



Horizon2020  
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for Research & Innovation



# Research on European Children and Adults born Preterm

PROJECT BROCHURE



**RECAP preterm** “Research on European Children and Adults born Preterm” is a project funded under the European Horizon 2020 Research and Innovation Programme. It features a powerful network of experts from various disciplines as well as patient organisations and research institutions.

The RECAP Cohort Platform constitutes a unique, sustainable, geographically diverse and thematically broad data hub for cohorts and elevates the visibility, breadth and translation capacity of very preterm birth/ very low birth weight research in Europe. Furthermore, it can help to reduce ethical, administrative and technical barriers to collaboration in research and create positive incentives for engagement from research teams around the world. This will enable

timely responses to emergent questions about best care and social policy for children and adults born very preterm or with low birth weight.

We are honoured to invite you to explore the unique work of the RECAP preterm project: This brochure summarises the objectives and set-up of an intense collaboration and productive learning within the project Consortium comprising 20 partners from 12 European countries.

We very much hope that, in the coming years, the RECAP Preterm Cohort Platform will become a widely used tool among researchers to look into data gathered from very preterm and very low birth weight cohorts across the world, so that the fruits of this EU funded project will grow.

The RECAP preterm Consortium

## Welcome

Over five years (2017-2021) the **RECAP preterm** Consortium developed a sustainable platform for research on children and adults born very preterm or with very low birth weight. The platform enables stratified sub-group analyses of sociodemographic and clinical characteristics, neonatal complications, and otherwise rare medical conditions that cannot be studied in national population cohorts. **RECAP preterm** will make it possible to investigate the many open questions on long term effects of very preterm birth/very low birth weight going beyond state of the art, for example:

- Which outcomes are universal results of very preterm birth/ very low birth weight?
- Which outcomes are substantially influenced by other social factors and vary between cohorts?
- How early can children at increased risk for long term adverse outcome be identified to provide appropriate interventions?
- What should be assessed in childhood and when to predict adult outcome?





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## Why our Research Matters

Normal human pregnancy lasts 40 weeks. However, every 10th baby is born preterm, which means before 37 weeks of pregnancy. Very preterm birth is defined as birth before 32 weeks and affects about 1-2% of all babies, that is, over 50,000 babies per year in Europe. Another significant global health problem is very low birth weight,

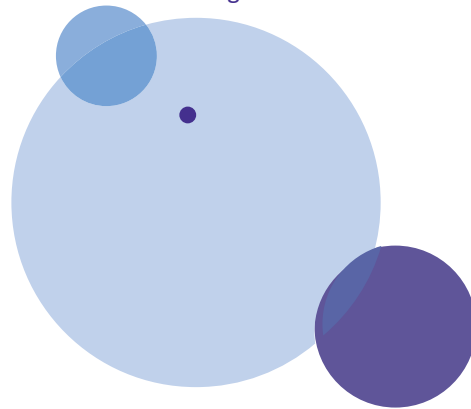
i.e. less than 1,500 grams (3.30 pounds). Low birth weight babies (under 2,500 grams (5.51 pounds) account for 60-80% of all neonatal deaths worldwide<sup>1</sup>.

Many babies born very preterm grow up to lead healthy lives. Nevertheless, babies born very preterm or with very

low birth weight have an increased risk for physical and mental health problems that can affect their participation in everyday activities - e.g. cerebral palsy, visual and hearing deficits, learning difficulties, social or emotional problems. These difficulties can impact a child's performance and integration at school. As adults, they are more likely to suffer from chronic diseases such as heart disease, hypertension or diabetes than their term born peers<sup>2</sup>. There is emerging evidence for increased risks of reduced mental health, quality of life, partnering, family life as well as employment chances and wealth in adulthood<sup>3</sup>.

Although survival of babies born extremely preterm (below 28 weeks of pregnancy) has greatly increased, the neurological and developmental outcomes did not improve at the same rate. Some findings on the effects of very preterm birth / very low birth weight on blood pressure, obesity, increased mood disorder or lowered quality of life have even been contradictory. Thus, it remains unclear which outcomes are universal or vary according to either obstetrical

or neonatal treatment, the available social or educational support or the cultural context. The real extent of the challenges babies born very preterm or with very low birth weight face and the impact on quality of life, as well as the child's compensatory mechanisms, show only with time. At first discharge home from neonatal hospitalisation, it is not possible to identify with certainty who will develop specific impairments, how long these will last, nor to determine their severity. It is important to identify children who are at risk of health and developmental difficulties early, to find factors in the environment that protect them against adverse out-comes and build on their strengths.



<sup>1</sup> Joy LE, Simon C, Jelka Z. 4 million neonatal deaths: When? Where? Why? *Lancet*. 2005;365(9462):891–900. doi: 10.1016/S0140-6736(05)71048-5. [PubMed]

Lawn JE, Blencowe H, Oza S, You D, Lee AC, Waiswa P, et al. Every newborn: progress, priorities, and potential beyond survival. *Lancet*. 2014;384(9938):189–205. doi: 10.1016/S0140-6736(14)60496-7. [PubMed]

<sup>2</sup> Raju TNK, Pemberton VL, Saigal S, Blaisdell CJ, Moxey-Mims M, Buist S. Long-Term Healthcare Outcomes of Preterm Birth: An Executive Summary of a Conference Sponsored by the National Institutes of Health. *The Journal of Pediatrics*.181:309-318.e301

<sup>3</sup> Baumann N, Bartmann P, Wolke D. Health-Related Quality of Life Into Adulthood After Very Preterm Birth. *Pediatrics*. 2016. Saigal S, Day KL, Van Lieshout RJ, Schmidt LA, Morrison KM, Boyle MH. HEalth, wealth, social integration, and sexuality of extremely low-birth-weight prematurely born adults in the fourth decade of life. *JAMA Pediatrics*. 2016;170(7):678-686

## National Population-Based, High-Quality Cohort Studies and their Limits

RECAP preterm will provide important information for parents, adults born very preterm or with very low birth weight, clinicians, policy makers or healthcare providers about the future and allows for anticipatory policy planning.

Given these challenges, research on very preterm birth or very low birth weight survival and long-term outcomes must necessarily be carried out using longitudinal designs; new cohorts have to be reconstituted over time and results need to be compared across cohorts.

Many European countries have constructed cohorts of children born very preterm or with very low birth weight to support research regarding the causes and consequences of preterm birth and provide data for policy and planning.

These studies follow a population-based design. Nevertheless, as very preterm born / very low birth weight babies represent only about 2% of all live births, these studies have to cover large populations or long time periods to achieve adequate sample sizes. The good news is that both recruitment and continued participation in population-based cohorts are usually higher than in general population cohorts which focus on the majority of children born at term.

Very preterm birth or very low birth weight have shown to be associated with social and economic risk factors such as low parental educational status or poverty, which can be negatively related to poor follow-up care. The population-based approach at inclusion makes it possible to accurately describe the participants and the populations that are difficult to follow-up.

Despite the extensive knowledge generated by these cohorts, there are limits to what national very preterm birth or very low birth weight cohorts can achieve. In particular, individual cohorts do not usually have sufficient sample sizes for in-depth analyses of many key sub-groups. Further, each cohort is anchored in its time and place and the generalisability of findings to other settings and other age groups cannot be addressed.

## Our Objectives

RECAP preterm aims to understand the causes of health issues faced by children born very preterm or with very low birth weight. Such information supports the development of policy recommendations for effective care that may lower medical, social and educational costs.

Identifying modifiable factors for improved outcome following very preterm birth or very low birth weight is key to effective policy development and intervention. Evidence-based information about prognosis and future complications is needed to assess the effectiveness of medical care and social programmes.

Making the best decisions for these children at birth, during childhood and intervene early to prevent or mitigate health and developmental problems later in life is one of the main goals of **RECAP preterm**.

### RECAP preterm...



... creates a sustainable, geographically diverse, multidisciplinary platform of very preterm/ very low birth weight cohorts from Europe and around the world, constituted over a 30 year time span, to optimise the use of population data for research and innovation in healthcare and policy.



... develops hypothesis-driven research on health and care of very preterm/ very low birth weight children and adults that builds on the unique opportunities provided by the larger sample sizes of combined cohorts and the added value of their geographic and temporal diversity.



... integrates exchange with stakeholders into the platform in order to disseminate results, to translate them into evidence-based care and policy.



... involves society and emphasizes patient and public involvement in order to reflect real-world needs.

## Who is behind RECAP preterm?

The network includes the major longitudinal studies in Europe and around the world and assembles massive amounts of data that reflect broad diversity.

To reach the project's objectives and go "from idea to application", RECAP preterm brings together a powerful network and highly experienced group of institutions, organisations and individual researchers from various disciplines, including for example life course epidemiology,

methodology, neonatology, epigenetics, economics, psychology and mental health, e-learning technologies, as well as parent and patient representatives. The network includes pregnancy and child to adult cohorts from Europe and around the world as well as data from four Nordic registries.

### Members

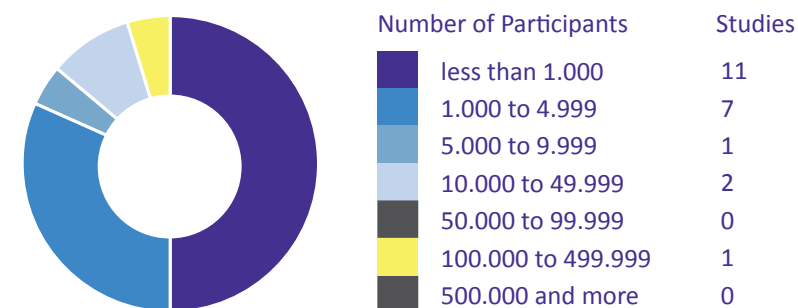
RECAP preterm brings together 20 transdisciplinary institutions:

1. NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK (TNO) The Netherlands
2. THE UNIVERSITY OF WARWICK United Kingdom
3. INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE (INSERM) France
4. INSTITUTO DE SAUDE PUBLICA DA UNIVERSIDADE DO PORTO (ISPUP) Portugal
5. INESC TEC - INSTITUTO DE ENGENHARIA DE SISTEMAS E COMPUTADORES, TECNOLOGIA E CIENCIA Portugal
6. UNIVERSITY OF LEICESTER United Kingdom
7. TERVEYDEN JA HYVINVOINNIN LAITOS Finland
8. EUROPEAN FOUNDATION FOR THE CARE OF NEWBORN INFANTS (EFCNI) Germany
9. NORGES TEKNISK-NATURVITENSKAPELIGE UNIVERSITET NTNU Norway
10. KAROLINSKA INSTITUTET Sweden
11. UNIVERSITAETSKLINIKUM BONN Germany
12. HELSINGIN YLIOPISTO Finland
13. OSPEDALE PEDIATRICO BAMBINO GESU (IRCC) Italy
14. HAmager og Hvidovre Hospital Denmark
15. PHILIPPS UNIVERSITAET MARBURG Germany
16. TARTU ULIKOOL Estonia
17. UNIVERSITEIT ANTWERPEN Belgium
18. Concentris Research Management GmbH Germany
19. EXTENSIVE LIFE OY Finland
20. Stichting MLC Foundation, the Netherlands



11. EST 2002-2003 – EST 2002-2003 ELBWI, <29GW at 5y
12. EST 2007-2008 - Very low gestational age infants born in Estonia in 2007-2008
13. ESTER - Preterm Birth and Early Life Programming of Adult Health and Disease
14. ETFOL - Treatment of extremely preterm infants: parents attitudes
15. EXPRESS - Extremely Preterm Infants in Sweden Study
16. GNN - German Neonatal Network
17. HAPP-e - Health of Adult People born Preterm – an e-cohort study
18. HeSVA - Helsinki Study of Very Low Birth Weight Adults
19. NTNU LBW Life - NTNU Low Birth Weight in a Lifetime Perspective Study
20. PEP - Project Extreme Prematurity
21. PIPARI - Development and Functioning of Very Low Birth Weight Infants from Infancy to School Age
22. POPS - Project On Preterm and Small for gestational age infants
23. RECAP-Registers - RECAP Preterm Nordic Registers (Finland, Sweden, Norway, Denmark)

### Distribution of studies by number of participants



Future cohorts will be easily integrated into the platform.

The existing very preterm birth cohorts contain prospectively followed populations of particularly vulnerable children of different ages from several countries over a broad historical time-span. They include exposures to variable and contrasting health care and technological interventions available at different points in time. The cohorts' historical time span and geographical diversity will provide a **unique opportunity to generate evidence** that will have greater generalizability than the cohorts individually.

### Participating Cohorts / Nordic Registries

The following studies are currently included in the RECP preterm Cohort Platform, with participant numbers ranging between 80 to 100,000 participants:

1. ACTION - Accesso alle Cure e Terapie Intensive Ostetrico Neonatali (Access to Obstetrical and Neonatal Intensive Care)
2. AYLS - Arvo Ylppö Longitudinal Study
3. BEST/BLS - Bavarian Longitudinal Study Cohort
4. EFGR in very preterm infants - Extreme Fetal Growth Restriction in very preterm infants (harmonization study)
5. UA\_EPIBEL - Antwerp University EPIBEL
6. EPICE - Effective Perinatal Intensive Care In Europe
7. EPICE-PT - Effective Perinatal Intensive Care in Europe – Portugal
8. EPICure 1 and 2
9. EPIPAGE 1 and 2 - Étude épidémiologique sur les petits âges gestationnels
10. EPT RECAP - A comparative analysis of extremely preterm birth cohorts in Europe participating in the RECAP consortium (harmonization study)

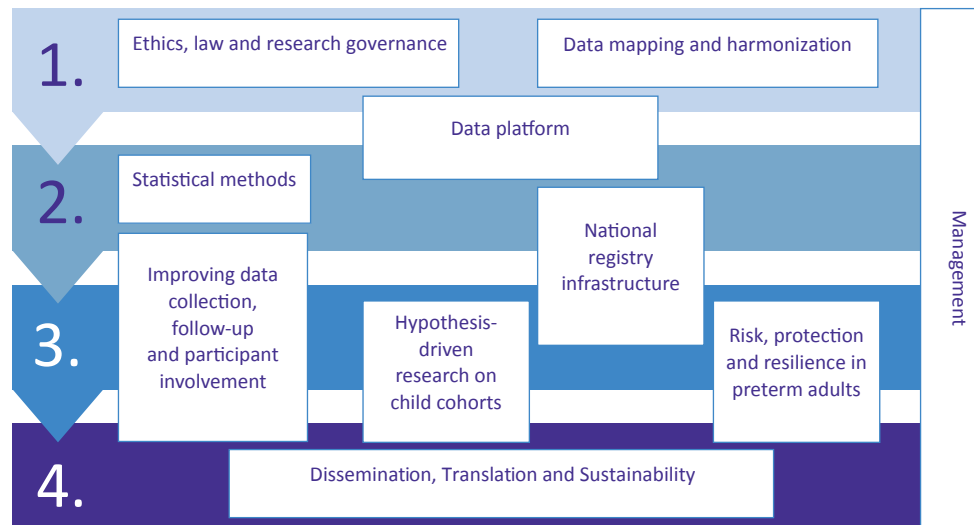
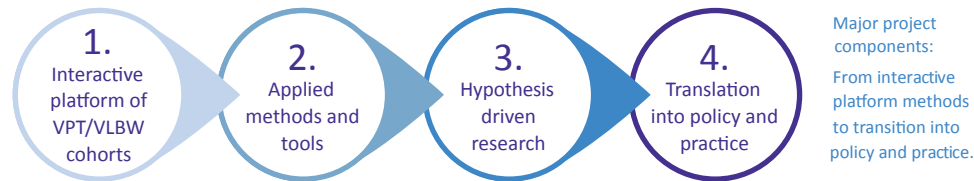


## From an Interactive Platform to Policy and Practice

The underlying basis for the RECAP preterm project is a governance model which enables sharing of data on very preterm birth/ very low birth weight cohorts and expertise from the consortia involved in these cohorts. The governance structure is based on European ethical and legal requirements. Mapping and harmonising the data items available in these cohorts ensures the construction of a non-disclosive interactive platform and enables sharing of individual patient data from very preterm birth/ very low birth weight cohort studies.

. The data platform brings together multiple geographically dispersed and autonomous database systems into a single virtual database for specified demonstration or research activities.

To achieve the way from an interactive platform of very preterm birth/ very low birth weight cohorts to transition into policy and practice, the work within RECAP preterm was organised in different -sometimes interdependent - work packages.



The four components and their associated work packages. Some work packages include tasks related to several of the components.

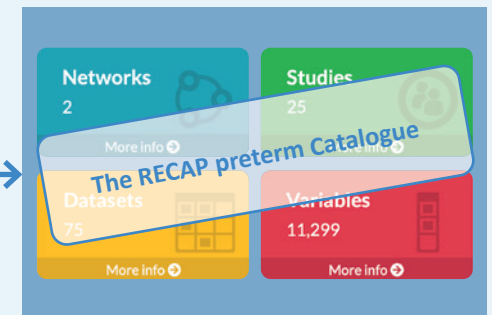
## The RECAP preterm Cohort Platform

The heart of the RECAP preterm project is the **RECAP preterm Cohort Platform**. This platform finally brings together extensive data from 23 population-based cohorts of children and young adults born very preterm from 12 European countries as well as further cohorts from around the world.

The platform facilitates the harmonization of data hosted at 13 sites across Europe, the so called "nodes". The data from the cohorts and additionally from national health data registers from four Nordic countries are kept securely in each institution, but new software allows for non-disclosive and safe data analysis across the cohorts. A "central node"

located in Portugal retrieves data dictionaries, variables and summary statistics from the individual nodes and feeds all this information into a central **RECAP preterm Catalogue**.

The **RECAP preterm Research Coordination Portal** is the central place of the platform: The cohort variable summaries can be accessed in the **RECAP preterm Catalogue** and data access requests can be made via the RECAP preterm **Cohort Platform Data Access Page**. This data access page guides the user through a four-step procedure – from submission of a research project to final approval and completion.



13 national nodes host the participating cohorts and studies.

## The RECAP preterm Research Coordination Portal

Networks

2



The RECAP Preterm Network:

A network is a group of epidemiological studies that has specific research interests. Currently, there are two networks represented on the RECAP preterm Cohort Platform:

**REsearch on Children and Adults born Preterm (RECAP preterm)**

**Screening to improve Health In very Preterm infantS in Europe (SHIPS)**

Studies

25



Two types of studies are presented on the platform:

**Individual study** - Any epidemiological study conducted to better understand the distribution and determinants of health and disease.

**Harmonisation study** – A research project harmonising data across individual studies to answer specific research questions.

Datasets

75



Two different types of datasets are presented on the platform:

**Collected dataset** containing the variables collected by a specific study during a data collection wave.

**Harmonised dataset** containing harmonised variables constructed from multiple collected datasets for use in analyses across several studies.

Variables

11,299



The variable search tool...

allows users to browse information within the data catalogue such as partner networks, studies, datasets and variables to facilitate identification of appropriate studies and

variables for inclusion in their research project or analyses. Users can search by topic of interest, scale/measure used, or by variable, dataset or study properties.

The RECAP preterm Cohort Platform gives access to an enormous wealth of data and presents a unique opportunity to answer scientific questions related to the health and well-being of children and adults born very preterm or with very low birth weight. The platform will enable us to evaluate changes in outcomes over time while providing important information on how the evolution in care of these high-risk babies has changed their developmental outcomes and quality of life.

Links

RECAP preterm Research Coordination Portal: <https://platform.recap-preterm.eu/pub/>

RECAP preterm Cohort Platform Data Access Page: <https://platform.recap-preterm.eu/pub/data-access-process>

## More Information

**Have a look at the project website** for more information about the background, methods, topics, and people involved as well as on how to access to the RECAP preterm Cohort Platform and how to develop a project with this platform.

**Watch the 11 e-learning modules about RECAP preterm and the use of the RECAP preterm Cohort Platform.** In the e-learning section of the RECAP preterm website, the research teams present interesting insights

into the project in form of short interviews and presentations. You can learn about existing cohorts, new research studies using the platform and their findings on children and adults born very preterm. You will also receive information on how to implement a collaborative research protocol, including the ethical and legal requirements, data harmonisation, the technological aspects of storing and sharing data, and analytic approaches and software or involvement of patient representatives in research projects.

Visit the RECAP preterm website:  
<https://recap-preterm.eu/>



### Contact

Project Coordination

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Prof. Jennifer Zeitlin, Institut national de la santé et de la recherche médicale (INSERM)

Dr. Sylvia van der Pal (TNO)

Please feel free to contact the Project Coordination via the RECAP preterm contact form on the website if you have a child or adult cohort for very preterm birth or low birth weight anywhere in the world and would like to join the network!



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The overall aim of this project is to improve the health, development and quality of life of children and adults born very preterm (VPT, < 32 weeks of gestation) or very low birth weight (VLBW, < 1,500g birth weight). VPT/ VLBW births constitute fewer than 2% of all births across Europe, but they account for up to half of perinatal and infant deaths, children with impairments and disabilities and more than a third of the health and educational budgets for children.