

POLISABIO

Polisabio Programme Evaluation: Final report

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- Executive
summary

The objective of this report is to analyse the research and innovation collaborations between UPV and FISABIO teams established through the actions and projects funded by the POLISABIO programme (2017-2021).

The evaluation work has been carried out by researchers from Ingenio (CSIC-UPV) and the Inn4all research group at the Universitat de València, in collaboration with staff from the Innovation Area at FISABIO and the Service for the Promotion and Support of Research, Innovation and Transfer at UPV.

The report is divided into four sections: a description of key aspects of the POLISABIO program based on the contents of the reports and participant details; the collection and analysis of primary data through a survey of researchers involved in the program; the conduct of semi-structured interviews; and the collection of data to develop indicators of scientific production and transfer. The main conclusions are:

1. High satisfaction of the participating research staff with the POLISABIO programme.
2. The 79 funded projects generated 52 scientific publications, 74 conference communications, 7 doctoral theses, 24 bachelor's theses, 19 master's theses, 4 awards, 4 software programmes, 8 patent applications, and raised more than 2.2 million euros of additional funding.
3. High mobilization capacity of the POLISABIO programme, especially among FISABIO staff without research experience.
4. Preponderance of motivations related to social impact (pro-social motivations) of the persons participating in the programme.
5. Simultaneity of division of labour and cross-fertilization of knowledge in collaboration.
6. Some UPV groups value the research experience of FISABIO groups when initiating collaborations.
7. The most criticized aspect of the programme is the amount of funding. Administrative barriers related to the allocation of resources between FISABIO and UPV groups, as well as problems with recruiting human resources, have also been identified.
8. Availability to overcome collaboration barriers derived from geographical distance by research staff not affiliated with institutions in the city of Valencia.
9. The matching practices of the POLISABIO team enable some barriers to be overcome, related to the "lack of understanding of the different languages" used by the research groups.

• Table of contents

1. Introduction	6
1.1. Description and general objectives of the POLISABIO programme	8
1.2. Funding calls and selection system	8
2. Methods	10
2.1. Sources and main data of the descriptive analysis of secondary data	11
2.2. Survey analysis	13
2.2.1. Methodology	13
2.2.2. Structure of the questionnaire	15
2.3. Semi-structured interviews	15
3. Analysis and results	18
3.1. Descriptive analysis of secondary data	19
3.1.1. Projects requested and granted per year	19
3.1.2. Distribution of projects by institution	19
3.1.3. Mobilization of research staff	21
3.1.4. Unique researchers	22
3.1.5. Teams	23
3.1.6. Interaction map	24
3.2. Survey and semi-structured interviews: main results	25
3.2.1. Respondents' profile	26
3.2.1.1. Type of research: basic – applied	26
3.2.1.2. Identification of beneficiaries	26
3.2.1.3. Citizen science	27
3.2.1.4. Professional profile according to time distribution across different activities	28
3.2.1.5. Motivations to participate in a research project	28

3.2.2. POLISABIO Experience	31
3.2.2.1. Previous Research Experience	31
3.2.2.2. Reasons for participating in the POLISABIO Programme	31
3.2.2.3. Satisfaction with the POLISABIO Programme	34
3.2.3. Participation in POLISABIO Projects	36
3.2.3.1. Contribution of the teams to the project objectives	36
3.2.3.2. Frequency and channels of interaction. Geographic aspects	40
3.2.3.3. Previous Links	41
3.2.3.4. Origin of the collaboration	41
3.2.3.5. Barriers found in collaboration	45
3.2.3.6. Impacts derived from the projects	47
4. Conclusions	54
5. References	59
ANNEX I: Questionnaire structure	60
ANNEX II: Indicators of resulting scientific production and transfer	61

The background is a vibrant teal color with a subtle circular pattern and numerous water droplets of various sizes scattered across the surface, creating a fresh and clean aesthetic.

1. Introduction

- The objective of this report is to present the results of the evaluation work of the POLISABIO programme (2017-2021) (<https://www.polisabio.es/index.php/es>) carried out within the framework of the “Technological Support Agreement between the State Agency Spanish National Research Council (CSIC), the Universitat Politècnica de València (UPV), and the Foundation for the Promotion of Health and Biomedical Research of the Valencian Community (FISABIO)” of January 17, 2023.

The POLISABIO programme evaluation analyses the research and innovation collaborations between teams from the UPV and FISABIO established thanks to the actions and projects funded by this initiative. The evaluation work has been carried out by researchers from Ingenio (CSIC-UPV) and the Inn4all research group at the Universitat de València, in collaboration with staff from the Innovation Area of FISABIO and the Service for the Promotion and Support of Research, Innovation, and Transfer at UPV. To formalize this collaborative approach, an Evaluation Monitoring Committee was created, made up of representatives from all the institutions participating in the evaluation process. This committee has met regularly since the launch meeting on 2 February 2023 until the completion of the process and delivery of the final report.

The report is composed of three parts: (i) description of fundamental aspects of the

POLISABIO programme based on the contents of the project justification reports and the details of the participants (PIs¹ and team members), (ii) collection and analysis of primary data from a survey of all the research staff participating in the programme and conducting qualitative interviews, and (iii) data collection to develop indicators of scientific production and knowledge transfer. In section 2 we discuss the methodology, and in section 3 we present the analysis referring to the first two parts. The structure of the survey, methodology, and results of the third part regarding indicators of scientific production and transfer are included in the annexes of the report. The Research Ethics Committee of UPV evaluated the research project on which this text is based and issued a favourable opinion (ref: P04_28-06-2023).

¹ Principal Investigator (initials).

1.1. Description and general objectives of the POLISABIO programme

The POLISABIO programme is part of the “Framework Agreement for Collaboration between the Universitat Politècnica de València (UPV) and FISABIO, signed on April 3, 2017, covering activities in training, scientific research and technological development, the exchange of experts, and the commercialization to third parties of jointly developed technologies.” The programme was launched in 2017 through a Collaboration Agreement between UPV and FISABIO to establish a joint initiative aimed at promoting research and innovation partnerships between UPV researchers from the Alcoi and Gandia campuses and FISABIO professionals affiliated with the Alcoi and Gandia Health Departments. Since then, and up to 2024, the program has been held annually, gradually expanding to include all three UPV campuses and all centers affiliated with FISABIO.

The POLISABIO program aims to generate synergies between researchers and professionals from both institutions, fostering research and innovation projects with strong scientific and technical potential, focused on innovative topics and attractive for securing public and private funding from national and international calls of interest. The program seeks to promote cooperation across all UPV campuses — with particular emphasis on the Alcoi and Gandia campuses — and among staff from centers affiliated with FISABIO. These include, in particular, professionals from the Health Departments of Vinaròs, Castelló, La Plana, Sagunt, Requena, València–Arnau de Vilanova–Llíria, València–Doctor Peset, La Ribera, Xàtiva–Ontinyent, Alcoi, Elda, Gandia, Marina Baixa, Sant Joan d’Alacant, Elx–Hospital General, Elx–Crevillent, Torrevieja,

and Orihuela, as well as from FISABIO–Salut Pública, Centre de Transfusió de la Comunitat Valenciana, Hospital de San Vicente, Hospital La Pedrera, Hospital Doctor Moliner, Hospital Pare Jofré, Hospital La Magdalena, and FISABIO–Oftalmologia Mèdica.

1.2. Funding calls and selection system

The programme consists of granting two types of financial aid. The “Preparatory Actions” for the exploration and formulation of future research/innovation projects, funded with 5,000 euros, and the “Projects” of innovation, technological development, and validation of results focused on health technologies, funded with 15,000 euros. The granting of the planned financial aid is carried out under a system of a competitive basis of award among groups from both institutions that meet the programme’s eligibility criteria.

The system of evaluation and selection for aid and projects consists of three phases. In the first phase, the research groups of UPV and FISABIO that wish to participate in the call complete an “expression of interest.” In this expression of interest, the groups present a project idea, based on capabilities and/or unresolved technical problems, to find the most suitable group to undertake a collaboration. With the information collected in the expressions of interest, the management units of the POLISABIO programme look for groups that can establish a collaboration between the two institutions. In a second phase, once the groups have been identified and matched, they submit joint proposals to the call. In the third phase, the POLISABIO management units evaluate and select the proposals to be funded by applying various criteria, such as the technical quality of the proposal, its impact, or the curriculum of the groups.

A microscopic view of plant cells, showing a network of cell walls forming a honeycomb-like structure. The cells are filled with a clear, slightly yellowish liquid. The background has a gradient from dark blue at the top to light yellow at the bottom. The text "2. Methods" is overlaid in white, sans-serif font on the left side of the image.

2. Methods

- The analysis consists of three parts. The first part is the description of fundamental aspects of the POLISABIO programme, based on the contents of the project justification reports and the details of the participants (PIs and team members). The second part is an analysis of different aspects related to the collaboration between FISABIO and UPV groups, which employs two methodologies:

1. the collection and analysis of primary data from a survey of the researchers participating in the programme, and
2. semi-structured interviews to understand the context of some aspects already addressed by the survey, and to capture emerging topics that arose in the semi-structured interviews, not addressed in the initial design of the survey, but which could be incorporated into the survey in the final redesign before sending.

The third part refers to the collection of data to develop indicators of scientific production and transfer, carried out by the POLISABIO team with the assistance of members of the Ingenio team (CSIC-UPV). This methodological section refers only to the first two parts. The methodology and results of the third part are included in the annex of the report.

2.1. Sources and main data of the descriptive analysis of secondary data

The descriptive analysis of secondary data of the POLISABIO programme is based on documents provided by the management and coordination team of the POLISABIO programme. These documents include, mainly, project justification reports (both funded and not funded). We also relied on various additional tables, with information on each project for each year of the call, covering the period 2017–2021.

An intensive work of data extraction and homogenization of the information available for each call of the programme was carried out, using the information previously indicated. As a result, three interrelated tables were generated to structure and condense

all the available information. These three tables constituted the main source of data for the descriptive analysis of secondary data, and for the identification of the target population of the survey and of the persons selected for the interviews.

Table 'Projects'. Each observation in the table corresponds to a different project. The variable "id_project" provides a unique indicator for each project. It is important to add that we use the term project to cover both the 'Actions call' and the 'Projects call' of the POLISABIO programme. This table provides information on all projects for the entire period analysed. Table 1 shows the main variables available at the project level, including in-

formation for each of the 168 project applications (both those funded and those not funded).

Table 'Persons'. Each observation in this table corresponds to a different person. The variable "id_person" uniquely identifies the individuals who participated in the POLISABIO programme. This table provides detailed information on the participants in the programme. For example, name and surname, contact addresses, department and campus (UPV), health department and affiliated center (FISABIO). It should be noted that the preparation of this table involved an intensive task of homogenization of names, surnames and identification of duplicates. The main

• Table 1. *Main variables available in the "Projects" table*

VARIABLE	DESCRIPTION
id_project*	Unique identifier for each project (N=168)
Acronym	Project acronym
IP_UPV	Name of Principal Investigator (UPV)
IP_FISABIO	Name of Principal Investigator (FISABIO)
score_upv	Score received from UPV evaluator
score_fisabio	Score received from FISABIO evaluator
UPV_total	Total score received
Year	Year of call for proposals
project_type	Type of project (Project / Action)
conced_upv	Amount contributed by the UPV to the project
conced_fisabio	Amount contributed by FISABIO to the project
conced_total	Total amount awarded
conced_dummy	Dichotomous variable indicating whether the project was awarded

* Unique identifier

fields are described in Table 2. A total of 541 persons (unique IDs) were identified: it is important to note that the table includes both those persons who participated in funded projects and those who applied for projects that were not funded.

Table ‘Participations’. The linking of the two previous tables takes place through the ‘Participations’ table. In this table, each observation corresponds to a different participation in a project. It is important to remember that the same individual may have participated in several different projects, so the number of observations in the ‘Participations’ table is necessarily higher than the number of observations in the ‘Persons’ table. Table 3 describes the variables available.

2.2. Survey analysis

2.2.1. Methodology

The second part of the quantitative study involved the design, distribution, and analysis of a survey of all participants in the POLISABIO programme. The survey was addressed to all researchers from FISABIO and UPV who participated in at least one project funded by the POLISABIO programme, both PIs and members of the research groups. This implies a sample population of 354 persons: 200 belonging to FISABIO, and 154 belonging to UPV (see Table 7 for more details). Of these, 112 persons participated as PIs in at least one project funded by the POLISABIO programme.

- Table 2. Main variables available in the “Persons” table

VARIABLE	DESCRIPTION
id_person*	Unique identifier for each person (n=541)
Name	First name
Surname	Last name
Email	Email address
UPV_grupo	Name of research group (UPV)
UPV_departamento	Name of department (UPV)
UPV_campus	Name of campus (UPV)
fisabio_dept_salud	Health department (FISABIO)
fisabio_centro_adscripción	Affiliated center (FISABIO)
nprojects_conc	Total number of projects awarded
nprojects_total	Total number of projects requested and awarded
nprojects_conc_pi	Total number of projects awarded as PI

* Unique identifier

• Table 3. Variables available in the “Participations” table

VARIABLE	DESCRIPTION
id_participant*	Unique identifier for each participation (n=963)
id_person	Person identifier
id_project	Project identifier

* Unique identifier

The contact data (e.g., email addresses) were extracted from the original information provided by the POLISABIO managing and coordinating team. For those researchers without an available email address, efforts were made to obtain it through alternative means (e.g., access to scientific publications, consultation of scientific or university directories, etc.). After extraction and completion of email addresses, the email address of 340 researchers was obtained, of which 321 were finally valid (90.7% of the population of 354 persons). Therefore, 321 researchers received the email with the invitation to participate in the survey.

For the design of the questionnaire through which the survey was carried out, interviews were arranged with PIs of groups participating in the POLISABIO programme. Specifically, during the period October to November 2023, a total of 5 interviews (in person or by videoconference) were carried out with PIs from UPV and FISABIO. These interviews allowed validating the relevance of the questions included in the questionnaire, as well as adapting and clarifying the content and design of the questions. The implementation and distribution of the survey were carried out electronically through the Qualtrics platform². Each researcher with a valid email address

² <https://www.qualtrics.com/>

received a personalized link to respond to the online questionnaire.

Prior to the distribution of the questionnaire, the POLISABIO programme coordinating team sent an email requesting the participation in the survey of all persons included in the sample population. The questionnaire was sent on March 8, 2024. Three reminders were sent (March 25, April 2 and April 15), to those researchers who had not responded or who had not completed the questionnaire. The collection of responses was definitively closed on April 20.

A total of 92 valid responses were obtained, representing a response rate of 28.7%. This rate was higher for UPV researchers (34.8%) than for FISABIO researchers (24.2%). It is also important to highlight that the response rate was higher for those respondents who had been PIs in at least one project funded by POLISABIO (47.7%), compared to those researchers who had not been PIs in any funded project (18.9%).

For UPV researchers, the response rates were 38% for the Vera campus, 30% for the Alcoi campus, and 31.8% for the Gandia campus. For FISABIO researchers, no large variations in response rates were observed between the different Health Departments.

2.2.2. Structure of the questionnaire

The questionnaire was structured in three blocks.

The Block **“Profile of respondents”** focused on the research and professional profile of the respondents. This block included questions related to research practices, such as the percentage of time devoted to different types of professional activities, the identification of research beneficiaries, motivations associated with participation in research projects, and other aspects related to professional experience.

In the **“POLISABIO experience”** Block, information was requested about the respondents’ personal experience in the POLISABIO programme. In this block, the questions did not refer to specific projects, but to the experience in the POLISABIO programme in general. This block included questions related to the motivations to participate in the POLISABIO programme, general satisfaction with the programme, and research experience before participating in the POLISABIO programme.

In the Block **“POLISABIO projects”**, information was requested about the respondent’s experience in different projects and/or actions in which they participated within the framework of the POLISABIO programme. Each respondent received a personalised questionnaire, which allowed them to view a series of data on the projects in which they had participated, facilitating the identification of the projects on which information was requested.

These identification data included, for example, the acronym for the project, the year of funding, the full names of the principal investigators from both institutions (FISABIO and UPV), the type of project (action or project), or the year of the call.

If the respondent had participated in more than one project, information was requested for up to three projects maximum. In the case of having participated in more than three, the three most recent were selected to facilitate answering the questions about each project. As shown in Table 7 (see Section 3.1.4), a large percentage of respondents only participated in a single project (73%). Only 5.1% participated in 3 projects, and 4.2% participated in more than three projects.

The questions associated with the projects included questions about the contribution of each of the partners (UPV group and FISABIO group) to the project, the frequency and channels of interaction, the identification of obstacles experienced, and the assessment of different types of impacts resulting from the collaboration.

2.3. Semi-structured interviews

The conducting of semi-structured interviews had two objectives related to the analytical possibilities offered by qualitative research. The first objective was to understand the context of some aspects addressed in the survey. In this way, the aim was to analyse some processes involved in the collaborations of the POLISABIO programme. The second objective was to capture emerging topics that arose in the interviews but had not been initially incorporated into the survey.

To fulfil the first objective of the interviews – understanding the context of some aspects already addressed in the survey – the list of open questions was initially based on the survey blocks related to: motivations to participate in a research project, reasons to participate in the POLISABIO programme, satisfaction with the POLISA-

BIO programme, contribution of the teams to the objectives of the project, frequency and channels of interaction (with emphasis on the relationship between geographical distance and collaboration), barriers encountered in collaboration, and the impact derived from the projects. Regarding the second objective – capturing emerging topics –, in the initial interviews we observed that the interviewees attached great importance to the work of the POLISABIO coordination team in matching groups from different institutions during the call. We therefore added a new block to the survey on the “Origin of the collaboration”, to try to capture this aspect, while also delving deeper into these matching practices in the remaining semi-structured interviews. In the conclusions section, we discuss this aspect in more detail.

The selection of interviewees was carried out in two phases. First, the research team identified 23 PIs according to the criteria of the number of projects and calls in which they had participated, geographical location, and their degree of intermediation in the collaboration network. The POLISABIO team selected 5 of those 23 PIs to conduct the interviews, 3 from UPV and 2 from FIS-ABIO. The five interviews were conducted between the second week of January and the first week of March 2024. The average duration of the interviews was 54 minutes. The interviews were semi-structured, based on blocks of open-ended questions that could lead to further questions related to the interviewees’ responses.

3. Analysis and results

- The analysis presented in this section is composed of three parts: the description of fundamental aspects of the POLISABIO programme; the collection and analysis of primary data from a survey of the researchers participating in the programme; and the semi-structured interviews conducted with the researchers. Since, as described in the methodological section, the design of the survey and the semi-structured interviews are closely related, we present the results of these two parts in a single subsection 3.2.

3.1. Descriptive analysis of secondary data

The combination of the tables presented in Section 2.1 allows us to provide a descriptive analysis of the information on the POLISABIO programme at both the project and individual levels.

3.1.1. Projects requested and granted per year

Figure 1 provides details on the total number of actions and projects granted per year. It is important to highlight that, in the years 2017 and 2018, no distinction was made between “Actions” and “Projects,” so the results for both years are presented under a single category. Over the entire

period 2017–2021, a total of 79 actions/projects were granted, out of 168 applications submitted. Therefore, the success rate (ratio of grants to applications) was 47% for the programme. It should be noted that this rate was significantly higher for Actions (54%, 69 out of 128 applications) than for Projects (25%, 10 out of 40).

3.1.2. Distribution of projects by institution

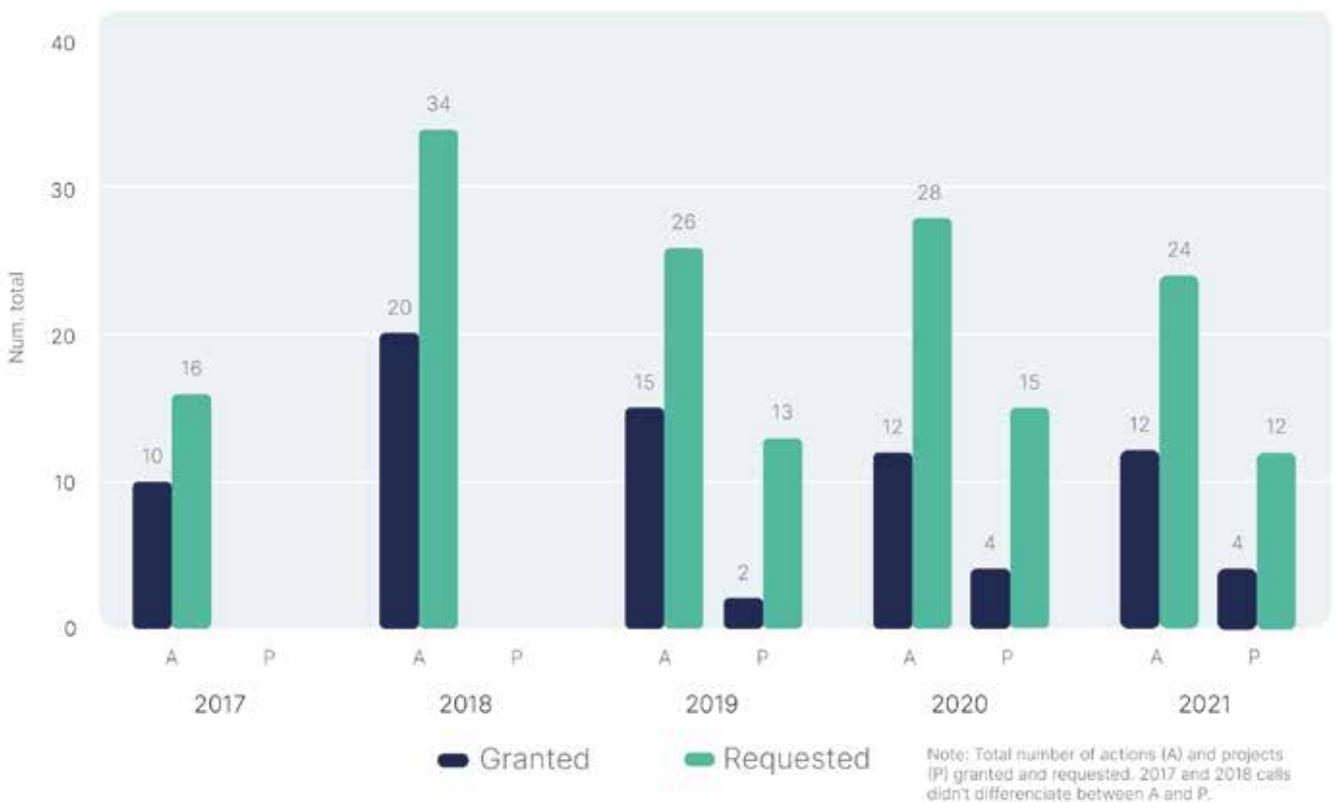
For UPV researchers, the location of the principal investigator was considered, distinguishing between: Vera Campus, Gandia Campus, and Alcoi Campus. Table 4 details the distribution of projects requested and granted by UPV Campus. It can be observed that more than half of the projects requested and granted correspond to UPV researchers

affiliated with the Vera Campus, while the Alcoi and Gandia Campuses each accounted for around one-fifth of the projects.

For FISABIO researchers, the location of the principal investigator was considered according to their FISABIO center of af-

filiation and the corresponding Health Department (HD). Table 5 provides the distribution of projects (granted and requested) by HD, highlighting the top 10 HD in terms of the total number of funded projects.

• Figure 1. Actions (A) and Projects (P) requested/granted per year



• Table 4. Distribution of projects by UPV Campus

Campus UPV	PROJECTS REQUESTED	PROJECTS GRANTED
Vera	95 (56,6%)	43 (54,4%)
Gandia	38 (22,6%)	18 (22,8%)
Alcoi	35 (20,8 %)	18 (22,8%)
Total	168 (100%)	79 (100%)

3.1.3. Mobilization of research staff

In this section, we present information on the research staff mobilized through the POLISABIO programme. The information distinguishes between principal investigators of projects and team members. It also distinguishes between staff belonging to FISABIO and UPV, and research staff participating in funded and unfunded projects. Table 6 shows the number of participations of UPV and FISABIO for each call.

It is important to highlight that Table 6 offers a count of participations, not of individuals. That is, the values represent the number of participations in awarded and not awarded projects each year, according to the role that each participant has occupied in each project. For example, in 2017, 41 persons affiliated with UPV (10 of them as PI) were part of teams funded by POLISABIO. That same year, 18 persons affiliated with UPV were part of projects submitted to the 2017 call but did not obtain funding. Therefore, the total values of each row

• Table 5. *Distribution of projects by Health Department (HD)*

	PROJECTS REQUESTED	PROJECTS GRANTED
requested	Projects	22 (27,8%)
granted	26 (15,5%)	13 (16,5%)
DS Elx Hospital General	17 (10,1%)	10 (12,7%)
DS Xàtiva – Ontinyent	13 (7,8%)	4 (5,1%)
DS_FISABIO_Salut Pública	12 (7,1%)	7 (8,9%)
DS Gandia	11 (6,6 %)	7 (8,9%)
DS Alicante-Sant Joan D’Alacant	8 (4,8%)	2 (2,5%)
DS_FISABIO_Oftal.	8 (4,8%)	3 (3,8%)
DS La Ribera	7 (4,2%)	2 (2,5%)
DS Orihuela	4 (2,4%)	2 (2,5%)
Other	20 (11,9%)	7 (8,9%)
Total	168 (100%)	79 (100%)

represent, for each call, the total number of persons who participated in funded and unfunded projects.

Some important aspects to highlight from Table 6 are as follows: first, we can deduce that the POLISABIO programme mobilized a total of 963 participations (516 in funded projects, and 447 in unfunded projects); with respect to participations in funded projects, 2018 was the year in which the highest number of research staff took part in projects funded through the POLISABIO programme (165 participations). This is because, starting with the 2019 call, the number of researchers per project/action was limited.

3.1.4. Unique researchers

With respect to unique researchers, a total of 541 different persons (from both FISABIO and UPV) participated in funded/unfunded projects in the POLISABIO programme during the period 2017–2021. As indicated previously, these persons may have participated in more than one funded project during this period.

Table 7 shows the frequency of participation in projects, considering only those persons who have participated in at least one funded project. Of the 541 persons initially considered, 354 have participated in at least one funded project. This popula-

● Table 6. *Participation in the POLISABIO programme*

	PARTICIPATION IN FUNDED PROJECTS					PARTICIPATION IN UNFUNDED PROJECTS				
	UPV		FISABIO		Total	UPV		FISABIO		Total
	IP	Equipo	IP	Equipo		IP	Equipo	IP	Equipo	
2017	10	31	10	21	72	6	12	6	14	38
2018	20	59	20	66	165	14	41	14	28	97
2019	17	26	17	33	93	22	37	22	53	134
2020	16	22	16	27	81	27	3	27	3	60
2021	16	35	16	38	105	20	41	20	37	118
TOTAL	79	173	79	185	516	89	134	89	135	447

tion (354 persons) will constitute the basis for the sending of the questionnaire, which is detailed in the following section.

Table 7 indicates that a total of 200 FISABIO researchers and 154 UPV researchers have participated in funded projects in the POLISABIO programme. Regarding the distribution of researchers according to their frequency of participation in projects, the following should be highlighted. A total of 77.5% of FISABIO researchers have participated in only one funded project. The remainder (22.5%) have participated in two or more funded projects. In the case of

UPV staff, 67.5% have participated in only one funded project. The remainder (32.5%) have participated in more than one funded project. It should be noted that 9 persons from UPV have participated in five or more funded projects.

3.1.5. Teams

In general terms, the average size of the teams in funded projects was 6.7 persons, and the average size of the teams in funded actions was 6.5 persons. With respect to projects that did not receive funding,

• Table 7. Frequency of participation in funded projects

Nº of projects	FISABIO		UPV		FISABIO+UPV	
	Total	%	Total	%	Total	%
1	155	77,5	104	67,53	259	73,16
2	32	16	30	19,48	62	17,51
3	9	4,5	9	5,84	18	5,08
4	2	1	2	1,3	4	1,13
5	2	1	4	2,6	6	1,69
6	0	0	2	1,3	2	0,56
7	0	0	3	1,95	3	0,85
TOTAL	200	100%	154	100%	354	100%

the average size of the teams was 5.3 persons (projects) and 4.9 persons (actions).

Table 8 provides detailed information on the average size of the teams by call year. It also disaggregates the size according to the number of FISABIO and UPV persons.

3.1.6. Interaction map

The information retrieved from the secondary data also enabled the mapping of interactions between the different institutions that participated in the POLISABIO programme. For this purpose, the affiliations of the principal investigators associated with all funded projects were

considered. For UPV staff, the research group of affiliation was considered. For FISABIO staff, the center of affiliation was considered.

This information allowed the representation of the relationships between the different institutions. The nodes represent the institutions. In green, those belonging to FISABIO are indicated, and in red, those belonging to UPV. The size of the node is proportional to the number of projects in which each institution has participated. The links (that is, the relationships between the nodes) represent the joint participations in projects funded by POLISABIO. The thickness of the links is proportional to the number of joint projects.

• Table 8. Average team size

	FUNDED			UNFUNDED		
	Total	UPV	FISABIO	Total	UPV	FISABIO
2017	7,2	4,1	3,1	6,3	3	3,3
2018	8,3	3,9	4,3	6,9	3,9	3
2019_actions	5,4	2,4	3	5,5	2,6	3
2019_projects	6	3,5	2,5	6,6	2,8	3,8
2020_actions	4,9	2,3	2,6	2	1	1
2020_projects	5,5	2,5	3	2,5	1,3	1,3
2021_actions	6	3	3	5,1	2,6	2,5
2021_projects	8,2	3,8	4,5	7,1	3,8	3,4

3.2.1. Respondents' profile

3.2.1.1. Type of research: basic–applied

Respondents indicated the extent to which they classify their research activities as 'basic research' or 'applied research.' Figure 3 (*Applied orientation of research*) shows the distribution of the indicator corresponding to applied research. A value of 100% indicates that the respondent reported that all their research is applied in nature. In the case of UPV staff, researchers indicated that, on average, 63% of their research can be classified as 'applied research,' while in the case of FISABIO, the average value corresponds to 56.2%. That is, in both groups, most researchers consider that their research has an applied orientation.

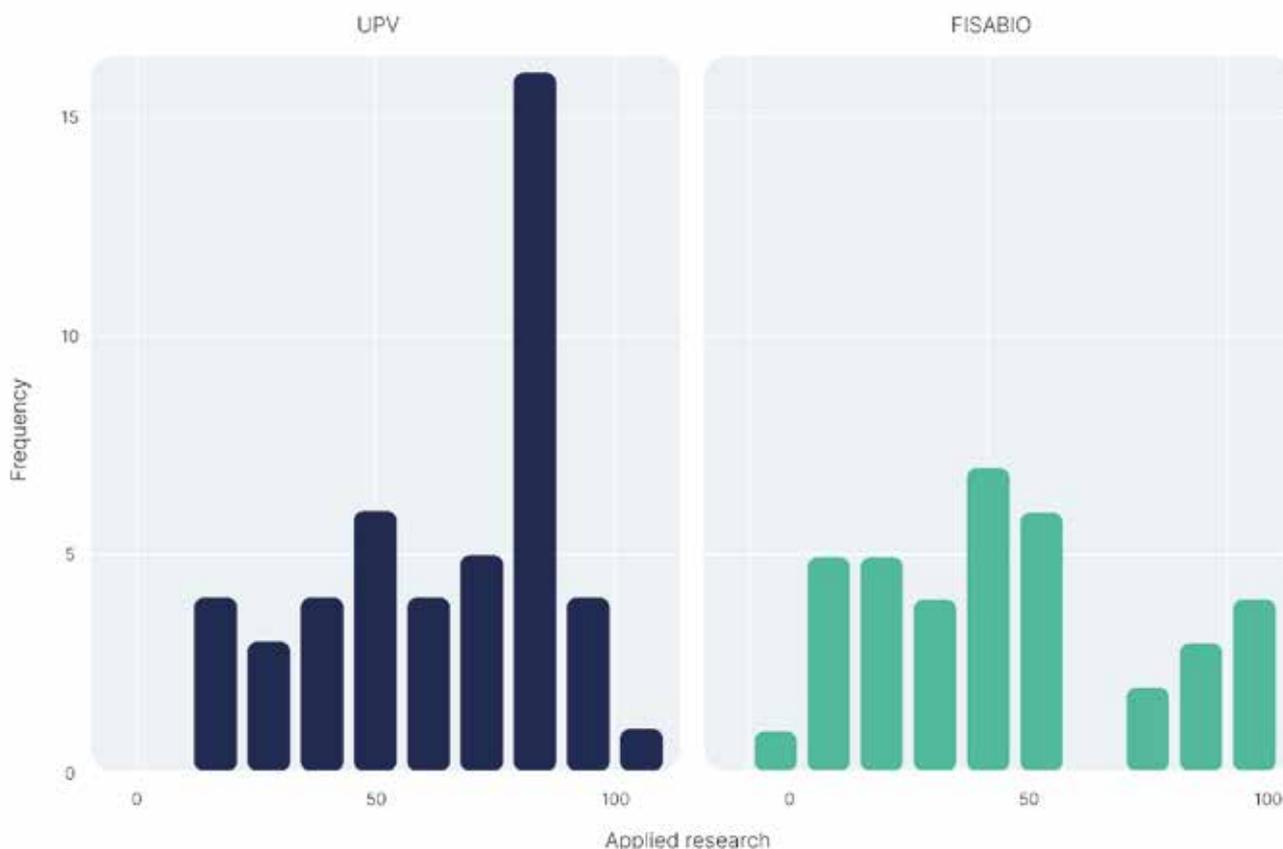
3.2.1.2. Identification of beneficiaries

Respondents indicated, on a scale of 1 to 7, the extent to which they considered that different groups benefit most directly from the results of their research activity. The question was posed as follows:

The research activity you carry out benefits different groups. Please indicate to what extent you consider that the groups listed below benefit most directly from the results obtained from your research activity. To do so, use a scale from 1 to 7 (1 = do not benefit at all; 7 = benefit very directly).

Figure 4 shows the percentage of respondents (from UPV and FISABIO) who indicated values of 6 or 7 for each of the suggested items. For UPV staff, 76% stated that the researchers of their own research

● Figure 3. *Applied orientation of the research*



group are direct beneficiaries of their research, followed by clinical professionals (47%), and society in general together with the scientific community (43%). In the case of FISABIO, the main beneficiaries are patients (71%), followed by their own research group (60%), and clinical professionals (56%).

3.2.1.3. Citizen science

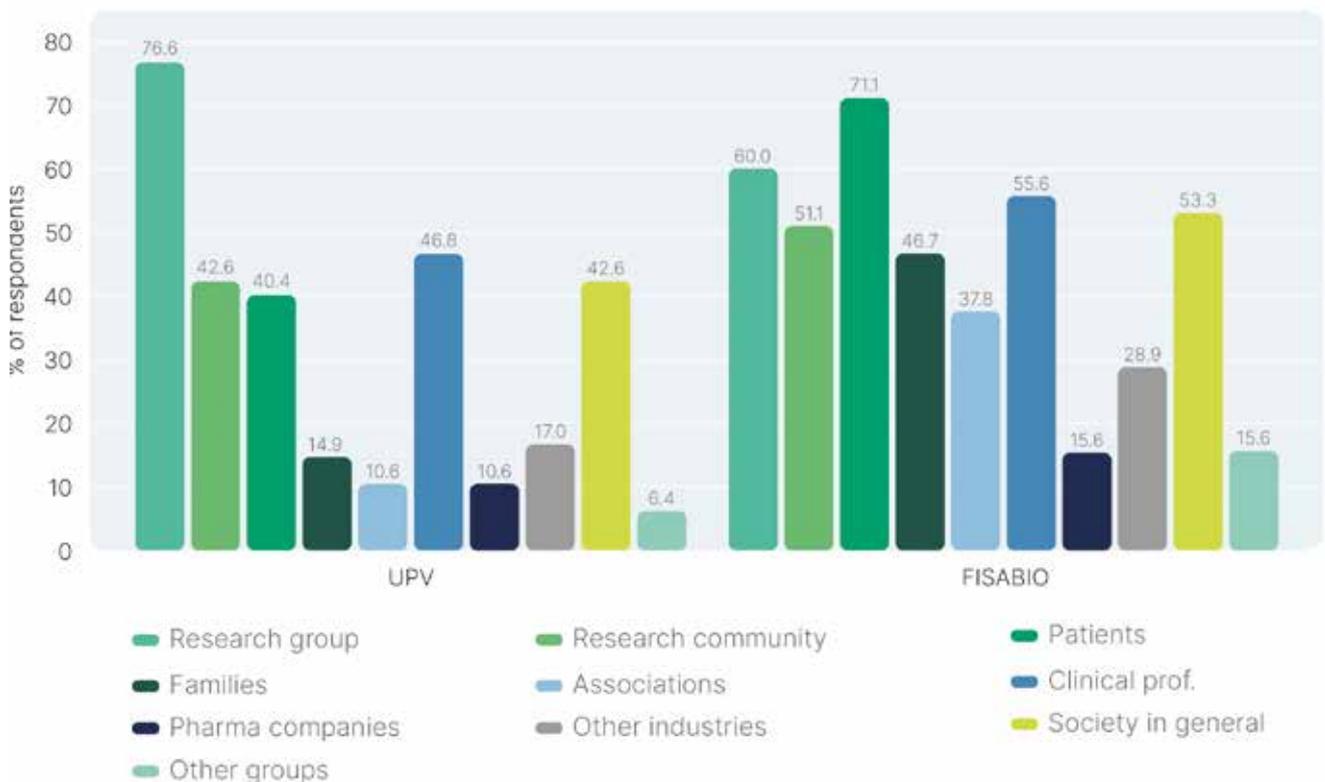
Respondents were asked to indicate to what extent they incorporate citizens and/or civil society organizations into different phases of research. Respondents indicated, on a 1 to 7 Likert scale, how frequently they incorporated citizens and/or civil so-

ciety organizations into different phases of their research activity³.

Figure 5 shows the percentage of respondents (from UPV and FISABIO) who indicated values of 6 or 7 in each of the suggested items. In the case of UPV, 53% of respondents interact with citizens and/or civil society organizations for data collection. 36% also do so to communicate their research results. In the case of FISABIO, respondents collaborate with citizens

³ The question asked the following: "Please indicate to what extent the following activities are part of your research practice. To do so, indicate the degree of frequency using a scale of 1 to 7. (E.g.: 1 = "never, does not occur"; 7 = "very frequently")."

● Figure 4. *Perceived beneficiaries*



Note: Percentage of respondents indicating values of 6 or 7.

and/or civil society organizations to determine research objectives (47%), for data collection (47%), and to discuss potential applications of the research (37%). Figure 5 also shows that a relevant percentage (at least one third) of FISABIO researchers incorporate citizens and/or civil society organizations at some stage of the research activity.

(45%) and teaching (32%) are the most important activities. However, for FISABIO researchers, clinical practice (43.6%) is the most common activity, followed by research (24.2%). It is important to emphasize that UPV staff devote almost twice as much time to research compared to FISABIO staff, who display a more heterogeneous activity profile.

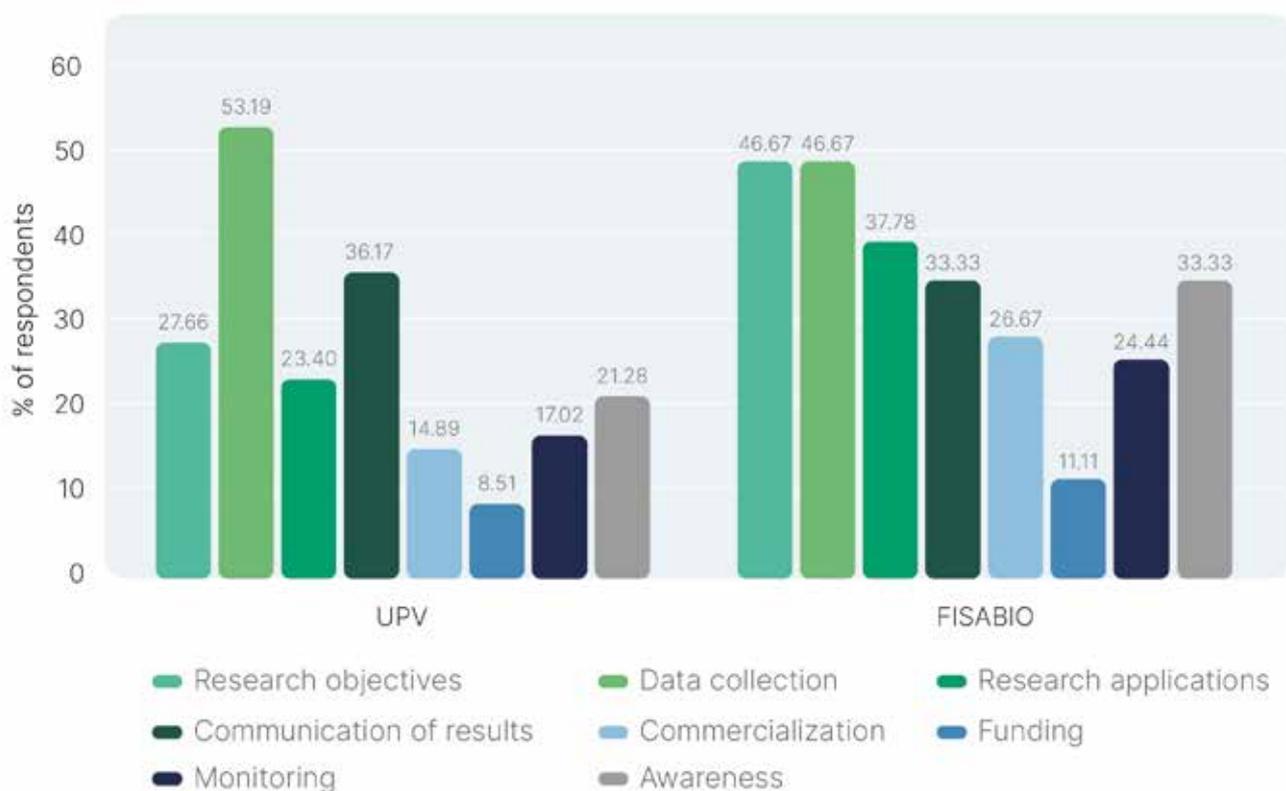
3.2.1.4. Professional profile according to time distribution across different activities

Respondents indicated the percentage of time that, during a typical work week, they devote to different activities. Figure 6 highlights the heterogeneity of professional profiles between UPV and FISABIO staff. In the case of UPV staff, research

3.2.1.5. Motivations to participate in a research project

Respondents indicated the degree of importance they attributed to different factors when deciding their level of participation in a research project. These factors included elements related to personal satisfaction (*e.g., facing an intellectual challenge*), professional recognition (*e.g.,*

• Figure 5. Incorporation of non-professionals into the research process



Note: Percentage of respondents indicating values of 6 or 7.

gaining professional recognition from my scientific community), or professional stability (e.g., improving my job stability), among others.

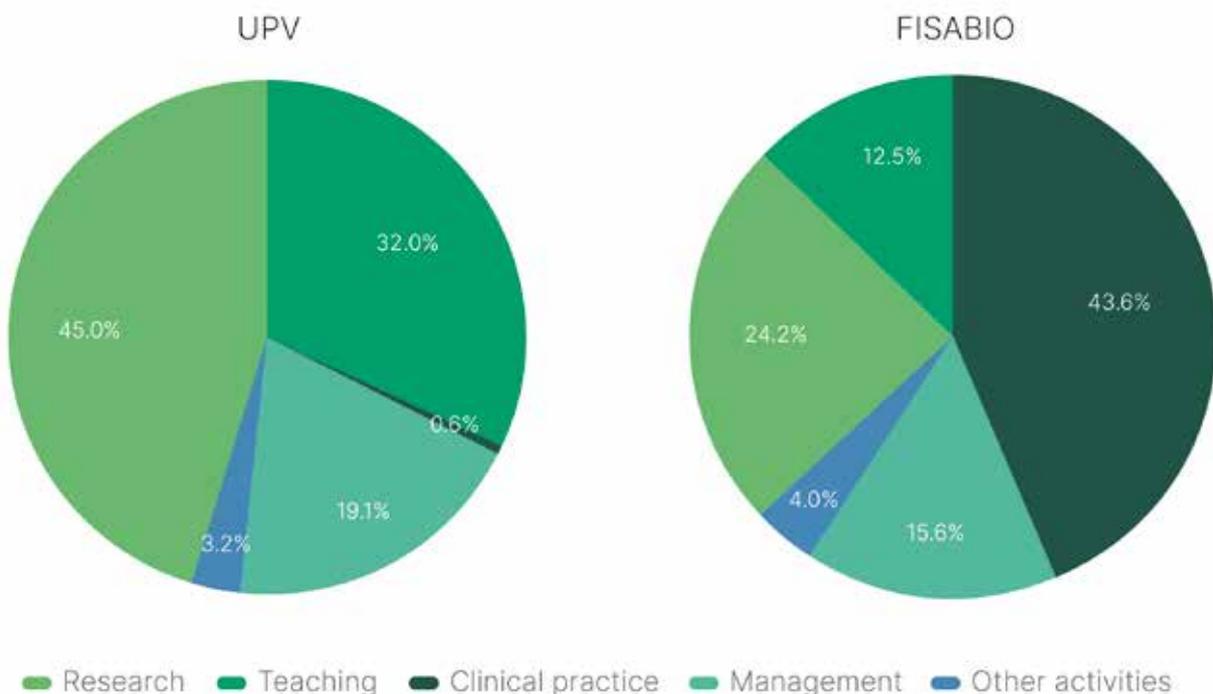
Figure 7 shows the percentage of respondents who indicated high or very high values (6 or 7) in the suggested items⁴. For UPV staff, the most relevant motivations to participate in research are the possibility of contributing to the advancement of knowledge in their own scientific discipline (85%), and the possibility of obtaining useful answers that help solve specific problems of other people or social groups

4 The question is phrased as follows: "Please indicate the degree of importance that you personally attribute to the following factors when deciding your level of participation in each research project. To do so, use a scale of 1 to 7 (1 = "not important at all," 7 = "very important")."

(85%), followed by the possibility of contributing to solving social needs or challenges (83%). In the case of FISABIO staff, the main motivation is also the contribution to the advancement of knowledge (80%), followed by personal satisfaction (78%), and the opportunity to generate a positive impact on actors outside the professional community (including patients and society in general), as well as the opportunity to contribute to solving social needs or challenges (both items with 71% of responses). Motivations related to social recognition or improvement of working conditions are considered less important.

In the interviews, regarding the general motivations of our interviewees to carry out research projects, our interviewees emphasized the interaction between interdisciplinarity and some of the motivations

• Figure 6. Professional profiles



that are not among the most highlighted in the survey: the possibility of improving career prospects in the case of UPV researchers, and of facing an intellectual challenge that provides personal satisfaction in the case of FISABIO researchers. In both cases, the interdisciplinary nature of the programme stimulates these secondary motivations.

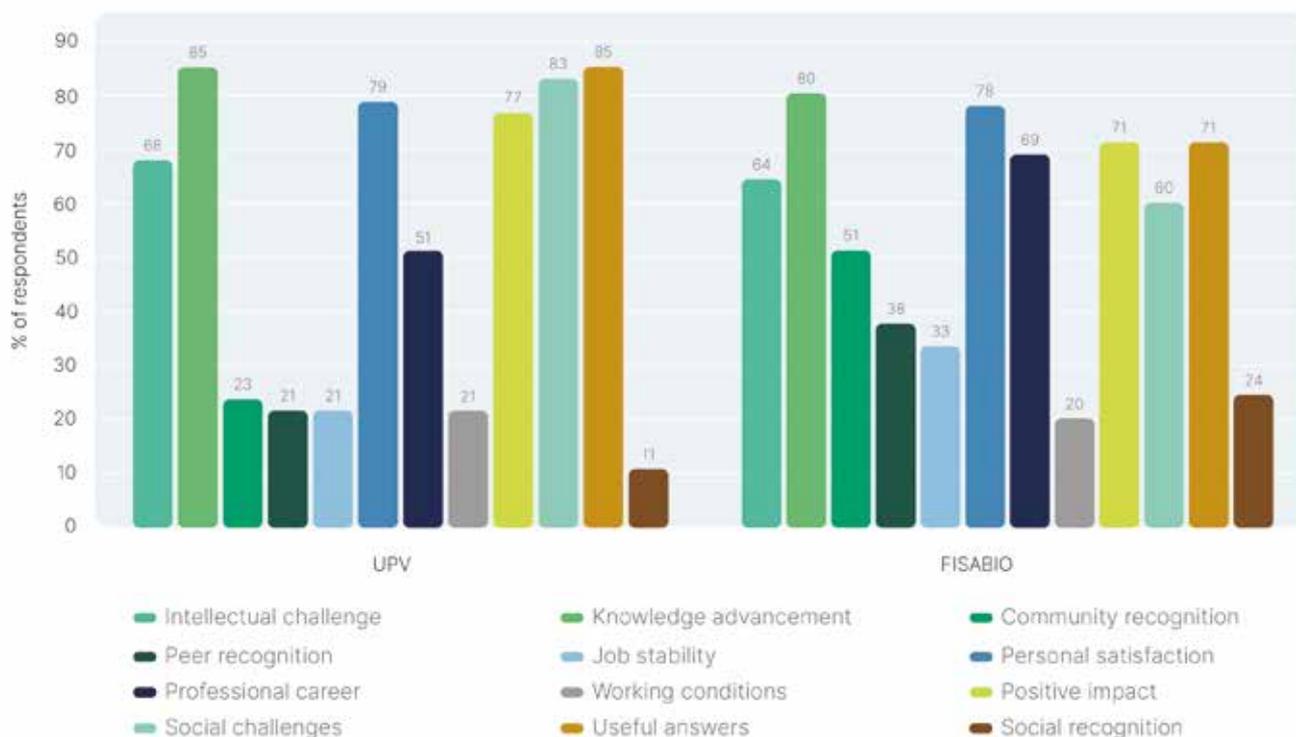
UPV Researcher 4 highlights the curricular benefits of interdisciplinary research funded by the programme:

"... if one day I want to apply for accreditation as a full professor ... I need it for my resume... Academically, for me it has been great, ... it has been published in journals. A new field has opened up for me. And now I have publications in health journals, which I didn't have before." (Researcher 4)

FISABIO Researcher 2, with a long career as a clinical professional, highlights the intellectual challenge that interdisciplinary research represents for clinical staff:

"I find it wonderful to be able to collaborate in something far beyond healthcare medicine ... I have been involved in these things all my life ... So this was very good for me because it was a way to continue and to be able to do things and in this case with the advantage or with the difference that these were not things so close to my own field, but intellectually more attractive because they were a little different ... In the end, my own field, well, I have some mastery over it, but doing things a little bit in another world and in another field ... I found it very attractive to be able to enter that field." (Researcher 2)

● Figure 7. Motivations for participating in research



Note: Percentage of respondents indicating values of 6 or 7.

3.2.2. POLISABIO Experience

3.2.2.1. Previous Research Experience

In this question, respondents were asked to indicate whether they had research experience (e.g., publication of academic articles, participation in research projects, presentation of papers at conferences, etc.) before they participated in the POLISABIO programme.

Figure 8 presents the results obtained, distinguishing between UPV respondents and FISABIO respondents. Notable differences can be observed between both groups. In the case of UPV staff, 84.4% of respondents already had more than 10 years of research experience before they participated in the POLISABIO programme. However, in

the case of FISABIO, 33.3% of respondents had no prior research experience, 17.8% had little experience (1 to 3 years), and 31% had 10 years or more. These differences highlight that the POLISABIO programme has been particularly useful in incorporating a significant proportion of FISABIO staff with little or no prior research experience into research activities.

3.2.2.2. Reasons for participating in the POLISABIO Programme

Respondents indicated the degree of importance they attribute to a series of reasons for participating in the POLISABIO programme. The items presented were slightly different for each group, so the results are shown separately.

• Figure 8. *Previous research experience*

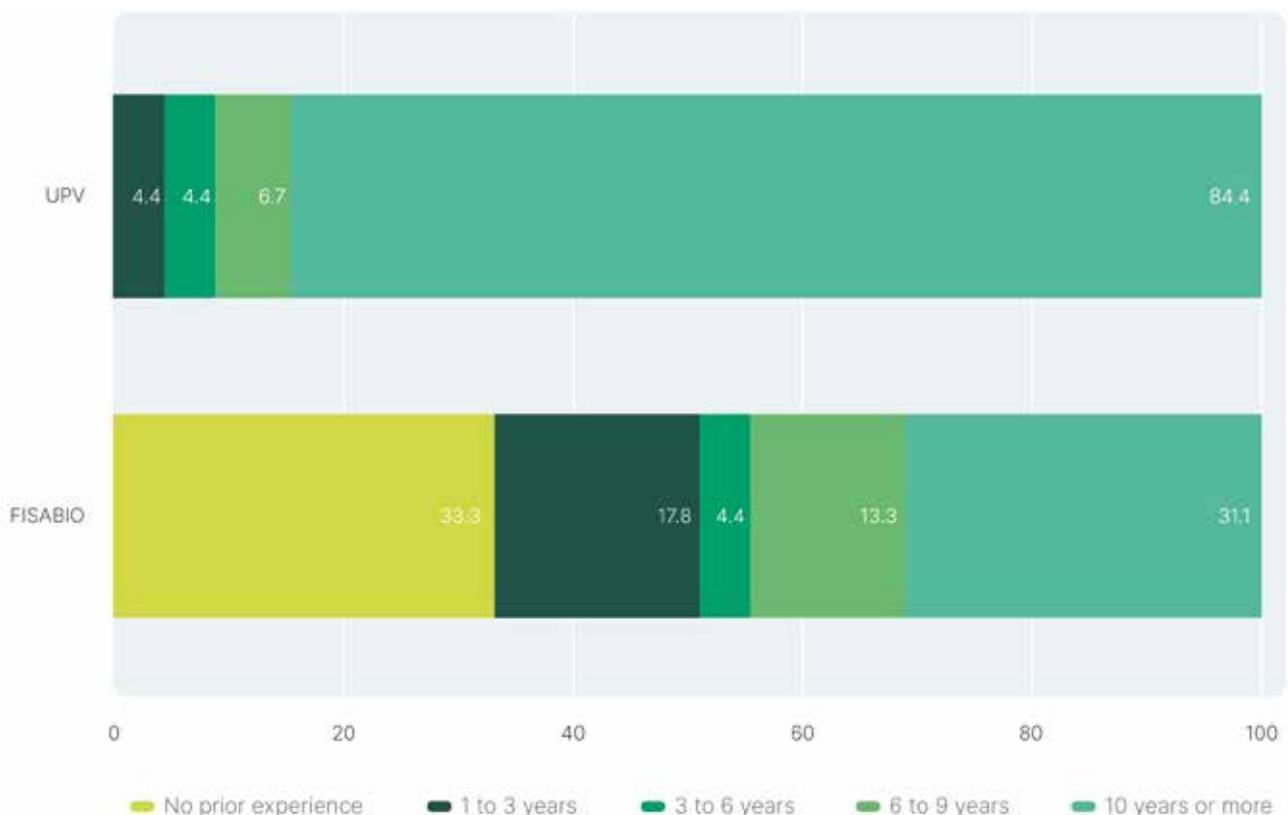


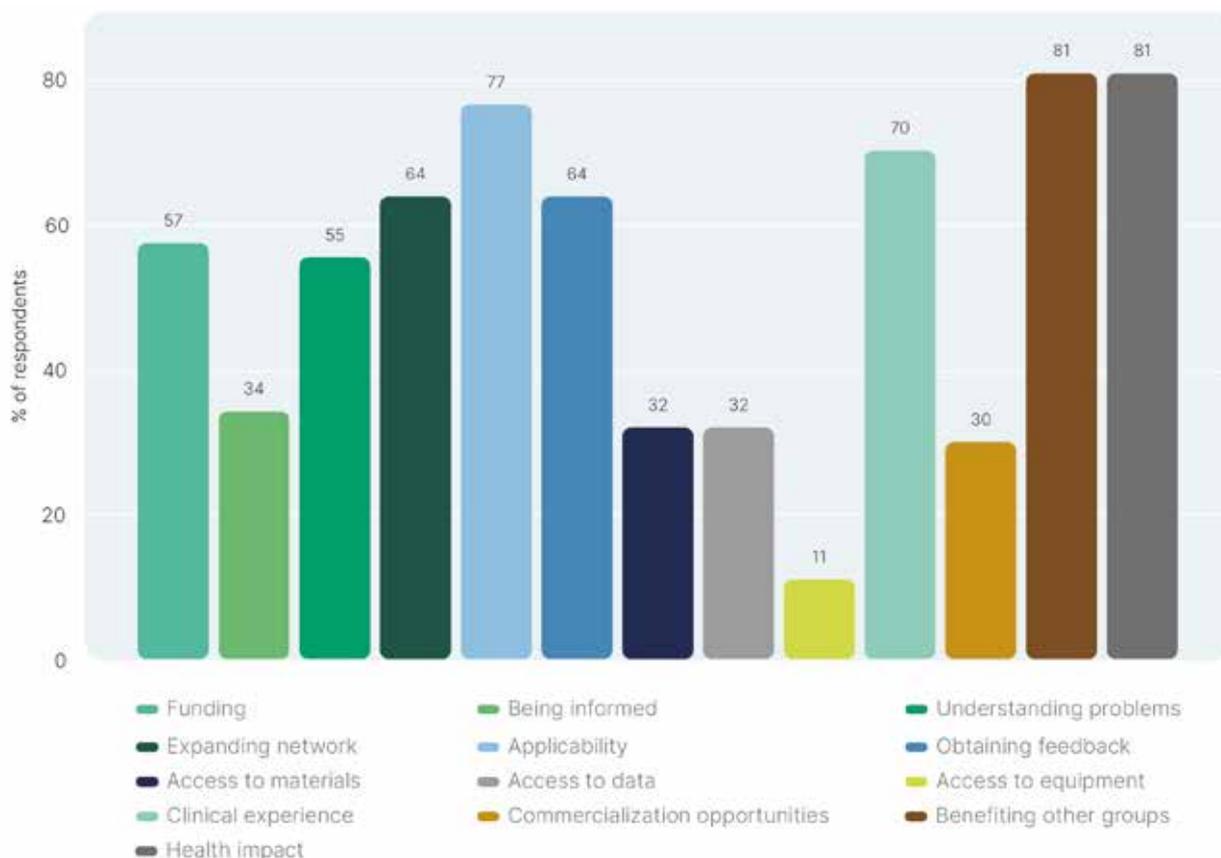
Figure 9 shows the percentage of UPV respondents who indicated high or very high values (6 or 7) on the suggested items. 81% of respondents indicated that “benefiting other groups through my research” and “having a positive impact on health” were important/very important reasons for participating in the POLISABIO programme. In third place was the objective of “improving the applicability of my research results,” with 77% of respondents. By contrast, only 11% of respondents considered “access to equipment for my research” as an important/very important reason.

Figure 10 presents similar information, this time for FISABIO respondents. As in the case of UPV researchers, FISABIO respondents also indicated that “having a positive impact on health” (76%) and

“benefiting other groups through my research (e.g., patients)” (73%) were important/very important reasons for participating in the POLISABIO programme, as well as the expectation of benefiting from the experience and knowledge of POLISABIO researchers (73%). By contrast, “access to data” (36%) and “access to equipment” (38%) were infrequent reasons for explaining the decision to participate in the POLISABIO programme

Our semi-structured interviews allowed us to delve deeper into some of the results of this survey question. Firstly, although funding is not a priority, this motivation may change depending on the stage of the participants’ research careers. Although the amount of funding for each project is not very high, it can, in some cases, be suf-

• Figure 9. Motivations for participating in the POLISABIO programme (UPV)



ficient as an incentive to start a line of research. FISABIO Researcher 5, who is at an early stage of her research career, states that her main motivation is the search for funding for research:

“We cannot access funding from the Instituto Carlos III, so if we want to do research, we can only access grants of this kind” (Researcher 5).

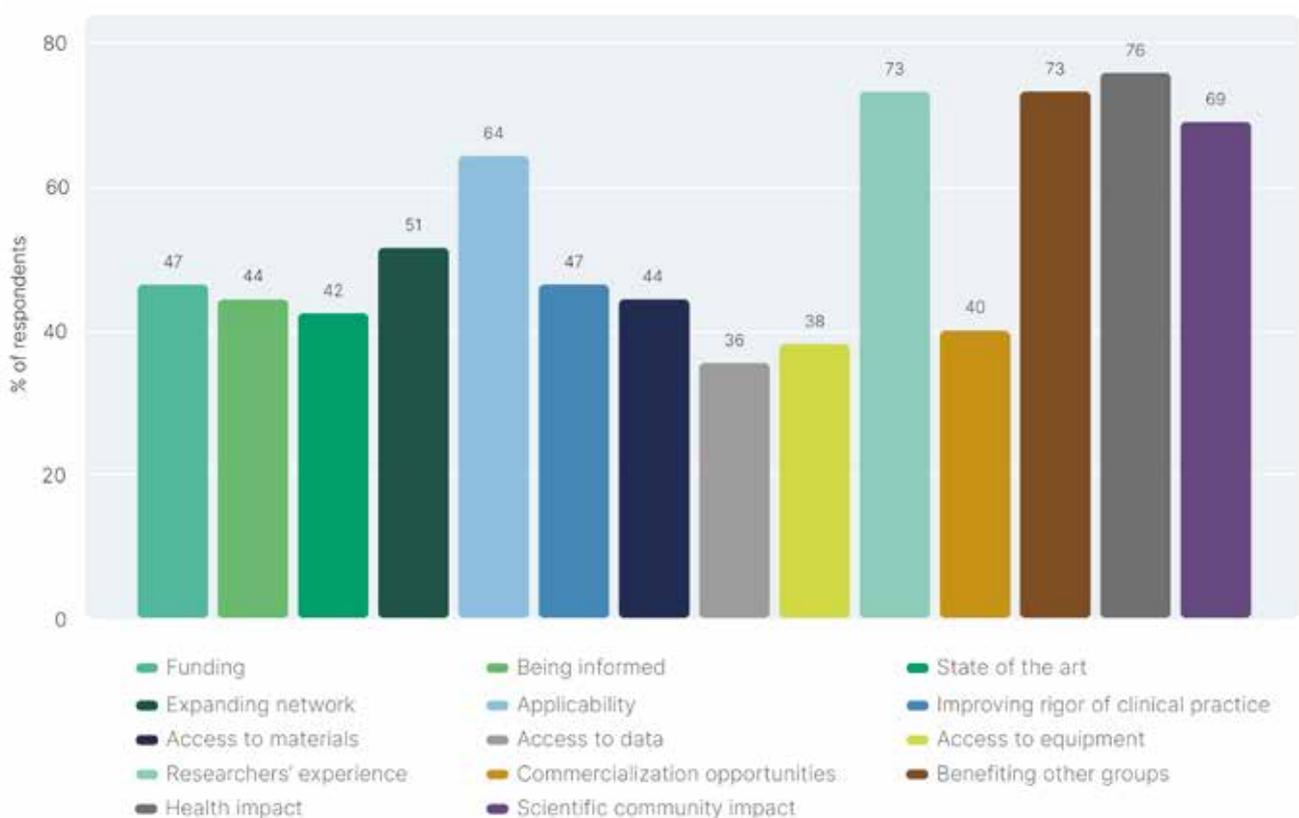
UPV Researcher 1, with a consolidated career trajectory, mentions interactions with other research collaboration funding programmes:

“We are motivated because we have had a predisposition for years to do work in the field of biomedicine... we are interested in collaborating with clinical groups... So, for us, it opens avenues of collaboration

and the possibility of applying for projects [through other funding programmes] at some point” (Researcher 2).

Secondly, UPV Researcher 3 highlights the possibility of increasing the applicability of her research as the main reason for participating in the programme, specifically referring to the patentability of the research project and relationships with companies. In her case, the project actually began as a continuation of a collaboration with a private company. For this interviewee, the professional experience in private companies of some UPV researchers is one of the reasons that explains this orientation toward applicability, which is indeed higher among UPV researchers (77%) than among FISABIO researchers (64%), as derived from the survey results:

● Figure 10. Motivations for participating in the POLISABIO programme (FISABIO)



“all this started because of collaboration with a company... [some] researchers come from the private sector. So that leads us to always carry out research with a view to a possible application later on, even if it is in five, ten, or fifteen years... So, it is true that we have that perspective, if not to patent, at least to develop something that can be scaled up at the industrial level and that allows not only technical but also economic viability and profitability” (Researcher 3).

3.2.2.3. Satisfaction with the POLISABIO Programme

In this block, respondents were also asked to evaluate, on a scale from 1 to 7, different aspects related to the POLISABIO programme. Figure 11 shows the percentage of respondents who indicated a “positive” or “very positive” evaluation to each of the items presented. Results are disaggregated by type of institution (FISABIO / UPV).

UPV respondents indicated a high level of satisfaction with the matching between UPV-FISABIO groups through expressions of interest: 79% indicated “high” or “very high” satisfaction. High levels of satisfaction are also observed with respect to the dissemination of the call (77%). The lowest rating refers to the funding granted (only 19% considered it positive or extremely positive). The patterns are similar for FISABIO respondents, although the values are lower. 62% of respondents evaluated positively/very positively the matching between FISABIO-UPV teams. 31% of respondents were satisfied with the amounts of funding granted to approved projects.

Additionally, respondents indicated their degree of “overall satisfaction” with the POLISABIO programme, using a scale from 1 to 7. The average score reported by

UPV respondents was 5.65, and the average score among FISABIO respondents was 5.44. It is important to highlight that, in general terms, respondents from both institutions showed high levels of overall satisfaction with the programme. 63.8% of UPV respondents expressed a “positive” or “extremely positive” opinion of the programme. This figure was 57.8% among FISABIO respondents.

The questionnaire also included an open-ended question, where respondents were asked to indicate whether they had any additional suggestions or comments regarding their participation in the POLISABIO programme: 23 respondents provided comments in this section.

A first set of comments refers to elements related to programme funding. Some respondents expressed complaints about the limited budget offered by the programme and suggested *“Increase the amount of funding, especially for groups wishing to register patents.”* In this regard, another respondent noted: *“The amounts are very limited. Particularly in Research Projects, dissemination activities should be eligible for funding.”* Another researcher stated, *“For researchers who are just starting, I think it is a good option, although the amount of funding makes it very difficult to carry out a project unless you have a consolidated research team that can cover part of the expenses. For established researchers, it is not worthwhile given the amount of administrative work involved—preparing the proposal, expense justification, final report...—and financially it is not profitable.”* Finally, it was also remarked that *“The funding allocation is very low. It usually does not even cover the development of a proof of concept. One must resort to other parallel sources of funding.”*

A second set of comments refers to administrative and/or bureaucratic proce-

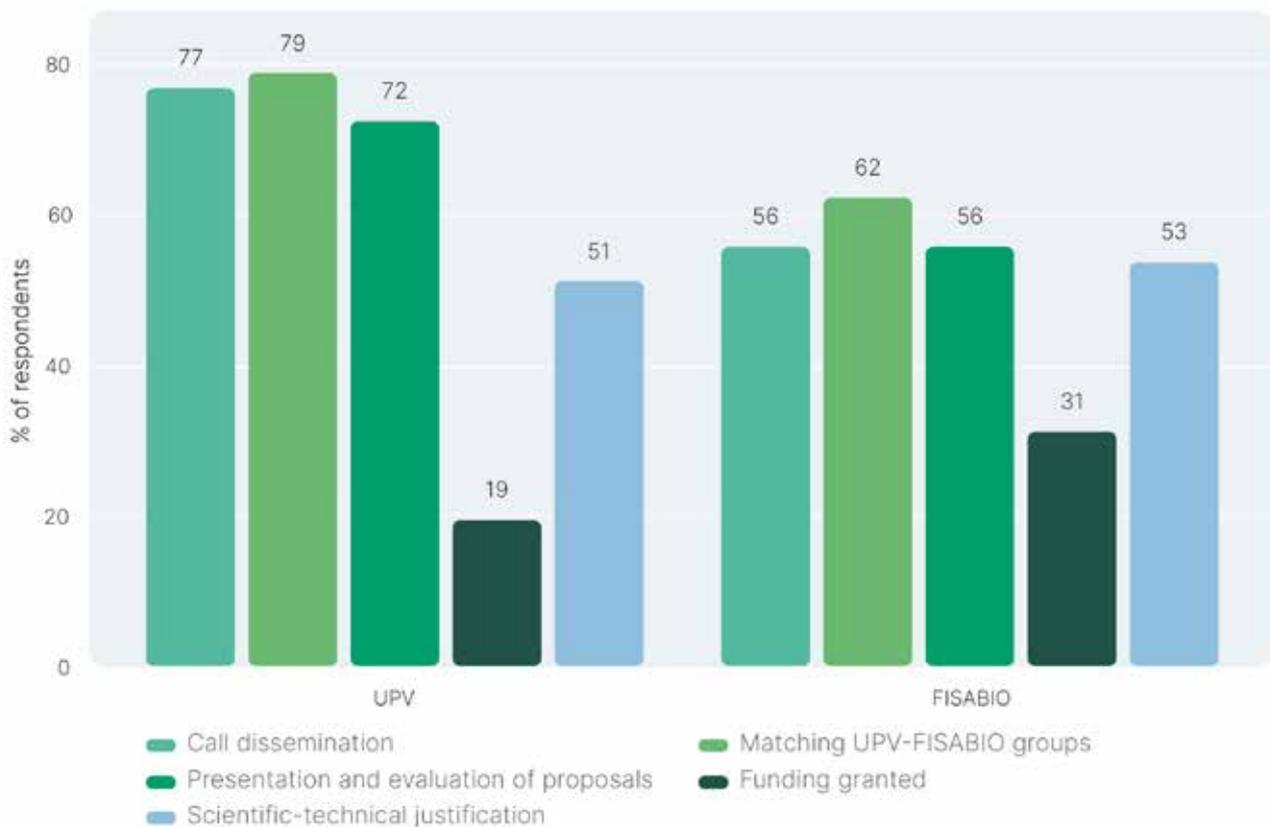
dures related to programme management. In this regard, issues were raised concerning changes in programme managers, the need to streamline processes with ethics committees, and the reduction of administrative bureaucracy handled directly by researchers: *"If we have to do everything ourselves, given the heavy clinical workload, many of the proposed projects are not viable, and in some cases, they do not even materialize or get submitted because of the bureaucratic requirements."*

Finally, a third set of comments expressed satisfaction with the programme. For example, one respondent noted: *"It represented a scientific benefit and the possibility of meeting other researchers and*

other experimental techniques." Others highlighted that the programme *"Breaks the ice between clinicians and academics"* and *"makes it possible to carry out research projects that would otherwise be difficult to undertake. It mentors and guides our steps in such a challenging and lengthy endeavour as research."* Another respondent remarked: *"It has been an excellent opportunity to turn an idea into a prototype. Without the support of POLISABIO, the development would not have been possible."*

In our semi-structured interviews, as in the survey and its comments, the most frequently questioned aspect of the programme was the "seed" nature of the

● Figure 11. Satisfaction with the POLISABIO programme



funding. Researcher 1 commented that, in his experience, projects must necessarily be co-financed with other funds belonging to the research groups. He also emphasized the need to continue funding the most promising projects. Another of our interviewees from FISABIO (Researcher 3) expressed frustration with the lack of continuity in funding, particularly in research structures within small hospitals that have less access to other funding sources.

On the other hand, at UPV the interdisciplinary nature of the programme and its capacity to mobilize research focused on health topics were highly valued. UPV Researcher 1, an experienced scientist, commented:

“As an idea, I find it very, very interesting. That is, the Polytechnic University, with its more engineering-based training, approaches the health field... Just the fact that someone wants to apply for a project and takes the trouble to look for someone on the other side to arrange an interview... that alone makes it worthwhile.” (Researcher 1)

UPV Researcher 2 also emphasized the programme’s ability to broaden research perspectives:

“Capabilities have been greatly enhanced, and it also allows you to open up research horizons that you would never have had otherwise. For example, in my case, the biomedical part—I would never have considered it if I had not been part of these programmes.” (Researcher 2)

In summary, the assessment of the programme highlights the two fundamental elements of its design: interdisciplinarity and “seed” funding. While interdisciplinarity is well valued, the limitations inherent in seed funding programmes are also emphasized.

3.2.3. Participation in POLISABIO Projects

As previously indicated in this section, questionnaire respondents were presented with a series of identifying data corresponding to the different projects in which they had participated. Each respondent was asked to answer a series of questions related to each of the projects in which they had been involved. To avoid overburdening respondents, the maximum number of projects about which a single respondent could provide answers was limited to three.

In this section, the unit of analysis for presenting the results corresponds to the “research project.” That is, each “project response” is treated as an independent unit of observation, even though several of these responses may refer to the same project (for example, two participants reporting on the same project) or a single respondent reporting on more than one project.

Consequently, this approach differs from that of the two previous sections, where the unit of analysis was the respondent. While in the previous sections the number of observations corresponded to the total number of respondents (92 valid responses, as indicated in section 2.2.1), in this section we have a total of 129 responses (i.e., 129 respondent-project level observations), referring to 68 different projects.

3.2.3.1. Contribution of the teams to the project objectives

Respondents were asked, for each project, to indicate how their own team and the institutional counterpart contributed to achieving the general objectives of the project. That is, UPV researchers were asked to what extent their own team (i.e., the UPV researcher’s team) and the team

they collaborated with on a given project (i.e., the FISABIO team) contributed. A similar logic was followed in the case of FISABIO participants.

Table 9 presents the percentage of responses in which each item is considered important or very important (i.e., rated with values of 6 or 7). For each institution, data are provided for self-assessment and for the assessment of the institutional counterpart⁵.

Regarding UPV's contribution to the general objectives of the project, UPV staff themselves mainly considered that they offered "information and advice to solve specific problems associated with the project" (91.3%), "energy and motivation" (91.3%), and "ideas about the orientation of the project" (88.4%). The lowest value was recorded for "access to patients, samples, data, or materials" (34.8%). On the other hand, FISABIO staff also evaluated the contributions of UPV staff. These values were significantly lower than those reported by UPV themselves. FISABIO researchers acknowledged the importance of the UPV team in providing "ideas about the orientation of the project" (68.3%) and "credibility of the project to third parties" (66.7%). Again, the lowest values were found in "access to patients, samples, data, or materials" (48.3%) and in "Pointed out relevant people and/or sources of information" (53.3%). The third column shows the difference in scores for each item. The results indicate important differences regarding task coordination (28.8 percent-

⁵ The question was phrased as follows: "Please indicate how your own team, as well as the team (from the institutional counterpart), contributed to the achievement of the objectives of the project indicated. For each item, please evaluate each team's contribution to the objectives of this project, using a scale of 1 to 7 (1 = no contribution to the project objectives; 7 = maximum contribution to the project objectives).

age points of difference), and the provision of information and advice to solve specific project-related problems (26.3 percentage points of difference).

With respect to FISABIO's contribution, FISABIO researchers themselves mainly considered that they provided "access to patients, samples, data, and/or materials" (81.7%), "knowledge and expertise on the topic" (80%), and "credibility to third parties" (80%). The lowest-scoring item was "Provided specific skills in experimental or analytical techniques" (65%). Their counterpart (the UPV team) also evaluated the contributions of the FISABIO team to the different projects. The highest-rated items were "Provided knowledge and expertise on the project topic" (78.3%) and "Provided credibility of the project to third parties." The lowest-rated item was "Provided specific skills in experimental or analytical techniques" (43.5%). Regarding differences, the last column indicates a discrepancy in terms of specific skills in experimental or analytical techniques, as well as in access to resources (patients, samples, data, etc.).

It is noteworthy that no clear-cut difference is observed in terms of the contributions of each group to the projects. In general, the perception of both groups is that the institutional counterpart provided "knowledge and expertise," "ideas about the orientation of the project," as well as "credibility of the project to third parties."

Where a certain division of scientific labour is indeed observed, according to cross-perceptions, is in "specific skills in experimental or analytical techniques" and in "access to patients, samples, data, and/or materials." Regarding the first item, FISABIO researchers considered that UPV teams provided "specific skills in experimental or analytical techniques" to a significant degree (63.3%), whereas there is

3. ANALYSIS AND RESULTS

• Table 9. Percentage of responses in which each item is considered important (6) or very important (7)

	PERCEPTION CONTRIBUTION UPV			PERCEPTION CONTRIBUTION UPV		
	UPV	FISABIO	Dif.	FISABIO	UPV	Dif.
Provided knowledge and experience on the project topic	85,5	61,7	23,8	80,0	78,3	1,7
Provided ideas on the direction of the project	88,4	68,3	20,1	78,3	68,1	10,2
Provided information and advice to solve specific problems associated with the project	91,3	65,0	26,3	75,0	66,7	8,3
Provided specific skills in experimental or analytical techniques	87,0	63,3	23,6	65,0	43,5	21,5
Referred me to relevant people and/or sources of information	71,0	53,3	17,7	75,0	73,9	1,1
Contributed to improving my ability and confidence to explain and defend the project's relevance	78,3	65,0	13,3	70,0	71,0	-1,0
Provided credibility to the project in the eyes of third parties	87,0	66,7	20,3	80,0	78,3	1,7
Provided access to patients, samples, data, and/or materials	34,8	48,3	-13,6	81,7	66,7	15,0
Provided access to facilities, methodologies, analysis techniques, and/or equipment	82,6	63,3	19,3	70,0	55,1	14,9
Contributed to the coordination of the team's (daily) tasks	85,5	56,7	28,8	78,3	65,2	13,1
Provided energy and motivation for the development of activities associated with the project	91,3	63,3	28,0	73,3	72,5	0,9

no reciprocal evidence that UPV researchers regarded this contribution as relevant from FISABIO teams (43.5%). Regarding the second item, UPV researchers considered that FISABIO teams provided “access to patients, samples, data, and/or materials” (66.7%), whereas there is no evidence that FISABIO researchers considered this contribution as relevant from UPV teams (48.3%).

Our semi-structured interviews confirm the most salient result of the survey, referring to the division of scientific labour between groups. But they add a new element: the perception among some UPV researchers of FISABIO groups’ ability—or lack thereof—to contribute to analytical work. On the one hand, some FISABIO groups are perceived as “Bio” groups, that is, groups capable of carrying out laboratory analyses. Other groups are identified as purely “Clinical,” without analytical capacity, mainly providing access to patients, samples, or materials. As we will see later, this classification may create certain barriers to collaboration between the two institutions. However, other UPV interviewees offered a different perception, suggesting that the more purely clinical groups may help overcome barriers derived from the use of different scientific languages.

An important part of FISABIO researchers’ contribution to these interdisciplinary projects consists of facilitating access to patients in various situations. FISABIO Researcher 2 described how, in their case, difficulties in accessing patients during the pandemic were overcome by expanding the search to patient associations and day centers:

“It is a bit of the clinical part ... which patients we could seek became very complicated due to the issue of non-face-to-face care. So the idea had to be somewhat adapted towards family associations, to-

wards day centers ... because that was the way to be able to contact people who normally gathered, rather than our specific patients that we could directly contribute. But yes, it was we who contributed the most clinical part.” (Researcher 2)

FISABIO Researcher 5 commented that in their project the technology had already been tested on healthy patients. One of the most important tasks of the project was to facilitate access to patients to analyse variations:

“What we are seeing is whether these devices, that is, whether that study makes sense, whether it provides any diagnostic and prognostic information about the pathology. They had already carried out studies on healthy individuals ... And now what we are seeing is in patients, and whether there are variations from normality that provide information.” (Researcher 5)

In addition to access to patients, FISABIO researchers also facilitate access and knowledge of healthcare materials, facilities, and real environments. UPV groups’ contribution to the projects focuses on technological development. This contribution is clearly reflected in the perceptions of interviewees. Researcher 1 and Researcher 4, both from UPV, described their contribution as follows:

“In the research projects I am involved in, the technical part has been carried out entirely by UPV.” (Researcher 4)

“The technical part, well, it has the capacity to provide technology. We are fundamentally ... a technology provider ... technology that sometimes is not even known.” (Researcher 1)

Regarding the skills in experimental or analytical techniques of FISABIO groups, UPV Interviewee 1, with collaboration experience with biomedical groups, made a very clear distinction between clinical

groups with research experience (“Bio” groups) and those solely engaged in clinical practice.

As we will see in the next section, the lack of research experience among “clinical” groups can be an obstacle to collaboration. However, UPV Researcher 2 offers a different perspective. She acknowledges that the differences between “bio” and “clinical” groups are significant, but adds that “clinical” groups can contribute to overcoming communication problems between groups from different disciplines:

“So it is true that the perspective of people who are on the hospital ward, compared to people who are used to researching, is very different. Okay. But ... those who are on the ward are also capable of bringing it down to a more grounded level, of using terminology that is very basic so that we can understand it ... whereas sometimes when you work with people from Hospital La Fe you say ... here I got lost ... Let's recap, I don't know what this word means.” (Researcher 2)

This contribution is significant because, as we will see in the next section, one of the most important barriers to interdisciplinary collaboration identified by our interviewees is indeed the use of different languages. Thus, there are both pros and cons to interaction with “Clinical” groups. For this UPV researcher, an “essentially clinical” group brings closeness to the problem, the ability to interpret engineering results in a clinical context, and a more understandable language.

Finally, our interviewees highlighted other contributions of FISABIO teams to the projects related to knowledge and expertise in the biomedical field, also emphasized in the survey. In addition to aspects of access and specific techniques employed, in this type of interdisciplinary project, the clinical interpretation of the problem to be

solved and of the proposed solution is crucial. UPV Researcher 1 stressed that clinical groups define the problem to be solved:

“The engineering side ... we are not close to the problem, right? ... The real problem is known by those in the bio side. And if they are on the clinical side, even better ... I think that approaching that type of problem, to see if it can be addressed somehow, I think it is very, very interesting.” (Researcher 1)

As Researcher 5 emphasized, in addition to the problem to be solved, clinical experience is also essential to clinically interpret the technical parameters of the solution:

“Obviously, they provide the devices and we provide the interpretation of the signals ... we provide the patients, the material to carry out the tests, and all the clinical knowledge applied in how to interpret the correlation with the clinic.” (Researcher 5)

3.2.3.2. Frequency and channels of interaction. Geographic aspects

In the semi-structured interviews, we also sought to explore the impact of geographic distance on project interactions, since this was one of the relevant evaluation elements for the POLISABIO management and coordination group. Four researchers discussed aspects related to geographic distance between project groups during the interviews. All these interviewees stated that geographic distance had not posed a considerable problem in the project. They also mentioned the more intensive use of online tools following the Covid-19 pandemic.

“It is true that for me the geographic barrier does not exist today, and even less since COVID, as the whole issue of online meetings has disappeared. I must say that before COVID I was someone who traveled

a lot to Valencia ... Now with online meetings, this has been greatly mitigated.” (Researcher 4)

“The UPV co-PI leaves with a grant, he is going to be away for three months and will be able to carry out all the development of the digital tool project, including interaction with patients online ... That is, the pandemic was what forced them to take that leap.” (Researcher 5)

In one of the projects of the interviewed researchers, related to a digital technology, all contacts were online. In two other cases, interviewees highlighted the importance of holding face-to-face meetings. UPV Researcher 2 referred to the need for in-person feedback on the use of technology in clinical contexts:

“When you see them in situ, how they place it, how they test it, how they handle it. All that gives you an answer that, if you don’t see it, you don’t get it. So I think there are always meetings that must be strictly online and meetings that must be strictly face-to-face.” (Researcher 2)

In another case, it was necessary for a UPV team member funded by the project to travel to hospitals for all clinical trials. The project funded this researcher’s travel expenses.

In summary, online connections and the availability of researchers outside Valencia city are sufficient to ensure that the geographical distance between project participants does not pose a significant difficulty.

3.2.3.3. Previous Links

In this question, respondents were asked whether, before collaborating on the project, they already knew one or more of the participants from the counterpart team.

Table 10 shows the percentage of responses for each of the suggested op-

tions, broken down by UPV and FISABIO respondents.

In general terms, respondents did not know the counterpart team before starting the collaboration within the framework of the POLISABIO programme (79.1% in the case of UPV respondents, 67.8% for FISABIO respondents). Among FISABIO respondents, it is also noteworthy that 20% already had a professional–formal relationship with one or more members of the UPV team.

3.2.3.4. Origin of the collaboration

Respondents were asked to indicate how the collaboration between their team and the institutional counterpart was initiated. The following response options were offered:

- a) My team proposed an “Expression of Interest” and the POLISABIO coordinators identified another team.
- b) The POLISABIO programme coordinators contacted my team regarding an “Expression of Interest” submitted by another team.
- c) My team identified on the POLISABIO website an “Expression of Interest” proposed by another team and expressed its interest in collaborating through the website or via the POLISABIO coordinators.
- d) My team proposed an “Expression of Interest” and another team identified this “Expression of Interest” and expressed its willingness to collaborate through the website or the POLISABIO coordinators.
- e) I do not know how the collaboration was initiated.

Table 11 shows the percentage of responses to each of the suggested options. UPV respondents reported that in 29% of the cases, the UPV team submitted an expression of interest, and POLISABIO helped to

identify a counterpart team. Among FISABIO respondents, the option with the highest percentage of responses (30.5%) was submitting an expression of interest to which a UPV team responded, expressing willingness to collaborate. Options a, b, and c include some type of what we have termed “matching practices” carried out by the POLISABIO team. Among UPV respondents, the aggregate of these three responses amounted to 75.4%, compared to 45.8% for FISABIO. It is important to note that the question did not specify whether the UPV or FISABIO management team within POLISABIO was responsible for these matching practices. In fact, as will be shown in the following section on interviews related to these matching practices, in some cases, the POLISABIO teams established direct contact with researchers from the other institution during these matching practices.

One of the most interesting findings from our interviews was the participants’ perception of the different matching practices that occur during the call. In this process, the work of the POLISABIO team is essential in bringing together research groups across institutions. Four interviewees reported that the POLISABIO team intervened directly in the networking process to match groups from different institutions. In another case, a group learned about the programme through a mailing and independently identified a counterpart team from the other institution. Furthermore, the interviews revealed different strategies employed by researchers themselves when seeking a counterpart team.

Cross-institutional matching

For Researcher 2, the POLISABIO team’s work in facilitating matches is excellent. As mentioned in the previous section re-

● Table 10. *Previous links*

	UPV	FISABIO
Yes, I already had a professional relationship with one or more members of the other team, with formal collaboration	9,0	20,3
Yes, I already had a professional relationship with one or more members of the other team, without formal collaboration.	6,0	6,8
Yes, I had another type of relationship (non-professional) with one or more members of the other team	6,0	5,1
No, I did not know any members of the other team before collaborating on the project.	79,1	67,8
	100.0	100.0

garding the matching practices of the two POLISABIO management groups, on occasions, the POLISABIO groups established direct contact with researchers from the other institution during these pairing practices, as this researcher highlights:

"For me, this aspect is fundamental ... when a network is created and a need emerges ... My experience tells me that both at UPV and FISABIO they have their contacts ... if I have expressed a need and perhaps, for some reason, the FISABIO researcher is overwhelmed and does not contact me because they don't see it, POLISABIO has moved forward ... There have been times when FISABIO has created needs and we were contacted from UPV to say 'Hey, I think you could easily provide a solution to this, but for some reason you did not show interest.' (origin of the collaboration). I believe there have even been cases where FISABIO contacted us directly ... So I think both entities

work very well as a network, they know the right levers to pull ... I believe the network functions very well." (Researcher 2)

Researcher 4 from UPV explained that POLISABIO's (the 'Tinder') helped them find a FISABIO group with which they consolidated collaboration:

"We only signed up for 'Tinder' once ... The hospital team signed up and described their problem. And the UPV team signed up and explained what we could do. And then POLISABIO connected us. That's how it worked in the first call, and the collaboration has continued ever since." (Researcher 4)

Researcher 1 from UPV also valued this matching work very highly:

"Once it is well done at the beginning, connecting two researchers from very different worlds to generate a first idea." (Researcher 1)

● Table 11. Origin of the Collaboration

	UPV	FISABIO
a) My team proposed and POLISABIO sought out another team	29,0	17,0
b) My team was contacted by POLISABIO	26,1	18,6
c) My team identified an expression of interest on the POLISABIO website	20,3	10,2
d) My team proposed an "expression of interest" and the other team contacted us	13,0	30,5
e) I don't know	11,6	23,7

Researcher 2 makes a very interesting observation about the matching practices of the POLISABIO team. This UPV researcher explains how the intervention of the POLISABIO team makes it possible to overcome one of the main obstacles identified by the interviewees (as we will see in the section on barriers) that hinder interdisciplinary collaboration: the use of different ‘languages’:

“What FISABIO contributes is ... on the medical side, sometimes things slip past us, like when you are looking for an active principle ...and the active principle, do you want me to do this? Okay, so I think that’s also the role of the network, right? That is, to be able to lower the technicality of the language so that there are points of agreement. ... both UPV and FISABIO can.... simplify that technical language and find these matches between the two entities. Super interesting ... UPV and FISABIO are capable of understanding and translating across disciplines to transmit ideas to researchers from the other side.” (Researcher 2)

Researchers’ Matching Strategies

In addition to the work of the POLISABIO team, researchers also developed their own strategies to establish contact between groups. The survey results showed that when asked about the statement “My team proposed an ‘Expression of Interest’ and the other team responded,” UPV groups reported that they responded to FISABIO demands in 30.5% of the cases. Otherwise, 13.0% of FISABIO groups responded to a request from the UPV. This effort by UPV researchers to contact counterparts was also confirmed in the interviews. Researcher 1 from UPV, with experience across several calls, described various strategies, including relying on pre-existing contacts or exploring groups from the other institution based on keywords and expressed capabilities:

“In some cases there was already some prior contact, and that opened the door to say, ‘Hey, look, since we already have a prior contact, let’s apply for a project in this call for a project proposal’ ... In other cases, it was more like a ‘door-to-door selling’ approach, looking at which groups exist, what problems they may have, how we could contribute, and contacting them, or them contacting us. It has also happened the other way around ... I think that when they reach out, it is often because of the keywords we include.” (Researcher 1)

Regarding how collaborations are initiated, interviews pointed to two different approaches: responding to a specific demand expressed in the call or exploring broader opportunities for collaboration. Researcher 2 described the first approach:

“For me, the demand is always specific ... Normally, we adjust and focus on what is being requested. But sometimes you see the demand and realize you cannot respond to it ... If it were more generic, it might lead to projects that we had never considered. But in my case, today, that is not the situation. For me, 100% of cases have been concrete demands to which we provided a solution.” (Researcher 2)

In contrast, Researcher 1 from UPV explained a more exploratory approach, without focusing on a specific demand:

“Well, in our case, the way we approached it was by identifying a group with potential and holding some meetings to explore what type of collaboration could be established. I think it is more difficult for us to have a clear idea from the outset ... That has not been the case. Our approach was more exploratory, to see what we could do together, and then assess whether there was any synergy.” (Researcher 1)

3.2.3.5. Barriers found in collaboration

Respondents were asked to indicate how frequently they experienced different situations (“barriers”) that might have negatively affected the achievement of project objectives. These barriers focused on the characteristics of the interaction with the counterpart team.⁶

Figure 12 shows the percentage of responses with values of 6 or 7 for UPV and FISABIO respondents. In the first case, the main barrier to collaboration experienced by UPV staff was bureaucratic in nature. 19% reported difficulties with administrative procedures during project execution

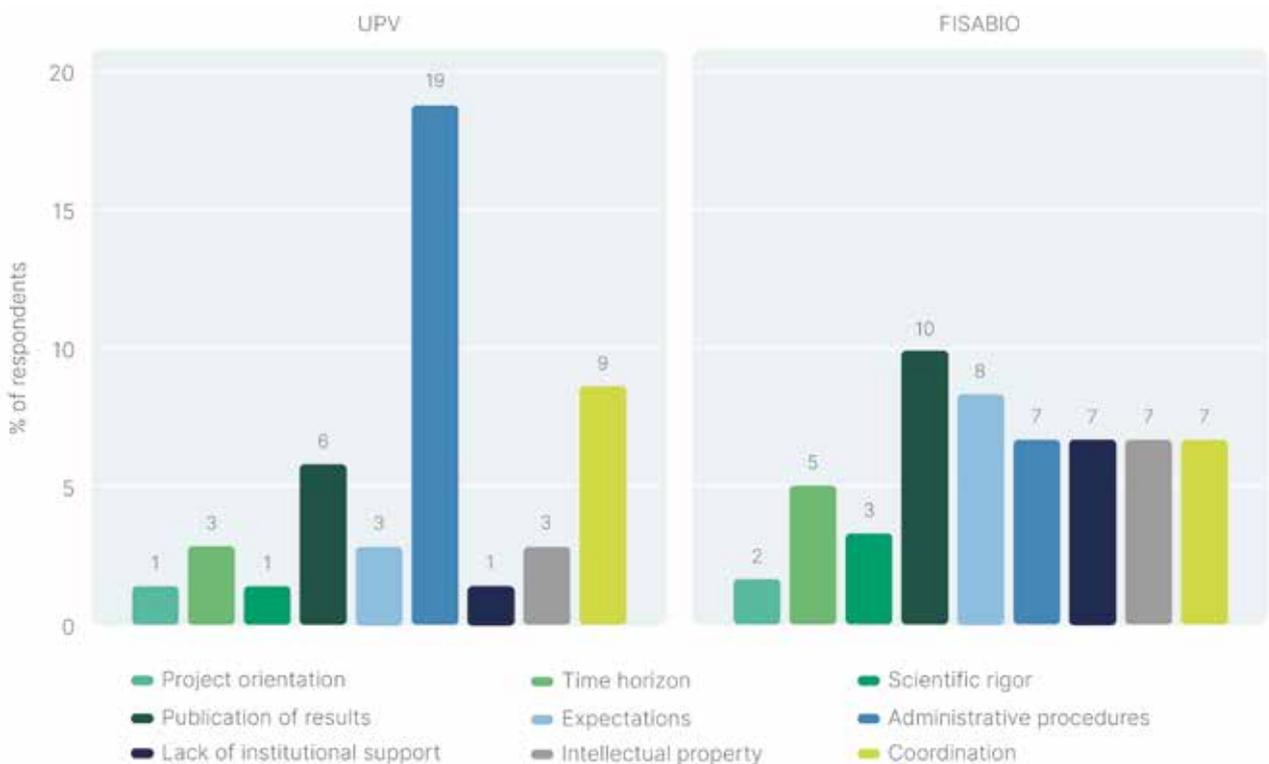
(e.g., hiring staff, ethics committees, etc.). For FISABIO staff, 10% reported frequent problems related to the publication and/or exploitation of project results, while 8% indicated frequent “lack of understanding regarding the expectations, environment, and professional practices” of their UPV counterparts.

These issues also appeared in the interviews. The most frequently mentioned administrative difficulties were related to the allocation of resources between UPV and FISABIO groups. Interviewees argued that allocation rules were sometimes inflexible, leading to problems with procurement management and hiring. In addition to these administrative barriers, other difficulties mentioned included delays in the resolution of calls and the need for programme evaluation.

Regarding difficulties with publishing and/or exploiting results, two of our interview-

⁶ The question was phrased as follows: “Please indicate how often you experienced the following situations while collaborating with the team (counterpart) in carrying out the various activities associated with the project (project acronym). To do so, use a scale of 1 to 7 (1 = never; 7 = very often).”

• Figure 12. *Barriers to collaboration*



Note: Percentage of respondents indicating values of 6 or 7.

ees, researchers at the UPV, highlight the regulatory requirements in the biomedical field when it comes to commercially exploiting results. For Researcher 1, these regulatory requirements are one of the most significant bottlenecks in this field, exacerbated by the shortage of professionals in academia who specialise in these areas:

"This whole regulatory part ... It's complicated and extremely costly. It is one of the bottlenecks in bio applications ... there is a huge gap in scientific training regarding regulatory aspects. There are very few experts, at least in academia. I'm not saying private companies don't have them, but in academia, there are few ... And that's where many projects die. I'd say 99.9% die there." (Researcher 1)

"From there it must continue with a company. I think that is the way forward. Without a company—through a spin-off, etc.—it is another possibility but also complicated. Not easy." (Researcher 1)

For Researcher 3 from UPV, the only way to overcome this regulatory barrier is to collaborate with companies experienced in the biomedical field with the necessary capabilities to address these regulatory processes:

"For us, those certifications and limitations were totally unknown ... In the second project, which was more development-oriented, we obviously partnered with a company that already had those certifications, and adapting a product line to that type of certification was not particularly difficult. So, it's true that we've learned enormously from that process, and that is one of the handicaps that projects involving product development encounter...we have certainly learned that.. finding a company that already has those certifications is much easier than asking a company to start from scratch and obtain them, because the bu-

reaucratic process is extremely slow." (Researcher 3)

With regard to the publication of project results in the form of articles in scientific journals, Researcher 2 from POLISABIO points out that the interdisciplinary nature of the projects sometimes makes it difficult to write these articles. Specifically, the interviewee mentions the difficulties associated with publishing the results of a proof of concept for a technological development in medical journals:

"This proof of concept ... That's so, so easy to say, but turning it into a medical article today, today I find it difficult ... to really see how I can explain that. Whether to present concrete experiences or everything together. I don't know... It's really hard for me, very, very hard." (Researcher 2)

As we saw in the previous section, surveys also identify this problem: 10% of FISABIO staff also reported frequent problems with publishing and/or exploiting project results.

Several interviewees also mentioned negotiations regarding the distribution of intellectual property rights between UPV and FISABIO as another barrier.

Finally, the "lack of mutual understanding regarding expectations, environment, and professional practices" between different professional contexts was also mentioned in interviews. Some interviewees noted that certain FISABIO groups, especially those focused on clinical practice, had little experience in research design or research funding. As we mentioned earlier, Researcher 1 from UPV, who has a long track record, makes a clear distinction between clinical and "bio" groups. Researcher 2 from FISABIO confirmed that, in their experience, some clinical groups were not used to research design.

Another prominent issue related to the lack of understanding between different

professional environments has repeatedly come up in our interviews: the “lack of understanding of the different languages” used by research groups.

The three researchers from the UPV agree on highlighting the difficulties associated with the use of different “languages” by the groups. Researcher 1, with a long career, described the initial difficulties when collaborating with clinical groups:

“Another limitation we had at the beginning—now we’ve overcome it after years of working with bio and clinical people—was the language. Okay, I think they and we had problems at first. I remember at first having meetings with clinical staff and leaving the meeting saying, ‘I do not understand a single word’. Absolutely nothing. That doesn’t happen now, but it can be a problem for new groups that have never done anything in the clinical field and want to start working with people who are more or partly clinical.” (Researcher 1)

Researcher 4 noted that the investment of time and effort in learning the “language” of clinical groups was key to sustaining collaborations:

“We met ... and have stayed together since. That’s because it takes three months just to understand the language.” (Researcher 4)

Researcher 2 also highlights the issue of different languages as critical in the collaboration process and emphasises the coordination work required to identify appropriate terminology in the exchange of samples:

“One thing that I consider essential in this type of collaboration is the language we use, not only from the point of view of what we say... I mean, if a doctor speaks using medical terms, I get lost, and if I speak using terms that are perhaps more chemical in nature, they get lost.” (Researcher 2)

“The first thing we do is put terminology on the table: what terms we will use, what references we will employ, and how we will codify developments. That rule is clear to my group. We are all going to have to put terminology, coding, and identification on the table in the first meetings and create a system in which I send you this sample for you to validate, so maybe we can make an Excel spreadsheet where we put the identification of what tests it has undergone... and you put the date you received it and your perceptions or observations about that sample. And if you don’t do that, it ends up being chaos. (Researcher 2)

In our view, it is particularly noteworthy that researchers consider the work carried out by the POLISABIO team during the matching process in the call for proposals to be capable of partially resolving the problem of the different languages spoken by the groups, as already mentioned in the section on the “Origin of the collaboration”.

3.2.3.6. Impacts derived from the projects

This section provides information on the questions related to the impact derived from the projects. The types of impact analysed covered four areas: “knowledge”; “training”; “health and well-being”; and “economic and knowledge transfer-related.”

Impact on knowledge

For each project, respondents indicated to what extent the activities carried out within the framework of the project had an impact on different aspects related to the creation and dissemination of knowledge (1 = no relevance; 7 = maximum relevance).

Figure 13 shows the percentage of respondents who indicated high (6) or very high (7) values for each of the items. The result with the highest values (33%) is the “presenta-

tion of the results to the study participants.” In addition, the “initiation of new lines of research” (32%) and the publication of academic articles (29%) stand out.

Impact on training

With respect to the impact on training, five potential impacts were proposed, for which respondents had to indicate their relevance (1 = no relevance; 7 = maximum relevance). Specifically, the following question was posed:

The activities carried out in the project (project acronym) have been useful for...

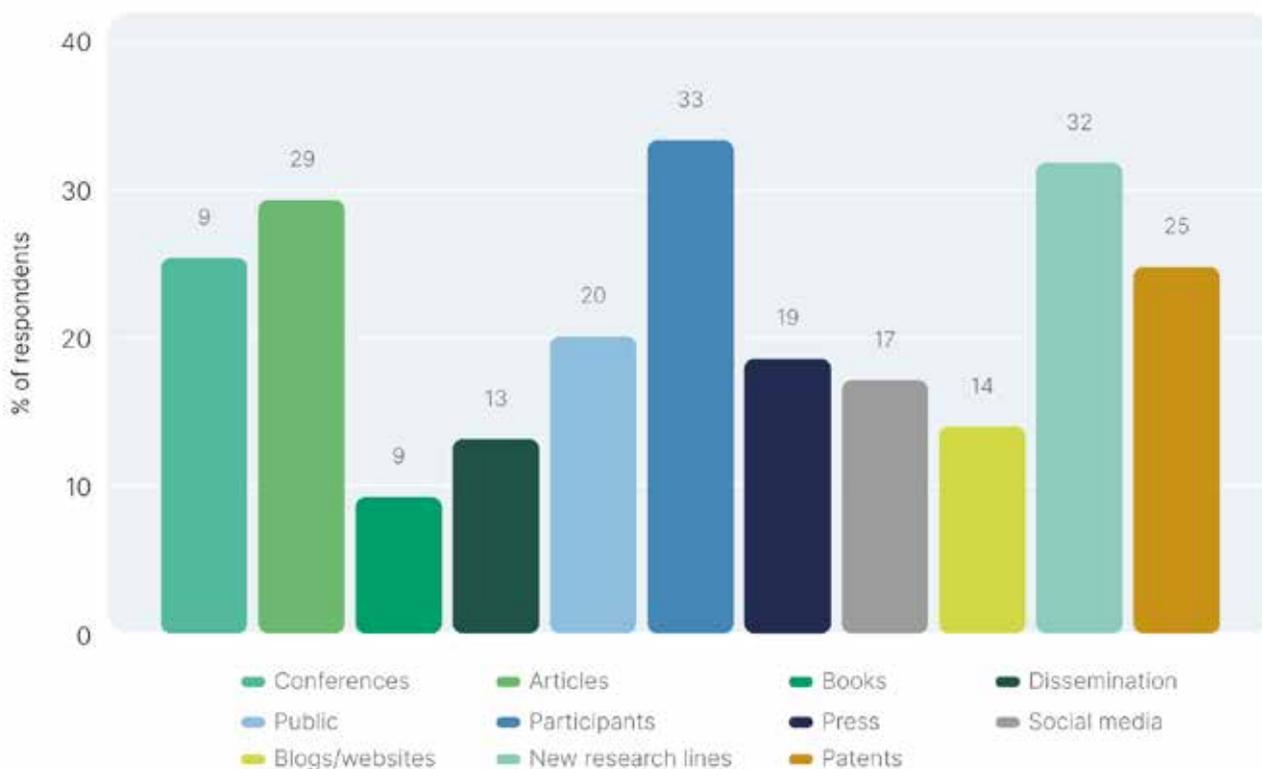
- ...training new researchers: e.g. doctoral theses, master’s dissertations, bachelor’s or master’s final projects.
- ...creating new collaborations with researchers from institutions other than

those participating in the POLISABIO programme (UPV or FISABIO).

- ...obtaining new projects and more funding.
- ...improving infrastructures (e.g., improvement of scientific equipment, electronic infrastructures, ...).
- ...improving the team’s training in research activities (e.g. management of scientific projects, experimental design, publication of results, etc.).

Figure 14 shows the percentage of respondents who indicated high or very high values for each of these items. Participation in the POLISABIO programme was particularly useful for generating new collaborations with staff from other institutions (43%), and for improving the team’s training in research activities (40%). On the

• Figure 13. *Impact on knowledge*



Note: Percentage of respondents indicating values of 6 or 7.

other hand, its capacity to improve infrastructures was much more limited (13%).

Impact on health

It was asked to what extent the results associated with the projects made it possible to generate positive impacts on health. Specifically, the following question was posed:

The results of the activities associated with the project have allowed...

- ...improvements in public health (e.g., morbidity, mortality).
- ...improvements in the quality of life of patients and their families.
- ...addressing social determinants of health (e.g., social cohesion, equity, removal of barriers, levels of social isolation, exclusion, social mobility).

- ...addressing environmental determinants of health (e.g., pollution levels).
- ...addressing aspects of acceptance (public understanding, awareness), accessibility (e.g., waiting time), or effectiveness and efficiency (e.g., readmission rates).
- ...the design or execution of clinical studies for new techniques, drugs, or substances for therapeutic or diagnostic use.
- ...improvements in healthcare quality thanks to better diagnostic, therapeutic, and/or management techniques.

The results are shown in Figure 15. Mainly, respondents emphasized the positive impact of the projects on the quality of life of patients and their families (33% of respondents). Improvements in healthcare

• Figure 14. *Impact on training*



Note: Percentage of respondents indicating values of 6 or 7.

quality, because of better diagnostic, therapeutic, or management techniques (31%), were also emphasized.

Economic impact

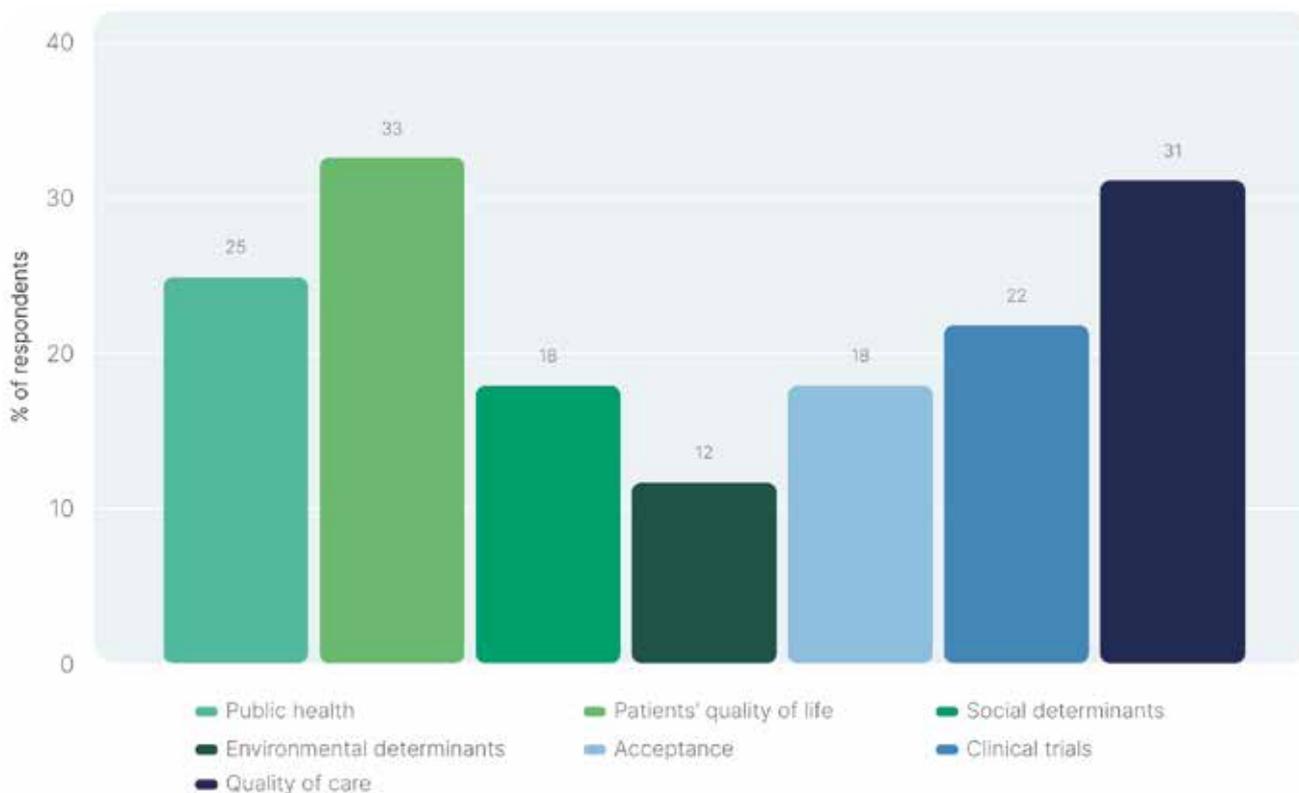
Finally, respondents indicated the extent to which the outcome of the activities associated with each project generated various results related to economic impact. The following question was posed:

The results of the activities associated with the project have generated...

- ...transfer and/or commercialization of technology through the licensing of patents or software.
- ...agreements or collaboration contracts with companies, administrations, foundations, or patient associations.

- ...transfer and/or commercialization of technology through the creation of spin-offs or start-ups.
- ...transfer and/or commercialization of technology by bringing to market innovations, products, or devices produced by the private sector through collaborative research contracts/projects with companies.
- ...jobs (inside or outside their own organization).
- ...economic benefits for society, such as more cost-effective programmes, cost reductions, productivity improvements, system sustainability.
- ...advisory activities for patient associations, companies, public administrations, or other non-academic actors.

• Figure 15. *Impact on health*



Note: Percentage of respondents indicating values of 6 or 7.

- ...clinical practice guidelines or protocols aimed at clinical professionals.
- ...treatment guidelines aimed at patients.
- ...prevention guidelines or protocols aimed at the general population.

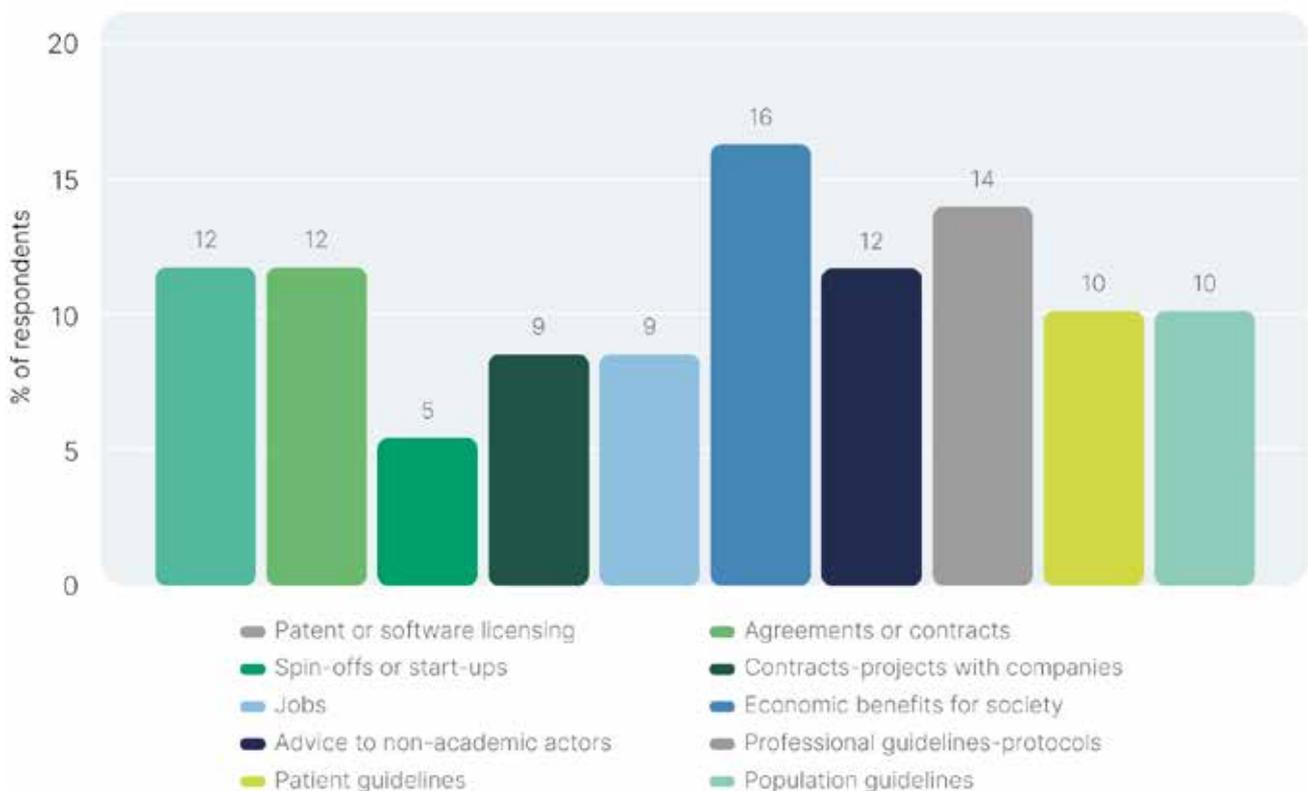
The results are shown in Figure 16. Mainly, economic benefits for society were perceived (16%). To a lesser extent, clinical practice guidelines or protocols aimed at clinical professionals were indicated (14%). In third place appear contributions of socio-economic impact such as: “transfer and/or commercialization of technology through the licensing of patents or software,” “agreements or collaboration contracts with companies, administrations, foundations, or patient associations,” and

“advisory activities for patient associations, companies, public administrations, or other non-academic actors” (12% each).

Our interviewees mentioned different types of impact of their projects. In this section, we mention transfer through patents or collaborations with companies regarding economic impact, the initiation of new interdisciplinary lines of research as knowledge impact, specific aspects of health impact (improvements in healthcare quality), and the training of new researchers.

Although the economic impact items in the survey are perceived as less important than those of the other categories of impact, it is noteworthy that all interviewees mentioned contacts of varying intensity with companies interested in commercializing the research results, even when the

• Figure 16. *Economic impact*



Note: Percentage of respondents indicating values of 6 or 7.

technology was at a low level of development. The three UPV interviewees also mentioned patent development as one of the main objectives of their research.

In the survey, one of the highest knowledge impacts refers to the “initiation of new lines of research.” Two UPV interviewees commented that the interdisciplinary lines of research opened by this project had subsequently been attempted to be funded in other calls in the field of health, although they also acknowledged the difficulty of this process:

“with a company a project for strategic action in health has been applied for, which is for technological development. Okay, it was not granted... but we will try again this year.” (Researcher 1)

With regard to the impact on health, UPV Researcher 3 highlights the inclusiveness of the POLISABIO programme when it comes to funding projects with an impact on healthcare quality that usually receive less attention, such as improvements in the comfort of patients and professionals.

“they are not projects to save millions of lives. Ours are not, ours are perhaps more focused on comfort, on facilitating the day-to-day work of those who work in medicine or of the patient himself.” (Researcher 3)

Finally, concerning impacts on training, for UPV Researcher 4, the training of new professionals is fostered by the possibility of preparing academic works with UPV students—such as master’s theses, related to the activities of the project—which, thanks to this training, can later join high-technology industries:

“(the most important impact of the project was) the master’s thesis, the final master’s project of the person involved. ... we have also produced an article and we have also won awards.” (Researcher 4)

4. Conclusions



- In this section, we synthesize the conclusions of the analysis from the previous sections and from the annexes that we consider most relevant for this report.

1) High satisfaction with the programme, except for the funding dimension.

The average score received from UPV respondents was 5.65 out of 7, and the average score from FISABIO respondents was 5.44 out of 7. It is important to highlight that, in general terms, respondents from both institutions showed high levels of overall satisfaction with the programme. 63.8% of UPV respondents have a “positive” or “extremely positive” opinion of the programme. This value is 57.8% for FISABIO respondents. In the interviews, UPV staff valued very positively the interdisciplinary nature of the programme and its capacity to mobilize research aimed at health issues.

2) Indicators of Derived Scientific Production.

From the 79 projects evaluated, 52 publications in scientific journals were generated (35.4% with at least one) and 74 conference communications (48.1% with at least one), showing high variability between projects. In addition, 7 doctoral theses, 24 bachelor’s theses, and 19 master’s theses were produced, as well as 4 awards linked to these initiatives. In terms of addi-

tional funding, the projects collectively secured over €2.2 million, with the Regional Ministry of Innovation as the main funding source (12 projects, >€1.6 million), followed by the POLISABIO program itself (16 projects, €232,300) and the European Commission (>€400,000 across 2 projects). Furthermore, 4 software developments were registered (5.1% of the projects) and 8 patent applications were filled (10.1%), (information collected from Annex II).

3) High mobilization capacity of the POLISABIO programme.

In the analysis, we provide data on the number of people mobilized by the programme. It is noteworthy that the programme has mobilized 541 researchers, including funded and unfunded proposals, and 354 (200 from UPV and 154 from FISABIO) if we consider only funded projects. The mobilization data can be complemented with the institutional interactions map, in which some of the hospitals and UPV research groups that participate most frequently in the interaction network are highlighted (such as the Dr. Peset Hospital of Valencia; the IDM (Interuniversity Research Institute for Molecular Recognition and Technological Development), from the

Vera Campus; the Virgen de los Lirios Hospital of Alcoi; or the Department of Textile and Paper Engineering, DITEXPA, at the Alcoi Campus). Finally, a survey result is highlighted that reflects the mobilization capacity of the POLISABIO programme among FISABIO staff: the POLISABIO programme represents the first contact with research activities for almost 50% of participants from FISABIO. In other words: more than 50% of respondents from the FISABIO environment indicated that they had no research experience or very little research experience prior to their participation in this programme.

4) Pro-social characteristics (motivations) of participants.

According to the survey results, respondents mostly perceive that their research is application-oriented. A priori, it may be surprising that a relatively low percentage of respondents consider themselves as purely basic researchers. For the most part, they find a main motivation in the “impact on third parties” and in the capacity to “respond to social problems” as motivations for research activities. This orientation towards applicability and towards impact on third parties is common to a large majority of participants, regardless of their affiliation with FISABIO or UPV.

5) Simultaneous division of labour and knowledge fertilization.

The cross-perceptions about the contribution of each of the groups allow two trends to be observed. On the one hand, both parties consider that both themselves and their partners contribute significantly in terms of “providing new ideas,” “knowledge and experience,” and “credibility.” In this sense, there is no division of scientific work or specialization between groups,

but rather a two-way direction of contributions. On the other hand, the division of scientific work is manifested in aspects such as the following: FISABIO groups provide patient data, and UPV groups provide knowledge in advanced techniques (according to the perception of the counterpart). It is interesting to point out this duality of behaviours: cross-fertilization of ideas and experience, on the one hand, and division of labour in more technical aspects associated with the provision of materials and data.

6) Some UPV groups value the research experience of FISABIO groups when initiating collaborations.

The lack of research experience and funding in some FISABIO clinical groups can be significant enough for some UPV groups not to undertake new collaborative projects even if there is an idea of interest. In any case, this barrier is closely related to the fact that one of the objectives of the POLISABIO programme is precisely to initiate clinical staff without prior scientific experience into research activity. The most questioned aspect of the programme has been its limited funding, which has generated criticism due to the “seed” nature of the allocated funds. In this sense, a recommendation formulated by interviewees would be to establish a third phase of the POLISABIO programme, which would select the most promising projects that have participated in the programme and provide them with greater funding. This initiative could mitigate the feeling of “frustration” at not being able to continue their research due to funding restrictions of the programme (and the difficulty of accessing other calls), sometimes expressed by researchers, especially from FISABIO. Furthermore, barriers to collaboration related to some administrative difficulties in hiring

human resources and in the management of purchases have been identified.

7) Ease of overcoming geographical distance by researchers not affiliated with institutions in the city of Valencia.

In the semi-structured interviews, we sought to explore the impact of geographical distance on project interactions. Our analysis shows that online connections and researcher availability are sufficient for the geographical distance between project participants not to constitute a considerable difficulty.

8) Matching practices.

One of the most interesting findings from our interviews was learning about our interviewees' perceptions of the work done by the POLISABIO team in matching research groups during the call for proposals. The survey already shows that the POLISABIO team participates in 75.4% of the initiation of collaborations in the case of UPV groups, and in 45.8% in the case of FISABIO. In the interviews, these matching practices are especially valued because they help overcome one of the most important barriers to collaboration in the project: the "lack of understanding of the different languages" used by the research groups. In our opinion, this is an issue that could be explored in future research. This issue caught our attention, and we carried out a review of the literature that confirms that these matching practices between interdisciplinary groups are a very novel aspect of the POLISABIO programme that could be analysed in more depth in the future. The literature on innovation systems has highlighted in recent decades the role of intermediary organizations or interface structures in articulating the collaboration of different stakeholders in the system

(Howells, 2006; Howells and Thomas, 2012; De Silva et al., 2018). One of the practices highlighted by this line of research is the "matching" of specific actors belonging to two or more of these stakeholder groups to carry out a specific collaboration project (Lepore, 2023).

The most frequently reported matching practices are of two types. First, the matching of academic research groups with companies. In these programmes, both actors express their capabilities and needs, and intermediary organizations process this information to find the most suitable partners to undertake a new collaboration project (Lee, 1996; Perkmann and Walsh, 2007; Lee, 2000). The Technology Transfer Offices of universities or research centers are one of the most frequent types of intermediary organizations involved in carrying out these programmes (Debackere and Veugelers, 2005; Siegel et al., 2003; de Falani et al., 2023). In addition, another very common practice for articulating an innovation system is 'matching' entrepreneurs and investors in programmes and events for the creation of new companies (Sapsed et al., 2007; Klerkx and Leeuwis, 2009; Collinson and Gregson, 2003).

The nature of the POLISABIO Programme is different from these common matching practices. The objective of this programme is to fund the collaboration of two groups from different institutions, UPV and FISABIO. The research groups from FISABIO are oriented towards biomedicine, with a predominance of those that, in addition to research, carry out different types of clinical activity. The UPV groups are dedicated to technological development in very diverse areas, including fields related to biomedicine. This diversity of knowledge ensures that in all the projects of the programme

4. CONCLUSIONS

there is intense interdisciplinary collaboration. In our literature review (assisted by AI) we have not found explicit descriptions or evaluations of this type of systematic interdisciplinary matching programmes, so we believe this is a novel aspect of the POLISABIO programme to be studied in the future.

On the other hand, during our work we have detected some opportunities for improvement regarding the management of calls and the evaluation of the programme's impact. In this sense, our proposals are:

- 1) Standardize the data collection format of the participating institutions in the different phases of call management.
- 2) Progressively add to the table of final project result indicators the measurement of collaboration process results (e.g., ratio between the number of "matching practices" promoted by the management team/total number of matchings in the call).
- 3) Group the result indicators into their different types of impact: scientific and knowledge impact, fundraising, economic and transfer impact, dissemination impact, social and health impact.

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● ANNEX I

Questionnaire Structure

The questionnaire consists of 21 questions distributed among the following sections:

- **BLOCK A. Participation in Polisabio projects (10 questions):** contribution of the teams to the project objectives; frequency and channels of interaction; prior links; duration of the link; origin of the collaboration; barriers to collaboration; impact on knowledge; impact on training; impact on health and well-being; economic and transfer to society impact.
- **BLOCK B. Experience in the Polisabio programme (3 questions):** prior experience; reasons for participation; programme evaluation.
- **BLOCK C. Researcher and professional profile (8 questions):** type of research; identification of beneficiaries; citizen science; motivations for participation; UPV profile; FISABIO profile; common profile; contribution to research.

To access the full questionnaire, please contact the authors.

● ANNEX II

Indicators of Resulting Scientific Production and Transfer

In addition to the analysis of primary and secondary information presented in the report, in May 2025, additional information was obtained on the main results associated with each project funded by the POLISABIO programme. The PIs of all projects and/or actions funded by POLISABIO (2017–2021) provided details about additional “results” related to each project funded through the POLISABIO programme. Specifically, information was obtained on: conference publications, journal publications, doctoral theses, bachelor’s theses, master’s theses, funded projects, awards, software, and patents. This information was obtained through a questionnaire sent to each PI of at least one project/action funded by POLISABIO during the evaluated period. In this questionnaire, respondents validated

a list of outputs, indicating those directly related to the corresponding POLISABIO project. Detailed information on the results obtained is provided below.

Journal and Conference Publications

Of the 79 unique projects evaluated, a total of 52 publications in scientific journals were generated, representing an average of 0.66 publications per project. The median is 0, with a standard deviation of 1.48, reflecting high variability among projects. 35.4% of the projects (28 in total) generated at least one publication in a scientific journal. It is also noteworthy that 2.5% of the projects have generated more than 3 publications in scientific journals. Furthermore, a total of 74 conference papers were generated, representing an average of 0.94 publications

per project. It is important to note that the median is 0, with a standard deviation of 1.5 and a maximum of 8 conference papers per project, indicating a skewed distribution with certain projects concentrating a larger number of outputs. Almost half of the projects (48.1%, 38 in total) produced at least one conference paper. Figure 17 shows the distribution of projects by the number of conference and journal publications.

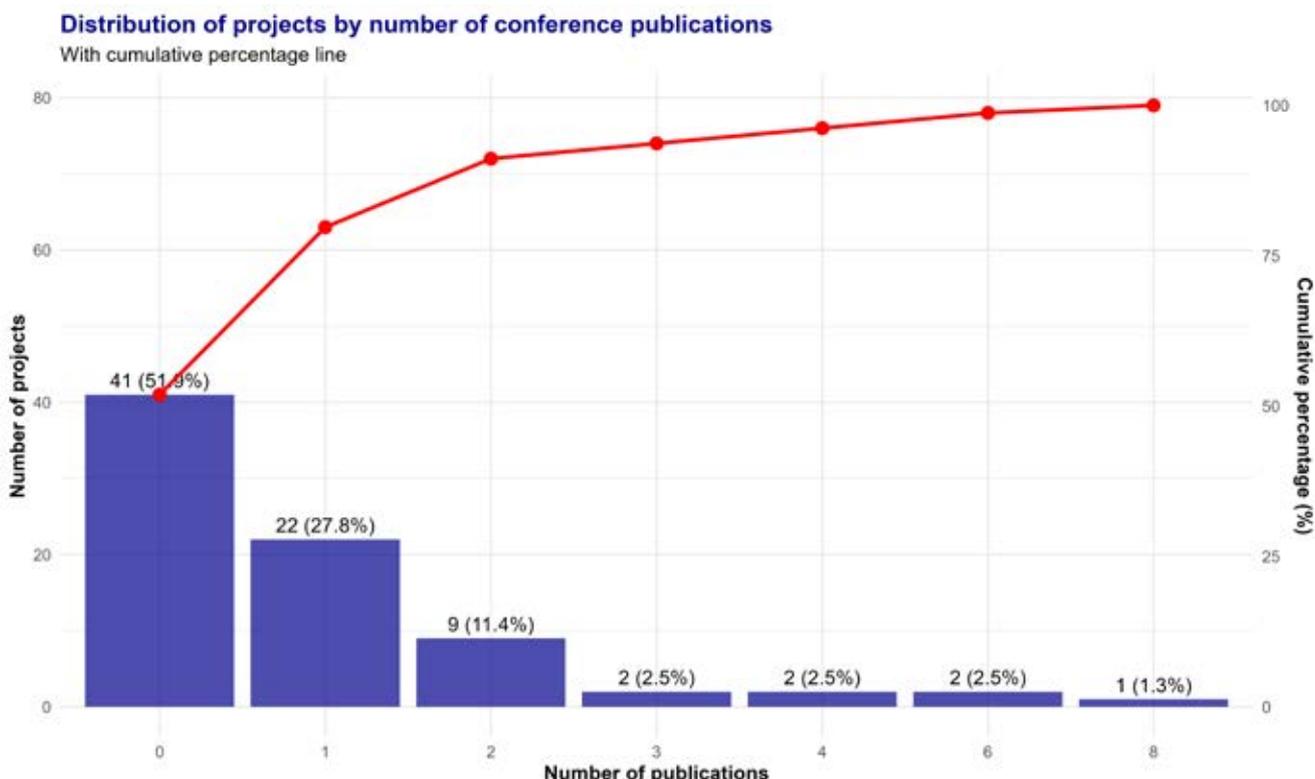
Doctoral theses, bachelor’s theses, master’s theses, and awards

A total of 7 doctoral theses associated with projects funded by the POLISABIO programme were identified. That is, 8.9% of the projects (7 in total) generated at least one thesis.

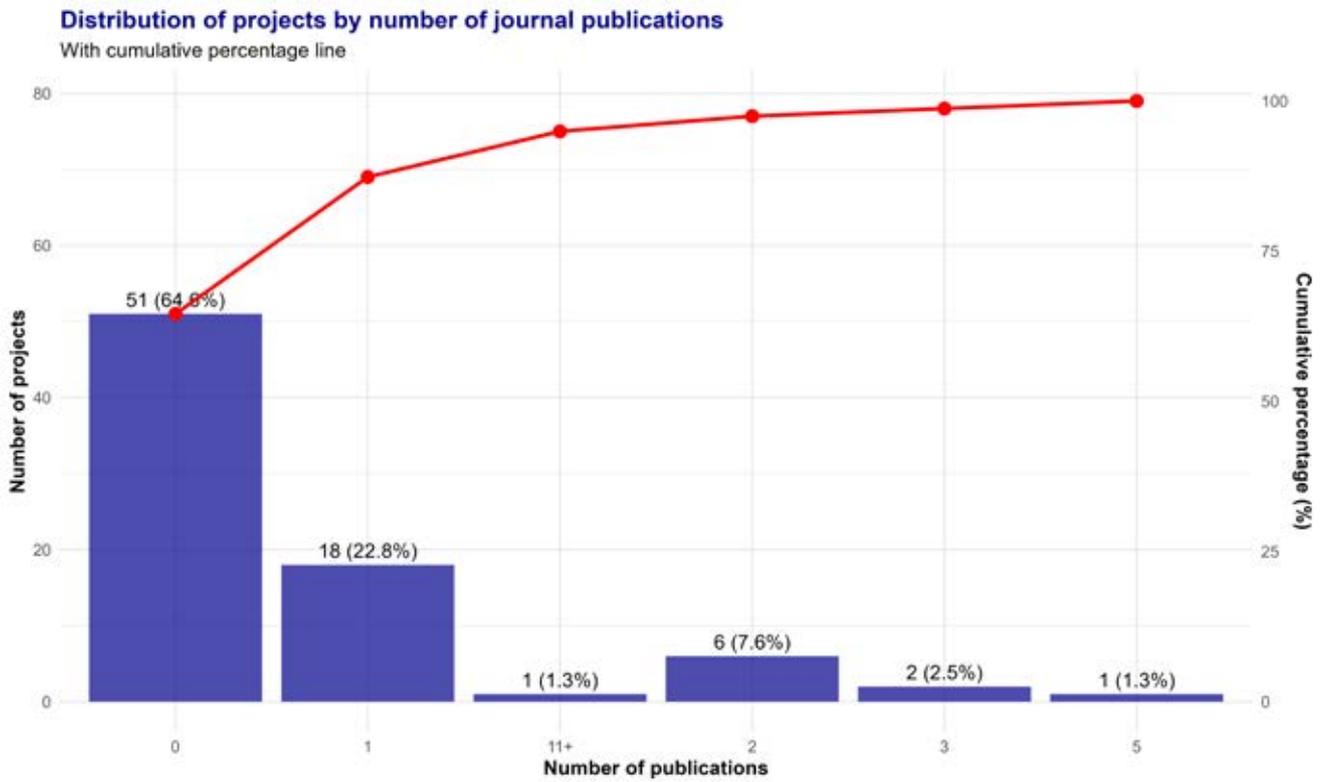
On the other hand, results directly related to student training were also reported. A total of 24 bachelor’s theses and 19 master’s theses were identified, representing an average of 0.3 bachelor’s theses and 0.24 master’s theses per funded project. 21.5% of the projects (17 in total) generated at least one bachelor’s thesis, while 16.5% (13 projects) produced at least one master’s thesis. Furthermore, 8.9% of the funded projects (7) produced both types of results (bachelor’s and master’s theses). Figure 18 shows the number and proportion of projects with at least 1 bachelor’s thesis, 1 master’s thesis, or both types of results.

Awards received in relation to projects funded by the POLISABIO programme were also reported. In total, 4 awards or distinctions were reported.

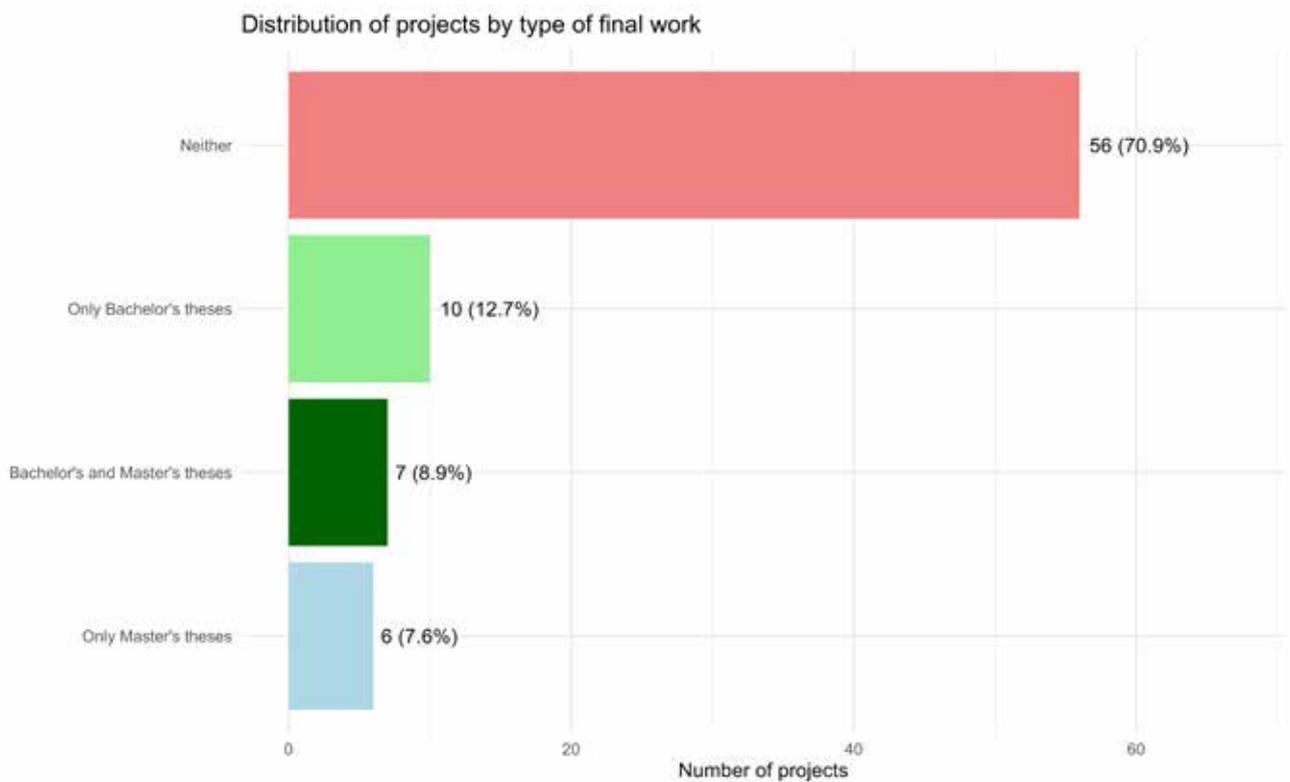
• Figure 17a. Distribution of projects by the number of conference publications



• Figure 17b. Distribution of projects by the number of journal publications



• Figure 18. Distribution of projects by Master's Theses, Bachelor's Theses, and Combined



Projects

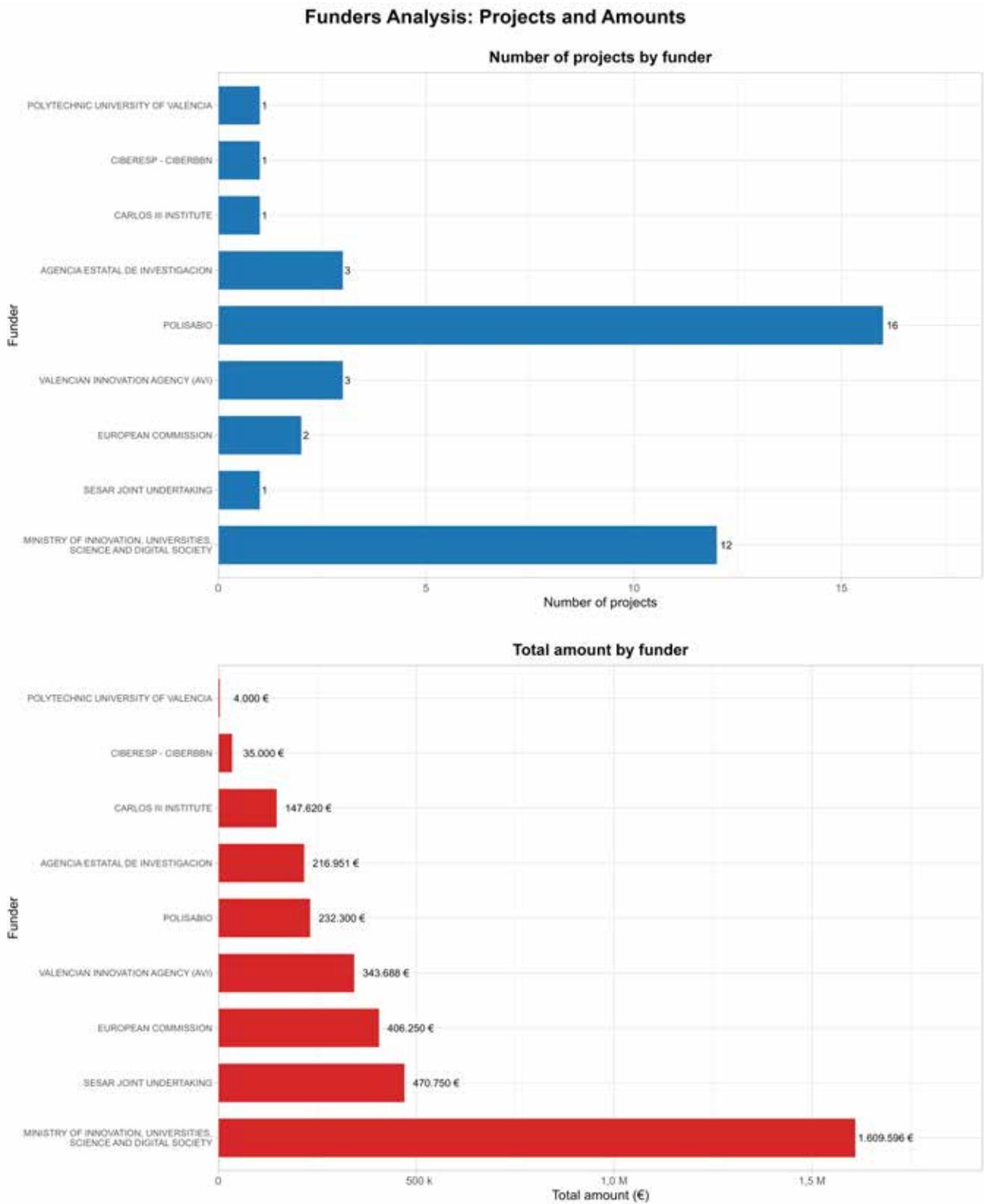
PIs were also asked to indicate whether they obtained additional funding associated with projects funded by the POLISABIO programme. Figure 19 shows the distribution of additional funding, comparing the number of projects (above) and the total amount in euros (below) by funding entity.

The Regional Ministry of Innovation stands out as the main funding body, contributing over €1.6 million through 12 projects. The POLISABIO programme itself financed 16 Innovation Projects derived from preparatory actions, with a more moderate investment of €232,300. Finally, the European Commission provided over €400,000 to support two of the projects.

Software and Patents

The Principal Investigators (PIs) of the projects reported the registration of a total of four software programs associated with the projects funded by the POLISABIO programme. This means that 5.1% of the projects (four in total) have registered at least one software program. In addition, a total of eight patent applications have been filed in connection with these projects. Therefore, 10.1% of the projects (eight in total) have generated at least one patent application. Moreover, commercialisation actions have been carried out for 75% of these patent applications.

• Figure 19. Number of projects and total amount financed by funders



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