

Why perform clinical trials on infectious diseases in Sweden?

Easy recruitment and high retention rate in trials

- Swedish inhabitants exhibit strong commitment and adherence in clinical studies.
- The Swedish population of **10 million citizens** all have unique individual social security numbers, which enables linkage of health registers, ideal premises for longitudinal studies, and **low loss-to-follow-up**.
- High level of **English** proficiency.
- Highly **digitalized society**.

Highly developed healthcare system for all citizens and research infrastructure improves validity of clinical studies

- Publicly funded healthcare provides **equal access to health care** for all patients.
- Almost all patients with infectious diseases are treated at public university or regional hospitals. This ensures that a **diverse and generalizable patient population** is included in clinical studies. Infectious diseases is a base speciality in Sweden and all major hospitals in Sweden have their own infectious disease clinic, which ensures **easy access to patients for trials all over the country**.
- A **national infrastructure for biobanks and health- and quality registers** available for research. These registers contain data from all in- and outpatient specialist care and prescribed medication in Sweden, enabling complete diagnostic and follow-up ascertainment in clinical studies. Since it is part of an already existing national infrastructure it can be used for clinical studies at a low cost. The completeness provides both high internal and external validity.
- Integrated infrastructure for **advanced molecular diagnostics**, e.g., Sci-Life Lab, which is ideal for clinical studies using -omics analyses, personalized medicine, and pheno- and endotypical targeted therapies.
- **Home nursing** and telemedicine is part of clinical care and can be integrated and used for follow-up in clinical studies.

National infrastructure facilitates inclusion of infectious disease patients in trials

- **The Swedish Society of Infectious Diseases (SILF)** coordinates clinical and educational activities in infectious diseases, promotes research, and develop harmonized national clinical guidelines.
- Sweden has one of the highest concentration of infectious disease specialist physicians per capita in the world. Infectious disease physicians are involved in treatment of patients in the emergency department and inpatient and outpatient settings, which facilitates unbiased recruitment of patients in clinical studies.
- **ACTION Sweden, a national research network for clinical trials** established in 2021, consists of physicians/researchers from 26 infectious disease clinics throughout Sweden. ACTION Sweden provides a **single-point-of-entry** for feasibility requests and multi-centre enrolment of patients in clinical studies (<https://www.sls.se/actionsweden/>).
- ACTION Sweden is governed by representatives from the seven academic infectious disease clinics in Sweden. These representative are experts in different areas of infectious diseases, e.g., **endocarditis** (Magnus Rasmussen, Lund), **respiratory tract infections** (Johan Westin, Gothenburg, Pontus Naucler, Stockholm), **sepsis** (Sara Cajander, Örebro), **antimicrobial resistance and antibiotic stewardship** (Thomas Tängden, Uppsala, Håkan Hanberger, Linköping, Pontus Naucler, Stockholm),

translational/immunological research (Johan Normark, Umeå), **urinary tract infections** (Thomas Tängden, Uppsala), **vaccinology** (Helena Hervius Askling, Stockholm).

- In total, **6 phase 1, 16 phase 2, and 32 phase 3/4** trials have been performed on infectious diseases during the last 5 years. 22 of these are industry sponsored trials.
- **Quality registers with national coverage** on Infectious Diseases for endocarditis, meningitis, sepsis, pneumonia, HIV, hepatitis, tuberculosis and Covid-19. These registers complement other national health registers, by including detailed information about disease severity, treatments, diagnostic procedures and outcomes. E.g. the HIV quality registry has been important in establishing Sweden reaching the UNAIDS 95-95-95 goal.
- The Quality registers together with other national health registers provide a cost-effective way to perform clinical studies with high validity in infectious diseases. The registers have been used for pivotal studies on treatment, diagnostic and vaccination effectiveness for e.g., endocarditis, sepsis, pneumonia, pneumococcal disease and antimicrobial resistance.
- The health registers can be used to obtain baseline data, follow-up information, and to optimize design (e.g. power calculations) of clinical trials.
- Collaboration with established international clinical trial networks, e.g. European Clinical Research Alliance on Infectious Diseases (Ecraid). ACTION Sweden is the national point of entry for Ecraid.
- Swedish infectious disease researchers have prominent roles in international organizations, e.g. the European Society of Clinical Microbiology and Infectious Diseases (ESCMID), in developing international research agenda, conference programs, and guidelines.

Regulation

- **Overarching CDAs** covering all study discussions with public healthcare.
 - Easy to organize **local sourcing of IMP** in Sweden.
 - **Regular inspections** from Swedish MPA to maintain high quality.
 - No need to **translate Cover Letter or CTIS data fields**, this speeds up the application process
 - **Quick data entry and high data quality**. Few follow-up questions when Swedish data is involved in IND submissions.
 - **Sweden is a cost-effective country for conducting studies**. Public healthcare is not allowed to charge more than the actual cost due to Swedish regulations.
-