A STUDY OF THE SWEDISH MEDTECH INNOVATION ECOSYSTEM

STUNS

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Medtech 4 Health

SWEDISH Medtech

sweden BIO
The Swedish Life Science Industry Organization

SEK 174.3 billion

The net turnover of the Swedish medtech industry has increased by 8% since 2020, reaching SEK 174.3 billion in 2024.

27.977

The number of unique medical devices (UDI-DIs) registered by legal manufacturers based in Sweden.

296

legal Swedish manufacturers were identified in the EUDAMED database.

31.500

In 2024, the medtech industry comprised around 2,200 companies in Sweden and employed 31,500 people.

6

Geographic anchoring across six clusters. Geographically, the medical technology activities are mainly concentrated in Stockholm-Uppsala, Southern and Western clusters.

+74%

Sweden's exports of medtech products have increased by 74% since 2015 and reached SEK 41.7 billion in 2024.

WHAT CHARACTERISES SWEDEN'S MEDTECH LANDSCAPE, WHERE ARE ITS STRENGTHS, AND WHAT ENABLES INNOVATION?

Sweden has long held a distinctive position in medical technology, built on close collaboration between industry, academia and healthcare, a strong research base and a long tradition of innovation. From established global companies to emerging ventures, Sweden continues to generate disruptive technologies in areas such as digital health, AI and telemedicine, with the potential to improve healthcare both nationally and internationally.

Yet despite these strengths, a comprehensive picture of the Swedish medtech ecosystem has been missing: one that maps not only the manufacturers and patents that define the sector, but also the regional clusters in which innovation takes shape.

This report is an important step towards building that picture. By mapping patents, manufacturers, research environments and six regional medtech clusters, it provides a better understanding of Sweden's medtech landscape and its capabilities, regional strengths and potential gaps that will shape its future development.

The report was commissioned by the Department of Pharmaceutical Affairs and Medical Technology at the Netherlands' Ministry of Health, Welfare and Sport, following a comparable study of the Dutch medtech ecosystem. By applying the same structure and lens to Sweden, examining the national patent landscape, the manufacturers bringing products to market, and six distinct regional clusters, the report is intended to allow the two ecosystems to be read side by side and to give Swedish and Dutch stakeholders alike a clearer basis for deepening collaboration between them.

What emerges is an ecosystem that is both concentrated and genuinely national. Patent activity and manufacturing remain anchored in a handful of regions, yet each of the six clusters examined contributes its own research strengths, clinical environments and industrial profile to the wider Swedish ecosystem. Taken together, they help explain how a country of Sweden's size has built such an outsized presence in medtech innovation, and where its future growth is likely to concentrate.

The work was coordinated by STUNS, in collaboration with Medtech4Health, Swedish Medtech and SwedenBIO, whose combined knowledge of the sector's actors, funding structures and regional dynamics made a study of this scope possible. Particular thanks are due to Agnes Ahlström and Ebba Eyrich who authored the report, Arash Zandian for the data analysis, and to the Embassy of the Kingdom of the Netherlands, whose financial support made this collaboration possible.

We hope this report offers a useful reference for policymakers, investors and industry actors in both Sweden, the Netherlands and beyond, and a solid foundation for continued exchange between our two countries' medtech ecosystems.

STUNS, Medtech4Health, Swedish Medtech and SwedenBIO

SUMMARY

This report was conducted during the summer of 2026 on behalf of the Department of Pharmaceutical Affairs and Medical Technology at the Ministry of Health, Welfare and Sport in the Netherlands. This was conducted in collaboration with STUNS, SwedenBIO, Medtech4Health, and Swedish Medtech. The aim was to map the Swedish medtech ecosystem, identify key actors in patent applications and manufacturing, and examine how innovation and development are distributed across the country.

To achieve this, the study combined quantitative data from the PATSTAT and EUDAMED databases with a literature review of relevant digital sources and validation sessions with experts. It should be noted that the report provides a snapshot of the ecosystem, which is constantly changing and may look different in the future.

Overview of the Swedish medtech ecosystem
Sweden's medtech ecosystem is built on a long-standing tradition of close collaboration between academia, healthcare, and industry. At the same time, the sector is undergoing a transformation toward digital health, AI and integrated healthcare services, driven by both traditional medtech companies and actors from adjacent technology sectors.

The medical technology industry
The medical technology industry forms a key part of the Swedish business sector, contributing significantly to economic growth and employment. In 2024, the sector comprised approximately 2,200 companies, employed 31,500 people, and generated a turnover of SEK 174 billion. The industry is highly export-oriented; in 2024, exports reached SEK 41.7 billion, following a 74% increase between 2015 and 2024.[2]

The Swedish medtech patent landscape
Based on patent data from PATSTAT (2016–2025), the report maps, among other things, Sweden's technical strengths, key actors and international position in medtech. Swedish patent activity is concentrated in three main areas: diagnostics and surgery (22.2%), implants, prosthetics, and wound dressings (21.5%), and dialysis, infusion systems, and respirators (18.3%). This focus on physical hospital and treatment equipment comes from Sweden's industrial history with manufacturers such as Gambro, Mölnlycke Health Care, and Nobel Biocare. At the same time, innovations in software and AI may be underestimated in patent data, as digital health solutions are often protected through trade secrets, copyright and rapid market entry rather than hardware patents.

Patent applications are generated almost exclusively by the private sector, where companies and individual inventors account for 99.7% of all 959 unique applicants, comprising a total of 8,449 patent families. The high share of private inventors (31.5%) is largely explained by Sweden's Teacher's Exemption, which gives academic researchers direct ownership of their inventions. The highest number of unique patents is held by established companies such as Essity, Gambro Lundia and Mölnlycke Health Care, while smaller specialist firms such as BrainLit have the highest innovation intensity per employee. In addition, companies from other industries are among the top 20 patent applicants, especially Ericsson and Volvo, showing how industrial expertise in telecommunications, 5G, and vehicle data is used to drive medtech forward.

From an international perspective, Sweden ranks fourth among the benchmark countries, with just over 1,000 patent applications per million inhabitants. Sweden's patent profile is similar to those of Denmark, Great Britain, and Switzerland, where surgery, implants, and fluid management also represent dominant areas. In contrast, the Netherlands stands out with twice the share of patents in healthcare informatics (19.8%), driven primarily by Philips. Unlike the benchmark countries, Sweden has no direct patent applications from independent research institutes. This is due to Swedish research institutes mainly conducting

[2] Data from Swedish Medtech retrieved from https://www.swedishmedtech.se/upl/files/220678.pdf

applied collaborative research where resulting patents are owned by industry partners, combined with the Teacher's Exemption.

Medtech devices and manufacturers

While patent data indicate a research focus on advanced hospital technology, the EUDAMED database (May 2026) gives a different picture of the actual medical device market in Sweden. In total, 27,977 unique devices (UDI-DI) registered by 296 Swedish legal manufacturers were identified. The market is heavily dominated by two categories: devices for persons with disabilities (29.5%) and miscellaneous devices (29.3%), where patient transfer sheets and mattresses make up 96.4% of the latter group. The high product volume in these areas can partly be explained by the fact that every variation in size, colour or packaging of a physical product requires a separate registration, unlike medical software which is usually registered as a single core product with customizable modules.

The product supply is concentrated among a few large actors, with the top ten MedTech manufacturers by unique product registrations representing 69.6% of the total market offering in Sweden. The largest individual shares belong to ArjoHuntleigh AB in the Southern cluster (15.5%), Nobel Biocare AB in Western (12.5%) and MediRoyal Nordic AB in the Stockholm-Uppsala cluster (7.1%). In summary, this confirms a dual-track industrial structure where Sweden has high-level expertise in patent-driven R&D for advanced diagnostics, oncology and dialysis, while actual manufacturing largely consists of simpler volume products for daily care, mobility and patient handling.

Public support systems for innovation

According to rankings from organisations such as WIPO and the EIS, Sweden is at the top in research and innovation performance. Sweden has a strong infrastructure for innovation support, with several public platforms assisting both companies and individual innovators. This infrastructure includes funding agencies (such as Vinnova), strategic innovation programmes (such as Medtech4Health), national research institutes (RISE), and trade associations (such as Swedish Medtech and SwedenBIO). In addition, Sweden stands out internationally through the Teacher's Exemption, which allows university researchers and academics to retain the rights to their patents and research results.

Geographical overview of the Swedish medtech sector

Sweden can be divided into six geographic clusters: Stockholm-Uppsala, Southern, Western, Southeastern, Central, and Northern. The majority of medtech activity in Sweden is concentrated in the Stockholm-Uppsala cluster, the Southern cluster and Western cluster. These three clusters account for most patent applications and manufacturers, as well as an advanced medtech research infrastructure. Stockholm-Uppsala stands out in medical imaging, radiotherapy, and digital health, the Southern cluster in dialysis and patient handling, and Western cluster in wound care, biomaterials, and implants. The remaining clusters, Southeastern, Central and Northern, have fewer patent applications, fewer manufacturers and less research infrastructure, but they focus on areas such as visualization, AI, eHealth and decentralized healthcare technology.

Conclusions

This report maps Sweden's medtech ecosystem across patent data, product registrations and regional support structures. The findings reveal a research-intensive sector characterized by distinct regional specializations and a dual-track industrial structure. While patent activity reflects advanced clinical R&D in areas such as diagnostics, surgical systems and dialysis, commercial market registrations are heavily centered on high-volume products for routine care, patient handling and mobility. Innovation is further driven by cross-industry collaboration, with established actors in telecommunications and automotive engineering contributing to advances in healthcare informatics and digital health.

Activity is primarily concentrated in the Stockholm-Uppsala, Southern and Western clusters, complemented by specialized niches in the Southeastern and Northern clusters. Given Sweden's decentralized healthcare system, stronger inter-cluster collaboration is essential to foster equitable adoption of new technologies nationwide. Supported by well-established triple-helix collaboration across academia, healthcare and industry, as well as the Teacher's Exemption, the sector demonstrates high inventive capacity.

A STUDY OF THE SWEDISH MEDTECH INNOVATION ECOSYSTEM

1 INTRODUCTION

This report was conducted at the request of the Department of Pharmaceutical Affairs and Medical Technology at the Ministry of Health, Welfare and Sport in the Netherlands. Having previously compiled a report on the Dutch medtech ecosystem, the Netherlands commissioned a similar study for Sweden to enable comparison between the two countries' ecosystems and strengthen collaboration. The report was authored by STUNS and conducted in collaboration with Medtech4Health, SwedenBIO and Swedish Medtech.

1.1 Background

The Medical Technology (medtech) industry in Sweden plays a critical role in driving economic growth, employment and healthcare innovation [1]. Sweden possesses a strong innovation landscape, driven by high research capabilities and close collaboration between academia, healthcare, and industry. However, the medtech landscape is complex, encompassing not only companies and their capabilities but also the broader innovation ecosystem, including research environments, clinical testbeds, innovation support structures, regulatory and intellectual property support and funding networks.

To fully understand Sweden's position in medtech, a comprehensive ecosystem analysis is required. This report examines the key actors in the Swedish medtech ecosystem, including organizations with high patent activity, companies that manufacture medtech products and public initiatives that support research, innovation and commercialisation. The report also analyzes the regional medtech clusters across Sweden and describes how their ecosystems are structured. For each cluster, the report examines the research and clinical environment, the innovation ecosystem and the industrial profile to provide a comprehensive overview of the regional medtech landscape.

1.2 Objective of the study

The report aims to identify what characterises Sweden's medtech landscape, where are its strengths and what enables innovation. To achieve this, the study focuses on four primary objectives:

- Gain an understanding of the Swedish medtech patent landscape, including the main technology areas and the actors that have the greatest influence on innovation. The study also compares Sweden's patent activity in an international context.
- Provide an overview of the industrial side of the medtech ecosystem by identifying the main medtech device manufacturers and the most prominent medtech device categories.
- Provide an overview of the public support system for innovation in Sweden and identify the features that characterise the Swedish innovation ecosystem.
- Understand the geographical distribution of medtech development and innovation by identifying and analysing the regional medtech clusters in Sweden.

MEDTECH DRIVES GROWTH AND INNOVATION

The Medical Technology (medtech) industry in Sweden plays a critical role in driving economic growth, employment and healthcare innovation. Sweden possesses a strong innovation landscape, driven by high research capabilities and close collaboration between academia, healthcare, and industry.

1.3 Research approach

To gain a broad understanding of the Swedish medtech ecosystem, both qualitative and quantitative research methods were used in this study:

- **Qualitative analysis**: The study includes a literature review based on publicly available information about the Swedish medtech ecosystem. The analysis is based on sources such as company websites, scientific publications, reports from industry organizations (e.g., Swedish medtech), and information from relevant authorities and databases (e.g., WIPO, EPO and the Swedish Intellectual Property Office). Also, Google web search and LLM-search was used to find relevant sources.
- **Quantitative analysis:** Two datasets were used to collect data regarding patents, manufacturers and medtech devices. More information about data collection can be found in Appendix A.
  - **Patent analysis**: Patent records were retrieved from the European Patent Office Worldwide Patent Statistical Database (PATSTAT, Autumn 2025 release). The selection includes filings between 2016 and 2025 containing at least one Cooperative Patent Classification (CPC) code across 13 CPC classes (12 subclasses and the main group A61K 40). To avoid counting the same patent multiple times, patent filings were grouped into INPADOC patent families and analyzed based on the applicant. Applicant names were cleaned through a three-step process and then categorized by actor type.
  - **EUDAMED**: Commercialized device data was extracted from the European Database on Medical Devices (EUDAMED, May 2026 snapshot). The Swedish universe was captured via manufacturer Single Registration Numbers (SRN prefixes SE-MF and SE-PR). Devices were counted at the UDI-DI level and categorized using the European Medical Device Nomenclature (EMDN) via Basic UDI-DI family propagation, achieving a 99.1% device coverage rate. Manufacturers were mapped geographically to Swedish counties. To ensure stability against live database fluctuations, device metrics are reported primarily as relative shares rather than absolute numbers.
- **Validation session:** Throughout the report, validation sessions were conducted with individuals with relevant expertise. They reviewed the sections related to their areas of expertise and provided feedback on the content, helping to validate the information and ensure its accuracy. See Appendix B for more information.

1.4 Definitions

This section outlines the analytical framework of the study by defining its core concepts and boundaries. It first presents the regulatory definition and scope of medtech, and then it establishes the definition of an innovation ecosystem used to analyze the Swedish medtech landscape.

1.4.1 Definition medtech

The Swedish Medical Products Agency (Läkemedelsverket) defines medical devices as follows [2]:

> *"Medical devices are products used across all areas of healthcare, for self-care, and in everyday life. They are products with a specified medical purpose, but which are not pharmaceuticals."*

Medtech is a broad field where healthcare professionals, patients and caregivers interact daily with products such as [3]:

- Advanced equipment (e.g., X-ray machinery, heart–lung machines)
- Basic supplies (e.g., cannulas, dressings, incontinence products)
- Digital systems (e.g., electronic health records, health apps)

The use of medical devices and in vitro diagnostic medical devices (IVD) are primarily regulated by the Medical Device Regulation (MDR) and the In Vitro Diagnostic Regulation (IVDR), which are the European Union's central regulatory frameworks for medtech [4]. The MDR defines a medical device as an article intended by the manufacturer to be used on humans that does not achieve its principal intended action by pharmacological, immunological or metabolic means [5]. This includes, for example, products intended for:

- diagnosis, prevention, monitoring, prediction or prognosis
- treatment or alleviation of disease

- compensation for an injury or disability
- investigation, replacement, or modification of the anatomy or of a physiological process
- providing information by means of in vitro examination

1.4.2 Definition innovation ecosystem

This study uses the following definition of an innovation ecosystem [6]:

> *"A dynamic set of related actors, activities, facilities and rules that are important for the ability of individual actors, and groups of actors to conduct research and to innovate and hereby create value."*

Innovation activities often extend beyond national borders as companies and researchers frequently collaborate with international partners, share knowledge and use resources from different countries. However, this report focuses on the key actors, patent applicants and medical device manufacturers that are registered in Sweden. The study also examines regional medtech clusters to understand how innovation is developed and supported across the country.

Finally, as innovation ecosystems are continuously evolving, it is important to emphasize that this study represents a snapshot of the Swedish medtech ecosystem at the time of data collection, and the dynamics presented in the report will probably change over time.

1.4.3 Definition manufacturer

In this report, the term manufacturer follows the definition provided in the MDR [7]:

> *"A natural or legal person who manufactures or fully refurbishes a device or has a device designed, manufactured or fully refurbished, and markets that device under its name or trademark."*

In EUDAMED, this means that the company placing the device on the market under its own name or trademark is registered as the manufacturer. Companies that physically manufacture devices on behalf of another company are therefore not registered as manufacturers.

1.5 Scope of the report

This report was commissioned by Dutch partners, The Ministry of Health, Welfare and Sport in the Netherlands, to enable a direct comparison between the Swedish and Dutch medtech landscapes. To ensure comparability, this study follows the same structure and methodology as the Dutch benchmark report [6], focusing on four primary areas:

- **The patent landscape**: An overview of patent activity and technological specializations.
- **Manufacturers and devices:** A mapping of medtech manufacturers and devices in Sweden.
- **Public support systems:** An overview of the public initiatives, incubators and funding mechanisms supporting the sector.
- **Regional clusters:** An examination of key medtech clusters, their core strengths and research environments.

The patent analysis provides an indication of technological innovation within Swedish medtech, but it does not capture the full innovation landscape. Patent applications require financial and organizational resources and are not equally relevant for all types of companies or innovations. As a result, larger and more established firms, as well as actors operating in patent-intensive technology areas, may be overrepresented. Smaller start-ups and companies that rely on other forms of intellectual property protection, such as trade secrets, copyright or rapid market entry, may be underrepresented. The analysis should therefore be interpreted as a mapping of patent-based innovation rather than a complete measure of medtech innovation in Sweden.

1.6 Contents

The remainder of this report is structured as follows. **Chapter 2** provides an overview of the Swedish medtech ecosystem, presenting key industry figures and central public and private actors. It analyzes patent trends across technology areas to identify Sweden's strengths, their geographical distribution, and how Sweden compares internationally. The chapter then examines main medical device categories and manufacturers to map commercial activity, before outlining public support initiatives and funding mechanisms. **Chapter 3** examines six regional medtech clusters across Sweden: Stockholm-Uppsala, Southern, Western, Southeastern, Central, and Northern. Each cluster is analyzed across three areas: Research and clinical environment, innovation ecosystem and industrial profile. **Chapter 4** summarizes the main findings of the report and highlights key aspects of medtech innovation in Sweden. Finally, a reference list and appendices with additional methodological and data details are provided at the end of the report.

2. SWEDISH MEDTECH INNOVATION ECOSYSTEM

This chapter provides an overview of the Swedish medtech innovation ecosystem. It first examines the size and characteristics of the Swedish medtech industry, followed by its innovation strengths, key actors and geographical clusters. The chapter also examines how these strengths are reflected in registered devices and manufacturers. Finally it presents the support systems and structures that enable innovation.

2.1 Swedish medtech industry profile

The medtech industry plays a vital role for the Swedish economy, driving economic growth and generating employment [1]. Medtech is essential for health and social care, where healthcare is continuously introduced to new technologies. By offering innovative solutions in monitoring, follow-up, diagnostics and treatment, these technologies enable healthcare systems to expand in their geographical reach and thereby benefit more patients. Sweden has a long history within the medtech industry, where a defining characteristic of the industry is the collaboration between healthcare providers, industry actors and academic institutions [8]. In 2024, the sector comprised around 2,200 companies, employed 31,500 people and generated SEK 174 billion in turnover [1]. Swedish medtech is also highly export-oriented, increasing 74% between 2015 and 2024 the exports reached SEK 41.7 billion in 2024.

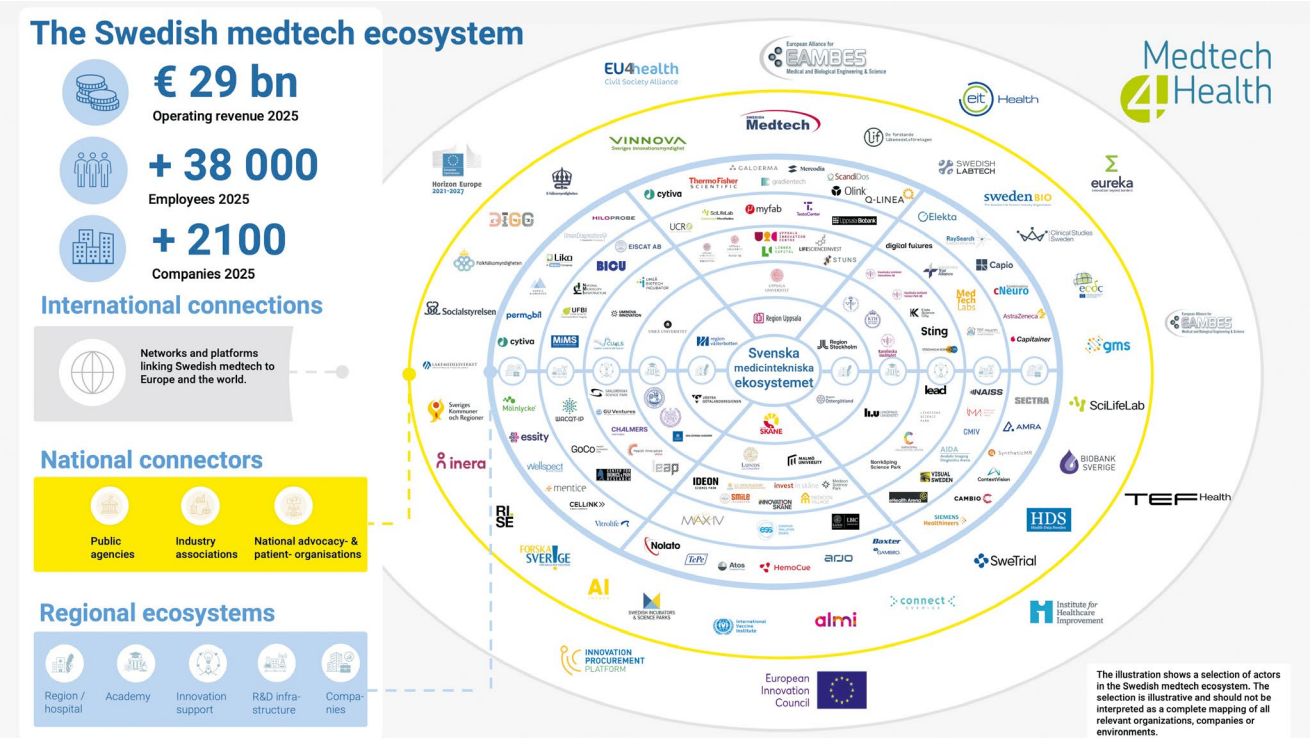

Figure 1: The Swedish medtech ecosystem.

Table 1. Showing the top 6 main technology subclasses with underlying main groups.
Source: PATSTAT.

SUBCLASS	% OF TOTAL	UNDERLYING MAIN GROUPS
Diagnosis, surgery, identification	22.2%	· Diagnostic measuring devices · Surgical instruments, devices or methods · Apparatus for radiation diagnosis (e.g. X-ray, CT) · Other diagnostic instruments (e.g. biopsy) · Surgical accessories and instrument support
Stents, prosthetic parts, implants, vascular filters	21.5%	· Bandages, dressings, absorbent pads · Implantable prostheses, stents, vascular filters · Non-surgical orthopaedic devices · Medical heating / cooling appliances · Devices for treatment of the ears
Syringes, inhalers, infusion pumps, dialysis machines	18.3%	· Suction / pumping devices (dialysis, blood) · Syringes, infusion / injection devices · Respiratory gas treatment (ventilators, anaesthesia) · Catheters and hollow probes · Tube connectors / vascular access ports
Sterilisation technologies, antimicrobial materials	10.3%	· Materials for dressings / absorbent pads · Biomaterials for prostheses (and coatings) · Sterilising / disinfecting apparatus and methods · Disinfection, sterilisation or deodorisation of air · Materials for other surgical articles
Healthcare informatics	10.1%	· ICT for medical diagnosis, simulation or data mining · ICT for therapies or health-improving plans · ICT for management of healthcare resources or devices · ICT for handling patient-related medical data · ICT for handling / processing medical images
Electrical stimulation devices, MRI therapy systems, radiotherapy	7.1%	· Radiation therapy (radiotherapy) · Electrotherapy (pacemakers, electrical stimulation) · Ultrasound therapy · Magnetotherapy

Sweden is at the forefront of global innovation in medtech, with a particular focus on digital health, AI, and telemedicine [9]. This success is driven by Swedish companies that actively pursue patents in emerging areas of digital communication and computer technology tailored for healthcare. In recent years, a significant share of Swedish medtech patents has centered on digital health solutions, including AI-driven diagnostics, telemedicine, and mobile health services. This trend reflects a broader market shift as traditional medtech firms expand beyond physical products to encompass integrated services and digital solutions [1].

2.2 Swedish medtech innovations and patent analysis

To identify and understand Sweden's core technological strengths within medtech, which companies drive this development and where they are located, a patent analysis was conducted using the PATSTAT database (Autumn 2025 release) and the Cooperative Patent Classification (CPC) system. A more thorough description of the CPC-system can be found in Appendix C.

2.2.1 Medtech patent classification and technology areas

Patent data indicate that Swedish medtech innovation is concentrated in six technology areas, which together account for almost 90% of patent applications. The largest are diagnostics and surgery (22.2%), implants and prosthetics (21.5%), and drug-delivery and dialysis technologies (18.3%) which can be seen in Table 1.

Sweden's high share of patents in surgical tools, implants, and fluid management is linked to its industrial background. Key companies established early market positions in these areas. Among others, Gambro developed dialysis and blood treatment systems, Mölnlycke Health Care focused on wound care and surgical products, and Nobel Biocare developed titanium dental implants.

This background is supported by collaboration between hospitals, medical faculties, and technical universities, helping engineers and doctors turn clinical needs into medical devices. Additionally, physical products, like implants, filters, and wound dressings, are straightforward to patent under European patent rules, which leads to higher patent volumes compared to software and algorithms.

Appendix D contains more information about the medtech patent applications in Sweden, including tables showing the distribution of different medtech subclasses, the top 10 main groups, top 10 subgroups, subgroups of each of the top 10 main groups and actor types that filed medtech patent applications.

AI creates significant opportunities within healthcare, particularly in areas such as diagnostics and precision medicine [10]. However, within PATSTAT there is no official AI classification, as AI rarely exists as a standalone product category [11]. Instead, it is typically integrated as a component within broader innovations [6]. As a result, AI medtech innovations are rarely protected by a single patent type alone, instead they are usually protected through a combination of different patents [10]. In addition, software and algorithms are harder to patent under European patent rules than physical devices. Many software and digital health companies protect their code through copyright, speed to market, and trade secrets instead of patents. Because of this, patent data may not show the full extent of Sweden's actual work and innovation in digital health and medical AI.

Overall, Swedish medtech patent activity is strongly focused on physical technologies used in diagnosis and treatment, reflecting the country's established industrial and clinical strengths. However, patent data may underestimate innovation in areas such as digital health and AI, where technologies are often protected through other means than patents.

2.2.2 Key patent applicants

Having mapped Sweden's primary technological strengths, the next step is to examine which companies drive these strengths and where they are geographically concentrated. In total, 959 unique applicants were identified in the PATSTAT database between 2016 and 2025, collectively generating 8,449 unique patent families. Figure 2 highlights the distribution across actor types, showing that innovation activity is heavily anchored in the private sector, where companies and individual inventors make up 99.7% of all applicants.

The dominance of companies among medtech patent applicants may partly be explained by their strong incentives to protect products and business opportunities. Patents help secure market positions and create competitive advantages, which makes it natural that companies account for the majority of applicants [12]. The high share of private inventor applicants can potentially be explained by the so-called Teacher's Exemption, where inventors in Sweden typically own their patents themselves rather than the university [13]. As a result, patents are often registered under private inventors or transferred to companies instead of being assigned to universities.

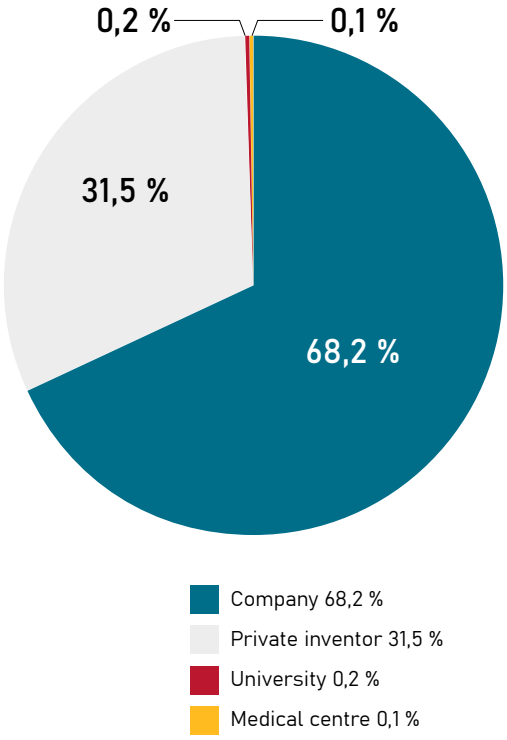

Figure 2. Distribution of medtech patent applications across actor types. Source: PATSTAT.

To gain a better understanding of which actors drive Sweden's innovation capacity, Table 2 is presented. The table shows the top 20 actors, which all are companies, along with the number of unique patents and total patents they have filed and an innovation index. See more about the definition of unique and total patents, and how the innovation index was calculated in Appendix C. The top 20 applicants together account for 11.7% of all unique patent families in the dataset. While traditional giants such as Essity, Gambro Lundia, and Mölnlycke Health Care lead in number of unique patents, normalizing by number of employees reveals high innovation intensity among smaller specialist firms, led by BrainLit with 116.7 patents per 100 employees. However, it is important to note that the PATSTAT data includes all patents filed up to the Autumn 2025 release and therefore also includes companies that are no longer active, such as Gambro Lundia.

Further on, Table 3 is presented, showing the areas of focus of the 10 largest actors in terms of the number of patent applications they have filed. By cross-referencing Table 2 and Table 3, together with Table 1, showing Sweden's innovative strengths, the analysis illustrates which companies drive Sweden's core technological strengths and where these actors are geographically anchored across 6 regional clusters.
Sweden's primary technological strength, according to Table 1, centers on surgical, diagnostic and imaging systems. It is mainly anchored in the Stockholm-Uppsala cluster, driven by sensor and analytics pioneers such as Tobii in diagnostic gaze tracking, alongside Excillum and Prismatic Sensors in X-ray and CT imaging. In the north of Sweden, Liko R&D in the Northern cluster contributes diagnostic measuring devices.

Another core strength is implants, prosthetics and wound care products. The Western cluster serves as the primary hub for this domain, led by global industry leaders Essity and Mölnlycke Health Care in advanced wound management, alongside Dentsply in dental implants.

The third major strength comprises fluid management, dialysis, and drug-delivery technologies. The Southern cluster has a strong historical connection to this area, with Gambro Lundia driving significant patent activity in dialysis and blood-pumping systems. Critical care and respiratory devices are led by Maquet Critical Care in Stockholm-Uppsala, complemented by AstraZeneca in drug delivery.

It is also interesting to note that Table 2 does not only consist of traditional medtech companies, but also includes actors from other industries, such as Ericsson and Volvo. Ericsson for example has a patent regarding identifying sensory inputs affecting the working memory load of an individual. Volvo has 15 unique medtech patents and their top 3 patent groups are within healthcare resource ICT (48%), person-identification diagnostics (36%), and patient-related medical data handling (32%). This cross-sector activity underscores how Sweden's technological capabilities in healthcare informatics leverage expertise from advanced telecommunications and automotive engineering.

Overall, Swedish medtech patent activity is mainly driven by companies, with both large established firms and smaller companies contributing to innovation. Patent activity is primarily concentrated in the Stockholm-Uppsala, Western and Southern clusters, with strengths in several key medtech areas.

2.2.3 Sweden's medtech patent landscape in an international context

Having identified Sweden's main technological

Table 2. Top 20 Swedish actors that filed the most medtech patent applications between 2016 and 2025. Source: PATSTAT.

NAME	CLUSTER	UNIQUE PATENTS	TOTAL PATENTS	INDEX
Essity	West	235	1423	12.2
Gambro Lundia	South	171	656	112.5
Mölnlycke Health Care	West	82	428	13.5
RaySearch Laboratories	Stockholm-Uppsala	76	220	25.5
Liko Research & Development	North	57	115	41.0
Maquet Critical Care	Stockholm-Uppsala	45	111	9.5
Tobii	Stockholm-Uppsala	43	111	13.5
Ericsson	Stockholm-Uppsala	36	115	0.3
Elekta	Stockholm-Uppsala	35	94	13.3
Arjo	South	30	110	15.0
Dentsply	West	25	90	6.6
Excillum	Stockholm-Uppsala	25	114	30.1
Prismatic Sensors	Stockholm-Uppsala	22	79	57.9
AstraZeneca	Stockholm-Uppsala	21	155	0.3
Wellspect	West	20	45	5.3
Volvo	West	15	25	0.1
BrainLit	South	14	57	116.7
Episurf Medical	Stockholm-Uppsala	14	42	73.7
Permobil	North	14	63	5.2
Atos Medical	South	13	31	5.7

Table 3. Focus area for the top 10 actors in terms of medtech patent applications. Source: PATSTAT.

NAME	KEY FOCUS AREA
Essity	· Bandages, dressings, absorbent pads · Materials for dressings / absorbent pads · ICT for management of healthcare resources or devices
Gambro Lundia	· Suction / pumping devices (dialysis, blood) · ICT for management of healthcare resources or devices · ICT for therapies or health-improving plans
Mölnlycke Health Care	· Bandages, dressings, absorbent pads · Materials for dressings / absorbent pads · Suction / pumping devices (dialysis, blood)
RaySearch Laboratories	· Radiation therapy (radiotherapy) · ICT for therapies or health-improving plans · ICT for medical diagnosis, simulation or data mining
Liko Research & Development	· Hospital / nursing beds · Diagnostic measuring devices · ICT for management of healthcare resources or devices
Maquet Critical Care	· Respiratory gas treatment (ventilators, anaesthesia) · Diagnostic measuring devices · ICT for management of healthcare resources or devices
Tobii	· Diagnostic measuring devices · Apparatus for testing the eyes; Instruments for examining the eyes · Methods or devices enabling patients or disabled persons to operate an apparatus or a device not forming part of the body.
Ericsson	· Diagnostic measuring devices · ICT for management of healthcare resources or devices · ICT for handling patient-related medical data
Elekta	· Radiation therapy (radiotherapy) · ICT for therapies or health-improving plans · ICT for medical diagnosis, simulation or data mining
Arjo	· Hospital / nursing beds · Pneumatic / hydraulic massage devices · Diagnostic measuring devices

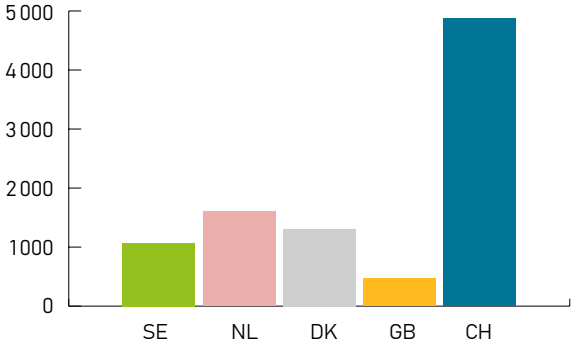

Figure 3. Number of medtech patent applications per million inhabitants in Sweden, the Netherlands, Denmark, Great Britain and Switzerland between 2016 and 2025. Source: PATSTAT, World Bank Group. [3]

strengths, the next step is to place these findings in an international context and examine how Sweden compares with similar European countries. Sweden's patent profile is therefore benchmarked against the Netherlands, Denmark, Great Britain and Switzerland. These countries were chosen due to relatively similar healthcare systems.

As illustrated in Figure 3, the volume of medtech patent applications per million inhabitants differs significantly between the benchmark countries. While Switzerland registers the highest volume of applications, Sweden ranks fourth with over 1000 patent applications per million inhabitants.

Table 4 presents the three most common medtech patent subclasses in each country and their share of all CPC classifications assigned to medtech patent applications. Across all five countries, diagnostics & surgery is the largest medtech patent subclass, accounting for between 22% and 45% of all medtech-related CPC classifications. Beyond this, Sweden, Denmark, Great Britain and Switzerland display similar patent profiles. In all four countries, the three largest subclasses are diagnostics & surgery, implants & prosthetics, and drug-delivery & dialysis technologies. The Netherlands stands out from the rest. While the other countries have around 9-10% of their classifications in healthcare informatics, the Netherlands reaches 19.8%, making it their second largest area.[4] This strong focus on digital health and diagnostics can partly be linked to the presence of Philips, a major actor in medical imaging and healthcare IT [6].

A comparison was also made between Sweden and the selected countries regarding the types of actors filing the largest number of medtech patent applications. As shown in Figure 2, companies account for 68% of all medtech patent applications in Sweden, while private inventors account for 31%. A similar distribution is observed in the Netherlands, Denmark, the United Kingdom and Switzerland in Figure 4. In all five countries, companies represent the largest group of patent applicants, followed by private inventors, whereas universities and medical centers account for only a small share of the total patent applications. As mentioned before, the Teacher's Exemption could be one possible explanation for the low share of university-owned patents in Sweden. However, the comparison also shows that countries without a Teacher's Exemption have similarly low shares of university-owned patents. This suggests that universities are generally not the dominant patent applicants within the medtech sector, even though the countries have different systems for ownership of patents.

One notable difference is that the other countries have a presence of research organizations among the patent applicants, while Sweden does not, as seen in Figure 4. This may be explained by the Teacher's Exemption in Sweden and the fact that the other countries have large independent research institutes which conduct applied research and own the intellectual property generated from their work. In Sweden, there is only one prominent research institute within medtech, RISE, which

HIGH SHARE OF PRIVATE INVENTOR APPLICANTS

In Sweden, private inventors account for as much as 31.5% of all medical technology patent applications. The high share of private inventor applicants can potentially be explained by the so-called Teacher's Exemption, where inventors in Sweden typically own their patents themselves rather than the university.

[3] Data from World Bank Group retrieved from https://data.worldbank.org/indicator/SP.POP.TOTL?locations=SE-NL-DK-CH [2026-08-16]

[4] Data retrieved from PATSTAT, Autumn 2025 release.

Table 4. Top three medtech patent subclasses in Sweden and selected European countries, based on the share of CPC classifications. Source: PATSTAT.

COUNTRY	TOP 3 SUBCLASSES	
Sweden	· Diagnosis, surgery, identification	22.2%
	· Stents, prosthetic parts, implants, vascular filters	21.5%
	· Syringes, inhalers, infusion pumps, dialysis machines	18.3%
Netherlands	· Diagnosis, surgery, identification	45.3%
	· Healthcare informatics	19.8%
	· Syringes, inhalers, infusion pumps, dialysis machines	9.70%
Denmark	· Diagnosis, surgery, identification	31.8%
	· Syringes, inhalers, infusion pumps, dialysis machines	21.0%
	· Stents, prosthetic parts, implants, vascular filters	14.2%
Great Britain	· Diagnosis, surgery, identification	31.8%
	· Syringes, inhalers, infusion pumps, dialysis machines	20.5%
	· Stents, prosthetic parts, implants, vascular filters	12.5%
Switzerland	· Diagnosis, surgery, identification	33.4%
	· Syringes, inhalers, infusion pumps, dialysis machines	21.9%
	· Stents, prosthetic parts, implants, vascular filters	12.6%

conducts applied research. However, because RISE primarily conducts collaborative research where patents are assigned to industry partners, research institutes account for a negligible share of direct medtech patent applicants.

Overall, Sweden shows a similar medtech patent profile to the other benchmark countries, both in terms of the main technology areas and the types of patent applicants. However, Sweden differs mainly in the absence of research organizations among the main patent applicants.

2.3 Medtech devices and manufacturers on the Swedish market

The patent analysis has shown where Sweden's medtech innovation is concentrated, which actors drive it, and how Sweden compares internationally. To understand how these innovation strengths are reflected in the actual medtech market, the analysis now turns to registered devices and manufacturers based on EUDAMED data. While patent data highlight technology-intensive innovation, EUDAMED provides a different perspective on the medtech market.

In total, 27 977 unique medtech devices (UDI-DIs) registered by manufacturers based in Sweden were identified in the EUDAMED database. As can be seen in Figure 5, the top two categories are devices for persons with disabilities and miscellaneous devices which accounts for 29.5% and 29.3% respectively of the medtech device categories. The majority of miscella-

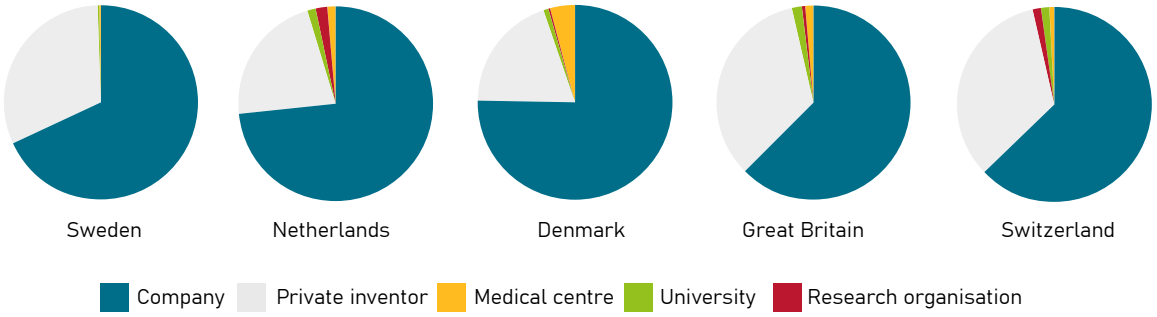

Figure 4. Distribution of medtech patent applicants in Sweden, the Netherlands, Denmark, Great Britain and Switzerland. Source: EUDAMED

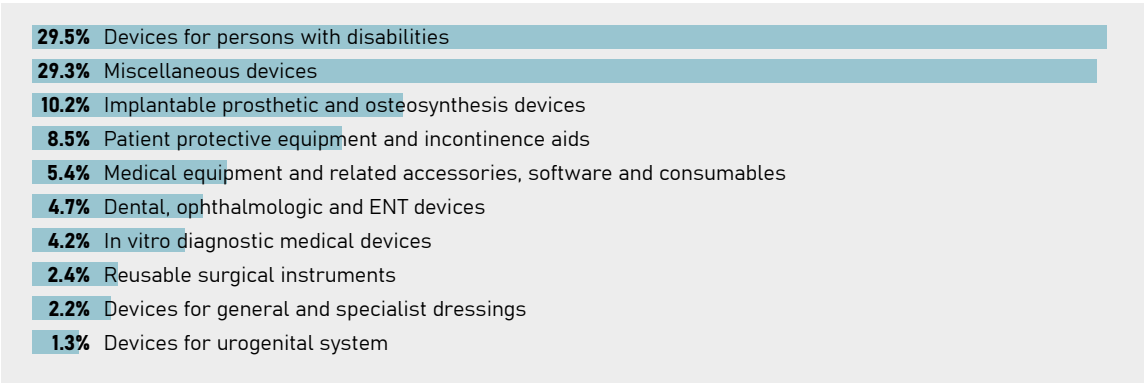

Figure 5. Top 10 medtech device categories. Source: EUDAMED

neous devices are patient transfer sheets and mattresses which covers 96.4% of the miscellaneous devices. In Figure 5, the distribution of the top 10 medtech device categories are presented. More information about the products included in each medtech device category is presented in Appendix E.

A potential explanation for the top two device categories could be the fact that every minor modification to a physical product, such as changes in size, color or packaging, requires it to be registered as a new product. Conversely, looking at the category including medical software, the number of products is significantly lower. This is because the software functions as a single core product that can be customized for individual clients simply by activating different modules, which does not generate a new product requiring separate registration.

Beyond the types of devices registered, it is also relevant to examine which manufacturers account for these products and how concentrated the Swedish manufacturing base is. A total of 296 legal medtech device manufacturers in Sweden were identified in the EUDAMED database. In Table 5 the top 10 medtech manufacturers based in Sweden are presented, ranked by share of total registered devices. These shares reflect the breadth of their registered product portfolios and the number of product variants, rather than market share. The top 10 device manufacturers account for 69.6% of all 27 977 unique medtech devices registered by manufacturers based in Sweden, indicating that a

Table 5. Top 10 Sweden-based manufacturers ranked by share of unique medtech device registrations in EUDAMED. Source: EUDAMED.

MANUFACTURER	% OF TOTAL	CLUSTER	PRODUCT DESCRIPTION
ArjoHuntleigh AB	15.5%	South	Patient Transfer Sheets And Mattresses (12%) Phaco-Vitrectomy Instruments (3%)
Nobel Biocare AB	12.5%	West	Dental Implants (8%) Dental Abrasive And Polishing Materials (2%)
Mediroyal Nordic AB	7.1%	Stockholm-Uppsala	Hip Orthoses (Including Abduction Orthoses) (7%)
Essity Hygiene and Health AB	6.5%	West	Incontinence Devices (6%)
Camp Scandinavia AB	6.2%	South	Hip Orthoses (Including Abduction Orthoses) (6%)
Nimacare AB	6.0%	Stockholm-Uppsala	Patient Transfer Sheets And Mattresses (6%)
B.I.M.A. PLASTTEKNIK AB	4.8%	South	Patient Transfer Sheets And Mattresses (5%)
Etac Supply Center AB	4.3%	Southeast	Wheeled Walker (3%) Washing, Bathing And Showering Devices (1%)
Mercado Medic AB	4.0%	Stockholm-Uppsala	Aids, Furniture And Home Aids For Persons With Disabilities (4%)
Phadia AB	2.9%	Stockholm-Uppsala	Genetic Tests (3%)

large share of unique registered devices is concentrated among a relatively small number of manufacturers. As can be seen in Table 5, ArjoHuntleigh AB (15.5%), Nobel Biocare AB (12.5%) and Mediroyal Nordic AB (7.1%) are the top three manufacturers .

The Swedish medtech industry can therefore be viewed from two perspectives. Based on the patent data, it has a strong research and development focus on advanced technologies such as cancer treatment, diagnostics and dialysis systems. However, the EUDAMED data show a broader manufacturing base, with Swedish manufacturers also producing large volumes of products supporting everyday care, mobility and patient handling.

2.4 Public support systems and funding

Innovation within medtech relies not only on technological capabilities and market demand, but on the strength of the underlying institutional framework. This section examines how Sweden supports the development of new ideas from research to market. It covers key organizations, funding programmes and structures that support research, innovation and com-

mercialisation within the Swedish medtech ecosystem.

According to the World Intellectual Property Organization (WIPO), Sweden generally exhibits a very high innovative capacity [14]. In the organization's annual report, the Global Innovation Index 2025, a comprehensive analysis is conducted on the innovation ecosystems of 139 economies. By tracking global trends in investment patterns, technological advancements, diffusion rates, and socioeconomic impacts, the capacity of each country is mapped. In the 2025 assessment, Sweden is ranked second in the world, behind only Switzerland.

This leading performance is further supported by European Innovation Scoreboard (EIS) 2026, the European Commission's annual in-depth analysis of research and innovation performance, in which Sweden places at the top [15] [16]. The European Innovation Scoreboard (EIS) assesses the innovation performance of EU Member States using the Summary Innovation Index (SII), which combines indicators covering areas such as research, investment, innovation activities and economic impacts [17]. In 2026, Sweden ranked first among EU member states in terms of the SII, performing at 139.0% of the EU average [16] [18]. The Commission specifically highlights that Sweden's primary strength lies in its robust ecosystem surrounding innovative small and medium-sized enterprises (SMEs), alongside the widespread collaboration between academia, the public sector and industry [16].

2.4.1 National support systems for innovation

Sweden's medtech innovation ecosystem is supported by a combination of national innovation funding, research institutes, incubators and sector-specific programmes. Key actors include Vinnova, RISE, Medtech4Health and Swedish Medtech, which support collaboration, commercialisation and implementation across academia, healthcare and industry.

Vinnova. A central pillar of this infrastructure is Vinnova, which is Sweden's innovation agency [19]. It is a government authority under the Ministry of Climate and Enterprise and also serves as Sweden's national contact authority for the EU framework programmes for research and innovation. Vinnova's mission is to strengthen Sweden's innovation capacity and support sustainable growth by funding research and innovation projects that generate societal benefits and contribute to long-term economic development [20]. The agency supports collaboration between companies, academia, the public sector and other stakeholders, with the aim of turning knowledge and research into new solutions and innovations.

SWEDEN RANKS AMONG THE WORLD'S INNOVATION LEADERS

According to WIPO's global analysis, Global Innovation Index 2025, Sweden ranks second in the world. This leading performance is further supported by European Innovation Scoreboard (EIS) 2026, the European Commission's annual in-depth analysis of research and innovation performance, in which Sweden places at the top.

RISE. Alongside funding and incubator networks, Research Institute of Sweden (RISE) serves as Sweden's national research institute and independent innovation partner for both the private and public sectors [21]. With over 3,000 employees, the institute operates nationally and internationally in collaboration with academia, industry, and societal actors. RISE focuses on developing technologies, products, services, and processes that promote a sustainable transition and strengthen industrial competitiveness, with a particular emphasis on supporting innovation processes within SMEs.

Medtech4Health. The purpose of Medtech4Health is to strengthen the Swedish medtech ecosystem both nationally and internationally by driving the implementation of medtech solutions within healthcare [22]. The initiative aims to elevate the national research and innovation system to position Sweden as an internationally leading actor, as well as to attract expertise, investments, and development. To realize its goals, Medtech4Health issues thematic project calls and finances the development of innovative products, services and work processes [22].

Swedish Medtech. Swedish Medtech is the joint trade association for medtech companies in Sweden, currently gathering approximately 200 member companies active within a variety of product and therapy areas [23]. The organization's member base is diversified, consisting of distributors and sales companies as well as actors with their own research, development and manufacturing in Sweden. Utilizing an extensive national and international network, Swedish Medtech works through collaboration and dialogue to strengthen healthcare and social care, and to position Sweden as an attractive market for innovation, development, and entrepreneurship.

SwedenBIO SwedenBIO is the national industry association for the Swedish life science sector, representing companies across biotechnology, pharmaceuticals, medtech and diagnostics. SwedenBIO works to strengthen the conditions for innovation, growth and competitiveness through advocacy, collaboration and knowledge sharing.

Within medtech, SwedenBIO works to strengthen the innovation ecosystem, improve conditions for companies developing and commercialising new technologies, and connect Swedish medtech innovation with investors, industry partners and international markets.

2.4.2 Teacher's Exemption

While organizations and initiatives provide important support for researchers and companies, the legal framework surrounding ownership of research results also plays an important role in the commercialisation process. In Sweden, this framework differs from many other countries through the Teacher's Exemption. Teacher's Exemption regulates the ownership of intellectual property created by researchers at universities [24]. Under this principle, researchers and other employees who conduct research at Swedish universities generally retain the right to commercialise their research results [24]. This differs from many other countries, where universities typically own the intellectual property rights to research conducted at their institutions [24]. However, the Teacher's Exemption does not apply to all research outputs. It primarily covers patentable inventions and work protected by copyright, but does not include physical research materials or research data.

While the Teacher's Exemption enables researchers to commercialise their innovations, successfully bringing research results to market often requires additional resources and support. Researchers often lack, for example, secure funding and the expertise required to negotiate patents or licensing agreements [24]. For this reason, Swedish universities typically provide support functions, such as Innovation Offices and holding companies, that researchers can collaborate with throughout the innovation process. These support functions offer guidance on issues such as intellectual property and commercialisation, in combination with legal advice and business development.

THREE COMPANIES TOP THE PATENT RANKINGS

The majority of medtech patent applications come from companies, with Essity, Gambro Lundia and Mölnlycke Health Care being the three companies with the highest number of patents in Sweden. Among the 20 companies with the highest number of patent applications, Ericsson and Volvo are also included, showing how industrial expertise in telecommunications, 5G, and vehicle data is used to drive medtech forward.

REGIONAL CLUSTERS

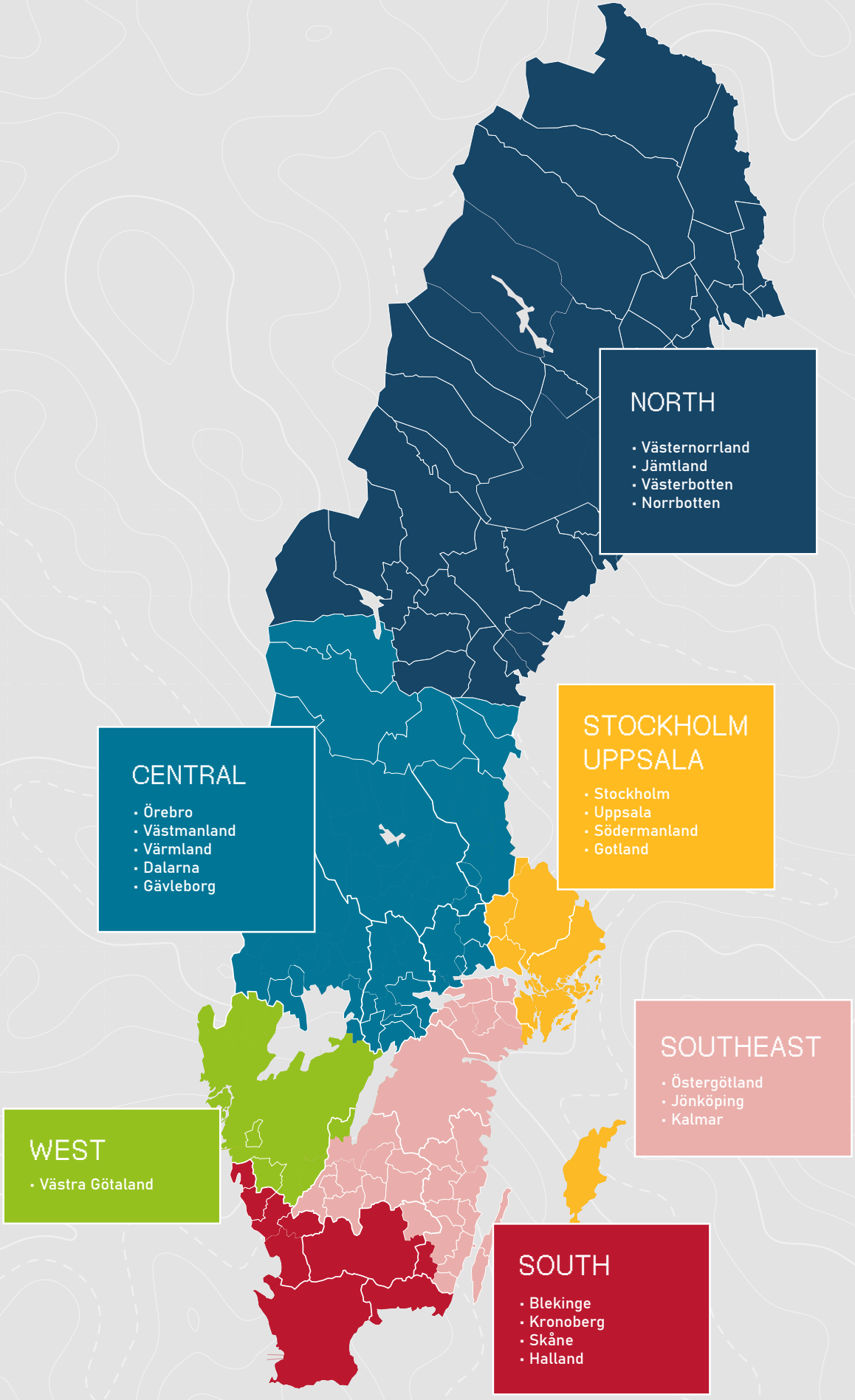

Figure 6. Sweden, divided into six medtech clusters.

3 REGIONAL MEDTECH CLUSTERS

The Swedish healthcare system is characterized by a decentralized governance model, where responsibility is distributed across 21 regions and 290 municipalities [25]. The 21 regions organize, finance, and provide most primary, secondary and tertiary care, as well as health information channels. Resources for primary care are less plentiful than in many other countries [25].

This section examines the different regions, the medtech products they use and the key actors involved. To simplify the analysis, the regions are grouped into six clusters. Figure 6 presents these six clusters and shows which regions are included in each cluster. While the clustering is based on geographical location, cross-regional collaborations are not restricted to these defined cluster boundaries.

This chapter will first present a geographical overview of the Swedish medtech sector with a focus on the distribution of patent applicants and manufacturers across the counties. Following a more thorough description of each cluster describing the research and clinical environment, innovation ecosystem and industrial profile of the cluster.

3.1 Geographical overview of the Swedish medtech sector

In Table 6, the regional distribution of the Swedish medtech actors are presented, sorted according to six regional medtech clusters. As can be seen in the table, the majority of all medtech device manufacturers are located in Stockholm (34%), Skåne (20%) and Västra Götaland (15%). Together, these three counties represent the majority of all patent applicants except private inventors. Stockholm emerges as the leading county within the Swedish medtech ecosystem, particularly among the nation's top innovators. The county accounts for 45% of the top 20 patent applicants ranked by the number of medtech patent applications, and 34% of the top 100 applicants. Furthermore, Stockholm hosts 34% of all registered medtech device manufacturers in the country. This reflects Stockholm's dual role as a major research hub and the preferred location for corporate headquarters and patent holdings.

Skåne and Västra Götaland are also two leading counties in Sweden. Skåne accounts for 20% of the top 20 patent applicants and 20% of registered device manufacturers. Västra Götaland shows a high concentration of innovation, representing 25% of the country's top 20 patent applicants, while accounting for 15% of registered device manufacturers.

In contrast, regions like Västernorrland and Norrbotten focus on innovation rather than production volume. Both appear among the top 20 patent applicants despite hosting almost no registered medtech device manufacturers. Conversely, regions like Halland and Jönköping show very low or non-existent patent applications among top applicants but hold a 3% to 4% share of device manufacturers. This pattern indicates that these regions focus primarily on manufacturing of medical devices rather than patent-driven R&D.

Some of the patent applicants, including both companies and private inventors, are not associated with a specific address or county in the dataset, resulting in the category 'Unknown'. As presented in Table 6, 23% of all applicants except private inventors are not registered to a specific region. It can be assumed that the regional distribution of these actors reflects the general distribution observed in the rest of the dataset.

Note that a value of 0% in any category does not mean that the county has no medtech actors or activities. For example, a value of 0% in the 'Top 20 applicants' category means that none of the 20 companies with the highest number of medtech patent applications are based in the county.

3.2 Stockholm-Uppsala cluster

The Stockholm-Uppsala cluster includes the regions Stockholm, Uppsala, Södermanland and Gotland. Medtech represents one of the primary strengths of the cluster [26] where the activity is centered around the counties Stockholm and Uppsala. This cluster consolidates more than half of Sweden's entire life science sector [26]. According to Vinnova's 2023 report, there

Table 6. Percentage share of medtech patent applications in Sweden, distributed by county. Sources: PATSTAT, EUDAMED.

	Share of patent applications (PATSTAT)			
County	**Top 20 applicants**	**Top 100 applicants**	**All applicants except private inventors**	**Medtech device manufacturers**
STOCKHOLM - UPPSALA CLUSTER				
Stockholm	45%	34%	23.9%	34%
Uppsala	0%	6%	5%	7%
Gotland	0%	0%	0.2%	0%
Södermanland	0%	0%	0.6%	1%
SOUTHERN CLUSTER				
Skåne	20%	24%	18.9%	20%
Halland	0%	0%	1.2%	4%
Blekinge	0%	1%	0.2%	0%
Kronoberg	0%	1%	0.6%	3%
WESTERN CLUSTER				
Västra Götaland	25%	20.0%	12.5%	15.0%
SOUTHEASTERN CLUSTER				
Östergötland	0%	4%	2.6%	4%
Jönköping	0%	0%	0.9%	3%
Kalmar	0%	0%	0.2%	0%
CENTRAL CLUSTER				
Västmanland	0%	2%	1.2%	1%
Värmland	0%	1%	0.8%	1%
Dalarna	0%	1%	0.3%	0%
Gävleborg	0%	1%	0.3%	0%
Örebro	0%	0%	0.8%	0%
NORTHERN CLUSTER				
Västernorrland	5%	1%	0.2%	0%
Norrbotten	5%	1%	0.2%	1%
Västerbotten	0%	2%	1.2%	2%
Jämtland	0%	0%	0.5%	1%
OTHERS				
Unknown	0%	1%	28%	0%

are 1,859 life science companies in the Stockholm-Uppsala cluster [27], with 34% operating within medtech. The foundational structure of the medtech ecosystem in the Stockholm-Uppsala region is built upon collaboration between academia, healthcare and industry [26], operating under the joint strategy and initiative known as Capital of Life.

In June 2024, leading regional stakeholders formalized this triple-helix collaboration within Capital of Life by signing a joint memorandum of understanding to establish a shared life science strategy [26]. This strategy aims to coordinate resources, enhance knowledge exchange and position Stockholm-Uppsala as one of the world's foremost life science ecosystems. The cluster spans the entire value chain, from fundamental research and clinical trials to healthcare implementation and commercialization. It is anchored by five universities (Karolinska Institutet, KTH Royal Institute of Technology, Stockholm University, Uppsala University, and the Swedish University of Agricultural Sciences) alongside top-ranked university hospitals, leading research infrastructure, and extensive capabilities in health data and precision medicine. By combining this academic and clinical expertise with a network of over a thousand life science companies and access to international talent, the cluster serves as a key driver of medical innovation, industrial growth and enhanced patient outcomes [26].

A primary strength of the Stockholm-Uppsala cluster lies in advanced medical imaging, image-guided diagnostics and precision treatment, with extensive capabilities spanning AI-driven diagnostics, spectral CT and photon-counting CT, and molecular imaging (PET/MRI). The region is also globally leading in image-guided cancer care and radiotherapy.

3.2.1 Research and clinical environment

This cluster hosts five universities: Karolinska Institutet (KI), KTH Royal Institute of Technology, Stockholm University (SU), Uppsala University (UU) and the Swedish University of Agricultural Sciences (SLU) [26]. Both KI and UU maintain close collaboration with the Stockholm-Uppsala cluster's two largest university hospitals, Karolinska University Hospital in Stockholm and Uppsala University Hospital (Akademiska sjukhuset) in Uppsala. Karolinska Institutet accounts for the single largest share of academic medical research [28]. Within the medtech field, its focus lies on bridging technological innovation and clinical care through need-driven research, developing and validating technologies that encompass wearable sensors, AI, process mining and digital health platforms [29].

IMAGING AND PRECISION TREATMENT STRENGTHS

A primary strength of the Stockholm-Uppsala cluster lies in advanced medical imaging, image-guided diagnostics and precision treatment, with extensive capabilities spanning AI-driven diagnostics, spectral CT and photon-counting CT, and molecular imaging (PET/MRI).

3.2.2 Innovation ecosystem

The cluster is geographically structured around a number of specialized areas and research parks that serve as meeting places for academia and industry. In Stockholm, Hagastaden has developed into a central district for life science, including medtech, strategically located close to KI and the university hospital [30]. Hagastaden is home to 185 global companies and start-ups, and the district continues to expand and evolve rapidly [31]. Within this area, KI Innovation operates to help researchers and students to commercialize medical and health-related innovations in an early phase [32] [9]. KI Innovations consists of three different initiatives: Innovation Lab, KI Science Park and KI Incubator [32]. KI Innovation Lab helps researchers to evaluate the potential of their research and identify future steps forward. KI Science Park operates as a platform where researchers, clinicians and companies can network and collaborate with 62 members [33] [34]. Through memberships, events, sponsorships and opportunities to share knowledge, it builds networks and promotes collaboration between different actors. KI Incubator helps start-up companies with business development and coaching. MedTechLabs is another center located in Hagastaden and represents a long-term initiative managed jointly by KTH, KI and Region Stockholm [35]. The center conducts needs-moti-

vated, clinical research and education with the aim of accelerating the implementation of new medical technology into healthcare. SciLifeLab is a national research infrastructure that is also located in Hagastaden [36]. SciLifeLab provides researchers with access to advanced technologies, expertise and resources within life science. It connects academia, healthcare and industry to support the development of new innovations.

In Uppsala, a corresponding structure exists in the Medtech Science & Innovation Centre (MTSI), which is a collaboration between UU and the Uppsala University Hospital [37]. MTSI functions as a meeting place that connects healthcare professionals, medtech researchers and students to solve concrete problems within the clinical environment. Regarding industrial development and manufacturing, activity in Uppsala is primarily concentrated in two areas: Uppsala Business Park and Uppsala Science Park. Uppsala Business Park comprises over 60 companies operating within medtech, biopharma and advanced manufacturing [38]. Uppsala Science Park is a research hub that brings together over 140 companies within life science, biotechnology, materials science and IT [39]. Beyond office and laboratory spaces, it offers support functions that assist smaller companies with business development, patents, legal matters and access to venture capital.

Uppsala is also home to the Uppsala Innovation Center (UIC), a business incubator that offers tailored business development support, networking opportunities and financing to companies across multiple sectors, including medtech [40] [9]. UIC collaborates with around 20 partners and acts as an independent collaborative partner, as it does not take any equity in the UIC companies. To support businesses focusing on medtech, UIC provides a customized programme specifically designed to assist with, for example, regulatory requirements following the medtech sector [41].

Other important innovation initiatives:

- **Stockholm Science City (SSCI):** A foundation that works to strengthen Stockholm's competitiveness in life science by promoting collaboration between universities, industry and the public sector [42] [43]. It builds networks and creates opportunities for collaboration to identify needs within the innovation ecosystem and make Stockholm more attractive for research and business. A particular focus is placed on Hagastaden, where SSCI works with Stockholms Stad, Region Stockholm, companies and universities to support collaboration within the life science ecosystem.
- **Flemingsberg Science:** An innovation hub that connects academia, healthcare and industry to support research, entrepreneurship and innovation within life science [44].
- **STUNS:** A foundation promoting collaboration between Uppsala's universities, the business sector, and society, situated in Uppsala Science Park and featuring a department focused on life sciences [45].
- **Sting:** The incubator for accelerating startups in the Nordics with a dedicated focus on life science, offering access to an extensive network of experienced coaches, entrepreneurs, and investors [46].
- **Digital Futures:** A cross-disciplinary research center established by KTH, Stockholm University, and RISE. It explores digital transformation, AI, and advanced data-driven technologies across society, with dedicated research initiatives in digitalized healthcare, medical AI, and precision medicine [47].

3.2.3 Industrial profile

This section outlines the industrial profile of the Stockholm-Uppsala cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

Table 6 shows how the Stockholm-Uppsala cluster hosts 42% of all medtech device manufacturers in Sweden. When looking at Table 5, Mediroyal Nordic AB is the largest manufacturer in the Stockholm-Uppsala cluster in terms of registered unique medtech devices, accounting for 7.1% of all unique devices registered by Sweden-based manufacturers. Mediroyal Nordic AB was founded in 2002 and manufactures innovative and functional orthoses for post-injury rehabilitation [48]. The second largest manufacturer in the Stockholm-Uppsala cluster, measured by the number of unique product registrations according to Table 5, is Nimacare AB.The company manufactures seat cushions for wheelchairs [49] and accounts for 6.0% of the unique medtech devices registered by manufacturers based in Sweden, which can be seen in Table 5. Another prominent actor in the cluster is Mercado Medic AB, which manufactures both manual and electric medical-grade REAL indoor work chairs, as well as power wheelchairs tailored for individuals with disabilities [50].

Patent applications

Table 6 illustrates that the Stockholm-Uppsala cluster accounts for 40% of all patents filed by the top 100 applicants. The cluster's development is driven forward by companies demonstrating how medtech today

is increasingly consisting of software development, AI and advanced data communication. Table 2 shows top 20 Swedish actors that filed the most medtech patent applications between 2016 and 2025 whereas 9 of these are based in the Stockholm-Uppsala cluster. Among these are RaySearch Laboratories and Elekta, two companies working with, among other things, software development for cancer treatment [51][52]. While Elekta develops both software and hardware, RaySearch Laboratories exclusively focuses on software solutions.

Tobii, which is also included in the top 10 based on Table 2, operates within the field of sensors and behavioral analysis [53]. Tobii integrates machine learning, AI and advanced signal processing to decode head and eye movements. This technology is utilized to measure gaze and attention, and is increasingly applied within clinical diagnostics and medical assessments.

Ericsson is the fourth company positioned within the top 10 in Table 2. Ericsson has developed specific 5G solutions tailored for hospital environments and digital healthcare [54]. Because modern hospitals rely on managing large volumes of data securely and in real time, for instance, for AI-supported diagnostic imaging, mobile Electronic Health Records (EHR), and Internet of Medical Things (IoMT) devices, traditional Wi-Fi networks often fall short. Ericsson's network architecture is designed to handle these capacity and security demands without the need for tethered cables.

A concrete sign of how industries are integrating is Ericsson's decision to relocate its entire operations in Kista, including its corporate headquarters, to Hagastaden [55]. This physical move of a telecommunications giant directly into a medtech focused area, illustrates how modern medtech is increasingly moving toward digital infrastructure and connectivity.

42 %

The Stockholm-Uppsala cluster hosts 42% of all medtech device manufacturers in Sweden.

3.3 Southern cluster

In the Southern cluster of Sweden, four regions are included: Skåne, Halland, Kronoberg and Blekinge. Among these, Skåne is the most prominent county in terms of academic research, university hospitals, research infrastructures, science parks and medtech companies. Skåne has approximately 680 life science companies, of which 58% operate within the medtech sector [56]. Within Skåne, the cities of Lund and Malmö form the core of the life science ecosystem. Lund has a particularly strong position as a research and innovation centre, driven by Lund University, Skåne University Hospital and several technology-oriented innovation environments. Malmö complements this ecosystem through its growing life science sector, entrepreneurial environment and proximity to Copenhagen.

3.3.1 Research and clinical environment

The cluster has a regional collaboration group for Research and Life Science that acts as a link between national initiatives, regional healthcare organizations, academia and research organizations [57]. The group works to identify research needs within healthcare and help bring research results into healthcare practice. The collaboration group includes representatives from Region Skåne, Region Blekinge, Region Kronoberg, Region Halland and Skåne University Hospital, and works closely with universities and clinical research organizations.

A central part of the research and clinical environment in the Southern cluster is the strong presence of universities with expertise in medicine, technology and health sciences. Lund University is one of the largest universities in the Nordic countries today and it invests significant resources in research every year [58]. A significant amount of medtech research is conducted at Lund University Faculty of Engineering (LTH). Through close collaboration with Lund University's Faculty of Medicine and Skåne University Hospital, LTH has contributed to major advances in medtech research and innovation [59].

Blekinge Institute of Technology (BTH) contributes to the medtech ecosystem through research in applied health technology, which focuses on how technology can support diagnostics, treatment, rehabilitation and healthcare delivery [60]. BTH has a research and education clinic that functions as a test and collaboration environment for academia, industry and healthcare providers, supporting clinical studies and the development of new health technology solutions. Malmö University strengthens the ecosystem through research in

biomedical science and technology [61]. The research focuses on developing new methods, materials and technologies for medical diagnostics, treatment and healthcare applications.

Beyond the university environment, Skåne University Hospital (SUS) represents a key clinical actor in the ecosystem. SUS is a leading centre for medical research in Sweden, with strong collaborations between academia and industry [62]. Through its close partnership with Lund University and Malmö University, SUS supports clinical research and the development of new diagnostic methods and medical technologies. The hospital is involved in several strategic research areas, including advanced therapy medicinal products (ATMP), precision medicine, genomics and AI.

3.3.2 Innovation ecosystem

The Southern cluster has a strong presence of life science parks and incubators that support the development and commercialisation of new healthcare solutions. In Lund, Medicon Village is located, which is a life science park established in 2012 [58]. It is the largest science park in Scandinavia that focuses specifically on life science. It serves as a meeting place where researchers, companies, startups and public organizations work together to develop new solutions in health and healthcare. Examples of partners include Skåne University Hospital and Lund University. The aim is to make it easier to move from research to finished products and treatments. In total, more than 180 organizations and companies are part of Medicon Village, involving around 2,800 people [63]. Medicon Village is a part of Medicon Valley, which is a life science cluster spanning eastern Denmark and south of Sweden [58]. It involves different universities, employees in the life science sector, PhD students, university hospitals and science parks Medicon Valley.

Based in Medicon Village, SmiLe Venture Hub is one of Europe's leading incubators for life science startups. The organization supports companies from early-stage research to commercialisation by providing incubation and acceleration programmes, educational courses, laboratory facilities, mentorship and access to a network [64].

Complementing the innovation environment in Lund, Medeon Science Park in Malmö provides another important hub for life science and medtech development. Medeon Science Park is Scandinavia's oldest and most experienced science park dedicated to life science, supporting innovation within healthcare, medtech and preventive health [65]. Medeon operates as a hub bridging industry, academia, and the public sector. Strategically positioned within the cross-border ecosystem linking Copenhagen, Malmö, and Lund, the science park operates in close proximity to the Medicon Valley cluster, as well as the major international research facilities MAX IV and the European Spallation Source (ESS).

STRONG LIFE SCIENCE INFRASTRUCTURE SUPPORTS INNOVATION

The Southern cluster has a strong presence of life science parks and incubators that support the development and commercialisation of new healthcare solutions. In Lund, Medicon Village is located. It is the largest science park in Scandinavia that focuses specifically on life science.

Beyond Skåne, additional initiatives contribute to strengthening the regional innovation ecosystem. One example is Halmstad University's participation in the Life Science Academy for Startups, an EU-funded project that supports life science startups in the south of Sweden and Denmark [66]. Through collaboration between universities, incubators and industry partners, the project helps startups develop and bring new life science and medtech products to the market.

Other important innovation initiatives:

- **ESS:** ESS is a research facility in which 13 countries are involved in the project [67]. ESS is being developed to become a powerful neutron source that will make it possible to study materials at the atomic level.
- **MAX IV:** MAX IV, a research facility that produces highly focused X-ray beams [68]. It works

by accelerating electrons to nearly the speed of light using an accelerator. These electrons are guided by electromagnetic fields, causing them to emit X-ray radiation. The X-rays are then used for research in materials science and life science [69].

- **Ideon Science Park:** Ideon Science Park works to support both researchers and startups developing new technologies [70]. The aim is to speed up the process from research to market introduction. They help create collaborations between researchers and companies, provide support with funding and mentorship, and offer access to facilities and infrastructure.
- **Innovation Skåne:** Innovation Skåne is Region Skåne's innovation organization, leading innovation processes, facilitating collaboration and supporting the development of new solutions. Its work includes projects focused on improving the sustainability and long-term development of the healthcare system [71].
- **High Five:** An innovation arena that supports development and entrepreneurship [72].
- Blekinge Business Incubator. Provides access to networks, resources and knowledge to develop ideas into market-ready solutions [73].

3.3.3 Industrial profile

This section outlines the industrial profile of the Southern cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

As shown in Table 6, Skåne accounts for 20% of all medtech device manufacturers in Sweden (58 manufacturers), while Halland, Kronoberg and Blekinge account for 4%, 3% and 0%, respectively. Table 5 shows that ArjoHuntleigh AB is located in Skåne and accounts for 15.5% of all unique medtech devices registered by manufacturers based in Sweden, making it the largest medtech manufacturer in terms of the number of registered devices. Arjohuntleigh AB is a Swedish company founded in 1957 and operates globally in over 100 countries and has approximately 7,000 employees [74]. The company develops products for patient transfer, hygiene, and the prevention of healthcare-related conditions. Its main products include patient transfer sheets and mattresses.

In addition, Camp Scandinavia AB is also located in Skåne and accounts for 6.2% of all unique medtech devices registered by manufacturers based in Sweden, as shown in Table 5. This makes it the fifth-largest medtech manufacturer in Sweden based on the number of registered devices. The company develops and sells orthopedic orthoses, mainly hip orthoses [75]. It is one of the leading producers of orthopedic orthoses in the Nordic region and the company is part of the Allard Support for Better Life group.

In Halland, B.I.M.A Plastteknik AB is a manufacturer accounting for 4.8% of all unique medtech devices registered by manufacturers based in Sweden. They manufacture medical cushions, mainly for wheelchairs, which provide support and improved comfort. All production takes place in Sweden [76].

Patent applications

Table 2 presents the top 20 Swedish actors that filed the most medtech patent applications between 2016 and 2025. As shown in the table, four companies from Skåne are represented among the top 20, while none of the other regions in the Southern cluster are represented. The second-ranked actor in Table 2 is Gambro Lundia, a company that was based in Lund. It has filed 171 unique patents (2%) and is the second largest applicant in Sweden between 2016 and 2025. Gambro Lundia was a medtech company that produced products for dialysis treatment. However, in 2013 it was acquired by Baxter, an American company, which led to production being moved away from Sweden. Arjohuntleigh AB is the 10th top patent applicant in Sweden when it comes to unique patents and is located in Malmö, Skåne.

LARGEST SWEDISH MANUFACTURER IN TERMS OF NUMBERS

ArjoHuntleigh AB is located in Skåne and accounts for 15.5% of all unique medtech devices registered by manufacturers based in Sweden, making it the largest medtech manufacturer in terms of the number of registered devices.

3.4 Western cluster

This cluster includes only one county, Västra Götaland. The Western Swedish medtech ecosystem is characterised by a strong industrial medtech base, leading clinical research and healthcare, medical research and engineering/technology is a defining characteristic of the ecosystem, with Gothenburg and Mölndal forming its main hub. The cluster's industrial strengths lie in physical medical devices and biomaterials, alongside cross-sector convergence driven by regional expertise in engineering, AI, and digital health.

Sahlgrenska University Hospital and Region Västra Götaland (VGR) provide a major clinical and healthcare environment, closely connected to the University of Gothenburg and Chalmers University of Technology. This is complemented by a strong industrial base, ranging from global companies such as AstraZeneca, Mölnlycke Health Care and Getinge to a growing community of specialised and emerging companies. The ecosystem also includes a broad infrastructure for innovation, commercialisation and business development that provide complementary functions across the innovation pathway.

To further develop this strong foundation, the Western cluster has established strategic initiatives aimed at strengthening collaboration within the life science sector. One example is the Agenda for Life Science in Western Sweden, which aims for the county to become a leading life science cluster in Europe by 2035 [77]. The agenda focuses on bringing together the life science ecosystem, creating a shared vision, identifying common challenges and addressing them collaboratively [78].

3.4.1 Research and clinical environment

The research and clinical environment in the Western cluster is characterised by close collaboration between academia, healthcare and industry. The main academic institutions are the University of Gothenburg and Chalmers University of Technology, complemented by the University of Borås, University of Skövde and University West.

The University of Gothenburg, and in particular the Sahlgrenska Academy, conducts research across a broad range of medical and health sciences. Chalmers University of Technology contributes strong engineering and technology expertise with applications in areas such as medtech diagnostics, medical imaging, AI, digital health and biomaterials [79]. The close geographical and organisational links between the University of Gothenburg, Chalmers and Sahlgrenska University Hospital provide an important basis for interdisciplinary and translational research combining medicine, clinical practice and engineering.

SAHLGRENSKA CONNECTS HEALTHCARE AND RESEARCH

A key part of the ecosystem is Sahlgrenska University Hospital. In addition to providing healthcare services, it is also actively involved in research aimed at improving and developing clinical care.

Sahlgrenska University Hospital is the main clinical research environment in the region and one of Sweden's largest university hospitals [77]. Together, VGR and the University of Gothenburg have been ranked as Sweden's leading county in terms of the quality of clinical research, according to the Swedish Research Council. The hospital provides access to highly specialized healthcare, clinical expertise, patients and healthcare data, creating important opportunities for clinical and translational research.

3.4.2 Innovation ecosystem

The strong research and clinical environment in the Western cluster is supported by a well-developed innovation ecosystem of science parks, innovation centres, incubators and collaborative environments, mainly concentrated around the Sahlgrenska area in Gothenburg and the Gothenburg–Mölndal corridor. One initiative that supports this ecosystem is Sahlgrenska Life, which is a joint initiative between VGR, the University of Gothenburg, and industry partners, aiming to strengthen research and innovation in healthcare [80]. By bringing together academia, healthcare, and companies in a shared environment, the initiative seeks to accelerate the development of new medical solutions

and make them available to patients more quickly. This is particularly relevant in rapidly growing fields such as precision medicine, AI and genomics [81]. Construction of the Sahlgrenska Life buildings began in 2026, and is expected to be in use by 2033. The facilities will include spaces for research in areas such as precision medicine and laboratory medicine, as well as education and collaborative environments where different actors can work together.

Another important innovation environment is GoCo Health Innovation City, an innovation cluster located in Mölndal just outside Gothenburg, adjacent to AstraZeneca's strategic R&D site, where companies, academia and healthcare collaborate to accelerate the development of new solutions within life science [82]. With more than 100 companies involved, GoCo serves as a meeting place where research can be more quickly translated into innovation.

In addition, Sahlgrenska Science Park in Gothenburg also plays an important role in supporting research and innovation. It's located close to Sahlgrenska University Hospital and the Sahlgrenska Academy, and offers, for example, health innovation labs, an accelerator programme and access to partner networks that support the development of new solutions [83]. Gothia Forum also supports the development and implementation of clinical studies, adding to the cluster's research capacity [84].

Other important initiatives:

- **AstraZeneca BioVentureHub:** A hub located within AstraZeneca's Gothenburg R&D site, providing emerging companies and academic groups with access to scientific expertise, advanced infrastructure and an international industrial R&D environment while allowing them to remain independent [85].
- **Lindholmen Science park:** a cross-sector innovation environment in Gothenburg, bringing together industry, academia and the public sector in collaborative research and innovation [86]. While not exclusively focused on life science, Lindholmen contributes important capabilities relevant to the future development of medtech, particularly in AI, digitalisation, visualisation and data-driven innovation. It is also home to AI Sweden, Sweden's national centre for applied artificial intelligence, providing opportunities for cross-sector collaboration between health, technology and other knowledge-intensive industries.
- **Chalmers Ventures:** Supports researchers and startups in commercialising deep-tech innovations by providing support and investment [87].
- **GU Ventures**: GU Ventures supports researchers and entrepreneurs from the University of Gothenburg in commercialising ideas and developing businesses, particularly within life science and technology [88].

3.4.3 Industrial profile

This section outlines the industrial profile of the Western cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

As can be seen in Table 6, Västra Götaland accounts for 15% of all medtech device manufacturers in Sweden. The county is also home to Nobel Biocare AB, the second largest manufacturer in Sweden in terms of registered unique medtech devices, which accounts for 12.5% of all unique medtech devices registered by manufacturers based in Sweden, as shown in Table 5. Nobel Biocare AB contributed to the development of the first titanium dental implants and today the manufacturer sells various dental implants as well as dental abrasive and polishing materials [89].

Another important manufacturer is Essity Hygiene and Health AB, which is the fourth largest medtech manufacturer in Sweden, accounting for 6.5% of all medtech devices registered by manufacturers based in Sweden, as shown in Table 5. Essity develops and sells products within areas such as incontinence care, wound care and personal hygiene [90]. The company operates in approximately 150 countries.

Patent applications

Västra Götaland is home to the company with the highest number of unique patent applications in Sweden between 2016 and 2025. This is Essity Hygiene and Health AB, which develops incontinence and hygiene products [90]. The company has filed 235 unique patents, corresponding to 2.8% of all unique patents during 2016 to 2025.[5] In addition, Mölnlycke Health Care is the third largest company in terms of patent applications, with 82 unique patents, as can be seen in Table 2. Mölnlycke Healthcare is a leading medtech company that develops products within wound care, surgical solutions, gloves, and antiseptics [91]. The company has been established since 1849 and its headquarters is located in Mölndal.

[5] Data retrieved from PATSTAT, Autumn 2025 release.

3.5 Southeastern cluster

The Southeastern cluster consists of the counties of Jönköping, Kalmar and Östergötland. The cluster has a regional collaboration group for research and life science that supports researchers and promotes networking and research infrastructure [92]. Jönköping, Kalmar and Östergötland developed a joint strategy in 2018 to strengthen the life science sector through increased collaboration between healthcare, universities and industry [93]. The strategy is based on the different areas of expertise within each county. Östergötland has a strong position in medtech, particularly in visualization and smart connected systems. Jönköping County's main strength lies in quality improvement and change management, having developed effective models for conducting clinical trials of pharmaceuticals and medical devices. Kalmar County specializes in eHealth, with investments in digital healthcare, AI and health data, carried out in close collaboration with Linné University and the eHealth Institute. Together, the three counties work to strengthen collaboration between healthcare, academia and industry aimed at supporting the development of new healthcare solutions. However, Östergötland is currently leaning towards the Stockholm-Uppsala cluster, as they see that this is where the primary networks and resources are located.

3.5.1 Research and clinical environment

The research and clinical environment in the Southeastern cluster is mainly concentrated in Östergötland, with Linköping University and Linköping University Hospital as key actors. Östergötland is one of Sweden's stronger counties in technology-driven life science, with strengths in medtech, AI, image analysis, visualisation and digital health [94]. It collaborates closely with Linköping University and the University Hospital, as well as with various companies, to develop new solutions. Linköping University (LiU) is a key actor in the medtech ecosystem, with strong research within areas such as AI, image analysis and medtech. LiU has a Biomedical Engineering department that researches bioelectronics, implant technology, biosensors and more. LiU also has AI environments such as AIICS (Artificial Intelligence and Integrated Computer Systems), as well as the Department of Computer and Information Science (IDA), which conducts research in machine learning, AI and related fields.

The University Hospital (US) in Linköping also carries out a significant amount of clinical research and works closely with the university. At the hospital, data collection and testing of methods take place, which are important for research. Several departments at the hospital are also involved in collaborations related to image diagnostics, flow measurements and similar areas.

STRONG IN MEDTECH, AI AND DIGITAL HEALTH

Östergötland with Linköping University and Linköping University Hospital as key actors, is one of Sweden's stronger regions in technology-driven life science, with strengths in medtech, AI, image analysis, visualisation and digital health.

3.5.2 Innovation ecosystem

Building on the strong research and clinical environment, the Southeastern cluster has developed an innovation ecosystem focused on translating research into new technologies and healthcare solutions. The ecosystem is particularly strong in Östergötland, where research centres, science parks and incubators support innovation within medtech For example, the Centre for Medical Image Science and Visualization (CMIV) is located in Linköping, which is a research initiative that develops and tests methods in AI-based diagnostics, medical image analysis and visualization. Analytic Imaging Diagnostics Arena (AIDA) is a national arena for research in medical image analysis that is coordinated through CMIV [95]. AIDA brings together academia, healthcare and industry to support the development and implementation of AI-based solutions in healthcare. Another relevant initiative is the Centre for Information-Driven Precision Health, which was established in 2025 as a competence center focused on research in AI and data analysis in healthcare. Overall, this highlights a strong technological research environment in AI, medical imaging and visualization in Östergötland.

The Southeastern cluster also has several science parks, for example Linköping Science Park and Norrköping Science Park. Both science parks have been commissioned by Region Östergötland to strengthen

and mobilise the cluster's life science ecosystem. Rather than focusing only on new startups, the initiative builds on companies already established in the cluster and aims to connect them with other relevant actors, identify opportunities for collaboration and create a more connected and coordinated life science ecosystem. Linköping Science Park works with areas such as AI, digitalization and visualization, while Norrköping Science Park has a strong focus on research and innovation in materials science and sensor technology [96]. There are also Jönköping Science Park and Kalmar Science Park, which work in close collaboration with Jönköping University and Linné University respectively.

Other important initiatives:
LEAD: A business incubator connected to Linköping University that supports researchers, students and entrepreneurs in developing innovative ideas into companies [97]. Through coaching, networks and commercialisation support, LEAD helps bring research-based solutions to the market. Up to 30% of the new ideas and companies accepted into LEAD are within the life science sector. LEAD was selected by NATO in 2026 as Sweden's accelerator within the Defence Innovation Accelerator for the North Atlantic (DIANA) [98]. Through DIANA, LEAD supports deep-tech companies by providing business coaching, test environments, academic expertise and connections to the defence industry and authorities.

3.5.3 Industrial profile

This section outlines the industrial profile of the Southeastern cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

As shown in Table 6, Östergötland accounts for 4% of all medtech device manufacturers in Sweden, while Jönköping accounts for 3% and Kalmar for 0%. Etac Supply Center AB is the manufacturer within the Southeastern cluster with the largest share of unique medtech devices registered by manufacturers based in Sweden. It ranks eighth nationally and accounts for 4.3% of all unique medtech devices, see Table 5. Etac Supply Center AB is based in Jönköping County and develops assistive devices for people with disabilities and for patient transfer [99]. Their main products include wheeled walkers, wheelchairs, as well as washing and showering devices.

The second largest medtech manufacturer in the Southeastern cluster is Attends Healthcare AB, also located in Jönköping, which accounts for 1% of all unique medtech devices registered by manufacturers based in Sweden. Attends is a manufacturer that provides incontinence products [100]. They manufacture items such as protective pads, pull-up pants, as well as hygiene and skincare products. The manufacturer operates globally, but most of its products are produced in Småland and it is part of Attindas Hygiene Partners.

The third largest medtech manufacturer in the cluster is Cetro Medical AB, which accounts for 0.3% of all registered medtech devices in Sweden.[7] The company develops and manufactures disposable medical instruments made from injection-moulded plastic [101]. Their tools are used in gynaecology, surgery and urology.

Patent applications

No companies from the Southeastern cluster are included in the top 20 list of the highest number of patent applicants in Sweden, as seen in Table 2. The largest company in the cluster in terms of the number of unique patent applications is Oboe IPR, with 6 unique patent applications between 2016 and 2025.[8] Oboe IPR is located in Linköping and works on commercialising technologies in areas such as biomarkers and ion pumps [102]. It is also involved in several EU projects within bioelectronics, medtech and sustainable technology.

The second largest company in the Southeastern cluster in terms of the number of unique patent applications is AMRA Medical, with five unique patent applications.[9] AMRA Medical is a Swedish company founded in 2010 as a spin-off from Linköping University [103]. The company develops AI- and MRI-based methods for analysing body composition, such as fat and muscle volume, for use in research and clinical studies.

BUILDING ON THE STRONG RESEARCH AND CLINICAL ENVIRONMENT

The Southeastern cluster has developed an innovation ecosystem focused on translating research into new technologies and healthcare solutions.

[6] Data retrieved from EUDAMED, May 2026 snapshot.
[7] ibid
[8] Data retrieved from PATSTAT, Autumn 2025 release.
[9] ibid

SCIENCE PARKS CONNECT RESEARCH, HEALTHCARE AND BUSINESS

The innovation ecosystem of the Central cluster is built upon a network of regional science parks and business incubators that bridge research, public healthcare, and commercial enterprise.

3.6 Central cluster

Geographically, the Central cluster corresponds to the Central Sweden Healthcare Region (Sjukvårdsregion Mellansverige) and encompasses the counties of Västmanland, Värmland, Gävleborg, Dalarna and Örebro. Organizationally, these counties are linked through a regional healthcare collaborative group for medtech, which serves as a bridge between the national and local levels within the knowledge management system [104]. The mission of the collaborative group is focused on achieving equitable and knowledge-based healthcare. In practice, this entails receiving and coordinating the implementation of national knowledge documents, managing regional medtech issues in consultation with the HTA council, and supporting the orderly introduction of new products by allocating responsibilities and clarifying requirements within the healthcare region. The group also collaborates with research and development in the evaluation of new methods and works to identify and correct unwanted product variations within healthcare.

At the local level, the management of medtech is divided among regional units. The regions of Örebro, Västmanland, Dalarna and Värmland have internal medtech units that hold primary responsibility for support, management, technical equipment and associated data systems across hospital clinics and departments [105][106][107][108].

3.6.1 Research and clinical environment

The cluster's academic and practical development within medtech varies across the counties In Örebro, the Örebro University Hospital (USÖ) and Örebro University serve as a central hub for knowledge exchange [109]. Demonstrating its role in the broader Swedish ecosystem, Örebro was selected to host the 2026 Medical Technology Days (Medicinteknikdagarna) [110]. This annual national conference is organized in collaboration with the Swedish Society for Medical Engineering and Physics (MTF), a nationwide professional association under the Swedish Society of Medicine dedicated to advancing research, education, ethics, and quality across Sweden [111]. This event represents a key meeting place for stakeholders in medtech healthcare, research and industry, with this year's theme focusing on the integration of medtech and AI [110].

Located within Örebro is also Camtö (Center for Assessment of Medical Technology in Örebro), which conducts systematic reviews of scientific literature (HTA - Health Technology Assessment) to ensure evidence-based healthcare [112]. Örebro University also hosts Center for Applied Autonomous Sensor Systems (AASSS) where a research group, AI for Life, focuses on applying AI, service robotics, and sensor systems to health technologies, human-robot interaction and assistive solutions for daily living [113].

Värmland has directed its medtech profile toward digital health [114]. This is primarily carried out through the DigitalWell Arena initiative, which is driven in collaboration with Karlstad University. Furthermore, the region and the university cooperate within a multidisciplinary research initiative known as DINHO, aiming to develop digital health innovations [115].

3.6.2 Innovation ecosystem

The innovation ecosystem of the Central cluster is built upon a network of regional science parks and business incubators that bridge research, public healthcare, and commercial enterprise. In Dalarna, the Dalarna Science Park operates as the county's innovation arena for collaboration between industry, academia and research, with a focus on internationalization where they cooperate with early-stage medtech companies [116] [117]. Inkubera in Örebro is a business and growth incubator offering advisory services to innovative companies [118]. While operating across various industries, Inkubera places a specific focus on research-driven firms within AI and Life Science. It provides four tailored programs to support innovative growth, ranging from early-stage idea ex-

ploration and testing to helping companies scale their operations.

Other important innovation initiatives:

- **Movexum:** Gävleborgs regional incubator, dedicated to support innovative startups and entrepreneurs in developing scalable business ideas [119].
- **Karlstad Innovation Park:** A collaborative meeting place connecting academia, industry, and the public sector to support innovation and regional business growth in Värmland [120].

3.6.3 Industrial profile

This section outlines the industrial profile of the Central cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

Regarding registered manufacturers in Sweden, Table 6 shows that the Central cluster accounts for a total of 2% of all medtech manufacturers in Sweden, distributed as 1% in Västmanland and 1% in Värmland. Among these manufacturers, Aurena Laboratories Holding is the largest actor in Värmland in terms of unique medtech products registered by manufacturers based in Sweden. In Västmanland, the most prominent manufacturer is Toul Meditech AB, which develops products and concepts for cleanroom environments [121]. The manufacturer's products focus on air purification in sensitive environments, designed to enable a more decentralized workflow within healthcare.

Patent applications

Regarding patents, the Central cluster has a more limited volume compared to the metropolitan clusters. In total, actors within the cluster account for 5% of the unique patent applications among the country's top 100 applicants, as shown in Table 6. This share is evenly distributed with 1% each in Örebro, Värmland, Dalarna and Gävleborg, while Västmanland accounts for 2%, as can be seen in Table 6.

Vivolab is a company in Dalarna that holds 7 unique patents for tools and assistive devices designed for rehabilitation and recovery [122].[11] Senseair, from Gävleborg, holds 8 unique patents and focuses on optical sensor technology applied for air purification within healthcare [123].[12] Located in Värmland is Aurena Laboratories Holding, which holds 4 unique patents and specializes in the contract manufacturing of medical devices based on bag-on-valve technology, which is a dispensing system for medical sprays [124].[13]

3.7 Northern cluster

The Northern cluster, consisting of Västerbotten, Norrbotten, Västernorrland and Jämtland, is characterized by a geographically dispersed structure where medtech and innovation resources are heavily concentrated in Västerbotten, while other parts of the cluster primarily focus on operation, maintenance, and broader digitalization. In Region Västernorrland, resources are gathered under the management department Healthcare Technology Operations (Verksamhet vårdteknik), whose units are chiefly responsible for the operation, maintenance and regulatory compliance of medtech equipment [125].

3.7.1 Research and clinical environment

The research and development landscape within the Northern cluster is primarily centred in Västerbotten, with the northernmost medical faculty in Scandinavia at Umeå University and Umeå University Hospital (NUS), anchored by strong clinical environments and specialized R&D units [126] [127] [128]. A core actor in this ecosystem is the department of Medical Technology, Research and Development (MT-FoU) at NUS, operating at the intersection of clinical practice, academia, and international research [129]. Its primary mission is to offer advanced technical expertise to support and translate healthcare professionals' own project ideas into practical research and development projects. The department's activities rest on three core pillars spanning research, development, and education. Within research, the focus lies on advancing measurement and analytical methods across sensor technologies, biomechanics, and biomedical image and signal processing. Its development work centers on engineering custom hardware and software solutions, including AI-driven clinical decision support tools and digital telemedicine platforms designed to capture physiological data and streamline care delivery. Finally, the de-

UMEÅ ANCHORS THE NORTHERN RESEARCH CLUSTER

The research and development landscape within the Northern cluster is primarily centered in Västerbotten, anchored by strong clinical environments and specialized R&D units.

[10] Data retrieved from PATSTAT, Autumn 2025 release.

[11] ibid

[12] ibid

[13] ibid

partment ensures long-term regional expertise through structured educational initiatives and academic supervision conducted in close collaboration with Umeå University. In addition to MT-FoU, there is also the Center for Information Technology and Medical Technology (CIMT), which, with its approximately 300 employees, is responsible for the region's total IT infrastructure as well as the lifecycle management of all medtech equipment [128].

The clinical infrastructure is also linked to the university hospital and the three universities in Västerbotten; Umeå University, Luleå University of Technology, and SLU, through its Umeå campus, which together ensure knowledge exchange and the supply of skills [130]. The life science sector in Västerbotten possesses a global competitiveness based on cutting-edge research within biotechnology and medtech, where collaboration between academia, healthcare and the business sector translates unique biobank data and precision medicine into future healthcare solutions for sparsely populated areas.

3.7.2 Innovation ecosystem

The Northern cluster innovation ecosystem is supported by an integrated network of specialized science parks, incubators, and investment hubs. Umeå Biotech Incubator focuses exclusively on the life science sector, offering specialized support to biotech and medtech startups [131]. By maintaining close ties to academia and clinical research environments, the incubator assists early-stage ventures from initial proof-of-concept through to full commercialization. In addition, Uminova Science Park in Umeå is located close to Umeå University, SLU Umeå, and Umeå University Hospital [132]. It is home to both Uminova Innovation and Uminova Invest. Uminova Innovation is one of Sweden's leading business incubators, selected for Vinnova's national Excellence Program. It provides high-level business development support to help entrepreneurs scale their ideas, actively bridging early-stage startups with industry partners, investors, and talent both nationally and internationally [127]. Uminova Invest provides support on how to invest money and succeed in the financial markets [133].

Other important initiatives:

- **Umeå University Holding AB:** The holding company Umeå University Holding AB has a focus on the early stages of a company's development, investing either independently or together with co-investors [134]. Beyond capital, the holding company offers value-added support to portfolio companies in areas including legal matters, brand development, intellectual property (IP), and financial management.
- **BizMaker:** Region Västernorrland's local business incubator, offering business development support and resources for early-stage startups across various sectors [134].
- **Bron Innovation:** A digital innovation hub and tech cluster connecting over 100 members from the private sector, academia and public organizations across Västernorrland and Jämtland Härjedalen [135]. Within healthcare, Bron is engaged in the national project Health Data Sweden (HDS), which develops a secure digital infrastructure for the collection and analysis of health data to streamline healthcare and support research [136].
- **Luleå Innovation Park:** An innovative science park and meeting hub that bridges academia, industry, and the public sector, fostering local and international knowledge exchange, technology transfer, and business growth [137].
- **High Coast Innovation Park:** An innovation hub centered on bioeconomy and digitalization, leveraging high-tech forestry and technology expertise to drive sustainable regional solutions [138].

3.7.3 Industrial profile

This section outlines the industrial profile of the Northern cluster, focusing on its medical device manufacturers and patent activity.

Medtech manufacturers

Table 5 presents the top 10 medtech manufacturers based on the number of unique devices registered by Swedish manufacturers. None of the manufacturers in the Northern cluster are represented among these top 10 manufacturers. As shown in Table 6, Västerbotten accounts for 2% of all medtech device manufacturers

GLOBAL COMPETITIVENESS

Cutting-edge research within biotechnology and medtech, where collaboration between academia, healthcare and the business sector translates unique biobank data and precision medicine into future healthcare solutions for sparsely populated areas.

in Sweden, while both Norrbotten and Jämtland account for 1%. Västerbotten has six manufacturers, with Nordic Biomarker AB being the largest in terms of the number of unique registered medtech products in Sweden. Nordic Biomarker is a leading European supplier of advanced reagents for coagulation analyzers. It is a Swedish original manufacturer of advanced reagents, calibrators and controls for coagulation and clinical chemistry analyzers and offers products used for a wide range of routine and specialty tests. The second largest manufacturer in Västerbotten is Nil Medical AB, which produces wearable infusion vests for patients, primarily children and young people, requiring continuous treatment [140].

Västerbotten is also home to the medtech manufacturers Medicvent and Uman Diagnostics.[14] Medicvent develops and manufactures products that remove airborne contaminants in healthcare environments, including its patented Double Mask, which is used in hospitals for anaesthesia and maternity care [141]. Uman Diagnostics, founded as a spin-off from Umeå University, develops biomarker solutions for neurodegenerative diseases.

Västernorrland only has 1 registered manufacturer which is Sjöbloms Sjukvårdsutrustning, whose production is focused on medical furniture and physiotherapy benches, including examination couches, gynaecology chairs, treatment tables, trolleys and sack holders [142][15]. In Norrbotten, the largest manufacturer is Liko AB, which develops and manufactures patient lifts, slings, and related mobility accessories [143].

Patent applications

Regarding patent applications in Table 6, Västernorrland and Norrbotten each account for 5% of the unique patent applications among the country's top 20 applicants, while Västerbotten accounts for 2% among the country's top 100 applicants. In Västernorrland, the medtech company Permobil is represented on the top 20 list with 14 unique patents according to Table 2. The company's products and development encompass electric and manual wheelchairs as well as associated comfort and support solutions for individuals with disabilities [144]. In Norrbotten, the leading actor on the top 20 list is Liko Research and Development, since 2008 a fully owned subsidiary to Baxter Hillrom, with a total of 57 unique patents. According to Table 3, their patent portfolio is focused on hospital and nursing beds, diagnostic measuring devices and ICT for the management of medical devices and healthcare resources.

[14] Data retrieved from EUDAMED, May 2026 snapshot.

[15] ibid.

4 CONCLUDING REMARKS

This report has mapped the Swedish medtech ecosystem by analyzing patent data (PATSTAT, Autumn 2025 release), commercial market registrations (EUDAMED, May 2026 snapshot), and institutional support structures across Sweden's regional clusters. Together, the findings present an ecosystem characterized by high research intensity, distinct regional specializations, and a dual-track industrial structure.

Key findings of the study

- **High-Tech R&D vs. volume manufacturing:** A central finding of this study is the clear contrast between Sweden's medtech innovation profile and its commercial market presence. Patent data highlight a strong research and development focus on advanced areas such as diagnostics, surgical systems and dialysis technologies. In contrast, the EUDAMED data reveal that the commercial manufacturing base is centered around high volumes of products supporting everyday care, mobility and patient handling, such as transfer sheets and orthoses. This dual-track structure shows that the Swedish ecosystem sustains both advanced clinical R&D and significant manufacturing of practical healthcare solutions.
- **Cross-industry convergence and digital health:** The analysis also shows that medtech innovation in Sweden involves collaboration and knowledge from several different sectors, particularly in areas related to digital technologies. The presence of companies like Ericsson and Volvo among the top 20 medtech patent applicants suggests that the Swedish sector increasingly leverages expertise from advanced telecommunications and automotive engineering to drive digital health and healthcare informatics forward.
- **Geographic anchoring across six clusters:** Geographically, the medtech activities are mainly concentrated in Stockholm-Uppsala, Southern and Western clusters. Together, these three clusters account for the majority of both medtech patent applications and manufacturers within the sector. Other regional clusters contribute with specialized strengths, such as medical imaging and visualization in the Southeastern, and specialized testbeds for decentralized care in the Northern. However, other parts of the country have fewer medtech companies and resources. To ensure that patients in all regions get equal access to new medical solutions, it will be important to improve collaboration and share knowledge more effectively across regional borders.
- **An enabling institutional framework:** Finally, the continuous flow of innovation from experimental research to commercialized products relies directly on a strong institutional framework. Sweden's international standing is built upon a long tradition of close collaboration between industry, academia, and healthcare. Public support initiatives, combined with the Teacher's Exemption, create a robust foundation that encourages entrepreneurship and helps translate academic research into practical medtech solutions on the market.

In conclusion, the Swedish medtech sector reflects a dynamic environment where traditional manufacturing and digital development exist side by side. However, as the ecosystem continues to evolve, the primary challenge is not only generating new patents, but ensuring that these solutions are effectively integrated into everyday healthcare across the entire country. Addressing this requires sustained regional collaboration, clear regulatory pathways and early collaboration between startups and healthcare providers to develop solutions that fit real clinical needs and create real value for patients.

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APPENDIX A: MATERIALS AND METHODS

Patent data from PATSTAT (2025 Autumn release) and device data from EUDAMED (snapshot of 29 May 2026).

Patent data and selection

Patent records were retrieved from the European Patent Office Worldwide Patent Statistical Database (PATSTAT), 2025 Autumn release. The applicant, application, classification, title, and abstract tables were joined into a single record per filing; filings with missing titles or abstracts were retained, because these fields were used only for description and verification rather than for selection. A filing was defined as medical technology if it carried at least one Cooperative Patent Classification (CPC) code falling within 13 subclasses drawn from the World Intellectual Property Organization, identified at the four-character subclass level. These subclasses spanned diagnosis, surgery, and imaging; implants, prosthetics, and dental devices; delivery and life-support devices; therapy, care-handling, sterilisation, and informatics technologies; and a narrowed cellular and immunotherapy group restricted to exclude general pharmaceuticals. Filings whose earliest filing year fell within 2016–2025 inclusive were retained, dating each invention to its first entry into the patent system. To avoid double-counting inventions filed in several jurisdictions, filings were grouped into International Patent Documentation Center (INPADOC) families and counted at family level; applicants (owners) rather than inventors were counted. For Sweden this yielded 8,449 unique applications, collapsing to 2,303 unique INPADOC families filed by 959 distinct applicants.

Applicant disambiguation and classification

Applicant names were cleaned and merged in three passes. First, names were standardised by uppercasing, stripping punctuation, removing Swedish legal forms (AB, HB, KB), and collapsing whitespace. Second, a hand-curated set of Swedish entity rules forced known organizations onto canonical labels (for example, merging post-2017 SCA filings into Essity), while keeping distinct businesses separate. Third, remaining near-duplicates were merged automatically using token-based string similarity, merging pairs scoring at least 88 on a 0–100 scale and assigning the most prolific variant as group representative. Each cleaned applicant was then assigned to one of five actor types (Company, Private inventor, University, Research Organization, Medical Centre) by a large language model, with a deterministic rule-based fallback for any unclassified name. The Swedish applicant base comprised 68.2% companies, 31.5% private inventors, and 0.2% universities; the scarcity of universities reflected the Swedish professor's privilege, under which academics rather than institutions own their inventions.

Medical-device data

Device data were obtained from the European Database on Medical Devices (EUDAMED), downloaded on 29 May 2026. Because EUDAMED has no device-level country field, the Swedish universe was defined by the manufacturer's Single Registration Number (SRN): actors whose SRN began SE-MF (manufacturers) or SE-PR (system and procedure-pack producers) were retained. Records were retrieved and de-duplicated. Devices were counted at the Unique Device Identification–Device Identifier (UDI-DI) level. Manufacturer names were normalised by basic cleaning only (uppercasing, stripping punctuation, and removing AB, HB, and KB); the curated entity rules and fuzzy clustering applied on the patent side were not applied here. This yielded 27,977 devices registered by 296 manufacturers.

Device classification and coverage

Devices were categorized using the European Medical Device Nomenclature (EMDN), with the first code character giving the top-level category. Because EMDN codes appear only on individual device detail pages, devices were grouped by their Basic UDI-DI family (the EUDAMED basicUDI field), one representative device per family was resolved via the EUDAMED detail endpoint, and the result was propagated to all devices in the family; each device-level look-up was resolved once per family and reused across the family. Completeness was quantified as device-weighted coverage, resolving the heaviest unresolved family first and iterating toward a target of 99.5% until no further families resolved. Swedish coverage reached 99.1% (27,730 of 27,977 devices); the unresolved remainder returned no EMDN data from EUDAMED itself and so represented a source-data ceiling rather than a methodological limit.

Geographic and statistical treatment

Each manufacturer was mapped from its registered city to a Swedish county (län) using a curated city-to-

county dictionary accommodating spelling variants, with manufacturers counted once per county. Swedish manufacturers were present in 19 counties; Stockholms län held the largest share, at 34.5%, with the top three counties together accounting for 69.3%. We report shares (percentages) rather than absolute counts because EUDAMED is a live register whose totals drift as devices are registered and withdrawn, whereas shares and rankings remain substantially more stable.

APPENDIX B: LIST OF EXPERT VALIDATION PARTICIPANTS

Throughout the development of this report, validation sessions were conducted with experts within the medtech sector who reviewed specific sections related to their fields of expertise. Table 7 lists the individuals who participated in these validation reviews alongside their organizational affiliations.

Table 7. List of expert validation participants and their organizational affiliations.

NAME	ORGANIZATION
Emma Danell	SwedenBio
Joanna Daffy	SwedenBio
Kristina Levan	Business Region Göteborg
Lena Miranda	Linköpings Science Park
Lena Strömberg	Medtech4Health
Magnus Lejelöv	STUNS
Maria Bagerfeldt	Medtech4Health
Mats Falck	Umeå universitet Holding
Reidar Gårdebäck	Swedish Medtech
Sarah Lidé	Medicon Village
Ylva Williams	Stockholm Science City

APPENDIX C: PATENT CLASSIFICATION AND METRICS

Patent classification

Patent applications are classified according to the Cooperative Patent Classification (CPC) system based on their technological field.[15] The CPC system is organized into several classification levels. At the highest level are sections, which are represented by a letter and correspond to broad areas of technology. For example, Section A covers Human Necessities, Section B covers Performing Operations and Transporting, Section C covers Chemistry and Metallurgy, Section G covers Physics and Section H covers Electricity.[16] There is also a Section Y, which covers technologies that span multiple technical fields.

Each section is further divided into classes, represented by two numerical digits that specify a narrower technological category.[17] Classes are subsequently divided into subclasses, indicated by an additional letter, which provide a more detailed description of the technology. Below the subclass level, inventions are categorized into groups and subgroups using numerical identifiers. The more levels that are added, the more specific the classification becomes.

Example of how a patent is classified: [18]

- Section: A (Human Necessities)
- Class: A61 (Medical or veterinary science; hygiene)
- Subclass: A61B (Diagnosis, surgery, identification)
- Group: A61B 5 (Measuring for diagnostic purposes; identification of persons) Subgroup: A61B 5/01 (Measuring temperature of body parts)

Unique and total patents

To identify unique patents, INPADOC Patent Families are used. A patent family consolidates all patent applications worldwide that are based on and cover the exact same underlying invention.[19] This metric indicates the actual number of unique technical innovations developed by an actor, regardless of how many countries they have sought patents in. Total patents refers to a specific application submitted to a patent authority, for example within an individual country or regionally via the EPO/WIPO.[20] Companies frequently apply for patents covering the same invention across multiple countries or in several stages. Consequently, the total number of patents reflects a company's geographic reach, whereas the number of unique patents indicates the actual number of unique technical innovations the company has developed.

Innovation index

The innovation index was calculated by dividing the number of unique patents by the number of employees within each company. A higher score directly corresponds to a higher patent density relative to workforce size. By normalizing the data against organizational scale, this metric highlights R&D-intensive actors regardless of their total organizational scale. However, a limitation of this measure is that some companies consist of multiple subsidiaries, with parts of their operations located outside Sweden, making it difficult to determine the exact number of employees associated with the Swedish medtech activities. Therefore, the analysis is based on available employee figures for the Swedish parts of the companies included.

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APPENDIX D: COMPLEMENTARY TABLES, PATSTAT

In this appendix tables will show the distribution of patents based on both subclasses and top 10 main groups, to provide insight into which technology fields that account for the greatest share of the Swedish medtech industry.

Table 8. Medtech subclasses. Source: PATSTAT.

SUBCLASS	% OF TOTAL	DESCRIPTION
A61B	22.2%	Diagnosis, surgery, identification (medical imaging, surgical instruments, diagnostic devices)
A61F	21.5%	Stents, prosthetic parts, implants, vascular filters
A61M	18.3%	Syringes, inhalers, infusion pumps, dialysis machines
A61L	10.3%	Sterilisation technologies, antimicrobial materials
G16H	10.1%	Healthcare informatics
A61N	7.1%	Electrical stimulation devices, MRI therapy systems, radiotherapy
A61G	4.0%	Hospital beds, wheelchairs, patient handling equipment
A61H	2.2%	Massage devices, movement therapy, exercise therapy equipment
A61J	2.0%	Medical containers, pill dispensers, feeding devices
H05G	1.0%	X-ray technology
A61C	0.7%	Dental instruments, dental prosthetics, orthodontic devices
A61D	0.6%	Devices and methods specifically for animal treatment

Table 9. Top 10 main groups. Source: PATSTAT.

MAIN GROUP	% OF TOTAL	DESCRIPTION
A61F 13	14.3%	Bandages, dressings, absorbent pads
A61B 5	12.0%	Diagnostic measuring devices, identification of persons
A61M 1	6.6%	Suction / pumping devices (dialysis, blood)
G16H 50	4.2%	ICT for medical diagnosis, simulation or data mining
A61N 5	4.2%	Radiation therapy (radiotherapy)
G16H 20	4.1%	ICT for therapies or health-improving plans
G16H 40	4.1%	ICT for management of healthcare resources or devices
A61M 5	3.3%	Syringes, infusion / injection devices
A61L 15	3.2%	Materials for dressings / absorbent pads
A61B 17	2.8%	Surgical instruments, devices or methods

Table 10. Top 10 subgroups. Source: PATSTAT.

SUBGROUP	% OF TOTAL	DESCRIPTION
G16H 50/20	3.8%	ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics {for computer-aided diagnosis, e.g. based on medical expert systems}
G16H 20/40	3.3%	ICT specially adapted for therapies or health-improving plans, e.g. for handling prescriptions, for steering therapy or for monitoring patient compliance {relating to mechanical, radiation or invasive therapies, e.g. surgery, laser therapy, dialysis or acupuncture}
G16H 40/67	2.9%	ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices {for the operation of medical equipment or devices for remote operation}
G16H 40/63	2.7%	ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices {for the operation of medical equipment or devices for local operation}

G16H 50/30	2.7%	ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics {for calculating health indices; for individual health risk assessment}
A61N 5/1031	2.6%	Radiation therapy {using a specific method of dose optimization}
A61F 13/472	2.5%	Bandages or dressings; Absorbent pads {Especially adapted for female use}
G16H 50/70	2.3%	ICT specially adapted for medical diagnosis, medical simulation or medical data mining; ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics {for mining of medical data, e.g. analyzing previous cases of other patients}
A61F 13/496	2.3%	Bandages or dressings; Absorbent pads {In the form of pants or briefs}
G16H 30/40	2.2%	ICT specially adapted for the handling or processing of medical images {for processing medical images, e.g. editing}

Table 11. Subgroups for each of the top 10 main groups. Source: PATSTAT.

SUBGROUP	% OF TOTAL	DESCRIPTION
FILTERS IMPLANTABLE INTO BLOOD VESSELS; PROSTHESES; DEVICES PROVIDING PATENCY TO, OR PREVENTING COLLAPSING OF, TUBULAR STRUCTURES OF THE BODY, e.g. STENTS; ORTHOPAEDIC, NURSING OR CONTRACEPTIVE DEVICES; FOMENTATION; TREATMENT OR PROTECTION OF EYES OR EARS; BANDAGES, DRESSINGS OR ABSORBENT PADS; FIRST-AID KITS Bandages or dressings; Absorbent pads		
A61F 13/472	2.5	Especially adapted for female use
A61F 13/496	2.3	In the form of pants or briefs
A61F 13/5616	1.8	Using flaps, e.g. adhesive, for attachment to the undergarment
DIAGNOSIS; SURGERY; IDENTIFICATION Measuring for diagnostic purposes; Identification of persons		
A61B 5/01	1.4%	Measuring temperature of body parts; Diagnostic temperature sensing, e.g. for malignant or inflamed tissue
A61B 5/055	1.3%	Detecting, measuring or recording for diagnosis by means of electric currents or magnetic fields (using microwaves or radio waves), involving electronic [EMR] or nuclear [NMR] magnetic resonance, e.g. magnetic resonance imaging [MRI]
A61B 5/082	1.3%	Evaluation by breath analysis, e.g. determination of the chemical composition of exhaled breath

DEVICES FOR INTRODUCING MEDIA INTO, OR ONTO, THE BODY; DEVICES FOR TRANSDUCING BODY MEDIA OR FOR TAKING MEDIA FROM THE BODY; DEVICES FOR PRODUCING OR ENDING SLEEP OR STUPOR **Suction or pumping devices for medical purposes; Devices for carrying-off, for treatment of, or for carrying-over, body-liquids; Drainage systems**		
A61M 1/1656	1.2%	Apparatus for preparing dialysates
A61M 1/287	1.0%	Dialysates therefore having venting means on or near the dressing
A61M 1/964	1.0%	Dialysates therefore having venting means on or near the dressing
HEALTHCARE INFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR THE HANDLING OR PROCESSING OF MEDICAL OR HEALTHCARE DATA **ICT specially adapted for medical diagnosis, medical simulation or medical data mining;** **ICT specially adapted for detecting, monitoring or modelling epidemics or pandemics**		
G16H 50/20	3.8%	For computer-aided diagnosis, e.g. based on medical expert systems
G16H 50/30	2.7%	For calculating health indices; for individual health risk assessment
G16H 50/70	2.3%	For mining of medical data, e.g. analyzing previous cases of other patients
ELECTROTHERAPY; MAGNETOTHERAPY; RADIATION THERAPY; ULTRASOUND THERAPY **Radiation therapy**		
A61N 5/1031	2.6%	Using a specific method of dose optimization
A61N 5/103	1.7%	Treatment planning systems
A61N 5/10	1.0%	X-ray therapy; Gamma-ray therapy; Particle-irradiation therapy
HEALTHCARE INFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR THE HANDLING OR PROCESSING OF MEDICAL OR HEALTHCARE DATA **ICT specially adapted for therapies or health-improving plans, e.g. for handling prescriptions, for steering therapy or for monitoring patient compliance**		
G16H 20/40	3.3%	Relating to mechanical, radiation or invasive therapies, e.g. surgery, laser therapy, dialysis or acupuncture
G16H 20/30	0.9%	Relating to physical therapies or activities, e.g. physiotherapy, riding motion, acupressure
G16H 20/10	0.8%	Relating to drugs or medications, e.g. for ensuring correct administration to patients

HEALTHCARE INFORMATICS, i.e. INFORMATION AND COMMUNICATION TECHNOLOGY [ICT] SPECIALLY ADAPTED FOR THE HANDLING OR PROCESSING OF MEDICAL OR HEALTHCARE DATA **ICT specially adapted for the management or administration of healthcare resources or facilities; ICT specially adapted for the management or operation of medical equipment or devices**		
G16H 40/67	2.9%	For the operation of medical equipment or devices for remote operation
G16H 40/63	2.7%	For the operation of medical equipment or devices for local operation
G16H 40/20	1.5%	For the management or administration of healthcare resources or facilities, e.g. managing hospital staff or surgery rooms
DEVICES FOR INTRODUCING MEDIA INTO, OR ONTO, THE BODY; DEVICES FOR TRANSDUCING BODY MEDIA OR FOR TAKING MEDIA FROM THE BODY; DEVICES FOR PRODUCING OR ENDING SLEEP OR STUPOR **Devices for bringing media into the body in a subcutaneous, intra-vascular or intramuscular way; Accessories therefor**		
A61M 5/20	0.4%	Automatic syringes, e.g. with automatically actuated piston rod, with automatic needle injection, filling automatically
A61M 5/002	0.3%	Packages specially adapted therefor, e.g. for syringes or needles, kits for diabetics
A61M 5/14276	0.3%	Specially adapted for implantation
METHODS OR APPARATUS FOR STERILISING MATERIALS OR OBJECTS IN GENERAL; DISINFECTION, STERILISATION OR DEODORISATION OF AIR; CHEMICAL ASPECTS OF BANDAGES, DRESSINGS, ABSORBENT PADS OR SURGICAL ARTICLES; MATERIALS FOR BANDAGES, DRESSINGS, ABSORBENT PADS OR SURGICAL ARTICLES **Chemical aspects of, or use of materials for, bandages, dressings or absorbent pads**		
A61L 15/60	1.2%	Liquid-swellable gel-forming materials, e.g. super-absorbents
A61L 15/26	1.2%	Macromolecular compounds obtained otherwise than by reactions only involving carbon-to-carbon unsaturated bonds; Derivatives thereof
A61L 15/42	1.1%	Use of materials characterised by their function or physical properties
DIAGNOSIS; SURGERY; IDENTIFICATION **Surgical instruments, devices or methods**		
A61B 17/3421	0.4%	Cannulas
A61B 17/3403	0.4%	Needle locating or guiding means
A61B 17/00234	0.2%	Distal tip tools as part of, mounted on or attached to the endoscope shaft or oversleeve, for displacing/cutting tissue

Table 12. Actor types that filed medtech patent applications. Source: PATSTAT

ACTOR TYPE	NUMBER OF ACTORS	% SHARE OF ALL ACTORS	% SHARE OF UNIQUE PATENTS
Company	654	68.2%	92.7%
Private inventor	302	31.5%	9.6%
University	2	0.2%	0.2%
Medical Centre	1	0.1%	0.0%

APPENDIX E: COMPLEMENTARY TABLES, EUDAMED

Appendix E presents Table 15, which provides a more detailed overview of the top 10 medtech device categories based on the number of registered devices. For each category, the table describes the types of devices included.

Table 13. Top 10 medtech device categories and their main product types. Source: EUDAMED.

DEVICE CATEGORY	% OF TOTAL	PRODUCT DESCRIPTION
Devices for persons with disabilities	**29.5%**	· Hip Orthoses (Including Abduction Orthoses) (16%) · Wheeled Walker (6%) · Aids, Furniture And Home Aids For Persons With Disabilities (4%)
Miscellaneous devices	**29.3%**	· Patient transfer sheets and mattresses (28.2) · Various devices not included in other classes (0.7%) · Medical device software (0.2%) · Blades without safety systems (0.1%)
Implantable prosthetic and osteosynthesis devices	**10.2%**	· Dental Implants (9%) · Intramedullary Nails In Complex Systems (1%)
Patient protective equipment and incontinence aids	**8.5%**	· Incontinence Devices (8%))
Medical equipment and related accessories, software and consumables	**5.4%**	· Phaco-Vitrectomy Instruments (5%)
Dental, ophthalmologic and ENT devices	**4.7%**	· Dental Abrasive And Polishing Materials (4%) · Plastic Spectacle Frames Without Lenses (1%)
In vitro diagnostic medical devices	**4.2%**	· Genetic Tests (4%)
Reusable surgical instruments	**2.4%**	· Odontostomatology Instruments, Reusable (2%)
Devices for general and specialist dressings	**2.2%**	· Elastic Bandages, Support And Compression (1%) · Dressings For Wounds, Sores And Ulcerations (1%)
Devices for urogenital system	**1.3%**	· Nelaton Catheters, Non Self-Lubricating (1%)


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