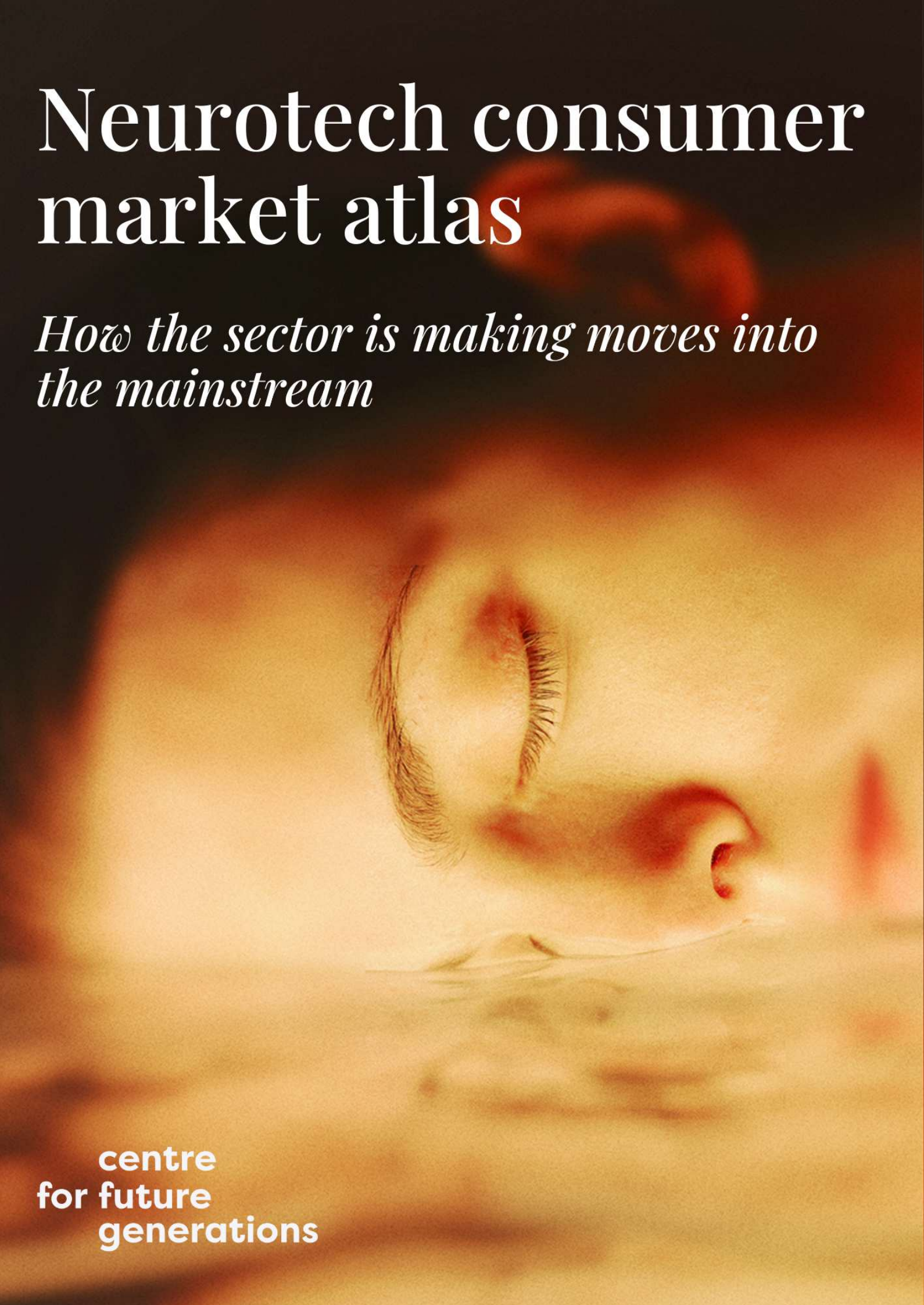
Neurotech consumer market atlas

How the sector is making moves into the mainstream



centre for future generations

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How the sector is making moves into the mainstream

Authors: *Laura Bernáez Timón, Virginia Mahieu*

Centre for Future Generations
Avenue des Arts 44
1040 Brussels
Belgium
E-mail: info@cfg.eu

This report is available at https://cfg.eu/neurotech-market-atlas/

Table of Contents

Key insights

- **Dedicated consumer neurotech firms now account for 60% of the global neurotechnology landscape,** with consumer firms outnumbering medical ones since 2018. Since 2010, consumer neurotechnology firms have proliferated more than four-fold compared with the previous 25 years.
- **North America leads the global neurotech market**, but Europe is not far behind. 48% of consumer firms are based in North America, with a stronger prevalence of wellness applications (sleep, relaxation, focus); Europe accounts for 38% of consumer firms, and leads in research-grade tools.
- **Miniaturisation and AI are accelerating integration into wearables**. EEG and stimulation technologies are being embedded into wearables, such as headphones, earbuds, glasses, and wristbands, rapidly positioning neurotech as a built-in feature of mainstream devices. AI has amplified this momentum by enabling more powerful extraction of insights from noisy data.
- **Agile consumer startups dominate early and growth-stage funding** in neurotech, benefitting from lean operations and the ability to iterate rapidly. Despite receiving lower average investment per firm compared to medical companies, consumer ventures account for a largest proportion of neurotech products available on the market. However, the sector remains heavily investment-driven, with funding levels far outpacing current revenue generation.
- **Patents and acquisitions by Big Tech suggest that neurotech's mainstream moment may be imminent**. Mainstreaming consumer neurotechnologies into everyday life could have profound and wide-ranging consequences for data privacy and technology governance, fundamental rights, and the nature of human agency.

Introduction

Over the last decade, neurotechnology has expanded beyond its traditional medical focus to emerge as a dynamic consumer market[1]. What began in the 2010s with a limited number of research-focused companies[2], adapting medical electroencephalography (EEG) for neuroscience studies outside the clinic has transformed into a diverse ecosystem of portable, cost-effective, and user-friendly wearables and software platforms. Driven by advances in several scientific and technological disciplines, these wearables harness an emerging digital infrastructure that integrates cloud-based analytics, mobile connectivity and rich app ecosystems. This architecture enables users to collect brain data in real time and visualise, analyse, and share insights. The consumer neurotechnology market now offers diverse applications in everyday wellness and lifestyle optimisation, immersive entertainment, cognitive enhancement, mental authentication, and even intuitive brain-computer interaction.

Neurotechnology has medical roots, but medical and consumer applications now target separate markets and address different needs, each carrying its own opportunities, risks, and ethical and regulatory considerations[3]. Although both sectors are progressing rapidly, their research and development strategies, funding requirements, target customers, and commercialisation timelines differ significantly. Though medical and consumer markets often use similar base technologies to monitor or stimulate the brain, consumer-oriented devices generally are not subject to the stringent safety and efficacy regulations that govern medical applications, nor do they require clinical trials. This allows them to innovate, enter the market, and reach more users more quickly and with fewer resources - provided they refrain from making any medical claims. Naturally, this new ability for the neurotech industry to, as the Silicon Valley motto puts it, 'move fast and break things' comes with its own set of risks and concerns.

The combination of lower market entry barriers, scientific breakthroughs, and a growing appetite for digital biometrics and wearables have driven a consumer neurotechnology boom. Yet, ethical and policy discussions around neurotechnology have largely focused on medical applications, or have considered medical and consumer technologies together, leaving something of a blind spot in the consumer space. This is driven in part by the absence of robust quantification and characterisation of the consumer market. As a result, questions around everyday neurotech integration, brain data governance and commercial incentives in consumer neurotech often go underexamined, even though they differ markedly from those in medical contexts. This lack of dedicated attention can hinder efforts to evaluate societal impact and design regulatory strategies that are fit for purpose.

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[1] Marcello Ienca and Effy Vayena, "Direct-to-Consumer Neurotechnology: What Is It and What Is It for?", AJOB Neuroscience 10, no. 4 (2019): 149–151, https://doi.org/10.1080/21507740.2019.1668493.

[2] Joshua Sabio et al., "A Scoping Review on the Use of Consumer-Grade EEG Devices for Research", PLOS ONE 19, no. 3 (2024): e0291186, https://doi.org/10.1371/journal.pone.0291186.

[3] Elisabeth Steindl, "Consumer neuro devices within EU product safety law: Are we prepared for big tech ante portas?", Computer Law & Security Review 52 (2024): Article 105945, https://doi.org/10.1016/j.clsr.2024.105945.ScienceDirect+7

To address this issue, the Centre for Future Generations has conducted a dedicated analysis of 271 neurotechnology companies worldwide, systematically distinguishing between medical and consumer applications, in order to provide an overview of this emerging sector.

The analysis is based exclusively on companies fully dedicated to neurotechnology. Generalist medical and consumer firms whose pipeline include neurotech products but whose funding and revenues stem primarily from other business lines, are not the scope of this investigation. Those firms are often more mature, but their metrics are highly influenced by activities outside neurotechnology. Consequently, the analysed companies are fully neurotech-oriented, which in the medical sector implies a skew toward innovation. We also conducted a series of interviews and exchanges with leaders of a diverse range of consumer and medical neurotech companies, from startups to established players.

Our analysis highlights a rapidly evolving consumer neurotechnology landscape, with EEG at its core, increasingly shaped by AI and blurring the line with clinical applications. Lean start-ups, characterized by fast market entry, strategic specialization, and integration into mainstream wearables, are redrawing the field's boundaries. These shifts invite broader questions about the future of neurotechnology and its governance.

A timeline of market transformation: from medical roots to consumer boom

Since the first-ever recording[4] of a human brain signal using EEG just over a century ago, neurotechnology has grown[5] from clinical diagnostics to neural implants[6] restoring movement[7] and speech[8], and more recently, to consumer wearables[9] for wellness and entertainment. Assessing cmpany founding dates uncovers three distinct phases in this structural shift toward consumer applications:

[4] Hans Berger, The German psychiatrist who recorded the first electrical brain signal, Advances in Physiology Education 48, no. 4 (2024): 361–365, https://doi.org/10.1152/advan.00119.2024.

[5] UNESCO, "Unveiling the neurotechnology landscape: scientific advancements innovations and major trends" (Paris: UNESCO, 2023), https://doi.org/10.54678/QCBM4164.

[6] K. Michelle Patrick-Krueger, Ian Burkhart, and Jose L. Contreras-Vidal, "The State of Clinical Trials of Implantable Brain–Computer Interfaces", Nature Reviews Bioengineering 3 (2025): 50–67, https://doi.org/10.1038/s44222-024-00239-5.

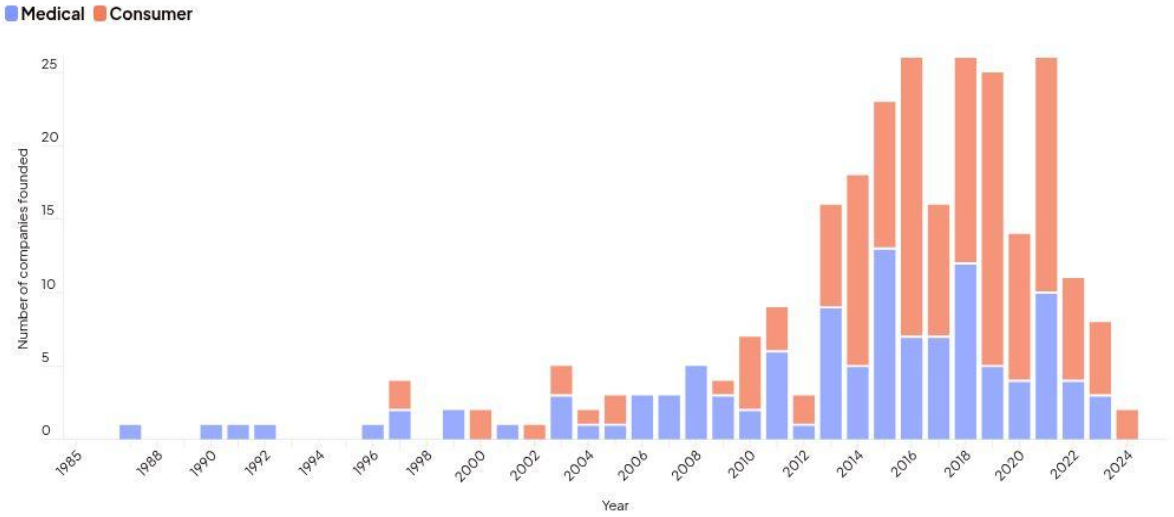
[7] Henri Lorach et al., "Walking naturally after spinal cord injury using a brain–spine interface", Nature 618 (2023): 126–133, https://doi.org/10.1038/s41586-023-06094-5.

[8] Miryam Naddaf, "Brain implant translates thoughts to speech in an instant," Nature 640 (2025): 295–296, https://doi.org/10.1038/d41586-025-01001-6.

[9] Marcello Ienca and Effy Vayena, "Direct-to-Consumer Neurotechnology: What Is It and What Is It for?", AJOB Neuroscience 10, no. 4 (2019): 149–151, https://doi.org/10.1080/21507740.2019.1668493.

A boom in neurotech company foundings since 2010

New companies per year, split by medical vs consumer-directed. Founding dynamics reveal three phases: medical only (1985–1994), the rise of consumer applications (1995–2010), and the boom of consumer neurotech (2011–onwards)



Medical firms are those with FDA, CE or equivalent approval (or in active pursuit). Consumer companies are those without such certification, selling their products directly to consumers.

Medical roots: Diagnostics and stimulation (1985 to 1994)

Between 1985 and 1994, dedicated neurotechnology companies were few, firmly rooted in clinical research, and with limited commercial uptake due to lengthy development timelines. Only five of the 271 companies in our dataset were founded during this period, and all focused on medical devices subject to FDA approval, CE marking or equivalent frameworks. These pioneers worked along two main fronts: electroencephalography (EEG) for diagnosis and monitoring, and non-invasive transcranial magnetic stimulation (TMS) for neurostimulation.

TMS illustrates the lengthy path to clinical adoption: the first medical TMS paper[10] appeared in 1985, the earliest TMS-focused company in our database launched in 1990, and FDA approval[11] (and broader clinical use) did not arrive until 2008.

[10] A. T. Barker, R. Jalinous, and I. L. Freeston, "Non-invasive magnetic stimulation of human motor cortex," The Lancet 325, no. 8437 (1985): 1106–1107, https://doi.org/10.1016/S0140-6736(85)92413-4.

[11] Neuronetics, Inc., 510(k) Summary: NeuroStar TMS Therapy System (Malvern, PA: Neuronetics, Inc., 2008), https://www.accessdata.fda.gov/cdrh_docs/pdf8/k083538.pdf.

The emergence of implants and the rise of consumer neurotech (1995 to 2010)

Between 1995 and 2010, the neurotechnology sector expanded steadily and, for the first time, extended beyond strictly medical applications. In total, 43 neurotech-focused companies were founded during this period, 27 medical and 16 consumer, meaning roughly one-third of new entrants targeted non-medical use. EEG was the leading platform, serving as the core technology for 19 firms (seven medical, 12 consumer).

On the medical front, at least seven startups concentrated on implantable solutions, notably neural implants and deep brain stimulation (DBS) systems. In this period, the first human neural-implant trials[12] (2004–2006) demonstrated wire-based systems enabling cursor control by thought alone, while DBS received FDA approval for the treatment of essential tremor[13] in 1997.

Several pioneering consumer neurotech companies also emerged, particularly in the late 2000s, developing tools for research, wellness and fitness, entertainment electronics and software platforms. Of the 16 non-medical firms, 12 leveraged EEG to create portable, gel-free headsets that approximated clinical-grade performance while facilitating out-of-lab research. A pivotal innovation was the commercialization of dry-electrode technology[14], first described in 1994 and adopted by consumer brands in 2007, which eliminated the need for conductive gel and unlocked consumer wearable EEG applications. These consumer companies also reduced channel counts[15] and developed more compact form factors. This trade-off diminished signal fidelity, but developers often benchmarked devices against clinical-grade EEG. These first consumer firms retained a scientific focus and had not yet penetrated the mainstream consumer market.

[12] Leigh R. Hochberg et al., "Neuronal ensemble control of prosthetic devices by a human with tetraplegia," Nature 442, no. 7099 (2006): 164–171, https://doi.org/10.1038/nature04970.

[13] Medtronic Inc., Premarket Approval (PMA) P960009: Medtronic Activa Tremor Control System (Minneapolis, MN: Medtronic Inc., 1997), https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMA/pma.cfm?id=P960009.

[14] Babak A. Taheri, Robert T. Knight and Rosemary L. Smith, "A dry electrode for EEG recording" Electroencephalography and Clinical Neurophysiology 90, Volume 90, Issue 5, May 1994, Pages 376-383, https://doi.org/10.1016/0013-4694(94)90053-1.

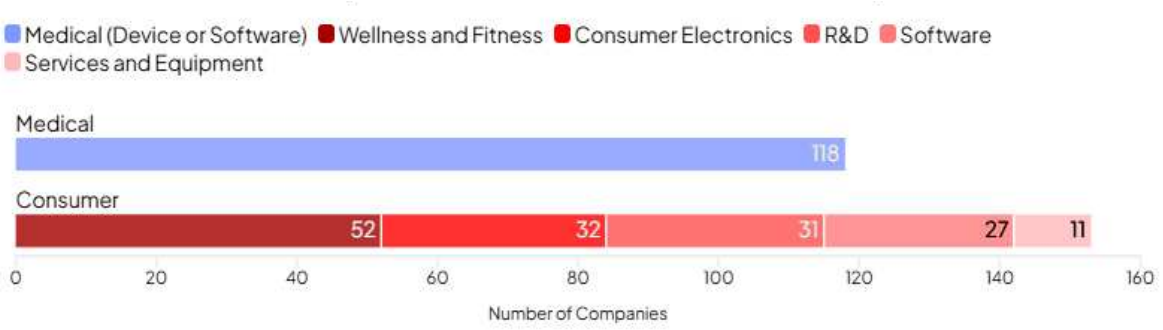
[15] NeuroSky, "How did NeuroSky develop the technology and the different products?" NeuroSky Support, accessed April 29, 2025, http://support.neurosky.com/kb/marketing/how-did-neurosky-develop-the-technology-and-the-different-products.

The neurotech boom: medical applications grow, consumer ones surge (2011 - onwards)

From 2011 on, neurotechnology experienced explosive growth. Scientific and technological breakthroughs converged in the mid-2010s, including the start of the boom in artificial intelligence with deep-learning[16], and the development of cloud infrastructure[17], allowing real-time signal processing from wearables and smartphones. These advances catalysed a wave of new ventures: 213 companies launched over this period, of which 130 were consumer-focused and 83 were dedicated to medical applications.

2025 market snapshot: more consumer than medical neurotech companies

Wellness and fitness is top choice for consumer neurotech companies



By around 2018, cumulative consumer startups overtook medical ones, marking the moment when brainwaves hit the market and drawing attention of scholars and legal experts to emerging data privacy and security challenges[18]. The mainstreaming of neurotechnology marked a turning point, as sensitive neural signals started to be collected and processed outside traditional healthcare safeguards.

Form factors in the consumer market started to diversify rapidly in the late 2010s. Early consumer devices were mostly headbands and headsets, but by the early 2020s EEG and stimulation

[16] Charlie Giattino and Veronika Samborska, "Since 2010, the training computation of notable AI systems has doubled every six months," Our World in Data, January 21, 2025, https://ourworldindata.org/data-insights/since-2010-the-training-computation-of-notable-ai-systems-has-doubled-every-six-months.

[17] BBC News, "Amazon web services 'growing fast'," BBC News, April 24, 2015, https://www.bbc.com/news/business-32442268.

[18] Marcello Ienca, Pim Haselager, and Ezekiel J. Emanuel, "Brain leaks and consumer neurotechnology," Nature Biotechnology 36, no. 10 (2018): 805–810, https://doi.org/10.1038/nbt.4240.Nature+1Nature+1

modules began to integrate into earbuds, glasses and wristbands. Miniaturisation technology and the development of wireless transmission systems with low latency unlocked interactive use cases in gaming and virtual reality, 'Fitbit for the brain' wellness trackers, cognitive performance boosters, real-time adaptive music playlists, and neurofeedback. Meanwhile, ubiquitous smartphones and the rise of fitness trackers provided the digital backbone and cultural acceptance for personal brain monitoring. Enterprise adopters[19] also emerged, deploying neuro-wearables for fatigue monitoring[20], neuromarketing insights[21] and even biometric authentication[22] via unique brain-signature[23] patterns.

This era also saw the consumer market reconfigure around lifestyle and wellness. Whereas the 2000s were dominated by lab-grade tools for research, the 2010s and 2020s birthed 45 brands focused on wellness-and-fitness, which became the most prominent consumer sector. Many wellness startups straddled a new regulatory grey zone: leveraging health claims that verge on medical ("Reduce stress in four minutes," "Forget fatigue," "Mental health care for everyone") while enjoying the leeway of the consumer market without the burden of clinical trials.

On the medical side, neural implants led the charge, with 13 new companies forming to develop implantable interfaces, followed by 24 using any form of electrical stimulation and eight in magnetic-stimulation technologies. Across both medical and consumer sectors, EEG remained the dominant platform: 93 new firms, 16 medical and 77 consumer, adopted it as their core technology. Artificial intelligence emerged as the second-most prevalent innovation, powering data-analysis platforms in 20 consumer and five medical startups.

The surge in both consumer and medical neurotechnology was supported by a 700% rise in investments[24] in neurotech companies between 2014 and 2021, totaling €29.20 billion.

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[19] Nita A. Farahany, "Neurotech at Work," Harvard Business Review, March–April 2023, https://hbr.org/2023/03/neurotech-at-work.

[20] John LaRocco, Minh Dong Le, and Dong-Guk Paeng, "A Systemic Review of Available Low-Cost EEG Headsets Used for Drowsiness Detection," Frontiers in Neuroinformatics 14 (2020): Article 553352, https://doi.org/10.3389/fninf.2020.553352.

[21] Bitbrain, "All you need to know about neuromarketing," Bitbrain Blog, January 9, 2019, https://www.bitbrain.com/blog/what-is-neuromarketing.

[22] Yneuro, accessed April 29, 2025, https://www.yneuro.com/.

[23] Ronen Kopito et al., "Brain-based Authentication: Towards a Scalable, Commercial Grade Solution Using Noninvasive Brain Signals," bioRxiv (2021), https://doi.org/10.1101/2021.04.09.439244.

[24] UNESCO, "Ethics of Neurotechnology", accessed April 29, 2025, https://www.unesco.org/en/ethics-neurotech.

Looking ahead

Since 2023, the pace of new company formation has decelerated, with only 10 new entrants, seven consumer-oriented and three medical. Software has emerged as the dominant sector, accounting for five of these new ventures.

Looking ahead, there are at least three possible explanations for the deceleration:

- The slowdown may mirror a broader contraction in global health-tech funding[25]. However, this hypothesis seems less likely, as data suggests that investment in neurotechnology has continued to rise[26], climbing from €582 million in 2022 to €2 billion in 2024, and is forecast to reach €3.5 billion by 2025.
- Fewer new entrants, alongside growing funding, may indicate a shift toward backing a smaller pool of well-capitalized companies with strong scale potential. The slowdown in company formation could signal early signs of industry consolidation, as capital concentrates in established players while emerging startups face tougher fundraising conditions.
- Some firms founded in late 2023 may not yet be publicly disclosed, meaning the apparent slowdown could simply be a temporary dip in an otherwise upward trend.

In short, while the data hints at a maturing market, whether this signals consolidation, capital concentration, or reporting lag remains to be seen. Whatever comes next will likely shape how our brains connect and interact with the digital world.

A snapshot of the consumer neurotechnology market today

Decades of technological evolution have transformed neurotechnology into an emerging consumer sector. How is this market structured now, and which consumer applications dominate? To understand its current dynamics, this section examines company counts, geographic distribution and dominant application areas.

Market composition and leading consumer markets

Of the 271 neurotech firms analysed, 153 focus on non-medical applications (56%) and 118 on medical applications (44%). Excluding diversified medtech companies, this underscores the

[25] PitchBook, "Spotify founder pulls in $260M Series B for Neko Health," PitchBook News & Analysis, January 23, 2025, https://pitchbook.com/news/articles/spotify-founder-pulls-in-260m-series-b-for-neko-health.

[26] Naveen Rao, "2024 Neurotech Funding Snapshot," Neurotechnology Futures, accessed April 29, 2025, https://neurotechnology.substack.com/p/2024-funding-snapshot,neurotechnology.substack.com+2neurotechnology.substack.com

prominence of consumer-oriented ventures, even if it does not reflect differences in company size or revenues.

Within the consumer cohort, wellness and fitness products[27] represent the largest segment, with 52 companies developing such devices. Research-grade R&D tools[28] and gaming/VR consumer electronics[29] are offered by 31 and 32 firms respectively. Another 27 companies provide brain-data analytics[30] platforms, including middle ware, hardware-agnostic software for real-time analysis, and mental authentication. A total of 11 companies specialise in enterprise services and equipment[31], offering tools for neuromarketing and workplace well-being.

The neurotechnology landscape spans the globe, albeit unevenly

North America is the largest hub, with U.S.-based firms accounting for over 48% of all identified neurotech companies. Europe follows closely at 38%, with a network spanning across the United Kingdom, France, Germany, Spain, Poland, Switzerland, and Netherlands. London leads Europe with 12 companies, followed by Paris with six, Munich with three and Barcelona with three; emerging nodes such as Warsaw and Tallinn also host four companies each.

[27] Includes companies such as Muse (https://choosemuse.com/), FocusCalm (https://focuscalm.com/), Mendi (https://www.mendi.io/), Pulsetto (https://eu.pulsetto.tech/), or Elemind (https://elemindtech.com/).

[28] Includes companies like Bitbrain (https://www.bitbrain.com/) and Wearable Sensing (https://wearablesensing.com/).

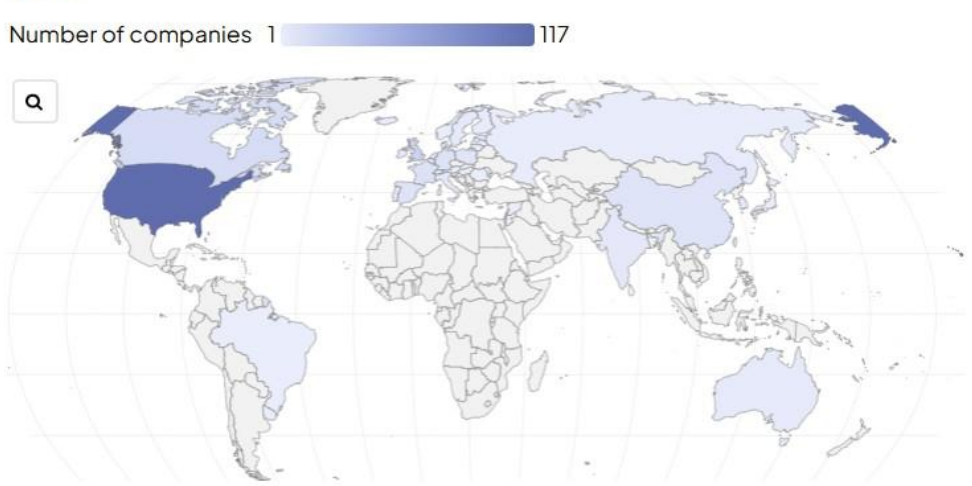
[29] Includes companies like Neurable (https://www.neurable.com/), Mudra (https://mudra-band.com/), or IDUN Technologies (https://iduntechnologies.com/).

[30] Includes companies like Neurobrave (https://neurobrave.com/), Intheon (https://intheon.io/), Arctop (https://arctop.com/), or YNeuro (https://www.yneuro.com/).

[31] Includes companies like InnoBrain (https://innobraintech.com/) and UserEmotion (https://useremotion.com/ue/).

Neurotech industry is concentrated in high-income countries

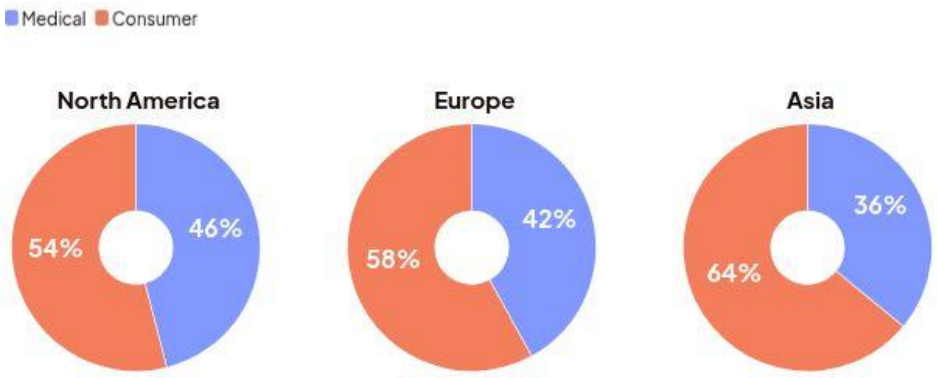
North America hosts 48% of neurotech companies, Europe 38%



Medical and consumer firms included. Only countries with neurotechnology companies are coloured.

Consumer neurotech represents around 60% of all neurotech firms across regions

Across North America, Europe and Asia, consumer-focused firms outnumber medical ones



North America hosts 131 companies, including medical and consumer, Europe hosts 103, and Asia, 31.

Despite regional differences, the ratio of medical to non-medical companies is fairly consistent worldwide (around 40:60), confirming that consumer-oriented neurotechnology is not limited to a few hotspots but is instead part of a global trend. Asia is comparatively underrepresented in our dataset (11% of all companies), a disparity that may reflect language and transparency barriers rather than a true absence of innovation (see Methodology).

Regional application tendencies

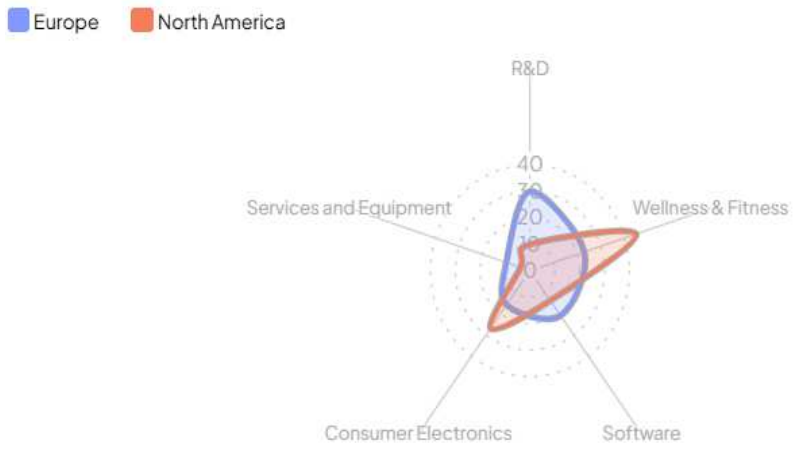
Across Europe, North America and Asia—home to 265 of the 271 firms in our dataset—the split between medical and non-medical companies is similar, but the dominant consumer segments differ.

In Europe, 43 companies pursue medical applications, while the remaining 60 focus on non-medical uses. Among consumer companies, research-grade R&D tools account for approximately 30% of consumer European ventures, followed by wellness and fitness devices at 23%, software platforms at 21%, gaming and VR electronics at 16%, and enterprise services and equipment at 10%. North America hosts 60 medical firms and 71 consumer companies. Among the latter, wellness and fitness leads with 45% of ventures, followed by gaming and VR electronics at 27%, software platforms at 14%, research-grade R&D tools at 10%, and enterprise services and equipment at 4%.

Overall, both regions have a similar medical share (42–46%), but Europe's consumer neurotech is led by R&D tools, whereas in North America it's mostly driven by wellness and fitness. These regional specialisations underscore differences in local ecosystems, investment patterns and policy frameworks.

Consumer companies in North America focus on wellness, while Europe specialises on R&D tools

Europe's second consumer application is neurotech software; North America's is consumer electronics for entertainment.



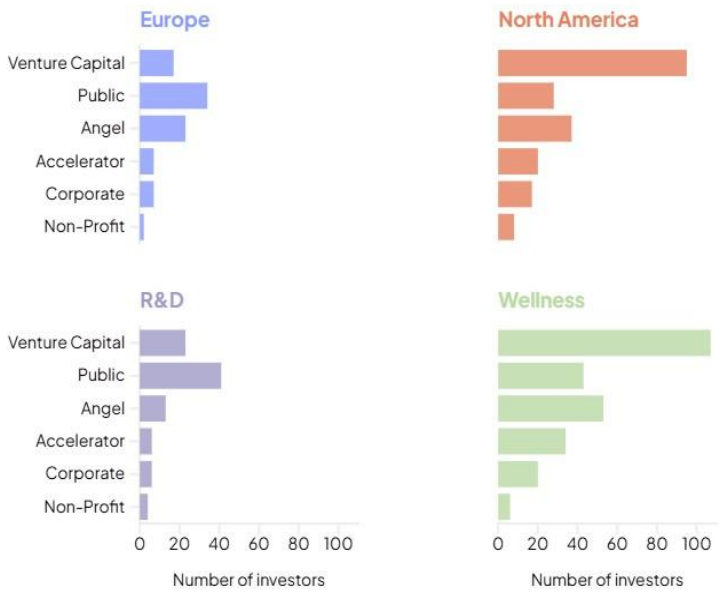
The radar chart displays the percentage of consumer companies dedicated to each sector. Regional totals: Europe = 60, North America = 72.

Differences in funding sources

Investor backing in North American neurotech ventures is dominated by venture capital and angel investors, accompanied by stronger accelerator and corporate participation, while Europe shows a more balanced funding landscape with greater reliance on public sources and modest non-profit involvement. Wellness-oriented companies tend to attract significantly more private capital—including venture, angel, and corporate investments—whereas R&D-focused firms depend more on public funding and grants and receive comparatively less support from accelerators and non-profits. These patterns point to two distinct ecosystems: one shaped by private, high-risk funding in North America and the wellness sector, and another grounded in public support across Europe and R&D-driven initiatives.

Public or private: Who funds consumer neurotech?

Companies headquartered in Europe receive comparatively more public funding, while those in North America rely more heavily on venture capital.



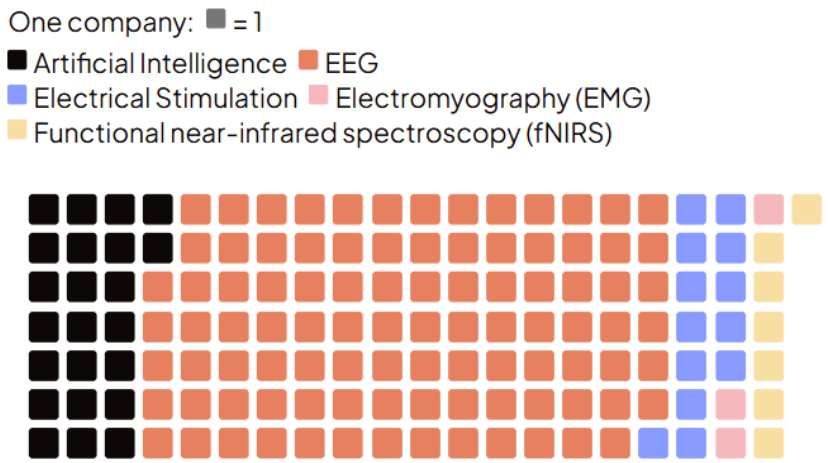
Geographical areas indicate the location of company headquarters, not the domicile of the investors. Only top 6 investor types are shown.

The technologies at the core of the neurotech market

The selection of a core technology modality is a critical dimension of the neurotech landscape. Neurotechnology is not defined by a single breakthrough, it is shaped by a wide array of technologies[32] for recording, stimulation, closed-loop feedback, neurofeedback, and signal interpretation, which are often used in combination. Hence, the choice of modality is rarely just technical: it reflects a variety of strategies, from how companies position themselves in the market to how they manage development costs and regulatory timelines. Examining which modalities prevail in the consumer segment and how their use has changed over time can shed light on the ways companies approach this complex landscape.

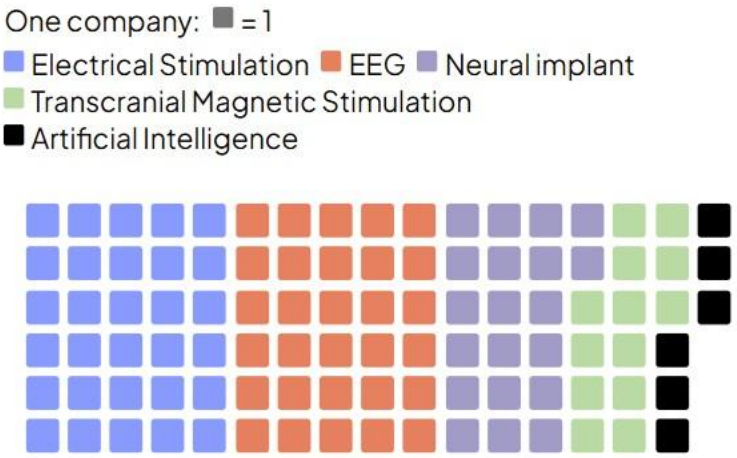
[32] Gerwin Schalk et al., "Translation of neurotechnologies," Nature Reviews Bioengineering 2 (2024): 637–652, https://doi.org/10.1038/s44222-024-00185-2.

Most consumer neurotech companies choose EEG



EEG dominates with 63.8 % of products, while AI-based devices represent 15.4 %, electrical stimulators 8.7 %, fNIRS headsets 4.7 %, and EMG sensors 2.0 %.

Medical neurotech runs on a mixed tech stack



Electrical stimulation and EEG each account for 26.3 % of use, followed by neural implants (17.5 %), transcranial magnetic stimulation (11.4 %), and AI-based systems (5.3 %).

EEG dominates, especially in the consumer market

The data reveal a clear leader: EEG is the most widely used modality, deployed, on average, by 46% of all neurotech companies. Its dominance is even more pronounced in the consumer segment, where nearly 64% of firms rely on EEG —compared with just 26% in the

medical sector.

EEG's consumer appeal stems from its portability, safety, low cost, a century of scientific validation[33], compatibility with wearable designs and exemption from medical device regulations[34]. These advantages have made EEG the backbone of numerous applications, from brain-computer interfaces[35] and productivity[36] monitors to gaming[37] peripherals and biometric authentication[38] tools.

This concentration around EEG is driving consumer firms to differentiate. Increasingly, consumer companies are integrating additional modalities, such as electrical stimulation[39] or functional near infrared spectroscopy (fNIRS)[40] –at least nine companies in the database combine one of these two modalities with EEG–, or tailoring their offerings to specific verticals like productivity, sleep, cognitive enhancement, workplace safety, sports performance, and gaming.

Artificial Intelligence: a strategic enabler in the consumer market

AI has emerged as the second-most prevalent technology in consumer neurotech). While nearly every firm engages with AI in some capacity, whether for signal processing, data interpretation, or user personalisation of wellness recommendations, in 15% of cases in the consumer market, AI constitutes the core of the value proposition and business model. By

[33] Faisal Mushtaq et al., "One hundred years of EEG for brain and behaviour research," Nature Human Behaviour 8, no. 9 (2024): 1234–1245, https://doi.org/10.1038/s41562-024-01941-5.

[34] Page 26 of Medical Device Coordination Group (MDCG), MDCG 2021-24: Guidance on Classification of Medical Devices, October 2021, https://health.ec.europa.eu/system/files/2021-10/mdcg_2021-24_en_0.pdf.

[35] For instance, BrainCo's headband (https://brainco.tech/#/).

[36] For instance, Neurable's headphones (https://www.neurable.com/)

[37] For instance, the VR Galea system by OpenBCI (https://galea.co/)

[38] For instance, YNeuro authentication software (https://www.yneuro.com/)

[39] Elemind combines EEG with electrical stimulation for sleep (https://elemindtech.com/)

[40] Muse has recently released a product combining EEG and fNIRs for mental fitness (https://choosemuse.com/blogs/news/the-science-of-eeg-fnirs-why-combining-these-technologies-enhances-mental-fitness?srsltid=AfmBOorBQY9KKypbKI_Cbi3ocIFQVEqovLNFPehMfLQcntdZLreWB9Zy)

extracting deeper insights from brain signals[41] AI enables real-time mental-state feedback[42], cognitive and age biometrics[43], and performance indicators tailored to individual users.

When framed as personalised wellness guidance rather than medical diagnosis, AI-driven recommendations fall outside medical device regulations, permitting rapid deployment and iteration. Yet, this very positioning may soon bring consumer neurotech companies under stricter scrutiny, as some applications may fall outside the health exemption for prohibited uses (such as subliminal messaging, profiling, and emotion recognition) under the new AI Act[44].

Beyond personalisation, AI tackles a core neurotech challenge: noisy, ambiguous brain signals. Advanced algorithms enhance signal decoding and support neuroadaptive systems; platforms that adjust in real time to a user's cognitive[45] or emotional[46] state, enabling fluid interaction with devices, robots and digital environments[47].

AI now serves as a strategic layer in neurotech development, boosting device performance and broadening the commercial potential of EEG-based products.

[41] Mahboobeh Jafari et al.,, "Emotion recognition in EEG signals using deep learning methods: A review," Computers in Biology and Medicine 165 (2023): 107411, https://doi.org/10.1016/j.compbiomed.2023.107450

[42] Dünya Baradari et al., "NeuroChat: A Neuroadaptive AI Chatbot for Customizing Learning Experiences," arXiv preprint arXiv:2503.07599 (2025), https://doi.org/10.48550/arXiv.2503.07599.

[43] Thomas M. James and Adrian P. Burgess, "Estimating chronological age from the electrical activity of the brain: How EEG-age can be used as a marker of general brain functioning," Psychophysiology 62, no. 3 (2025): e70033, https://doi.org/10.1111/psyp.70033.

[44] European Commission, AI Act, accessed April 29, 2025, https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai.

[45] Zander Labs, Innovative Passive BCI & Human Centred AI Business Solutions, accessed April 29, 2025, https://www.zanderlabs.com/business.

[46]Yue Wang et al., "Wearable Wireless Dual-Channel EEG System for Emotion Recognition Based on Machine Learning," IEEE Sensors Journal, Volume: 23, Issue: 18, 15 September 2023, https://doi.org/10.1109/JSEN.2023.3303441.

[47] Christina Schneegass et al., "Broadening the mind: how emerging neurotechnology is reshaping HCI and interactive system design," i-com 23, no. 1 (2024): 1–15, https://doi.org/10.1515/icom-2024-0007.

Other modalities in the consumer market

Electrical stimulation devices represent approximately 9% of the consumer neurotechnology market. Most of these products utilise electricity to stimulate peripheral nerves, such as the vagus nerve, to modulate mood and concentration[48] or cognitive performance[49].

fNIRs headsets and headbands[50] make up roughly 5% of offerings and provide real time feedback on changes in cerebral blood oxygenation, which is an indirect measure of brain activity. Electromyography sensors[51] have so far accounted for only 2.0% of the market but show promise in decoding motor-neuron signals, particularly in wristband form for external device control.

A more diverse medical market

Although a deep dive into the variety of modalities used in the medical neurotech sector warrants its own study, a comparative overview highlights how consumer firms leverage (and differ from) their clinical roots.

The medical market is less reliant on EEG and instead explores other modalities more evenly. Among dedicated medical companies, EEG underpins 26% of ventures (versus nearly 65% in the consumer market). Electrical stimulation, including non-invasive transcranial electrical stimulation and other forms of invasive stimulation is used by 26% of firms analysed.

[48] For instance, Pulsetto (https://eu.pulsetto.tech/)

[49] For instance, Neurosym (https://nurosym.com/en-es)

[50] Such as Kernel's headsets (https://www.kernel.com/products) and Mendi headband (https://www.mendi.io/).

[51] For instance, the wristband developed by Pison (https://pison.com/)

Neural implants[52] account for a significant share of clinical activity. However, despite their prominence in public discourse[53], implants represent about 17% of the technologies developed in the dedicated neurotech medical segment (and 0% of the consumer market). While implants give more precise data and control over the brain, they still pose higher health risk which, even in clinical contexts, puts them at a disadvantage in terms of innovation and uptake.

Transcranial magnetic stimulation is used by 11% of firms as a non-invasive form of stimulation. AI-specialised medical companies represent 5% of the firms, as AI in the medical domain usually plays a supporting role—embedded within diagnostic assistance, signal analysis or treatment-optimisation platforms rather than forming the business's core offering.

In medical neurotech, technological diversity is driven more by specific clinical use cases and unmet therapeutic needs than by market-driven differentiation. It cannot be ruled out that, depending on how ethical guidelines and regulatory pathways for invasive interfaces mature, much like the evolution of cosmetic procedures, consumer neurotech may eventually incorporate more invasive modalities once they are proven safe and effective in clinical contexts.

The evolution in modality choice

Driven by scientific advances, technical feasibility, and market dynamics, the deployment of modalities across neurotechnology companies has followed distinct timelines. Patterns in founding dates and modality selection reflect broader shifts in the sector, with most modalities expanding within the commercial landscape—whether medical or consumer-facing—within the past 15 years. These trajectories often mirror developments across adjacent fields such as materials science, signal processing, and computing.

TMS and EEG were among the first modalities adopted commercially, with companies using these modalities appearing as early as the late 1980s. TMS-based firms emerged gradually, with a small increase in activity between 2010 and 2015. Although EEG has a long

[52] For instance, Blackrock Neurotech (https://blackrockneurotech.com/), INBRAIN Neuroelectronics (https://inbrain-neuroelectronics.com/), Synchron (https://synchron.com/), Forest Neurotech (https://forestneurotech.org/), Neuralink (https://neuralink.com/), or Paradromics (https://www.paradromics.com/).

[53] Reitis-Münstermann,T.; Damjanovski, A.; Caielli, A.; Vanigioli, D.; Väljamäe, A., Neurotechnology and Neurorights: an overview of European online news, European Commission/European Parliament, 2025, JRC139537. https://sciencemediahub.eu/wp-content/uploads/2025/02/Neurotechnology-and-Neurorights-an-overview-of-European-online-news.pdf.

history in clinical and research contexts, its commercial uptake grew more substantially from the mid-2000s onward and became notably denser after 2015. This growth coincides with the expansion of consumer neurotechnology and technical improvements such as dry electrodes.

Electrical stimulation (ES) and its specific forms—transcranial electrical stimulation (tES/tDCS) and vagus nerve stimulation (VNS)—began appearing in company portfolios from the mid-1990s. Their expansion has been moderate but steady, particularly after 2010, reflecting sustained interest in non-invasive neuromodulation across both clinical and consumer applications.

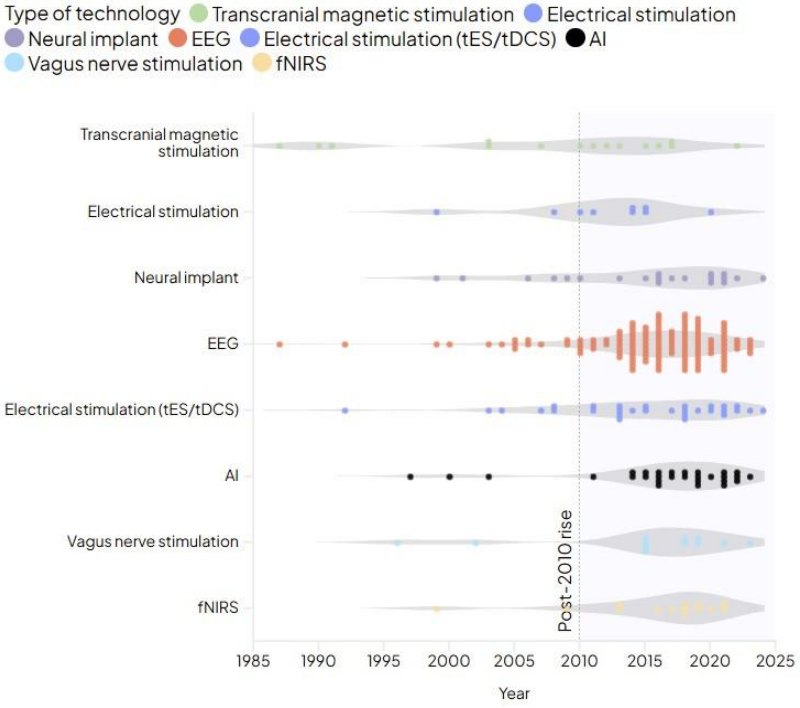
Neural implant-based companies started to emerge in the late 1990s and early 2000s, showing a continuous but moderate growth through the 2010s. This trend aligns with progress in miniaturization, wireless communication, and the development of biocompatible materials. Companies developing neural implants became more numerous from 2015 onwards, in parallel with advances in AI-based signal processing and developments in surgical and minimally invasive implantation techniques.

AI has seen rapid adoption as a core component of neurotechnology offerings, despite being a more recent development. Nearly all companies using AI today were founded after 2010, following advances in machine learning that enabled new approaches to signal decoding, denoising, personalization, and real-time feedback.

The use of newer modalities such as fNIRS began to grow after 2015, with applications in both medical and consumer settings. While their commercial adoption is still limited, their presence reflects ongoing diversification in sensing technologies.

Since 2010, neurotech companies have used a wider set of technologies

EEG, AI, and neural implants rise over time.



Each dot represents a neurotech company, color-coded by its primary technological modality at the time of founding (except for older software companies that adopted AI later, following its widespread emergence after 2010). Only modalities represented by more than five companies are shown.

Signals from a growing Neurotech ecosystem

The number of dedicated neurotechnology firms has surged, giving rise to diverse consumer sectors shaped by regional differences and distinct strategic choices regarding technological modalities. How does this translate into real-world market presence, especially among consumer-focused ventures? To answer this, structural indicators such as funding stage, market readiness, team size and funding were analyzed.

A sector in the growth stage

Funding stage serves as a proxy for the position of neurotechnology companies along the startup lifecycle[54], ranging from ideation and product prototyping (Seed), to market ready products with early traction but without clear product–market fit (Series A), to established product–market fit and customer growth (Series B/C), and finally to large-scale operations and organizational maturity (Series D+).

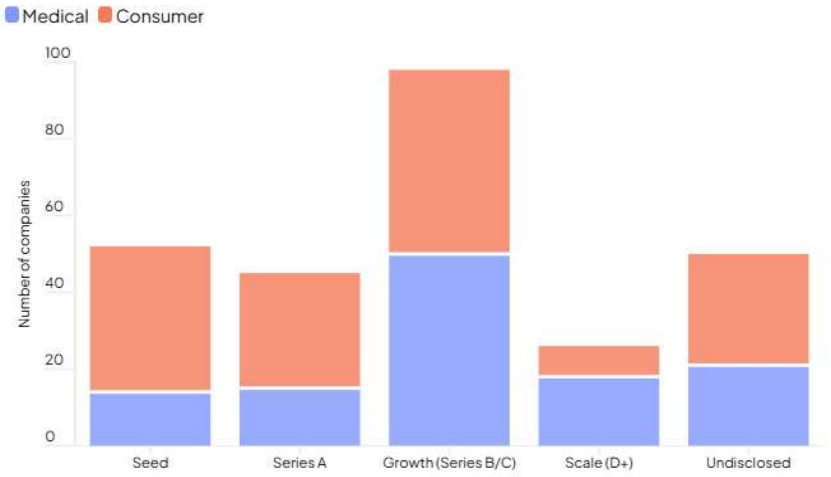
A significant proportion of the companies analyzed (36.2%) fall within the Growth stage (Series B/C), reflecting a marked transition beyond early-stage development and toward expansion and operational scaling.

The distribution of companies across stages also reveals notable differences between medical and non-medical segments. Early stages (Seed and Series A) are predominantly composed of non-medical companies (over 60% in each), suggesting experimentation and market exploration in the consumer space. In contrast, the Scale (Series D+) stage is heavily skewed toward medical companies, which make up more than 70% of that segment, highlighting the higher capital requirements and regulatory maturity typical of medical neurotechnologies.

[54] Y Combinator, "Stages of Startups," YC Startup Library, accessed April 29, 2025, https://www.ycombinator.com/library/Ek-stages-of-startups.

Neurotech runs on early and growth-stage capital

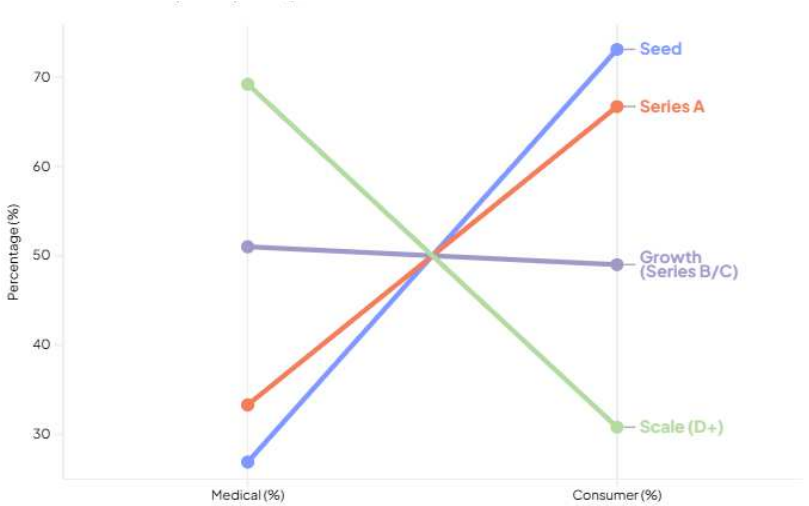
The prevalence of early and growth-stage funding signals a sector in development, with few firms yet reaching late-stage maturity and scale.



Categories are based on publicly available funding data. 18% of companies in the dataset do not disclose funding stage.

Neurotech companies that have reached scale are mostly medical

Medical firms are usually older and more mature, while consumer companies are newer and mostly early stage.



Proportion of medical and consumer neurotechnology companies at each founding stage. Percentages are relative within each stage.

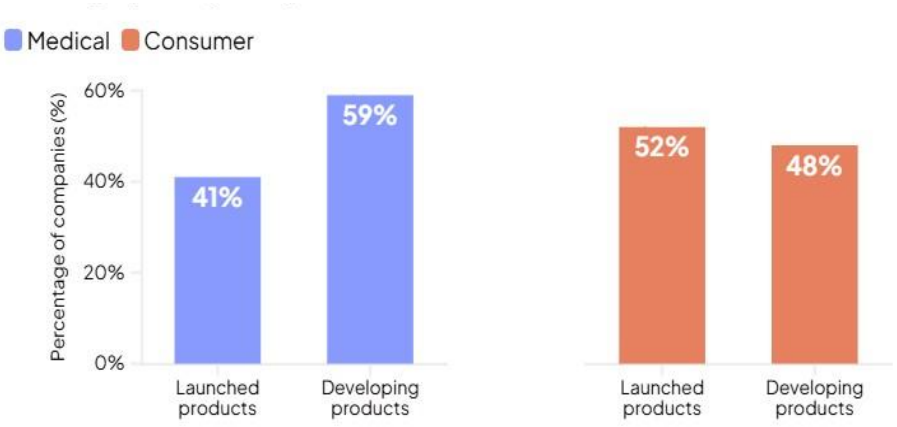
The slow lane and the fast track

The funding profile does not necessarily translate into a greater number of medical products on the market. On the contrary, the consumer segment features a higher proportion of commercially available products, with 52% of consumer companies having launched at least one product. In comparison, only 41% of medical neurotechnology firms report having a product on the market, with many still in pre-commercial development.

Combined with the fact that consumer neurotech companies tend to be younger than their medical counterparts on average, this suggests that consumer firms typically bring products to market earlier—often even at early funding stages and before product–market fit, scalability, or business models are fully validated. Medical companies, by contrast, generally face longer development timelines due to clinical trials, regulatory approval processes, and infrastructure demands. Hence, the speed and structure of commercialisation differ significantly between medical and non-medical sectors.

Consumer neurotech reaches the market faster

Over half of consumer-focused companies have launched products, compared to just 41% of medical firms, despite their average younger age.



Workforce disparities

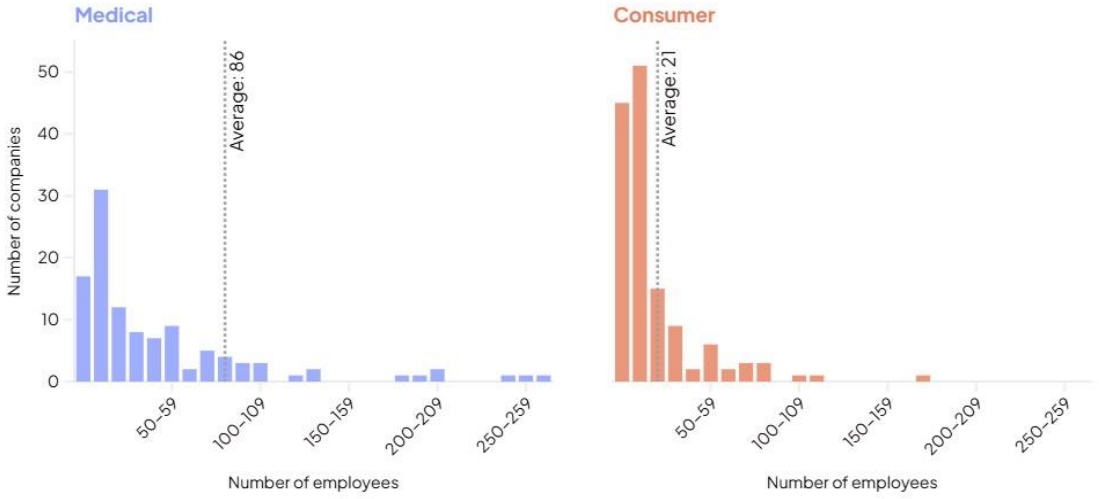
Team size closely reflects the developmental stage and operational demands of neurotechnology companies. On average, consumer-focused firms employ 21 people, whereas medical companies have a significantly larger workforce, averaging 86 employees. This disparity becomes even more pronounced among the largest 10% of

companies by headcount: top medical firms reach an average of 132 employees, compared to just 51 in their consumer counterparts. Despite these differences, the most common team size in both sectors remains 10–19 employees, though this range is proportionally more prevalent among consumer-focused companies.

These differences underline the divergent growth models and resource requirements across the two segments. Consumer startups often remain lean and agile, prioritizing speed to market and flexible operations. In contrast, medical companies tend to scale headcount early to support the complex demands of clinical validation, regulatory approval, and infrastructure development. While both types typically fall within the EU's definition of small and medium-sized enterprises[55] (SMEs), medical firms more frequently operate near the upper limit of that classification in terms of both personnel and capital intensity.

Consumer neurotech companies tend to stay small

Average team sizes differ, median numbers of employees are similar for medical and consumer neurotech firms.



Distribution of employee numbers (only companies with <500 employees shown). Dashed lines indicate the mean for each sector.

[55] European Commission, SME Definition, accessed April 29, 2025, https://single-market-economy.ec.europa.eu/smes/sme-fundamentals/sme-definition_en.

Funding landscape and capital allocation patterns

The financial structure of neurotechnology companies reveals consistent patterns across both medical and non-medical segments. This analysis focuses on companies that report both funding and revenue, comprising a total of 75 medical and 92 consumer neurotechnology companies.

A key observation across both sectors is that aggregate funding far exceeds reported revenue. On average, medical companies raise 13 times more in funding than they report in revenue, while for non-medical companies, the ratio is 6:1. This discrepancy reflects structural differences between the two segments: consumer neurotechnology products tend to be less complex, face lower regulatory barriers, and reach the market more quickly, facilitating earlier revenue generation. In contrast, medical neurotechnologies typically require substantial pre-market investment due to lengthy and expensive clinical validation and regulatory approval processes. A seemingly more favourable revenue-to-funding ratio for consumer companies, at least in the short term, poses the risk that investors might favour lower-barrier consumer applications at the expense of longer-term medical innovation.

The allocation of capital also differs markedly between the two sectors. In medical neurotechnology, 68% of funding goes to companies without market-ready products, perhaps indicating investor confidence in long-term innovation. In contrast, 69% of funding in the non-medical sector supports companies already in the market, reflecting both the lower-risk nature of consumer neurotech and the reduced barriers to entry. These differences suggest diverging investment strategies: in the medical domain, funding is often driven by clinical utility, whereas in the consumer domain, investment is geared toward wider consumer traction, faster time-to-market, and earlier monetisation. This suggests that although there is still confidence in long-term medical innovation, the pull of near-term returns in the consumer space could redirect investment over time.

Consumer companies generate similar revenue to medical ones with only a quarter of the funding

Like most emerging industries, neurotech shows more funding than revenue, with medical companies attracting most of it.

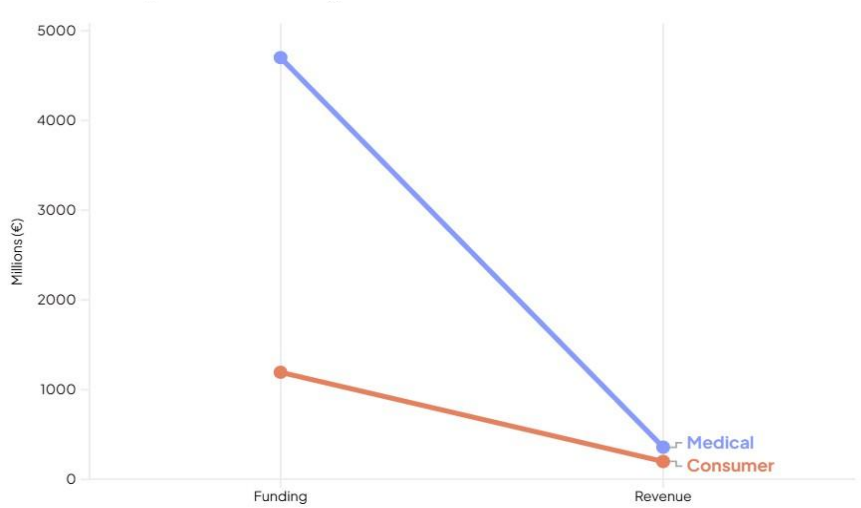
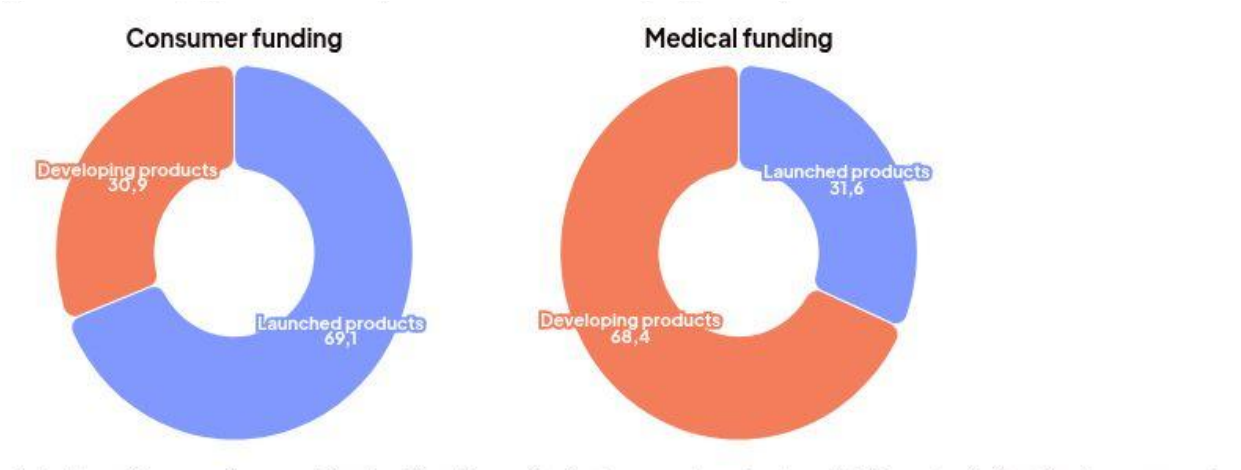


Chart displays aggregated funding and revenue by sector, summing all reported values from individual neurotech companies.

Funding in consumer neurotech skews toward firms with products on the market

Most medical funding, in contrast, goes to companies still developing their products.



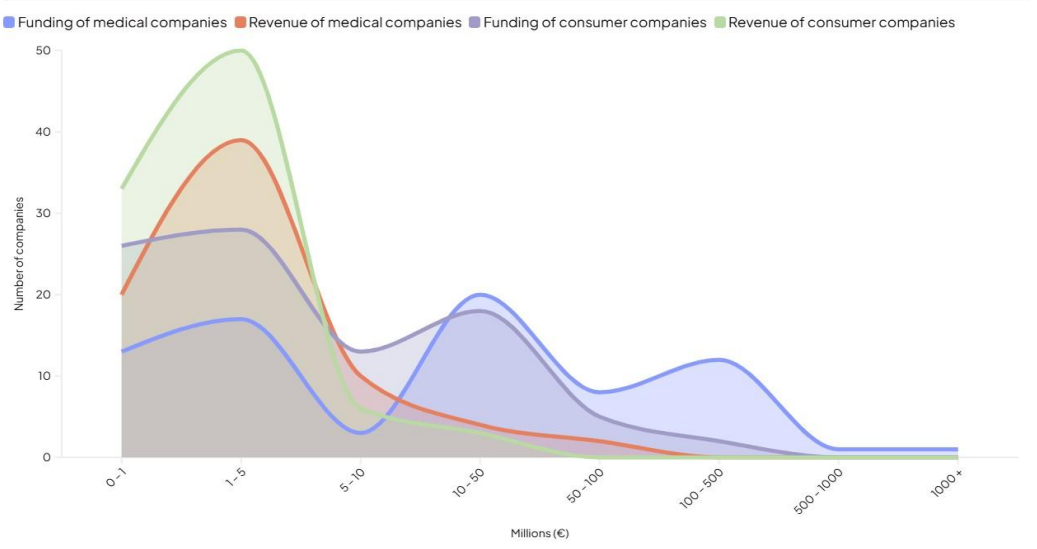
Charts reflect the present market status of companies receiving funding. Figures indicate current product availability, not whether funding occurred before or after product launch.

On a per-company basis, funding volumes differ significantly. Medical neurotechnology companies raise an average of €62 million, compared to €13 million for non-medical firms. In addition to scale, the distributions themselves vary in shape: medical funding is highly skewed, with a small number of companies securing disproportionately large rounds that inflate the sector average. Funding in the consumer sector, by contrast, is more evenly distributed and modest. Revenue distributions are tightly compressed in both sectors, reflecting limited monetisation overall—particularly in the medical domain, where most firms remain in development stages.

One important caveat is that several companies report revenue despite having no products on the market. This could reflect legitimate income from licensing, pilot programs, or service-based business models. However, it could also indicate misreporting or misclassification, particularly where grants or other non-dilutive funds are recorded as revenue. If this is the case, the observed imbalance between funding and revenue would be even more pronounced, and the role of pre-commercial investment in shaping the sector may be underestimated.

Most neurotech companies raise and earn €1–5M, but medical firms more often exceed that

The distribution of funding for medical companies is skewed toward higher values, while revenue remains narrowly distributed and low for both medical and consumer neurotech.



Histograms show the distribution of reported funding and revenue per company in the medical and consumer neurotechnology sectors.

Big tech is circling

While consumer neurotech companies remain largely in the domain of SMEs, Big Tech appears to be closely observing the evolution of the field[56], placing strategic bets, acquiring foundational IP, and aligning neurotechnology with their broader ecosystems.

Company/Investor	Strategic move	Signal of intent
Apple	• FDA-cleared Apple Watch features: ECG[57], Sleep Apnea[58], Hearing Aid Software[59]. • EEG AirPods patent[60] • Integration of iPhone, iPad, and Apple Vision Pro with Synchron's BCI[61]	• Bridging wearables and medical tech • Embedding brain recording into earbuds • Aligning BCI with Apple ecosystem
Meta	• Acquired CTRL-Labs[62] • Developing EMG neural	• Exploring neural input for control of external

[56] Elisabeth Steindl, "Consumer neuro devices within EU product safety law: Are we prepared for big tech ante portas?", Computer Law & Security Review 52 (2024): Article 105945, https://doi.org/10.1016/j.clsr.2024.105945.ScienceDirect+7

[57] U.S. Food and Drug Administration, De Novo Classification Request for ECG App (DEN180044), September 11, 2018, https://www.accessdata.fda.gov/cdrh_docs/reviews/DEN180044.pdf.

[58] U.S. Food and Drug Administration, 510(k) Premarket Notification K240929: Sleep Apnea Notification Feature (SANF), September 13, 2024, https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K240929.

[59] U.S. Food and Drug Administration, FDA Authorizes First Over-the-Counter Hearing Aid Software, September 12, 2024, https://www.fda.gov/news-events/press-announcements/fda-authorizes-first-over-counter-hearing-aid-software.

[60] Erdrin Azemi et al., Biosignal Sensing Device Using Dynamic Selection of Electrodes, US Patent Application US20230225659A1, filed January 9, 2023, and published July 20, 2023, https://patents.google.com/patent/US20230225659A1/.

[61] "Synchron To Achieve First Native Brain-Computer Interface Integration with iPhone, iPad and Apple Vision Pro", Business Wire, May 13, 2025, https://www.businesswire.com/news/home/20250513927084/en/Synchron-To-Achieve-First-Native-Brain-Computer-Interface-Integration-with-iPhone-iPad-and-Apple-Vision-Pro

[62] Nick Statt, "Facebook acquires neural interface startup CTRL-Labs for its mind-reading wristband," The Verge, September 23, 2019, https://www.theverge.com/2019/9/23/20881032/facebook-ctrl-labs-acquisition-neural-interface-armband-ar-vr-deal

	wristband[63]	devices and entertainment
Samsung	• Samsung Ventures invested in Pison[64] (neural wristband)	• Entry into wrist-based neurotechnology
Google	• Acquired Fitbit[65]	• Expanding health-focused wearables
Amazon	• Alexa integration with Synchron's BCI[66]	• Aligning BCI with smart home ecosystem
NVIDIA	• Developing Clara chip[67] • Partnered with Synchron[68]	• Enabling neurotech infrastructure
Jeff Bezos	• Investor in Synchron[69]	• Supporting non-surgical BCI with Alexa potential

These signals across firms and modalities suggest that the race is not to be first, but to be ready. As consumer neurotech matures and consolidates, Big Tech may be poised to act—through acquisition, integration, and large-scale deployment across their existing hardware-software ecosystems.

[63] "Inside Facebook Reality Labs: Wrist-Based Interaction for the Next Computing Platform," Meta Newsroom, March 18, 2021, https://about.fb.com/news/2021/03/inside-facebook-reality-labs-wrist-based-interaction-for-the-next-computing-platform/.

[64] "Pison Announces Investment from Samsung Ventures, Strengthening Strategic Presence in Consumer Wearables for Neurocognitive Performance," Business Wire, January 7, 2025, https://www.businesswire.com/news/home/20250107628048/en/Pison-Announces-Investment-from-Samsung-Ventures-Strengthening-Strategic-Presence-in-Consumer-Wearables-for-Neurocognitive-Performance.

[65] Osterloh, Rick. "Google completes Fitbit acquisition." The Keyword (blog). January 14, 2021. https://blog.google/products/platforms-devices/fitbit-acquisition/.

[66] Synchron, "Synchron Announces First Use of Amazon's Alexa with a Brain Computer Interface," Business Wire, September 16, 2024, https://www.businesswire.com/news/home/20240916709941/en/Synchron-Announces-First-Use-of-Amazons-Alexa-with-a-Brain-Computer-Interface.

[67] NVIDIA, Clara for Digital Health Solutions, accessed April 29, 2025, https://www.nvidia.com/en-us/clara/digital-health/.

[68] Conor Hale, "Synchron and Nvidia set sights on AI model trained by direct brain activity," Fierce Biotech, March 19, 2025, https://www.fiercebiotech.com/medtech/synchron-and-nvidia-set-sights-ai-model-trained-direct-brain-activity.

[69] Peter Green, "Gates, Bezos invest in Synchron's brain computer interface," MedTech Dive, December 16, 2022, https://www.medtechdive.com/news/gates-bezos-synchron-brain-computer-interface/638953/.

Big Tech's involvement could pave the way for brain-sensing capabilities to be seamlessly integrated into some of the world's most widely used devices, such as earbuds. This could reshape market structure and broaden the scope of neurodata collection, raising questions around data privacy and interoperability.

Policy implications

The consumer neurotechnology sector has grown rapidly over the past decade, outpacing its medical counterpart in number of companies and attracting a significant amount of investment and attention, including from Big Tech. With increasing miniaturisation, specialisation, and integration into mainstream wearable devices, consumer neurotech is shifting from a niche innovation to a pervasive feature of everyday digital ecosystems.

The rapid growth marks a critical moment for policymakers. As brain-sensing devices become more accessible and increasingly integrated into everyday products—smartphones, earbuds, glasses—they could potentially reshape how people work, rest, socialise, manage their health, and interact with technology. This growing presence of brain data in daily life raises pressing questions[70] around data privacy, consent, autonomy, and rights.

International frameworks, such as the OECD's Recommendation[71] on the Responsible Development of Neurotechnology, UNESCO's forthcoming ethics recommendation[72], and the recently launched European Charter[73], offer important high-level principles—centred on transparency, safety, and human flourishing. Yet these remain voluntary, and their relevance to the fast-moving consumer neurotech space is still contested. Creators of consumer neurotech argue they are democratising access to brain health, while critics

[70] Centre for Future Generations, "Towards inclusive EU governance of neurotechnologies," Centre for Future Generations, October 30, 2024, https://cfg.eu/towards-inclusive-eu-governance-of-neurotechnologies/.

[71] Organisation for Economic Co-operation and Development (OECD), Recommendation of the Council on Responsible Innovation in Neurotechnology, OECD/LEGAL/0457, 11 December 2019, https://legalinstruments.oecd.org/en/instruments/oecd-legal-0457.

[72] UNESCO, "Draft of the Recommendation on the Ethics of Neurotechnology", accessed April 29, 2025, https://www.unesco.org/en/ethics-neurotech/recommendation.

[73] European Brain Council, European Charter for the Responsible Development of Neurotechnologies, accessed April 29, 2025, https://www.braincouncil.eu/european-charter-for-the-responsible-development-of-neurotechnologies/.

question whether they meaningfully contribute to human flourishing[74] compared to their medical counterparts.

This analysis of the consumer neurotechnology market underlines the need to anticipate its potential trajectory, analyse its contribution to society, and translate global ethical principles into enforceable European standards. Existing regulations—such as the GDPR, the AI Act, and the Medical Devices Regulation—must be stress-tested to ensure they are equipped to manage blurred boundaries and risks posed by consumer neurotechnologies. Europe has the opportunity to lead with both innovation and regulation that is anticipatory, proportionate, and grounded in rights protection—before public safeguards are outpaced by technological momentum.

[74] Marcello Ienca and Effy Vayena, "Direct-to-Consumer Neurotechnology: What Is It and What Is It for?", AJOB Neuroscience 10, no. 4 (2019): 149–151, https://doi.org/10.1080/21507740.2019.1668493.

Methodology

This analysis is based on a dataset of 271 neurotechnology companies. The dataset includes startups and established players at various stages, from product development to fully commercialised offerings.

Inclusion criteria

Companies included in this analysis were categorised based on regulatory intent, commercialisation stage, and core technology focus:

- Technologies that directly record or stimulate the brain and/or nervous system, irrespective of application.
- Medical neurotechnology companies are companies with FDA approval, CE marking, or a defined pathway toward medical certification (e.g., breakthrough device designation, clinical trial fundraising).
- Non-medical neurotechnology companies are companies that are not FDA approved or CE marked, focusing instead on consumer-oriented applications.
- A small number of companies hold low-risk medical certifications, and also sell directly to consumers. These are classified as medical.
- Funding stages were grouped into five categories based on typical startup trajectories: Seed, Series A, Growth (B/C), Scale (D+), and Unknown/Undisclosed. Early stages like Seed, Pre Seed, Accelerator, and Grants were classified as Seed. Series A stood alone. Series B/C, Growth Funding, and Corporate fell under Growth (B/C). Later stages like Series D, Buyout, M&A, and Public Company were grouped as Scale (D+). Non-equity forms like Debt or Undisclosed were marked as Unknown/Undisclosed.

Exclusion criteria

To maintain a comparable dataset and a clear focus on neurotechnology, the following were excluded:

- Large generalist medical technology firms whose revenue extends far beyond neurotechnology (e.g., Medtronic, Philips, Siemens Healthineers, Boston Scientific).
- Large consumer electronics companies that engage in or fund neurotechnology R&D but are not primarily neurotech-focused (e.g. Apple, Meta, Samsung).

- Companies focused on adjacent medical technologies, including pharmaceuticals, cochlear implants, eye-tracking systems, and retinal implants.
- Companies focused on adjacent consumer biometric and wellness technologies, such as heart rate and fitness trackers, AR/VR, mental health apps that collect self-reported data, as well as nootropics.
- Surgical, imaging and procedural neurotech: Companies specialising in surgical neurotechnology (e.g., neuromonitoring systems for intraoperative procedures) or imaging (e.g. MRI, fMRI, CT).
- Neurofeedback clinics and research institutions: Private neurofeedback clinics, academic research groups, student associations, and non-commercial initiatives.
- Companies working on neuromorphic computing or brain-inspired hardware that do not involve direct recording, stimulation, or processing of neural data.

Disclaimers and limitations

- This analysis does not claim to be an exhaustive review of all neurotechnology companies, though it covers a significant number of key players across both medical and consumer neurotechnology sectors, as of January 2025. The dataset will be regularly expanded and updated to reflect market changes to the best of our ability.
- The accuracy of company retrieval depends on the completeness and specificity of keyword selection. Thus, certain companies may not be captured. Similarly, search engines may favor English-language sources, potentially leading to underrepresentation of companies from non-English-speaking regions, particularly in Asia.
- Companies often span multiple categories (for instance, if they use several technologies), making classification inherently subjective. Categories were assigned with a focus on clarity and utility rather than granularity.
- The dataset includes companies that have existed at any point in time, based on the public data available. It is possible that some of the identified companies have since ceased operations, pivoted, or been acquired.
- Reported financial metrics, including funding and revenue, are based on publicly available information and may not always reflect standardized accounting practices. In particular, some companies may report certain types of non-dilutive funding—such as

government grants, R&D subsidies, or project-based contracts—as revenue. As such, revenue figures should be interpreted with caution.

Data collection and data availability

Company data was sourced from the StartUs Insights Discovery Platform, which aggregates publicly available information from market reports, press releases, company websites, social media, public databases, and industry intelligence sources. To enhance the depth of this dataset, it was manually cross-referenced with additional sources, including company press releases, and websites, PitchBook, and Crunchbase.

Data is available upon reasonable request. Please contact us for further information.

Authors

Laura Bernáez Timón | Fellow - Neurotechnology

Laura examines the technological advancements driving neurotechnology adoption, assessing innovation, market trends, and integration challenges to predict their path toward widespread societal use.

Virginia Mahieu | Director - Neurotechnology

Virginia explores how neurotechnologies impact society, combining neuroscience and foresight to ensure that governance frameworks are up to scratch so these emerging technologies contribute to a brain-healthy future.

About CFG

The Centre for Future Generations is an independent think-and-do tank created to help decision-makers anticipate and govern rapid technological change. We are here to make sure that emerging technologies are used in the best interests of humanity. Find out more on www.cfg.eu.