

**Subject: Public selection procedure for the recruitment of 9 fixed-term researcher positions with full-time commitment under Article 24, paragraph 3, letter a) of Law No. 240 of December 30, 2010 (prior to the reform introduced by Law No. 79 of June 29, 2022), funded by the resources allocated to the National Plan for Supplementary Investments to the National Recovery and Resilience Plan, in relation to the "DARE-Digital Lifelong Prevention" Project Initiative.**

### THE DIRECTOR

- Considering** Regulation (EU) No. 2021/241 of 12/02/2021, establishing the Recovery and Resilience Facility;
- Considering** the National Recovery and Resilience Plan (PNRR), approved by the ECOFIN Council Decision on July 13, 2021, notified to Italy by the General Secretariat of the Council with note LT161/21 on July 14, 2021;
- Considering** the decree of the Minister of Economy and Finance of July 15, 2021, allocating resources to the Ministry of University and Research for "Research Initiatives for Innovative Technologies in the Health and Care Sector";
- Considering** Directorial Decree No. 931 of June 6, 2022, which issued the Call for Granting Funding for Research Initiatives for Innovative Technologies in the Health and Care Sector, funded by the resources provided for in the National Plan for Supplementary Investments (PNC) to the National Recovery and Resilience Plan, as identified by Decree-Law No. 59 of May 6, 2021, converted, with amendments, by Law No. 10 of July 1, 2021;
- Considering** Directorial Decree No. 1511 of September 30, 2022, which approved the ranking of submitted Initiative proposals, with the University of Bologna ranked 3rd for the DARE Initiative - Digital Lifelong Prevention - PCN0000002 - CUP B53C22006450001;
- Considering** Directorial Decree prot. No. 1985, which grants the benefits to the PNC\_0000002 initiative named "DARE - Digital Lifelong Prevention" proposed by Alma Mater Studiorum - University of Bologna;
- Referring to** the notice published in the Official Gazette - 4th special series on 16/06/2023, in which the University of Bologna issued a selection notice for the assignment of fixed-term research contracts under Law No. 240 of December 30, 2010, Art. 24, paragraph 3, letter a) (prior to the reform introduced by Law No. 79 of June 29, 2022), funded by the resources of the National Plan for Supplementary Investments (PNC) to the PNRR;
- Referring to** the provisions of Article 13 of this notice;

**Considering** the resolutions of the Department Councils for which the positions are activated, adopted in accordance with Article 17 of the Regulation for the Discipline of Fixed-Term Researchers, issued with Directorate Decree No. 344 of 2011 on March 29, 2011, and subsequent amendments;

**Considering** the resolution of the Board of Directors dated 30/05/2023, approving the activation requests mentioned above;

## HEREBY STATES

### Art. 1 – Purpose

A competitive evaluation procedure based on qualifications and public discussion is hereby announced for the recruitment of 9 fixed-term researcher positions under Article 24, paragraph 3, letter a) (junior) of Law No. 240/2010 (prior to the reform introduced by Law No. 79 of June 29, 2022), with full-time commitment for a duration of 36 months.

The gross annual salary is €36,840. The economic treatment will be annually adjusted as per the provisions for salary adjustments applicable to non-contractual staff.

The contracts will be funded by the resources allocated to the National Plan for Supplementary Investments (PNC) to the PNRR.

The specific elements of each position are defined in the corresponding annex to this notice. In the following articles, reference is made to the annexes whenever there are specific elements for each selection.

### Art. 2 – Activities to be performed

The researchers will have to carry out 350 hours of supplementary teaching and assistance to students, for each academic year covered by the contract.

The hours of frontal teaching on annual basis are indicated in each attachment.

Concerning the provisions of art. 10 of the Reg. regarding fixed term researchers, issued by Rectoral Decree no. 344 of March 29<sup>th</sup> 2011 and amendments, the project that each winner will have to develop and the scientific productivity objectives are explained in the relative attachment.

### Art. 3 – Admission requirements

The selection is open to those who come from non-EU countries. Each attachment specifies the necessary requirement to be able to participate in the relative selection.

In particular, either the possession of the PhD or, for the sectors concerned, of a medical specialization diploma may be required.

In any case, applicants must be in possession of qualification at the date of the deadline for the submission of applications to the present selection.

In case of a Ph.D. obtained abroad, it is necessary to attach the decree of academic recognition of the degree (so-called decree of equivalence, as provided for by Article 74 of Presidential Decree No. 382/1980). This requirement applies to those who already possess

it. Alternatively, the recognition decision of the degree for the purpose of participating in competitions for researcher positions in universities and public research institutions must be provided, in accordance with Legislative Decree No. 206/2007 - amended by Legislative Decree No. 15/2016 (for EU degrees) - and Presidential Decree No. 394/99, Article 49 (for non-EU degrees). In the meantime, before the competent authorities issue the recognition decision, it is possible to submit the receipt confirming the submission of the recognition request.

For more information on the procedures for the recognition of foreign degrees, it is recommended to consult the university's web page regarding "Non-academic recognition to participate in researcher competitions" at the following address: <https://www.unibo.it/en/teaching/enrolment-transfers-and-degrees/recognition-of-a-foreign-degree-1>.

In any case, the proof of the equivalence of the foreign qualification must be produced to the administration prior to beginning service and, anyhow, within 180 days from the publication of the approval decree of the procedure on the official university bulletin, otherwise the exclusion from the position of winning candidate occurs.

Applications from professors, associate professors, or researchers with tenure will not be accepted, even if the applicant is not in service.

The selection is not open to any persons who are related by blood up to the fourth degree, to a professor working in the Department that proposed the activation of the single contract, or to the Rector, Director General or a member of the Board of Governors of the University. Furthermore, the selection is not open to anyone who has had research fellowship or fixed-term researcher contracts at the University of Bologna or any other state-funded, private-funded or distance-learning Italian university pursuant to articles 22 and 24 of Italian Law 240/2010, or with any other body listed in paragraph 1 of Art. 22 of Italian Law 240/2010 for a period which, summed to the foreseen duration of this contract, exceeds a total of 12 years, even if not consecutive. For the purposes of the duration of the above-described periods, in compliance with the laws in force any periods of maternity or sick leave shall not be calculated.

State employees may on unpaid leave for the entire duration of the contract, thus occupying a non-tenure position without pay or social security contributions, in cases where such a position is allowed by the structure of origin, likewise without pay or social security contributions.

#### **Art. 4 – Application procedure**

The submission of the applications for participation in the selections must be made exclusively via electronic procedure by accessing the following link:

<https://personale.unibo.it>

**Regarding all procedures, the deadline is the following: 4<sup>th</sup> July 2023 at 12:00 (noon, Italian Time).**

The application must be submitted at the same time with the insertion of all the attached documentation required.

The following documents shall be enclosed to the electronic application form (preferably files: PDF, other supported files: JPG, BMP, PNG):

1. identification document scanned (10MB max);
2. curriculum vitae with indication of the scientific-professional activity (10MB max);
3. reference letters, if any. Letters can be submitted directly by the candidate uploading it during the application, in case of possession (10MB max), or can be submitted by the referee. In this case candidates should provide the referee e-mail address. When the application is closed, the system will send an automatic request to the referee, referring to the candidate and the procedure. The referee must submit his letter through the link into the e-mail. At this address he/she will upload his/her letter by the application deadline in order to be considered as part of the candidate's application.
4. scientific publications (other supported files are TIFF and PS, 20MB max each document) which are already printed at the date of the call of application deadline, or scientific publications accepted for printed, together with the editor acceptance letter. While uploading each document will be asked to indicate the title, the authors' names, the editor, the year of publication. Optional information are the month, the ISBN code, the DOI code, the booklet number.

Pursuant to Ministerial Decree 243/11, the PhD thesis is considered a publication, and thus if presented by the candidate it shall be included in the maximum number of publications indicated in each attachment.

While applying, applicants shall declare under their own responsibility:

1. surname and name;
2. place and date of birth;
3. citizenship;
4. residence address;
5. (if Italian citizens) registration to electoral rolls. If any, the reasons why he/she is not registered or cancelled from them;
6. that there have not been any criminal proceeding against them or current criminal proceedings; otherwise, applicants shall specify the proceedings against them (the date of the measure and the judicial authority that issued it) and pending penal proceedings. The existence of a previous criminal conviction is not in itself an impediment to hiring, unless it is a conviction for a crime that prevents the establishment of the employment relationship with the public administration as it derives from the interdiction from public office, or the inability to contract with the public administration, or the termination of the employment relationship (articles 28, 29, 32-ter, 32-quater, 32-quinquies of the Criminal Code, articles 3,4, 5, L. 97 of March 27, 2001). In other cases, the Administration will ascertain the gravity of the criminally relevant facts committed by the person concerned, for the purposes of access to public employment. This check is carried out with the aim of ascertaining the

- existence of the fiduciary element which constitutes the fundamental prerequisite of the relationship between employer and worker, as well as for the purpose of assessing the existence of the requisites of moral suitability and aptitude to carry out activities as a public employee;
7. to have or not to have benefited of non-voluntary leave periods due to maternity/paternity compulsory abstention or for serious health reasons, indicating the periods in case
  8. possession of the qualification required pursuant to Art. 3 of this call for application and the mark obtained, if any;
  9. to be fit to the employment the selection refers to;
  10. that they are not, nor have been, professors, associate professors or researchers with tenure, even if not in service;
  11. that they are not related by blood up to the fourth degree, to any professor working in the Department that proposed the activation of the single contract, or to the Rector, Director General or a member of the Board of Governors of the University of Bologna;
  12. elected e-mail address for the purpose of the participation in this contest;
  13. Foreign citizens shall also declare to have a proper knowledge of Italian and to enjoy civil and political rights also in their origin countries or the reasons for loss of enjoyment.

Any modification shall be timely communicated to the Ufficio Ricercatori a tempo determinato.

In case of technical problems, contact the support: [assistenza.cesia@unibo.it](mailto:assistenza.cesia@unibo.it) .

### **Art. 5 – Applicants' obligations**

The penalty of exclusion from the selection shall apply in the following cases:

- Non compliance with the terms and procedures for submitting the application form indicated in article 4 of this call for applications;
- Lack of the qualification required to participate in the selection indicated in each attachment.

All applicants shall be admitted to the contest and the Administration reserves the right to check that they actually are in possession of the requirements necessary to apply for the selections; the Administration may, at any time and even after the exams, order the exclusion from the selection hereto.

### **Art. 6 – Selection Board**

With regard to each procedure, the Selection Board will be appointed upon administration resolution and is composed of three full or associate professors belonging to the competition Scientific sector or, alternatively, to the same competition macro-sector for which the procedure is announced or of equivalent role in the case of components not coming from national universities, identified by the Department that proposed the activation of the contract.

Two of the members, external to the University, are drawn with the methods provided by the art. 8-bis of the "Regolamento per la disciplina delle chiamate dei Professori di Prima e Seconda fascia" in application of articles 18 and 24 of the Law 240/2010 issued with DR 977/2013 and s.m. A third component is identified by the Department Council among the professors inside or outside the University. As envisaged by art. 57 of Legislative Decree 165/2001, in order to guarantee equal opportunities between men and women for the access to work and work treatment, generally, at least one member is female.

The Commission appoints a president and a recording secretary between their members. Notice of the appointment of each Commission will be published on Alma Mater Studiorum - University of Bologna website.

### **Art. 7 – Selection procedure**

With regard to each procedure, the selection procedure is carried out by the Board after a preliminary evaluation of each candidate's qualifications, curriculum and scientific production, including the doctoral thesis, according to the criterion identified by the MIUR in D.M. 243/2011.

The candidates chosen in the preliminary evaluation based on their comparative merits - between 10 and 20% of the number of applicants and not less than 6 - will then be called for interview. The interview will consist of a discussion of the candidate's qualifications and scientific production and may take the form of a seminar open to the public. If the total number of candidates is 6 or less all candidates will be interviewed.

Any reference letters produced by the candidates will also be considered.

The discussion will take place in the language indicated in each attachment.

With regard to each procedure, the discussion with the Commission will take place starting from 24<sup>th</sup> July 2023, and it will be carried out in public form and electronically using the audio and video teleconferencing tool via the Teams platform (the workstation from which candidates will take do the interview must be equipped with a webcam - essential for the recognition of the candidate - microphone and headphones and/or audio speakers).

With reference to each procedure, the notice of the day and time in which the public discussion will take place will be announced together with the publication of the list of admitted candidates on the University website at: <https://bandi.unibo.it/docenti/rtd>.

The publication on the University website will constitute official notification to all applicants, without any obligation for any further communication.

The publication will be communicated by e-mail to the address indicated by the candidates in the application.

The Alma Mater Studiorum - University of Bologna does not assume any responsibility for the non-receipt or the not-read of the e-mail.

It is up to candidates to keep themselves informed by consulting the University website page to find necessary information about selection.

Candidates attending the interview must bring a valid identification document with them.

EU citizens shall bring their passport or an identity document issued by their country of origin. Non-EU citizens shall bring their passport.

### **Art. 8 – Individuation of the winner and recruitment**

With regard to each procedure, after the exams, the Board proceeds to identify the winner. On equal merits, priority will be defined according to the date of birth and the youngest one shall precede.

In the case of selection procedures for multiple positions, the winning candidate who achieves the highest score will have the right to choose the research project to be developed or the location (in case there is a single project but multiple locations). The winning candidate with the next highest score after the first candidate will then choose from the remaining projects or locations, and so on, until the last winning candidate is assigned the remaining project or location.

In case of the winner's withdrawal, the candidate who obtained the highest overall score after the winner will be called.

The procedure's acts are approved pursuant to an administration resolution and will be published in Alma Mater Studiorum – University of Bologna Official Bulletin.

The terms to raise any appeal shall start from the date of publication of the forementioned notice, in case the resolution has not been otherwise disclosed.

The Department that activated the single position will propose recruitment by a majority vote of the professors and associate professors of the Department and approved by the Board of Governors. The Department will also propose the start date of the employment relationship.

### **Art. 9 – Employment procedures**

Following the conclusion of the recruitment procedure referred to in art. 9, the candidates will be asked to sign a fixed-term contract of full-time or defined-time employment.

The employment relationship is governed by a personal contract, statutory laws and EC regulations.

In the event that the research project is in the medical field and provides for the performance of medical activity, the latter is governed by the national collective agreement for medical staff and by the specific appointment conferred by the hospital facility where the researcher will carry out the activity.

The personal contract shall specify any reasons for which it might be terminated, as well as the relevant periods of notice. In any case the contract will be terminated immediately and without notice in the event of the cancellation of the recruitment procedure to which it is inalienably linked.

The trial period shall last three months. At the end of the period, unless the employment relationship has been terminated by either of the parties, the employee is confirmed for service and the whole period worked from the beginning of the contract shall be calculated for seniority purposes.

## **Art. 10 – Documentation required for the participation in the public selection and for hiring purposes**

For the purpose of participating in the public selection, documents and qualifications in English, French, German, and Spanish may be submitted in their original language.

However, scientific publications related to the subject area of the competition, in the case of selection procedures in language-related fields, may also be submitted in their original language. Documents and qualifications in other languages must be presented in their original language, accompanied by a certified translation in Italian or English.

The translation must be certified as faithful to the foreign text and can be carried out by the competent diplomatic or consular representation or by an official translator. As for the documentation required for employment purposes, any acts or documents drafted in a foreign language must be accompanied by a certified translation into Italian, faithful to the foreign text, which can be carried out by the competent diplomatic or consular representation or by an official translator.

## **Art. 11 – Rights and duties of a researcher with a fixed-term contract of employment**

In accordance with the rights and duties of public employees prescribed by the Italian civil code, on signing the contract the researcher will be expected to perform all those activities mentioned for each position in the relative attachment as well as to carry out the research periods in the company and abroad (the latter only where applicable).

In the event that medical assistance services are provided, the researcher will also assume rights and duties related to this activity.

These activities will be carried out in respect of the existing hierarchy and in coordination with existing programmes and research projects.

The researchers will perform the requested activities in person, substitution is not permitted. Existing Italian laws concerning maternity, injury and illness will be applied.

The researcher undertakes to fulfill the obligations of conduct prescribed by the code of conduct, issued by DPR 62/2013.

## **Art. 12 – Processing of personal data and person in charge for the contest**

Information about the processing of personal data (provided during the application process) are available at the link: [www.unibo.it/privacy](http://www.unibo.it/privacy) (Notice for participants in contests and selections published by the University).

The person in charge of the contest is Mr. Gianfranco Raffaeli, Responsabile dell'Ufficio Ricercatori a tempo determinato - Piazza Verdi n. 3 - 40126 Bologna.

For further information, please contact: Ufficio Ricercatori a tempo determinato dell'Alma Mater Studiorum - Università di Bologna – Piazza Verdi n. 3 - Tel. +39 051 2099980 – 2098958 - 2098972, Fax 051 2086163; e-mail: [apos.ricercatoritempodeterminato@unibo.it](mailto:apos.ricercatoritempodeterminato@unibo.it).



### **Art. 13 – Reference Regulations**

The present notice is issued based on the following regulations:

- Art. 24 of Law no. 240 dated December 30th, 2010;
- D.P.R. (Decree of the President of the Republic) no. 445 dated December 28th, 2000;
- Leg. Decree no. 165 dated March 30th, 2001;
- Law 241/1990;
- Regulation for fixed-term researchers of Alma Mater Studiorum – University of Bologna, (link: [http://www.normateneo.unibo.it/NormAteneo/Regolamento\\_ricercatori\\_a\\_tempo\\_determinato.htm](http://www.normateneo.unibo.it/NormAteneo/Regolamento_ricercatori_a_tempo_determinato.htm)).

For the Director of Area del Personale  
f.to digitalmente Giovanni Longo

### Attached documents:

- Summary table of activated positions;
- Attachments:
  1. SSD BIO/13 - Experimental Biology, positions 1, Department of Biomedical and Neuromotor Sciences - DIBINEM
  2. SSD BIO/14 - Pharmacology, positions 1, Department of Medical and Surgical Sciences - DIMEC
  3. SSD FIS/07 - Applied Physics, positions 1, Department of Physics and Astronomy "Augusto Righi" - DIFA
  4. SSD INF/01 - Informatics, positions 1, Department of Computer Science and Engineering - DISI
  5. SSD ING-INF/06 - Electronic and Informatics Bioengineering, positions 3, Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
  6. SSD MED/44 - Occupational Medicine, positions 1, Department of Medical and Surgical Sciences - DIMEC
  7. SSD SECS-P/03 - Public Economics, positions 1, Department of Economics - DSE

**SUMMARY TABLE OF ACTIVATED POSITIONS**

Department	Call	Project	CUP	Project Code	Competitive Sector	Scientific Disciplinary Sector	nr. Positions	Campus
Biomedical and Neuromotor Sciences - DIBINEM		PNC - DARE	B53C22006450001	PNC0000002	05/F1 - Experimental Biology	BIO/13 - Experimental Biology	1	Bologna
Medical and Surgical Sciences - DIMEC		PNC - DARE	B53C22006450001	PNC0000002	05/G1 - Pharmacology, Clinical Pharmacology and Pharmacognosy	BIO/14 - Pharmacology	1	Bologna
Physics and Astronomy "Augusto Righi" - DIFA		PNC - DARE	B53C22006450001	PNC0000002	02/D1 - Applied Physics, Physics Teaching and History of Physics	FIS/07 - Applied Physics	1	Bologna
Computer Science and Engineering - DISI		PNC - DARE	B53C22006450001	PNC0000002	01/B1 - Informatics	INF/01 - Informatics	1	Bologna
Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI		PNC - DARE	B53C22006450001	PNC0000002	09/G2 - Bioengineering	ING-INF/06 - Electronic and Informatics Bioengineering	3	Bologna
								Bologna
								Cesena
Medical and Surgical Sciences - DIMEC		PNC - DARE	B53C22006450001	PNC0000002	06/M2 - Forensic and Occupational Medicine	MED/44 - Occupational Medicine	1	Bologna
Economics - DSE		PNC - DARE	B53C22006450001	PNC0000002	13/A3 - Public Economics	SECS-P/03 - Public Economics	1	Bologna

## ATTACHMENT 1

The specific elements of this procedure are as follows:

- **Department:** Department of Biomedical and Neuromotor Sciences - DIBINEM
- **SC:** 05/F1 – Experimental Biology
- **SSD:** BIO/13 – Experimental Biology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 12
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAl lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Maria Chiara Pelleri
- **Project title:** Genomics, Transcriptomics and Metabolomics of trisomy 21 (Down syndrome)
- **Duration of contract:** 36 months
- **Brief description of the project:** The research will be carried out in the field of Genomics, Transcriptomics and Metabolomics of trisomy 21 (Down syndrome). The study will involve the integration of clinical, biochemical, genetic and bioinformatics data in order to clarify the genotype-phenotype relationship, investigate the mechanisms of the biology of human intelligence and identify new treatment possibilities for the intellectual disability associated with this form of trisomy. Artificial intelligence methods, including machine learning, will also be used to analyse the data.
- **Objective of the research project:** During the project the researcher must publish at least 2 articles in peer-reviewed journals.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

## ATTACHMENT 2

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 05/G1 – Pharmacology, Clinical Pharmacology and Pharmacognosy
- **SSD:** BIO/14 – Pharmacology
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 32
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAl lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Elisabetta Poluzzi
- **Project title:** Digital lifelong prevention: defining applied research methods for preventive digital medicine
- **Duration of contract:** 36 months
- **Brief description of the project:** DARE project aims to define the experimental approach to digital prevention on primary and secondary human diseases, with a high impact on duration and quality of life. Since the most defined framework and regulation on preventive treatments is related to medicines, pharmacologists have suitable expertise to identify steps and criteria for the development of digital prevention tools. By analysing some pilot studies included in DARE project, the researcher will support the study implementation and the relevant validation of methods, in terms of: study design definition, ethics and legal aspects, expected impact of study results on medical practice. To this purpose, the researcher will take advantage from clinical pharmacology and pharmacoepidemiological expertise, as well as ethics in the involvement of patients/subjects and institutions in each single study.
- **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 2 national or international meetings relevant for the subject of the project.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

### ATTACHMENT 3

The specific elements of this procedure are as follows:

- **Department:** Department of Physics and Astronomy "Augusto Righi" - DIFA
- **SC:** 02/D1 – Applied Physics, Physics Teaching and History of Physics
- **SSD:** FIS/07 – Applied Physics
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAl lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Daniel Remondini
- **Project title:** Data analysis and predictive models for disease diffusion surveillance systems using biomedical, genomics, epidemiological and social data with Complex Networks techniques, Machine Learning and Dynamic Systems
- **Duration of contract:** 36 months
- **Brief description of the project:** Development of algorithms for Data analytics of biomedical, genomics, health and social data using new statistical tools and machine learning techniques to early detect disease outbreaks and the change points in their evolution. Retrieval and elaboration of human mobility data from social networks and ICT technologies using Complex Network theory. Dynamical models on complex networks to simulate disease spreading at different spatial and temporal scales and development of control strategies using suitable control parameters. Development of disease surveillance systems based on predictive models for epidemics evolution, to estimate the impact on hospitalizations' trends of frail populations. Applications of the same methodologies to the surveillance of the impact of environmental exposures related to climate changes of frail people.
- **Objective of the research project:** The scientific purposes are: 1) the development of a surveillance system to support decisions towards an optimal allocation of human, technical and economic resources and to allow to develop better and innovative health policies integrated with digital data. 2) to write scientific papers, to participate to national and international congresses and meetings, and to find new sources of financial support within a European, National and International context.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

## ATTACHMENT 4

The specific elements of this procedure are as follows:

- **Department:** Department of Computer Science and Engineering - DISI
- **SC:** 01/B1 – Informatics
- **SSD:** INF/01 – Informatics
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAI lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Maurizio Gabbrielli
- **Project title:** Development of AI based tools for activities of the DARE project – Digital Lifelong Prevention
- **Duration of contract:** 36 months
- **Brief description of the project:** The researcher will work to identify/adapt/develop data-driven tools and methods used in the pilots of spokes 2 and 3 of the DARE project, including descriptive and predictive analytics. Both generic and modelling-specific explainable methods will be used whenever relevant. AI-based (semantic) indexing of entities and relations in the data will be developed for the extraction of patterns and correlations, including aid in the searching, browsing, retrieval, and explanation of information to demonstrate tangible value and improved usability of health data for end-users.
- **Objective of the research project:** We consider a reasonable objective the publication of two papers in international conferences and one paper on an international journal.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English

## ATTACHMENT 5

The specific elements of this procedure are as follows:

- **Department:** Department of Electrical, Electronic and Information Engineering "Guglielmo Marconi" - DEI
- **SC:** 09/G2 – Bioengineering
- **SSD:** ING-INF/06 – Electronic and Informatics Bioengineering
- **Number of positions:** 3
- **Number of hours of frontal teaching per year:** 60
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAI lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Duration of contract:** 36 months
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English
- **Description of the projects and their specific elements:**
  - 1) **Project 1 – title:** Digital Health solutions for prevention
    - **Main place of employment:** Bologna
    - **Project manager:** Sabato Mellone
    - **Brief description of the project:** The DARE project aims to develop technologies and innovations in the health sector. Leveraging digital enabling technologies, it will develop innovative methods and solutions for preventing diseases with the greatest impact on the duration and quality of life. In this context, the researcher will apply bioengineering methods to applications that require a highly multidisciplinary approach. In particular, the activity will focus on designing and developing knowledge-based and data-driven computational models to be deployed on different computing solutions, ranging from HPC clusters to edge platforms. The researcher will also need to contribute to develop the DARE strategy for interoperability and standardization of data and models. Each development activity will be based on this strategy to ensure the solutions' portability and scalability.
    - **Objective of the research project:** The three-year scientific productivity objectives envisage publishing the results of the research project in at least 3 papers in an indexed international scientific journal and contributing to the writing and submission of at least 1 further research project (regional, national, or European). In addition, the researchers will also have to contribute to drafting the project deliverables of the pertinent spoke and participate in at least 2 national or international scientific congresses in the sector.



2) **Project 2 – title:** Development and validation of digital risk prediction models for primary prevention

- **Main place of employment:** Bologna
- **Project manager:** Lorenzo Chiari
- **Brief description of the project:** The DARE project aims to develop technologies and innovations in the health sector. Leveraging digital enabling technologies, it will develop innovative methods and solutions for preventing diseases with the greatest impact on the duration and quality of life. In this context, the researcher will develop statistical and machine learning-based models for risk prediction aimed at helping guide clinical decision-making and designing new primary prevention strategies. The two pilot studies in which he/she will be involved will concern the prevention of falls in the elderly population and the prediction of diseases related to environmental exposure to heavy metals. He/she will also be able to contribute to develop and improving advanced digital tools for population surveillance and public health preparedness, helping to promote more effective and inclusive integrated care models.
- **Objective of the research project:** The three-year scientific productivity objectives envisage publishing the results of the research project in at least 3 papers in an indexed international scientific journal and contributing to the writing and submission of at least 1 further research project (regional, national, or European). The researchers will also have to contribute to drafting the project deliverables of the pertinent spoke and participate in at least 2 national or international scientific congresses in the sector.

3) **Project 3 – title:** Artificial Intelligence systems for clinical decision support

- **Main place of employment:** Cesena
- **Project manager:** Stefano Diciotti
- **Brief description of the project:** The DARE project aims to develop technologies and innovations in the health sector. Leveraging digital enabling technologies, it will develop innovative methods and solutions for preventing diseases with the greatest impact on the duration and quality of life. In this context, the researcher will apply bioengineering methods to applications that require a highly multidisciplinary approach. In particular, the activity will focus on developing secure, explainable, and reproducible data analysis pipelines based on artificial intelligence techniques (machine learning and deep learning) for clinical decision support.
- **Objective of the research project:** The three-year scientific productivity objectives envisage publishing the results of the research project in at least 3 papers in an indexed international scientific journal and contributing to the writing and submission of at least 1 further research project (regional, national, or European). In addition, the researchers will also have to contribute to drafting the project deliverables of the pertinent spoke and participate in at least 2 national or international scientific congresses in the sector.

## ATTACHMENT 6

The specific elements of this procedure are as follows:

- **Department:** Department of Medical and Surgical Sciences - DIMEC
- **SC:** 06/M2 – Forensic and Occupational Medicine
- **SSD:** MED/44 – Occupational Medicine
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 0
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAl lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Paolo Boffetta
- **Project title:** Use large-scale cohort studies to identify lifetime, environmental and occupational determinants of healthy ageing
- **Duration of contract:** 36 months
- **Brief description of the project:** Pooled analysis of determinants of healthy aging and chronic diseases in prospective studies from Europe and United States, which have been harmonized within the CHANCES project. Application of ML technique to identify second-level determinants based on harmonized variables.
- **Objective of the research project:** During the project the researcher must publish at least 3 articles in peer-reviewed journals and attend at least 3 national or international meetings relevant for the subject of the project.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** English
- **Foreign language:** no

## ATTACHMENT 7

The specific elements of this procedure are as follows:

- **Department:** Department of Economics - DSE
- **SC:** 13/A3 – Public Economics
- **SSD:** SECS-P/03 – Public Economics
- **Number of positions:** 1
- **Main place of employment:** Bologna
- **Number of hours of frontal teaching per year:** 30
- **Medical assistance services, if required:** Not required
- **Costs indication:** 36.840,00 gross euros per year
- **Financial coverage:** National Plan for PNRR complementary investments (PNC), PNC-I.1, D.D. 931 del 06/06/2022
- **Project:** PNC – DARE, “DigitAl lifelong pRevEntion” (proposal code PNC0000002)
- **CUP:** B53C22006450001
- **Project manager:** Gianluca Fiorentini
- **Project title:** Impact evaluation of population health management strategies targeting community care services and using big-data and digital solutions
- **Duration of contract:** 36 months
- **Brief description of the project:** A first task is to provide an in-depth literature review to contribute to the research design of quasi-experimental settings for the analysis of primary and secondary prevention initiatives involving primary care providers and community nurses in the engagement and active management of individuals. These initiatives will be based on traditional programs delivering clinical guidelines and additional information on risks, as well as on the adoption of digital technologies to provide better monitoring of patients. A second task is to contribute to the development of a platform integrating already existing individual-level longitudinal databases on healthcare services with supply-side data on the characteristics of professionals and structures involved in primary and intermediate care. A third task is to contribute to the implementation of such research interacting with NHS managers and with the practitioners involved to sort out operational problems and to ensure a proper implementation of the protocols. Finally, the candidate will be required to draft policy recommendations to improve the design of healthcare planning and management for primary and secondary prevention in primary and intermediate care settings.
- **Objective of the research project:** over the three-year period the researcher is expected to produce at least 3 publications, including working papers, of which at least one published in international journals.
- **Admission requirement:** PhD
- **Maximum number of publications:** 12
- **Language in which the interview will take place:** Italian
- **Foreign language:** English