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Article info:

Received 09.03.2020.

Accepted 16.11.2020.

UDC – 005.6

DOI – 10.24874/IJQR15.03-12



HOW DOES IT WORK A QUALITY/PERFORMANCE MANAGEMENT SYSTEM IN A BIOMEDICAL RESEARCH INSTITUTION?: LIGHTS AND SHADOWS.

Abstract: *In recent years the contraction of public and private investments in many countries has had a negative impact on the research activities and innovation.*

The strategic fundraising has become increasingly complicated and the need for accountability to the stakeholder in spending the funding drawn requires full transparency and effective organization in management. The public research institutions to be more competitive and transparent could optimize its management introducing new organizational models such as Performance Management System.

The adoption of “traditional” tools to manage performance remains controversial and the balance between respect for the researcher’s freedom and personnel management policy represents the main difficulty. A winning strategy for applying Performance Management System could be the implementation of a personalised Quality Management System tailored on the need of the public research institution. In our experience we adopt a custom-made model, which incorporates the Common Assessment Framework developed for the public sector. In this work, we described the implementation of the model and the results obtained after four years of application.

Keywords: *Performance management; Quality management; Common Assessment Frameworks; Public Scientific research.*

1. Introduction

Over the years greatly attention has been paid to the adoption of Performance Management System (PMS) in private scientific research and innovation centers, while, in the public sector, the implementation of PMS remains controversial. A winning strategy for applying PMS could be the implementation of a Quality Management System (QMS).

A key issue regarding the application of PMS and QMS in public research field is the

peculiarity of the scientific research sector in terms of both human resources and processes (Cadez, Dimovski, & Groff, 2017; Krapp, 2001; Mathur-De-Vre, 1997, 2000). As a consequence on the one hand several researchers assert that the adoption of PMS and QMS international standards could produce relevant benefits for their activities (Camman & Kleibohmer, 1997, 1998; Flick, 2009; Martensson, Fors, Wallin, Zander, & Nilsson 2016; Petit 1999a, 1999b; Petit & Muret, 2000; Robins, Scarll, & Key, 2006): on the other hand further scientists see PMS

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and QMS as a synonym for rigidity, leading to a greater amount of complications in the daily routine and limiting the researcher activity itself. Furthermore, this system could be wrongly perceived as a sort of 'judgment' of the scientists' work (Outaki, Gmouh, Bazi, & Kerak, 2019; Wood & McCamey, 1993).

In addition, in public research field, further aspects deserve to be mentioned as critical factors to success for PMS and QMS implementation. In fact, several of the involved stakeholders are unique in type, number and difficulty heterogeneity. Internal organization often includes difficulties in defining roles and responsibilities, objectives and targets and this kind of systems may suffer the lack of specific dedicated quality management skills (Agostino, Arena, Azzone, Dal Molin, & Masella, 2012; Arena, Arnaboldi, Azzone, & Carlucci, 2009; Arnaboldi & Azzone, 2010; Boland & Fowler, 2000; Campatelli, Citti, & Meneghin, 2011; Poli, Pardini, Citti, Cornolti, & Picano, 2014).

It is worth mentioning that in recent years the contraction of public and private investments in many countries has had a negative impact on the research activities, and processes' innovation thanks to application of performance management models in public research might create important opportunities. In fact, the reduction of government funds for research leads to limitation in guarantying continuous recruitment of staff, increase in the average age of researcher and leak of human capital already trained. The primary consequences of this situation are i) the impoverishment of the central and autonomous role of the researcher, ii) the lack of continuity even for the most innovative and promising research fields, iii) the reduction of frontier research activities not commissioned but 'curiosity driven' and iv) the absolute need to direct the greatest efforts towards attracting external resources for targeted sectors dictated by the stakeholders (Agostino et al., 2012; Lanati, 2010, Outaki et.al., 2019).

In addition, technological development has favoured interaction between research groups, creating multidisciplinary networks and promoting global communication among research groups all over the world. At the same time, strategic fundraising, both public and private, has become increasingly complicated and the need for accountability to the stakeholder in spending the funding drawn (Agostino et al., 2012, Bouckaert, 1993) requires full transparency and effective organization in management.

As stated above, the public research institutions need to be more competitive and transparent by optimizing management and, thus, necessarily by introducing new organizational models (Arnaboldi & Azzone, 2010).

Typically, QMS such as ISO 9001 standard, Six Sigma, Malcolm Baldrige, EFQM model, CAF model (Brown, 1996; Dobrovič, Kmeco, Gallo, & Gallo Jr., 2019; European Foundation for Quality Management [EFQM], 2013; L. Fonseca & C. Fonseca, 2015; International Organization for Standardization [ISO], 2015; Kalfa & Yetim, 2018; Lynch & Cross, 1991; Otley, 2003; Martínez-Costa & Martínez-Lorente, 2008; Psomas, Pantouvakis, & Kafetzopoulos, 2013; Suárez, Calvo-Mora, Roldán, & Periañez-Cristóbal 2017; Tari & Gavin, 2016; Tomažević, Tekavčič, & Peljhan, 2017; Valmohammadi & Roshanzamir, 2015; Yunis, Jung, & Chen, 2013), based on the theoretical approach summarized by the Deming cycle: Plan, Do, Check and Act (PDCA) (Deming, 1994; Deming & Edwards, 1982) are considered significant instruments to improve organization's performance.

The purpose of the present work is to describe the implementation and obtained results, in four years of application, of a PMS model, based on QMS tool, in a Research Institute of the scientific network of the Italian National Research Council (CNR), the Institute of Clinical Physiology (IFC).

2. Method

The mission of the Italian National Research Council can be summarised in the outcome 'creating value through the knowledge generated by research'. The development of scientific research and the promotion of innovation should satisfy the collective and the individual needs and generate well-being and social cohesion. In the scientific community, freedom of thought, scientific autonomy and empowerment of personnel should be guaranteed in order to achieve stakeholder's satisfaction and continuous improvement. CNR is composed by several Institutes that deal with different

cultural/scientific/technological topics with high social impact.

2.1. The Institute of Clinical Physiology

The Institute of Clinical Physiology is the largest biomedical research institute of the CNR. The focus of research in IFC is the health and well-being of people through the development of approaches and technologies capable of personalizing and thus improving the diagnosis and treatment of citizens.

Figure 1 resumes how the mission of Italian National Research Council is implemented in IFC, the largest Institute of the CNR in medical and biological field.

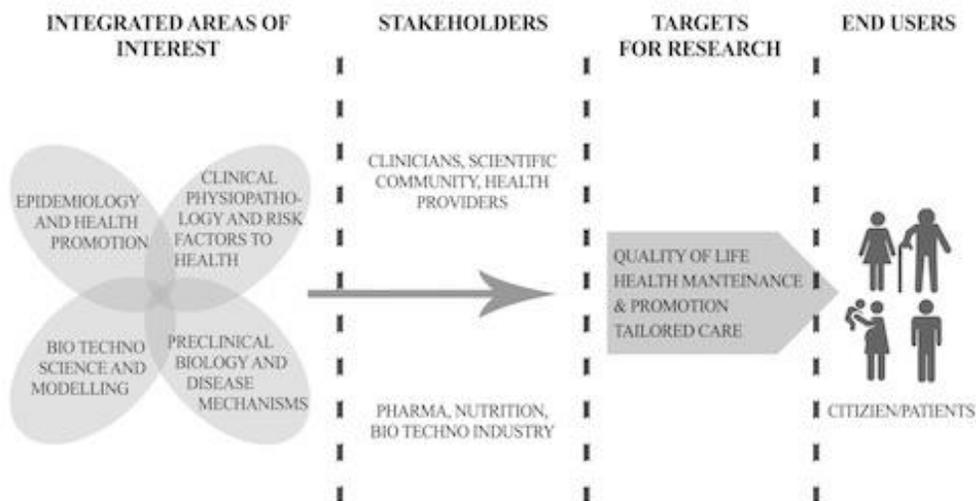


Figure 1. Institute of Clinical Physiology's mission

The research activities of the Institute are grouped into 4 macro areas (epidemiology, bio-techno sciences, clinical physiology and preclinical biology), each macro area is developed by researchers that operate in complete autonomy and develop their own research lines contributing to the performance of the Institute.

The researchers, with different profiles, in a multidisciplinary environment, ranging from medicine to engineering, work together to implement the strategic plan of the Institute.

Among its significant activities the Institute

includes:

- The physiology of diseases: the topics investigated range from decades of experience relating to the cardio-pulmonary system, including the complex dynamics of interaction, for example with the endocrine-metabolic and central nervous systems, to the most recent study in the oncology field.
- Preclinical experimentation which, through an ethical approach based

on imaging technologies (such as micro-PET, micro-CT and micro-ultrasound) and study of cellular properties, seeks to identify new diagnostic targets and therapies.

- Bioengineering that ranges from the analysis of physiological signals and biomedical images useful, for example, for the estimation of innovative biomarkers, to the implementation of biotechnologies (suitable for creating biocompatible tissues, for example), up to the development of new medical devices.
- Epidemiology which, through large population studies, seeks to steer society and governments towards intervention strategies.

Some support units are available for the research activities. These include offices with expertise in training and grant management, administrative issues, informatic systems, personnel and recruitment strategy.

2.2. Stakeholders

The external stakeholders are multiple including i) the scientific community interested in the production of knowledge, ii) the industry, interested in exploiting knowledge for practical purposes transforming new ideas into innovative and winning products for society, iii) students who are beneficiaries of higher education activities (for example, masters, doctorates, research grants, fellowships, etc.), iv) the institutions that, through public resources, encourage and support research and development and v) the citizens are the 'end users' of the Institute 'product' and they benefit from scientific development and production of knowledge: the ultimate goal of any type of research is to improve the quality of life.

Finally, employees are considered internal stakeholders: in a particular environment such as research the motivation and

satisfaction of the staff contribute significantly to improving performance.

2.3. Processes

The primary processes of the Institute are:

- Research;
- Higher education;
- Third mission (knowledge transfer).

In order to achieve the desired output and, therefore, to be able to meet the needs of the interested parties, the primary processes have to be supported by secondary processes (infrastructure, human resources, economic-financial, purchases and suppliers management etc.), by decision-making processes (policy, action planning, risk management, definition of objectives, etc.) and by monitoring and measurement processes (performance evaluation, non-compliance management, etc.). Figure 2 shows the processes representation of the Institute compliance to the ISO 9001:2015 standard.

While the primary processes contribute directly to the final output (products and services) and represent the Institutional Performance (IP) intended as competitiveness of the institute, the secondary processes represent the Organizational Performance (OP) intended as the ability of the internal organizational system to respond to the needs of internal and external stakeholders.

The objectives related to the IP are tied tightly to the organizational capability and therefore to the OP. The strategic objectives related to IP cannot be disconnected from those related to OP.

As regard to IP, the strategic actions related to research include the development and strengthening of multidisciplinary and translational research, the improvement of internationalization, the consolidation of the network with other institutions and the investment in biotechnological innovation as a tool to obtain products or services useful for satisfying the needs of the society.

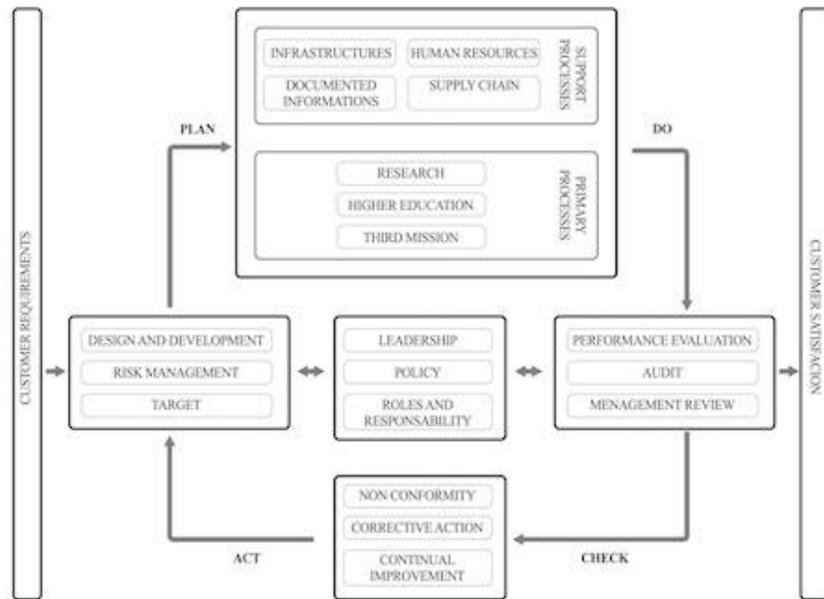


Figure 2. Institute's processes representation, compliance to the ISO 9001:2015 standard

Relative to higher education, strategic actions include the increase of the offer for higher education and excellence paths, the enhancement of merits to attract the best young people.

Finally, the strategic actions linked to the third mission include the enhance of the heritage of patents and the promotion of spin-offs using collaborations with the outside to develop high technology in the territory and marketing competence.

For IP, strategic actions for governance include the identification of an internal communication strategy that helps to improve the performance of the organizational-managerial processes and the implementation of a monitoring process to verify the effectiveness of actions taken.

The strategic actions for research support services concern the improvement of the quality of services in terms of efficiency and effectiveness, with particular regard to the identification of funding opportunities, support for the presentation of projects, monitoring and management of funds,

reporting, and budget management and better integration between the central administration and the Institute.

2.4. Performance evaluation

The model used for the performance evaluation has been developed by the Institute and it is described in the paper 'How and why to implement a Performance Management System in public research institutions: the approach and the experience of a large multidisciplinary Italian centre' (Poli, Cornolti, Pardini, & Iervasi, 2018). It is worth noting that IFC has a small internal group of people trained in the field of quality assurance who provide their expertise and background to these activities.

The adopted model is articulated in the following steps:

- Definition of the strategy;
- Analysis of the organizational system and processes mapping;
- Feedback procedure.

Figure 3 shows the synthesis of the self-assessment model.

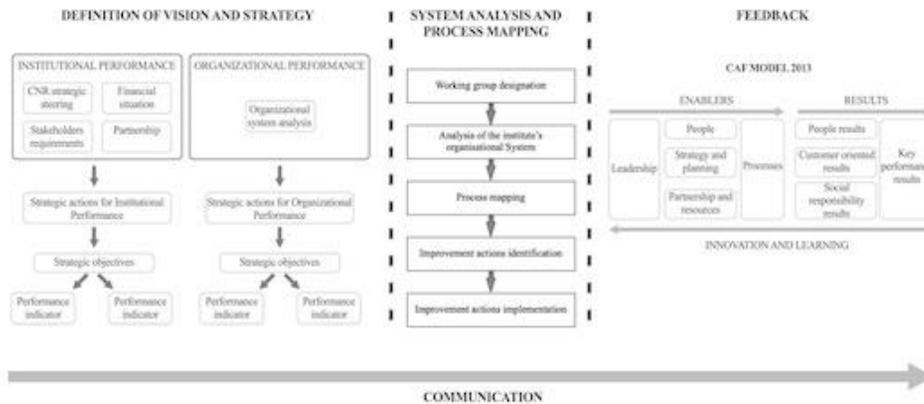


Figure 3. Synthesis of the self-assessment model.

2.5. Strategy definition

A preliminary analysis of the context was carried out by the Management at the time of the formalization of the Strategic Plan. In this context the risks and opportunities for the Institute, emerged from the SWOT analysis and the strategic actions related to the Institutional Performance (Research, Higher Education and Third Mission) and to the Organizational Performance of governance and support for research have been identified.

On the basis of the results of a SWOT analysis the Institute has a consolidated multidisciplinary brand, it is well integrated in the international scientific network and its researchers are highly qualified to conduct large national and international projects. Despite this, the lack of institutional funds, the increase in the average age of personnel, the reduced recruitment of young researchers and the 'brain drain' could cause an impoverishment of the central and autonomous role of the researcher with a reduction in competitiveness.

Following the SWOT analysis results, the strategic lines dictated by the national body of research and the stakeholder's requests have been defined; the strategic actions included the orientation towards issues with high social health impact, the development of an internationalization approach, the

reinforcement of the network with other public institutions and private companies. Other strategic actions concern organizational-managerial aspects and the output of these actions can be summarized in the improvement of the quality of services in terms of efficiency and effectiveness with particular attention to the identification of funding opportunities, research support, project submissions, monitoring and funding management, etc.

2.6. Analysis of the organizational system and processes mapping

For the implementation of the strategic actions a Working Group (WG), consisting of 11 people, was designated by the management. This team was composed by personnel from different "branches" of the Institute, well balanced both in terms of skills (specific skills: knowledge of the organization, skills about processes, etc. and soft skills: ability to communicate, flexibility, ability to work in group, analytical skills, management skills, ability to adapt to change etc.), and in terms of representativeness of the various components of the organization (eg, researchers, technicians and administrative employees). The WG analysed the Institute's organizational system (through a mapping of its processes) in terms of processes

description, processes owners and relative improvement actions. Each process identified as critical has been analysed for strengths and weaknesses. The ultimate goal was to improve performance by standardizing the activities related to research support into operational procedures that would go to make up the Institute's new Quality Management System.

The process mapping started from the macro-process "Scientific Project" and analysed all the linked processes and activities. The information was collected through brainstorming, interviews with staff (experience, organizational knowledge, etc.) and analysis of historical data. This has allowed the identification of the responsibilities, the standardization of activities and the drafting of Standard Operating Procedure (SOP) and "cross-functional process map" type diagrams for the representation of processes and their interaction.

After the self-assessment of the organizational system the SOP and flowcharts have been made available to the staff in a special intranet section. In the same way, the performance indicators originated from the strategy have also been defined.

2.7. Feedback procedure

During the entire process of implementation, a feedback procedure has been activate to get an immediate check of the results and to monitor the outcomes of the decisions and the actions taken.

The feedback procedure includes the analysis of performance indicators performed annually in the management review.

Three years after the start of the project a total quality management tool based on the Common Assessment Framework (CAF), inspired by the EFQM model of excellence of the European Foundation for Quality Management and developed by European Institute of Public Administration (EIPA)

has been applied to the Institute (European Institute of Public Administration [EIPA], 2012).

The CAF model is based on the principle that the excellent results relating to organizational performance are obtained thanks to a leadership that guides the organization through the policies and strategies for managing personnel, partnerships, resources and processes (Bajramovic & Gram, 2018; C.R. Popescu, G.N. Popescu & V.A. Popescu, 2017).

The platform F@CILECAF, provided by the Italian Public Administration Department, accompanies the administrations in throughout the journey from the in data collection (through the administration of a specific questionnaire) to the preparation of the Self-assessment Report and the Improvement Plan.

3. Results

3.1. Strategy definition

The first important result of the project is the formalization of the strategy in the 'Strategic Plan' that indicates the way to go on to achieve concrete goals reducing the risk of uncoordinated decisions. For the measurement of the achievement of the objectives in strategic plan 26 performance indicators were initially identified: 21 for the IP measurement and 5 for OP. During the years some indicators has been changed with the changing of the context: some have been cancelled and others specific indicators for individual activities have been identified.

Table 1 shows the actual strategic actions, strategic objectives and indicators identified for: a) research, b) higher education and c) third mission.

Also actions and objectives linked to OP have been changed over the years as the performance management project progressed. Table 2 shows the strategic actions, the strategic objectives and the indicators identified for OP.

Table 1. Strategic actions, strategic objectives and indicators identified for research, higher education and third mission.

	Strategic actions	Strategic objectives	Indicator
Research	Development and enhancement of the multidisciplinary and translational research with 3 priority targets: a) Quality of life; b) Maintaining health status; c) Personalized care.	Improvement of the scientific production indicators	Number of scientific publications Impact factor
		Improvement to the ability to attract funds	Competitive grants (total, national and international) attracted
		Improvement of the projects with a high socio-health impact	Number of active national and international projects
Higher education	Enhancement of the offer related to high education and excellence paths	Improvement of the training offer	Number of post docs and phd attracted
	Encourage cooperation agreements between territorial structures	Improvement of the number of collaborations with other institutions for training purposes	Number of active agreements with institutions for training purposes
	Develop and enhance the internationalization	Improvement of the internationalization	Number of foreign students attracted per year
Third mission	Promotion of the dissemination of knowledge	Improvement of the number of spin-off	Number of spin-off
		Improvement of the number of patents	Number of patents

Table 2. Strategic actions, strategic objectives and indicators identified for research, higher education and third mission.

	Strategic actions	Strategic objectives	Indicator
Governance	Knowing the system through a process of self-analysis and promoting the performance cycle for continuous improvement	Implementing the self-analysis process	Yes or not
		Completing process mapping	Yes or not
Support services	Improve the quality of services in terms of efficiency and effectiveness, in particular regard to identifying funding opportunities, supporting the presentation of projects, monitoring and managing funds, reporting and managing the budget and better integration between the administration central and the Institute	Extending the QMS to the all Institute's services	Yes or not
		Implement the improvement actions identified following the process analysis	Yes or not
		Develop ad hoc indicators for the Institute's services	Yes or not

3.2. Analysis of the organizational system and processes mapping

In order to standardize the activities identified in the process mapping, the relevant information was also collected through:

- Staff experiences;
- Organizational knowledge collected through interviews;
- Historical data.

In the first year WG, during its activity, has highlighted and analysed 77 processes, for

each of them a process owner has been identified; each activity linked to the process has been described and, when necessary, improvement actions has been identified. Furthermore, the improvement actions, has been classified in order of priority based on performance impact; 8 of these had high impact, 19 had medium impact and 15 had low impact.

The outputs of the processes mapping have been the standardization of the activities in SOPs and flow charts, which constitute the new documentary system of the Institute. The SOPs are listed below:

- Management of documentation
- Training of personnel
- Risk management
- Management of non-conformities
- Internal audits
- Management of the instrumentation /equipment
- Corrective actions preventive actions
- Management review
- Qualification of suppliers
- Human resources management
- Management of agreements
- Access of staff in the institute
- Visitors access
- Activation of research grants
- Management of competitive grants
- Use of research laboratories.

3.3. Feedback procedure

During the project implementation period, the feedback was guaranteed by a continuous risk assessment procedure and by the periodic management reviews.

One year later, the WG, expanded with additional skills, was again involved to assess the implementation status of the activities and for the final approval of the SOPs. Each process was analysed to verify if the actions taken had been effective, this activity was performed following a risk assessment methodology.

For the risk analysis, the strengths and weaknesses of the system, processes are taken into consideration and control points have been introduced to mitigate the impact of the risk (legislative aspects, policies or procedures, staff training, organization chart and job descriptions, control changes, management of non-conformities, training planning, validations, maintenance etc).

The risk factors are analysed in order to quantify the Risk Index (RI) by evaluating the impact (I) and the probability of occurrence (P) according to the following formula:

$$RI = I \times P$$

Table 3 shows the rationale for defining the risk class for each identified risk, considering the impact and probability of occurrence.

Table 3. Risk class

	Unlikely	Likely	Very Likely
Low	Irrelevant	Tolerable	Moderate
Medium	Tolerable	Moderate	Actual
High	Moderate	Actual	Intolerable

The following actions are associated with the 5 resulting risk classes:

- Irrelevant: No action required.
- Tolerable: No further control actions are required. If necessary, improvement actions can be identified.
- Moderate: Risk mitigation actions are required.
- Actual: Activities should not continue until the risk has been reduced. The necessary resources must be committed in order to reduce the risk.
- Intolerable: Activities should not be carried out until the risk is reduced. If it is not possible to reduce the risk even with the use of adequate resources, the activities cannot continue.

This approach makes it possible to periodically review the effectiveness of the

actions undertaken and to intercept any new risks and opportunities at early stage of the process.

The main results that emerged in the risk assessment can be summarized below.

The reduction of public investments and the reduction of private financing, especially from the industrial sector, have had an important impact on the conduct of research activities in recent years. The lack of funds has led to a limitation in the recruitment of personnel, a high average age of permanent research staff and the flight of valuable human capital in training or already trained. The consequence of this situation has been an impoverishment of the central and autonomous role of the researcher and the need to increase the attraction of external funding. For this reason, the Institute has decided to invest in the enhancement of the skills of researchers with specific training concerning both aspects linked to the attraction of funds, both the managerial and financial and scientific management aspects of the grants obtained.

The periodic review of the strategy and objectives allows to keep the strategy aligned with the objectives and purposes of the Institute, reducing the risk of uncoordinated decisions. It is of fundamental importance that the performance assessment is made on the basis of real data, collected in a systematic way, only in this way is possible identify the right path.

Also, the benchmark with analogous Italian and international institutions is important to reduces the risk of self-referencing.

As regard to the internal context the greatest weakness of the system was represented by the overlapping of responsibilities, with the drafting of the SOPs this risk has been significantly reduced. The staff awareness about the application of the QMS procedures continues with a communication strategy.

At least annually the performance indicators are monitored in order to verify the performance of the institution.

Figures 4, 5, 6, 7, 8 shows the IFC's most relevant performance indicators.

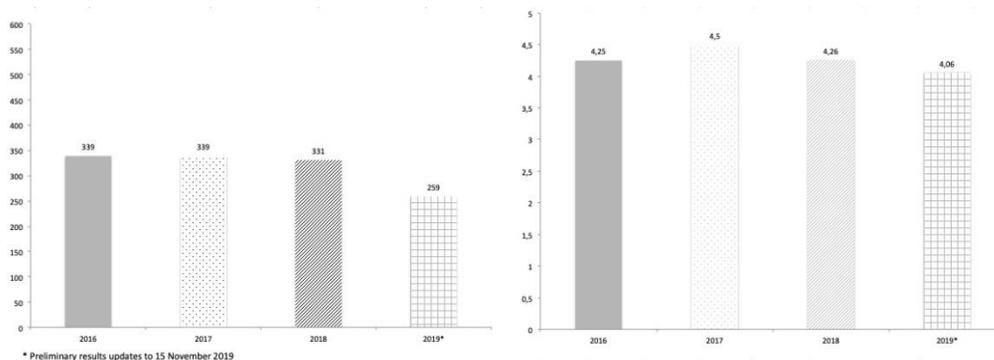


Figure 4. Scientific publications and impact factor 2016-2019.

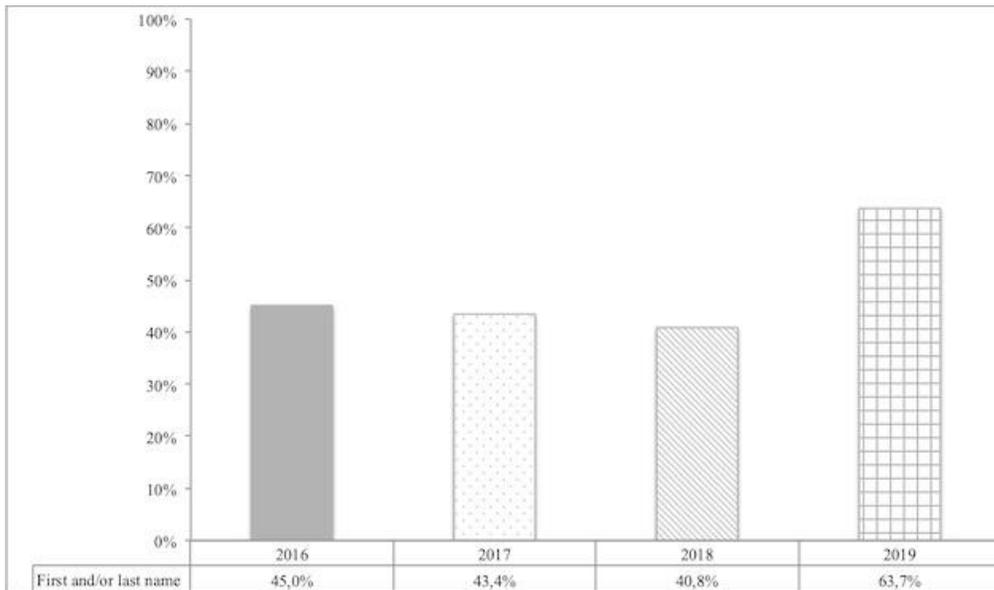
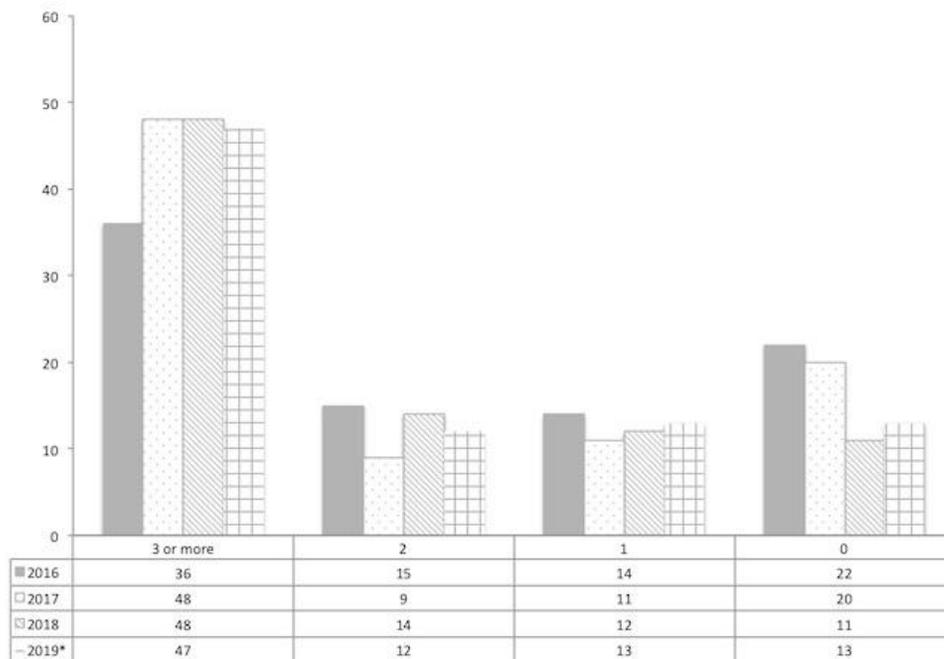


Figure 5. First and/or last name 2017-2019.



*Preliminary results updates to 15 November 2019

Figure 6. N° of Scientific publications vs researcher 2019.

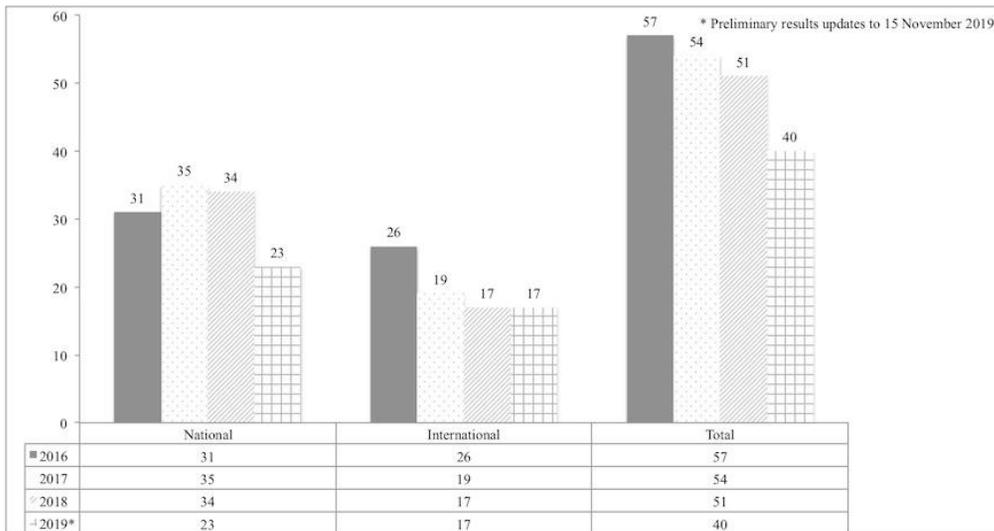


Figure 7. Attracted grants 2016-2019.

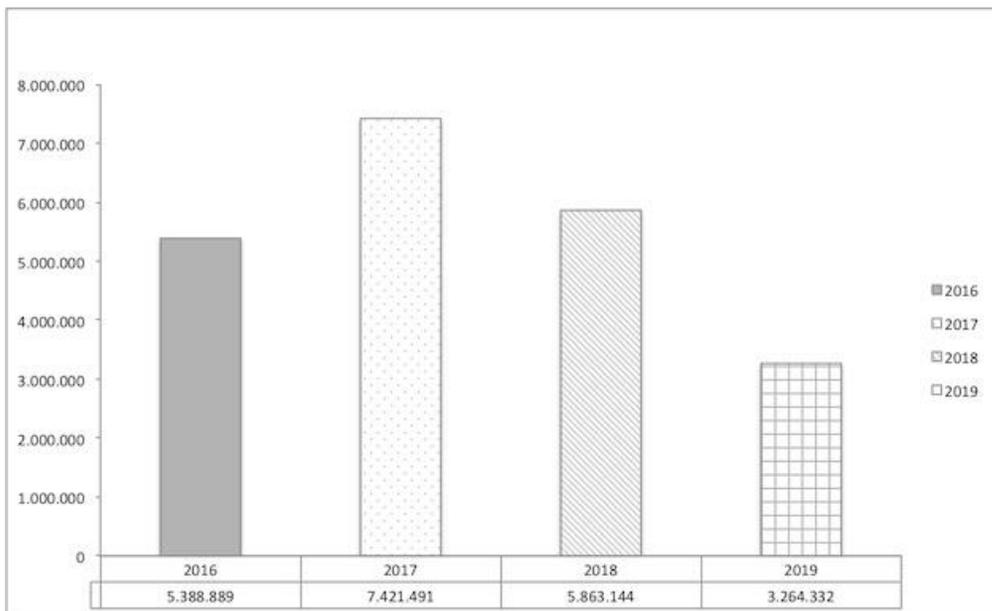


Figure 8. Attracted funds 2015-2019.

In the first months of 2019, in accordance with the time schedule, the Institute started the third phase of the project which involved the use of the CAF model, inspired by the principles of management excellence.

The CAF model adoption was formalized, three years after the start of the project, by

joining the call of the Department of Public Administration.

In the various steps of the self-assessment, the Department of Public Administration led the self-assessment group in implementing the stages of the process to achieve levels of excellence in the field of Quality for the

Public Administration. The Institute was the first CNR Institute to join this very important initiative.

A self-assessment group used the results of a CAF questionnaire and the evidence gathered for the preparation of a self-

assessment report.

The participation in the CAF questionnaire was 43% of personnel eligible (137 units of a total of 319) and the preliminary results of the evaluation are resumed in figure 9.

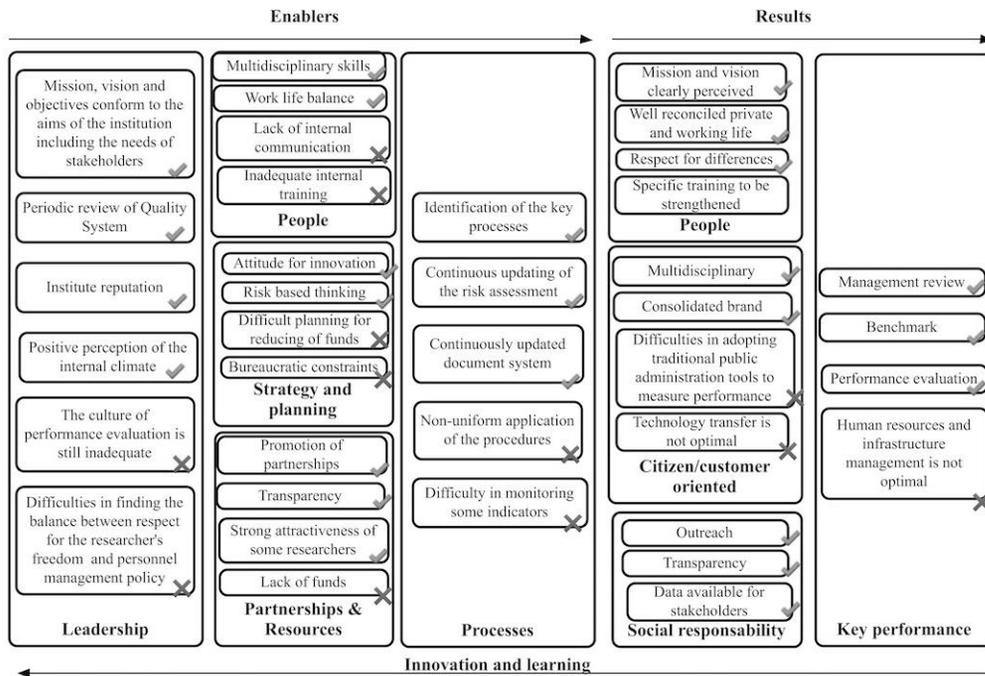


Figure 9. Preliminary results of the evaluation.

The self-assessment process produced an Improvement Plan that reflected the risk assessment feedback and identified four improvement transversal projects which are listed below:

- Promotion of training and sharing initiatives related to technology transfer and the application of management methodologies in research.
- Implementation and use of the database for data collection and storage
- Standardization of activities and identification of suitable performance indicators especially for research support services (orders, security, missions, etc.), of

the methods of planning, execution and collection of information related to staff training / skills

- Consolidation of internal communication and strengthening of external communication.

The performance management model was certified in 2016, by an external organization accredited, according to the ISO 9001: 2015 standard. The certificate is renewed annually through a surveillance audit.

The CAF self-assessment process was inspected by the experts of the Department of Public Administration through the CAF External Feedback Procedure which led to the issue of the CAF Effective User Certificate.

4. Discussion and Conclusion

Our study provided results obtained after four years of quality management implementation in a public research organization. On one hand this short observational period is not enough to show if the implemented system has produced an effective long-term improvement in the Institute's performance and the trend monitoring will continue. On the other hand, we can assert that this approach up to now has been able to keep the organization's strategy under control by adapting to changes in the context. In fact, the developed model allows us to keep the Institution's performance under control in terms of both OP and IP.

Furthermore, the adopted continuous monitoring of performance indicators allows resources to be directed appropriately and immediately towards the most promising sectors.

Our work shows that after four years of the model application, the Institute has maintained the peculiar multicultural and multidisciplinary connotation in the cardio-neuro-endocrinological, cardio-nephrological, epidemiological, experimental oncology, cellular and subcellular biological fields.

The consolidated expertise of the institute researchers in national and international projects and in patenting in the biomedical and biotechnological field, has also guaranteed the institute's active presence in the national and international research scenery with connection with the productive and industrial world.

External institutional relations with industrial partners and public or private bodies have also been strengthened to avoid the loss of competitiveness.

The scientific production of the Institute, documented by the number of articles published annually according with an international peer-reviewed approach and first/last name from IFC, is stable as well as

the high level of the related journals showed by the impact factor.

Furthermore, scientific production is completely in line with the performance of the department (source: Sciences Biomedical Department of the Italian National Research Council 2015 brochure) with a value of 2.6 publications / year per researcher of the Institute vs a value of 1.8 publications / year per researcher in the Biomedical Sciences Department of the CNR. Also the ability to attract resources from 'applications' of competitive nature is significant, even in a difficult historical period where research funding is scarce, with a number of grants active in recent years that are consistently greater than 50. The high quality of human resources involved in the research activities of the Institute, the profound perception of the importance of their role for the community well-being and the availability of support offices play a crucial role.

Finally, it is worth noting as regards the Common Assessment Framework experience, it is important to underline that the assessment of the Institute carried out through this platform, was mainly possible thanks to the Management commitment in constantly improving Institute's performance. Subsequently, the process of involvement of staff has been facilitated by sharing awareness about the role and the importance of performance evaluation processes, for the organization's results and also for the achievement of the individual researcher's strategic objectives.

We have also to underline that the preliminary results obtained from the evaluation show that the main difficulty of a research institution in the adoption of "traditional" tools to measure performance is represented by the balance between respect for the researcher's freedom and personnel management policy. Also the difficulty in the collection and monitoring data linked to the lack of performance evaluation culture among employees are critical issues emerged in our experience. The lack of a real budget

that the Management can dedicate to fund activities related to performance and to valorise good results can be another crucial point specific for our (Italian and with a centralized management over the local “Institute” management) public research context.

According to the criteria established in the CAF model, the Institute’s next step will be the external peer to peer evaluation, and this will provide a further key opportunity for the

management model and the researchers. An innovative aspect that could improve the application of this European model could be the personalization of the CAF model for research.

All these key issues, mainly based on cultural features, remain still open and might represent great opportunities for supporting the role of the Research in the Society of the future.

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