

EVALUATION REPORT OF THE UNIT
MESuRS - Laboratoire modélisation,
épidémiologie et surveillance des risques
sanitaires

UNDER THE SUPERVISION OF THE
FOLLOWING ESTABLISHMENTS AND
ORGANISMS:
Conservatoire national des arts et métiers -
Cnam

EVALUATION CAMPAIGN 2023-2024
GROUP D

Report published on May, 27 2024



In the name of the expert committee :

Niel Hens, chairman

For the Hcéres :

Stéphane Le Bouler, acting president

In accordance with articles R. 114-15 and R. 114-10 of the French Research Code, evaluation reports drawn up by expert committees are signed by their chairmen and countersigned by the Hcéres chairman.

To make the document easier to read, the names used in this report to designate functions, professions or responsibilities (expert, researcher, teacher-researcher, professor, lecturer, engineer, technician, director, doctoral student, etc.) are used in a generic sense and have a neutral value.

This report is the result of the unit's evaluation by the expert committee, the composition of which is specified below. The appreciations it contains are the expression of the independent and collegial deliberation of this committee. The numbers in this report are the certified exact data extracted from the deposited files by the supervising body on behalf of the unit.

MEMBERS OF THE EXPERT COMMITTEE

Chairperson: Mr Niel Hens, Hasselt University, Belgique

Experts: Ms Emilie Counil, Institut national d'études démographiques - INED
Mr Nicolas Vauchelet, Université Sorbonne Paris Nord

HCÉRES REPRESENTATIVE

Mr Arnaud Seigneurin

REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr Stéphane Lefebvre, Cnam
Mr Tarek Raissi, Cnam

CHARACTERISATION OF THE UNIT

- Name: Modélisation, épidémiologie et surveillance des risques sanitaires
- Acronym: MESuRS
- Label and number: EA4628
- Composition of the executive team: Laura Temime

SCIENTIFIC PANELS OF THE UNIT

SVE Sciences du vivant et environnement
SVE7 Prévention, diagnostic et traitement des maladies humaines

ST1: Mathématiques

THEMES OF THE UNIT

The unit dedicates its research efforts to three scientific themes connected to health risks: infectious diseases and occupational hazards, which are long-standing areas of focus within the team, and environmental health, a newly emerging area of interest.

HISTORIC AND GEOGRAPHICAL LOCATION OF THE UNIT

The host team EA4628 of the Conservatoire National des Arts et Métiers (Cnam), "Modélisation, épidémiologie et surveillance des risques sanitaires" (MESuRS), was established on January 1, 2011, and then renewed on January 1, 2014, under the direction of Professor William Dab. Following its last evaluation by Hcéres in 2017, it was renewed again on January 1, 2019, under the direction of Professor Laura Temime. Historically, the research project of the EA focused on infectious and occupational health risks, with a methodological coherence (epidemiology, biostatistics, modeling). More recently, the team has also ventured into the field of environmental risks. All team members are located in offices situated at the Cnam's "Saint Martin" site in the 3rd arrondissement of Paris.

RESEARCH ENVIRONMENT OF THE UNIT

Due to the limited size of the team, MESuRS' activities rely on its external collaborations, which are numerous, both nationally (Inserm, universities, EHESP, ...) and internationally (Imperial College, ...). In particular, MESuRS has two structural partnerships that were established in 2015-16: Pasteur-Cnam sur les Risques Infectieux et Emergents (PACRI), which links MESuRS and the Epidemiology of Emerging Diseases Unit at the Institut Pasteur; and a partnership chair "Entreprises et Santé" linked with the private sector.

UNIT WORKFORCE: in physical persons at 31/12/2022

	31/12/2022
Permanent staff	5
Other professors	2
Non-permanent staff	6
Supporting staff	1
Total	14

DISTRIBUTION OF THE UNIT'S PERMANENTS BY EMPLOYER: in physical persons at 31/12/2022. Non-tutorship employers are grouped under the heading "others".

Nom de l'employeur	EC	C	PAR
CNAM	4	0	2
Total personnels	4	0	2

GLOBAL ASSESSMENT

The MESuRS research unit is a young and dynamic team covering of a well-chosen spectrum of research topics embedded into the three research themes infectious diseases and occupational hazards and environmental health. The latter being a newly emerging area of interest. The unit uses and develops state-of-the-art methodology in epidemiology, biostatistics and modeling resulting in very good quality research with several publications in high-impact journals as well as societal valorisation activities and a growing number of projects and research income over the past few years. More particularly, the two successful partnerships (PACRI and the chair "Entreprises et Santé") are very well established. A new and promising partnership, ESTER, is currently being set up. Whereas the unit has taken up all recommendations as formulated in the last evaluation report, the disproportionality high teaching load within this small team needs to be evaluated and monitored very closely to ensure that the unit's scientific output and activities and hence its excellent reputation remain of high quality.

DETAILED EVALUATION OF THE UNIT

A - CONSIDERATION OF THE RECOMMENDATIONS IN THE PREVIOUS REPORT

In response to the previous evaluation's recommendations on scientific production and activities, the unit significantly enhanced its publication efforts in targeted areas. They successfully published in top journals related to occupational health and made concerted efforts to disseminate their mathematical and statistical modeling work to a broader medical audience, while also presenting at key biostatistics conferences. This strategic approach helped balance the dissemination of their research findings effectively.

Following the recommendations on its scientific strategy and projects from 2017, the unit made substantial progress:

- **Enhanced Collaborations:** Strengthened internal collaborations within Cnam and initiated interdisciplinary projects incorporating economic perspectives, particularly in occupational health.
- **Focused Research Themes:** Developed projects at the intersection of infectious diseases and occupational health, and maintained a strong research focus on occupational health even after the retirement of William Dab, through strategic recruitments.
- **Global and National Relevance:** Addressed infectious risk with a balance between national involvement and global health issues, exemplified during the COVID crisis.
- **Improved Project Management:** Implemented the recommendation to include project managers in funding applications for better project oversight.

These efforts demonstrate the unit's commitment to adapting and evolving in response to previous evaluations, ensuring a continued focus on relevant and impactful research.

B - EVALUATION AREAS

EVALUATION AREA 1: PROFILE, RESOURCES AND ORGANISATION OF THE UNIT

Assessment on the scientific objectives of the unit

The MESuRS unit at Cnam focuses on developing scientific tools for health and safety risk management, aligning with Cnam's strategic goals. It supports interdisciplinary research, engaging in national and European projects, and emphasizes public outreach. Key initiatives include CIFRE theses, collaborations with other research units, and creating decision-support software. Their work, spanning artificial intelligence to health and safety, underscores a commitment to societal and economic impacts.

Assessment on the unit's resources

The MESuRS unit relies on contract funding, constituting over 95% of its financial resources, with an average of €10k/year from Cnam's research direction. It occupies 270 m² in central Paris, including offices and meeting spaces. Support includes a statistician engineer for research and IT needs, with administrative tasks handled by Cnam's research management, albeit with resource constraints. Access to international journals and databases is provided via Cnam's library and the Pasteur Institute.

Assessment on the functioning of the unit

The institution annually sets HR policies, emphasizing training, research, and faculty recruitment. Collaborative planning and HR commission play key roles, with achievements like new faculty hires. Staffing needs are collectively addressed, including a 2020 engineer recruit. Health, safety, heritage preservation, and environmental sustainability are priorities. Research ethics and data protection follow strict protocols, including ethics committee approvals and CNIL compliance, with efforts underway to establish a Cnam ethics committee and enhance data security.

1/ The unit has set itself relevant scientific objectives.

Strengths and possibilities linked to the context

MESuRS's scientific objectives align well with Cnam's ambition (see evaluation report). The unit focuses on three important research themes of which two are well established and one is under development. The unit is distinctive in its approach as exemplified by modelling of infectious risk in healthcare settings; assessing interventions like public policies (pension reform); scenario modelling of co-benefits.

Weaknesses and risks linked to the context

The unit's dependency on temporal positions results in a volatile workforce, challenging long-term project continuity and institutional memory. The unit's teaching responsibilities and administrative duties risk infringing on valuable research time.

2/ The unit has resources that are suited to its activity profile and research environment and mobilises them.

Strengths and possibilities linked to the context

The unit is very active in calls for tender. They can rely on the support from the research department of CNAM.

Weaknesses and risks linked to the context

Whereas the unit is grateful for the support of €10k/year from Cnam's research direction, an increase in budget is needed given expenses (a.o. publication costs, travel) have increased substantially.

3/ The unit's practices comply with the rules and directives laid down by its supervisory bodies in terms of human resources management, safety, environment, ethical protocols and protection of data and scientific heritage.

Strengths and possibilities linked to the context

There is a structured approach at Cnam in HR management, with an emphasis on training, research, competitive recruitment, and collaborative planning, although details on gender parity and psychosocial risk prevention are less specified. Efforts towards safeguarding scientific assets and data show proactive

compliance with ethical standards and CNIL guidelines, alongside the initiation of a research ethics committee, indicating a commitment to ethical research and data protection. The unit's environmental preservation efforts are commendable, highlighted by the adoption of an environmental charter, leadership in sustainability practices within Cnam, and initiatives like greenhouse gas emission assessments and sustainable travel preferences.

Weaknesses and risks linked to the context

While the institution demonstrates awareness and action in HR management, scientific asset protection, and environmental sustainability, the committee suggests expanding on the implementation and measurable impacts of these practices to further assess their efficacy and areas for improvement. There seems to be no internal policy at Cnam for archiving which requires specific attention.

EVALUATION AREA 2: ATTRACTIVENESS

Assessment on the attractiveness of the unit

The unit's global impact is highlighted by international talks, leading scientific events, and editorial roles in excellent journals. It co-organizes key conferences and is active in research groups, showing a commitment to public health. Its role in the European research area, through projects like PRIMAVERA and ties with Imperial College London, emphasizes its international influence.

- 1/ The unit has an attractive scientific reputation and is part of the European research area.*
- 2/ The unit is attractive because of the quality of its staff support policy.*
- 3/ The unit is attractive through its success in competitive calls for projects.*
- 4/ The unit is attractive for the quality of its major equipment and technical skills.*

Strengths and possibilities linked to the context for the four references above

- 1/ The unit has an attractive scientific reputation and is part of the European research area.
 - The unit boasts international recognition through invited talks and leadership in organizing major scientific events, enhancing its scientific reputation.
 - Active participation in European research networks and collaborative projects, such as PRIMAVERA and ARCANE, extends its influence and integrates it deeply into the European research area.
 - Associations with prestigious institutions like the Imperial College London offer avenues for further collaborations and research innovations.
- 2/ The unit is attractive because of the quality of its staff support policy.
 - A structured HR policy with a focus on competitive recruitment and collaborative planning supports a dynamic and conducive work environment.
 - Initiatives for career development and internal mobility demonstrate a commitment to staff growth and satisfaction.
- 3/ The unit is attractive through its success in competitive calls for projects.
 - Success in securing funding from competitive calls, including major European projects, highlights the unit's research excellence and attractiveness.
 - The ability to attract significant research funding opens opportunities for cutting-edge research and attracts top talent.

- 4/ The unit is attractive for the quality of its major equipment and technical skills.
- The text does not explicitly mention the quality of equipment or technical skills, but the success in competitive funding and international collaborations implies access to high-quality resources and advanced technical expertise.
 - Engagement in high-profile projects suggests the unit possesses or has access to state-of-the-art equipment and technical skills necessary for leading-edge research.

Weaknesses and risks linked to the context for the four references above

- 1/ The unit has an attractive scientific reputation and is part of the European research area.
- Dependency on a few key individuals for international recognition and networking may pose a risk to the unit's sustained reputation.
 - The evolving nature of the European research landscape requires continuous effort to maintain relevance and competitiveness.
- 2/ The unit is attractive because of the quality of its staff support policy.
- The absence of detailed practices addressing gender parity and the prevention of psychosocial risks could limit the attractiveness of the unit's HR policies.
 - Potential resource limitations might affect the unit's ability to provide comprehensive support to all staff members.
- 3/ The unit is attractive through its success in competitive calls for projects.
- Reliance on competitive funding sources may introduce financial instability and pressure to continuously outperform, impacting long-term research planning.
 - The competitive nature of grant acquisition could divert focus from exploratory or foundational research areas not aligned with funding trends.
- 4/ The unit is attractive for the quality of its major equipment and technical skills.
- Without specific mention, the actual state of equipment and technical capabilities remains unclear, potentially highlighting a gap in the unit's presentation of its strengths.
 - Continuous updates and maintenance of technical skills and equipment are essential to retain attractiveness, requiring ongoing investment and focus.

EVALUATION AREA 3: SCIENTIFIC PRODUCTION

Assessment on the scientific production of the unit

The unit stands out for its scientific output, achieving an average of 3.6 publications per researcher annually in top-tier journals, with fifteen out of 68 articles in excellent journals. The unit upholds scientific integrity, ethical standards, and open science principles, ensuring significant contributions to both academic and public domains. Its policy supports open access publishing and the sharing of codes and data, aligning with national and international funding bodies' expectations.

- 1/ The scientific production of the unit meets quality criteria.*
- 2/ The unit's scientific production is proportionate to its research potential and properly shared out between its personnel.*
- 3/ The scientific production of the unit complies with the principles of research integrity, ethics and open science. It complies with the directives applicable in this field.*

Strengths and possibilities linked to the context for the three references above

1/ The scientific production of the unit meets quality criteria.

- The unit has demonstrated a strong publication record, with 68 articles in international peer-reviewed journals, averaging 3.6 publications per permanent teaching researcher annually. A significant portion of these publications (over 20%) are in excellent journals, highlighting the unit's commitment to quality. Recognition by the National Institute for Research and Safety for publications in occupational health further underscores this.

2/ The unit's scientific production is proportionate to its research potential and properly shared out between its personnel.

- All members of the unit are productive, contributing to a healthy balance of publication across the team. The strategic support for young researchers, including doctoral and post-doctoral fellows, is commendable, ensuring their active participation in high-level research and publications.

3/ The scientific production of the unit complies with the principles of research integrity, ethics, and open science. It complies with the directives applicable in this field.

- Training in scientific integrity for doctoral students, adherence to ethical charters, and the use of anti-plagiarism software illustrate the unit's commitment to research integrity and ethics. Open access publishing and the sharing of codes and data via platforms like GitHub reflect a strong adherence to the principles of open science.

In general the unit's achievements are outstanding in infectious disease research and very good in both occupational hazards and environmental health.

Weaknesses and risks linked to the context for the three references above

1/ The scientific production of the unit meets quality criteria.

- No apparent weaknesses were found.

2/ The unit's scientific production is proportionate to its research potential and properly shared out between its personnel.

- No apparent weaknesses were found.

3/ The scientific production of the unit complies with the principles of research integrity, ethics, and open science. It complies with the directives applicable in this field.

- The reliance on external platforms for data and code sharing, while practical, highlights the need for robust internal mechanisms to ensure long-term accessibility and compliance with evolving open science practices. The commitment to open science principles must be continuously evaluated against the backdrop of changing regulations and ethical standards.
- Open science often requires paying high publication fees for which budgets should be available.

EVALUATION AREA 4: CONTRIBUTION OF RESEARCH ACTIVITIES TO SOCIETY

Assessment on the inclusion of the unit's research in society

The unit excels in non-academic collaborations, notably with the "Entreprises et Santé" chair, enhancing research in occupational health with significant funding and publications. It collaborates with public agencies on environmental and infectious diseases projects, and engages with the nonprofit sector, influencing health policy at various levels. The unit's research assists health decision-makers, contributing to societal debates, especially on climate change and health impacts. Its outreach extends to the public via media and blogs, aiming to improve dissemination further.

1/ The unit stands out for the quality and the amount of its interactions with the non-academic world.

2/ The unit develops products for the cultural, economic and social world.

3/ The unit shares its knowledge with the general public and takes part in debates in society.

Strengths and possibilities linked to the context for the three references above

1/ The unit stands out for the quality and the amount of its interactions with the non-academic world.

- Demonstrates strong ties through the "Entreprises et Santé" chair and strategic partnerships, enriching research with practical applications.
- Collaborates effectively with public health agencies and the nonprofit sector, emphasizing its multidisciplinary reach and impact.

2/ The unit develops products for the cultural, economic, and social world.

- Creates tools and applications aimed at health risk management and influencing public policy, showcasing a practical application of research.
- Engages at various levels, including local, national, and international, to influence health policy and decision-making.

3/ The unit shares its knowledge with the general public and takes part in debates in society.

- Engages the public through platforms like The Conversation and media, contributing actively to societal debates, especially on climate change and health.
- Influences public discourse through research on ethical aspects and policy impacts, reflecting its societal role.

Weaknesses and risks linked to the context for the three references above

1/ The unit stands out for the quality and the amount of its interactions with the non-academic world.

- No weaknesses were raised.

2/ The unit develops products for the cultural, economic, and social world.

- No weaknesses were raised.

3/ The unit shares its knowledge with the general public and takes part in debates in society.

- While engagement is notable, there's room for expansion to increase impact and visibility among the general public further.

ANALYSIS OF THE UNIT'S TRAJECTORY

Since its inception, the unit has aimed to develop mathematical, statistical, and computational tools for health risk assessment, focusing on infectious diseases and occupational health. The strategy for the new period includes addressing emerging health risks across three axes: healthcare environment, work evolution impacts, and climate change and health. This reorientation is based on a state-of-the-art analysis and team expertise. Key goals include continuing infectious disease research, expanding occupational health studies, and introducing new environmental health themes. The unit plans to enhance European collaborations and data collection to feed developed models.

RECOMMENDATIONS TO THE UNIT

Recommendations regarding the Evaluation Area 1: Profile, Resources and Organisation of the Unit

Overall only few recommendations are due:

- We would recommend the unit to discuss with Cnam authorities to consider moving admin on site (in the lab) part-time.
- We would like to commend and encourage the unit to retain the cohesion that is currently present in the unit.
- We believe the teaching load should be better recognised and reduced if possible, e.g. for junior staff in particular.

Recommendations regarding the Evaluation Area 2: Attractiveness

We believe the unit could benefit from inviting researchers from abroad to spend time at MESuRS. Of course this is conditional on the budget availability.

Recommendations regarding Evaluation Area 3: Scientific Production

We advise the unit to keep working on the interface of the different research themes as has been successfully done since the previous evaluation.

Recommendations regarding Evaluation Area 4: Contribution of Research Activities to Society

We recommend the unit to continue to showcase their results; using multiple blogs, websites, etc.

CONDUCT OF THE INTERVIEWS

Date

Start: 04 March 2024, 10am

End: 04 March 2024, 4.30pm

Interview conducted: on-site

INTERVIEW SCHEDULE

10:00 - 10:05 Règlement intérieur du Hcéres par A SEIGNEURIN

Présentation du Comité par son président

Séance publique (tous les membres de l'unité)

10:05 - 10:25 Présentation scientifique et administrative de l'unité (20 mn)

15 min présentation + 20 min discussion

Séance publique (tous les membres de l'unité)

10:25 - 11:55 Présentations scientifiques par les responsables des axes thématiques

12 min présentation + 13 min discussion (soit 25 min par équipe au total)

Séance publique (tous les membres de l'unité)

10:25 - 10:45 : Axe risque infectieux (25 min)

10:45 - 11:05 : Axe santé au travail (25 min)

11:05 - 11:25 : Axe santé environnementale (25 min)

11:25 - 11:55 : Discussion scientifique générale

11:55 - 12:10 : Echange avec les responsables des partenariats structurants de l'unité (15 min)

12:10 - 13:30 Déjeuner du comité et pause (1h20 min)

Réunion à huis clos

13:30 - 14:00 Rencontre collective avec les représentants des établissements (30 mn)

Réunion à huis clos

14:00 - 14:30 Rencontre avec les chercheurs (30 mn)

En l'absence de tout personnel d'encadrement (directeur, chefs d'équipe)

14:30 - 15:00 Rencontre avec les post-docs, doctorants et les étudiants (30 mn)

En l'absence de tout personnel d'encadrement (directeur, chefs d'équipe)

15:00 - 15:20 Rencontre avec la directrice de l'unité (20 mn)

Réunion à huis clos

15:20 - 16:30 Débriefing du comité

Réunion à huis clos

GENERAL OBSERVATIONS OF THE SUPERVISORS

Evaluation HCERES
de l'unité « Modélisation, épidémiologie et surveillance des risques
sanitaires », MESuRS

Réponse du Cnam
Observations de portée générale

Objet : Rapport de l'HCERES pour l'unité « Modélisation, épidémiologie et surveillance des risques sanitaires », MESuRS

Le Conservatoire national des arts et métiers a pris connaissance du rapport d'évaluation de l'unité MESuRS. Au nom de l'unité de recherche, il remercie vivement le comité d'experts pour la très grande qualité de son travail, la pertinence des observations et des recommandations contenues dans le rapport. Il se félicite de l'évaluation extrêmement positive de l'unité qui souligne la très grande qualité de ses activités de recherche et de ses publications, la richesse de ses collaborations nationales et internationales ainsi que celle de ses partenariats socio-économiques. Le Cnam a conscience des actions et supports à apporter pour consolider l'activité de l'unité dans la perspective de son contrat quinquennal 2025-2029.

La direction de l'unité a pris connaissance du rapport d'évaluation du HCERES la concernant et remercie le comité pour ses observations et ses recommandations constructives et pertinentes. Elle n'a pas d'observations à formuler

L'adjoint de l'Administratrice générale
en charge de la recherche



Stéphane Lefebvre

The Hcéres' evaluation reports are available online:
www.hceres.fr

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2 rue Albert Einstein
75013 Paris, France
T.33 (0)1 55 55 60 10

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