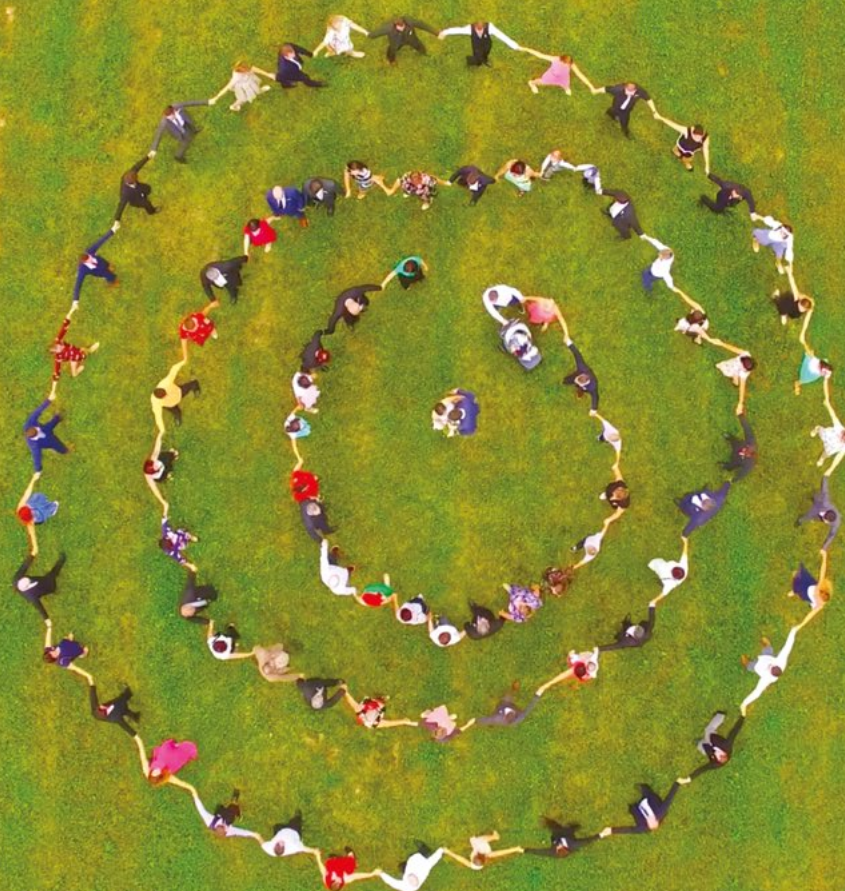




Social Report **2020**



Letter from the President

This is a time in our lives, like none other.

The emergence of the COVID-19 pandemic has undoubtedly been a serious threat to all our lives, but also a driver to expand our focus and work towards shedding light on the unknown.

Throughout the pandemic, we have worked to keep our studies active by readjusting procedures to meet the changing times that forced families and children into lockdown, while ensuring they could continue to participate safely. True to our mission, we have worked with our Penta ID Network to ensure we minimized any additional strain on clinical staff and prioritized the need for health professionals across clinical sites to support all children and families during this emergency.

Despite this challenge, we have achieved some **remarkable successes** this year. We concluded the ODYSSEY trial, completed enrolment into two studies, eight new projects kicked-off, our PentaTr@ining moved online and we published a number of important peer-reviewed papers. Overall, Penta has continued to grow, and we are proud of what we have been able to achieve, thanks to our collaborators' untiring commitment.

While the COVID-19 pandemic continues to produce uncertainty, it is also bringing out **the best in our researchers**, who have taken on the challenge of COVID-19 to find solutions for our most vulnerable. This is evident from the success of our new COVID-19 research portfolio, with 65% of funding applications submitted in 2020 receiving approval. We are incredibly thankful to our entire Network for making this possible.

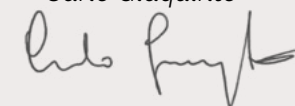
This year has led to us all adjusting to a new virtual world. We have not been able to maintain our face-to-face meetings throughout the pandemic, however our desire to stay connected has led to us finding new ways to work with our Network members and collaborators. We initiated a series of clinical webinars and opportunities to discuss and share information on child health matters, including COVID-19 from across the globe. These discussions have been vital to the continuation of our work and highlighted the need for **child-focussed research** to understand the direct and indirect impact of SARS-COV-2 on child health and the role of children in the transmission of the virus.

Our goal is to keep **child health at the top of the global research agenda** and ensure that we are filling the knowledge gaps and providing regional and global overviews. We are continuing to work with the WHO and other global collaborators to build capacity for preparedness around COVID-19 and future emerging infections that have the potential to harm maternal and child health. We have expanded our network by establishing new partnerships with organizations and researchers with different backgrounds and skills.

This report on our 2020 activities is an appreciation for all the work carried out in Penta and the Penta ID Network, which works towards our vision to improve the prevention, diagnosis and treatment of infection in children through **excellent clinical science**. Our work has never been more important.

We are grateful to the Penta ID Network members, the Foundation staff and all partners for their continued support. We are extremely proud of the children, adolescents and their families who have continued to participate in our research. It is our hope that we will contribute to better understanding and managing this pandemic, just as we have been doing for HIV and other paediatric infections.

Carlo Giaquinto





Throughout the pandemic, we have worked **to keep our studies active** by readjusting procedures to meet the changing times that forced families and children into lockdown, while ensuring they could continue to **participate safely**

1.

ABOUT US

We are an **independent global collaboration** devoted to determining and implementing the **best ways to prevent, diagnose and treat** diseases in children



Our vision

To be at the forefront of clinical science that improves prevention, diagnosis and treatment of infection in children



Our mission

To build a global network that conducts excellent research to help health systems achieve optimal outcomes for children



What makes us unique

**One network
One vision
One voice**



Our network of collaborators and investigators share our vision. We are all convinced of the power of our partnership and are serious about improving prevention and treatment options for children with infection everywhere – for good.

Our values

**Sharing,
understanding
and belonging**



We encourage and support the sharing and exchange of ideas, innovations, data and proposals within the network, and we value every contribution.

Our guiding principles

Inclusion, team spirit, responsibility, transparency



As an international collaborative platform coordinating and undertaking research designed to improve child health and combat infections – we include and respect investigators throughout our network. Making space for all those passionate about our mission is something we pride ourselves on – we seek to create a genuine platform for teams to build a body of research that counts for children's wellbeing.

About Penta

Penta is an alliance of people united by a common vision

The Paediatric European Network for Treatment of AIDS (Penta) was established in 1991 as a collaboration between paediatric HIV centres in Europe. The primary aim of the Network was to undertake **independent clinical trials** to address specific questions about antiretroviral therapies in children living with HIV.

Funding received from the European Union, international organizations (such as UNICEF and the World Health Organization), the pharmaceutical industry, the English Medical Research Council (MRC), France's INSERM and Italy's Istituto Superiore di Sanità (the research branch of the Ministry of Health) has helped Penta investigators answer critical issues in HIV care.

Over time, as the network started to grow beyond HIV clinical trials and observational studies, Penta became an ideal platform to generate, develop and support research

and training activities – and thus the **Penta Foundation** was born.

Recognising that other infections in children were similarly neglected, in 2011, Penta evolved into **Penta ID** (Infectious Diseases), extending its research (both clinical and basic) to other paediatric infectious diseases. With the growing threat of antimicrobial resistance – Penta has since built an ambitious and unique agenda to tackle antimicrobial resistance, developing prevention and treatment strategies for children and newborns.

1991

Penta
Paediatric European Network for Treatment of AIDS

2004

Penta Foundation
was set up, an Italian based non profit organisation

2011

Penta ID
Extension of network to address other Infectious Diseases

2016

Penta ID Innovation
For profit spin-off company

2019

Penta UK
Our UK based charity

2020

Penta ID Network
Launch of the 5-year scientific strategy

From the initial focus on HIV to the broader area of PID and paediatric medicines and vaccines

Our Objectives

Penta does so much more than clinical studies: we have large observational and cohort studies, pregnancy studies, a basic science platform across the different key scientific areas, pharmacology, social science, training and educational programmes. We have developed a unique and ever-growing network of investigators who are leading champions for child health in their home countries.

In order to continue on this ambitious path, Penta has established five objectives for the next 5-years.

To create

a vibrant network of experts and investigators generating solutions for children's health, notably infections

To develop

impactful research on prevention, diagnosis and treatment and management of infections in children

To develop and deliver

training and education programs for clinical providers and researchers that ensure high quality of care and research

To form

partnerships and consortia that collaborate to drive research agendas and deliver impact

To build

the next generation of leading researchers in paediatric infectious diseases

Our Impacts

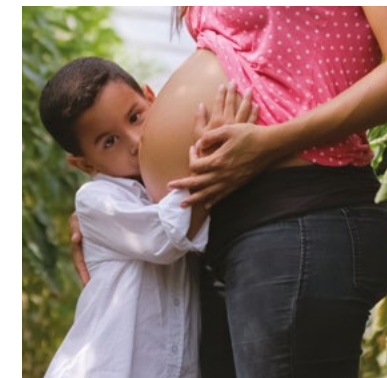


Infections prevented and treated in children, decreasing mortality, morbidity, Disability Adjusted Life Years & health care cost



Better and faster licensing and safety data for paediatric drugs

Better therapeutic and prevention options for children and in pregnancy



Better safety and therapeutic options for infections in pregnancy

Our key partners

Penta's clinical research is only made possible through our long-standing collaboration with three leading clinical trials centres MRC CTU at UCL (UK), INSERM (France) and PHPT (Thailand)

We have also entered into a number of framework collaboration agreements with other organizations that help us deliver our vision. In Italy, our key partners are the University of Padova and [Ospedale Pediatrico Bambino Gesù](#) (OPBG) in Rome. In Africa, we have a growing group of investigators, and we have formalised collaborations with our longstanding partners; [Joint Clinical Research Centre](#) (JCRC) in Uganda and [Makerere University](#) – John Hopkins University Research Collaboration (MUJHU), to ensure the delivery of the best care to Ugandan children.

In 2020, we have strengthened our collaboration with [Doctors with Africa CUAMM](#), a Non-Governmental Organization based in Italy. Together, we aim to develop programs to protect vulnerable communities in Sub-Saharan Africa.

The Global Accelerator of Paediatric Formulation – [GAP-f](#), which we contributed to set up, entered into its implementation phase this year. GAP-f is a WHO led innovative collaborative model that will accelerate the availability of optimized treatment options for infectious diseases such as HIV, tuberculosis and viral hepatitis

affecting children in low - and middle - income countries. Within this partnership, we are leading the Clinical Research Working Group, that will facilitate all the clinical research activities in the GAP-f portfolio.

Another one of our key partners is the Global Antibiotic Research & Development Partnership – [GARDP](#), which is committed to tackling serious and drug-resistant infections in children by accelerating the development of antibiotic treatments with a focus on global neonatal and paediatric strategic trials aiming to build the evidence base for public health interventions and inform treatment guidelines.

We continue to be involved at the regulatory level as a member of the European Network of Paediatric Research at the European Medical Agency ([Enpr-EMA](#)). Penta is also part of the WHO's Paediatric Antiretroviral Working Group ([PAWG](#)) and Paediatric Antiretroviral Drug Optimization ([PADO](#)).

[EPIICAL](#) (Penta's cohorts platform focused on HIV) has been refunded till 2024 including new world class laboratories and new cohorts from low and middle-income

countries. This collaboration is becoming a unique basic research asset for infections beyond HIV.

Thanks to [EPPICC](#) (European Pregnancy and Paediatric Infections Cohort Collaboration), we have expanded our partnerships further. The [EPPICC](#) collaboration has taken on the legacy of EUROCOORD, an EU funded Network of Excellence established in 2011 by the biggest HIV cohorts and collaborations within Europe: CASCADE, COHERE, EuroSIDA, and Penta. Today, EPPICC counts 12 pregnant cohorts in 9 countries and 24 paediatric cohorts in 18 countries in Europe and Thailand. By sharing scientific expertise and resources, the EPPICC cohorts are collecting safety data on antiretrovirals after their roll out into the market.

Finally, we have started new collaborations in the area of research on COVID-19. We will bring the expertise and capabilities of our Penta ID Network into [Vac4EU](#) (Vaccine monitoring Collaboration for Europe), an open community for scientific debate and study implementation around COVID-19 vaccines.

Our commitment to conduct research in close collaboration with African research institutions has been recognised by the **Italian National Institute of Health**. In their 2020 report, *The Italian health research in partnership with Africa: a survey on the ongoing projects*, Penta proved to be one of the institutions making the highest investment through collaborations with African health researchers and institutions at the benefit of children's health.

www.iss.it

Our passion for collaborative research and knowledge sharing never ends. We will continue to grow our Network of researchers and build new partnerships to expand our research and training

Since we started

TRAINING AND EDUCATIONAL PROGRAMME

TRAINING COURSES

70

DELIVERED TO **5000+**
HEALTHCARE WORKERS FROM
36 COUNTRIES

TYPE OF PROFESSIONALS TRAINED MAINLY DOCTORS

OTHERS INCLUDE:

- NURSES
- MEDICAL ASSISTANTS
- PHARMACISTS
- SOCIAL WORKERS
- PSYCHOLOGISTS
- NUTRITIONISTS
- PATIENT GROUPS
- MEDICAL STUDENTS
- RESEARCHERS
- EPIDEMIOLOGISTS
- HEALTH SERVICE PROGRAMME ADVISORS



8%

PER YEAR

INCREASE RATE OF
DELEGATES TRAINED

COURSES HAVE BEEN DELIVERED IN:

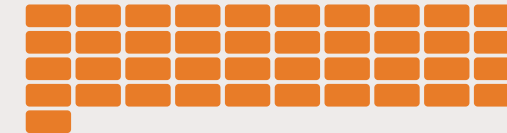
- ENGLISH
- RUSSIAN
- SPANISH
- FRENCH
- PORTUGUESE
- GEORGIAN

SINCE 2013 YOUNG **PEOPLE
LIVING WITH HIV** HAVE BECOME
INCREASINGLY INVOLVED
IN THE DESIGN AND DELIVERY OF
OUR TRAINING PROGRAMMES

STUDIES AND PROJECTS

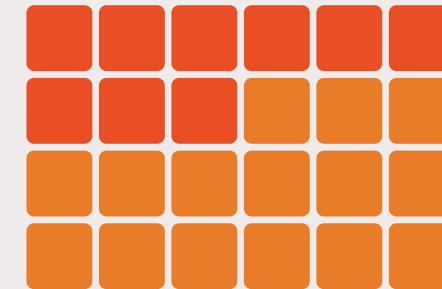
41

STUDIES



24

EU FUNDED
PROJECTS



9

COORDINATED
BY PENTA

15

IN PARTNERSHIP

MORE THAN

50,000

WOMEN AND CHILDREN ENROLLED IN OUR
STUDIES (SINCE 2012)

OVER

250

PEER-REVIEWED
SCIENTIFIC ARTICLES

2020 at a glance



TRAINING AND EDUCATIONAL PROGRAMME

TRAINING PROGRAMME
WITH DELEGATES FROM OVER
40 DIFFERENT COUNTRIES

4 **PENTATR@INING**
COUNTRY-BASED
COURSES

1 ONLINE “HIV &
OTHER CONGENITAL
INFECTIONS”
COURSE

LAUNCH OF THE PENTA
EDUCATION PROGRAMME:

151 HIGH SCHOOL STUDENTS

246 ADULTS TRAINED

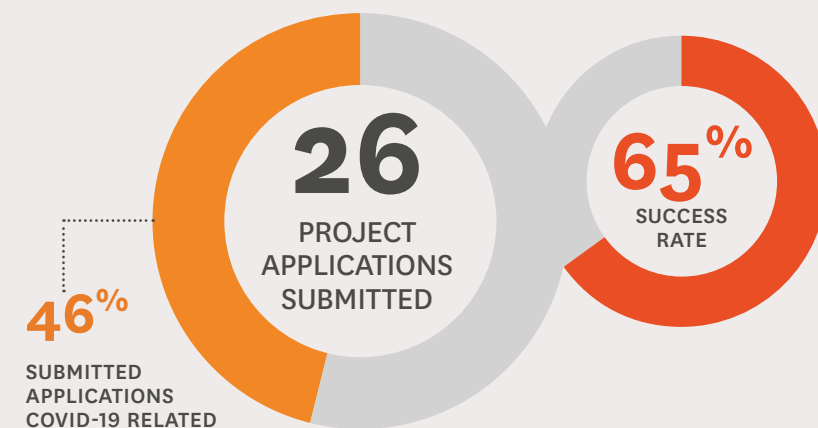
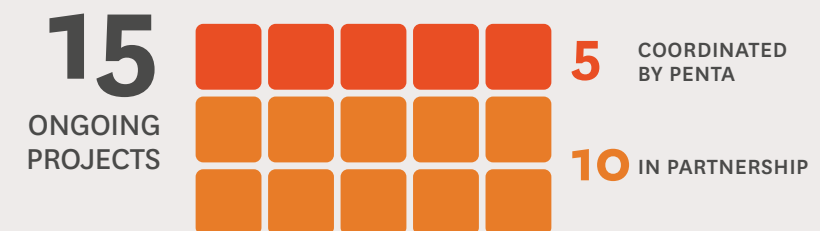
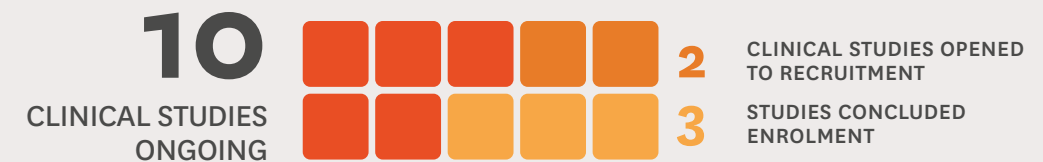
MORE THAN
110

ENROLLING SITES
IN **31** COUNTRIES ENGAGED
IN OUR STUDIES

TOTAL FUNDS
MANAGED BY THE
FOUNDATION

9.4 M EUROS

STUDIES AND PROJECTS



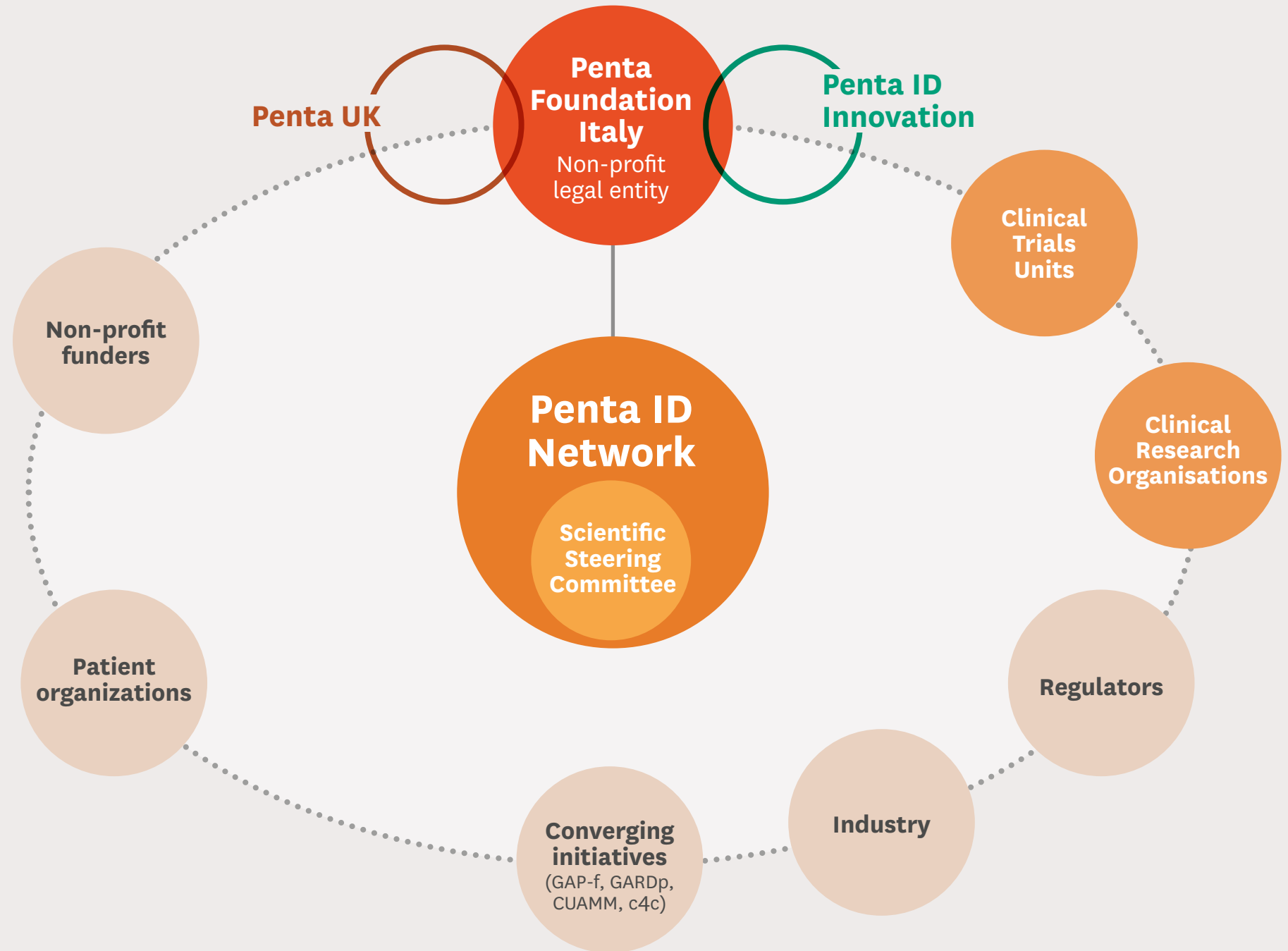
2. HOW WE OPERATE / ORGANIZATIONAL STRUCTURE

The flexible, multidimensional,
Penta environment



Our Stakeholders

The Penta ID Network is central to everything we do at Penta. With the skills, experience and expertise of all our Network members, the Penta Foundation, Penta Foundation UK and Penta ID Innovation, develop and deliver world class research and training to drive understanding and good practice around the management of infections in children



Penta ID Network

We support research that seeks to better understand both the dynamics of transmission and the best management of infections in pregnant women and children



The Penta ID Network reaches almost every corner of the world, with clinical sites and collaborators in Asia, Africa and the Americas, growing steadily since its initial set up in Europe back in 1991. Our members cover an incredible depth and breadth of expertise in the area of infections, including clinicians, trialists, basic researchers, educators and advocates.

We leverage this diversity in conducting research, world class clinical trials and training programmes. All with the aim to improve the lives of women and children through the generation and application of new scientific knowledge.

In 2020, we launched the 5-year Penta ID Network **scientific strategy**, with four key scientific priorities:

- HIV & viral infections
- Severe sepsis and antimicrobial resistance
- Pregnancy and vertical transmission
- Neglected or emerging childhood infections

To drive forward the delivery of the scientific strategy, **scientific working groups** have been formed within the Network to lead and develop new research concepts, training programs and activities in each of these scientific areas.

To date, **six scientific working groups** have been established, with each working group defining and agreeing on its objectives and workplan to advance its scientific area. Consisting of members from

the Penta ID Network, these groups work closely with the Penta Foundation staff, the Penta Board and the wider Penta ID Network.

The scientific working groups:

- Blood-borne viruses
- Infection in pregnancy and vertical transmission
- Severe bacterial infections and AMR
- Fungal Infections
- Basic Science
- Clinical Pharmacology

A key focus for the scientific working groups is facilitating the involvement of early career researchers to support the sustainability of the Penta ID Network.



“We learned from COVID-19 lessons that will help to fight other diseases including HIV. Together, we put value back into the health workers, the researchers, infectious diseases, and vaccinology”



Alfredo Tagarro is a Paediatrician at Hospital Infanta Sofia and Clinical Researcher in Hospital 12 de Octubre. He is also a Senior Lecturer of Paediatrics at the European University of Madrid.

The COVID-19 pandemic has represented a unique professional and personal challenge throughout the year. Many unimaginable things happened during this frantic year, from the school closures to the confinement, and we had to adapt and think creatively. The pandemic took me back to the intensive care unit for some weeks, taking care of adults, enduring endless shifts with limited resources. Back home, we prepared and implemented research projects, again with limited resources, for children with COVID-19.

During the first months of the pandemic, we did not need to sleep much – we had so much energy and adrenalin. We drove from work to home and back through solitary streets, listening to the sad news with wet eyes. The forecast of hundreds of thousands of deaths sadly fulfilled, including beloved people. Time went by, and some things improved, but the hope of a quick recovery faded. Waves followed each other. **For months we studied like crazy this new disease and worked hard to find meaningful pieces of knowledge that could help other physicians across the world – because this is what we do as Penta ID researchers, it is our duty.** We had to fight against the frustration of not being quick enough. Science became, more than ever, a race against the clock. Patients died, children were not allowed to attend school, and information became obsolete so quickly...

Epidemiology and Infectious Diseases were released out of the closet and filled the newspapers and social media. The focus was

now on us, scientists and physicians, and this was sometimes scary. We finally were exhausted and had to recover physically and mentally to be useful again.

Out of this havoc, some opportunities emerged. We were involved in the fascinating task of describing the spectrum, epidemiology and pathophysiology and diagnosis of a new disease. We put together this huge collaborative COVID-19 project in children, named EPICO, which involved more than 75 hospitals and almost 200 paediatricians, and many other research collaborations across the world, including those facilitated by Penta, such as ORCHESTRA. We participated in scientific meetings with some of the best researchers around the globe, many of them under the umbrella of Penta. Sharing ideas and experiences in the Penta ID Aperitivo webinars and other meetings enriched our research plans and reinforced our network. Penta coordinated collaborations such as EPIICAL showed their strength and solid foundations withstanding the impact of the pandemic, despite everything.

We learned from COVID-19, lessons that will help to fight other diseases including HIV. **Together, we put value back into the health workers, the researchers, infectious diseases, and vaccinology.**

This last year was sad, weird, boring, exciting, frustrating, and exhausting... I hope that we will soon overcome this situation with the bittersweet taste of having left a crisis behind... if we can still smell and taste ;-).

Penta Foundation

We invest in projects that improve the lives of children with infections

The Penta Foundation is a non-profit organization of social utility (under Italian Legislative Decree no. 460 of 4 December 1997) set up in 2004 by "Comitato Assistenza e Ricerca AIDS Pediatrico C.A.R.A.P. – ONLUS" (AIDS Paediatric Assistance and

Research Committee - non-profit organization).

The Foundation exclusively pursues, without profit, goals of social utility and notably develops, promotes and supports scientific research of particular social interest

concerning disadvantaged people in the field of paediatric infectious and general diseases. In this context, the Foundation is a coordination hub of various entities at an international level, dedicated to child health. In this role, it is a sponsor and funder of clinical studies, it leads national and international research projects and training programmes and, is a centre for the collection, analysis, research and dissemination of research findings in the field of HIV and other infectious diseases.

The Foundation has adopted an Organization, Management and Control Model under the Italian Legislative Decree No. 231 of June 8th, 2001, related to the "Administrative liability of legal entities, companies and associations, including those lacking legal personality". This Model includes the appointment of a supervisory body and an ethical code that outlines the general behavioural standards to which all people working or collaborating with the Foundation must adhere.

Penta Foundation governance

The Foundation is managed by a Board of Directors consisting of six members, who remain in office for a renewable term of three years. The Board appoints among its members - the President, who is the Foundation's legal representative. The Board of Directors is appointed by C.A.R.A.P. – ONLUS and the first appointment was in 2004. The Board steers the Foundation towards a sustainable future by adopting sound, ethical, and legal

governance and financial management policies, as well as by making sure the foundation has adequate resources to advance its mission.

The current members are:

- **Carlo Giaquinto** (*Chair*)
- **Diana Gibb** (*Vice Chair*)
- **Mike Sharland** (*Vice Chair*)
- **Paolo Rossi**
- **Claire Thorne**
- **Franco Zacchello**



PRESIDENT
Carlo Giaquinto

BOARD OF AUDITORS
Francesco Gallo (President)
Francesco Grassi
Elisa Mormile

SECRETARY GENERAL
Francesco Simone

The Foundation is supported by a **Supervisory Body**, that is entrusted – among others – with supervising compliance with law and by-laws of the Foundation, and the **Statutory Auditor**, which exercises the accounting control.

In accordance with EU Regulation 679/2016 General Data Protection Regulation (GDPR), we have appointed a **Data Protection Officer**,

an external expert consultant who assists the Foundation in the implementation of the Guidelines of the European legislation on personal data protection and who constitutes the contact point between the Italian Data Protection Authority and any person interested in the way we manage personal data.

Penta Foundation staff

A wide range of personnel coming from **10 different countries** is dedicated to the activities of the Penta Foundation.

As of 2020, we have **37 core staff members**; **16 external consultants** and **5 independent contractors**, who support project specific activities.

We have multidisciplinary teams with diverse competencies in the area of project and data management, clinical and regulatory, training and education, finance and legal affairs.

To meet the needs of our research agenda and to be able to support our expanding Penta ID Network, the Penta Foundation is still expanding.

This prompted us to:

- review our organizational structure
- invest in our people's competencies and support their career path
- improve our company welfare and introduce staff wellbeing policies

- strengthen our organizational culture and the sense of belonging
- tirelessly improve our processes, technologies, and systems.

In March 2020, we launched a call for training, open to all our staff. This allowed us to provide financial support for high-level staff training transparently.

In November 2020, we started to set up remote working stations for every member of the staff to allow staff to work despite the COVID-19 pandemic.

Penta has a sizable number of **volunteers**. Our PentaTr@ining programme is built upon the voluntary contributions upwards of **50 experts**, who are committed to develop and deliver our curricula across four widely spoken languages (English, Russian, Spanish, French).



Our people

CORE STAFF MEMBERS

37

16 EXTERNAL CONSULTANTS

5 INDEPENDENT CONTRACTORS

VOLUNTEER EXPERTS FOR TRAINING PROGRAMME

50

38.5 YEARS AVERAGE AGE

5.8%

TURNOVER RATE IN THE PERIOD 2018-2020

90%

PERCENTAGE OF STAFF WITH BACHELOR'S DEGREE

60%

PERCENTAGE OF WOMEN WITH A LEADING ROLE (LINE MANAGERS AND DEPARTMENT CHIEFS)

97.3%

RATE OF PERMANENT WORK CONTRACTS ON TOTAL NUMBER OF EMPLOYMENT CONTRACTS

Penta Foundation core competencies

In 2020 we revised our scientific strategy for the next five years. This has led to an important evaluation of the Foundation’s operational structure in order to ensure that the Foundation can support the Network’s mission through qualified teams and streamlined procedures

Program Operations

In 2020, Penta merged the Project Management and the Clinical & Regulatory areas into one team to allow for the effective coordination and oversight of all Penta projects and trials. This team leads complex, international research projects from application to implementation and the closing phase, according to national and international laws and regulations, liaising with private and public funders.

The team also supports the Penta ID Network in conducting global multi-centre clinical research studies, sponsored by Penta, and provides guidance on ICH GCP guidelines and ethical standards during project and protocol design. Thanks to our regulatory expertise, we act as the primary point of contact for Regulatory Agencies and the European Medicines Agency for Paediatric Investigation Plan applications.

Data Management and Infrastructure

Penta handles all data within the research studies it sponsors, ensuring efficiency and regulatory compliance. To do so, the Data Management and Infrastructure Team provides expertise and applies cutting edge cloud technologies.

The range of data management activities spans from data management planning and data collection for observational

studies to validation, transformation, long term storage and secondary usage of data. Furthermore, the Data Management and Infrastructure Team constantly explores new technologies to further expand its support to the Penta ID Network in conducting excellent research.



PRESIDENT
Carlo Giaquinto



CHIEF PROGRAM OFFICER
Laura Mangiarini

- NETWORK, EDUCATION AND TRAINING
- PROGRAM OPERATIONS
- DATA MANAGEMENT AND INFRASTRUCTURE



CHIEF FINANCE AND ADMINISTRATION OFFICER
Luigi Comacchio

- FINANCE
- LEGAL
- ADMINISTRATION



CHIEF PEOPLE, COMMUNICATIONS AND CULTURE OFFICER
Giuseppe Bonura

- HR
- COMMUNICATIONS
- IT
- QUALITY ASSURANCE



Quality Assurance

Penta is committed to promoting and maintaining a quality-focused culture to ensure the delivery of high-quality, meaningful research.

At Penta, we define quality as meeting and exceeding expectations in all critical aspects of research, including:

- Ensuring participant safety and well-being.
- Safeguarding compliance with regulatory requirements and international standards and guidelines.
- Streamlined and efficient operations based on structured and documented processes.

Our approach to managing quality is through the Penta Quality Management System (QMS), as an instrument to achieve the intended objectives, guarantee compliance with requirements and expectations, and promote continuous improvement. We do this by holding ourselves accountable to the highest standards and by requesting that the same standards are adopted by our collaborators when working with us.

Finance, Legal and Administration

Penta values transparent and sound financial management and promotes a culture of strict compliance with national and international standards. The Finance, Legal and Administration team works to guarantee the efficient and effective use of financial resources and provides the Penta ID Network with the legal expertise it requires to achieve the success in its endeavours.

Network, Education and Training (NET)

In 2020, Penta brought together the training, education and Penta ID Network management into one team to support the development and synergy between these key areas of work. The team provides structure and management to the Penta ID Network to support the Network's

sustainability, with a key focus on supporting early career researchers globally. The team also collaborates with experts from the extensive Penta ID Network to deliver high quality, interactive, comprehensive, tailored training and education courses to healthcare workers and young people. This is achieved through an innovative

approach of combining face-to-face courses with digital e-learning methods. Thus enabling Penta to deliver training and education courses to healthcare workers and young people across the globe, with a particular focus on low income countries.

Communications

At a time when scientific research is increasingly driving political, social and economic dynamics, we believe that making science accessible is key for democracy and progress. Penta is committed to communicate its methods and results openly, and to engage in the public debate around the role of science and

the importance of paediatric research in our society.

Penta's Communication team, which coordinates the internal and external communications of the Foundation and across the Network, continuously explore new communication routes to reach an ever-increasing network of

individuals and organizations. Our communications are designed to ensure that our studies translate clinical research and scientific findings into messages that can be understood by our beneficiaries and society and show the impact of what we do. We are enthusiastically engaging with the Youth

Trial Boards, our scheme of active patient participation in paediatric HIV clinical trials. They play an integral role in helping society and the general community understand the relevance of our research and ensure that the ethos of "About us, with us" is central to everything we do.

Penta ID Innovation

We want to accelerate the research that makes a difference to children's health

Penta ID Innovation is Penta's consultancy spin-off. Stemming from the Penta ID Network of experts in paediatric infectious diseases, Penta ID Innovation aims to reduce the gap between industry and academia to deliver high-level consultancy services and enhance paediatric drug development.

Working for the biggest players of the market, Penta ID Innovation is collaborating with IQVIA and CROMSOURCE (two Contract Research Organisations) to create new capabilities in managing worldwide drug development programs to address the challenges of bringing new therapies to children.



Penta UK

Strengthen opportunities and collaborations with UK

In line with our growth, the Penta Foundation has set up a branch office in the UK, which has been registered as a charity. The objects of the charity are for the public benefit and in line with the Foundation's strategic priorities. In 2020, the Board approved the charity's strategic plan and

workplan, which allowed us to strengthen opportunities and collaborations with UK partners and expand our portfolio of collaborative research activities. The first research initiative of Penta UK is now underway. The Penta UK Board looks forward to 2021 and aims to expand the breadth of activities.

3. ACTIVITIES AND ACHIEVEMENTS

Not just clinical trials, but **cohort**
and **pregnancy studies** and
educational programmes



Research activities

In 29 years of activities, we have contributed to the development of new treatment strategies for children living with HIV. Results from Penta studies have been used by companies for regulatory purposes and our efforts have decreased the time for drugs to be accessible to children in Europe, Africa and Asia

We have designed and conducted pharmacovigilance studies that have contributed to identifying any potential safety signal of novel antiretrovirals after they have been licenced for use.

These efforts have contributed to making HIV in children a **treatable condition**.

The arrival of SARS-CoV-2 resulted in 2020 being an extraordinary year. Our first concern at the emergence of the infection was to secure the participation of children and mothers in our ongoing studies, by introducing safety measures that would allow them to continue receiving their medications safely and in compliance with the recommendations from the regulatory agencies. Throughout the year, recruitment in our studies continued, with increased safety measures.

Despite the exceptional difficulties brought by the COVID-19 pandemic, two large trials testing new treatment options for children and adolescents completed this year.

ODYSSEY is a large global trial designed to evaluate the efficacy and safety of a new combination of anti-HIV medicines including dolutegravir in the form of a small, dispersible tablet, compared with current HIV treatment in children starting first- or second-line therapy. The trial was closed in July. If positive, these results will support the use of dolutegravir-based HIV treatments for children and adolescents in low resource settings, contributing to **closing the gap between HIV treatment options** available for adults and children.

The **SMILE** trial was also completed in 2020, testing a simplified HIV treatment for children and adolescents. If the results show comparable viral load control to current treatment regimens, the reduction of pill burden and side effects will significantly increase children and adolescents' adherence to the therapy, greatly **enhancing their chances for a normal life**.

Another important study that we have completed this year is **NeoOBS**, the first ever global hospital based observational cohort study of neonatal sepsis. NeoOBS recruited 3,500 babies from 19 centres across 12 countries and will directly inform the design of a new global neonatal sepsis trial focussed on improving the evidence base of WHO neonatal antibiotic treatment guidelines.

This year saw a new focus for us; as central to our scientific strategy, we collectively pulled together to investigate COVID-19. Some excellent research has been generated in Europe and worldwide, understandably focusing on acute, more severe disease in COVID-19 patients and their clinical management. At Penta, we have committed to **addressing some of the most pressing evidence gaps** underlying this pandemic and affecting our children, including susceptibility to infection, natural history, treatment and immune protection, longer-term consequences of the disease and the impact on the progression and management of pre-existing conditions.

We have mobilized cohorts and registries in Europe and other parts of the world to promote **innovative new studies around existing data collection** on SARS-CoV-2 infected patients.

This comprehensive network includes individuals of all ages (from infants to the elderly) with pre-existing conditions (chronic disorders, chronic infections, immunosuppressed) and a large spectrum of management practices.

With this purpose in mind, we have promoted the **EPPICC Serology study** under the larger EPPICC program to study the prevalence and distribution of SARS-CoV-2 antibodies in children and adolescents living with HIV.

We believe that only through joining our resources and experience can we advance our knowledge and inform strategies for COVID-19 control. For this reason, we have joined two large European initiatives: **RECOVER** (Rapid European SARS-CoV-2 Emergency Research response) and **ORCHESTRA** (Connecting European Cohorts to Increase Common and Effective Response to SARS-CoV-2 Pandemic).

Penta is also a member of the Vaccine Monitoring Collaboration for Europe, **VAC4EU** to monitor the safety of COVID-19 vaccinations in multiple European countries in near real-time and detect novel safety signals. This is strategically very important for Penta as we enter into the network of real-world data.

Ongoing research activities

Penta now has a strong portfolio of studies and projects and a growing network of investigators

2020 Projects and studies

HIV

We support research that seeks to better understand both the dynamics of transmission and how to obtain optimal health outcomes for pregnant women and children

Dolutegravir is a new drug which has been shown to be effective and safe as part of a once-daily treatment for adults with HIV. As the tablets are small and can be dissolved in water, they are easy to administer and more tolerable for younger children who cannot swallow large tablets and have limited treatment options.

In 2020, the U.S. Food and Drug Administration approved the use of dolutegravir dispersible tablets to treat children living with HIV, a decision based in part on data from the ODYSSEY trial. Results from a sub-study of the ODYSSEY trial has shown that children over 20kg in weight can safely have adult doses of dolutegravir. ODYSSEY has also contributed data for the regulatory approval of a generic fixed dose combination tablet suitable for children in South Africa.

SMILE

Strategy for Maintenance of HIV suppression with once daily Integrase inhibitor + darunavir/ritonavir in childrEn

Aim

To evaluate safety and antiviral effect of a once daily integrase inhibitor administered with darunavir/ritonavir compared to current standard antiretroviral therapy among HIV-1 infected, virologically suppressed paediatric participants.

from 2013 until 2021

Penta budget
€ 2,664,961

Total budget
€ 2,664,961

Funder
Janssen, Gilead, ViiV Healthcare, Penta

Penta's Role
SPONSOR

By developing a simplified HIV treatment for children and adolescents, we can expect to see a reduction in the pill burden and adverse side effects of antiretroviral drugs. With a simplified option, it is more likely that adolescents adhere to treatment and follow their doctor's recommendations.

In 2020, the study completed its last patient last visit. Overall, the trial followed 300 participants in 32 sites across 11 countries worldwide. A study continuation phase access program was started in sites where the studied drug is not licenced yet, to allow children to continue with the same regimen if deemed useful.

ODYSSEY

A randomised trial of dolutegravir (DTG)-based antiretroviral therapy vs standard of care (SOC) in children with HIV infection starting first-line or switching to second-line ART

Aim

To assess the efficacy and toxicity of dolutegravir plus 2 NRTI versus standard of care among HIV positive children and adolescents

from 2014 until 2021

Penta budget
€ 11,590,153

Total budget
€ 11,590,153

Funder
ViiV Healthcare

Penta's Role
SPONSOR

EPIICAL

Early treated Perinatally HIV Infected individuals: Improving Children’s Actual Life

Aim

To implement a predictive platform for the early identification of novel therapeutic strategies for HIV infected children

from 2016 until 2020

Penta budget

€ 8,561,664

Total budget

€ 8,561,664

Funder

ViiV Healthcare

Penta’s Role

COORDINATOR

The EPIICAL Consortium has successfully conducted studies on children living with HIV, by setting up different paediatric cohorts in Europe and Africa. These highly defined cohorts represent the most natural background to test novel strategies to obtain long-term viral remission in children treated early for HIV.

Research activities will continue for the next four years, with the aim to develop a model able to predict the response of a patient to different therapeutic strategies.

REACH

Research on HIV, tuberculosis (TB) and/ or hepatitis C (HCV) in patients with mono- , co-infections and/ or comorbidities in the context of fostering collaboration with the Russian Federation

Aim

A collaborative effort to fill the knowledge and data gaps on the HIV epidemic affecting children, adolescents and pregnant women across Russia. It will provide new data on long-term antiretroviral therapy toxicity, HIV resistance, Hepatitis C virus and Tuberculosis coinfections and comorbidities in this setting

from 2019 until 2021

Penta budget

€ 1,164,507

Total budget

€ 2,986,749

Funder

European Commission – Horizon 2020

Penta’s Role

COORDINATOR

EPPICC

Dolomite study

Aim

To assess the pharmacokinetics, usage and safety of Dolutegravir in pregnancy and exposed infants in Europe

from 2018 until 2021

Penta budget

€ 819,000

Total budget

€ 819,000

Funder

ViiV Healthcare

Penta’s Role

COORDINATOR

Kaletra study

Aim

To assess the safety and efficacy of Kaletra (Lopinavir/Ritonavir) oral solution in children aged 14 days to 2 years who are living with HIV in Europe

from 2019 until 2021

Penta budget

€ 534,864

Total budget

€ 534,864

Funder

AbbVie

Penta’s Role

SPONSOR

BREATHER Plus

A randomised open-label 3-arm, 96-week trial evaluating the efficacy, safety and acceptability of weekends off dolutegravir-based antiretroviral therapy (ART) and monthly long-acting injectable ART compared to daily dolutegravir-based ART in virologically suppressed HIV-infected children and adolescents in sub-Saharan Africa

Aim

To compare short cycle therapy (five days on, two days off) dolutegravir-based antiretroviral therapy to daily dolutegravir-based ART in virologically suppressed adolescents living with HIV in sub-Saharan Africa

from 2019 until 2024

Penta budget

€ 88,187

Total budget

€ 7,401,327

Funder

European Commission – EDCTP2

Penta’s Role

PARTNER

D3

A randomised non-inferiority trial with nested PK to assess DTG/3TC fixed dose formulations for the maintenance of virological suppression in children with HIV infection aged 2 to <15 years old

Aim

To assess whether DTG/3TC is non-inferior to Standard of Care, consisting of an anchor drug (NNRTI, PI or INSTI) and 2 NRTIs, in terms of virological suppression

from 2020 until 2026

Penta budget

€ 1,494,088

Total budget

€ 15,245,002

Funder

ViiV Healthcare

Penta’s Role

SPONSOR

SHIELD

A multicentre, open-label, single-arm trial to evaluate the safety, pharmacokinetics and antiviral activity of fostemsavir in combination with optimized background therapy (OBT) in HIV-1 infected children and adolescents who are failing their current combination antiretroviral therapy (cART) and have dual- or triple-class antiretroviral (ARV) resistance

Aim

To evaluate the safety of 24 weeks of treatment with fostemsavir + OBT in at least 60 HIV-1 infected children and adolescents aged 6 to < 18 years and weighing at least 20kg who are failing their current antiretroviral treatment and have dual-or-triple-class ARV resistance

from 2020 until 2027

Penta budget

€ 1,809,545

Total budget

€ 9,158,955

Funder

ViiV Healthcare

Penta’s Role

SPONSOR

EMPIRICAL

Empirical treatment against cytomegalovirus and tuberculosis in severe pneumonia in HIV-infected infants: a randomized controlled clinical trial

Aim

To develop a clinical trial to evaluate whether empirical treatment against cytomegalovirus and tuberculosis improves survival of HIV-infected infants with severe pneumonia

from 2019 until 2024

Penta budget

€ 571,420

Total budget

€ 7,680,619

Funder

European Commission – EDCTP2

Penta’s Role

PARTNER

EPPPR

Embedding Patient Participation in Paediatric Research

Aim

To develop a fully digital model of global paediatric patient participation to support the engagement of young people living with HIV in clinical trials

from 2020 until 2022

Penta budget

€ 171,464

Total budget

€ 171,464

Funder

ViiV Healthcare

Penta’s Role

PARTNER

PENTA SOCIAL REPORT 2020 / 44

PENTA SOCIAL REPORT 2020 / 45

Antimicrobials

Both mothers and children are at the heart of Penta: we work on the prevention of mother-to-child transmission but also on the identification of optimal treatment for babies who are infected, using old and new antibiotics and testing new combinations of antibiotics



NeoVanc

Treatment of late onset bacterial sepsis caused by vancomycin susceptible bacteria in neonates and infants aged under three months

Aim

To develop an optimal dosing and monitoring regimen for vancomycin use in preterm neonates and infants under 3 months of age.

In 2020, the study closed patients' enrolment. NeoVanc was an open-label, parallel, phase IIb, non-inferiority RCT comparing an "optimised" regimen of vancomycin to a "standard" regimen in infants less than 90 days. Infants with clinical sepsis or confirmed Gram-positive sepsis criterion were enrolled from 22 neonatal intensive care units in 5 European countries.

242 babies were enrolled over two years. There was no clear evidence of non-inferiority of the shorter optimised arm compared to the longer duration standard arm, but a potential ototoxicity signal was identified potentially linked to the loading dose.

from 2014 until 2020

Penta budget
€ 653,378

Total budget
€ 5,993,000

Funder
European Commission – The Seventh Framework Programme - FP7

Penta's Role
COORDINATOR

COMBACTE-MAGNET

Combatting Bacterial Resistance in Europe - Molecules Against Gram Negative Infections

Aim

To determine more effective treatment strategies for intensive care unit (ICU) infections, particularly with Gram-negative bacteria

from 2015 until 2021

Penta budget
€ 397,530

Total budget
€ 167,002

Funder
European Commission – Innovative Medicines Initiative - IMI

Penta's Role
PARTNER

NeoOBS

NeoAMR Observational Study

Aim

To collect high-quality observational data to inform trial design and comparator selection for a clinical trial(s) to assess the efficacy of novel antibiotic regimens in areas with high endemic rates of antimicrobial resistance

from 2017 until 2020

Penta budget
€ 2,497,461

Total budget
€ 2,497,461

Funder
GARDP

Penta's Role
PARTNER

In 2020, NeoOBS completed recruitment with more than 3200 newborns across 19 cities in 11 participating countries. This is now a well established network of researchers, scientists, clinicians and implementation partners, who can develop and deliver innovative real-world research.

PediCAP

Impact of duration of antibiotic therapy and of oral step-down to amoxicillin or co-amoxiclav on effectiveness, safety and selection of antimicrobial resistance in severe and very severe childhood community-acquired pneumonia (CAP): a randomised controlled trial

Aim

To optimize antibiotic treatment for children aged 3 months to 10 years hospitalized with severe/very severe community-acquired pneumonia in South Africa, Uganda, Zambia and Zimbabwe

from 2019 until 2024

Penta budget
€ 792,756

Total budget
€ 6,779,077

Funder
European Commission – EDCTP 2

Penta's Role
COORDINATOR

Value-Dx

The value of diagnostics to combat antimicrobial resistance by optimizing antibiotic use

Aim

To facilitate and accelerate the rigorous assessment and implementation of new diagnostic technologies into healthcare settings, by establishing the infrastructure, methods, processes and approaches needed to understand, evaluate, assess, and demonstrate the multi-faceted value of diagnostics, and overcome the associated barriers to their widespread adoption and use

from 2019 until 2023

Penta budget
€ 719,593

Total budget
€ 10,992,100

Funder
European Commission – Innovative Medicines Initiative - IMI2

Penta's Role
PARTNER

Other Viruses

We leverage our expertise in the study and prevention of mother to child transmission of HIV, we investigate the mechanisms and consequences of vertical transmission of other viruses



ZIKAction

Preparedness, research and action network on maternal-paediatric axis of ZIKV infection in Latin America and the Caribbean

Aim

Initially developed to address key knowledge gaps relating to Zika virus epidemiology and its natural history and pathogenesis, this project shifted its focus to implementing tools and building an infrastructure for data collection that could be used in future epidemics

from **2016** until **2021**

Penta budget
€ 1,061,926

Total budget
€ 6,916,193

Funder
European Commission – Horizon 2020

Penta's Role
COORDINATOR

RESCEU

Respiratory Syncytial virus Consortium in Europe

Aim

To gather information on the scale of **Respiratory Syncytial Virus (RSV)** infection in Europe and its economic impact and use this information to design best practice guidelines for monitoring of RSV and to shape future vaccination programmes

from **2017** until **2021**

Penta budget
€ 212,500

Total budget
€ 15,016,625

Funder
European Commission – Innovative Medicines Initiative - IMI2

Penta's Role
PARTNER

Network Building

We are improving the landscape for clinical research: we facilitate the generation of information needed to ensure that the right drugs, at the right doses are developed and made available for children and newborns

The GAP-f network wants to ensure that safer, more effective, and more durable paediatric formulations are developed and made available quickly, in order to provide better medicines to children in need and achieve universal health coverage.

In 2020, the study supported the WHO's review of the Essential Medicines List by conducting a global, comprehensive gap analysis survey on the most needed medicines not made in formulations suitable for children.

C4C

Collaborative Network for European Clinical Trials For Children

Aim

To develop a large, collaborative paediatric network that will facilitate the development of new drugs and other therapies for the entire paediatric population in Europe.

In 2020, three Proof of Viability clinical studies opened to recruitment. Through these studies, C4C is putting its infrastructure to the test, as they are utilising the infrastructure and resources of the connect4children network.

from **2018** until **2024**

Penta budget
€ 7,011,250

Total budget
€ 140,496,816

Funder
European Commission – Innovative Medicines Initiative - IMI2

Role
COORDINATOR

ECRAID

European Clinical Research Alliance on Infectious Diseases

Aim

To establish a coordinated and permanent European infrastructure for clinical research on infectious diseases.

In 2020, the first part of the project, ECRAID Plan, was concluded and a business plan, which will allow the Network to increase efficiency for testing and developing new diagnostics

PREPARE

EPlatform for European Preparedness Against (Re)emerging Epidemics

Aim

To harmonise large-scale clinical research studies on infectious diseases, preparing rapid responses to any severe infectious disease outbreak and providing real-time evidence for clinical management of patients.

In 2020, the project initiated and implemented clinical research studies on COVID-19 across Europe.

from **2014** until **2021**

Penta budget
€ 575,800

Total budget
€ 23,992,375

Funder
European Commission – The Seventh Framework Programme - FP7

Penta's Role
PARTNER

in the next five years through ECRAID Base, was developed.

from **2019** until **2020**

Penta budget
€ 152,650

Total budget
€ 2,994,560

Funder
European Commission – Horizon 2020

Penta's Role
PARTNER

COVID-19

Working through joint collaborations to advance treatment and care of COVID-19 and building research preparedness for future emerging infections with the potential to impact maternal and child health

EPPICC COVID

EPPICC Serology Study

Aim

To describe the prevalence and distribution of SARS-CoV-2 antibodies in children and young adults living with HIV in Europe and South Africa.

from 2020 until 2022

Penta budget
€ 282,172

Total budget
€ 282,172

Funder
ViiV Healthcare

Penta's Role
SPONSOR

RECoVER

Rapid European SARS-CoV-2 Emergency Research response

Aim

To develop data and evidence-based knowledge on the SARS-CoV-2 epidemic and translate these into recommendations for improved patient management and/or public health response measures.

In 2020, RECoVER enrolled its first patients into 3 of its studies. The studies could answer critical questions on COVID-19 and inform healthcare workers and policymakers on optimal care and effective public health measures. The Social Sciences team of RECoVER assessed the perceptions of European healthcare workers of local Infection Prevention and Control procedures during the COVID-19 pandemic and the impact it has had on their emotional wellbeing.

from 2020 until 2022

Penta budget
€ 36,250

Total budget
€ 20,590,195

Funder
European Commission – Horizon 2020

Penta's Role
PARTNER

ORCHESTRA

Connecting European Cohorts to Increase Common and Effective Response to SARS-CoV-2 Pandemic

Aim

By creating a new pan-European cohort built on existing and new large-scale population cohorts in European and non-European countries, the project will advance knowledge on the control of the COVID-19 infection. The data sharing infrastructure will allow data to be shared and made available throughout Europe and beyond, shaping the continuously evolving public health and vaccination strategies

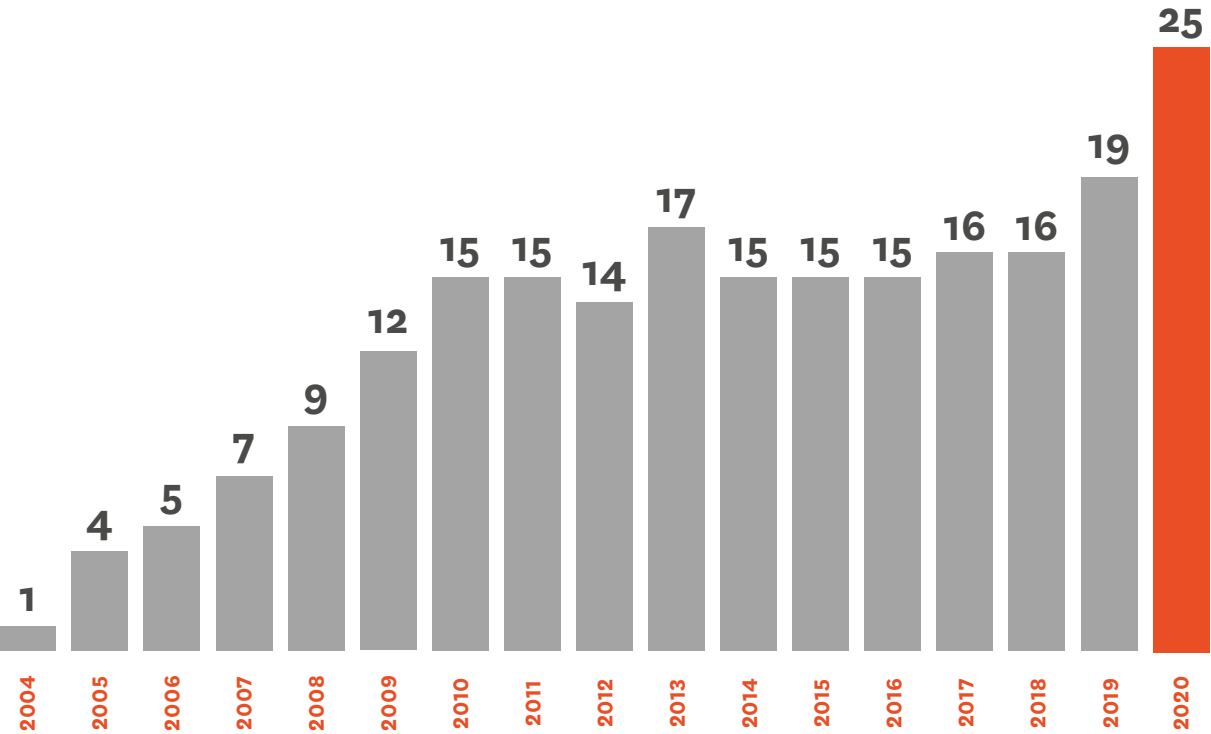
from 2020 until 2023

Penta budget
€ 149,000

Total budget
€ 19,887,642

Funder
European Commission – Horizon 2020

Penta's Role
PARTNER



“This was a unique opportunity for mutual support to carry out science in this new situation. **Rapid sharing of information between Penta ID Network centres** became essential to better understand the infection pattern and management in children.”



Daniele Donà is a researcher and paediatric infectious diseases consultant at the Department of Women's and Children's Health, University of Padova – Italy

The global health crisis of the SARS-CoV-2 pandemic is changing the world. In the Veneto Region in Italy, an exponential spread of patients affected by COVID-19 has been observed since 21st February 2020, the day of the first COVID-19 positive adult admitted to the University Hospital of Padua.

This impetuous pandemic infection put a tremendous amount of stress on many hospitals interfering with ordinary medical practice. Moreover, all the research activities were slowed down considerably with a sudden change in priorities regarding time and funding.

Since February 2020, we in the Paediatric Infectious Diseases team have been immediately involved in implementing infection prevention and control (IPC) strategies, including the Paediatric Department's reorganization to contain the in-hospital viral spread. These actions have been taken to ensure prompt recognition of children suspected or confirmed for SARS-CoV-2 infection and to guarantee both urgent care to COVID-19 infected children and the safety of all healthcare workers and other non-infected children of the Paediatric Department of the University Hospital of Padua.

This protocol resulted from all our daily efforts to merge scientific evidence available at the time of epidemic onset in the Veneto Region with clinical and organizational issues faced within the first month of coexistence with COVID-19.

Alongside daily clinical care of COVID-19 positive children, this was a unique opportunity for mutual support to carry out science in this new situation. **Rapid sharing of information between Penta ID Network centres** became essential to better understand the infection pattern and management in children.

Furthermore, the strengthened collaboration with different laboratories with immunological analysis led us to implement a COVID-19 family cluster dedicated clinic. Given the growing increase in COVID-19 cases, it is important to analyse the prevalence of the SARS-CoV-2 antibody in previously infected patients and in the wider population, in order to understand the evolution of the immunologic response, to understand if individuals infected during the first wave will be protected upon re-exposure.

The COVID-19 follow-up clinic was first established at the end of March 2020, aiming to evaluate the medium and long-term impact of SARS-CoV-2 infection in family clusters, including children. Children and their relatives were sent to the clinic 4-8 weeks after the end of the isolation period for all family members, through different routes; after being hospitalized and recovered by the Paediatric COVID-19 Unit of our Hospital and/or after being evaluated in our COVID-19 dedicated Emergency Room or after receiving a home-based evaluation, provided by their family paediatricians.



above:
Paediatric Infectious diseases
Unit – King Edward VIII
Hospital.

“Equitable access to effective COVID-19 vaccines in low-middle income countries remains a major threat to global health and needs urgent action.”



Moherndran Archary is a Paediatric Infectious Disease Specialist in the Department of Paediatrics and Child Health at King Edward VIII Hospital affiliated to the Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban, South Africa.

The first case of COVID-19 in South Africa was diagnosed in a traveller from Europe to South Africa on the 5th of March 2020. The initial imported infections fuelled the first wave of the pandemic 3 months later, while further mutations of the circulating wild-type virus fuelled the more severe second wave 7 months thereafter. The South African government responded by implementing, several mitigating strategies including lockdowns, social distancing, use of face masks in public and school closures to slow and control community transmission. These control measures had variable success in controlling transmission but also exposed the social disparities in South Africa, with the most vulnerable members of society being heavily affected by the impact on the economy and disruptions to healthcare, education and employment opportunities.

In KwaZulu-Natal, where almost half the population is below the age of 19 years, acute COVID-19 infection in children and adolescents have thankfully been largely asymptomatic or mildly symptomatic. The major impact of COVID-19 in children has been the disruption of health services (especially in prevention of mother-to-child transmission of HIV, immunization and growth monitoring) and the impact of economic hardships on food security, health seeking behaviour and education of children.

As an infectious diseases unit based at King Edward VIII Hospital, which is a university referral hospital, much of our initial activity centred around the public health response (including contact tracing, isolation and

management of patients with COVID-19), Infection Prevention and Control (IPC) activities and preparing health facilities for screening, testing and cohorting of inpatients. A large component of our initial activities focused on the development of a national guideline for the management of COVID-19, getting back to school and risk mitigating strategies. As the pandemic progressed, we shifted our attention to the management of children with COVID-19 and Multi-Inflammatory Syndrome in Children (MIS-C).

Conducting research during the COVID-19 pandemic has been challenging, requiring innovative strategies to maintain the safety of both study participants and research staff. This was of extreme importance as many of our studies included children on antiretroviral treatment and needed an ongoing supply of these essential medications. Implementation of risk mitigating strategies at a site level, remote visits and delivery of medications to participants home had allowed us to continue research activities even during the peak of the pandemic.

COVID-19 has been extremely challenging, equitable access to effective COVID-19 vaccines in low-middle income countries remains a major threat to global health and needs urgent action. Our health sector, being poorly resourced, struggled to deal with the everchanging demands of the pandemic and responding to challenges required learning lessons quickly and adapting fast. Fortunately, having access to the expertise and community of infectious diseases specialists within Penta was extremely helpful as we and the rest of the world were learning about this new disease.

Other activities

Education

Education is one of the most effective tools in prevention, and Penta's sexual education programmes are addressed to young people and adults to support the awareness and prevention of disease spread.

- In 2020, we delivered our educational activities in one high school in Italy (8 classrooms-123 students). These activities are aimed at increasing knowledge amongst young people on sexually transmitted infections (STIs), thus fighting both the spread of STIs and the stigma associated with HIV.
- We also piloted a **sexual and relationship educational programme** addressed to 16-year-old students in schools. However, due to the COVID-19 pandemic, in the second half of 2020, we transformed all our face-to-face programmes to be run online. We held a total of 8 online courses in 2020.
- We also launched the **Work In Progress (WIP) Group**, a group of HIV-infected adolescents and young adults, who support us to create educational content and material to promote respect and tolerance toward HIV-infected people.
- Across Italy, we have rolled out a **national online course addressed to adults** working with children and young people in different settings, parents, educators and healthcare professionals. These programmes aim to provide adults with the skills necessary to support young people to develop the knowledge, skills, ethical values and attitudes they need to make conscious, healthy and respectful choices about relationships, sex and reproduction. In 2020, we trained 246 adults coming from 13 different cities in 6 different regions of Italy.

“The meeting made me aware of how much ignorance and scarce knowledge can negatively affect HIV-infected people. It's so sad that in 2020 we still have a problem of discrimination towards seropositive people.”



“You have expanded our knowledge more than we ever expected. PentaTr@ining is a “must” for every physician handling HIV cases. Thank you very much to the tutors and my fellow students! We have increased our network despite the COVID-19 pandemic. Just amazing!”

From a delegate from the Philippines

Patient involvement

Increasingly it is recognized that patients, including children and adolescents must be involved in research – not just as passive beneficiaries but as leaders and influential drivers. Penta has been pioneering in developing examples of how researchers can engage children and their families into the research work. This includes:

- **Youth Trial Board** is a pilot project nested within the **ODYSSEY** study. The project has developed an interactive, youth-friendly, activity-based training programme with young people living with HIV across four different countries (Uganda, Zimbabwe, South Africa and the UK). Russia is the fifth country in the world to have adopted this model, with the training having been modified for the REACH research focus. The **REACH** Youth Advisory Board is developing patient and public information about the project

and its findings, and is looking at ways to engage the wider community in understanding and taking an interest in REACH. In **EPPICC**, the Youth Trial Board has been driving the design of the project identity and communication materials.

- The **Embedding Patient Participation in Paediatric Research (EPPPR)** project began in September 2020, funded by ViV Healthcare. Building on the successful Youth Trial Board pilot project, the EPPPR project will work across six countries to develop a programme to support the sustainability of Youth Trial Boards in large clinical research hubs. Working with young people to enable these Boards to become integrated into clinical, quantitative and qualitative research studies.

Penta involvement in International Cooperation Projects

Since the early 2000s, Penta has been involved in the management of several international cooperation projects in low-and middle-income countries, in partnership with different Italian and international NGOs, such as “Casa Accoglienza alla Vita Padre Angelo”, the Romanian Angel Appeal Foundation and various hospitals and associations in Eastern Europe and Sub-Saharan Africa. These initiatives are aimed at improving the health conditions and the quality of life of children living with HIV and their families.

In recent times, we have devoted specific attention to:

- the problem of domestic and gender-based violence, by raising awareness

in communities and consolidating links of mutual respect within the family.

- the fight of the HIV stigma, by supporting adolescents living with HIV and engaging with the communities they live in. Together with our partners, we are running the **Action for Life** project, which is targeting the health and psycho-social situation of HIV positive children and adolescents, by supporting clinical activities, sports and cultural activities and professional trainings.

In addition to social activities, through the implementation of our projects we are contributing to build the expertise of our local partners in the conduct of research projects.

PentaTr@ining

Penta remains committed to providing clinical training in paediatric HIV and other infections as part of its goal to improve clinical care for children, and to ensure robust high-quality clinical assessment as part of its trials. We also continually seek to expand capacity building by ensuring that new investigators are trained and supported to run research and are able to design their own studies. The [WHO Toolkit](#) for research and development of paediatric antiretroviral drugs and formulations, developed in collaboration with Penta, was a major step towards this. Moreover, Penta provides [HIV Treatment guidelines](#) for clinicians and other healthcare professionals. Currently being revised in conjunction with [European AIDS Clinical Society \(EACS\)](#) following an update in 2019, the guidelines act as a

concise reference document to guide antiretroviral choices for children and adolescents with perinatally acquired HIV.

Starting in 2005, **PentaTr@ining** (formerly ‘Tr@inforPedHIV’) is an in-depth training programme designed to provide specialist knowledge for healthcare workers caring for HIV infected children, adolescents and pregnant women. This pioneering course has integrated distance learning with interactive face-to-face courses. Having carried out 70 training courses to date, Penta is able to deliver and tailor its innovative and high-quality training for a range of settings. In total, more than 5,000 healthcare workers from 36 countries across the globe have benefitted from our training courses.

Penta is now also actively engaged in clinical research

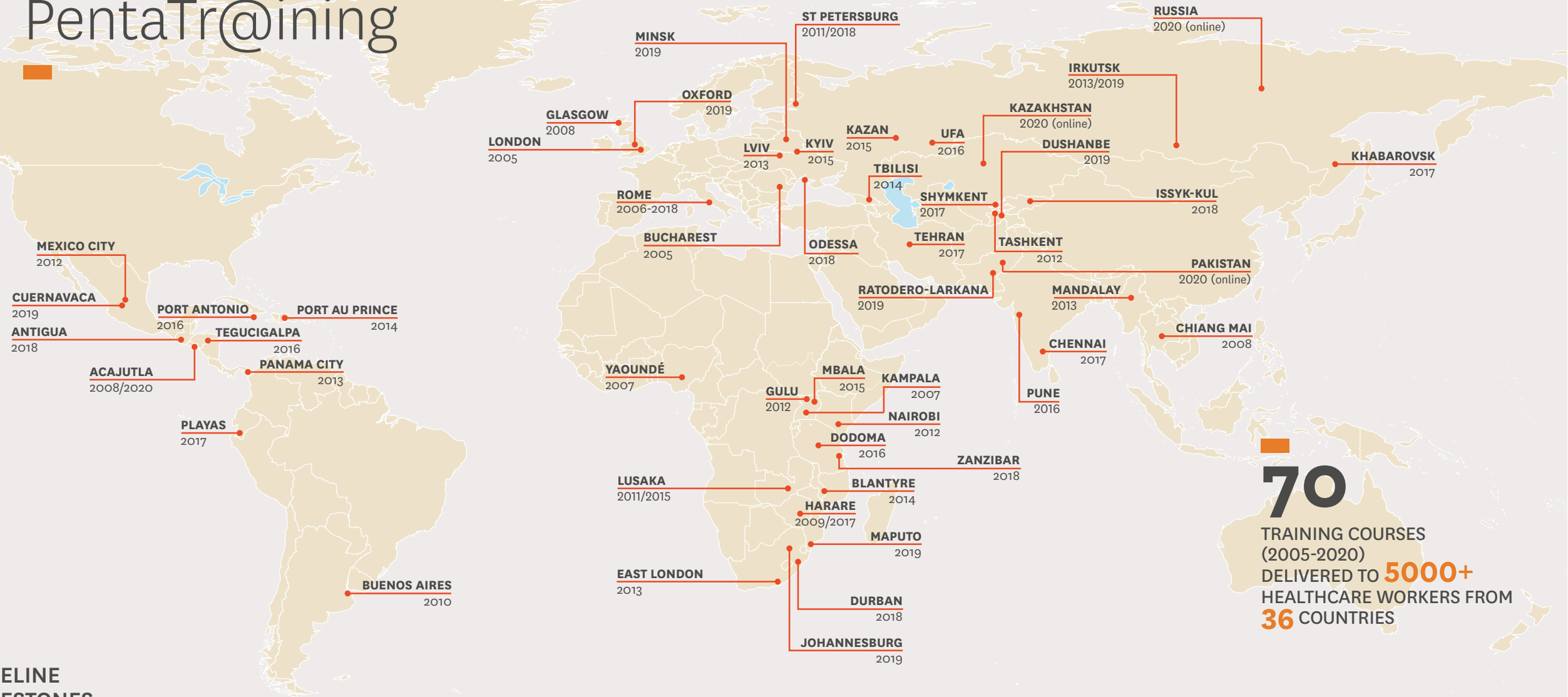
in other congenital infections. For that reason, we have completely revamped and updated the training content and curriculum areas covered for our core online training course: “**HIV & other Congenital Infections**”. Our aim is to deliver a new course centred around updates in a variety of different congenital infections, whilst building on the success, reputation and true collegiate spirit of the previous Tr@inforPedHIV platform. Over 100 delegates from 40 different countries around the world registered and participated in our upgraded online course in 2020.

Amid the extraordinary circumstances of the COVID-19 pandemic, HIV services in 2020 were quickly overshadowed by the need to manage and treat COVID patients. With the specific problems that can

stem from reduced access to HIV care, it became all the more crucial to ensure that training needs of healthcare workers caring for vulnerable populations continued to be met. In addition to our flagship course, we held comprehensive online distance trainings for delegates based in the Russian Federation, Pakistan and Kazakhstan. The only residential course to take place was in Acajutla, El Salvador in February, just before the global lockdown put the brakes on international travel.

PentaTr@ining continues to develop and evolve in response to the changing needs of children and pregnant women living with HIV. As we move forward, we plan to expand our training programmes into other clinical areas of our research activity, including antimicrobials and antifungals.

PentaTr@ining



70

TRAINING COURSES
(2005-2020)
DELIVERED TO **5000+**
HEALTHCARE WORKERS FROM
36 COUNTRIES

TIMELINE MILESTONES

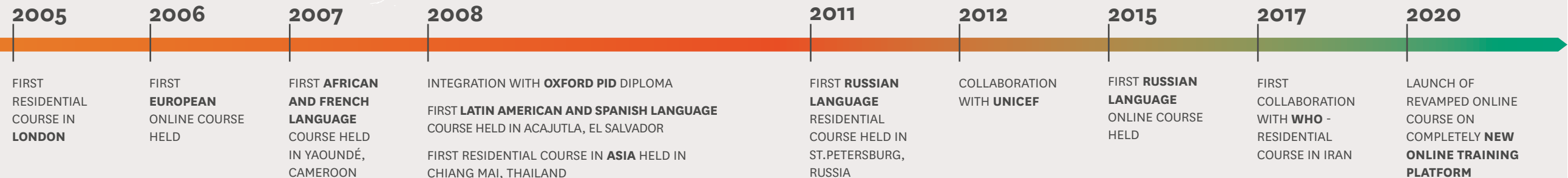




Illustration by a participant of
"Sexually Transmitted
Infections (STIs) Project" course

“The COVID-19 pandemic is also making us all aware of the importance of the healthcare system. I have always considered medical doctors, nurses, educators, psychologists, volunteers that work in hospital settings as heroes”.



Yes, I'm positive! Not for Coronavirus but for HIV. Since I was born, 24 years ago. HIV and COVID-19 are not so different. Like COVID-19, HIV forces you to change your way of living. It is easy to experience anxiety or depression because you have to deal with an invisible enemy that obliges you to stay on your own. You can't run away from your deepest thoughts.

When the lockdown was announced I did not feel so scared. I have been social distancing since I was born. HIV infection often leads to feelings of being alone, and distancing from others. We are now required to wear a face mask because of the current pandemic. However, I have worn a virtual mask since I was a child. It protects me because people have little knowledge of HIV, they seem unaware that my infection does not define me - there is a lot more to me than this! I wear my mask, so I feel more self-confident. I wear it to hide my emotions.

COVID-19 is teaching us the importance of taking care of our own and other people's health. Washing hands and wearing a mask, these actions are not so different from using a condom during sexual intercourse, in order to protect yourself and others. The COVID-19 pandemic is also making us all aware of the importance of the healthcare system. I have always considered medical doctors, nurses, educators, psychologists, volunteers that work in hospital settings as heroes. They support me, taking care of my physical and mental health.

**From a young man
living with HIV**



4. THE FUTURE: CHALLENGES AND OPPORTUNITIES

Following a successful year,
our activities in 2020 are focused on
organizational growth and continuing to
strengthen network capabilities



Looking forward

Next year we will bring children to the centre of COVID-19 research. So far, international research into COVID-19 has predominately focused on adults, due to the less severe presentation in infected children. However, because most children in the foreseeable future will be unable to get vaccinated (especially in low and middle-income countries), transmission will continue to occur with the risk of selecting new variants which could facilitate the circulation of the virus in the overall population.

We now know that some paediatric groups (such as those living with HIV, other immunosuppressive conditions, including cancer patients, or children with chronic heart or lung diseases, such as cystic fibrosis or TB) appear to be at higher risk of disease progression, but a lot is still unknown about the factors influencing severity of the disease.

We strongly believe that the differences between children and adults may reveal important clues regarding the pathogenic mechanisms of COVID-19 and the spreading of the infection.

We will bring our experience and our Network in the collection of real-time safety data during the roll-out of **new vaccines**.

There are exciting times ahead. In 2021, we will see the final results of two of our key clinical trials, ODYSSEY and SMILE. We hope to demonstrate the safety and efficacy of a dolutegravir based HIV treatment suitable for children and adolescents, especially those living in low resource settings, so they can have access to **the best drug early in life** and thus close the gap between HIV treatment options available for adults and children. Also the EPIICAL studies will provide essential biological understandings on the best strategies to improve

virological control in children living with HIV. Similarly, our NeoVanc trial is promising to provide some helpful insights on vancomycin use in neonates.

Over the next year, we will be working to strengthen the Penta ID Network by supporting the scientific working groups to develop **new research** and training across scientific areas. Sustainability will be a key focus for the Network, by widening our Network membership and facilitating the involvement of early career researchers.

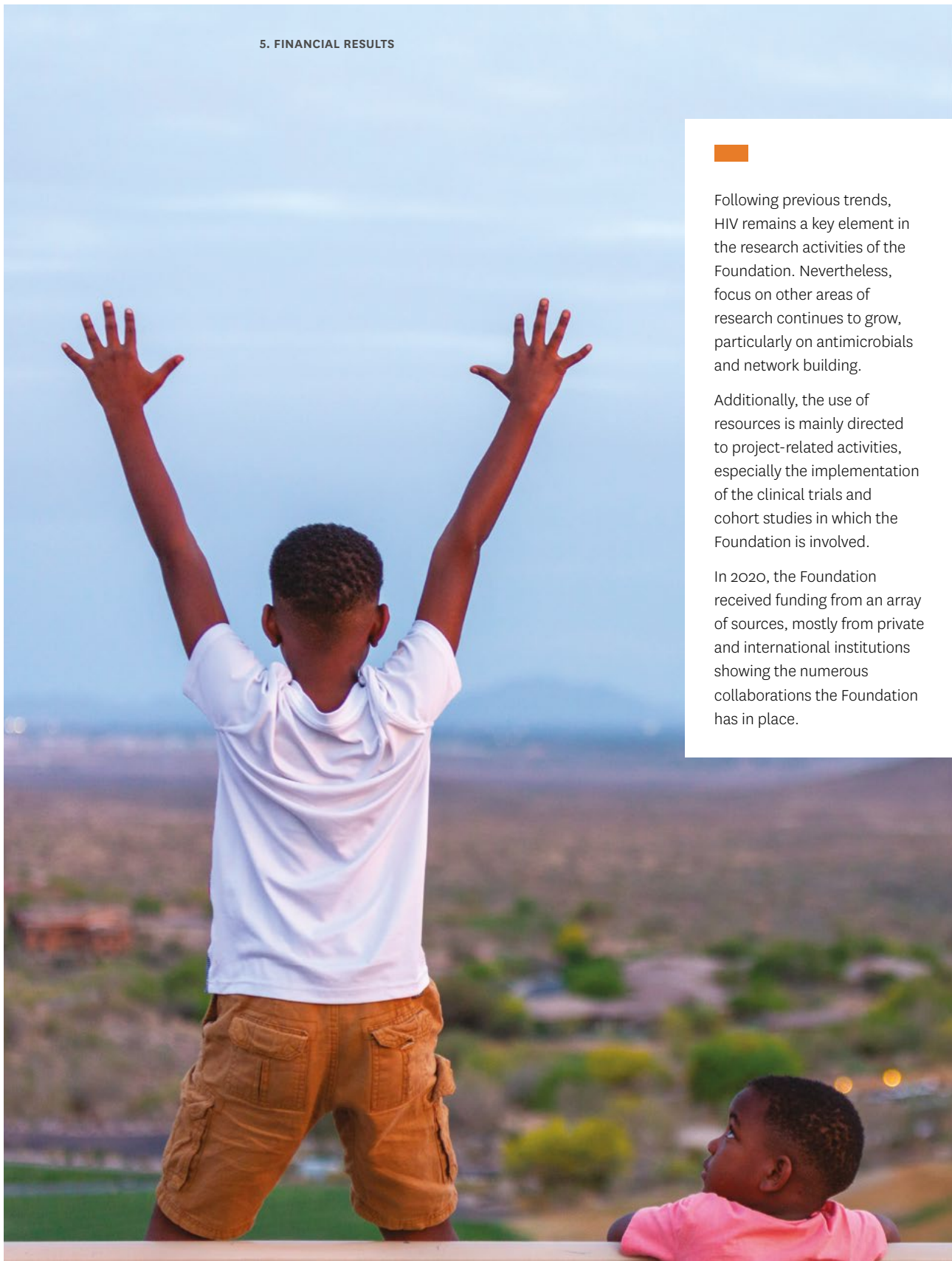
Our years of dedication to HIV have helped the scientific community make strides in advancing treatment strategies and making HIV a treatable condition. We will not stop there. We will continue **our fight against infectious disease** threatening the lives of children and their mothers.



5. FINANCIAL RESULTS

Penta is an independent organisation funded by **public and private contributions** from international organisations



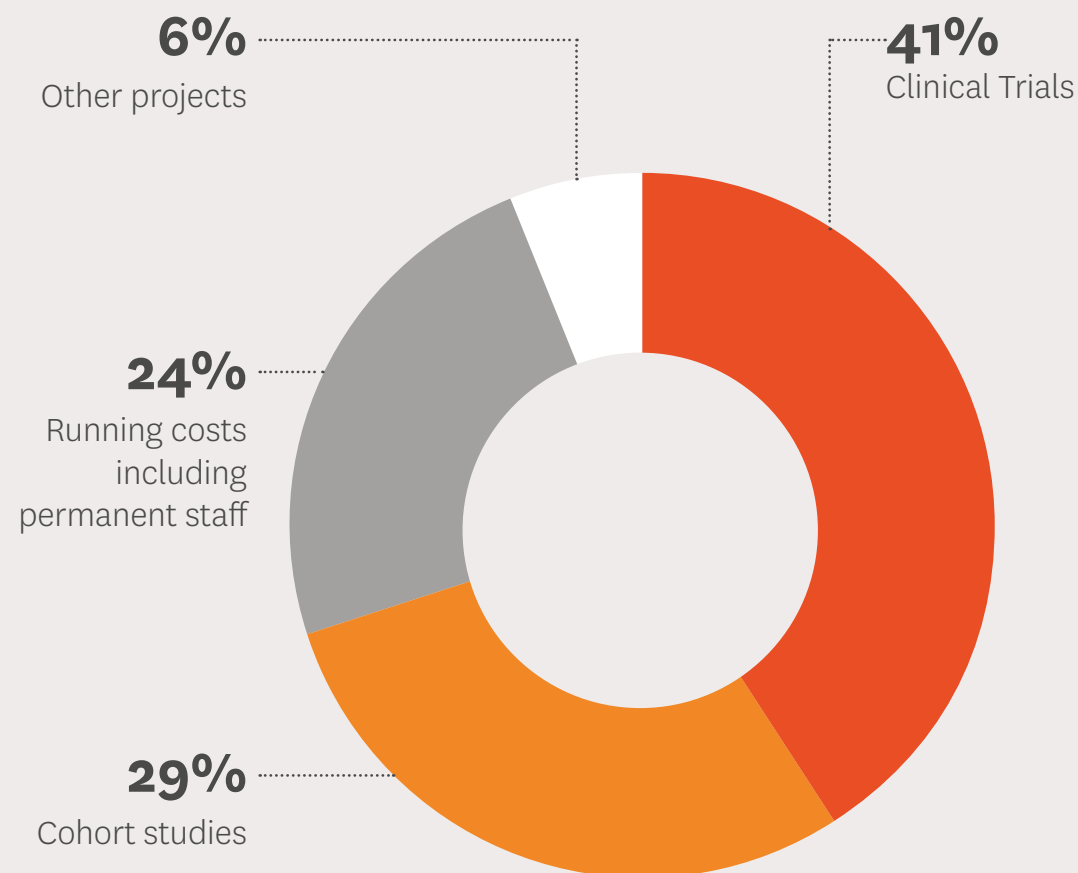


Following previous trends, HIV remains a key element in the research activities of the Foundation. Nevertheless, focus on other areas of research continues to grow, particularly on antimicrobials and network building.

Additionally, the use of resources is mainly directed to project-related activities, especially the implementation of the clinical trials and cohort studies in which the Foundation is involved.

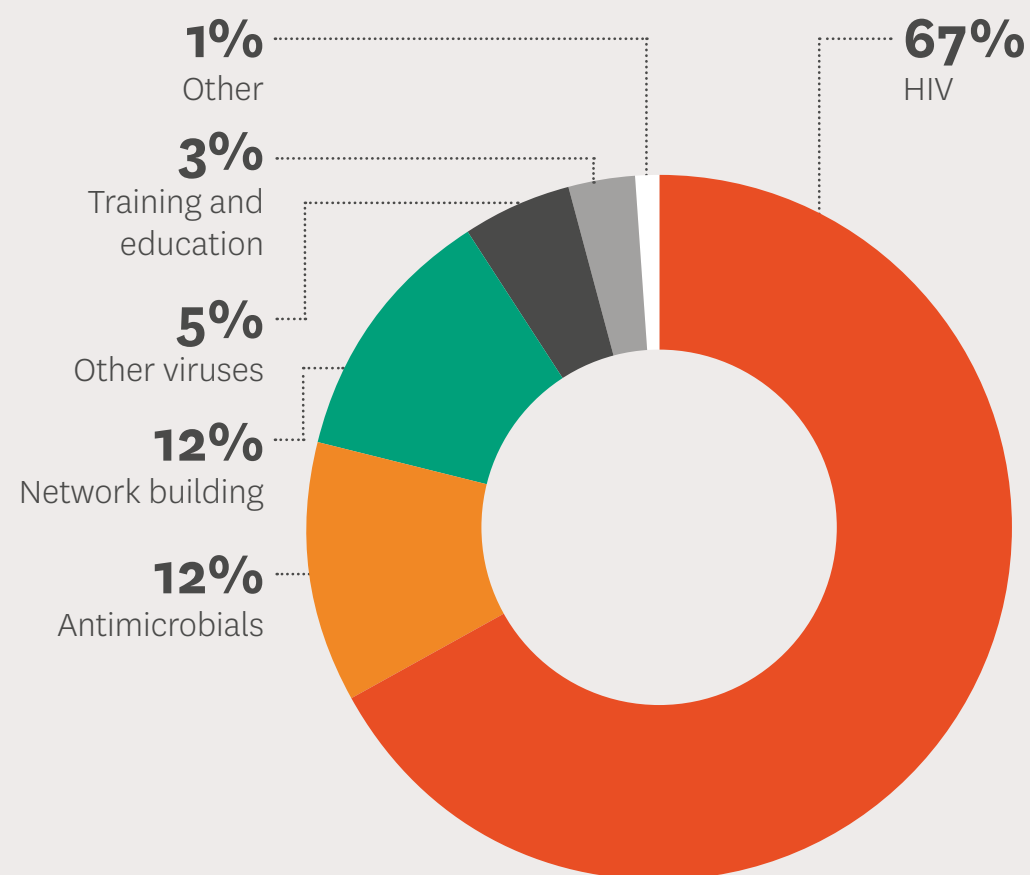
In 2020, the Foundation received funding from an array of sources, mostly from private and international institutions showing the numerous collaborations the Foundation has in place.

Expenses by type of activity



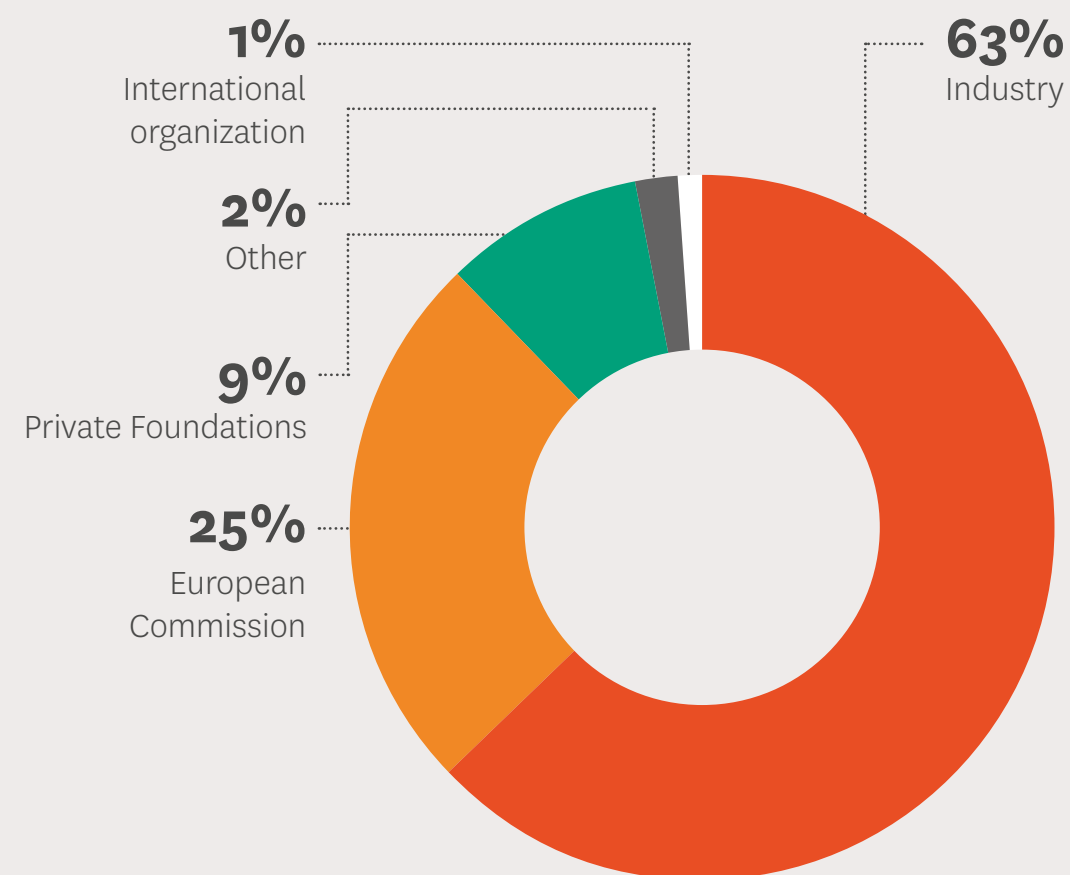
THE CHART SHOWS THE PERCENTAGE DISTRIBUTION OF THE USE OF RESOURCES BY TYPE OF ACTIVITY FOR 2020. AS SHOWN, MOST OF THE EXPENSES WERE INCURRED IN RELATION TO THE IMPLEMENTATION OF CLINICAL TRIALS AND COHORT STUDIES, HIGHLIGHTING THE NUMEROUS STUDIES THE FOUNDATION IS RUNNING.

Revenues by research area



THE CHART SHOWS THE PERCENTAGE DISTRIBUTION OF REVENUES BY RESEARCH AREA IN 2020. HIV CONTINUES TO BE THE FOUNDATION'S KEY RESEARCH AREA. THE SIGNIFICANT INCREASE IN NETWORK BUILDING COMPARED TO PREVIOUS YEARS HIGHLIGHTS THE GROWING IMPORTANCE OF THE FIELD.

Revenues by funder



THE CHART SHOWS THE PERCENTAGE DISTRIBUTION OF REVENUES BY FUNDER IN 2020. THE HIGHEST PROPORTION CORRESPONDS TO PRIVATE SOURCES, WHICH SHOWS THE NUMEROUS COLLABORATIONS THE FOUNDATION HAS IN PLACE. THE EUROPEAN COMMISSION CONTINUES TO BE A KEY FUNDER.

Contents

| | |
|--|----|
| <i>Letter from the President</i> | 2 |
| ABOUT US | 6 |
| Our vision | 8 |
| Our mission | 8 |
| What makes us unique | 9 |
| Our values | 9 |
| Our guiding principles | 9 |
| About Penta | 11 |
| Our Objectives..... | 12 |
| Our Impacts | 13 |
| Our key partners..... | 14 |
| Since we started | 16 |
| 2020 at a glance..... | 18 |
| HOW WE OPERATE / ORGANIZATIONAL STRUCTURE | 20 |
| Our Stakeholders | 22 |
| Penta ID Network | 24 |
| Penta Foundation | 28 |
| Penta Foundation governance | 29 |
| Penta Foundation staff..... | 30 |
| Our people | 31 |
| Penta Foundation core competencies | 32 |
| Penta ID Innovation | 36 |
| Penta UK | 37 |
| ACTIVITIES AND ACHIEVEMENTS | 38 |
| Research activities | 40 |
| Ongoing research activities..... | 42 |
| Other activities | 56 |
| THE FUTURE: CHALLENGES AND OPPORTUNITIES | 64 |
| Looking forward | 66 |
| FINANCIAL RESULTS | 68 |
| Expenses by type of activity..... | 71 |
| Revenues by research area | 72 |
| Revenues by funder | 73 |

LISTS OF ACRONYMS

| | | |
|---|---|---|
| CLEO Centre for Clinical Epidemiology and Outcome Research | GAP-F Global Accelerator for Paediatric Formulations | PADO Paediatric Antiretroviral Drug Optimization |
| CRO Contract Research organization | HCV Hepatitis C Virus | PAWG Paediatric Antiretroviral Working Group |
| DNDI Drugs for Neglected Diseases initiative | IMI1/IMI2 Innovative Medicines Initiative | PHPT Program for HIV Prevention and Treatment |
| EDCTP European and Developing Countries Clinical Trials Partnership | INSERM Institut National de la Santé et de la Recherche Médicale | PIP Paediatric Investigation Plan |
| ENPR-EMA European Network of Paediatric Research at the European Medicines Agency | JCRC Joint Clinical Research Centre | TB Tuberculosis |
| GARDP Global Antibiotic Research & Development Partnership | MRC CTU Medical Research Council Clinical Trials Unit | UCL University College London |
| | NGO Non Governmental Organization | WHO World Health Organization |
| | OPBG Ospedale Pediatrico Bambino Gesù | |



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