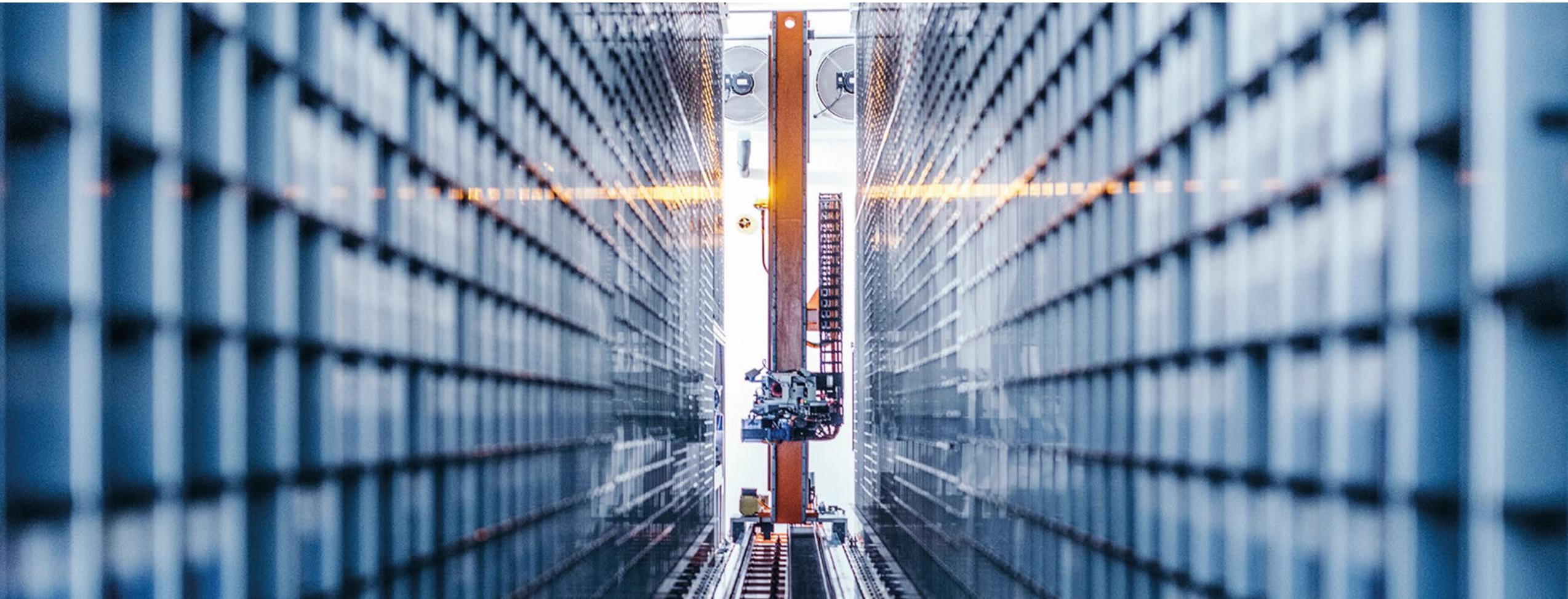


COVID-19 - WHAT ARE DANISH IHCC COHORTS DOING, HOW WE TACKLED THIS CHALLENGE

STATENS
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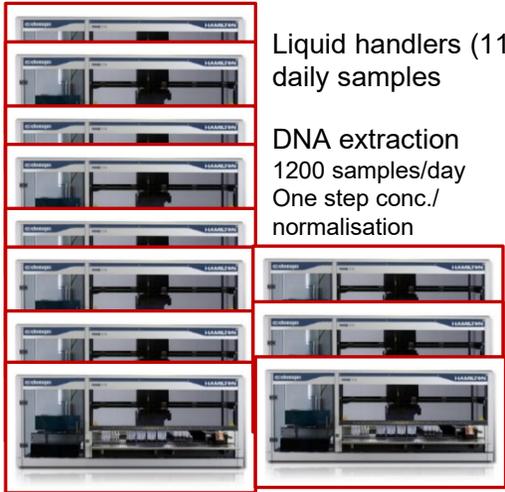
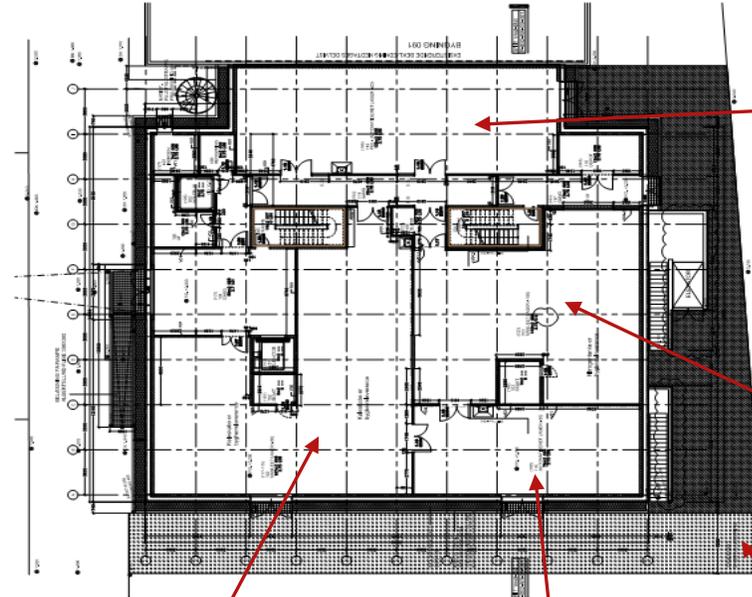
DANMARKS
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BIOBANK



THE DANISH NATIONAL BIOBANK

>12 million samples in store

- and growing by 1 million new samples per year



Liquid handlers (11)
daily samples



DNA extraction
1200 samples/day
One step conc./
normalisation



Quantitative assays

- Immunological and biochemical assays
- Microbiological assays
- MesoScale platform 10 analytes/run
- Luminex platform 30-50 analytes/run



Genetic
analysis



Metabolomics
Proteomics

- 20 °C automated storage
(4 M tubes, 3 M PKU cards)



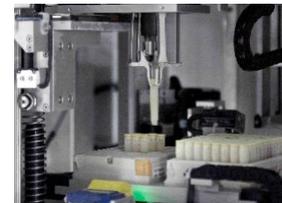
-196 °C storage
21 tanks



-80 °C automated
storage (4 M)



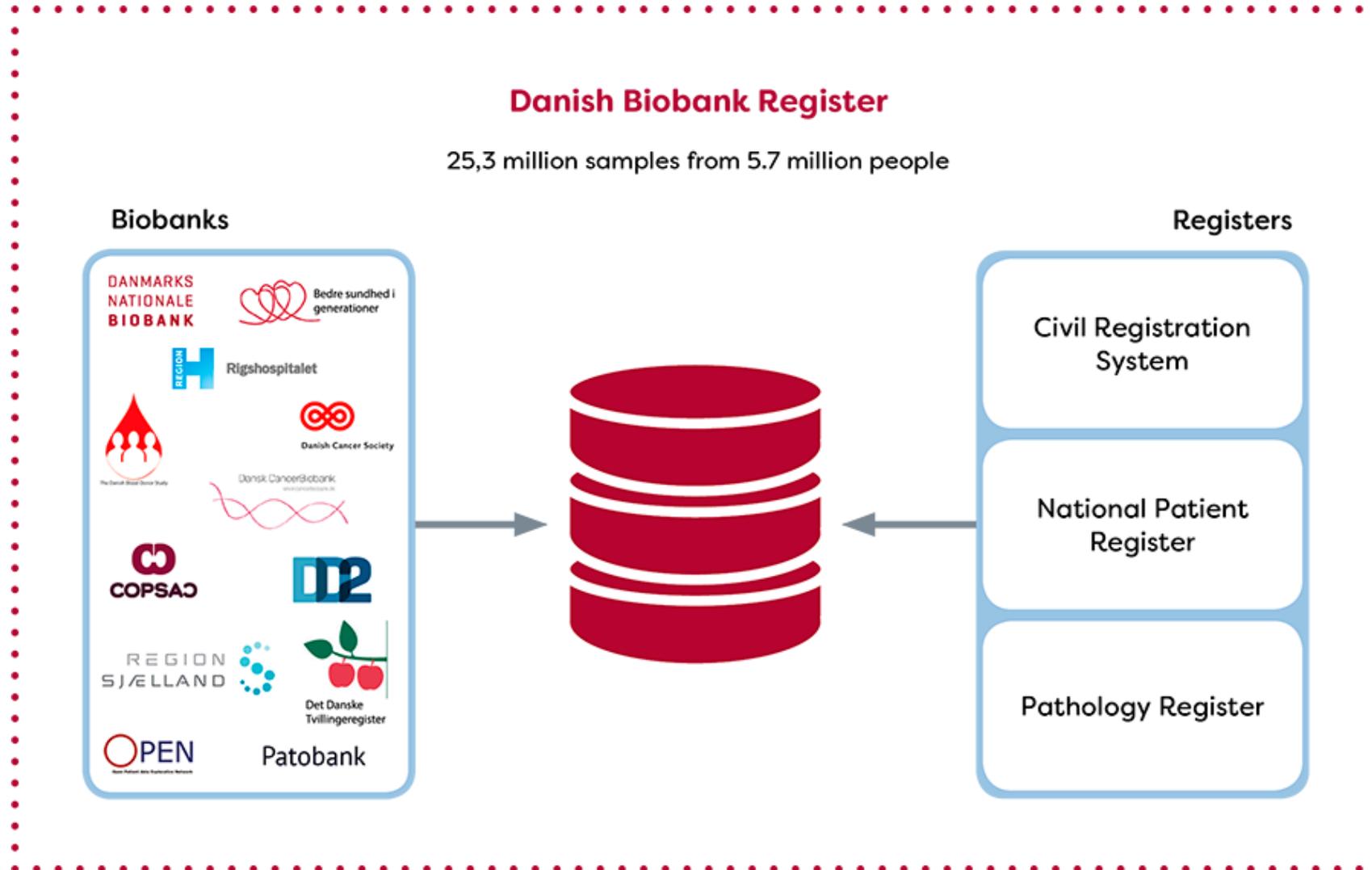
-80 °C automated
storage (4 M)



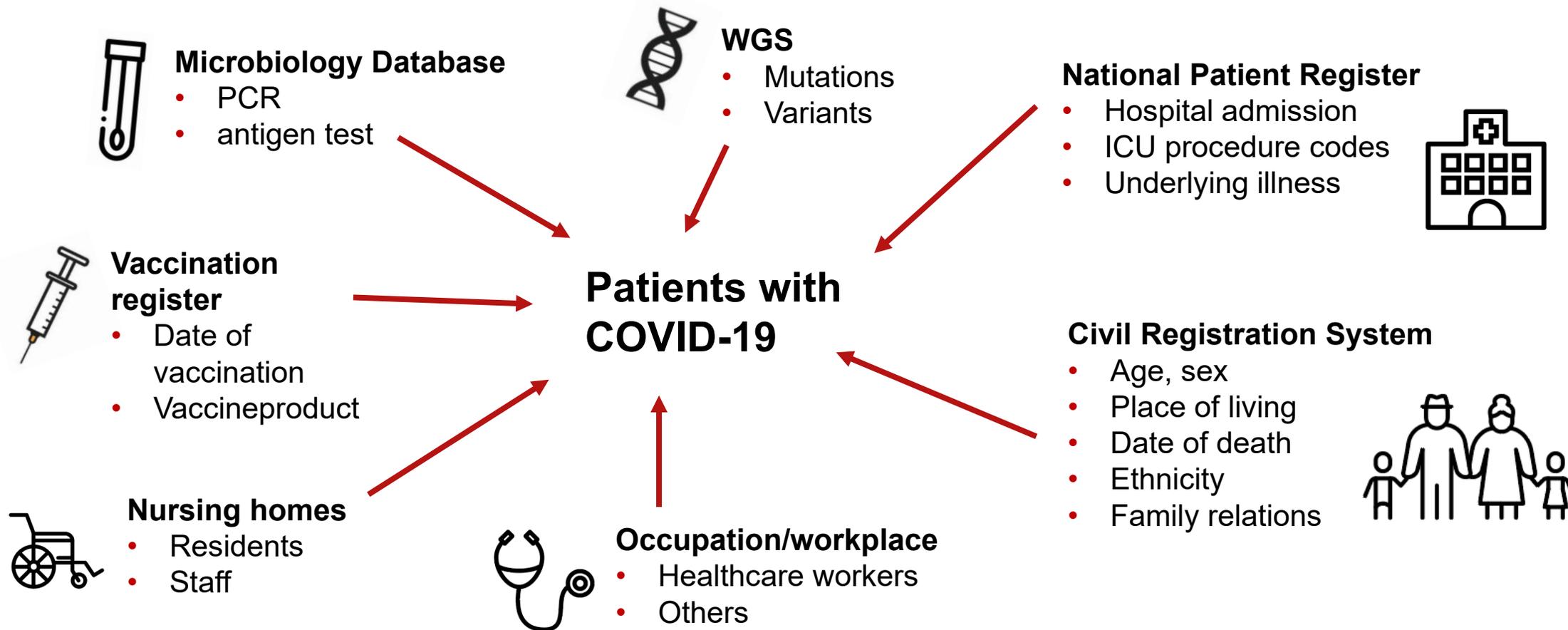
3 walk-in freezers, - 20 °C
(basement, 4 M)



THE DANISH BIOBANK REGISTER



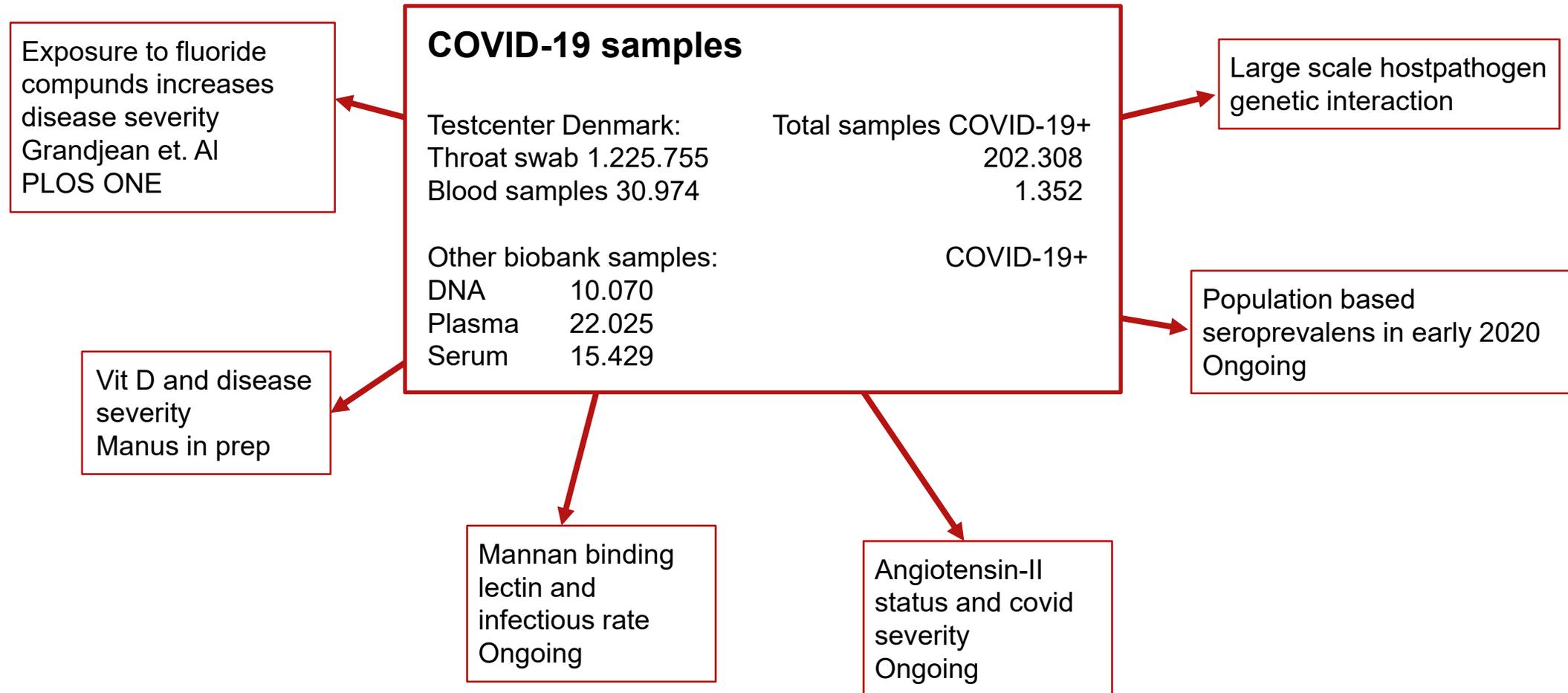
COVID-19 SURVEILLANCE



- Follow trends
- Assess severity
- Identify riskgroups
- Describe transmission chains
- Detect new virus variants
- Estimate vaccine effectiveness
- Side effects of vaccinations
- Assess effects of interventions

THE DANISH NATIONAL BIOBANK

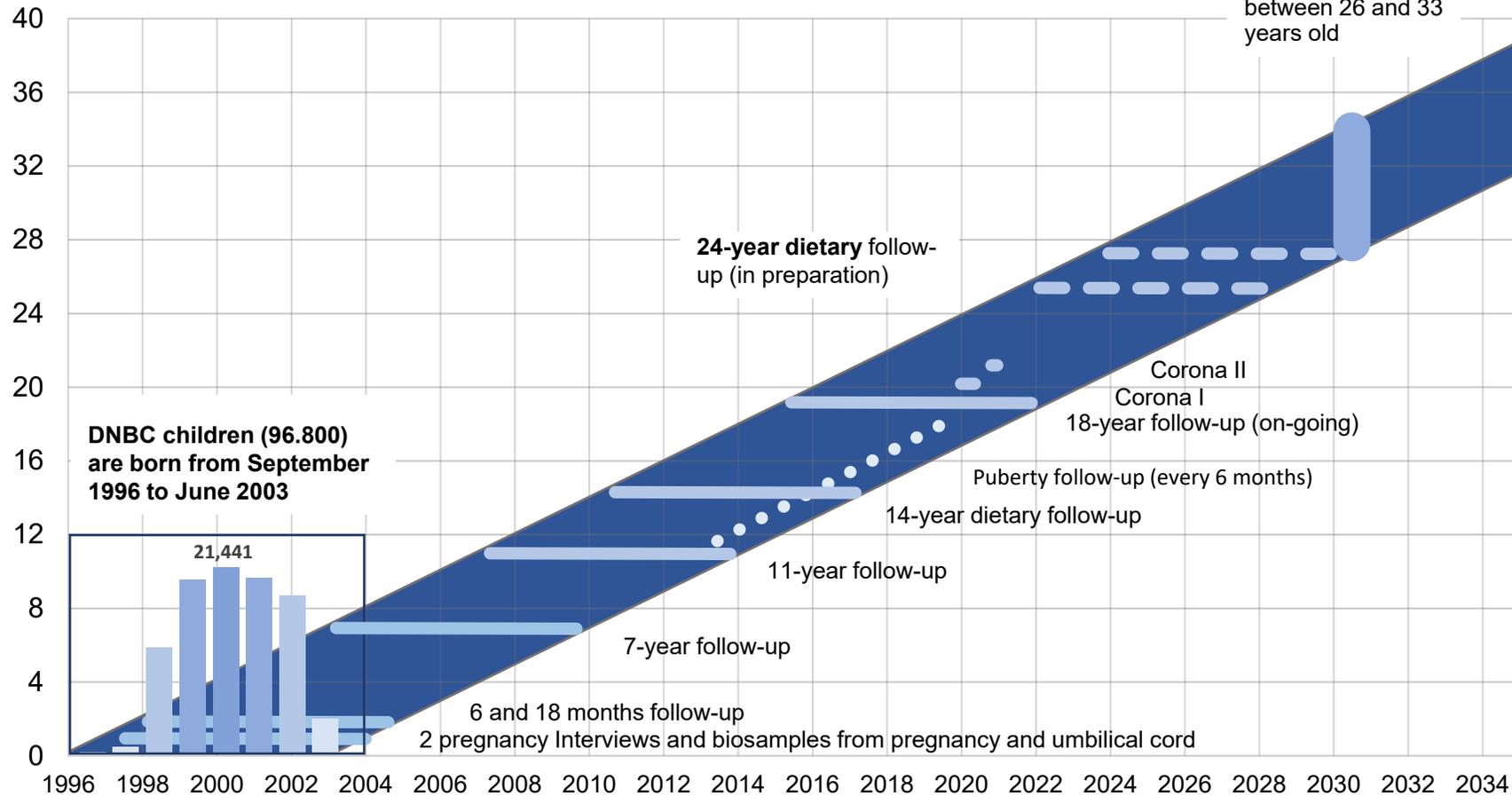
The biobank has >12 million biological samples in store



THE DANISH NATIONAL BIRTH COHORT OFFSPRING POPULATION AND GLOBAL DATA COLLECTIONS



DNBC Offspring Age



Young adult follow-up (in preparation)

Corona I and II – Mental health and well-being spring 2020 and 2021

18-year: Mental health

Puberty: Repeated every 6 months from age 11½ - 17½, youngest 22,500 participants only

14-year: FFQ self-reported diet and exercise

11-year: Self-reported child health – from mother and child

7-year: Child health reported by mother

Gest. week 16 and 30, child age 6 and 18 months: Computer Assisted Telephone Interviews

Year

COPENHAGEN HOSPITAL BIOBANK

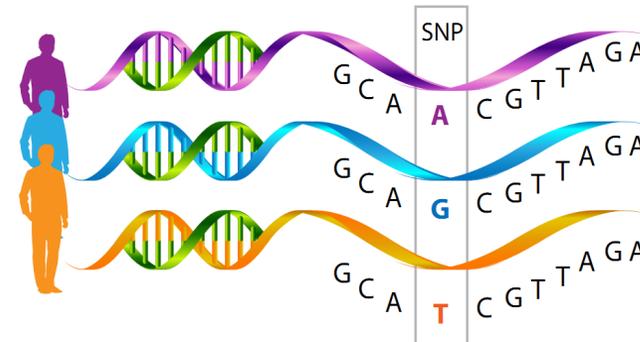
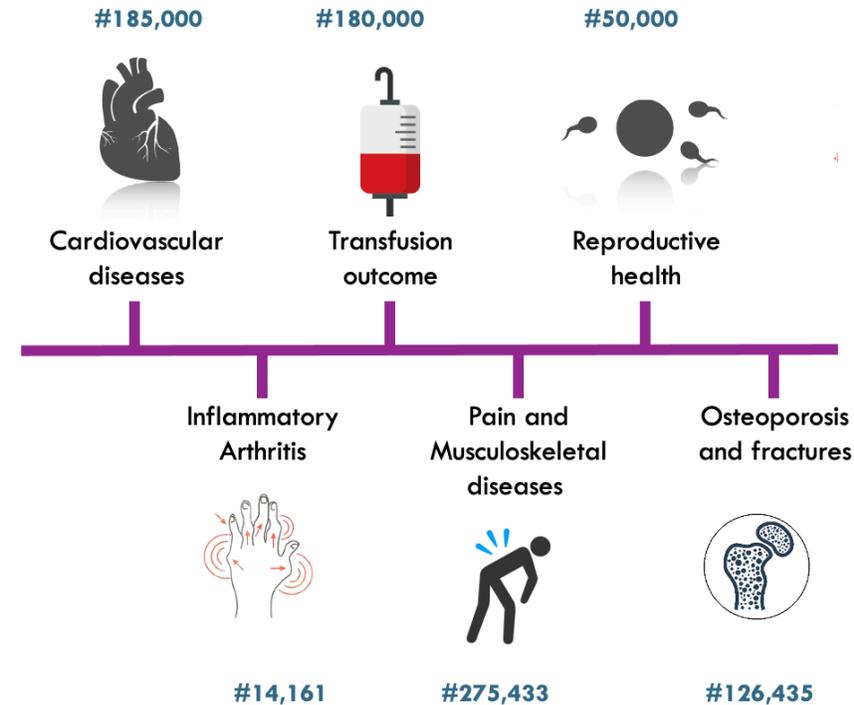


Region
Hovedstaden

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- Biobank with **>430K** patients
- Initiated at Rigshospitalet in Copenhagen in 2009
- Collection of surplus of EDTA whole blood from the Clinical Immunology department
- Average age of patients at inclusion >45 years
- Linkable with Danish national registries and electronic health records
- Illumina GSA chip in collaboration with  **deCODE** genetics



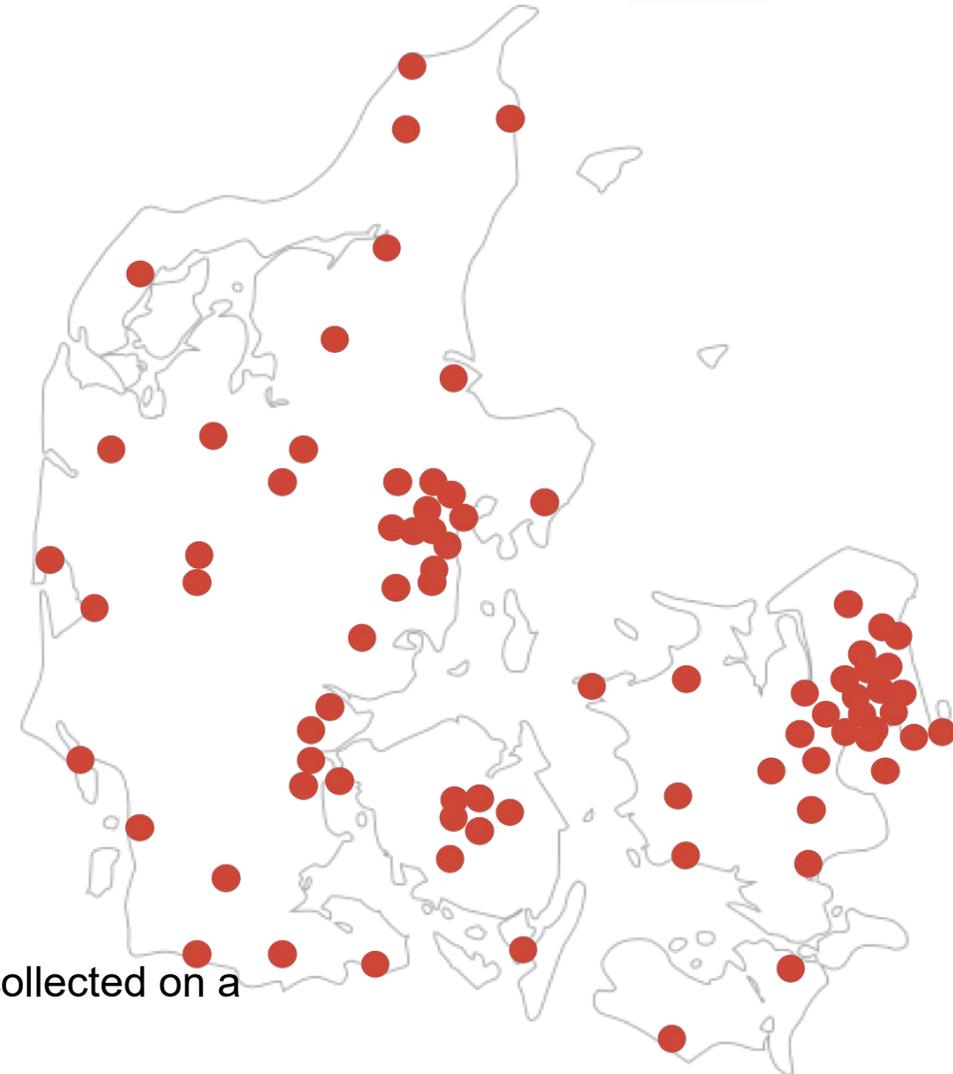
THE DANISH BLOOD DONOR STUDY



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- Nationwide recruitment of donors via the Danish Blood Banks
- 206 donation points across Denmark
- High participation rate: 95%
- Builds on existing infrastructure
- **135K** blood donors recruited since 2010
- Donors donate up to four times per year (10 times if plasma donors)
- EDTA plasma stored in biobank at each donation
- Data (questionnaire, chip genotype, register, biomarkers) collected on a dedicated secure cloud

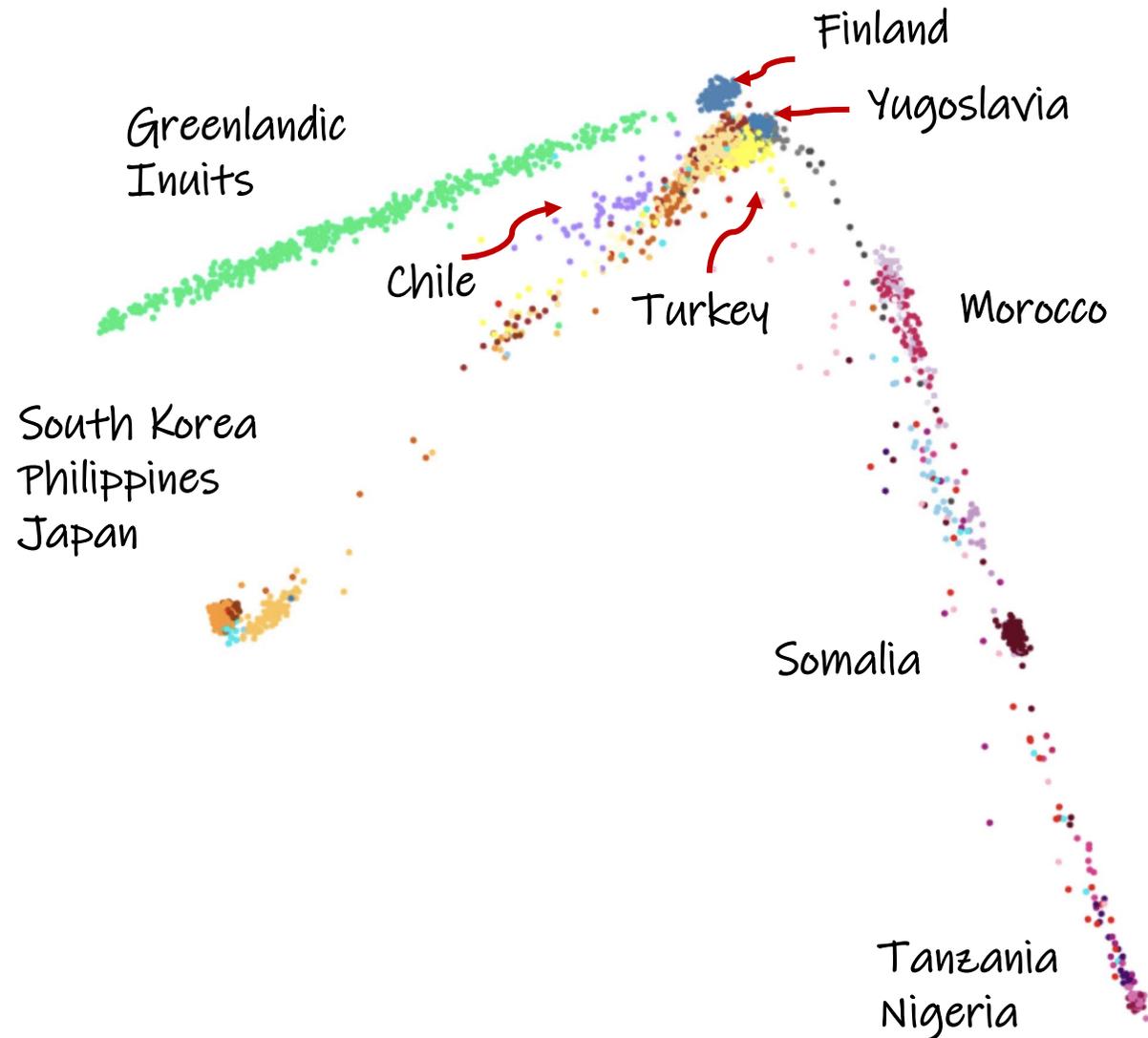


EPIDEMIOLOGY AND GENETICS OF COVID-19

- The project is based on a **national collaboration**, allowing **combination of all large established genetic cohorts in Denmark**, to conduct a large genetic-epidemiological study on COVID-19 disease.
 - Genetic cohorts: Copenhagen Hospital Biobank, the Danish COVID-19 Biobank and the Danish National Biobank
- The **objective** of the study is to acquire novel knowledge on COVID-19 disease pathogenesis and trajectories including influence of host genetics, environmental factors, co-morbidities, viral variants/strain and microbiome.
- The project applies a **precision medicine approach to COVID-19** by revealing genetic variants and environmental factors determining both disease susceptibility, -severity and mortality.
- These data allows us to develop a *frailty index score* or other risk parameters, with further stratification of specific risk groups according e.g. gender-specific trends in disease trajectories and comorbidities that affects survival and disease progression.
- The project is funded by *Sygeforsikringen Danmark* (grant no. 2020-0178)

THE DANISH BIOBANKS SHOW DIVERSITY IN GENETIC ANCESTRY

- 96% are of European origin
- High-resolution HLA typing from high-quality imputed genotypes
- Linkable to symptom screening and COVID-19 outcome data via Danish registries
- Host and viral sequence data



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THANKS FOR LISTENING

