



Rialtas na hÉireann  
Government of Ireland

# Focus on Medical Technologies

December 2018

# Medical Technologies

Ireland – a leading location for Medical Technologies with effective collaboration across enterprise and the research system



## GLOBAL MARKET

**\$521.2bn**

Medical Devices in 2017

**\$674.5bn**

Growth Forecast by 2022

Source: Medical Devices: Technologies and Global Markets, BCC Research, March 2018



## IRISH EXPORTS

**€9bn**

in 2016 from agency supported firms

Direct Economy Expenditure (DEE)

**€2.5bn**

in 2016

Source: Department of Business, Enterprise and Innovation, Annual Business Survey of Economic Impact, 2016; DEE relates to total payroll costs, materials and services sourced from Irish suppliers

Ireland is the second largest exporter of Medtech products in Europe

Source: IDA Ireland

14 out of the world's top 15 leading Medtech multinationals now have operations in Ireland



## EMPLOYMENT

**27,642**

in 2017 in agency supported firms

Source: Department of Business, Enterprise and Innovation, Annual Employment Survey, 2017

Jobs in Medtech are highly regionally dispersed with the majority of jobs outside the Dublin area



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Prepared by the Department of Business, Enterprise and Innovation

## The sector in numbers

Global <sup>i</sup>	Market Size			Growth Forecast			
	Medical Devices technologies \$521.2bn (2017)			\$674.5bn by 2022, CAGR 5.3% (2017-2022)			
Ireland	Exports (2016) <sup>ii</sup>	% of National (Exports) <sup>iii</sup>	5-year CAGR (2011-2016)	Employment (2017) <sup>iv</sup>	% of National (2017) <sup>iv</sup>	5-year CAGR (2012-2017)	DEE (2016) <sup>v</sup>
Agency	€9.0bn	4.6%	1.35%	27,642	1.24%	4.22%	€2.5bn
Irish	€97.4m	4.55%	15.6%	687	0.03%	10.55%	€0.1bn
Foreign	€8.9bn	0.05%	1.24%	26,955	1.21%	4.08%	€2.4bn

i) Medical Devices: Technologies and Global Markets, BCC Research, Mar 2018

ii) ABSEI 2016, DBEI - figures do not include optical equipment (e.g. contact lenses manufacturing) and does not include exports or employment in sub-supply and support services firms that cater primarily to the medical devices sector

iii) Percentage of national exports is derived using total exports from ABSEI 2016

iv) AES 2016, DBEI- figures do not include optical equipment (e.g. contact lenses manufacturing) and does not include exports or employment in sub-supply and support services firms that cater primarily to the medical devices sector

v) Percentage of national employment is derived using CSO Labour Force Survey, Total Employed, Q4 2017

v) Direct Economy Expenditure relates to total payroll costs, materials and services sourced from Irish suppliers

## Description of the sector globally

- Medical technology encompasses medical devices and technologies for diagnosis, monitoring, or treatment of diseases or medical conditions.
- The medical technologies (Medtech) sector is diverse and encompasses a myriad of products across segments including: Medical Devices - minimally invasive technology, implanted devices, diagnostic equipment and imaging systems, surgical systems, dental equipment and devices, drug delivery devices, and ophthalmic and optical products and technology and Medical Technology - Digital health, electronic health records, analytics, diagnostics and telecare/telemedicine.
- Geographically the US is the largest market at \$170 billion followed by Western Europe at \$80 billion and Asia Pacific at \$70 billion with Asia Pacific predicted to have strongest annual growth at 6.5%.<sup>1</sup>
- Globally, Drug Delivery is the largest segment, reaching \$207.8 billion in 2017, CAGR 3.2%. Cardiovascular is the highest growth segment, worth \$29.7 billion in 2017 with a projected CAGR of 8.8% through 2022.<sup>2</sup>
- Companies may be involved in some or all activities in the supply chain including: R&D; clinical trials; design and/or manufacture of products and solutions; management of global business services; as well as sub-

<sup>1</sup> Evaluate Medtech 2015

<sup>2</sup> Medical Devices: Technologies and Global Markets, BCC Research, Mar 2018

supply and services specific to the sector (e.g. construction of clean rooms, analytics, contract research/manufacturing etc.).

## Global developments and implications

- Prospects for the sector are driven by ageing populations, increases in chronic ailments, increasing consumer wealth in emerging economies, growth in healthcare expenditure and by technology enabled solutions and services.
- Developments in information-based medicine and personalised healthcare - the appropriate treatment, in the appropriate way, to the appropriate patient, at the appropriate time – is driving demand for more customised medical technology products including combination products, companion diagnostics, and innovative delivery mechanisms.
- There is a progressive shift from hospital to patient centric care (at home or in the community) enabled by convergence of IT and integrated sensors with medical devices. All aspects of design (functional, aesthetic etc.) are important in this context.
- The application of Big Data will drive a fundamental shift in how the medical devices sector functions. Big data and IoT impact on the Medtech industry is increasing in clinical settings with patient data access, home care and ambulatory settings. In addition, analytics is core to manufacturing excellence, quality and customisation.
- Technology developments in advanced diagnostics and sensors, IoT, 3D Printing, biocompatible materials and coatings etc, will all enable product development in the Medtech markets.
- A growing focus on wellness and awareness of physical fitness is leading to market growth of wearable medical technology. The emerging trend in wearable medical technology is miniaturization. Growth in mobile smartphone based apps include heart rate monitors, oxygen monitors, weight loss help, etc.
- Health economics is increasingly at the fore as procurers focus on patient outcomes as a key criterion. Medical device reimbursement and payment pressure continues as does competition among medical device companies to secure group purchasing contracts.
- The introduction of EU Regulations (one for medical devices, and one for in-vitro diagnostic medical devices) aimed at ensuring high levels of safety, restoring public confidence in Europe and consistency of application within the internal market will have implications for business and for innovation in the sector. The Regulations will require registration of devices, device identification to ensure traceability, and involve reinforced rules governing clinical evaluation throughout the life of the device amongst other requirements.
- At a corporate level, trends are towards acquisition and partnerships among market leaders to broaden global footprint across the value chain e.g. Abbott acquired St Jude Medical. Boston Scientific, Stryker, Zimmer-Biomet also made acquisitions. Also, trends to improve efficiency through restructuring.

## The sector in Ireland

- Ireland's Medtech sector has become one of the leading producers of medical device products globally and is the second largest exporter of Medtech products in Europe. Ireland is the number one destination of choice for Medtech investments into Europe<sup>3</sup> and represents the second largest employer in the medical technology industry within Europe, on a per capita basis.
- 14 out of the world's top 15 leading Medtech multinationals now have operations in Ireland, and many have multiple sites. Companies such as Boston Scientific, Medtronic, Johnson & Johnson, Stryker, Becton Dickinson, Baxter, Abbott, Edwards Life Sciences, Cardinal Health, and Cook Medical. Boston Scientific and Medtronic are in the top 5 employers in Ireland.
- Jobs in Medtech are highly regionally dispersed with the majority of jobs outside the Dublin area.
- The Medtech portfolio spans Vascular/ Neuro Vascular, Orthopaedic, Diagnostic, Ophthalmic, Combination Devices, Connected Health and Corporate Services. Products manufactured in Ireland include interventional products, diagnostics, medical equipment, vision, hearing products and orthopaedic and cardiovascular implants.
- There is a strong indigenous Medtech base in Ireland consisting of established companies and a continuous flow of new medical technology high potential start-ups (HPSUs) established in Ireland year-on-year and supported by Enterprise Ireland. Enterprise Ireland have supported over 30 Lifesciences HPSUs in the period from 2012-2016, with close to half in MedTech. Spin-outs from academic research are a key driver of the HPSU pipeline and are characterised by strong IP and innovative technologies. Central to the success of both Irish and foreign owned companies based here has been their R&D capabilities, technical expertise, leadership and management strengths and collaborative partnerships.
- M&A activity is a feature of the Medtech sector. Many innovative Irish high potential indigenous start-up companies have been acquired by global multinationals. Amongst the larger Irish Medtech companies acquired by overseas firms in recent years are: ArcRoyal (2014), Pro-Tek Medical (2015), Creagh Medical (2015), Creganna (2016), Steripack (2016), Neuravi (2016), VistaMed (2017), Finesse Medical (2017), Avenue Moulds (2017), Crospon (2017).
- Enterprise Ireland operates a protocol for the smooth handover of the acquired entity to IDA Ireland, with the focus on ensuring the business remains and grows in Ireland. This has proved to be very successful, with all the above expanding operations here.
- Operational excellence is evidenced with global Shingo awards for: Abbott, J+J, Boston Scientific, Lake Region, Medtronic.
- There is a strong sub-supply base with expertise in delivering high quality materials, sterilisation, wire, tubing, printing, packaging, tool-making, automation, business services and contract solutions from

<sup>3</sup> FT FDI Market Share Report, 2016

companies such as Harmac, Vention, Nelipak, Vistamed, TE Connectivity (Creganna), Zeus, Integer (Lake Region/Great Batch), Steripak, Icon and Steris, Trend Technologies, Takumi Precision Engineering and Caragh Medical.

- Ireland has a proven track record in regulatory performance (Health Products Regulatory Authority, HPRA and National Standards Authority of Ireland, NSAI).
- Ireland hosts a strong Medtech services base (including contract research & manufacturing) with 50% of companies located here in the “Business-to-Business” space. Irish owned companies are preferred vendors for a number of leading MNCs.
- Interconnectedness is a growing feature of Irish Medtech and broader advanced manufacturing sector. This is manifested in strong links between original equipment manufacturers (OEM's) and innovative sub-suppliers and service providers.
- Brexit presents a risk to Medtech companies for access to the UK and EU markets where quality, regulatory, customs & financial procedures are often interlinked with the UK.

## Ecosystem

- Medical Devices, Diagnostics, Connected Health and Therapeutics are key research areas for Ireland within the Health and Wellbeing Research Priority Areas 2018-2023. Research and innovation in associated areas such as Manufacturing 4.0, 3D printing, Robotics, Internet of Things, Data Analytics and advanced materials also enables medical device development.
- Significant investments in medical device focused or enabling Research Centres, Technology Centres and Technology Gateways including: CÚRAM Centre for Research in Medical Devices; ARCH, the technology Centre in Connected Health; AMBER in Advanced Materials and Bioengineering Research; CONNECT, the Centre for Future Networks and Communications; The Insight Centre for Data Analytics; CeADAR, Centre for Applied Data Analytics; ADAPT, Centre for Digital Content Technology; FutureNeuro; INFANT, Irish Centre for Fetal and Neonatal Translational Research; The Synthesis and Solid State Pharmaceutical Centre (SSPC); IPIC Irish Photonic Integration Centre; Manufacturing Centres I-Form and Confirm; IMR (Irish Manufacturing Research); Tyndall and a number of Technology Gateways including: MICRA (Biodiagnostics), MET (Medical and Engineering Technologies), APT (polymer technology), Shannon Applied Biotechnology, and also GMedtech.
- Clinical Research Coordination Ireland: Joint initiative, funded by the Health Research Board and Enterprise Ireland, and supporting five national clinical research facilities provides infrastructure and staff (including a Clinical-Industry Liaison Officer and a Quality and Regulatory Affairs Manager) to enable clinical research to be undertaken in a safe and appropriate environment.
- Enterprise Ireland has forged a strategic partnership with Mayo Clinic and Cleveland Clinic in the USA as part of growing international commercialisation collaborations. Cleveland Clinic and Enterprise Ireland



recognise the importance of clinical innovation and will present the Clinical Innovation Award 2018. This award aims to support clinicians in Ireland in the translation of their innovative ideas into benefits for the health care system and medical technologies sectors.

- There are strong links between the enterprise development agencies, the Irish Medtech Association (IMA) and the Irish Medical and Surgical Trade Association (IMSTA) aiming to adopt a unified approach to the development of this sector.
- The National Health Innovation Hub in Cork (a joint DBEI and DoH initiative) drives collaboration between the health system and SME sector, to develop and commercialise new healthcare technologies, products and services.
- Ireland is home to design companies for manufacturing (Dolmen Design, Design Partners, etc.), which is relevant in context of human factors and ergonomics in Medtech products and services
- BioInnovate Ireland is a national Medtech innovation fellowship training programme co-funded by Enterprise Ireland in which clinicians, industry and academia can collaborate to develop novel medical technologies based on clinical needs assessment. The Fellowship programme trains new innovators based on the Stanford BioDesign Programme. This programme is unique in Europe and is the only international programme recognised by Stanford through its affiliate programme.
- There are traineeships available in Medical Administration and for Laboratory Assistants.

## Relevant Reports

*Click on hyperlinks below*

- [DBEI Research Priority Areas, 2018-2023](#)
- [Future skills needs of the Irish Medical Devices Sector, 2008](#)
- [eHealthIreland Strategy](#)

## Key actors

**Health:** Department of Health (DoH), Health Service Executive (HSE), Health Research Board (HRB), Health Information and Quality Authority (HIQA) eHealth Ireland

**Enterprise:** Department of Business Enterprise and Innovation (DBEI), Enterprise Ireland (EI), Science Foundation Ireland (SFI), IDA Ireland

**Regulatory:** Health Products Regulatory Authority (HPRA), National Standards Authority of Ireland (NSAI), European Medicines Agency (EMA)

**Industry Associations:** Irish Medtech Association (IMA), Irish Medical and Surgical Trade Association (IMSTA)

**Academia and Education:** Department of Education and Skills (DES), CÚRAM - Centre for Research in Medical Devices, Clinical Research Development Ireland (CRDI), Higher Education Authority (HEA), SOLAS

## Recent Developments

### Company Developments

- Abbott in Donegal announced that it is to expand its Donegal manufacturing facility with the creation of c.500 new jobs over the next number of years. The facility is a Centre of Excellence for blood glucose monitoring (July 2018)
- Cerner, a supplier of health and care technology and services, will create 50 new roles focussed on R&D and the improvement of data intelligence and population health management for its European clients (July 2018)
- BD, a leading global medical technology company, announced the creation of 85 new jobs for the Limerick region (July 2018)
- Avery Dennison Corporation, (NYSE:AVY), a global materials science and manufacturing company, today announced plans to expand its medical product manufacturing operations in Longford, Ireland, increasing the Finesse Medical Ltd., facility's end-to-end medical device manufacturing capacity and capabilities for its customers (May 2018)
- Edwards Lifesciences Corp., (patient-focused innovations for structural heart disease and critical care monitoring) announced it is to establish a manufacturing operation in the Mid-West with investment totalling €80m and 600 jobs (March 2018)
- Quidel Corporation (rapid diagnostic testing solutions) announced it is to establish a Business Service Centre in Galway city to support its new international business, targeting the creation of 75 jobs over five years (February 2018)
- Beckman Coulter, which develops, manufactures and markets products that simplify, automate and innovate complex biomedical testing, is expanding the company's development and manufacturing facility at Lismeehan, County Clare, creating 70 jobs over the next two to three years (December 2017)
- Vitalograph, provider of cardio-respiratory diagnostic products, announced 50 new jobs at its manufacturing and R&D facility in Co Clare. The new roles will be data analysts, software designers and engineers (October 2017)
- Creganna Medical, part of TE Connectivity announced it is to invest a further \$13 million in its Galway facilities to enable the continued growth of the company's medical device business in Ireland. (August 2017)
- Bausch + Lomb, global eye health company, opened a €85 million extension at its Waterford facility creating 125 additional jobs, bringing the total to 300 since the Waterford facility expansion first began in 2015. (July 2017)
- Boston Scientific officially opened its €17 million investment in endoscopy research at European Innovation Centre Galway (June 2017)
- Abbott relocated its Irish Nutritional Devices business to a new, purpose-built IDA Ireland Advanced Technology Building located in the Finisklin industrial estate in Sligo. The move will see a combined investment of almost €10 million enabling the creation of a medical nutrition device centre of excellence (May 2017)
- Aventamed, has developed an innovative device which transforms ear tube (grommet/ tympanostomy tube) surgery in children and adults and will be hiring for 15 new positions in the areas of sales, marketing, quality, regulatory and R&D (April 2017)



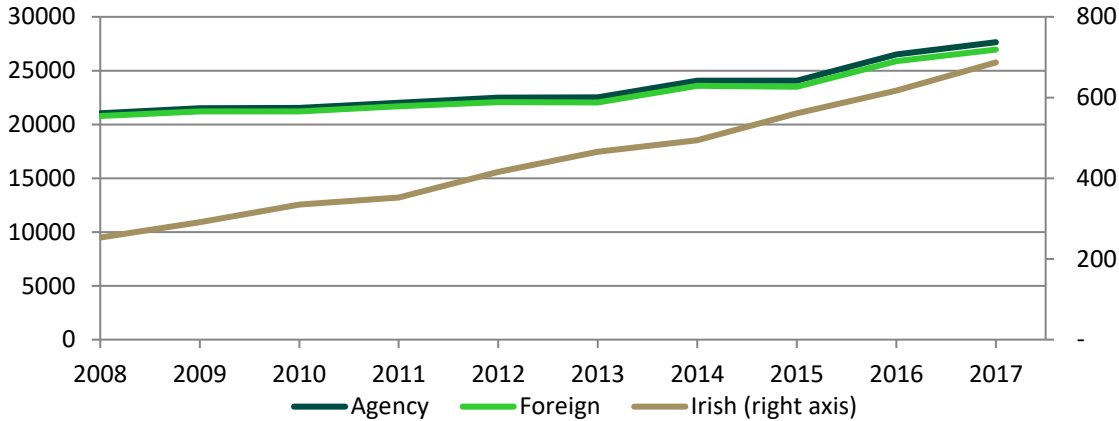
- Intelligent Implants, is at the forefront of electrotherapeutic devices to treat disease and aid recovery in bone and other tissues through pioneering the use of data, engineering, and biologics to bring novel, active and connected medical devices to healthcare, will be hiring for 10 new positions across regulatory, quality and R&D (April 2017)
- Digital Health company SilverCloud Health, leading provider of evidence-based online mental health and behavioural healthcare solutions, raised \$8.1 million in Series A funding (January 2017)

### Sector Developments

- INCASE is a new innovation partnership between Limerick Institute of Technology, Cook Medical and VistaMed aimed at developing the companies 'assembly processes in line with the fourth industrial evolution, translating Industry 4.0 into a working manufacturing quality improvement tool' (May 2018)
- Eight indigenous Medtech specialist companies have formed an innovative business cluster to promote Ireland as a global centre of excellence for the industry. The Atlantic Medtech Cluster is one of the first collaborative groups set up under Enterprise Ireland's Clustering Programme. The cluster has combined annual revenue of €33m and employs 287 people (May 2018)
- CÚRAM, the SFI Research Centre for Medical Devices based at National University Ireland (NUI) Galway announced a new research project as part of their partnership with Boston Scientific, to develop medical devices that allow surgeons to support minimally invasive procedures when carrying out life-saving repairs for aneurysms and aortic valve repair. It is one of several new research projects emerging from the collaboration between CÚRAM and Boston Scientific (March 2018)
- SFI Research Centres I-Form (Additive Manufacturing) and CONFIRM (Smart Manufacturing) launched in 2017
- Medical Technologies 'Med in Ireland' Conference welcomed 300 international buyers to Dublin (October 2017)
- Professor William Wijns, appointed to NUI Galway as Professor of Medical Devices to lead a €5 million research project, which will develop wearable sensors to alert patients at elevated risk of heart attacks to triggers such as stress or high blood pressure (December 2016)

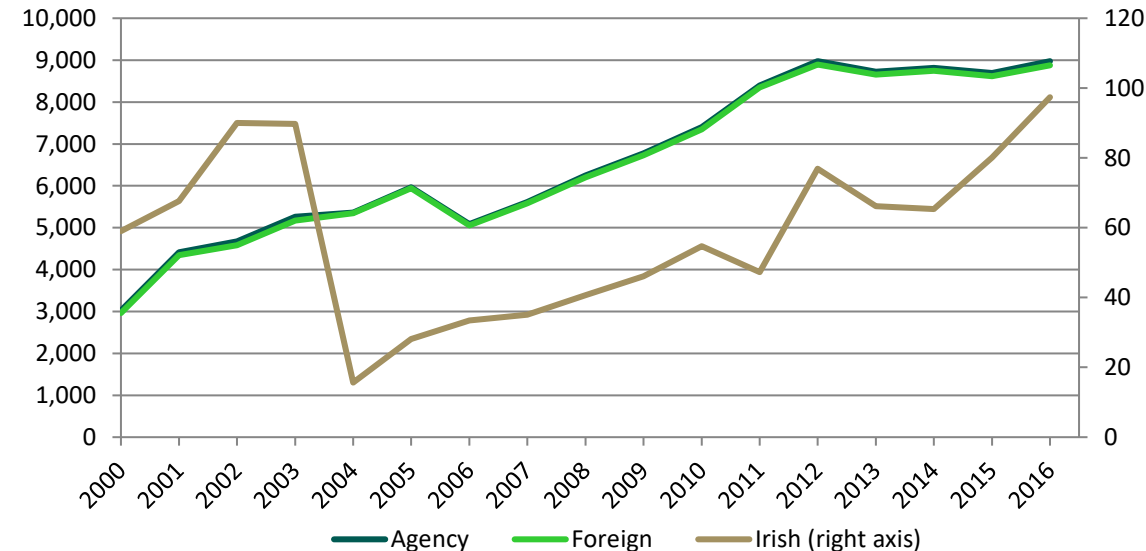
Data Trends

Employment in Agency-Assisted Companies in the Med-Tech Sector (2008-2017)



Employment in agency supported enterprises continues to increase, with Irish owned enterprises growing strongly over the past decade, although from a relatively low base.

Exports of Agency-Assisted Companies in the Med-Tech Sector (2000-2017) (€million)



Total agency and foreign exports have performed well, increasing year on year with the exception of 2006. Irish exports experience a dramatic decrease in 2004. This drop can be attributed primarily to one company which has recovered in more recent years.

Sources: Annual Employment Survey (employment), ABSEI (exports) – various years