



**Institut Pierre Louis d'Épidémiologie et de Santé Publique**

Research unit n° 1136 (UMR-S 1136)

SUMO

CLEPILIR

THERAVIR

NEMESIS

EPAR

PEPITES

ERES

ADMIN & SI

<http://www.iplesp.upmc.fr/fr/home>





Institut Pierre Louis d'Épidémiologie et de Santé Publique  
Pierre Louis Institute of Epidemiology and Public Health

## IPLESP presentation

Director: Fabrice Carrat

Deputy Director: Dominique Costagliola

Secretary General: Marianne Bailly

The Pierre Louis Institute of Epidemiology and Public Health was created in January 2014 as a unique laboratory gathering all the research forces in Epidemiology and Public Health within Sorbonne Université in order to increase our visibility and attractiveness, to facilitate collaborative works between the teams, and to provide more efficient allocation of administrative or operational staff.

The Institute has been successfully evaluated and renewed in January 2019, and is constituted of 7 INSERM/Sorbonne Université teams and a transversal administrative and computer and information technology teams.

Our common overarching objective is to produce original knowledge on several of the most pressing public health issues and on the effectiveness of related interventions. Our most prominent specificities are to use innovative design and analytical methods to ensure the highest level of evidence for our findings and, where appropriate, our capacity to set up, integrate and exploit massive data from various sources. The Institute is covering the main domains of epidemiology, whether clinical, populational or social, as well as pharmacoepidemiology, biostatistics, statistical and mathematical modelling, clinical research including methodology and clinical trials, relations between environment and health status, social determinants of health, and health care organization. In terms of applications we are dealing mainly with communicable diseases (influenza, HIV infection, viral hepatitis ...), nosocomial and emerging infections, with chronic diseases (inflammatory chronic diseases, respiratory, allergic and cardiovascular diseases), with psychiatric disorders and with critical care.

The teams are listed below:

SUMO: communicable diseases surveillance and modelling (P.-Y. Boëlle);

CLEPILIR: clinical epidemiology of chronic viral diseases (F. Carrat);

THERAVIR: therapeutic strategies for HIV infection and associated viral diseases (A.-G. Marcelin, C. Katlama);

NEMESIS: neighborhood environments and mobility: effects on social health inequalities (B. Chaix);

EPAR: epidemiology of allergic and respiratory diseases (I. Annesi-Maesano);

PEPITES: pharmacoepidemiology and healthcare assessment (F. Tubach);

ERES: social epidemiology research team (M. Melchior);

The Institute also includes a team for administrative support (M. Bailly) and information system (G. Dussallant, S. Hysenij).

IPLESP website

## IPLESP at the forefront of COVID-19 research

From January 2020, several IPLESP teams have initiated research on the new coronavirus in different areas: modelling, surveillance, population epidemiology, clinical epidemiology, therapeutic evaluation, social epidemiology. This work gave rise to fruitful collaborations between the teams and their results were communicated during online seminars (<https://youtu.be/ieKOlo-DXvA> , <https://youtu.be/zuw3u1QS90M>).

Team SUMO has developed a suite of models to tackle different aspects of the COVID-19 pandemic: risk analysis of healthcare systems, analysis of case importations on the French territory, and the development of scenarios for mitigation and lockdown exit. The Sentinelles network provide important data for monitoring the spread of the new coronavirus in France. Future work will focus on the analysis of seroprevalence data and numerical approaches for mobility tracing and contact reduction.

Team CLEPILIR co-leads the SAPRIS study involving the collection of clinical and serological data on 130,000 participants included in the French general population cohorts (Constances, E3N-E4N, NutriNet Santé, Elfe Epipage2). The team also evaluates the impact of the epidemic on hospitalization using medico-administrative data and coordinates the CORIPAS clinical trial to assess the efficacy of hyperimmune plasma. Its future work will focus on the description and prognosis of persistent forms of COVID-19 and the prediction of severe forms of COVID-19 from hospital data warehouses.

Team THERAVIR has evaluated the effectiveness of drugs targeting COVID-19 in collaboration with the PEPITES team and has developed virological tools to study this infection (measurement of the neutralizing activity of antibodies, analysis of molecular epidemiology). It is involved in a cohort of SARS-CoV-2 infected persons followed-up on an outpatient basis. Its future work will focus on the analysis of seroprevalence and serum neutralization data. It will also actively contribute to the adaptive, multinational and pan-European clinical trial platform for COVID-19 and other emerging infectious diseases (DisCoVeRy for Solidarity). Finally, it will coordinate the FAMICOV study, on the evaluation of intra-household transmission of SARS-CoV-2 infection.

Team EPAR is working on SARS-COV-2 airborne transmission, the relationships between air pollution exposure and COVID-19 severity and fatality and the impact of lockdown air pollution decline on COVID-19 at the national and international level. These works are conducted in collaboration with the European Respiratory Society (ERS) and the American Thoracic Society (ATS).

Team PEPITES is involved in several patient cohort studies (COVID ICU, COVIDeF, COACH, COVIDOM, SEROCOV) which will help to better understand the natural history of the disease, to identify risk and prognostic factors and to study the evolution of seroprevalence among caregivers. The COVIMID project, based on the national healthcare database, will assess the impact of the pandemic on patients with chronic inflammatory diseases. Finally, the team has designed and implemented several clinical trials in prophylaxis (revaccination by BCG, nicotine patches) or treatment (Hydroxychloroquine in general medicine, Nivolumab, Nicotine).

Team ERES is conducting research on the impact of the COVID-19 epidemic in terms of social inequalities, mental health and addictive behaviour, through studies in the general population (COMET international study, TEMPO cohort) and among people in precarious situations (ECHO study). It is also taking part in a randomised controlled trial on the effectiveness of Hydroxychloroquine in primary care (MG-COVID) as well as in qualitative research aiming to describe the health of special populations (e.g. EPIC project conducted among pregnant women).



TEAM 1

# SUMO

## Surveillance and modelling of communicable diseases:

MANAGER PIERRE-YVES BOËLLE

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### Team presentation

The SUMO team brings together research specialists for the development of epidemiological information systems used in the surveillance of communicable diseases and the analysis of their dissemination using modelling approaches.

Communicable diseases remain a major problem in public health. Mobility, both regional and global, allow the ever faster spread of infectious pathogens and create the conditions for the emergence of new diseases. These phenomena are also supported by individual behavioural choices, for example vaccination hesitancy reducing population protection or inappropriate consumption of antibiotics increasing bacterial resistance.

The team is developing several projects to better characterize communicable diseases and their spread in modern populations:

- with the Sentinelles network ([www.sentiweb.fr](http://www.sentiweb.fr)), we produce real-time statistics on the spread of common or emerging communicable diseases in France in the general population, and on certain infections monitored as part of the support centre for the prevention of healthcare associated infections (CPIAS) in the Île-de-France region;
- we study of emerging infectious diseases that may directly or indirectly affect France such as Ebola or vector-borne diseases such as Zika and Chikungunya, but also infections on return from travel with the Malaria travellers registry;
- we model pathogen transmission at the local or regional scale using contact networks, with large scale models in the GLEAM project ([www.gleamviz.org](http://www.gleamviz.org)), and the transmission of nosocomial pathogens between health facilities;
- we use back-calculation models to analyze the epidemiology of HIV infection in the FHDH database (ANRS C04) and to quantify the management cascade, from infection to treatment;

These projects are based on transversal methodological developments in the field of computational statistical inference (ML, MCMC, ABC) allowing us to adjust complex models to observation data, and on the theoretical analysis of the characteristics of the dynamic networks supporting transmission.



### Team websites

The Sentinelles network: surveillance and research in primary case platform

<https://www.sentiweb.fr>

BiostaTGV: everyday biostatistics

<https://biostatgv.sentiweb.fr>

GrippeNet.fr/COVIDnet.fr: influenza-like illness and COVID-19 surveillance

<https://www.grippenet.fr>

Periodic: analysis for periodic epidemics

<https://periodic.sentiweb.fr>



TEAM 2

# CLEPIVIR

## Clinical epidemiology of chronic viral diseases

MANAGER FABRICE CARRAT

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### Team presentation

The CLEPIVIR team is devoted to clinical epidemiology of chronic viral diseases. Researchers coordinate leading thematic cohorts of persons living with HIV, chronic viral hepatitis C, B and/or Delta, and HIV-hepatitis co-infections. They also develop and use specific statistical methods for estimating treatment effect from observational data.



The main scientific objectives are to quantify the benefit, risks, and cost-effectiveness of antivirals on the long term and to evaluate the risk of comorbidities - notably cancer, cardiovascular or metabolic complications - and strategies to prevent them.

We will bring together among the largest cohort studies on these infections in the world to address these issues:

- the FHDH-ANRS CO4 cohort is a hospital multicentre open cohort with on-going inclusion since 1989. Patients are eligible if they are infected by HIV1 or HIV2 and are managed in a participating centre. The database includes data from 125 hospitals corresponding to over 153,000 patients seen at least once between 1992 and 2015, and covers above 60% of those under care in France;
- the ANRS CO22 HEPATHER cohort is a national multicentre observational study of subjects with past or present viral hepatitis C (14,400) or B (6600). The cohort was set-up in August 2012 in 32 centres, includes a centralized biobank at cohort entry and individual linkage to national medico-administrative databases;
- the French multicenter HIV-HBV cohort to explore the prognostic value of HBV biomarkers in HIV-coinfected persons.

The methodological part focuses on comparing the performances of different methods for linking drug exposure (duration/dose) with a beneficial or a side effect, the integration of antiviral resistance as effect modification in genotypic drug resistance algorithm, and the measurement of treatment effect when the proportionality assumption is not valid.

One of our major commitment is to provide the national health authorities with data on care (including antiviral access, use, cost, efficacy and safety) at the national level in order to guide the public-health policy on these chronic infections.

Team website

ANRS CO22 HEPATHER

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TEAM 3

# THERAVIR

## Therapeutic strategies for HIV infection and associated viral diseases

MANAGERS ANNE-GENEVIÈVE MARCELIN [anne-genevieve.marcelin@iplesp.upmc.fr](mailto:anne-genevieve.marcelin@iplesp.upmc.fr)  
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### Team presentation

The THERAVIR team is an alliance from basic to clinical and population-based research towards medical progress in the fight against HIV/AIDS. It provides a unique opportunity to mix basic scientists, clinicians involved in infectious disease research, epidemiologists and statisticians.



Our research is characterized by both fundamental and applied approaches. We are developing projects with immediate implications on the management of patients and decision-making processes in health institutions but also more fundamental projects devoted to better characterize the genetics, physiology and ecology of HIV and its associated viral diseases.

Our scientific program is based on translational research: from bench to bedside to population. The interplay between these different approaches is a key point of our team. It is quite unique to develop in the same team researches that go from new drugs development, to the clinical efficacy evaluation and the implementation in population, with also an orientation and strong involvement towards low-income countries. We search to optimize the current preventive and therapeutic strategies to fight this pathogen and we develop new approaches on both aspects. The effectiveness but also cost and cost-effectiveness of these interventions will be evaluated to propose decision-making strategies. All these researches are largely based on cohorts and clinical trials coordinated through the Agence Nationale de Recherches sur le SIDA et les hépatites virales (ANRS) monitoring and statistical data analysis center of the team.

Despite the universally recommended antiretroviral treatment, HIV infection remains a major challenge in France with a stable number of new infections, the need for long life therapy and its burden of complications with increased risk in comorbidities for aging patients (i.e cancers) and in antiviral resistance. Based on these aspects, four areas have been identified: antiretroviral therapeutic strategies, pathophysiology of HIV persistence, HIV associated cancers, public health (HIV epidemic control and resistance surveillance).

[Team website](#)



TEAM 4

# NEMESIS

## Neighborhood environments and mobility: effects on social health inequalities

MANAGER BASILE CHAIX

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### Team presentation

The two research objectives of Nemesis are to investigate how neighborhood environments influence health and to explore the impact of mobility/transport on health. Regarding the first objective, our contribution is to investigate the neighborhood / environmental determinants of health behavior and health using detailed space-time data. Regarding the second objective, we aim to develop a comprehensive model of the relationship between transport and health integrating the physical activity benefits of active transport but also the exposures, related to air pollutants and noise, and stress, incurred in the different transport modes.



In the MobiliSense (ERC) project and in the MINDMAP (H2020), HANC (ANR), and Polluscope (ANR) projects nested in our RECORD Cohort, we will develop a novel methodological package relying on sensor-based data collections, “life segment” analysis, and simulations. This approach implies a continuous monitoring of participants with wearable sensors of location, movement, posture, and behavior, environmental exposures, and health status. These data take into account the full dynamic of exposures over the places visited and disaggregate spatially and temporally the behavioral and health outcomes of interest. It is then possible to conduct “momentary” analyses, investigating the successive life segments of individuals as the statistical units of analysis, using case-crossover modeling (comparing each individual to herself/himself). Finally, we will continue to develop simulation studies of public policies effects. It involves a “data enrichment” step through which we export information derived from the sensors from our small study samples to large representative population survey samples, and simulation of the impact of interventions and public policies in these large, sensor-enriched samples.

The aim of these methodological developments is to improve the theoretical and policy-relevant knowledge on the influence of urban and transport systems on health.

Team website

RECORD study (Residential Environment and CORonary heart Disease)

<http://www.record-study.org/>



TEAM 5

# EPAR

## Epidemiology of allergic and respiratory diseases

MANAGER ISABELLA ANNESI-MAESANO  
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### Team presentation

Allergic and respiratory diseases affect a relevant segment of the population resulting in significant social and economic burden and their prevalence is increasing worldwide. Taking the most known diseases, according to the World Health Organization (WHO), there are now at least 300 million people suffering from asthma and over 200 million people



suffering from COPD that includes chronic bronchitis and emphysema. In terms of mortality, each year in the world there are almost 250,000 asthma-related deaths and COPD ranks at the 5th leading cause of death. In addition, a WHO/World Bank projection to 2020 brings COPD to the 3rd leading cause of death with 4.7 million deaths. Although other allergic and respiratory diseases like rhinitis, drug allergy, pulmonary interstitial diseases ... are also very common at the population level, although their impact has still to be estimated.

EPAR's\* three main research aims consist in: the identification of allergic and respiratory phenotypes/endotypes and their distribution; the determination of the role of environmental risk factors in the aggravation and the development of endotype/phenotypes and diseases in view to explain the augmentation of the prevalence of these conditions in the past decades using an exposomic approach taking into account the entire lifespan; and the implementation of appropriate management, care and prevention measures for these diseases. Among the main modifiers of the relationship between the exposome and allergic and respiratory diseases, the influence of medical treatment (including immunotherapy) on the evolution of these diseases is taken into account.

Epigenetics as an intermediate factor that can be influenced by the exposome and in turn acts on the gene - environment interactions is a crucial step in understanding the development of allergic and respiratory diseases. The progress of the project is based on the development of new methods of evaluation of human exposure (expology) and of statistics applied to the impact of the exposome on allergies and respiratory diseases (DAG, predictive models, EWAS, machine learning, deep learning ...) with the help of massive data including routine health databases. EPAR has developed an European Environmental database containing information on major stressors (air pollution, soil contaminant, water quality, consumption products, diet...) (EDMS).

EPAR is currently involved in the following research projects: EU FP7-ENV HEALS (as IP) [www.heals-eu.eu](http://www.heals-eu.eu), INTIMIC EarlyFood (WP leader), EIT-Health POLLAR (WP leader), OBIWAN FPI, EPISARC, Cohort of birth EDEN, birth cohort ELFE, ASTHM'CHILD, PAALM, BALISTIC, Registry of severe Sarcoidosis, OQAI.

\* Located in Paris (faculty of medicine Saint-Antoine, hospitals Trousseau and Tenon) and Montpellier (CHU)

Team website





TEAM 6

# PEPITES

## Pharmacoepidemiology and healthcare assessment

MANAGER FLORENCE TUBACH  
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### Team presentation

The scientific topics of the PEPITES team are pharmacoepidemiology (assessment of drugs and medical devices in real life setting) and healthcare assessment. More precisely, our research concerns high risk populations with specific characteristics (e.g. elderly or ICU patients), benefit risk assessment of biologics in any indication, healthcare assessment with a particular focus on the underlying processes of patient management (e.g. admission, hospital stay strictly speaking, or discharge elements) and its consequences on drug benefit/risk.



Our research is based on the use of field data and healthcare administrative databases or warehouses of in-hospital clinical data, the use or development of several methods, often combined, including patient reported outcomes and e-cohorts for taking the patient perspective into account, various designs for comparative ER and pharmacoepidemiology, systematic reviews and meta-analyses, pragmatic trials, cohorts, case-only designs) and associated statistical modeling / analyses (e.g., causal inference in observational data, modeling of drug exposure, medico-economic evaluation, meta-epidemiological studies).

A large part of our research was endorsed or funded by French health institutions (HAS, OMEDIT, CNAMT, ARS, ANSM, ministry of Health) attesting the interest of public decision-makers for our research and our capacity to translate research into practice and policy.

This multidisciplinary team will involve epidemiologists, biostatisticians, pharmacists and clinicians (gastroenterologists, rheumatologists, geriatricians, dermatologists, intensivists).

[Team website](#)



TEAM 7

# ERES

## Social epidemiology research team

MANAGER MARIA MELCHIOR  
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### Team presentation

Team ERES (a French acronym for *Equipe de Recherche en Epidémiologie Sociale*) was created in 2014, after the merger of two preexisting Inserm research groups, *Equipe DS3* of the former UMRS 707 and the research team *Equipe 11* of the UMRS 1018 in Villejuif. This merger served to gather synergic research resources to study processes and determinants of the social and territorial inequalities in health and health care utilization. Since 2014, ERES is one of the leading research groups in social epidemiology in France.



The general objectives of ERES are to improve knowledge of social determinants of health, and assess interventions and policies dedicated to reducing social inequalities in health and health care utilization. The results we produce help health professionals and public health decision makers adapt their practice in a context where social inequalities in health have widened in recent years across industrialized countries, despite continued increases in longevity. The specificity of our team is that it includes researchers specialized in the study of different areas of health (cancer, mental health and addiction, medical prevention practices), but also investigators who take a cross-cutting view, focusing on determinants of social inequalities with regard to multiple areas of health (neighborhood, primary care) and/or different populations (adolescents, pregnant women), including some which are hard-to-reach and marginalized (the homeless, migrants). ERES has longstanding collaborations with clinicians (primary care, HIV, psychiatry), researchers in social sciences (sociology, geography, political science) and biostatistics, within IPLESP and outside, yielding an interdisciplinary environment.

Our research covers four areas in particular:

- social determinants of health, with a particular focus on immigrant populations living in France in order to examine relations between patterns of legal status, acculturation and discrimination and health (using sources such as the CONSTANCES and ELFE cohort studies as well as the SIRS study);
- social inequalities in health across the lifecourse and across generations (ex. ELFE, EDEN and TEMPO cohort studies, BIEN-ETRE project);
- social consequences of chronic diseases (ex. CANTO, IMPACTS cohort studies);
- consequences of societal features on social inequalities in health (DEPICT, SIRS studies).

### Team websites

Team ERES's site

<http://www.iplesp.upmc.fr/eres>

SoEpidémio, team ERES's blog

<https://soepidemio.com/>



# TEAM : ADMIN & SI

## Administration and Information technology

**MANAGERS** MARIANNE BAILLY – GUILLAUME DUSSAILLANT – SERGE HYSENJ  
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### Team presentation

The « Administration and IT » team's mission is to manage the resources of IPLESP, and to support its research teams in the conduct of their activities. Present on the two sites where the center is located, it provides, in connection with the administrative supervisory authorities, local services and expertise in the following areas:



#### The administration department:

- follow-up of budget execution (allocations and contractual resources);
- purchasing management;
- setting up and supervision of the reception of new hires, and of the recruitment process;
- organizing and managing the business trips of staff and external guests;
- dissemination of information;
- coordination of specific files (request for resources, works, professional interviews, telecommuting...);
- design and implementation of management support tools (dashboards, documentary databases, guidebooks...);
- events organization (general assembly, seminars, scientific advisory board...).

#### The information technology (IT) department:

- management and maintenance of computing equipment, systems and networks;
- provision of computational resources necessary for research activities;
- technical assistance;
- ensuring the security and protection of personal and scientific data;
- hosting scientific sites and cohorts (Grippnet, Covidnet, Sentiweb...);
- ensuring compliance with current ISO and data privacy (elaborated by the French data protection authority (CNIL)) regulations;
- project management for research teams;
- keeping update with, and proposing new technologies (Big Data, bioinformatics, computing clusters, monitoring...);
- managing the relationship with external providers and suppliers.

## LOCATION

*Teams are based at several locations in Paris*

### SORBONNE UNIVERSITÉ

27 rue Chaligny - 75012 PARIS - France

 **8** Faidherbe-Chaligny     **1** Reuilly-Diderot

Bus 46 : Faidherbe-Chaligny    Bus 86 : Hôpital Saint-Antoine

### AP-HP.SORBONNE UNIVERSITÉ

- **HÔPITAL SAINT-ANTOINE**

184 rue du Faubourg Saint-Antoine (Bâtiment Jacques Caroli)  
75012 PARIS - France

 **8** Faidherbe-Chaligny     **1** Reuilly-Diderot

Bus 46 : Faidherbe-Chaligny    Bus 86 : Hôpital Saint-Antoine

- **HÔPITAL PITIÉ-SALPÊTRIÈRE**

56 boulevard Vincent Auriol (Institut de Cardiologie) - 75013 PARIS - France

 **6** Chevaleret

Bus 27 : Nationale    Bus 61 : Chevaleret

47 boulevard de l'Hôpital (Division Mazarin) - 75013 PARIS - France

91 boulevard de l'Hôpital (Institut CIMI) - 75013 PARIS - France

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