National Evaluation in Spain** funded by the ISCIII extraordinary call.

See the news item we published at the time: <https://www.isciii.es/Noticias/Noticias/Paginas/Noticias/CNEenCOVID19.aspx>

Scientific and technical activities

The areas of activity are focused on:

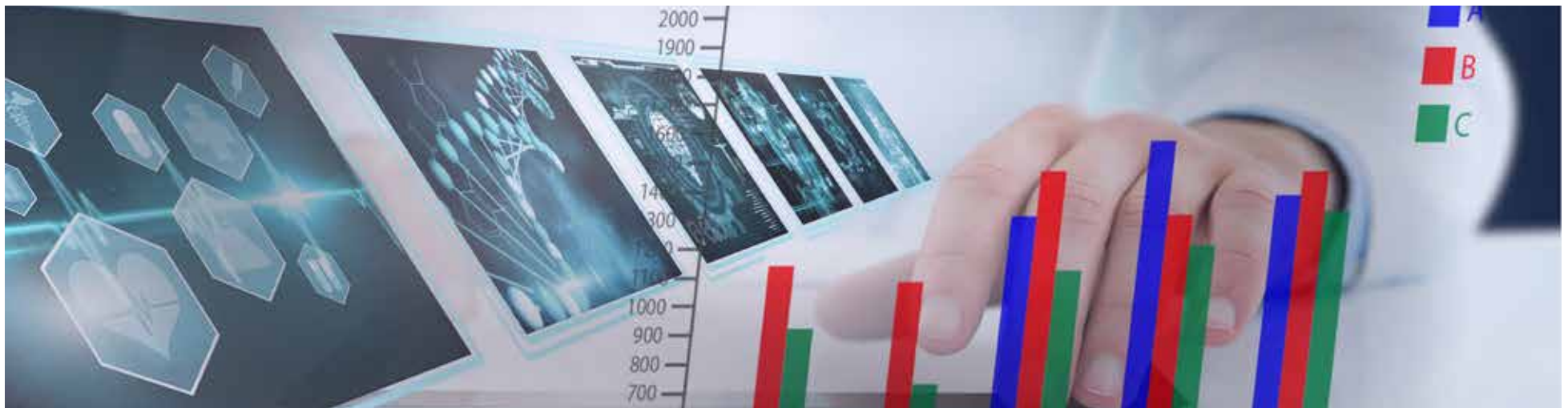
- **Chronic Diseases:** The CNE provides relevant information on cancer, cardiovascular and metabolic diseases, neurodegenerative diseases and disability by monitoring mortality and investigating the main risk factors.
- **Communicable Diseases:** Management of epidemiological surveillance systems implemented for the control of the COVID-19 pandemic in Spain. Management of communicable disease surveillance systems and outbreak studies carried out by the National Network for Epidemiological Surveillance. Participation in surveillance activities in the EU coordinated by the ECDC, the WHO and the EFSA (European Food Safety Authority). Research activities related to the study of risk factors and evaluation of intervention measures to prevent communicable diseases, evaluation of the effectiveness of the influenza vaccine in Spain and Europe, and methodological development to assess the severity of influenza epidemics and pandemics.

Main lines of activity:

- **Communicable Diseases and risk behaviors:** The CNE provides technical advice on prevention and control programs implemented with the Autonomous Communities and coordinated by the Ministry of Health. It participates, among others, in the: (a) plan for the elimination of tuberculosis in Spain; (b) working group for the transmission of Crimean-Congo hemorrhagic fever in Spain; (c) working groups of the Ministry of Health's National Vaccines Committee; (d) surveillance of healthcare-associated infections; (e) analysis of daily mortality; f) strategic plan against hepatitis C; g) strategic plan for the prevention and control of HIV and STIs (sexually transmitted infections); h) evaluation of policies for early diagnosis of HIV; i) evaluation of risk behaviors and socially vulnerable populations; and j) National Antimicrobial Resistance Plan.
- **Environmental Epidemiology of Cancer:** a) Geographic distribution of cancer mortality, spatiotemporal evolution and its relationship with environmental and social determinants; b) environmental and lifestyle risk factors, with special attention to diet and nutrition; c) genetic and molecular epidemiology of cancer and other chronic diseases; d) impact of air and industrial pollution on the health of the population; and e) design and management of databases and web and mobile applications related to this area.
- **Aging, Neurodegeneration and Mental Health:** a) Aging and predictors of mortality and disability; b) dementias, parkinsonisms, and prion diseases; and c) morbidity and mortality due to external causes; and d) quality of life and patient-reported outcomes.
- **Epidemiology of cardiovascular and metabolic diseases:** a) individual and contextual risk factors for cardiovascular and other chronic diseases; b) role of heavy metals in chronic diseases; c) spatiotemporal distribution of mortality due to cardiovascular diseases and its relationship with environmental and social determinants.
- **Risk behaviors and socially vulnerable populations:** a) evaluation of novel strategies for early diagnosis of HIV and HCV (especially rapid tests in non-clinical settings and self-testing) and linkage of infected persons with treatment, in collaboration with the national AIDS plan; b) epidemiological surveillance of alcohol and psychoactive substance use, patterns of use, impact on health and evaluation of prevention and control policies, in collaboration with the national plan on drugs and the European Monitoring Center for Drugs and Drug Addiction (EMCDDA); c) project to transfer the experience of Spain and European countries regarding policies to reduce harm from substance use to some Eastern European countries, in collaboration with CHAFAEA (Consumer, Health, Agriculture and Food Executive Agency); and d) evaluation of social inequalities on mortality and the impact of different socioeconomic determinants and social and health policies on social inequalities.
- **HIV/Sexually Transmitted Infections (STIs)/Hepatitis:** a) Epidemiology of HIV infection and STIs: late diagnosis, disease progression, response to antiretroviral treatment and mortality; aging and co-morbidities; co-infections with hepatitis C virus, hepatitis B virus, human papillomavirus and sexually transmitted infections; b) estimation of the proportion of undiagnosed HIV infections in the general population and key populations; c) health inequalities of the HIV-positive population: gender, race and socioeconomic axes; d) study of the quality of life of people living with HIV; e) reproductive health of HIV-positive women; and f) use, acceptability and impact of pre-exposure prophylaxis (PreP) in the HIV-negative population at risk of contracting the infection.

Participation in international committees, consortia and networks

- AMOCAPE (Atlas of Cancer Mortality in Portugal and Spain)
- ART-CC: The Antiretroviral Therapy Cohort Collaboration
- Biomarkers of HPV (human papillomavirus)-driven head and neck cancer in Latin America and Europe (HEADLAcE)
- CASCADE: Concerted action on seroconversion to AIDS and death in Europe
- CHAFAEA (Consumers, Health, Agriculture and Food Executive Agency)
- European Network on the Germline Genetics of Gastric Cancer
- HBM4EU
- HIV-CAUSAL: HIV Cohorts Analyzed Using Structural Approaches to Longitudinal data
- InCHEHC: International Collaboration on Hepatitis C Elimination in HIV Cohorts
- International validation of two non-motor scales in Parkinson's disease: the Neuropsychiatric Fluctuations Scale (NFS) and the Shame in Parkinson's disease (SPARK) Scale
- Joint Action on Health Information towards a sustainable EU health information system that supports country knowledge, health research and policy-making (InfAct)
- Joint Action on implementing good practices for chronic diseases (CHRODIS+)
- Joint Action on Population Health Information Research Infrastructure (PHIRI)
- Kangbuk Samsung Health Study
- Movement Disorders Society Task Force (MDS-TF) in Spasticity
- "Non-Motor Parkinson's Disease Study Group" of the International Parkinson and Movement Disorder Society
- Prostate Cancer Association Group to Investigate Cancer Associated Alterations in the Genome (PRACTICAL)
- Stomach Cancer Pooling (StoP) Project
- "Task force on tremor" of the International Parkinson and Movement Disorder Society



4.2.3. National Environmental Health Center (CNSA)

The CNSA contributes to protecting health by assessing exposure to environmental pollutants. It carries out its activities under a quality management system, with accreditation according to the UNE-EN ISO/IEC 17025 Standard. It is a National Reference Laboratory for Air Quality (LNRCA) and an associated laboratory of the Spanish Metrology Center as it is the depositary of the National Ozone Standard. It provides traceability to the measurements of the air quality networks of the Autonomous Communities. It is the national coordinator and interlocutor before the European Union for Human Biomonitoring (HBM) activities.

Highlighted activities

- ISCIII-AEMET (Spanish State Meteorological Agency) contract through the LNRCA for the assessment of transboundary air pollution for the period 2021-2023(25).
- After expert peer-review, EURAMET (European Association of National Metrology Institutes) has re-confirmed the suitability of the CNSA as depositary of the National Ozone Standard for an additional period of 5 years.
- Contributors to the Technical Document "Risk assessment of SARS-COV-2 transmission by aerosols. Prevention measures and recommendations." Directorate General of Public Health. Ministry of Health 2020.
- The CNSA holds since 2017 the leadership and supervision of the European Platform for Human Biomonitoring (www.hbm4eu.eu), which includes the design and implementation of studies to provide reference values for exposure to priority chemicals in the European population.
- Definition of the criteria for comparability of data from European national HBM programs (among others from France, Belgium and Germany) for the historical analysis of trends in chemical exposure of the European population (<https://www.hbm4eu.eu/online-library/?mdocs-cat=mdocs-cat-8&mdocs-att=null>), based on the quality program directed together with human sample analysis laboratories at the European level (see annual report 2019).
- Development of a non-invasive technique for mercury analysis in dried blood spot (DBS) micro-samples.
- Design and implementation of new Human Risk Assessment schemes for Mercury (coordination) and Pesticides (participation) incorporating HBM data.
- Project "Urban Observatory for Multi-Participatory Enhancement of Health and Wellbeing (URBANOME)". PE 945391 Horizon Europe.
- ENAC accreditation of two new tests at the LNRCA: determination of the mass concentration of nitrogen dioxide by diffusive sampling according to the UNE-EN 16339: 2014 Standard and determination of ammonium ion in rainwater.

Scientific and technical activities

Despite the impact the confinement has had on laboratory activities, more than 105,000 analyses were conducted at the CNSA, and more than 60 reports and export certifications, issued by the National Reference Laboratory (LNRCA) and other units of the Center, were prepared. Likewise, as depositary of the National Ozone Standard (RD 250 / 2004), 19 transfer standards were calibrated.

The CNSA has been designated Grant Signatory of PARC (Partnership for the Assessment of Risks from Chemicals) of the Horizon Europe program for Spain, and participates as part of the Steering Committee and coordinates the participating Spanish institutions. The CNSA is also co-leader of Work Package 9 and co-leader of Task 4.1 Human Biomonitoring. In addition to these leadership roles, the CNSA will actively participate in the Risk Assessment Work Packages 5 and 6.

Design of the European harmonized intervention study HBM4EU-Mom to evaluate the efficacy of dietary advice to reduce prenatal exposure to methylmercury by measuring mercury exposure in biological samples of pregnant women. With some delay due to the pandemic, the second field phase of the harmonized SPECIMEn study to assess the levels of exposure to mixtures of pesticides in the European population has also been carried out.

Design and implementation of the research protocol for the epidemiological analysis and application of biomarkers of effect in relation to mercury exposure in European populations. Design of statistical analysis protocols to evaluate the combined effect of mixtures of chemical pollutants.

Coordination of the HBM4EU online library (<https://www.hbm4eu.eu/online-library/>).

Quality assurance activities at the international level

- Air quality: a) World Meteorological Organization (WMO) program; b) by the Norwegian Institute for Air Research (NILU); c) by the German Institute for Occupational Safety and Health (IFA); and d) by ACTRIS (Aerosols, Clouds, and Trace Gases Research Infrastructure Network) of the JRC (Joint Research Centre) of the European Commission.
- Human biomonitoring program QMEQAS of Canada and the Quality Assurance program of HBM4EU.
- Ecotoxicology Assessment Exercise program (Aquacheck).
- Environmental radioactivity organized by the JRC of the European Commission and the European Radiation Dosimetry Group (EURADOS).

The CNSA participates in LifeWaste4Green and VITINNAT, European projects focused on the use of natural formulates to mitigate the adverse effects of chemical pesticides on the environment and human health. The formulates have been evaluated with ecotoxicological tests and in-silico techniques (QSAR) applying the 3R principle, thus reducing the use of vertebrates for biomedical purposes. The first results have been presented at the prestigious SETAC-Europe congress.

Continued participation in the monitoring of the draft of the National Plan for Health and Environment at the request of the Ministry of Health (Human Biomonitoring, Air Quality in Indoor Environments, Environmental Radioactivity, and Urban Air Quality (see Annual Report 2019).



Participation in national / international consortia / committees

- European Network of National Air Quality Reference Laboratories (AQUILA).
- Technical Committee for Quality (TC-Q) of the European Association of National Metrology Institutes (EURAMET).
- Management Board of the European Human Biomonitoring Initiative (HBM4EU).
- Commission of Associated Laboratories of the Spanish Metrology Center (CEM).
- Technical Committees for Standardization CEN/TC 264/Air quality WG 12 and WG 42; Secretariat and members of the Technical Subcommittee for Standardization AEN/CTN 77/environment SC 2/Air of AENOR; AEN/CTN 77/environment of AENOR; AEN/CTN 77/SC 1 Water; AEN/CTN 215 "Equipment and methods of measurement related to electromagnetic fields in the human environment".
- Technical Committee for the proposed modification of the RITE (Regulation on heating installations in buildings).
- Members of the Environmental Health Committee, Ministry of Health.
- National Technical Group on Contaminants in Food of the AESAN (Spanish Agency for Food Safety and Nutrition).
- National Technical Group on Persistent Organic Pollutants of the MITERD (Ministry for the Ecological Transition and the Demographic Challenge).
- State Committee for Animal Welfare CECOBA and the European network PARERE – EURL ECVAM (Network for Preliminary Assessment of Regulatory Relevance).
- Managing Council of the National Radiation Protection R&D Platform (PEPRI).
- Coordinator of the PEPRI non-ionizing radiation working group.
- Honorary presidency of the Spanish Network for Alternative Methods to Animal Experimentation (REMA).
- Research Ethics Committee of the Institute of Health Carlos III.
- Animal Welfare Ethics Committee of the Institute of Health Carlos III.
- Electronic Working Group CODEX ALIMENTARIUS "methylmercury in fish".
- International Network "WHO Chemical Risk Assessment Network".
- EURADOS (European Radiation Dosimetry Group) WG2: 'Harmonization of Individual Monitoring in Europe' and WG3 'Environmental dosimetry'.
- Members of the ISES i-HBM Working Group.
- PEPRI Emergency and Physical Safety Working Group.



4.2.4. Research Institute for Rare Diseases (IIER)

The **objectives** of the IIER are aligned with those of the International Rare Diseases Research Consortium (IRDiRC) and are to: 1) investigate and diagnose patients with undiagnosed rare diseases (RD); 2) develop therapies for rare diseases and tumors; and 3) identify the determinants of these diseases, as well as the impact of the measures adopted in the previous points. In a year marred by the SARS-CoV-2 pandemic, the IIER maintained all its activities and adapted them at all times to meet the constraints.

Highlighted activities

The IIER conducts experimental and translational research in the field of rare diseases, rare tumors, toxic oil syndrome, and autism spectrum disorders (ASD). The main lines of research are: 1) The role of abnormalities in the innate immune system in RD; 2) The study of rare pediatric tumors: genetic abnormalities and advanced therapies; 3) Gene and cell therapy in congenital muscular dystrophies and rare tumors; 4) The application of new genetic analysis technologies for diagnosing RD; 5) The study of the determinants of RD and their distribution; 6) Risk factors and prevention of congenital anomalies; 7) Research on epigenetic and gene regulation mechanisms in striated muscle and some associated rare diseases; 8) Development of three-dimensional cultures (organoids) in order to model RD that affect the liver; and 9) Identification of disease-modifying genes in rare lung diseases.

Scientific and technical activities

The undiagnosed rare disease program – SpainUDP

<https://spainudp.isciii.es/>

The IIER collaborates with the Undiagnosed Diseases Network International (UDNI <http://www.udninternational.org/>). This program contributes not only to providing diagnostic services but also to research. It is also a partner in the European SOLVE-RD project <http://solve-rd.eu/>.

National Rare Diseases Registry

In 2020, we continued to develop the application that will house the State Registry of Rare Diseases (ReeR). Furthermore, the IIER continues with the Rare Diseases Patient Registry Platform <https://registroraras.isciii.es/>, prioritizing the registry of patients without diagnosis and of rare eye pathologies in collaboration with the thematic Eye Diseases Research Network OftaRed and the ONERO Observatory (National Observatory for Rare Eye Diseases).

National Rare Disease Biobank

The National Rare Disease Biobank (BioNER- <http://bioner.isciii.es/>) continues its activity within ISCIII's Biobank Platform (<https://redbiobancos.es/>), and the European Eurobiobank network (<https://rd-connect.eu/what-we-do/biosamples-data/>). It currently is the Coordinator of that network.



Functional Unit for Research on Congenital Anomalies

In this Unit, the ECEMC (a scientific group of ASEREMAC – the Spanish Association for the Registry and Study of Congenital Malformations) carries out its activity, within the framework of the agreement established with the ISCIII, under the technical coordination of the IIER. The ECEMC is a clinical-epidemiological research program on congenital defects (CD). It has a multidisciplinary and translational approach that has been operating since 1976 and has a clinical network that includes more than 300 physicians (mainly pediatricians) working in hospitals throughout Spain. Since 1991, it has two information services on teratogens, one for health professionals (SITTE-Telephone Information Service on Teratogens) and the other for the general public (SITE-Telephone Information Service for Pregnant Women). Three research lines are developed: 1) Epidemiological surveillance of CD in the ECEMC and analysis of associated variables and factors; 2) Clinical and etiological study of children with CD; and 3) Epidemiological analysis of teratogens.

Genetic Diagnosis Service

The genetic diagnosis service carries out its activities in the diagnosis of diseases with a genetic basis such as retinoblastoma, infantile sarcomas, alpha-1 antitrypsin deficiency, bullous epidermolysis, and different types of rare cancer. It is also in charge of the genetic diagnosis of the undiagnosed rare diseases program SpainUDP and the National Rare Disease Biobank (BioNER). The service is accredited by the National Accreditation Entity (ENAC) for identifying genetic abnormalities in retinoblastoma according to the quality standard UNE-EN ISO 15189: 2013.

Other Scientific and technical activities and programs

The IIER also operates the following programs: 1) Follow-up of the Toxic Oil Syndrome cohort; 2) Participation as partners in the EJP RD (European Joint Program on Rare Diseases), where IIER is co-leader in two work packages and is member of the Executive Committee; 3) Participation in the international networks EUROCAT, ICBDSR and ENTIS, and in the JRC-EUROCAT NTD Working Group.

Participation in consortia and committees

The IIER is a member of the International Rare Disease Research Consortium (IRDiRC) representing the ISCIII, and is a member of the International Conference of Orphan Drugs and Rare Diseases (ICORD). Dr. Eva Bermejo is an external consultant to the AEMPS (Spanish Agency of Medicines and Medical Devices) and an expert member of the European Medicines Agency and Clinical Advisory Committee (CAC) of the “European Rare Disease Models & Mechanisms Network (RDMM-Europe)”, of “Solve-RD - solving the unsolved rare diseases”. Beatriz Martínez and Eva Bermejo are members of the Advisory Board of the Spanish Federation of Rare Diseases (FEDER) and Beatriz Martínez is also a member of the Rare Diseases Commission of the Spanish Association of Human Genetics.



4.2.5. Functional Unit for Research into Chronic Diseases (UFIEC)

The Functional Unit for Research into Chronic Diseases (UFIEC) carries out different types of activities related to basic and translational research, reference diagnostics and training in the area of chronic diseases. The unit is a resource for scientific and technical support for the most prevalent chronic diseases in the context of the SNS. Its vision is to serve as a Reference Center for Biomedical Research on Chronic Diseases and as a resource for scientific and technical support, acting in accordance with the guidelines of the WHO and the European Commission. It comprises 11 research groups.

Highlighted activities

The structure of the UFIEC is divided into three areas of work: oncology, neurobiology and a transverse area focused on regenerative medicine, the study of pharmacological targets, the detection of new biomarkers, the development of animal models and computational biology. The currently implemented research lines are:

- Analysis of signaling pathways involving Ras proteins, their differential regulation and their role in tumor development. Search for new therapeutic strategies against colorectal cancer.
- Study of the pathophysiology of glioblastomas, search for therapeutic targets using IDP (Intrinsically Disordered Proteins) inhibitors and based on epigenomics.
- Identification, validation and development of new therapies based on the inactivation of tumor-promoting kinases and the use of the NIS transporter as a mechanism for cancer therapy.
- Basic research on genetic susceptibility factors in Alzheimer's disease and prion diseases, as well as the study of the molecular bases of conformational neurodegenerative diseases, including Alzheimer's disease, Parkinson's disease and Creutzfeldt-Jakob disease.
- Study of the diversity of myeloid cells in the brain, with the aim of developing new therapies against neuroinflammation associated with neurodegenerative pathologies and brain damage.
- Research into neural stem cell biology and its possible therapeutic application in neurodegeneration, with special focus on Alzheimer's and Parkinson's diseases.
- Research on anti-inflammatory mechanisms active in human mesenchymal stem cells for their application as cell therapy in Multiple Sclerosis.
- Study of the pathophysiology of Amyotrophic Lateral Sclerosis (ALS). Search for new disease-causing genes and genetic risk associations through the analysis of whole genomes of patients (Project MinE).
- Identification and validation of colorectal cancer biomarkers involved in tumor dissemination, as well as quantitative immunomic and proteomic analysis of this tumor and negatively related chronic diseases for early diagnosis.

Scientific and technical activities

Diagnosis of human prionopathies: the Spongiform Encephalopathies Unit of the UFIEC provides services to the SNS as a reference molecular diagnostic unit for human prionopathies. During 2020, 442 determinations were carried out, divided into 70 determinations by PCR and sequencing of the PRPN gene, and 372 determinations of the 14-3-3 protein by western blot.

Stem Cell and Organoid Biotechnology: a platform dedicated to stem cell research and the use of these cells for modeling human diseases and experimental development of new cell therapies. Incorporating the most recent advances in pluripotent stem cell and organoid technology, the unit is currently developing models to study various chronic diseases. Specifically, there are ongoing projects involving the development of mini-lungs for the study of cystic fibrosis and chronic obstructive pulmonary disease, and the development of mini-brains for the study of neurodegenerative pathologies such as Alzheimer's disease.

Functional Proteomics: this platform uses techniques based on mass spectrometry and antibody microarrays to identify proteins altered during the development and progression of different pathologies, as well as protein and phage microarrays to analyze the humoral response in patients and to identify autoantibodies specific to these diseases. It also aims to develop and implement new methods for the early diagnosis of these diseases.

Computational Biology: its aim is to implement computational biology tools to advance research on chronic diseases, as well as the development and application of multiplexed sample analysis methodologies.



Participation in Committees and Consortia. Research Partnerships

UFIEC staff participates in different scientific and technical committees at the national and international level, such as the OEBA (Spanish Organ in Charge of Animal Welfare), the ISCIII Biosafety Commission and National Biobank, the Spanish National Agency for Assessment and Forecasting, Technical Commissions of the ISCIII's Health Research and Development Strategy, the Committee of Nanotechnologies of the UNE-AENOR (Spanish Association for Standardization), the ECDC, the European Union Network of Laboratories for the Validation of Alternative Methods (EU-NETVAL), and the International Agency for Research on Cancer (IARC).

Furthermore, UFIEC groups participate in several collaborative consortia: CIBERONC, CIBERNED, MinE International Consortium for the study of Amyotrophic Lateral Sclerosis, DEGESCO Consortium on the genetics of dementia, Thyroid Cancer Study Group (TIROSEEN), and RETICS on Asthma, Adverse Drug Reactions and Allergy (ARADyAL).

Different members of the UFIEC have ongoing collaborations with national and international research groups from CSIC, CNIC, CNIO, the CIEN Foundation, universities from different Autonomous Communities, the Aragonese Institute of Health Sciences, the Royal College of Surgeons in Ireland (RCSI) Dublin, the National Polytechnic Institute of Mexico, Universities of Buenos Aires, Geneva, Leuven, Michigan and Santiago de Chile, and with healthcare groups from several hospitals.



FUNDRAISING

The UFIEC's research activity was funded mainly through funds obtained in competitive calls, both from public institutions (7 projects from the Ministries of Economic Affairs and of Science, Innovation and Universities, 3 from the Strategic Action in Intramural Health, 1 intramural project), and private institutions (1 from the Spanish Foundation for the Promotion of Research in Amyotrophic Lateral Sclerosis (FUNDELA) and 3 from the Spanish Association Against Cancer (AECC). IDP Pharma and the James McDonnell Foundation are funding neuro-oncology projects. Furthermore, several groups receive funding through the Research Networks and CIBERs.

4.2.6. National Center of Tropical Medicine (CNMT)

The National Center of Tropical Medicine (CNMT) provides services to the National Health System regarding prevention, control and study of imported, emerging and/or re-emerging tropical diseases and activities related to global health. It coordinates the Network of Excellence for Collaborative Research on Tropical Diseases (www.ricet.es), undertakes teaching activities in aspects related to tropical diseases, and promotes scientific and technical cooperation programs with countries where these pathologies exist.



Highlighted activities

- Renewal of the Network for Collaborative Research on Tropical Diseases (www.ricet.es) RD16CIII/0003/0001. End: 2021.
- Start of studies for the certification of the elimination of onchocerciasis on Bioko Island, Equatorial Guinea. Task Force for Global Health project, NTDs Support Center, through the FCSAI (State Foundation, Health, Childhood and Social Welfare) and with funding from the Bill & Melinda Gates Foundation. The CNMT participates as Principal Investigator.
- Project: Mapping of Onchocerciasis and Filariasis in Continental Equatorial Guinea. Funded by WHO-AFRO, FCSAI and Probitas Foundation TRVI 422/19.
- Continuation of the Action Plan for Research and Cooperation Program on Neglected Tropical Diseases and other Tropical Diseases in Bahir Dar, Amhara State, Ethiopia.
- Participation in the COSMO-Spain survey of behaviors and attitudes in response to the COVID-19 pandemic.
- Participation in the MALCOV study: SARS-CoV-2 and Plasmodium co-infection and global health implications. Code: 202020E159 (internal code (PEIBA): 1274-N-20), CSIC Project, Regional Government of Andalucía and Ministry of Health and Social Welfare of Equatorial Guinea.
- Approval of the project "Operational research on the effectiveness of nutrition actions towards reducing undernutrition in Angola" (FRESAN-Component IV). Budget Heading: AO/FED/37-953. Eleventh European Development Fund.

Scientific and technical activities

- Research Projects and International Cooperation for Development actions.
- Project for the implementation of Continuous Improvement Plans for the management of Malaria, HIV/AIDS, Tuberculosis and Neglected Tropical Diseases at hospital level in the provinces of Litoral, Kie Ntem and Wele Nzás of Equatorial Guinea. Management assignment of the AECID (Spanish Agency for International Development Cooperation) to the FCSAI Foundation.
- Coordination of the Network for Collaborative Research on Tropical Diseases (RICET): Program for the Prevention and Control of Imported, Emerging and/or Re-emerging High Impact Tropical Diseases RD12/0018/0001
- Antimalarial resistance mutations in Equatorial Guinea and Ethiopia: differences in areas with different malaria endemicity. Health Research and Development Strategy Project (PI: Pedro Berzosa Díaz).

4.2.7. Digital Health Research Unit (UITES)

The Digital Health Research Unit (UITES) promotes and develops R&D&I and Training activities in the field of Information and Communication Technologies (ICT) applied to health. Its lines of activity are: a) Development of PITES: Open Platform for Innovation in Telemedicine and e-Health, with specific actions in the fields of Active and Assisted Living (AAL) and Mobile Health (mHealth); b) Standardization and interoperability of information systems and electronic health records (EHR); c) Creation of repositories for the secondary use of information and knowledge extraction (artificial intelligence and machine learning); d) ICT empowerment of patients and professionals; e) Reliability analysis of complex monitoring environments and the safe use of medical devices in assisted environment contexts (AAL); f) Analysis of guarantees, protection, safety and electromagnetic compatibility (EMC) of telemedicine applications; and g) Evaluation of mobile telehealth e-services.

Highlighted activities

- Opening of a new line of research in artificial intelligence, participating in data analysis projects of COVID-19 patients.
- Increase in training activity with the collaboration of 4 external researchers (master's degree and rotations of Resident Medical Interns).
- In outreach, we participated in the Iberdrola INNOVA R+D+i program for young researchers (students in the 4th year of compulsory secondary education (ESO).
- UITeS was awarded the IV Madrid Telecommunications Night Award for Innovation by the Madrid Delegation of the Spanish Association of Telecommunications Engineers (AEITM) for "outstanding research, development and innovation in the field of Information and Communications Technologies applied to Health and, in particular, for its involvement in the fight against the COVID-19 pandemic".

Scientific and technical activities

During 2020, there were 10 (7 national and 3 international) projects active, including participation in the AIDS Research Network (RIS), the Healthcare Services for Chronic Diseases Research Network (REDISSEC), and projects in collaboration with IMIENS (Joint Research Institute - National School of Public Health).

Participation in international committees, consortia and networks

- AAL Forum Committee Members.
- Technical Secretariat of CTN139 and CTN 215 of the Spanish Association for Standardization (UNE).
- Participation as experts in CEN TC251 and ISO 215.
- Members of the Research Group "Medical Bioelectromagnetics" with registration CCS2008/R10, University of Alcalá de Henares, Madrid.
- Members of the Smart-Health Platform.
- Member of the Inventiveness and Creativity Committee of the Spanish Institute of Engineering.
- Member of the Metrology Committee of the Spanish Institute of Engineering.



4.2.8. Healthcare Research Unit (Investén-ISCIII)

The Healthcare Research Unit (Investén-ISCIII) has been working since 1996 on promoting research in nursing care and other disciplines related to this field. Its resources are offered to all National Health System (SNS) professionals interested in care research.

The Unit's activities aim to develop strategies and promote actions for the promotion and coordination of multidisciplinary and translational research in healthcare, strengthening the link between clinical practice and research and enabling the implementation of safe and quality care to improve the health of the population.



Highlighted activities

During the SARS-CoV-2 pandemic, the unit has increased support to clinical practice in the area of providing safe care under pandemic conditions and protection and support to professionals. The unit has worked on the search and dissemination of the best available evidence related to COVID-19 and made it available to professionals involved in management and professionals involved in clinical practice.

Scientific and technical activities

Investén-ISCI coordinated research projects and activities. It carried out virtual training and dissemination activities. Finally, it increased its scientific publications. The focus of all these activities involved the following lines of activity:

- Increasing the presence and visibility of care research led by nursing professionals, physiotherapy professionals and other professionals in health sciences.
- Promoting the exchange of transactional knowledge and incorporation of scientific activity in care at the European and international level.
- Promoting training in topics related to research methodology and Evidence-Based Clinical Practice (EBCP) for professionals involved in the provision of care.
- Improving the transfer of research results in care by providing support for the application of these results in clinical practice.

Participation in national and international consortia and committees

Collaboration agreement with the 17 Autonomous Communities in the field of EBCP and international collaboration with: Registered Nurses' Association of Ontario (RNAO) of Canada; the Joanna Briggs Research Institute (JBI) of Australia both in the international group and in its European Consortium, and finally with the Universities of Toronto, Cardiff and South Australia.



4.2.9. Central Scientific and Technical Units (UCCTs)

The Central Scientific-Technical Units (UCCTs), area of the General Sub-Directorate for Applied Services, Training and Research comprise six Units: Genomics Unit, Bioinformatics Unit, Flow Cytometry Unit, Electron and Confocal Microscopy Unit, Histology Unit and Veterinary Unit.

Their primary objective is to offer scientific and technical assistance to support clinical diagnosis and research. The UCCTs also develop competitive technical projects that allow them to be always up-to-date.

Highlighted activities

- Complete sequencing of SARS-Cov-2 genomes.
- Viral genome analysis of samples corresponding to the West-Nile outbreak in Andalucía during the summer of 2020.
- Role of the APP protein and its derivatives in human neural stem cell biology and their involvement in Alzheimer's disease. Project modality.
- Collaboration in the development of a standardized architecture of clinical data for the generation of infobanks and their secondary use in research: technological solution.
- Study of the exomes of 146 patients and their relatives, and analysis of the first 13 genomes within the SpainUDP program of the IIER-ISCI.
- 320 "in vivo" assays in P2 facilities with different pathogens, 32 of them for the diagnosis of human botulism at a national level.
- The UCCTs are integrated into a laboratory quality management system based on ISO 9001 and 15189 standards. Three Units (Veterinary, Confocal Microscopy and Flow Cytometry) have their services certified by AENOR, and tests of two other Units, Electron Microscopy and Genomics, are ENAC-accredited.



Scientific and technical activities

- Implementation of the Novaseq 6000 high-capacity mass sequencing system.
- Genomic sequencing of more than two thousand bacterial isolates within the surveillance and control programs carried out at the National Microbiology Center.
- Installation, for the first time in the country, of a cryo-electron microscope equipped with a direct electron detector in a Biosafety Level 2 environment.
- Implementation of Opentrons robots for the diagnosis of COVID-19 and transfer to the SNS, and the development of a web tool to help in the use of this equipment <https://openrobots.isciii.es/>.
- Putting into production of software that facilitates the tracing of samples throughout the massive sequencing and analysis process <https://iskylims.isciii.es/>.
- Support for the development of GMOs (Genetically Modified Organisms) by the CRISPR technique through electroporation of embryos.
- Support for 620 requests for in vivo procedures for the centers CNM, UFIEC, IIER and AECOSAN.
- Diagnosis by means of electron microscopy techniques (21 samples).
- Research support for the observation and analysis of biological samples by means of optical confocal microscopy (~400 hours of observation) and electron microscopy (~600 samples and ~350 hours of observation).
- Determination by three-dimensional cryo-electron microscopy techniques of the first atomic structures of non-group A rotavirus particles.



Participation in national and international consortia and committees

The Microscopy Unit is part of REMOA (Advanced Optical Microscopy Network) and the Laboratory Network of the Autonomous Community of Madrid. It also forms part of the Spanish Network of Virus Biophysics. It is also part of the consortia “Near-atomic structural analysis of nanomachines and macromolecular assemblies by the Spanish cryo-EM community” and “The Iberian cryo-EM community BAG” for access to European cryo-electron microscopy facilities.

The Bioinformatics Unit is part of the nf-core Bioinformatics community due to its collaboration in the development of the SARS-CoV-2 genome analysis pipeline (<https://nf-co.re/viralrecon>). It represents the ISCIII in the European 1+M Genome initiative that aims to sequence 1 million human genomes by 2022 (<https://digital-strategy.ec.europa.eu/en/policies/1-million-genomes>), and is a member of the COVID-19 data portal Europe consortium <https://www.covid19dataportal.org/>.

4.2.10. Biological Alert Laboratory Network (RE-LAB)

Highlighted activities

The ISCIII coordinates the Biological Alert Laboratory Network (RE-LAB), which is a scientific and technical infrastructure composed of twelve reference laboratories specialized in microbiology and the Rapid Identification Laboratory (LABIR) of the Military Emergency Unit, as a collaborating laboratory, within its competences in the field of civil protection. The role of this network is fundamental in the mitigation of the risks derived from both the intentional release of biological agents and the accidental release of such agents.

Its purpose is to provide operational support to the National Security System against risks and threats posed by biological agents. It is an important element in the case of terrorist threats of a biological nature in Spain. Under its control, a coordinated response with the competent health authorities can be organized, especially with the Health Alert and Emergency Coordination Center (CCAES) of the Ministry of Health and with the law enforcement agencies, to give a rapid and effective response to incidents of a biological nature.



Scientific and technical activities

The RE-LAB Management Unit coordinated the network reference laboratories' response to alerts regarding postal deliveries containing possible biological threat agents that occurred throughout the year.

- The alert management procedure is certified in accordance with the UNE-EN ISO 9001:2015 Standard.
- The ISCIII participates, through the CNE and RE-LAB, as an affiliated entity in the TERROR Joint Action of the European Commission's Directorate General for Health and Food Safety, whose main objectives are to address gaps in health preparedness and strengthen cross-sectoral work with security, civil protection and health sectors' response to biological and chemical terror attacks.
- It promotes the participation of the network laboratories in the H2020 Security Challenges calls and disseminates information about other calls of interest.
- It is the ISCIII point of contact for the List of National Organizations collaborating with the European Food Safety Authority (EFSA) and the Spanish Agency for Food Safety and Nutrition (AESAN).

Participation in Committees and Working Groups

- Working Group for the creation and implementation of the National Bio-custody Commission created within the Specialized Committee on Non-Proliferation of Weapons of Mass Destruction, to comply with the mandate of the National Bio-custody Plan (Order PCI/168/2019, of 22 February), on behalf of the Ministry of Science and Innovation.
- Interministerial Group for the Prohibition of Biological Weapons (GRUPABI), coordinated by the Sub-Directorate General of Non-Proliferation and Disarmament of the Ministry of Foreign Affairs, European Union and Cooperation.
- Interministerial Working Group for the implementation of the Chemical, Biological, Radiological, and Nuclear (CBRN) Action Plan of the European Union coordinated by the Ministry of Home Affairs.



4.2.11. Health Technology Assessment Agency (AETS)



The Health Technology Assessment Agency (AETS) addresses the SNS' needs for scientific information and evidence related to determining the policy on healthcare benefits and improving its quality and efficiency. Thus end, the AETS offers objective assessments of the health, social, ethical, organizational, and economic impacts of health techniques, procedures, and interventions to provide a scientific basis for the decisions made by authorities and other healthcare agents.

Highlighted activities

During 2020, the AETS completed 25 health technology assessments within the "Spanish Network of Agencies for Assessing National Health System Technologies and Performance" (REDETS). It also conducted teaching activities, research projects and consultancy, and participated in consortia, networks and national and international committees.

Scientific and technical activities

Since 2012, most of the activities of the AETS have been undertaken within the framework of the "Spanish Network of Agencies for Assessing National Health System Technologies and Performance" (REDETS). The activities carried out in 2020 were:

- Reports on the effectiveness and safety of different products and technologies including reports on the protection plan against pseudo-therapies commissioned by the Ministry of Health and the Spanish Network of Agencies for Assessing National Health System Technologies and Performance.
- Coordination of Monitoring Studies.
- Evaluation of technologies using the New and Emerging Health Technologies Detection System.
- Participation in the Clinical Practice Guidelines (CPG) program of the HealthGuide (GuíaSalud) in the SNS.
- Participation in international projects (EUnetHTA, CHRODIS+, PERMIT, 1+ Million Genomes).

Participation in national and international consortia and committees

- Permanent member of the EUnetHTA Executive Board.
- International Information Network on new and Emerging Health Technologies, to support decision-making on their appropriate use and need of re-assessment (EUROSCAN).
- International Network of Agencies for Health Technology Assessment (INAHTA).
- Implementing good practices for chronic diseases Joint Action (CHRODIS+ JA)

The AETS represents the ISCIII in:

- Commission on Benefits, Insurance and Funding of the SNS
- Committee for the Designation of Centers, Services and Reference Units (CSUR)
- Advisory Committee for Orthoprosthetic Benefits
- Advisory Committee for Dietetic Product Benefits
- Medicinal Products Committee of the AEMPS

4.3. Transversal research programs

4.3.1 Global Health

The ISCIII Global Health program is a transversal activity aimed at promoting collaboration and coordinating the efforts of different ISCIII actors working in the area of global health and tropical medicine (different centers and units, such as CNMT, CNE, CNM, CNSA and ENS, and the General Sub-Directorate for International Research Programs and Institutional Relations). Its **objective** is to develop the institute's capabilities in the area of Global Health. The organizational diagnosis has revealed multiple capabilities in this area.

The program creates alliances with other Spanish and foreign entities with which the ISCIII maintains relations, such as the Spanish Agency for International Development Cooperation, the State Secretariat for International Cooperation, the Special Program for Research and Training in Tropical Diseases (TDR/WHO) and the European & Developing Countries Clinical Trials Partnership (EDCTP).

It participates in 2 projects funded by the EDCTP in the 2020 call, and during 2020 the ISCIII joined the COVID-19 Clinical Research Coalition and the Chagas Coalition.

Training is also a key aspect of this program and the ISCIII together with the UNED through IMIENS is designing a University Master's Degree in Global Health.



4.3.2. Digital Health

Digital health is the application of digital methods and the use of data and information to improve people's health. Recent technological developments (big data, artificial intelligence, Internet of Things, telemedicine, etc.), the strains on healthcare systems (such as aging, chronic diseases, public health crises such as COVID-19 and sustainability) and new trends in medicine (e.g. personalized, predictive, and participatory medicine) are accelerating the application of digital health in biomedical research, clinical research, healthcare and public health.

The ISCIII Digital Health program is a transversal activity aimed at promoting collaboration and coordinating the efforts of the different ISCIII units working in this area. Its **aim** is to contribute, from a scientific perspective, to the digital transformation of healthcare in its various spheres of action. The program also plans to work in collaboration with Spanish and international entities.

Training is a key aspect of this program and the ISCIII is designing with the UNED through IMIENS a University Master's Degree in Biomedical and Health Informatics, divided into four areas of activity: research; training and professionalization; methodological support (design, evidence, evaluation and monitoring of projects); and implementation programs (e.g. personalized precision medicine or participatory medicine).

Digital health represents a key element for the fulfillment of the Sustainable Development Goals (SDGs) of the UNDP (United Nations Development Program), specifically the one related to health and well-being (SDG 3).

4.3.3. Prevention and management of chronic diseases: CHRODIS-PLUS



Joint action funded by the 3rd Health Program of the European Union (running from September 2017 to November 2020), coordinated by the ISCIII, and in which 50 institutions from 21 European countries participated. This initiative aimed to improve the quality of life of the chronically ill through the development of national plans and strategies and the promotion of the exchange of best practices related to the prevention and management of chronic diseases.

During its course, 21 best practices were implemented in the following areas:

- Health promotion and primary prevention
- Integrated multimorbidity care model
- Fostering quality care for people with chronic diseases

Furthermore, tools have been developed and adapted to improve workability and help people with chronic health conditions stay longer in the workplace in the best possible conditions.

On the other hand, 16 policy dialogues were organized (14 at the national level, including Spain, and 2 at the European level), which focused on catalyzing change in strategies related to chronic diseases towards sustainable evidence-based policies.

The ISCIII carried out the overall coordination of the project from the National School of Health (ENS), in collaboration with the Health Technology Assessment Agency, the National Epidemiology Center and the National School of Occupational Medicine in different working areas, such as the evaluation of the implementations of the multimorbidity models, the development of the methodology for the policy dialogues, and the definition of the Consensus Statement, as well as on the tools to favor the participation of people with chronic diseases in the workplace.

50 institutions

21 countries

16 political dialogues

Primary prevention

Integrated care

Improved employability

4.4.

ISCI-UCM Joint Center for Research on Human Evolution and Behavior

This center carries out its activities in three areas of work:

- human evolution,
- ancient DNA, and
- cognitive neuroscience.

In addition to research related to the Atapuerca archaeological sites, the team collaborates with other sites both inside and outside Spain. We would like to highlight Aroeira and Lagar Velho (in Portugal), Pinilla del Valle (Madrid), Cuevas de Fuentos de León (Badajoz), Valle del Tejadilla (Segovia), and El Gegant and Canyars (Barcelona).



HUMAN EVOLUTION

In the area of human evolution, we continued the study of the different skeletal elements from the sites of the Sima de los Huesos and Gran Dolina de Atapuerca (Burgos), as well as from other Middle Pleistocene populations such as Aroeira (Portugal) and from the Upper Paleolithic of Axlor (Vizcaya) to better understand the evolution of human anatomy. Also, a study on the possible hibernation of individuals from the Sima de los Huesos was published in the journal *Anthropologie*. We conducted several studies of acoustics to better understand the evolutionary patterns of the middle and inner ear. We studied and compared contemporary specimens, such as the specimen from Aroeira 3 (Portugal), with the Sima de los Huesos specimens and with other Neanderthal populations.

In 2020, we published 8 articles on paleoanthropology and another 8 on topics related to human evolution, such as faunal studies and studies on geochronology, paleoclimate and paleoecology.

ANCIENT DNA

The aim of this research line is to study ancient DNA from European fossils, with special emphasis on the Atapuerca specimens, to obtain knowledge of the evolution of Neanderthals and modern human populations. We obtained the amino acid sequence of the protein remains from the tooth enamel of *Homo antecessor* and were able to precisely determine the position of *Homo antecessor* in the human family tree. The analysis of ancient proteins (paleoproteomics) provided evidence of a close relationship between *Homo antecessor*, *Homo sapiens*, *Homo neanderthalensis* and the Denisovans. The results of this study were published in the journal *Nature*.

COGNITIVE NEUROSCIENCE

The main objective of the Cognitive Neuroscience Section of the UCM-ISCI III Joint Center for Research on Human Evolution and Behavior is to explore in depth those aspects of human behavior that are characteristic and significant of our species. Our results have multiple applications: from a health point of view, they help us understand various behavioral health disorders, and from a social point of view, they are applicable in important platforms and contexts of information transmission, such as the educational, institutional and political spheres. All research conducted in this section addresses human behaviour - always in the light of the activity and anatomy of the brain, which is why it falls into the discipline of Cognitive Neuroscience. For that purpose, we have a laboratory for brain mapping based on the electrical activity of the brain (EEG).

In this context, our main lines of research are the following:

- **Extralinguistic factors affecting language comprehension.** Mainly, the following variables are studied: A) emotional, B) social and C) of the brain's motor coordination and sequencing system. This line will provide a deeper understanding of the nature of language, its possible evolutionary origins, as well as the variables that would allow more efficient transmission of linguistic messages of a certain complexity.
- **Study of social emotions.** Humans are hypersocial beings, and to understand their main motivations it is useful to know in depth some of their most characteristic emotions. In our laboratory we study, among others: guilt, shame and pride.
- **Study of individual identity and its construction throughout the different stages of life.** Knowing where personal identity is located and how it is constructed in the brain is of paramount importance. Many psychiatric disorders are rooted in abnormalities in the identity of the self.
- Linked to the foregoing research line is the **study of patients with schizophrenia**, in collaboration with the CSM (Mental Health Center) of Fuencarral (associated with the Hospital La Paz), the Hospital 12 de Octubre of Madrid, and the Hospital Clínico Universitario of Valladolid, with which we are also studying factors that may explain the mechanisms through which certain psychotic symptoms are produced.

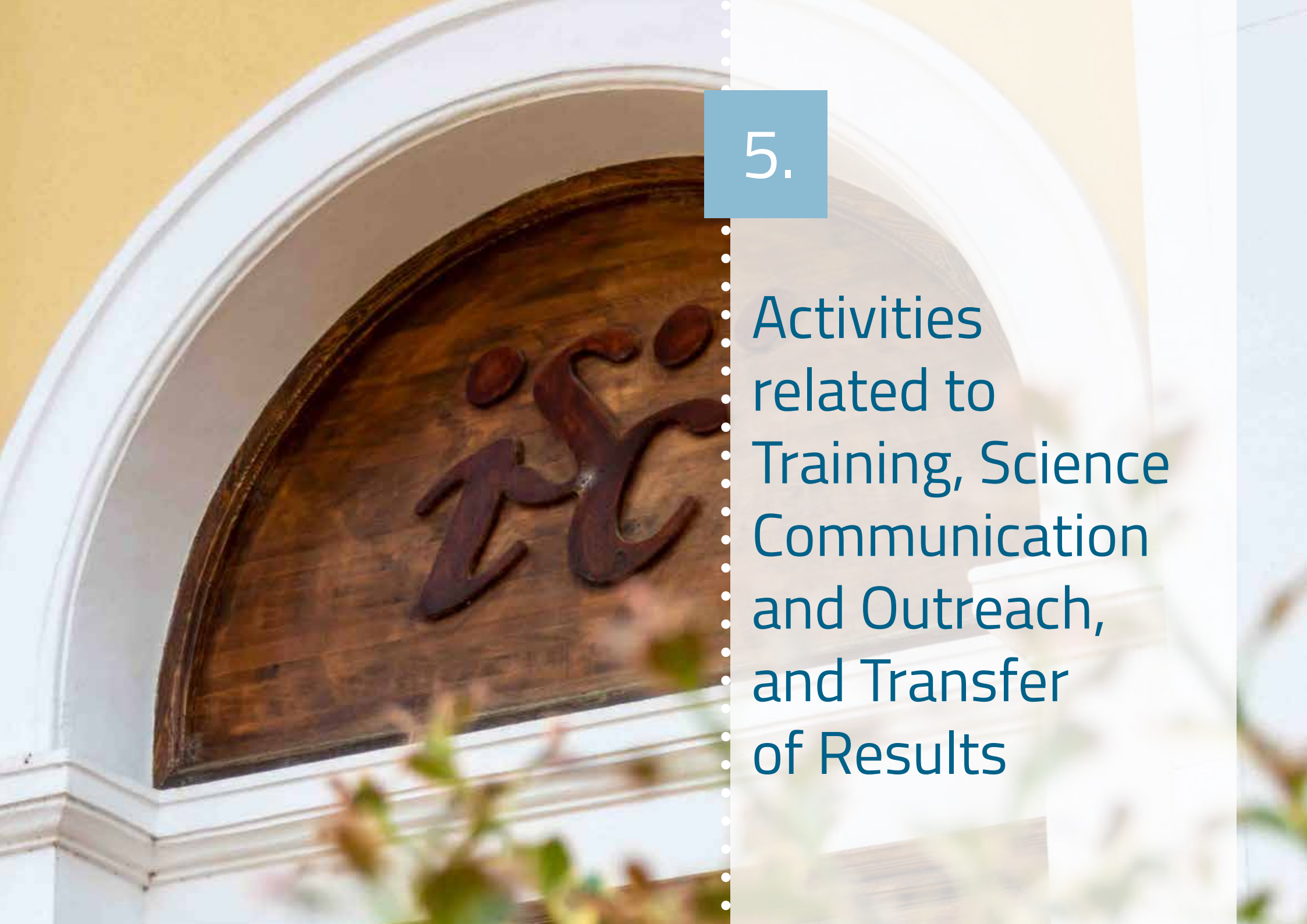
As a result of this research, 5 articles were published in 2020 in international journals ranked in quartiles Q1 and Q2.

KNOWLEDGE DISSEMINATION

To meet this objective, two exhibitions were held at the Museum of Human Evolution in Burgos:

The mysterious butterflies of the soul. Santiago Ramón y Cajal (November 2020). This exhibition was intended to pay tribute to Santiago Ramón y Cajal, highlighting his facets as a researcher and a teacher, but also as an artist and a humanist. It also aimed to show the great activity he devoted to making his idea that social and economic progress is based on scientific development a reality. The exhibition was organized around a selection of facsimiles of drawings by the Spanish Nobel Prize winner, on loan from the Cajal Institute of the CSIC. The drawings are accompanied by other pieces, including two microscopes on loan from the Institute of Health Carlos III. Museum of Public Health and Hygiene.

"Aida. The Egypt of dreams" (January 2020). The opera Aida is the main theme of the exhibition and the pretext to expose the "Egyptomania", the beginning of Egyptology as a science and the opening of the Suez Canal, one of the world's greatest engineering works, highlighting the Spanish presence and participation in these scenarios.



5.

Activities
related to
Training, Science
Communication
and Outreach,
and Transfer
of Results

5.1. National School of Public Health (ENS)

The National School of Public Health (ENS), founded in 1924, specializes in postgraduate training and continuing education in the areas of public health, health management and administration, and international health. It carries out research, technical studies and consultancy for public administrations and scientific, healthcare, and development cooperation entities.

Highlighted activities

- Mediterranean and black sea field Epidemiology Training Program network to increase security in the EU neighborhood. Acronym: MEDIPIET. (<https://medipiet.isciii.es/>). The objective of the project is to increase the security of the Mediterranean and Black Sea areas by supporting training in prevention and control of population threats of any origin. Funding entity: DG-PARTNERSHIP, with the collaboration of DG-SANTE and JRC (1,800,000€). Partners: ECDC (scientific leadership, through a Memorandum of Understanding with ISCIII) and FCSAI (for budget management). Scope: 18 countries of the Mediterranean Sea and the Black Sea. Duration: January 2019-December 2021.
- Participation in ENE-COVID survey: Development and management of a platform and contents for training in protocols and processes of the ENE-COVID study. Design, development and coordination of the Virtual Campus Project for Health Professionals and the ISCIII Virtual Campus for Citizenship.
- Design, coordination and dialogue with the Ministry of Health for the development and implementation of the Knowledge Management System to support the integral COVID-19 vaccination process in the ISCIII teaching platform (Campus for Professionals).

Table. Regulated Education ENS 2017-2020

	2020	2019	2018	2017
Master's Degrees	4	4	4	4
Diplomas	4	4	4	3
Short Courses	9	16	20	21
Hours taught	3,869	4,009	4,031	3,852
ECTS ¹ Equivalent	295	305	307	297
Students	425	576	378	474

¹ECTS: European Credit Transfer System, a system adopted by all universities in the European Higher Education Area (EHEA) to guarantee the homogeneity and quality of the studies they offer.

Table. 2020 Training offer

2020 TRAINING OFFER	Academic load (teaching hours)	ECTS
Master's Degree in Public Health	1,500 (750)	60
University Master's Degree in Healthcare Administration	1,500 (750)	60
Master's Degree in Systems Management and Information and Communications Technology in Health	1,500 (750)	60
Master's Degree in Bioinformatics Applied to Personalized Medicine and Health	750 (250)	60
Diploma of Specialization in Senior Management and Administration of Nursing Services and Units (online)	250	10
Diploma of Social and Health Ethics and Functioning of Committees	250	10
Diploma of Specialization in Public Health for Development Aid (blended)	250	10
Diploma of Specialization in Health Law and Bioethics (Online)	250	10
In-person continuing education courses/workshops	369	15

Students in training	2020	2019	2018	2017
Total number of MIRs in training programs (R1, R2, R3, and R4)	12	10	9	8
Number of Master's Degree and Diploma students	294	235	205	225
Number of students in continuing education	119	331	164	241
Total students	425	576	378	474



Activities with UNED/IMIENS (Joint Research Institute - National School of Public Health)

Projects:

- Effect of healthy habits messages in TV food ads on adolescent attitudes: a randomized intervention study. National School of Public Health, Madrid, 2019-2021. Project funded by IMIENS in the Resolution of February 14, 2019, of the call for joint ISCIII-UNED research projects 2018. BICI No. 19, 25 February 2019.
- Sexual violence against women: response of the health and social sectors to the needs of women who experience it. ENS, Madrid, 2019-2021. Project funded by IMIENS in the Resolution of February 14, 2019, of the call for joint ISCIII-UNED research projects Course 2019-2020. BICI No. 1, 7 October 2019.
- Accessibility, transition through the process and reasons for abandoning assisted reproduction treatments. A mixed methodological approach. IMIENS. Project funded by IMIENS in the Resolution of February 14, 2019, of the call for joint ISCIII-UNED research projects 2018. BICI No. 19, 25 February 2019.
- Modeling the natural history of Buruli ulcers and the impact of strategies to improve its diagnosis and reduce its impact. ENS, Madrid, 2019-2021. Project funded by IMIENS in the Resolution of February 14, 2019, of the call for joint ISCIII-UNED research projects 2019. BICI No. 1, 7 October 2019.
- Evaluation of HIV-PMTCT (Prevention of Mother-to-Child Transmission of HIV) services in Equatorial Guinea. ENS, Madrid, 2018-2020. Project funded by IMIENS in the Resolution of June 25, 2018, of the call for joint ISCIII-UNED research projects 2018. BICI No. 36, 4 October 2018.
- Procedure for systematization of exposome data for the development of a computational expotyping platform. PIC-IMIENS-2018-003. ENS, Madrid, 2018-2021. Project funded by IMIENS through the call for joint ISCIII-UNED research projects 2018.



Separate courses described previously

- | | |
|--|---|
| • Master's Degree in Healthcare Administration | • University Expert in Community Nutrition and Public Health |
| • Master's Degree in Medical and Clinical Management | • University Expert in Health Promotion |
| • Master's Degree in Public Health | • University Expert in Nutrition, Health and Functional Foods |

5.2. National School of Occupational Medicine (ENMT)

The National School of Occupational Medicine (ENMT-ISCIH) is the ISCIH's specialized center for training, consulting and research in occupational medicine and nursing. Its mission is to contribute, together with other bodies of the General State Administration, Autonomous Communities and social partners, to strengthening the preventive system and improving workers' health.

The National School of Occupational Medicine is a National Reference Center of the International Occupational Safety and Health Information Center (CIS) of the International Labor Organization.

Moreover, as a **reference center, the ENMT continues to lead the first stage in training** specialists in Occupational Medicine and Nursing for the multidisciplinary teaching units in Occupational Health of 12 Autonomous Communities.

Specialized health training in Occupational Nursing has been initiated for 32 resident intern nurses from the Teaching Units of 6 Autonomous Communities (Aragón, Asturias, Canarias, Castilla y León, Madrid and País Vasco).

During 2020 the ENMT has formalized the following institutional relationships:

- General action protocol between the ISCIH and the National Institute for Safety and Health at work (INSST) for the stimulation of training, research and innovation in occupational safety and health.
- Service provision contract between the ISCIH and Quirón Prevención for the training of specialists in Occupational Medicine and Nursing.

Furthermore, procedures have been initiated for the formalization of new agreements between the ISCIH and the Regional Government of Extremadura, as well as with the Autonomous Community of the Islas Baleares and the Autonomous Community of Castilla y León for the training of specialists in Occupational Medicine and Occupational Nursing.



TEACHING AREA

The ENMT has carried out the following activities in each of its areas of activity:

Table. Courses taught at ENMT during 2020

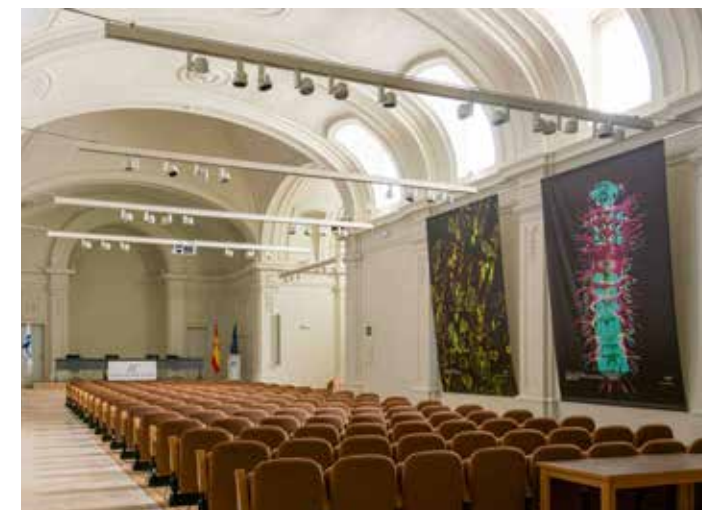
ENMT COURSES 2020	FORMAT	CCT*/ECTS CREDITS	No. OF STUDENTS	TRAINING HOURS
** Specialized Healthcare Training MIR in Occupational Medicine	Until March 2020: in-person From March 2020: Distance learning (live streaming)	NOT APPLICABLE	97	800
Specialized Healthcare Training MIR in Occupational Nursing	ENMT e-learning + live streaming	NOT APPLICABLE	32	400
Occupational diseases for primary care physicians, 8th edition	ENMT e-learning	6.9 CCT	62	98
Occupational diseases for primary care physicians, 9th edition	ENMT e-learning	6.9 CCT	62	98
University Master's Degree in Medical Evaluation of Inability to Work and Dependency (ISCIII-UAH -INSS -IMSERSO)	ENMT e-learning	60 ECTS	6	420
University Expert Degree in Medical Evaluation of Inability to Work and Dependency (ISCIII-UAH -INSS -IMSERSO)	ENMT e-learning	42 ECTS	19	294
8th Scientific Workshop on Systematic Review Studies in Occupational Health	IN-PERSON		93	6
Introductory Course on Planning Health Promotion Interventions in the Workplace	ENMT e-learning	4.8 CCT	44	45
Presentation day master's dissertations (Master's Degree in Ethical Assessment of Disability and Dependency)	VIRTUAL (live streaming)	-	6	5
Workshop on the COVID-19 Pandemic and its Medical Impact on Mutual Insurance Companies	VIRTUAL (live streaming)	-	170	2
TOTAL			591	2,168

*CCT: Course submitted to evaluation (of teachers and contents) by the Commission for Continuous Training of the National Health System.

** Only MIR students (R1) who received in-person theory classes are included.

Table. Global training indicators

GLOBAL TRAINING INDICATORS 2020	No. of Students
* Total number of MIRs in training programs (R1, R2, R3, and R4)	179
Total number of resident nurses in training programs (R1)	32
No. of students in continuing in-person education (until the beginning of the pandemic)	46
No. of students in virtual direct-streaming education	176
Number of students in online continuing education	261
Number of students in postgraduate education in agreements with Universities	25
TOTAL	719*



* MIR students (R1) who received in-person theory classes plus MIR students (R2, R3 and R4) who continue in training with non-classroom activities, included in the research training, carried out until the end of the residency, were included.

Participation in the doctoral program of the UNED through IMIENS, with the ongoing supervision of an international doctoral student's thesis.

SCIENCE OUTREACH

1. Participation of the ENMT as a speaker at the CHRODIS + Conference: Improving prevention strategies and quality of life for people with chronic conditions November 19, 2020

2. Publishing of the **Occupational Medicine and Safety Journal**:

The 4 usual yearly issues were prepared for publication, and throughout 2020 the four issues corresponding to 2019 (nos. 254, 255, 256 and 257) and two issues corresponding to 2020 (nos. 258 and 259) were published.

Table. Articles published in 2020 compared to 2019

	2019	2020
Original articles	7	13
Case Studies	6	3
Review articles	10	6
Others	7	1
TOTAL ARTICLES	30	23

5.3. Teaching Activities in the Centers and Units

Highlighted activities

The ISCIII's own centers and units carry out teaching activities associated with their research work and scientific and technical support; the most important activities were hosting training stays and participation in doctoral programs and postgraduate programs.

The PhD Program in Biomedical Sciences and Public Health is the first doctoral program of the ISCIII-UNED; it will start in the academic year 2020-2021 and globally covers a wide and varied number of research lines. There are 171 professors involved, 134 from the ISCIII and 37 from the UNED, which makes up a quality training offer with an interdepartmental and inter-faculty character and a professional and research orientation.

Teaching activities

The most significant teaching activities of the ISCIII's Centers and Units are the following:

- Training stays: Nearly 230 people made training stays at the ISCIII in 2020, complying at all times with the individual and collective protection measures established at the ISCIII as a consequence of the COVID-19 pandemic. It is worth mentioning that 46% of the training stays corresponded to students who had completed their TFG/TFM (Bachelor's Thesis/Final Master's Degree project) and were working on their doctoral thesis, 10% corresponded to hospital residents in training, and 19% to stays by collaborating scientific personnel.
- Participation in doctoral programs, postgraduate training, university courses and academic activities.
- Participation of the centers and units in the organization and coordination of teaching activities, the coordination of master's courses, and the organization of programs and activities should be mentioned.



5.4. Science Communication and Outreach



210 210 informative items published on the ISCIII website
<https://www.isciii.es/Noticias/Noticias/Paginas/default.aspx>

30 dissemination items published on the ISCIII website
<https://www.isciii.es/InformacionCiudadanos/DivulgacionCulturaCientifica/DivulgacionISCIII/Paginas/default.aspx>



65 press releases
 sent to the media



79 videos
 distributed and published



19 popular-scientific
 reports

of the Coronavirus Scientific Analysis Group
<https://www.conprueba.es/informes>



COVID-19 Guide,
 developed by the BNCS

<https://www.isciii.es/QueHacemos/Servicios/Biblioteca/Paginas/Guia-COVID.aspx>



Visits and followers

> 6,000,000 visits to our website: www.isciii.es



Twitter

20,000
 followers
12 millones
 impressions



LinkedIn

10,000
 followers
6 millones
 impressions



Youtube

457 subscribers
169,182 views
121,662 impressions



Events organized

Second meeting
"Getting to know the ISCIII"
 Majadahonda Campus
 January 15

3rd ISCIII Symposium Women
and Girls in Science
 Chamartín Campus
 February 11

UIMP Summer Courses, Santander
COVID-19: epidemiology, microbiology
and research into surveillance and control
strategies of the pandemic
 August 27-28

Online outreach seminars
Coronavirus and Public Health: Lessons
learned and challenges for the ISCIII
 September 9

The flu: "A seasonal classic"
 September 28 or 23

Tribute to Dr. Rafael Nájera and presentation of
the book "El ISCIII en el marco de la evolución
de la salud pública [The ISCIII in the context of
the evolution of public health]"
 September 28

Science Week (online)
"The cells that defend us: the immune system-
Virtual visit to an immunology laboratory"
 November 4

PCR: the Sherlock Holmes of science
 November 10

Researchers' night (online)
"Science from different angles"
 November 27

5.5. Office for the Transfer of Research Results (OTRI)

In accordance with its bylaws, ISCIII's Office for the Transfer of Research Results (OTRI) is responsible for managing and coordinating the transfer of research results, as part of the General Sub-directorate for International Research Programs and Institutional Relations.

Highlighted activities

- **Patent management:** in 2020, the OTRI had a portfolio of 88 patents, including granted and filed patents, belonging to 20 patent families. Of these, 15 are Spanish and the other 73 are international, either already granted or pending. Two new patent families were incorporated, related to the inventions: *"Use of new exosomes for the treatment of neoplasms"* and *"A new method for manual and automated extraction of nucleic acids (DNA and RNA) in Openrons robots."*
- **Licenses of Materials and Know-How:** Various national and international agreements were processed in order to transfer and license the use of materials.

Promotion of the Technology Portfolio: Attendance at Fairs and Congresses

In 2020, the OTRI actively participated in the European Forum for Science, Technology and Innovation TRANSFIERE 2020, held in Málaga. The ISCIII participated with a stand in which its scientific and technical offer was publicized. Meetings were also held with companies of the sector.

In addition, the ISCIII has continued to carry out activities to publicize its technological offer through e-mails and through technological portals such as the EEN (Enterprise Europe Network) and the ISCIII's own website.

Of note, as a singular activity in 2020, the ISCIII promoted in collaboration with the U.S. Department of State a working mission during the first two weeks of February to visit world reference centers in the field of health research and innovation in the cities Washington, Boston and Cleveland. The purpose of the visit was to strengthen cooperation in biomedical and health innovation between Spain and the United States. ISCIII's OTRI, together with the ITEMAS Platform, coordinated this visit in which nine other experts from the ITEMAS Platform participated.

Consulting and advising activities

Consulting and advising activities were carried out in relation to queries made by ISCIII researchers on patentability issues of research results, non-disclosure agreements, co-ownership agreements and processing of various types of documents, such as ISCIII internal procedures.

5.6. National Library of Health Sciences (BNCS)

The National Library of Health Sciences (BNCS) provides bibliographic support to all ISCIII activities and documentary services to the SNS. It develops various projects to make the health sciences literature produced in Spain visible through the database **IBECS** (<http://ibecs.isciii.es>), the portal **SciELO España** (<http://scielo.isciii.es>), the collective catalog of health sciences journals in Spanish libraries **CNCS** (<http://cncs.isciii.es/>), and the adaptation of the **DeCS** thesaurus to the terminology used in Spain. It disseminates the scientific and institutional production of the ISCIII and its foundations (CNIC and CNIO) both nationally and internationally through the institutional repository **REPISALUD** (<https://repisalud.isciii.es/>).

HIGHLIGHTED ACTIVITIES

- The BNCS creates **the COVID-19 guides** (one for professionals and another one for citizens) with web resources from official sources and contrasted quality. This is an adaptation of the “2019-nCoV Acute Respiratory Disease: Health Information Guide” of the Disaster Information Management Research Center (DIMRC) of the NLM (National Library of Medicine, part of the National Institutes of Health (NIH) of the United States). They were first published in February 2020 and are updated daily. They received more than 201,000 visits and 150,000 visitors in 2020, and the home page was the third most consulted page of the ISCIII portal in the first weeks of the pandemic.
<https://www.isciii.es/QueHacemos/Servicios/Biblioteca/Paginas/Guia-COVID.aspx>
- **3rd Meeting of Representatives of the Ministries of Health of the Autonomous Communities**, convened by the ISCIII in December 2020 to discuss issues related to the CNCS (National Catalog of Health Sciences Publications). Minutes: https://cncs.isciii.es/wp-content/uploads/2021/02/3a-Reunion_Acta-202001201_signed.pdf
- **Action Plan 2020 of the Virtual Health Library (BVS)**, carried out as members of the network of Virtual Health Libraries in Latin America, the Caribbean and Spain and coordinated by BIREME (Specialized Center of PAHO-Pan American Health Organization). The main goals of the activities included: management of the BVS network, updating and expansion of bibliographic control, development/updating of the portal, governance and users. The BVS Spain portal has received about 270,000 visits.
- **Eighth meeting of the SciELO/IBECS Advisory Committee** held on March 9, 2020; the Committee is composed of experts in open access and scientific publishing. Approval of the inclusion of 13 journals into the SciELO collection and 16 into the IBECS database.



Table. Initiatives for the dissemination of Spanish scientific information

Virtual Health Library - Spain (http://bvsalud.isciii.es)	
IBECS Spanish Health Sciences Bibliographic Index	238 journals and 198,771 articles, an increase of more than 13,508 records 68,885 links to full-text articles included in SciELO España and in open-access journals
SciELO España Collection of Spanish open-access health science journals	66 publications and more than 42,000 full-text articles in html and pdf formats More than 46 and a half million visits (46,772,450), with an average of more than 4 million/month (4,252,041) More than 48 million pages downloaded (48,191,269)
DeCS Health Sciences Descriptors	436 new/modified descriptor definitions, 291 new/modified descriptors and 4,464 new alternative terms
National Health Sciences Catalog (CNCS)	
CNCS National Health Sciences Catalog	622,542 collections and 29,498 journals were integrated 142,280 records 178,045 queries to the CNCS API 14,160 thematic revisions and 2,154 modifications and new publications 1,482 users and 27,538 records consulted through the library catalog More than 13,500 visits to pages of the Catalog and 400 visits to the CNCS website and blog
BNCS Social Networks	
Twitter profiles	@BNCSisciii @scielospain @bvs_spain @REPISALUDisciii
Institutional Repository (REPISALUD)	
REPISALUD Scientific and technical production of ISCIII, CNIC and CNIO	Creation of the COVID-19 Reports collection No. of items: 5,945 (3,438 research and 1,953 institutional)

Table. Library, publishing and exhibition services

Library services	
In-library consultation	562 in-person users and 15 new reader sign-ups
Collections	Bibliographic collections: 42,803 publications , of which 38,144 are monographs and 2,673 are journals . An increase of 1.1% 278 active electronic subscriptions More than 55,000 accesses to electronic books and journals
Database queries	209,133 (not including free databases such as PubMed, etc.)
Interlibrary loans and document requests	4,594 requests with an average response time of less than 1 day. 79% of the applicant libraries are from health centers
Editorial program	
	11 titles published in electronic format.
http://publicaciones.isciii.es	2,724 subscribers to alerts
Museum of Public Health and Hygiene	
Guided group tours	26 guided tours and 345 visitors
Collaborations	
PAHO/WHO BIREME	Coordination of the BVS and BIREME/BNCS/BSC
Red Scielo.org	Coordination of the portal SciELO España
FECYT	INEOS project
BVS of the Autonomous Communities	Development of the CNCS

BIREME: Latin American and Caribbean Center on Health Sciences (PAHO Specialized Center; PAHO: Pan American Health Organization); INEOS Project: pilot project 'Infrastructures and Standards for Open Science'; FECYT: Spanish Foundation for Science and Technology



Museum of Public Health and Hygiene

This state-owned museum, located within the ISCIII premises, owns a noteworthy collection on public health in Spain, including a bacteriological laboratory from the first third of the 20th century. It also owns a documentary archive from the former Directorate General of Health, a library and the historical archive of clinical records from the former hospitals for infectious diseases. The BNCS coordinates the visits and activities of the Museum of Public Health and Hygiene. The Museum offers a program for guided group tours open to the general public, although due to the pandemic we experienced during 2020, these activities were limited to the first months of 2020. During the year, the visits indicated in the table above on Library Services were organized.





6.

Internationalization

The internationalization of the Spanish Science, Technology and Innovation System is one of the priority areas and the central focus of the Spanish Science, Technology and Innovation Strategy 2013-2020. The General Sub-Directorate for International Research Programs and Institutional Relations of the ISCIII is working both on the promotion of participation in European and international R&D&I programs and on European and international programming in the fields of Research Infrastructures, International Joint Programming Initiatives (including ERANETS), Joint Transnational Calls, and other International Consortia.

6.1. International research infrastructures

International Scientific Infrastructures are large facilities, resources or services that the scientific and technological community needs to conduct cutting-edge research of the highest quality and to transmit, exchange and preserve knowledge, technology transfer and innovation. They are distributed throughout Europe, and provide access to the entire international scientific community. Given their scientific and technological complexity, they are unique and exceptional in their kind and require very high investment, maintenance and operation costs. For this reason, and because of their strategic nature, they can only be achieved within a framework of international collaboration.

The international health research infrastructures are distributed in networks across different member states, that is, they consist of a central core and interconnected national nodes.

The ISCIII acts as a nexus between the national platforms, of which it is a co-funder, and the international community; the ISCIII facilitates international European and translational access to and use of these platforms and gives prominence to Spanish science in the European setting.



During the year 2020, the ISCIII had an active presence in the following European Research Infrastructures:

- ▶ **ELIXIR:** Distributed European Bioinformatics Infrastructure for Life Sciences, involving 22 countries and more than 200 Research Institutes that jointly develop fundamental services that allow access, integration and analysis of data to the research community. The Spanish scientific node was until this year the INB (Spanish National Bioinformatics Institute), a virtual platform funded by the ISCIII consisting of 19 computational biology groups that have been up and running since 2003. The INB coordinates, integrates and develops key bioinformatics resources in different areas of Life Sciences, including genomics, proteomics, transcriptomics, genomic medicine, structural biology and translational medicine, and participates in international projects such as the 1+Million Genomes Initiative (1+MG).

- ▶ **EATRIS-ERIC:** Distributed European infrastructure for Translational Medicine, facilitates collaborations between researchers, clinicians and technology developers for the design and development of preventive, diagnostic and therapeutic strategies in translational research and development of innovative biomedical technologies. The Spanish node of EATRIS operates under the supervision and coordination of the ISCIII, which in turn participates through 21 accredited Health Research Institutes, 5 of which joined last year. The year 2020 was characterized by the creation of a national EATRIS coordinator at the ISCIII, as a focal point for the participation of the different nodes in this initiative.

- ▶ **ECRIN-ERIC:** Distributed European Infrastructure for clinical trials, is a support and management body for multicenter and multinational non-commercial clinical trials. Its aim is to improve collaboration and networking and to ensure that medical practice decisions are based on evidence from quality clinical research. ECRIN aims to achieve an advanced level of technical competence in all the processes involved in the development and management of clinical research, legal guarantees, and competence of the researchers participating in the platform's studies on methodological aspects and good clinical practices. Spain's participation in this infrastructure is embodied in the Spanish platform SCReN, which acts as a Spanish scientific node. SCReN comprises 31 UICECs (Clinical Research and Clinical Trial Units) from 13 autonomous communities.





- ▶ **EU-Openscreen-ERIC:** Distributed infrastructure for Biology, Chemistry and Screening of Compounds for Therapeutic Activity. The general objective of this European infrastructure is to provide the scientific community with access to technical information, expertise and capabilities in research related to chemical compounds, the knowledge of their biological interactions and the discovery of new drugs. EU-Openscreen-ERIC comprises a centralized chemical compound library, a network of screening platforms, centers of expertise in pharmaceutical chemistry, and an open-access database that collects the results of the aforementioned chemical-biological interactions. EU-OPENSREEN develops molecular tools and compounds in a collaborative manner and offers researchers from both academic institutions and industrial organizations open access to its shared resources. Spain participates through a network of 4 research centers that are part of the Spanish Drug Discovery Network REDEFAR, funded by the AEI (Spanish State Research Agency), which currently provides two of the eight European high throughput screening centers.
- ▶ **IARC:** Specialized WHO Agency for Research on Cancer. The objective of IARC is to promote international collaboration in cancer research between countries and organizations. It is based on a multidisciplinary approach from different fields such as epidemiology, scientific evidence from laboratory experimentation and biostatistics, working together with a single mission which is the identification of the causes and prevention of cancer, for the development and adoption of preventive measures to reduce the incidence of the disease. It aims to become a global benchmark for cancer information, a global cancer biobank and the production of scientific evidence for cancer control policies.

6.2. International Joint Programming and International Consortia

In its role as a funding agency for research in health and biomedicine, the ISCIII participates in different European and international research programs together with R&D&I funding bodies from these countries. The main objective of these public-public partnerships is to develop joint research and innovation agendas, and to implement them through calls for transnational research projects. Their funding derives from national funds, where each national agency finances the research of its own country, generally with partial co-funding from the European Union. In the case of the ISCIII, this funding is implemented through the Health Research and Development Strategy, specifically in the call for projects of international joint programming 2020. The initiatives of this type in which the ISCIII participated in 2020 are described below.

6.2.1 Joint Programming Initiatives (JPIs):

- **Joint Programming Initiative on Neurodegenerative Disease Research** (*Joint Programming on Neurodegenerative Disease Research – JPND*): In an increasingly aging society, coordination and alignment of transnational research programs on neurodegenerative diseases is urgently needed. In 2020, a call for transnational research projects on **new imaging technologies and brain stimulation in neurodegenerative diseases** was launched with a budget of 18 million Euros. As a result, twelve projects were funded, two of them coordinated by Spanish groups funded by the ISCIII.
- **Joint Programming initiative on Antimicrobial Resistance Research** (*Joint Programming Initiative on Antimicrobial Resistance Research - JPI AMR*): The aim of this initiative is to develop joint research programs to combat antimicrobial resistance. The 2020 call was for **international research networks** with the objective to aggregate capacities, facilitate the exchange of and access to knowledge, techniques and data, as well as training. Seven research networks were funded, one of them coordinated by a Spanish group funded by the ISCIII.
- **Joint Programming Initiative “A Healthy Diet for Healthy Life”** (*Joint Programming Initiative “A Healthy Diet for Healthy Life” – JPI HDHL*). The aim of this initiative is to coordinate European research on nutrition, diet, health and physical activity to prevent or minimize diet-related chronic diseases. This year, a call for projects aimed at the **prevention and treatment of malnutrition in the elderly** was launched. Six projects were selected for funding, two of which have Spanish participation funded by the ISCIII.

6.2.2 ERA-NET Cofund and European Joint Program (EJP)

Of all the ERA-NET Cofunds, the following are coordinated by the ISCIII:

- **ERA PerMed:** this ERA-Net of research in Personalized Medicine is coordinated by the ISCIII at the European level. From Spain, besides the ISCIII, the Center for the Development of Industrial Technology (CDTI), the Regional Government of Navarra, the Department of Health of the Cataluña Regional Government, and the Scientific Foundation of the Spanish Association against Cancer participate as funders. In 2018, it launched its first call for projects with a budget of 30 million Euros, co-funded by the EU, and in 2019 it launched its second call with the same budget. This year, as a result of its third call, 18 consortium projects were funded, amounting to 23.3 million Euros, with the participation of seven Spanish groups funded by the ISCIII.
- **EuroNanoMed III:** This initiative is also coordinated at the European level by the ISCIII and 27 funding agencies from 21 countries and regions participate, including the CDTI, the State Research Agency and the ISCIII from Spain. In 2020 the eleventh call for R&D&I projects in nanomedicine was launched, which involved an investment of 8.2 million Euros in 10 research projects; 6 Spanish groups funded by ISCIII participate, and 3 of them act as coordinators.

In addition to the coordinated ERA-NETs, the ISCIII participates as a funding body in other European strategic priority thematic areas such as: i) Rare Diseases (in the framework of the *European Joint Program for Rare Diseases - EJP RD*) in which a call for advanced therapies was launched in 2020 and six Spanish groups were funded; ii) Neurosciences (*NEURON-3*) in which there was also a specific call for Neuroethics and Cardiovascular Diseases (*ERA-CVD*); and iii) finally those under the umbrella of the JPIs described above, such as JPCofund 2 (JPND), JPI-EC-AMR (JPI AMR), ERA-HDHL and HDHL-INTIMIC (both from JPI HDHL).



6.2.3 Initiatives based on Article 185 of the Treaty on the Functioning of the European Union

The ISCIII actively participates in two public-public initiatives created under Article 185 of the TFEU (Treaty on the Functioning of the European Union) where both the European Commission and the Member States contribute resources to fund research projects.

- **EDCTP (European and Developing Countries Clinical Trials Partnership).** This is the main Global Health program at the European level and its mission is to reduce poverty and improve health in Sub-Saharan African countries by funding collaborative clinical research, and to increase research capacity so that it results in the development of new or better medical interventions against poverty-related infectious diseases. There is a growing participation of Spanish research groups. Up to 2020, out of a total of more than 120 projects, 20 projects involving Spanish participation have been funded by this program, for which nearly 11 million Euros have been received; 9 of these 20 projects are coordinated by Spanish groups
- **AAL-2 (Active Assisted Living):** This program aims to find innovative solutions based on information and communication technologies to improve the quality of life of older adults. The 2020 call was delayed due to the COVID-19 health crisis; it was resolved in early 2021.

A total of 31 groups were funded by the ISCIII through the different programs in which it participates, with an approximate investment of 4.6 million Euros.

6.2.4 Other international initiatives

As a result of different international agreements in 2020, the ISCIII participated as a sponsor in an international call with **the United States**, specifically with the National Science Foundation and the National Institutes of Health, in which the ISCIII and the AEI (the Spanish State Research Agency) participated in the Collaborative Research in **Computational Neuroscience (CRCNS)** call. In 2020, the ISCIII also sponsored a bilateral project with the United States.



Summary of the AES 2020 calls for International Joint Programming Initiative Projects

Table. Funding of AES 2020 international joint programming projects with the participation of Spanish groups

Program*	Projects	Eligible	Fundable	Awarded (€)
EuroNanoMed-3	75	30	6	1,086,532
ERA PerMed	72	24	7	679,294
EJP RD	65	11	6	1,089,998
JPND-JPco-fuND	32	7	3	650,495
ERA-CVD	11	11	3	439,565
NEURON	10	5	0	
Aquatic Pollutants	6	5	-	
JPI HDHL - 3 years	6	6	2	338,047
NEURON ELSA	5	5	2	69,360
CRCNS	1	1	1	153,065
JPI-AMR - Networks	1	1	1	91,779
Total	284	106	31	4,598,134

* The acronyms of the programs included in the table are defined in the text of the section on International Joint Programming.



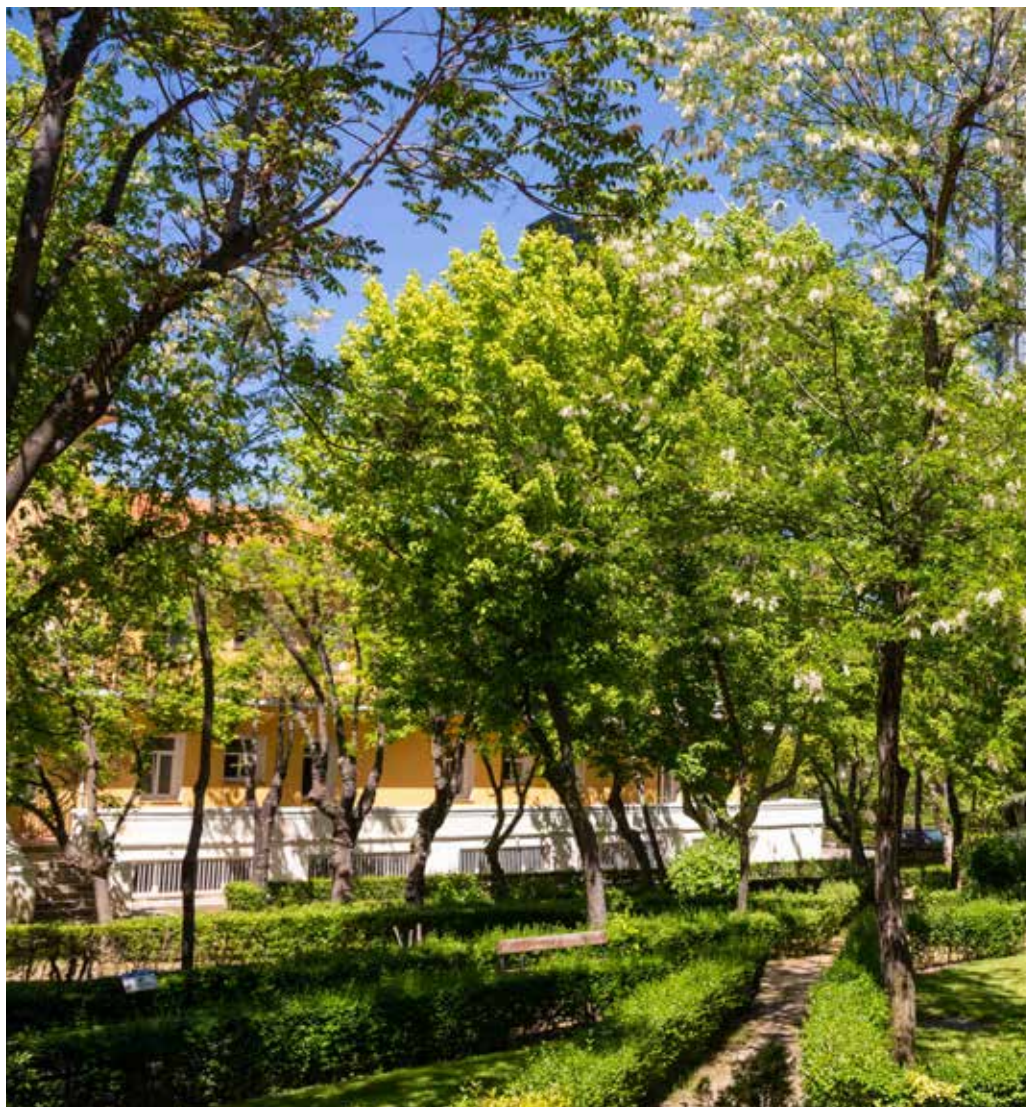


6.2.5 Other international consortia

In addition to the initiatives and programs mentioned above, the ISCIII participated in the international initiatives listed below. These consortia are mostly related to existing programs in one way or another and the role of the ISCIII is to align them with the funding activities:

- **1+MG:** More than 1 Million Genomes
- **IRDIRC:** International Rare Diseases Research Consortium
- **GloPID-R:** Global Research Collaboration for Infectious Disease Preparedness
- **CEPI:** Coalition for Epidemic Preparedness Innovations
- **TDR:** Research on Diseases of Poverty
- **ICPerMed:** International Consortium for Personalized Medicine
- **PMC:** Personalized Medicine Coalition
- **ICGC:** International Cancer Genomics Consortium
- **RIMAIIS:** Red Iberoamericana Ministerial para la Investigación en Salud

6.3. Promotion of International Programs



One of the functions of the ISCIII is to promote the structuring of the SNS and, in order to do so, the promotion of the internationalization of the entire SNS System is one of the cornerstones of its international activity. During 2020, efforts have been focused, on the one hand, on supporting participants in the latest calls of Horizon 2020, the EU Framework Program for Research and Innovation, including the special calls that arose in response to the COVID-19 pandemic; on the other hand, efforts focused with particular attention on preparing for participation in the new program, Horizon Europe, which starts in 2021 for the period 2021-2027.

Whereas it is true that the Framework Program attracts most interest and activity, support has also been given to participation in other European and international programs and initiatives.

The internationalization of the activity also involves counseling the ISCIII centers themselves. In this regard, 2020 was a particularly active year in which the ISCIII submitted 45 proposals to different international programs, mainly Horizon 2020, but also to other European and North American (National Institutes of Health) programs. In addition, a total of 26 international projects with ISCIII participation were approved or initiated this year.

6.3.1 Promotion of Participation in H2020 and preparation for Horizon Europe

During 2020 the European Projects Office (OPE) of the ISCIII worked intensively on awareness, promotion and dissemination activities of Horizon 2020, with particular attention to all existing opportunities for the area of health sciences and in the field of the SNS. In this regard, the COVID-19 health emergency also shaped much of the international activity. Of particular note is that the OPE publicized the European [ERAvsCORONA](#) plan and all its associated activities, including the European Data Portal for COVID-19. The EPO website hosted a section¹ dedicated to compiling useful resources and events for researchers and centers.

Activity during the first half of 2020 focused on promotion, training and help in preparing proposals for the latest H2020 calls, including specific support for participation in the calls launched in response to the COVID-19 epidemic emergency. During the second half of 2020, the activity intensified regarding preparatory actions for the new Horizon Europe Program, with specific awareness-raising activities in the last part of the year, including a 3-day pilot webinar course on the new features of the Program. A total of 37 courses, workshops and webinars were organized, as well as 9 information days and other dissemination activities conducted largely by telematic means. In order to contribute to these promotion, consulting, and training activities, more than 30 communications with information of interest were sent to distribution lists of researchers and research managers, with records of more than 1,100 contacts; the website, available at <http://eu-isciii.es>, was updated continually and was also renewed to adapt it to the new Horizon Europe program.

During 2020, all activity on new opportunities and instruments that may arise with the new Program has intensified, and information on the future **Cancer Mission** has been systematically included in many conferences, in order to dynamize and prepare Spanish participation in it.

Likewise, 2020 has been a very active year in the European initiative **1 Million Genomes (1+MG)**, where the ISCIII coordinates the Spanish participation and a first coordination workshop was organized with all mirror groups at the national level. The ISCIII also participates in the support and coordination action "*Beyond 1 Million Genomes*", precisely to support the effective implementation of the roadmap outlined by the signatory countries.

Subject	Courses	Workshop/ Webinar	Information day / Conference
General	2	1	1
Societal Challenge 1	1	8	4
ERC	1	12	1
RI	1	1	2
L&F Aspects	2	3	
EATRIS		5	1

ERC: European Research Council; RI: Research Infrastructures; L&F: Legal and Financial

¹ <https://eu-isciii.es/category/sars-cov-2/>

In **Societal Challenge 1 “Health, Demographic Change and Wellbeing”**, as part of the calls managed directly by the European Commission, the results of the Spanish participation in 2020² continued its successes of previous years. As many as 204 participations were registered, involving more than 77 million Euros for Spanish entities, **10.2% of the EU funds**. In 2020, Spain led 15 of the 126 projects awarded. Altogether, and since the launch of Horizon 2020 in 2014, Spain coordinated 168 projects out of a total of 1,098 actions funded (**15.3%**) and is the **EU’s leading country in number of coordinated projects**. In total, Spain accounted for 1,254 participations in projects funded under Social Challenge 1, which represents 11.1% of the EU28 countries. In terms of attracting funds, Spain received more than 524 million Euros in H2020 grant support, which represents a rate of **return on EU-28 investment of 10.1%**. This accomplishment keeps Spain in fifth position in the health area, only behind the United Kingdom (15.9%), Germany (14.4%), the Netherlands (13.4%) and France (10.8%).

Concerning this rate of return, the tractor effect of the ISCIII environment together with the SNS is remarkable, with nearly 50% of the successful participations and 45% of the returns (EU 28).

Table. Summary of the participation of Spanish entities in H2020 Societal Challenge 1. Data accumulated until 2020. Source: EC Dashboard, March 2021

H2020	Participations	Projects coordinated	EU Contribution €
ES	1,254	168	524,573,353 €
UE28	11,254	1,098	5,183,610,689 €
[ES/UE28]	11.1%	15.3%	10.1%

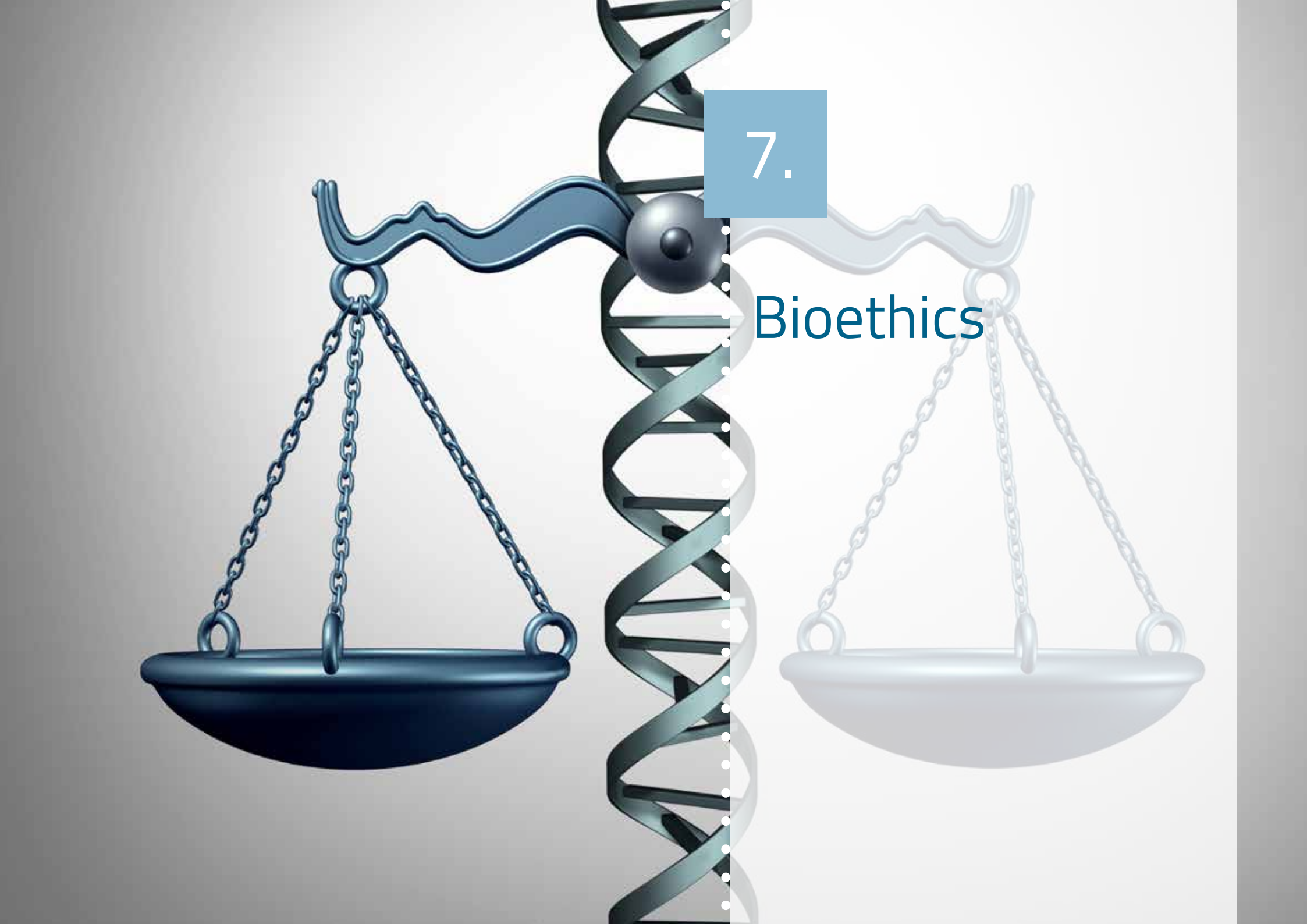
ES: SPAIN; EU28: EU of the 28 Member States; ES/EU28: % ES of the total of the EU28

6.3.2. EU Health Program

The ISCIII has the responsibility of being the National Contact Point of this program, promoting participation in the program, offering advice to interested parties and collaborating in the outreach activities of the program. In this regard, in addition to the continuing provision of advice, the ISCIII collaborated with a total of 5 events to disseminate the Program in Spain. The Work Program for 2020 was adopted on January 28. The call had a budget of 65 million Euros, of which €37 million Euros was allocated to co-funding activities through grants for projects carried out by entities working in the field of health, universities, policy makers, international or non-governmental organizations, through networks such as the European Reference Networks for rare diseases, and Joint Actions of the health authorities of the EU Member States.

The main topics funded in 2020 were: mental health, increasing vaccination coverage, reforms for the health workforce, pharmaceutical innovation and access to medicines, tobacco control, evaluation of health technologies, medical devices and rare diseases.

² Calls closing in 2020



7.

Bioethics

7.1. National Stem Cell Bank

The Sub-directorate for Cell Therapy and Regenerative Medicine of the ISCIII is in charge of the management, presidency and secretariat of the Technical Commission of the National Stem Cell Bank (BNLC) created under Article 42 of Act 14/2007, of July 3, on Biomedical Research. It is a biobank network affiliated to the ISCIII, with a central hub in charge of coordination and with nodes in Granada, Barcelona, and Valencia, which makes all stem cell lines generated in Spain available to the scientific community.

Meetings held

The BNLC Technical Commission held two meetings by teleconference. In addition, the heads of the nodes held three meetings with the chairwoman of the commission, also by teleconference.

List of cell lines deposited in 2020

During 2020, 22 induced pluripotent stem (iPS) cell lines were deposited in the BNLC. These cell lines were established in the following research centers:

CIEMAT- Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas [Research Center for Energy, Environment and Technology] (1), CABIMER Centro Andaluz de Biología Molecular y Medicina Regenerativa [Andalusian Center for Molecular Biology and Regenerative Medicine] (2), Centro Vasco de Transfusión y Tejidos Humanos [Basque Center for Transfusion and Human Tissue] (1), CIPF- Centro de Investigación Príncipe Felipe [Prince Felipe Research Center] (2), Fundació privada per la Recerca i la Docència Sant Joan de Déu [Sant Joan de Déu Research Foundation] (2), Centro Pfizer – Universidad de Granada – Junta de Andalucía de Genómica e Investigación Oncológica [Pfizer-University of Granada-Junta de Andalucía Centre for Genomics and Oncological Research] (GENYO) (6), Hospital Clinic de Barcelona – IBEC (1), Hospital La Fe de Valencia (1), Universidad A Coruña (3), Universidad Autónoma Madrid (2), Universidad Pompeu Fabra (1).

Lines requested in 2020

In 2020, the transfer of 35 iPS cell lines and 1 embryonic cell line for 12 projects carried out by 12 researchers (three of them from foreign institutions) was requested and approved.

The following iPSC lines were requested: iCas9-FL-BCL-iPSC (4), IC-Ctrl1-F-iPS-4F-1 (2), IC-AD1-F-iPS-4F-1, IC-AD2-F-iPS-4F-1, IC-AD3-F-iPS-4F-1, IC-AD4-F-iPS-4F-1, IC-AD5-F-iPS-4F-1, iPSC-CoQ4mut-clone 14, iPSC-CoQ4mut-corrected, iPSC-CoQ4mut-clone 34, IC-Ctrl2-F-iPS-4F-1, IC-Ctrl3-F-iPS-4F-1, CBiPS1sv-4F-5, FiPS Ctrl1-mR5F-6, FiPS Ctrl2-Ep6F-8, KiPS4F-1, [MS] FiPS1-R4F-3 (2), [MS] FiPS2-R4F-10, [MS] FiPS3-R4F-1, [MS] FiPS4-R4F-1, [MS] FiPS6-R4F-2, [MS] FiPS5-R4F-6, hiPSC clone 1, [CTRL.PD] FiPS005-4F-9, LVNC-FiPS-MIB1Ctrl-WTm6, [FiPS] Ctrl1-Ep6F-5, [FiPS] Ctrl1-Ep6F-5, FiPS Ctrl2-Ep6F-8, FiPS Ctrl1-SV4F-7 (2), and FiPS Ctrl2-SV4F-1 (2).

The requested hESC line was ES4.

During 2020, the BNLC web site was updated and a search system for the lines registered in the BNLC was implemented, which speeds up and facilitates searches by researchers interested in requesting cell lines.

7.2. Advisory Committee for Human Tissue and Cell Donation and Use

By Act 14/2007, of July 3, on Biomedical Research, the Advisory Committee for Human Tissue and Cell Donation and Use was created as the collegiate body, affiliated to ISCIII. It is a permanent and consultative body that is designed to advise and orient regarding research and experimentation with human embryonic samples and tissues, and to contribute to the updating and dissemination of scientific and technical knowledge in this matter.

During 2020, there were no changes in the composition of the Committee and four meetings of the Committee were held, on March 27, June 22, September 24 and December 23, where a total of 46 research projects received information.



7.3. National Register of Biobanks

The General Sub-Directorate for Research on Cellular Therapy and Regenerative Medicine coordinates the activity of the National Register of Biobanks, created by the Act on Biomedical Research and developed by Royal Decree 1716/2011, of 18 November, which establishes the basic requirements for authorization and operation of biobanks for biomedical research purposes and the processing of biological samples of human origin, and that regulates the operation and organization of the National Register of Biobanks for biomedical research.

On 31 December 2020, a total of 74 biobanks and 1,924 collections were included in the Register; one new biobank and 118 new collections were registered during 2020.

74 biobanks

1,924 collections

7.4. Bioethics Committee of Spain

The Bioethics Committee of Spain (CBE), created by Act 14/2007, of 3 June, on Biomedical Research, is an independent collegiate body for consultation on matters related to the ethical and social implications of Biomedicine and Health Sciences.

Its Technical Secretariat is located in the General Sub-Directorate for Research on Cell Therapy and Regenerative Medicine of the ISCIII, which provides technical support. During 2020, it held six regular plenary, online or mixed meetings and one meeting of the working group.

Documents approved: In 2020 the CBE approved and published 3 reports and one declaration:

- “Report of the Bioethics Committee of Spain on the bioethical aspects of the prioritization of health resources in the context of the coronavirus crisis”,
- “Report on the ethical-legal requirements in research with health data and biological samples in the context of the COVID-19 pandemic”,
- “Report of the Bioethics Committee of Spain on the end of life and care in the dying process, in the context of the debate on the regulation of euthanasia: proposals for reflection and deliberation”,
- “Declaration of the Bioethics Committee of Spain on the vaccination strategy against COVID-19 and, in particular, on the prioritization of vaccination”.

The attendance of the President of the CBE, Mr. Federico Montalvo Jaaskelainen, to the meeting of the NEC (“Meeting of the National Ethics Councils Forum and the European Group on Ethics in Science and New Technologies (EGE)”) held in Berlin, on-line on November 18 and 19, is hereby also reported.



7.5. Research Ethics Committee



Requests for reports

In 2020, the Research Ethics Committee (CEI) evaluated 130 research projects involving human beings. These projects came from ISCIII's centers and from the Foundations affiliated to the Institute, which represents an increase of 10% over the previous year.

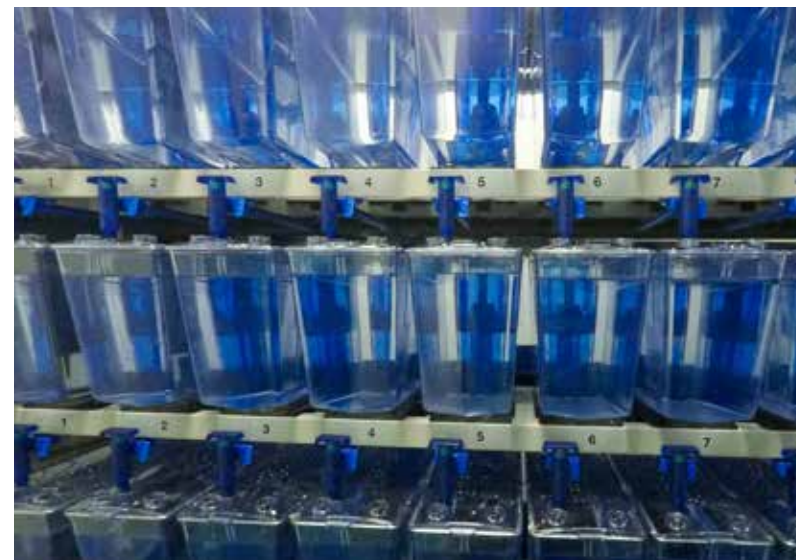
Training and dissemination activities

On November 24 and 25, the "8th Conference on Ethical Aspects of Biomedical Research. Challenges of the new normal: research and RECs in times of pandemic" was organized and held online.

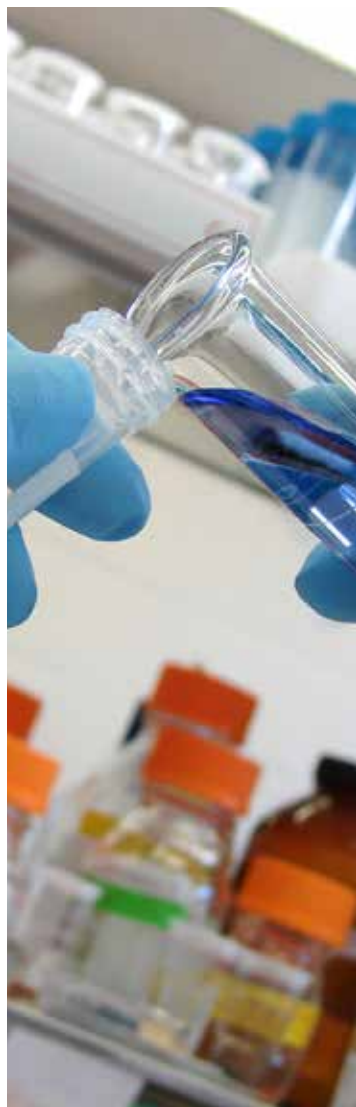
7.6. Research Ethics and Animal Welfare Committee

Requests for reports

In 2020, 35 research projects involving the use of animals were evaluated. These projects were from ISCIII centers and from the Foundations affiliated to the Institute.



7.7. Technical Unit for Thalidomide Victims



The Health and Social Services Commission of the Spanish Parliament approved on November 24, 2016 a non-legislative motion on the protection of people affected by Thalidomide.

At its meeting on November 8, 2017, the SNS Inter-regional Council created two specific working groups: the Institutional Commission for Thalidomide and the Scientific and Technical Committee for Thalidomide.

The **Institutional Commission for Thalidomide** is formed by the Ministry of Health, the Ministry of Labour and Social Economy, the Ministry of Finance and the Ministry of Economic Affairs and Digital Transformation, as well as the Autonomous Communities, the Collegiate Medical Organization and the Association of Victims of Thalidomide in Spain.

The **Scientific and Technical Committee (CCT) for Thalidomide** is composed of:

- Dra. Encarna Guillén Navarro (President)
- Dr. Enrique Galán Gómez
- Dr. Feliciano J. Ramos Fuentes
- Dr. Juan Antonio Ortega García
- Dr. Pablo Lapunzina Badía
- Dr. Antonio Pérez Aytes
- Dr. Sixto García Miñaur

The Secretary General of Health and Consumer Affairs, by resolution of February 13, 2019, entrusted the ISCIII with the creation of a Technical Unit to coordinate all actions of the Evaluation Units created in the Autonomous Communities, and to establish an information system to channel the reports from persons applying to participate in the procedure vis-à-vis their final assessment by the Scientific and Technical Committee.

During 2020, the General Sub-Directorate for Cell Therapy and Regenerative Medicine of the ISCIII coordinated all information that was generated in this process, provided support to the Scientific and Technical Committee, and collected all documentation generated by the Evaluation Units of the Autonomous Communities.

On December 31, 2020, the Registry had annotated 585 dossiers submitted by the Autonomous Communities, 509 of which were reported by the Scientific and Technical Committee.

8.

Consortia and Foundations



8.1. Public Consortia of Biomedical Research Networking Centers

The activity of the Consortia **CIBER** (Public Consortium of Biomedical Research Networking Centers) and **CIBERNED** (Public Consortium of Biomedical Research Networking Centers - Neurodegenerative Diseases) can be consulted on their respective websites at the following URLs:

ciber isciiii
www.ciberisciii.es

ciberNed isciiii
<https://ciberned.es/>
Centro Investigación Biomédica
en Red Enfermedades
Neurodegenerativas

The most relevant activities of each scientific area of the CIBER Consortium are described below:

► Area of Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN):

Participation in the European project initiated in 2020 Graphene Flagship Core Project 3 (within the Graphene Flagship). The project aims to secure the position of European research in the technological revolution associated with graphene, with the participation of 160 academic and industrial entities from 23 countries.

► Thematic Area of Pathophysiology of Obesity and Nutrition (CIBEROBN):

Initiation of two studies: - Nutrition Program. Seroprevalence of COVID-19 in the PREDIMEDPLUS cohort, and COVID-19 and Impact of Confinement. Initiation and coordination of an international study on Eating Disorders and Obesity.

► Thematic Area of Liver and Digestive Diseases (CIBEREHD):

The outstanding work of Dr. Jordi Bruix, outgoing Scientific Director, has allowed the growth of our research and the consolidation of the structure of the area. The use of the international cohort of variceal hemorrhage led by Dr. Hernández Gea and in which different groups in the area participate, has allowed the production of numerous manuscripts that will be key in the treatment of this serious complication of cirrhosis.

► Area of Respiratory Diseases (CIBERES):

National CIBERESUCICOVID project funded by the ISCIII COVID-19 Fund, code COV20_001100, for the study of risk factors, personalized prognosis and one-year follow-up of SARS-CoV-2- infected patients admitted to Spanish Intensive Care Units (UCIs).

► Thematic area of Rare Diseases (CIBERER):

A tissue bioengineering product based on the use of patient cells corrected through genomic editing has been designated as an orphan drug by the EMA for the treatment of Recessive Dystrophic Epidermolysis Bullosa; the sponsor is CIBERER and the studies were carried out by the group of F. Larcher and M. del Río (CIEMAT, UC3M, IIS-FJD and CCST).

► Area of Diabetes and Associated Metabolic Diseases (CIBERDEM):

It has been described that patients with diabetes and obesity lose the normal regulation by ingested succinate levels. This impaired response recovers after treatment with bariatric surgery (Diabetes Care 2020). This line of research to understand the role of succinate in the pathophysiology of diabetes and obesity may enable the development of new clinical and therapeutic tools for the treatment of these diseases. Several projects in this line have been funded by the ISCIII and the La Caixa Foundation, resulting in two patents.

► **Area of Mental Health (CIBERSAM):**

CIBERSAM continues to contribute highly significant findings regarding the role of genetic variants related to multiple psychiatric pathologies, publications of guidelines for family members and patients, and results related to innovations in therapeutic options. In this special year, CIBERSAM has focused on analyzing the impact of the pandemic on mental health, both in the general population and in healthcare personnel. This resulted in 82 publications on COVID-19 and the funding of four competitive projects.

► **Area of Epidemiology and Public Health (CIBERESP):**

National study of sero-epidemiology of SARS-COVID-2 infection in Spain (*ENE-COVID Study*). Coordination and participation in the *MINDCOVID project* funded through the COVID-19 call of the ISCIII, in collaboration with the CIBERSAM area and other networks. Project “Cohort CIBER-SNS” of the IMPaCT infrastructure call, with collaboration of the whole CIBER and coordinated by CIBERESP.

► **Area of Cardiovascular Diseases (CIBERCV):**

CAR-VID study on cardiac sequelae after SARS-CoV-2 infection; multicenter trial on cardiac glycogenosis due to genetic variants in PRKAG2; and the bB-ECHO project, which studies the efficacy of esmolol in the identification of cardiovascular alterations.



► **Area of Cancer (CIBERONC):**

Participation in the genomics platform for the diagnostic study of tumors of unknown origin and poorly characterized lymphomas. Important advances in research on breast cancer, lymphomas, colon cancer, lung cancer and immunotherapy.

► **Thematic area of Frailty and Healthy Aging (CIBERFES):**

H2020 DIABFRAIL-LATAM project coordinated by CIBERFES and direction of the EIT-HEALTH project POSITIVE, which will evaluate the effectiveness of a technological platform for the detection, intervention and non-invasive monitoring at home of frail elderly people or those at risk of becoming frail.

Table. CIBER and CIBERNED Publications

	PUBLICATIONS	Q1	%	D1	%
CIBER					
BBN	763	509	66.7	189	24.8
CV	757	441	58.3	157	20.7
DEM	362	269	74.3	100	27.6
EHD	687	394	65.02	202	33.33
ER	628	459	73.09	196	31.21
ES	785	390	61.13	156	24.25
ESP	1,367	764	55.89	347	25.38
FES	249	153	69.86	51	23.29
OBN	747	454	60.78	114	15.26
ONC	711	456	64.13	238	33.47
SAM	852	516	60.56	197	23.12
CIBERNED	691	457	66.1	216	31.2

Q: quartile; D: decile.

In addition, in 2020 researchers of the different CIBER groups filed 20 new priority patent applications, IPRs (3 concerning software), 6 licenses, 20 signed CDAs and 22 signed MTAs.

As for **CIBERNED**, it has a total of 12 active patents/patent families, thus continuing with its commitment to promote translational research. Throughout 2020, researchers of the different groups filed 8 new patent applications, of which 5 were divisional; in addition, 4 PCT (Patent Cooperation Treaty) extensions were filed. Among the 691 scientific articles published, 12 publications in journals with an impact factor (IF) higher than 15 (The Lancet, Nat. Rev Neurol., Cell Stem Cell, Nat. Cell Biol, Alz & Dem) and principal authorship of CIBERNED members stand out; these papers report significant advances in several areas such as new biomarkers in biological fluids, genetics of Parkinson's disease, clinical trials, prognostic models of Creutzfeld-Jakob disease, and the role of stem cells in neurodegenerative diseases.



8.2. Foundations

8.2.1. Spanish National Center for Cardiovascular Research Foundation (CNIC)

The Carlos III Spanish National Cardiovascular Research Center (F.S.P), CNIC (www.cnic.es/en), is a state public sector foundation under the Ministry of Science and Innovation, and was created through an ISCIII initiative. It receives private support from the Pro CNIC Foundation (www.fundacionprocnic.es). The objective of the CNIC is to promote cardiovascular health through basic and clinical research and training, by contributing to the advancement of scientific knowledge in the cardiovascular area and to the translation of this knowledge to the prevention, diagnosis and treatment of cardiovascular diseases.

In 2020, scientific activity was carried out by a total of 412 researchers and technicians belonging to 31 Research Groups (<https://www.cnic.es/en/research/laboratories>) and 11 Technical Units (<http://www.cnic.es/en/investigacion/unidades-tecnicas>) grouped into three multidisciplinary research areas: Vascular Pathophysiology, Myocardial Pathophysiology and Cell and Developmental Biology. These areas constitute and interconnect the two major research departments of the CNIC: Basic Research and Clinical Research.

During 2020, the CNIC also made an important scientific contribution to the fight against COVID-19. Several research groups worked on finding treatments with existing drugs or identifying new therapeutic targets. They also collaborated in COVID-19 prevention projects by studying the capacity of immune cells to modulate vaccines, and new diagnostic antibody tests were developed. Valentín Fuster's studies on anticoagulants and their ability to improve the survival of patients hospitalized with COVID-19 provided a decisive boost to the approach to the disease in the first months of the pandemic. In addition, clinical studies in the cardiovascular area (PESA, Secure, Tansnip, Reboot, etc.) continued to make progress (www.cnic.es/es/investigacion/clinica) and integrate basic and clinical researchers to facilitate rapid translation to the patient.

The CNIC organized scientific webinars, both internal and open to the scientific community, and participated in Science Week with a talk on COVID-19 for children and families (www.cnic.es/es/noticias/semana-ciencia-2020-charla-sobre-covid-19-para-ninos-familias).

412 Researchers
and technicians
31 Investigation groups
11 Technical units



With regard to international recognition, V. Fuster received the Prince Mahidol Prize for Medicine for his innovative contributions to cardiovascular medicine. M. Torres was named Honorary Member of the Latin American Academy of Sciences. The European Society for Clinical Investigation awarded the Young Investigator Award to G. Sabio and the International Society for Heart Research awarded J.A. Nicolás the Young Investigator Award. F. Sánchez Madrid was one of the winners of the National Research Award 2020 in the category “Santiago Ramón y Cajal” and B. Ibañez was awarded the prize for “Young talent in Biomedical Research” in the 4th edition of the Constant and Vital Awards of the Axa Foundation.

All these advances have been communicated and disseminated through the web site (www.cnice.es/es/actualidad) and the media, with interviews, press releases, videos and reports in the written press, radio and television.



Scientific production

The CNIC produced 327 publications (78% articles, 11% reviews and 11% other kinds of publications); 314 of them appeared in JCR-indexed journals, 71% in first quartile journals and 36% in first decile journals. A total of 78 publications were in journals with impact factors higher than 10, and 50 publications had impact factors higher than 15 (see list); 51% of the publications were led by a CNIC researcher. In regard to collaboration, 35% of the publications were created in collaboration with other national institutions; 39% with both national and international institutions; 20% solely with international institutions; and lastly, 5% of the publications were by CNIC authors alone. This year, 57% of the publications were published in Golden Open Access. All publications can be accessed at:

www.cnice.es/es/investigacion/publicaciones/resultados?y=2020

R&D&I activities: Fundraising

Fifty-four projects were started with national competitive funding for a total amount of 7.51 million Euros. With regard to international funding, 16 projects received funding mainly from European Union calls (Horizon 2020) for a total of 7.46 million Euros: worth mentioning are two ERC CoG projects and the CNIC-led H2020-RESILIENCE project/clinical trial “Remote Ischemic Conditioning in Lymphoma Patients Receiving Anthracyclines” with 6 million Euros for 5 years, of which the CNIC will receive 1.7 million Euros.

Information on projects at:

<https://www.cnice.es/es/investigacion/proyectos>.

R&D&I activities: Technology Transfer

The CNIC collaborates with companies and other public entities to ensure the highest efficiency in the transfer of research results. In 2020, one new patent application was filed with the European Patent Office, four patents were extended internationally through the PCT treaty, and one entered national phases. On December 31, 2020, the CNIC held 17 active patent families, five of which were licensed. Some of these patent families are exclusively owned by the CNIC, others are co-owned with Spanish or foreign public entities and still others are jointly owned with companies (www.cnic.es/es/noticias/otri-como-capitalizar-inversion-talento-recursos-centros-academicos).

Two of the patents developed by the CNIC advanced in 2020 and are close to commercialization. The first of these concerns a biosensor with which a drop of blood can be used to detect in a few minutes whether a patient is suffering from acute myocarditis, which will be an essential tool in clinical practice for the differential diagnosis of acute myocarditis and myocardial infarction, which have similar symptoms but very different treatments. The other patent regards the VF-3D ESSOS, an ultra-fast MRI scanner with a scanning time of less than 1 minute compared to the usual 40 minutes, which will help to promote the use of this technique as a routine diagnostic method in hospitals.

Training

The Center's training activities are coordinated through a comprehensive training plan, called CNIC-JOVEN (www.cnic.es/en/training-cnic). This is a plan designed to bring biomedical research closer to young people and to create a pool of future researchers of excellence in the cardiovascular field. In 2020, 15 doctoral theses were defended; adapting to the pandemic situation, 9 were presented on-line. Fifty-three specific agreements were formalized with universities for internships that were mixed in-person and distance learning. The predoctoral, Master's, Cardiojoven, Invesmir and Res@cnic-sec programs, with a total of 123 participants, were also successfully adapted to COVID-19 prevention measures at the CNIC.



All these activities have led to the CNIC being ranked in the SCImago Institutions Ranking as the second best cardiovascular research center in the world, just behind the National Heart Lung and Blood Institute, which forms part of the NIH in the United States. In addition, the European Society of Cardiology presented the CNIC at its last congress as one of the leading centers of excellence in cardiovascular research.

8.2.2. Spanish National Cancer Research Center Foundation (CNIO)

In 2020, the scientific activity of the CNIO (www.cnio.es) was carried out by a total of 505 researchers and technicians organized in 23 Research Groups, 4 Clinical Research Units, 17 Support Units and the Biobank across 5 Research Programs (Molecular Oncology, Structural Biology, Human Cancer Genetics, Clinical Research and Biotechnology) plus 2 Sections in the Experimental Therapies Program. The CNIO gives support to scientific activity through Scientific Management, the Technology Transfer Office, Communications, International Relations, Philanthropy and Development, Institutional Image and Outreach, Technical Management and Administration. The total number of CNIO staff at the end of the year was 596 employees, including external contractors providing services at the CNIO.



Scientific production

In 2020, the CNIO published a total of 263 scientific articles. Of these, 36 were published in journals with impact factors of between 10 and 15, and 36 articles were published in journals with an impact factor greater than 15. The year 2020 was once again a very productive year in terms of the publication of high-impact articles, exceeding the previous year by 26%. According to the Scimago ranking, in 2020 the CNIO ranked ninth among the world's cancer centers, ranking first in Spain and third in Europe. According to the Nature Index at the end of 2020, the CNIO ranks second among cancer centers in Europe and eighth worldwide.

Competitive funding

In 2020, 142 research projects were active, of which 14 were international collaborative projects and 42 were national collaborative projects. Of the individual projects that fund the main lines of research conducted at the CNIO, it is worth mentioning the grants from the European Research Council (ERC): during 2020 a total of 8 projects (3 ERC-Advanced, 4 ERC-Consolidator and 1 ERC-Starting) were active. Of these 8, 3 started in 2020 (2 Advanced and 1 Consolidator).

Training

During 2020 the CNIO signed agreements with the Universities of Salamanca, Valencia, Alicante, Rey Juan Carlos, Universidad Internacional Menéndez Pelayo, Politécnica de Valencia and Universidad del País Vasco. Agreements were also signed with several public high schools. Fourteen doctoral theses were defended. Fifteen percent of the 109 PhD students working at the CNIO in 2020 were graduates from foreign universities. In 2020, the fifth call of the CNIO Friends Postdoctoral Fellowship Program was launched, resulting in the hiring of six scientists. Seven medical residents from 5 different hospitals visited the CNIO for three-month stays. A total of 85 students participated in MSc/BSc laboratory training programs and 5 vocational training technicians participated in the Workplace Training Program (FCT).

Events

During 2020, 14 conferences were held as part of the Distinguished Seminar series, 9 of which were delivered on-line.

As for outreach events for the general public, although the confinement situation during this year made it necessary to hold most events in virtual format, during the first months the CNIO was able to open its doors to 269 people, mostly students, for guided tours. Furthermore, on November 27th, the CNIO participated in the eleventh edition of the Researchers' Night. In total, 98 connections were made with 280 people, a record participation. Also in November, the CNIO took part in Science Week, an event organized by the Fundación para el Conocimiento madri+d, which this year celebrated its twentieth edition. Our scientists connected with seventy people to tell them where, on what, how and why we work.

The Women in Science Office (WISE Office), created to contribute to achieving and ensuring gender equality in science, organized 7 seminars with the participation of important personalities in the fields of communication, politics and art (<https://www.cnio.es/en/women-in-science/activities-events/>).

On November 24, 2020, the 2nd CNIO-Banco Sabadell Foundation *Workshop on Philosophy, Science and Medicine, Socio-environmental factors of health and disease*, brought together through an online platform leading scientists and philosophers in their field to discuss issues such as cancer from a philosophical and scientific perspective.



Innovation

The CNIO's Technology Transfer & Valorization Office (OTTV) processed a total of 261 transfer records concerning intellectual property of CNIO researchers (60% of them with foreign entities). Around 17% of these agreements were collaborative research agreements, which represent a volume of 2.4 million Euros of income for the CNIO. About 4% are license agreements of intellectual property assets generated by the CNIO, which generated a net income of 728,000 Euros.

Eight new ideas were incorporated into the OTTV portfolio, of which 1 turned into a priority patent application and 7 will be in 2001. Another patent entered the PCT (Patent Cooperation Treaty). In coordination with external patent agents, the OTTV manages a portfolio of 34 patent families.

In addition to the 3 projects that have been ongoing since 2018, in 2020 a new project coordinated by Felipe Cortés Ledesma (CNIO Topology and DNA Breaks Group) and Luis Blanco Dávila (CBMSO-CSIC) has been awarded a CaixaImpulse CONSOLIDATE COVID-19 grant. This project develops a new cost-effective and highly reliable screening test for the rapid diagnosis of SARS-CoV-2 infection.

In 2020, an ERC Proof of Concept grant was awarded to Óscar Fernández-Capetillo (CNIO Genomic Instability Group) for the TARGETSET project, aimed at advancing the development of new inhibitors of the SETD8 protein, a protein associated with the development of neuroblastomas and medulloblastomas, pediatric tumors that currently have a poor prognosis; the project also aims to study the preclinical potential of a compound that could help treat these tumors.

The OTTV participated jointly with the Institute of Health Carlos III in the 9th edition of TRANSFIERE (Malaga, February 12-13, 2020). TRANSFIERE is a professional and multisectoral European forum on science, technology and innovation for knowledge and technology transfer.

In collaboration with the prestigious European intellectual property firm Mewburn Ellis, the OTTV organized a training seminar on the protection of intellectual and industrial property in bioinformatics, artificial intelligence and big data for CNIO researchers.

In order to promote the culture of innovation, the Management of Innovation selected with the support of the Banco Santander Foundation 6 CNIO researchers to participate in the course to be developed in 2021 'Accelerate: Building Business from Science and Technology' of the Instituto de Empresa business school.

In 2020, the Telomere Therapeutics spin-off was launched on the basis inventions of the Telomeres and Telomerase Group led by Dr. Maria A. Blasco, in which the CNIO and the Autonomous University of Barcelona participate. This new company, which received investment from InVivo Capital Partners, will develop telomerase-based gene therapy technology in the field of lung and kidney fibrosis. The CNIO and the UAB have licensed two co-ownership patent applications to the company plus one more patent, also in co-ownership, which will be filed soon with the European Patent Office, and that protect the results obtained by the laboratory of Dr. María Blasco (CNIO, Telomeres and Telomerase Group) and by the research group of Dr. Fátima Bosch from the UAB.

Nine collaborative research projects were signed with international companies (Foxy Pharmaceuticals, Paragon Biomedical, Pfizer, ExBio Praha, Becton Dickinson, Aelin Therapeutics, Verastem, Amgen and Biogen) and two national companies (Telomere Therapeutics and L'Oreal S.A.).

Noteworthy collaborations with industry include a research contract between CNIO, Cris Cancer S.L. and Bionam Biotech A.I.E. for a pancreatic cancer project led by Dr. Mariano Barbacid, Group Leader of Experimental Oncology, with a budget of €1,500,000, and a contract with Telomere Therapeutics for €1,020,000 for a lung and kidney fibrosis project led by Dr. Maria A. Blasco. Other collaborations are those of the CNIO Experimental Therapeutics Program led by Dr. Joaquín Pastor, with Foxy Pharma and the CSIC, in order to develop activators of the FOXO target in models of cancer and aging-related diseases.

Science and Society

In 2020, the CNIO organized the third edition of "CNIO Arte", which brought together two great personalities from the fields of art and science, the visual artist Carmen Calvo and the paleoanthropologist Juan Luis Arsuaga. The profits of 'CNIO ARTE' are entirely allocated to the philanthropic platform "CNIO Friends". Additionally, to broaden this initiative, the first Art and Science Symposium was held in 2020, directed by Carlos Jiménez, professor emeritus of esthetics, historian and art critic.

Milestones

- The CNIO renewed in 2020 its accreditation as a Severo Ochoa Center of Excellence; it is one of only 6 Spanish research centers that have received this recognition on a continuous basis since the creation of this program in 2011.
- At the end of 2020, the CNIO took over the Presidency (through its Director, María Blasco) and coordination of the alliance of Severo Ochoa centers and María de Maeztu units (SOMMa). SOMMa was launched in 2017 with the mission to promote, strengthen and maximize at the international level the value of the cutting-edge research carried out at the centers accredited with this award, as well as their scientific, social and economic impact.
- In 2020 a selection process was carried out for the recruitment of a new Junior Cancer Immunity Research Group, which resulted in the incorporation in January 2021 of Dr. Maria Casanova from the Icahn School of Medicine at Mount Sinai Hospital, New York.
- Following the pandemic, several groups and units of the center have undertaken projects related to SARS-CoV-2 research, two of them with funding from the special ISCIII call for this type of projects.
- During 2020, collaborative contracts were signed with companies in the pharmaceutical and biotechnology sector for 2.4 million Euros, 34% more than the amount obtained in 2019.
- A total of 813,000 euros was received from donations through the CNIO Friends platform, and 259,000 euros from legacies and bequests.



8.2.3. Research Center for Neurological Diseases Foundation (CIEN)



The Research Center for Neurological Diseases Foundation (CIEN) is a state public sector foundation under the Ministry of Science and Innovation through the Institute of Health Carlos III (ISCIII). Its objectives include supporting, promoting, and coordinating research on neurological diseases, especially neurodegenerative diseases (ND). The CIEN's strategic position in ND research is strengthened by its scientific collaboration and management role in the CIBER Consortium in the area of neurodegenerative diseases (CIBERNED). Since 2010, the development of a biobank of neurological samples (CIEN Tissue Bank) that participates in the ISCIII-sponsored Spanish National Biobank Network Platform has reinforced this position. The cooperation between the CIEN Foundation and CIBERNED has been recognized by the European Union as a Center of Excellence in Neurodegeneration Research (CoEN) within the Joint Program for ND.

Important milestones of the CIEN Foundation in 2020

- Researchers of the CIEN Foundation published 24 scientific papers in specialized journals, 20 (83.33%) of which were published in first and second quartile journals, with a mean impact factor of 6.937.
- ISCIII Research Professor and CIBERNED Principal Investigator **Miguel Calero** was appointed **Scientific Director of the CIEN Foundation**.
- Organization of the 2nd edition of the Memorables Film Festival, a short film festival dedicated to Alzheimer's disease, whose main objective is to promote the creation and dissemination of short films that have this disease as their main theme.
- Celebration of the 10th anniversary of the opening of the CIEN Foundation Tissue Bank (BT-CIEN). During these 10 years, the BT-CIEN's activity has experienced sustained growth, both in the registration of donors and obtaining donated brain tissue, and in the transfer of samples to researchers.
- **Dr. Bryan Strange**, Director of the Clinical Neuroscience Laboratory of the CTB-UPM and head of the Neuroimaging area of the CIEN Foundation, was awarded the Research Excellence Incorporation Award of the Polytechnic University of Madrid 2020.
- **Incorporation of the beneficiary of the Queen Sofia Foundation - Mapfre 2020 Grant, for stays at the CIEN Foundation and the University Hospital of Cologne, Germany.**
- **Conduction of a survey of the entire cohort of the Vallecas Project to determine how the SARS-CoV-2 pandemic had impacted the elderly population. Subsequently, a scientific study, recently published in Gerontology, was carried out with the collected information.**
- Website: <https://www.fundacioncien.es/>

8.3. Monitoring of the Activities of Consortia and Foundations

8.3.1. Monitoring of Consortium activities (CIBER and CIBERNED)

The activities carried out by the General Sub-Directorate for Networks and Cooperative Research Centers in relation to the monitoring of the activities of the CIBER and CIBERNED Consortia are detailed in the table below.

Table. Quality indicators of the Consortia in 2020

	CIBER	CIBERNED	Total Consortia
Meetings of Boards of Governors	3	3	6
Meetings of Standing Committees	8	4	12
Area Steering Committee meetings	77	4	81
Recruitment files and service contracts approved	63	12	75
Agreements entered into	48	3	51
Co-ownership agreements	27	2	29

CIBER: Public Consortium of Biomedical Research Networking Centers

CIBERNED: Public Consortium of Biomedical Research Networking Centers - Neurodegenerative Diseases

8.3.2. Monitoring of the Activities of Consortia and Foundations (FCNIC, FCNIO, FCIE)

As secretary of the board of trustees of the three foundations affiliated to the ISCIII, the General Sub-Directorate for Networks and Cooperative Research Centers has the functions assigned to it by the bylaws of the foundations and carries out, among others, the following activities:

2020	Trustee meetings held	Delegate Commission meetings held	Recruitment files approved	Agreements, addenda and other types of accords approved
FCNIO	3	10	36	64
FCNIC	2	6	9	63
FCIE	2	3	6	1
Total	7	19	51	128

