# ANNUAL REPORT 2023

epicentre

ÉPIDÉMIOLOGIE • EPIDEMIOLOGY

**Epicentre is a satellite of Médecins Sans Frontières (MSF) dedicated to epidemiology, medical research, and training.**

**Since its creation in 1986, Epicentre has been designing and running projects in complex, often unstable humanitarian contexts to support MSF's mission and meet the needs of vulnerable populations.**

# Editorial
# Strengthening Links, Renewing Commitment

It is with enthusiasm and commitment that I address you as the new General Director of Epicentre. I have long been driven by our shared mission with MSF: to work with populations in crisis through the practice of medicine, to bring help where it is most needed, and to continue to find solutions to the health challenges facing these populations. At my side are two new scientific directors, Valérie Briand for the Research Department and Etienne Gignoux for the Interventional Epidemiology and Training Department.

Epicentre remains a unique place where the problems faced by MSF's medical teams are transformed into research questions. This year's achievements are a perfect illustration of this ability to work hand in hand with MSF to support programmes, guide decisions, fuel advocacy, improve knowledge of diseases and train staff and new epidemiologists in the field.

Our two research centres, located in Niger and Uganda, play a crucial role in our ability to respond to urgent and emerging health needs in their respective regions, while contributing to the generation of data and innovative solutions. Because of their strong regional roots, they contribute to the emergence of new collaborations and partnerships that serve the common objectives we share with MSF. Niger has been facing a complex political situation for several months, but our teams are managing to maintain our activities and continue our studies.

I am therefore committed to continuing along the path set out by my predecessors, namely working together with MSF to develop innovative strategies and maximise our operational effectiveness, particularly in emergency situations, while preserving our independence.

**Klaudia Porten, General Director of Epicentre**

# Highlights 2023

Discover some of our achievements and high-impact projects, as well as the milestones of the past year. Every step forward, every statistic, and every new project illustrates our commitment to providing feasible, concrete and appropriate solutions to improve preventive, diagnostic, or therapeutic medical care for the most vulnerable populations.

## Hepatitis E: Results and positive impact of the 1st mass vaccination campaign in Bentiu, South Sudan

In 2022, during an epidemic in the Bentiu camp of South Sudan, Epicentre performed the first real-world evaluation of a mass hepatitis E vaccination campaign. The study enabled Epicentre to highlight the safety of administering the vaccine to pregnant women, the absence of serious side effects, and that the vaccine was generally well accepted. These results will play a decisive role in the vaccine accreditation process and in the creation of a vaccine stockpile by the International Coordinating Group (ICG). Since the end of the study, MSF has initiated a vaccination campaign in Fangak, a highly remote area where the Ministry of Health declared a hepatitis E epidemic in September 2023. This campaign is the subject of several ongoing Epicentre studies.


Peter Caton

## Mortality surveys shed light on humanitarian crises in Sudan, the Democratic Republic of Congo, and Haiti

In 2023, Epicentre conducted mortality surveys in three distinct contexts, among Sudanese refugees in Chad, on the outskirts of Goma in the Democratic Republic of Congo (DRC), and in Cité-Soleil in Port-au-Prince, Haiti. All three revealed troubling trends in violence-related mortality:

- In Cité-Soleil, Nearly 41% of deaths were linked to violence
- In Chad, there was a 20-fold increase in mortality in the Ourang camp, a 2-fold increase in the Toumtouma camp, and a 3-fold increase in the Arkoum camp compared with the pre-crisis period
- In the DRC, we observed alarming mortality rates among men and children under 5 (2 deaths per 10,000 people per day, double the emergency threshold) and found that 10% of women over 20 had been raped

These mortality surveys guide MSF's programmatic activities and fuel its ability to push the international community to mobilize resources for these urgent humanitarian crises.

## Abortion: up to 7 times more severe complications in two hospitals in fragile and conflict-affected environments

The AMoCo study assessed abortion-related complications in two hospitals located in fragile and conflict-affected contexts in Bangui in the Central African Republic and Jigawa State in Nigeria. In the two hospitals, more than 50% of women admitted following an abortion-related complication had severe, life-threatening or even fatal conditions. The high proportion of severe complications observed in both hospitals suggests that a proportion of these abortions were induced by unsafe methods. Indeed, the proportion of septic abortions (genital infections) was high: 27% in the Bangui hospital and 19% in the Jigawa hospital. The study recommends that women have access to a wide range of cost-free contraceptive services as well as to safe abortion and post-abortion care at both primary health centers and in hospitals. It also calls for increased investment in projects aimed at improving community knowledge of safe contraceptive and abortion methods.

## Cutting-edge training for field epidemiologists: 1st FETCH promotion

To build capacity in the fight against epidemics and humanitarian crises, Epicentre has developed a new one-year training course for field epidemiologists: Field Epidemiology in Humanitarian Contexts (FETCH). This initiative aims to equip healthcare professionals with the skills they need to manage surveillance, investigation, and epidemiological surveys in complex emergencies and humanitarian contexts. An initial cohort of 7 epidemiologists completed the first iteration of the training in 2023 and second cohort has already begun for 2024.

## Renewal of the management team

**Appointment of Klaudia Porten as General Director, Etienne Gignoux as Director of the Interventional Epidemiology and Training Department, and Valérie Briand as Director of the Research Department.**

This new management marks Epicentre's determination to strengthen the impact of its epidemiological and medical studies and its desire to take advantage of synergies with MSF to maximize the effectiveness of emergency response and disease control. This renewed commitment will help us to respond to the ever-evolving landscape of challenges in global health.

As it does every year, Epicentre organized a Scientific Day to present its studies and research. This open event provides a unique platform for exploring advances and challenges in the field of public health, with a focus on interventions in conflict and crisis affected zones.

# Key figures

Number of full-time equivalent staff: 299

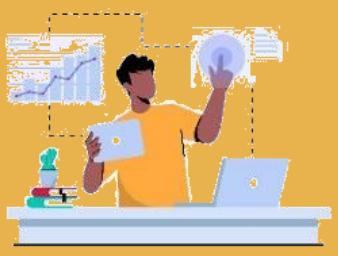
55% of whom are scientific staff and 45% support staff

41 nationalities

39% women

61% men

- Research centres: Paris (France), Mbarara (Uganda) and Maradi (Niger)
- Teams of epidemiologists in the field and in other locations: Mali, Democratic Republic of Congo, Malawi, Chad, South Sudan, Niger, Uganda as well as in New York, Dubai, Dakar, Geneva, Brussels, London, Cape Town.



264 people trained

11 training courses: 1 RepEpi online-Intersection, 1 RepEpi Paris-Intersection, 4 PSP (2 in Bordeaux, 1 in Dakar, 1 in Nairobi-Intersection), 1 REE India-Intersection, 2 RepEpi Cameroon and Democratic Republic of Congo, 1 RUE Goma, Module Epi&Stats du FMHA/ MSF Academy-Intersection

6 university courses

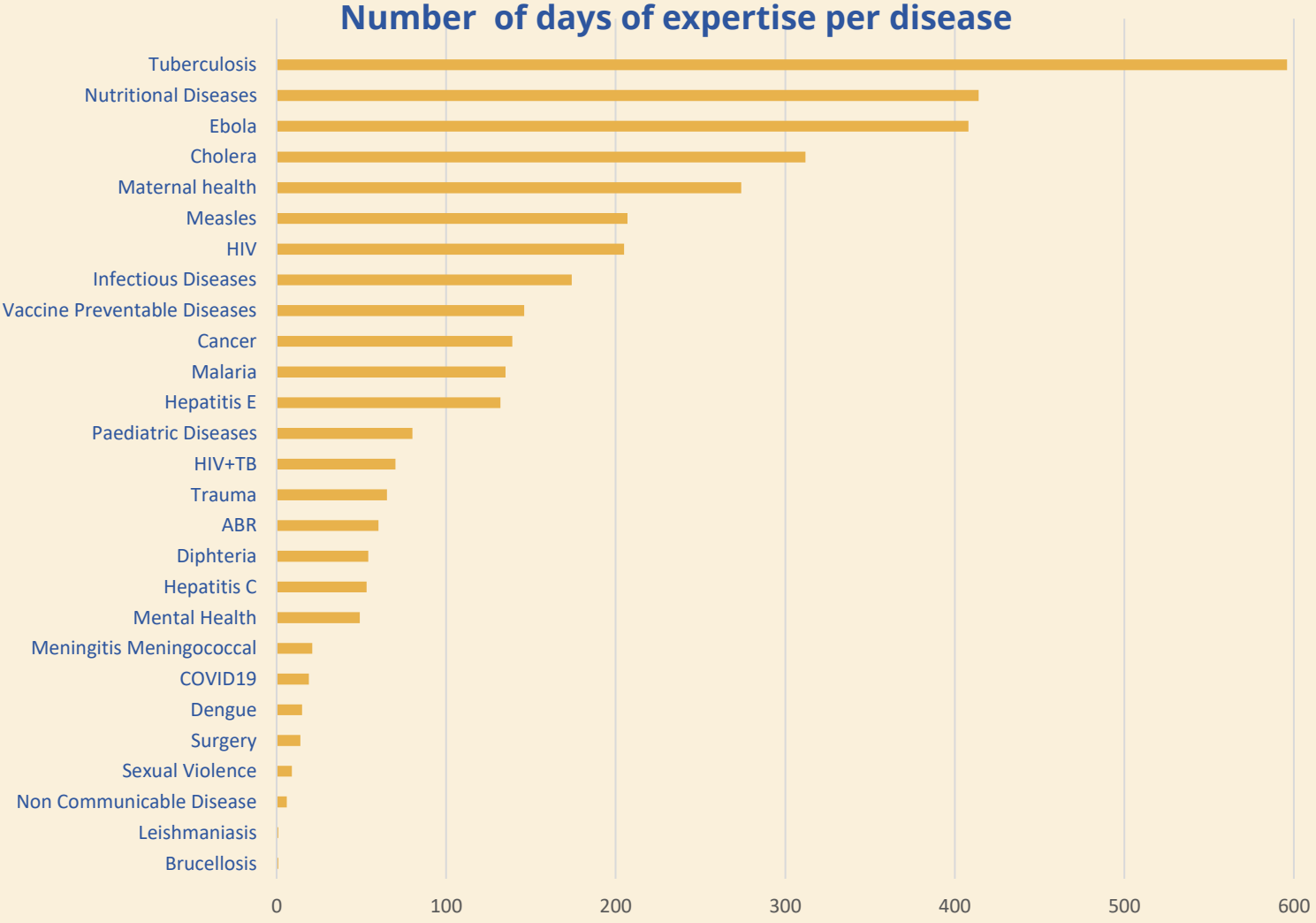
59 publications in peer-reviewed journals

- ✓ 32% of publications with 1er or last author Epicentre
- ✓ 46% of articles with an impact factor greater than 10

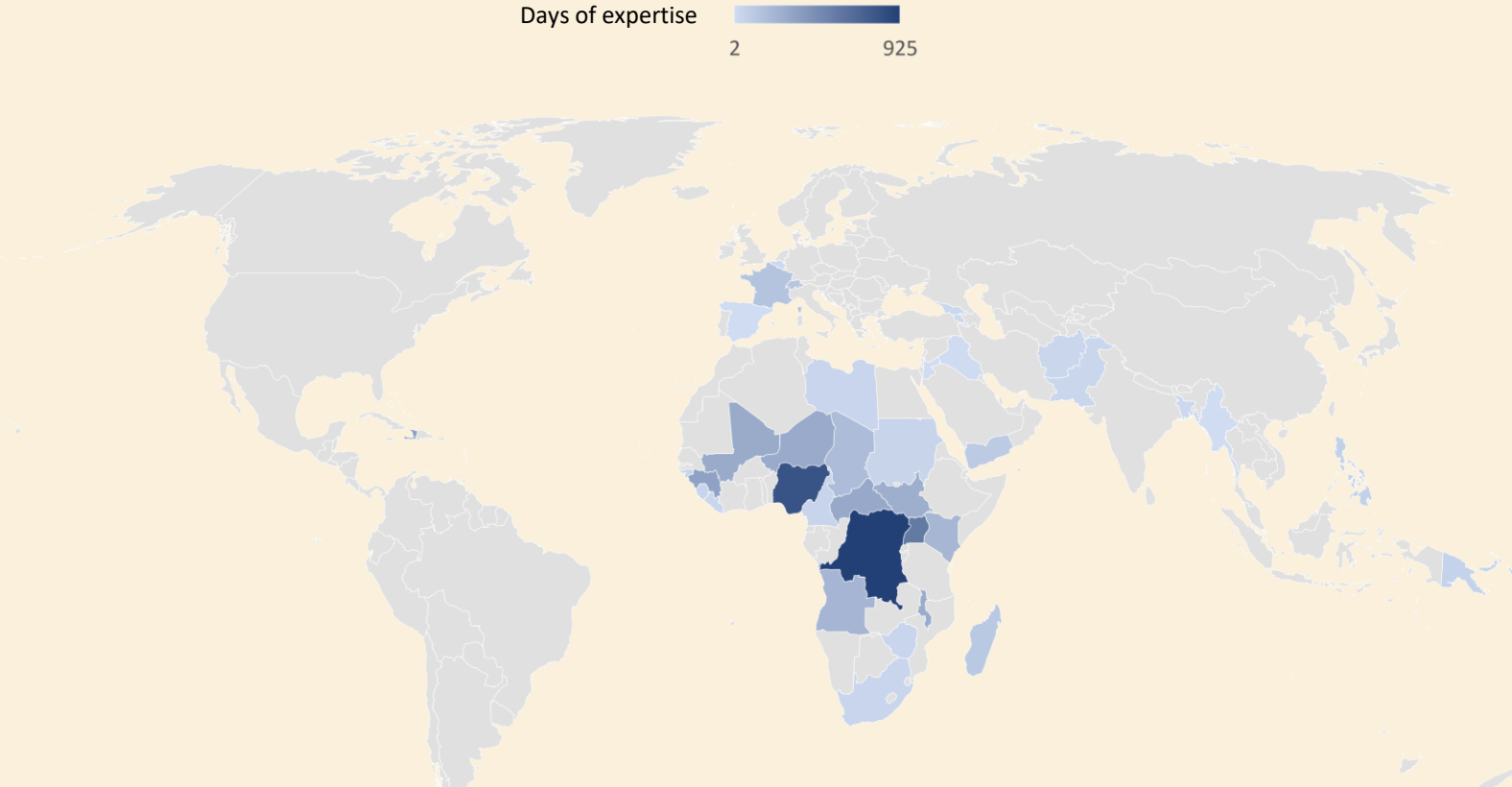
€17.2 million in resources enabling Epicentre to carry out projects for MSF, including €12.5 million in funds raised by MSF from the public and €4.7 million from external funders.

# Key figures for 2023

## Number of days of expertise per disease




## Number of days of expertise per country



# Malaria

## Combining programme support and research

### Rapid diagnostic tests (RDTs)

Currently, RDTs using the HRP2 marker are compromised by the emergence of *Plasmodium falciparum* with mutations preventing expression of the *pfhrp2* and *pfhrp3* genes. The prevalence of these mutations varies from country to country. An Epicentre study in collaboration with MSF is underway to assess the prevalence of these mutations in South Sudan.

### MDA strategy in Ituri, DRC: coverage and impact on prevalence, morbidity, and mortality

For several years, MSF-Switzerland has been carrying out mass distributions of anti-malarial drugs (MDA) in part of the Angumu health zone, Ituri, in response to high malaria mortality. Since 2021, Epicentre has been evaluating their impact. First finding: MDA coverage is high at nearly 85%. The prevalence of malaria varies significantly between intervention zones: 62.4% in the routine zone without MDA or indoor residual spraying (IRS), 58.4% in zones with IRS, and 30.3% in the zone with MDA. In addition, the crude mortality rate and infant mortality rate were higher in the routine zones than in those using MDA.

### SMC strategy in Chad

Over the years, Epicentre has described the performance of seasonal malaria chemoprevention (SMC), a treatment based on sulfadoxine-pyrimethamine (SP) and amodiaquine (AQ) administered to children under five at one-month intervals during the transmission season, deployed in the Moïssala district in southern Chad since 2013 by MSF in collaboration with national and local health authorities. Evaluation of the dynamics of malaria cases and hospitalisations over time and the expected impact of the strategy according to the implementation model adopted has led to the extension of the SMC to 5 distribution cycles in 2021, with the 1st cycle starting earlier in the transmission season. Further modelling work is underway to identify the most effective SMC implementation model and to assess the impact of other prevention strategies (such as vaccines) combined or integrated with SMC.
Another study is evaluating changes over time in the proportion of *Plasmodium falciparum* infections presenting mutations associated with resistance to SP (dhfr/dhps) and AQ (*pfcrt/pfmdr1*). Initial results confirm an increase in these resistances, in particular an increase in quintuple mutants (*dhfr* and *dhps*), possibly associated with reduced clinical efficacy.

### DeTACT trial, multi-country including Niger

In view of the recent emergence of resistance to artemisinin and related drugs in Asia and Africa, the DeTACT study assessed the efficacy and safety of artemisinin derivative-based triple therapy (TACT) versus standard combination therapy (ACT): AL, AL+AQ, ASMQ, ASMQ+PPQ. In Niger, preliminary results favor a better post-treatment prophylactic effect with TACT compared with ACT and no signs of artemisinin resistance were observed. Further results will evaluate PCR-corrected efficacy, pharmacokinetics, pharmacodynamics and investigate the outcomes from the other study sites.

135 days of expertise

Chad, DRC, Niger, South Sudan

6 projects in 2023

**Coming soon**
Study on the R21/Matrix-M vaccine: Since October 2023, the World Health Organization (WHO) has been recommending the R21/MM vaccine to prevent malaria. It is the 2nd antimalarial vaccine recommended by the WHO, after the RTS, S/AS01 vaccine. In Chad, a clinical trial comparing two strategies for implementing vaccination with R21/MM is currently under discussion.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# Nutrition

## From clinical research to diagnosis and care management

### A long experience of the Niger research centre

More than 50% of children hospitalised for severe acute malnutrition (SAM) develop complications linked to diarrhea, which are associated with a poor prognosis and a mortality rate of 21%. Recommendations for the rehydration of children with SAM are being debated because of their conservative nature. The GASTROSAM trial, supervised by Epicentre's Niger centre, aims to evaluate standard rehydration strategies (intravenous and oral), usually used in children without SAM, in children with SAM and diarrhea. The study is taking place in Kenya, Uganda, Nigeria and Niger under the supervision of Epicentre.

The Epicentre research centre in Niger is coordinating the MDF study, which is evaluating the efficacy and safety of a food targeting the microbiota to promote lasting nutritional recovery in children suffering from uncomplicated acute malnutrition. With Plumpy'Nut, while the children appear to recover in terms of body mass, their intestinal flora remains altered, which seems to have an impact on their long-term growth. The hypothesis is that the new therapeutic food formulation will have an effect on children's growth through its action on the microbiota.

The TB-ALGORIT-SAM study is evaluating the diagnostic performance and feasibility of two new treatment decision algorithms for pulmonary tuberculosis in children with SAM in Niger (to find out more, see the tuberculosis factsheet).

### And in other countries

Using prospectively collected routine programme data, among children aged 6-59 months in Katsina State, north-west Nigeria, case-fatality rates and relative risks by SAM diagnostic category, stratified by age group, were calculated. The results suggest that children with a low WHZ (weight-for-height ratio) on admission have a higher risk of dying and require special attention.
In addition, a study is underway to determine whether criteria can be used to identify children suffering from moderate acute malnutrition who carry a high risk of mortality, based on the 3 cohorts from Katsina in Nigeria, Niger and Burkina Faso.

### Opening up to patient-centred care

Malnutrition in young children can have potentially irreversible long-term consequences, particularly in terms of cognitive development. Early psychosocial stimulation of malnourished infants and young children has shown benefits for cognitive and social development. StimNut is a mixed-methods study evaluating the feasibility of integrating a psychosocial stimulation intervention into standard nutritional care for SAM children aged 6 to 23 months in Koutiala, Mali.

414 days of expertise

Burkina Faso, Chad, Kenya, Mali, Niger, Nigeria, Uganda

7 projects in 2023

Coming soon

**Large-scale implementation of StimNut**

The StimNut approach will be deployed in several countries after a phase of adapting the strategy to each context. Evaluation of the implementation of these strategies should make it possible to formulate specific recommendations for integrating these practices into MSF programmes.

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# Hepatitis E

## Influencing healthcare recommendations and policies

In response to an increase in cases of hepatitis E in the Bentiu camp for displaced persons, MSF and the South Sudanese Ministry of Health have implemented the first mass reactive vaccination campaign against the hepatitis E virus, using the three-dose recombinant vaccine, Hecolin®, in 2022. To date, there is no specific treatment for hepatitis E, whose mortality rate can exceed 25% in pregnant women, increasing the risk of spontaneous abortions and stillbirths. Recommended since 2015 by the WHO to limit or prevent epidemics and mitigate negative consequences in high-risk groups, such as pregnant women, Hecolin® has proved effective in preventing the disease in clinical trials but has never been administered in the context of an epidemic. Three vaccination campaigns took place in Bentiu in March, April, and October 2022, targeting 26,848 people aged between 16 and 40, including pregnant women. A total of 39,764 people received one dose, 26,110 two doses, and 14,293 three doses.

### Effectiveness of the two-dose vaccine

MSF and Epicentre set up enhanced surveillance and carried out a case-control study to estimate the effectiveness of the two-dose vaccine (VE). Incidence fell after the first mass reactive vaccination campaign against hepatitis E. Preliminary estimates of VE suggest that the short-term protection provided by this reduced-dose regimen may be high and potentially sufficient to respond to epidemics.

### Little reluctance to vaccinate and few side effects

At the end of the 3rd vaccination round, interviews were conducted with a representative sample of 1,599 people eligible for vaccination. The results showed that 86% of the eligible population had received at least one dose, 73% at least two doses, and 58% all 3 doses. Overall, the vaccination campaign was well accepted by the population of the Bentiu camp, with few reports of undesirable side-effects.

### Monitoring a cohort of pregnant women

To address the lack of evidence on the safety of Hecolin® in pregnant women, Epicentre has documented the results in a cohort of vaccinated and unvaccinated pregnant women. The results will be presented in 2024.

132 days of expertise

South Sudan

1 project in 2023

**Coming soon**

In early 2024, in response to an epidemic in Fangak, one of the most remote areas of South Sudan, MSF launched a vaccination campaign targeting women aged between 16 and 45. At the same time, Epicentre is carrying out a survey on vaccination coverage, passive surveillance of adverse events, and a qualitative study on the acceptance of this strategy exclusively targeting women.

It should also be noted that the study in Bentiu has contributed or will contribute to

- Creation of a stockpile by the International Coordination Group (ICG) for the supply of vaccines
- Pre-selection in the GAVI portfolio
- Inclusion of data in vaccine approval dossiers


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# Tuberculosis

## Proven expertise recognised within MSF and beyond

### Combating the burden of under-diagnosis

Diagnosis of pulmonary tuberculosis (TB) remains complex. Chest X-rays are a useful tool for screening and diagnosis. In low-income countries, a chest X-ray is often performed as the first line of defense for people presenting with symptoms or belonging to populations at high risk of TB in order to identify those who should benefit from a molecular confirmation test. In Manila, Philippines, MSF is using artificial intelligence algorithms to analyse the X-ray for abnormalities suggestive of pulmonary TB. Epicentre has evaluated the algorithm's prediction scores according to the positivity rate of the molecular tests to identify the one that guarantees the best screening.
In a study in Papua New Guinea, Epicentre also helped to show that ultrasound for the diagnosis of pulmonary TB had a sensitivity comparable to that of chest X-ray.

### More effective and less restrictive therapies

Epicentre is collaborating on the endTB project (Expand new drug markets for TB), led by MSF, Partners In Health, and Interactive Research and Development, and funded by Unitaid. It includes a multicentre prospective observational cohort evaluating the safety of bedaquiline and/or delamanid-based treatments for multidrug-resistant TB in children and adults in 17 countries. The results showed that these treatments generate few adverse events, guarantee a better quality of life for patients, and result in fewer treatment interruptions. They offer a safe and effective therapeutic alternative for patients resistant to numerous anti-tuberculosis drugs.
The endTB project also includes a clinical trial, the results of which support the use of three new treatment regimens whose efficacy and safety are comparable to those of conventional treatments to treat multidrug-resistant TB (MDR-TB) or rifampin-resistant TB (RR-TB), while reducing the duration of treatment by half. In addition, the trial highlights the potential of a fourth treatment regimen as an alternative for people who cannot tolerate bedaquiline or linezolid; one of these two drugs is included in all the treatment regimens currently recommended by the WHO for MDR-TB.
The Epicentre research centre in Mbarara, Uganda, is taking part in the IntenseTBM study coordinated by the University of Bordeaux and Inserm, sponsored by ANRS and funded by EDCTP, which aims to reduce mortality from the most fatal and disabling form of TB, tuberculous meningitis. In sub-Saharan Africa, mortality due to tuberculous meningitis is as high as 40% in HIV-uninfected patients and up to 70% in people living with HIV. This multicentre clinical trial is based on intensifying treatment in the first two months by administering high-dose rifampicin and combining linezolid with the usual drugs, isoniazid, pyrazinamide, and ethambutol, which are administered in standard doses. The benefit of a complementary aspirin-based treatment to reduce mortality and complications will additionally be evaluated, with or without the intensified anti-tuberculosis treatment. By mid-2023, 50% of participants were already recruited.

596 days of expertise

Burkina Faso, Chad, Guinea, Mali, Niger, Nigeria, Uganda

14 projects in 2023

**Coming soon**

The TACTiC project - Test, Avoid, Cure TB in Children - was launched in mid-2023 by MSF with the aim of improving the diagnosis of TB in children in at least 12 countries in Africa and Asia. This project implements the new WHO recommendations, including two new treatment decision algorithms aimed at increasing the number of children diagnosed and put on treatment. Epicentre is leading the operational research evaluating the effectiveness and acceptance of these algorithms.

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# Ebola

## From data collection to complex analysis

### Added value for MSF and Ministries of Health…

During the recent Ebola epidemics, as various actors and MSF sections intervened in complex and evolving contexts covering diverse and geographically dispersed areas, Epicentre contributed to the coordination and support of epidemiological activities.
During the 10e Ebola epidemic in the DRC, Epicentre developed new tools to facilitate global coordination and support for epidemiological activities.
These tools include:

- Monitoring tools (databases and registers) to systematically collect patient data,
- Automated reports for more effective communication, and
- A web platform to display data on case management and the evolution of the epidemic visually, using graphs and tables, accessible to all partners via secure access.

Today, these data are providing major information on intervention strategies, from decentralised care models and triage algorithms to field evaluation of RDTs and the effectiveness of the rVSVΔG-ZEBOV-GP vaccine, which is recommended for use during epidemics. In an epidemic situation, Epicentre has now confirmed that this vaccine is just over 80% effective in reducing the risk of infection, and that vaccination protected all Ebola patients from death, even those who had received the vaccine shortly before the onset of symptoms, after having been exposed to a person infected with the Ebola virus.

### … and at the service of clinicians

The management of Ebola cases also benefits from the analysis of patients' clinical descriptions. Using cumulative data, it is possible to assess the probability of patients surviving from the time of admission, based on the qPCR cycle threshold. It can also be used to identify sub-groups of patients requiring specific treatments and to estimate the proportion of hospital days required. External validation of the PRedicting Ebola Death risk Score (PREDS) could be used to predict in-hospital mortality in patients receiving advanced care. At the same time, the development of a clinical deterioration score will make it easier to assess changes in patients' state of health in real time, offering invaluable assistance in adapting treatment strategies as effectively as possible.

408 days of expertise

DRC, Uganda

7 projects in 2023

Coming soon

Studies are continuing to capitalise on the data collected, analyse the triage algorithm, and draw up protocols for evaluating Ebola RDTs to be implemented during an epidemic, develop a risk stratification tool for defining high-risk contacts by analysing historical data from treatment centres, and define comprehensive protocols for post-exposure prophylaxis.

# Cholera

## Finding solutions with local players, using external funding

### Reduce response times

One of the questions Epicentre is tackling with funding from GAVI is how to integrate RDTs into cholera surveillance in the DRC and Niger. The reference method for diagnosis is culture or PCR from stool samples, which requires a laboratory and often leads to long delays. Added to this is the fact that most cases are not tested. Although simpler and faster, RDTs have limitations in terms of the accuracy of their results, and the question remains as to whether they can replace the reference test for identifying a cholera epidemic, and whether their results are sufficient to estimate the true incidence of cholera in areas with very different incidences. The study also assesses their sensitivity and specificity in comparison with reference diagnostic methods, under real-life conditions and in different endemic contexts. The other point tackled by the study is the sampling strategy, or in other words which patients should be tested by RDT among suspected cases in order to determine the true incidence of cholera.
The CATI (Case-Area Targeted Intervention) strategy deployed by MSF in the DRC aims to provide a rapid package of interventions to people living in high-risk areas around a detected case. It combines antibiotic chemoprophylaxis, hygiene promotion interventions and the distribution of hygiene kits, as well as a dose of oral vaccine, within a 100-metre radius of index cases. Preliminary results show that rapid implementation of CATI with vaccination is feasible, and that coverage is satisfactory.

### Analysing the obstacles and unknowns for vaccination

Also in the DRC, a Wellcome-funded study is assessing the impact of preventive oral vaccination campaigns in high-risk areas and the transmission of cholera. The preliminary results provide initial guidance for implementing vaccination campaigns. In the urban area of Goma, the multi-stage, patchy vaccination strategy and population movements have tended to dilute vaccination coverage. The high vaccination coverage in the rural area of Bukama, on the other hand, seems to be attributable to a vaccination strategy that is well adapted to the population's way of life. In Goma, the consumption of surface water or water delivered by truck appears to be a risk factor for cholera infection, while in Bukama, the risk appears to be associated with the public distribution system.
In collaboration with the Guinean Ministry of Health and with financial support from the Grieg Foundation, MSF-Belgium, with the support of Epicentre, is conducting a clinical trial to determine the optimal interval between two doses of oral cholera vaccine. The trial is assessing whether the immune response to two doses of oral cholera vaccine given 6 or 12 months apart is at least as good as that obtained by administering the second dose of vaccine according to the manufacturer's instructions, i.e., two weeks after the first.

312 days of expertise

DRC, Guinea, Niger

9 projects in 2023

Coming soon

Wellcome-funded retrospective modelling analysis of the impact of reactive cholera vaccination campaigns in several countries


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# Measles

## Finding solutions with local players

### Urgepi: a vast project to curb measles epidemics

Epicentre is working with MSF on the Urgepi project, one of whose aims is to develop an algorithm for prioritising measles epidemic alerts in the Grand-Katanga region of the DRC. The Urgepi strategy uses a risk-targeted approach, in which more resources are allocated to geographical areas with a higher risk of major epidemics. It includes preventive vaccination, enhanced surveillance, and reactive interventions. According to the data analysed, selecting high-risk areas based on low vaccination coverage can be a simple and effective alternative to the current model-based strategy for identifying them. This approach made it possible to limit the occurrence and scale of measles epidemics in several health zones in the Katanga region in 2021/22.

The Urgepi project has also enabled the opening of a 2nd laboratory in Lubumbashi - in addition to the one in Kinshasa - with the capacity to carry out ELISA tests to detect anti-measles IgM. To implement a reactive vaccination campaign in the DRC, it is necessary to confirm two or three cases (depending on the health zone) using ELISA tests on serum samples. Although the situation has improved slightly with this 2nd laboratory, serum samples are often still not sent out or are sent out with delays of up to several weeks, which degrades their quality and makes the results unreliable. As an alternative to serum, the WHO recommends the use of DBS (dried blood) when it is impossible to transport serum samples. However, their performance in routine surveillance and their acceptance among health staff and local transporters have not yet been demonstrated in the DRC. A study launched by Epicentre will explore these aspects.

### Anticipating the spatio-temporal risk of measles epidemics in Niger

Thanks to an R2HC grant from Elhra, Epicentre is developing three new complementary statistical tools to better anticipate and predict measles epidemics in Niger:

- Pre-season: a statistical model to classify the 72 districts according to their epidemic risk (i.e. low, medium, high) based on the number of cases reported retrospectively over the last 20 years, vaccination activities/coverage, and other identified risk factors.
- At the start of the season: an alert algorithm to quickly and reliably identify districts showing signs of an emerging epidemic.
- Throughout the season: weekly prediction of short-term measles incidence at district level, to identify trends and prioritize districts for resource allocation.

207 days of expertise

DRC, Niger

8 projects in 2023

**Coming soon**

Development of easy-to-use decision-making tools for the preventive and reactive allocation of measles vaccine, with funding from the WHO. The study will be based on the following work packages: (i) identification of outbreaks requiring immediate intervention, (ii) prioritisation of vaccine allocation during preventive activities, and (iii) prioritisation of vaccine allocation during reactive activities.

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# Research centres in Niger and Uganda

## A regional base to provide a better response to the health challenges facing sub-Saharan Africa

### The Niger Research Centre

Set up in 2005 in Maradi, the Centre has 200 staff working on epidemic investigation and response, clinical trials, laboratory testing , data management, quality control, logistics, and administrative activities. Collaboration with the Ministry of Health, the University of Maradi, and Cermes is an important asset that fosters partnerships and enhances the effectiveness of initiatives. In addition, proximity to MSF improves operational coordination. The efforts made to support the Ministry of Health are illustrated by epidemic surveillance projects such as ALERTE on diseases with recurrent epidemic potential and the R2HC project specific to measles (see p. 14). The Research Centre has extensive experience in the field of nutrition, enabling it to conduct studies on new nutritional supplements (MDF, see p. 9) and the management of dehydration in children with SAM (GastroSAM, see p. 9). In addition, support for capacity building for the R21 malaria vaccine trial beyond Niger's borders underlines the organisation's regional influence and expertise. Despite these strengths, challenges remain, notably the need to continue activities in a context of geopolitical instability, to overcome the difficulties caused by the blockage of cargo ships, and to ensure the co-construction of new projects with existing and new partners.

### The Uganda Research Centre

At the heart of the Mbarara University Hospital Centre, the Uganda Centre has an experienced team of doctors, nurses, epidemiologists, statisticians, biologists, laboratory technicians, logisticians, and administrators. With its Good Clinical Laboratory Practice (GCLP) accredited laboratory, it is recognised for its ability to carry out multi-centre therapeutic and vaccine trials on yellow fever, Ebola, tuberculosis, malaria, and HIV. It collaborates with the Ministry of Health, the Mbarara University of Science and Technology and other regional centres of excellence. The ZEBOVAC trial is one of many examples: conducted by Epicentre and sponsored by the MRC/UVRI/LSHTM, it assessed the safety and immunogenicity, measured by ELISA, of the Ad26.ZEBOV/MVA-BN®-Filo vaccine. In addition, the Centre's long experience in the field of tuberculosis means that it is now a pilot site for the project, on which other sites will be able to build. The CONTACT study, coordinated by the Institut de recherche pour le développement (IRD) and for which the Centre was one of the study sites - the other being in Cameroon - demonstrated the effectiveness and economic impact of a community-based tuberculosis screening and preventive treatment intervention for children living in contact with a patient suffering from the disease.
However, challenges remain, including strong regional competition, diffulties for the retention of trained staff, and the desire to position the Centre as a reference site for studies in paediatric oncology, which is an emerging theme for MSF.

Niger, Uganda

17 projects in 2023

Coming soon

- Case-control study to assess the real-life effectiveness of the new pentavalent meningococcal meningitis vaccine (MenFive) in Niger
- Development of a new warning algorithm for the early detection of measles epidemics in Niger and statistical models to predict them, with funding from Elhra
- Following on from the DeTACT project carried out in Niger (see p. 8), a qualitative study to inform stakeholders and policy-makers of the imminent availability of a fixed-dose triple combination of artemether-lumefantrine plus amodiaquine (ALAQ), followed by the development of a roadmap for its deployment in Uganda, by the Mbarara centre, in collaboration with MORU.
- Post-TB SIQ study, funded by the ANRS, coordinated by the IRD and supervised by Mbarara centre to assess the association between the presence of post-tuberculosis pneumonitis and deterioration in quality of life in the medium and long term in people who had been treated for pulmonary TB in 5 therapeutic trials conducted in Benin, Guinea, and Uganda.

# Training

## Building the capacity of MSF staff

Epicentre offers a range of training courses designed to equip MSF staff with the skills and knowledge they need to deal with a variety of emergency situations. These include the Populations in Precarious Situations (PSP) training course, which prepares MSF staff to respond to humanitarian emergencies, and the Response to Epidemics (RepEpis) training course, which provides participants with the knowledge and tools to be attentive and responsive to diseases with epidemic potential. In addition, certain training courses can be developed on request and delivered directly in the field, according to the specific needs of missions.
The training offer has recently been strengthened by the Field Epidemiology Training in Humanitarian Contexts (FETCH) which started in October 2022 with a cohort of 7 epidemiologists. In 2023, this project obtained ICT funding from MSF to continue its development and welcome a new cohort.

### FETCH, training in field epidemiology for humanitarian contexts

This one-year training course will enable epidemiologists to acquire sufficient autonomy to manage the surveillance and investigation of epidemics and carry out population surveys as part of MSF operations and in complex emergency contexts. This epidemiological expertise will complement the operational response capabilities and resources provided by Epicentre to MSF to deal with epidemics, to describe and analyse the health situation of populations to better guide programmes, and to pursue research to propose solutions adapted to populations living in unstable conditions or with inadequate access to healthcare.

### Teaching outside the classroom

Epicentre also contributes to international public health, tropical medicine and epidemiology in the field through various presentations at universities and training courses organised by its partners (Institut Pasteur, WHO, UNICEF, ECDC-EPIET, etc.).
Epicentre's epidemiologists are involved in a number of university diplomas, including Sorbonne University's DIU International Health and Tropical Medicine with the Hôpital de la Pitié Salpêtrière-AP-HP, the Master's in Global Health Emergencies at the University of Bristol, the DU in Tropical Medicine at the University of Rennes, the DU Montpellier/ DIU / DESIU Tropical and Mediterranean Medicine - International Health and the Diplôme d'expertise dans la gestion des interventions d'urgence sanitaire at Henri Mondor - SAMU de Créteil.

538 days of expertise

Belgium, Cameroon, DRC, France, Kenya, Senegal, Sri Lanka

12 training courses and 264 staff MSF trained in 2023

Coming soon

Recognition of FETCH as a university degree within ISPED

1ère FETCH cohort

# Beyond the past year: Challenges and prospects for the future

Throughout the year, Epicentre pursued its mission of improving access to quality healthcare for people living in precarious situations. This mission guides all our actions, and our projects are designed from the outset with a view to their practical implementation on the ground.

### Working alongside MSF

This report has provided an opportunity to take stock of some of our flagship projects and those due for completion in 2023. However, our portfolio of activities is much broader and more diverse. Many other studies or activities in support of MSF's operations are ongoing or under development. Epicentre supports MSF in responding to epidemics, by participating in surveillance activities, collecting data, and deploying tools to better inform monitoring and response. The data science team plays a vital role in providing valuable data that can then be analysed and used to understand the health situation, identify risk factors, deploy aid programmes for populations, and warn of emerging problems. The *Outbreaks Tools* project*, for* example, is designed to meet the need for data standardisation and to ensure the rapid implementation of *linelists to* improve the quality of collected data. In addition, interactive *dashboards,* offer the possibility to view all the available data in just a few clicks and make accessing them more democratic. These data can take the form of tables, graphs or maps, making it possible to track the evolution of an epidemic over time, the evolution in the number of cases or hospitalisations and their geographical location.

As well as exploring new areas, Epicentre is continuing its commitment to fields of expertise such as neglected tropical disease. As part of a consortium coordinated by *DNDi*, a phase 2/3 clinical study has shown that fexinidazole is highly effective in treating sleeping sickness caused by *T.b. rhodesiense*, and that it is a safe alternative to existing drugs. In late 2023, the European Medicines Agency issued a favourable opinion on the use of fexinidazole as the first oral treatment for human African trypanosomiasis *rhodesiense*. Building on previous successes and the complementary nature of *DNDi* and Epicentre, new collaborations are being discussed in the field of neglected tropical diseases.

Antibiotic resistance is a growing concern on the African continent with which MSF is confronted in many of its fields. Epicentre has long been involved in monitoring antimicrobial resistance. A recent study in Niger and Uganda highlighted that healthcare workers face many challenges in prescribing and administering antibiotics, resulting from individual, institutional, and economic factors. Using the data collected by WHONET, the WHO's microbiological data management and analysis system, Epicentre's *data scientists* and epidemiologists can now draw up cumulative antimicrobial susceptibility reports at the local level, providing guides to help healthcare workers make empirical decisions about antibiotic therapy, as well as raising awareness of resistance at the project and national level. Analyses in Mali, Yemen, Niger, and the Central African Republic show a high level of resistance in paediatric and surgical programmes.

All these examples show that Epicentre is a unique place to answer the questions MSF teams are asking, to provide key information for defining the priorities of MSF's programmes, and *ultimately to* provide solutions to improve access to quality healthcare.

Our dual roots in research and operations are an asset for strengthening strategic partnerships with the academic, medical and research communities in the countries and regions where we operate, collaborating with local health authorities and other stakeholders, and serving as a platform to other institutions.

Our simultaneous focus on research and training means that MSF's field teams are better able to work with epidemiological data and question their own practice. The FETCH training course fits perfectly into this dynamic.

To reinforce this mission, Epicentre has set several objectives for the coming years, including expanding and diversifying our areas of expertise, consolidating our position, particularly within MSF, strengthening our regional roots and the impact of our studies; all while remaining open to development opportunities.

### Further regionalisation

The research centres in Niger and Uganda provide the essential infrastructure for a wide range of projects and ensure that Epicentre maintains strong regional positioning and links with local institutions. The development of these centres over the last few years bears witness to their maturity and their ability to take on increasingly ambitious initiatives. They are the pillars on which we can build as we continue to expand our presence in Africa.

By strengthening our partnerships and exploring new approaches, we aim to broaden the scope of our programmes and increase their positive impact on public health. The development of the human and social sciences within Epicentre will allow us to better understand the role of beneficiaries in the implementation of our projects, by working with them to develop research that meets their needs.

In the coming years, Epicentre will continue to evolve in order to respond even better to MSF's needs while maintaining its model at the crossroads of humanitarian action and research. The new strategic plan for 2026-2029 will be drawn up in conjunction with MSF's various sections and should ensure that we create common areas for co-decision and co-construction on the major issues of the future.

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