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**Introducing The MVIS® Global
Bionic Healthcare ESG Index**

Revolutionizing Healthcare As We Know It

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The Future of Bionic Healthcare

Emerging technologies in the medical devices industry are upheaving traditional tools for patient care, and “Bionic Healthcare” companies are among the foremost innovators within this growing sector. Technology capable of allowing the blind to see, the paralyzed to walk, or predicting strokes prior to clinical examination would undeniably transform healthcare opportunities for patients with medical conditions that were previously thought to be incurable. The **MVIS® Global Bionic Healthcare ESG Index** tracks the performance of companies that are specifically engaged in this revolution of healthcare delivery.

Bionic healthcare pertains to the operation or implementation of bio-sensors, dental or vision-related implants (excluding cosmetic-related implants), prosthesis, bioprinting, or the preservation of organs and tissues, among other medical capabilities. This includes the substitution of compromised organs with the use of artificial organs that interact with live tissue. Factors including the growing geriatric population and the need to reduce our dependency on human donors are driving the substantial growth observed in the past decade.

In the U.S. alone, there are over 100,000 candidates on waiting lists for organ transplants¹. Related technology in the Bionic Healthcare sector are developing methods to not only store and transfer, but implant and engineer organs used to save patient’s lives. In the same vein, the estimated number of diabetics worldwide in 2021 is over 500,000,000². Visionary products such as Medtronic’s Smart Insulin Pen³, among other continuous glucose monitoring (CGM) systems, present unique healthcare management solutions to millions of individuals worldwide. In another illustrative example, Lifetech’s heart occluder is used to treat Aortopulmonary window (APW), a rare congenital heart disease. Just 7mm in length, the wire-meshed transcatheter device is designed to redirect blood flow from the heart. The occluder prevents the need for open heart surgery, and is implanted through non-invasive means.

This paper introduces The **MVIS® Global Bionic Healthcare ESG Index**, which not only screens out bad actors from an ESG perspective, but also includes companies related to the United Nations Sustainable Development Goals (SDG) on Good Health and Well-Being. The index focuses on companies related to the modernization and revolution of healthcare. The proceeding sections highlight the construction process and includes quantitative analysis.

“Technology capable of allowing the blind to see, the paralyzed to walk, or predicting strokes prior to clinical examination would undeniably transform healthcare opportunities for patients with medical conditions that were previously thought to be incurable.”

¹ <https://www.statista.com/statistics/398499/number-of-us-organ-transplant-candidates-by-organ/>

² <https://www.statista.com/statistics/271442/number-of-diabetics-worldwide/>

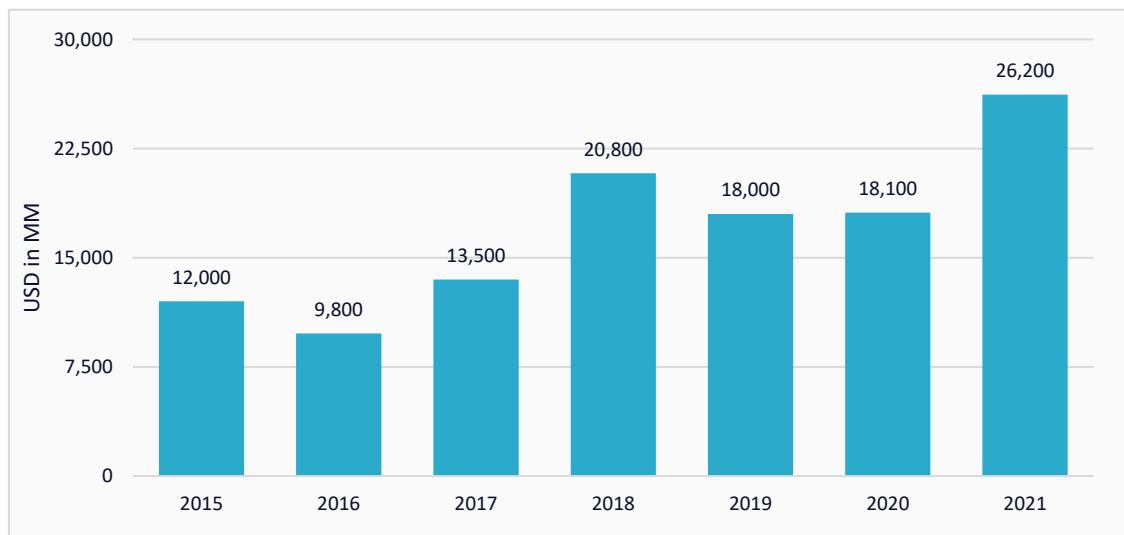
³ <https://www.medtronic.com/us-en/healthcare-professionals/products/diabetes/smart-insulin-pen/inpen-smart-insulin-pen-system.html>

Industry Growth

The global health care sector covers a wide range of industries from health insurers and pharmaceutical manufacturers to biotechnology and medical devices companies. Within this broad ranging sector, the companies that are driving transformative innovation are focusing on personalized health care or solutions that address rare conditions. The sub-segment of the medical device industry that focuses on medical implants, prosthesis and bioprinting, is particularly compelling in terms of growth potential due to a robust venture capital ecosystem and projected adoption of such treatments around the world.

Acceleration in venture capital funding within the biotechnology industry reflects the growth seen in the bionic healthcare sector. Access to capital presents opportunities for companies to navigate economic challenges while stimulating M&A activity, further promoting innovation. As depicted by **Exhibit 1**, venture capital funding in the U.S. and Europe has dramatically increased in the past 6 years to 26.2 billion USD, providing tailwinds to the broader sector.

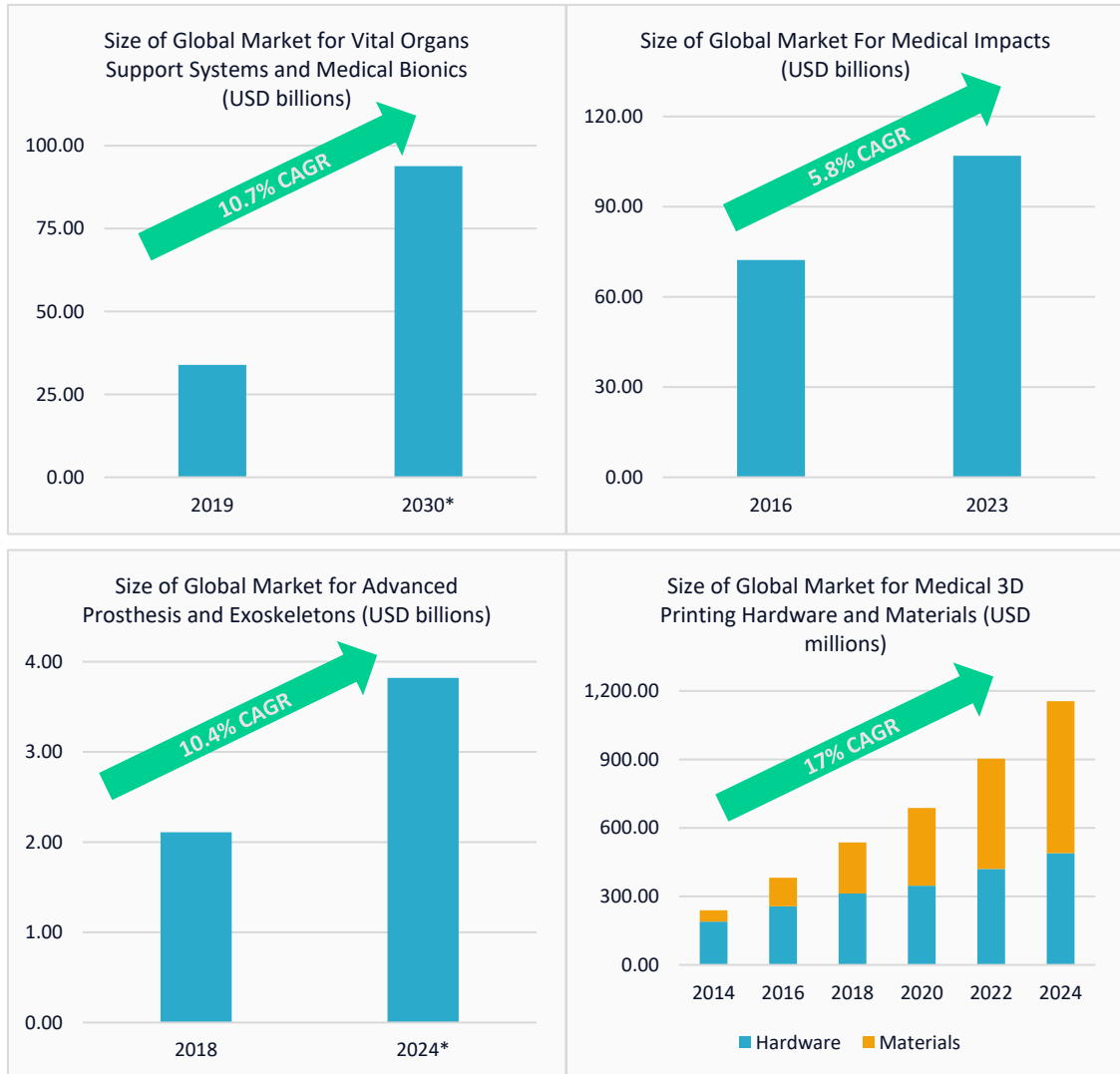
Exhibit 1: Venture Capital in the US and European Biotechnology Industry from 2015-2021



Source: Statista

Companies that comprise the **MVIS® Global Bionic Healthcare ESG Index** are expected to deliver meaningful growth over the coming years, given the industry market size is growing at a rapid pace, as illustrated in **Exhibit 2**. The Medical 3D Printing market size, in particular, has strong demonstrated growth at a CAGR of 17%. The market size for medical devices is estimated to be 495.46 billion USD. Some of the driving factors include a consumer shift to wearable and portable medical devices, as well as a willingness to adopt to advanced medical technologies.⁴

Exhibit 2: Global Size of Bionics-Related Medical Device Segments



Sources: Top-left: Next Move Strategy Consulting; Top-right: BIS Research; Bottom-left: BIS Research; Bottom-right: SmarTech, Statista.

⁴ <https://www.fortunebusinessinsights.com/industry-reports/medical-devices-market-100085>

Index Architecture

Accessing sustainable investments using a “thematic” investment approach, allows investors to target groups of stocks tied to an investment thesis. Thematic investing can reach across traditionally defined sectors and or industries to pull in all companies that are relevant to the given theme. In the case of bionic healthcare, however, thematic investing carves out a specific niche from within a standard industry.

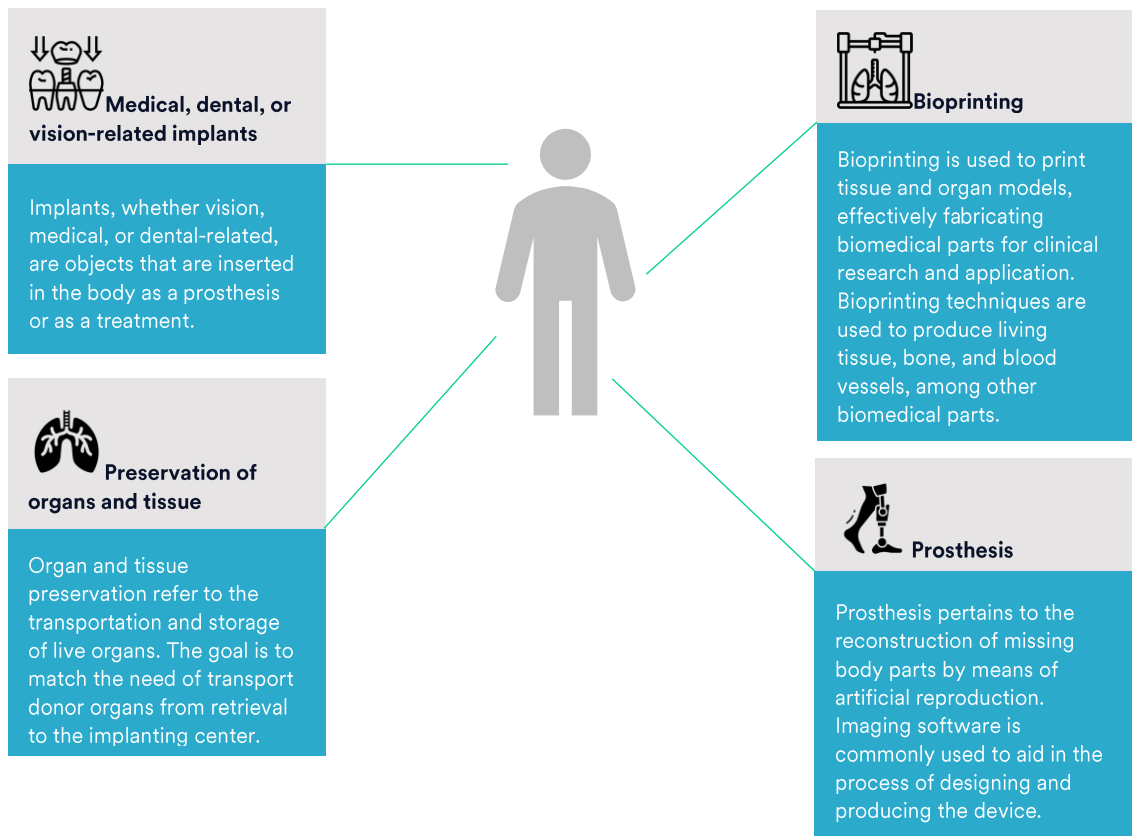
Compared to other targeted disruptive themes, sustainable themes have the added benefit of targeting companies whose raison-d’être is to improve the world’s environment, social or governance conditions; compared to other ESG-focused investments, sustainable themes have the benefit of targeted exposures tied to a unique investment thesis focused on growth opportunities.

The **MVIS® Global Bionic Healthcare ESG Index (MVBION)** selects stocks that meet both thematic and ESG criteria, following the EU SFDR principle of “Do No Significant Harm” (DNSH) as described below. MVBION targets sustainable objectives mapped to the United Nations Sustainable Development Goals (SDGs) on Good Health and Well-Being, aligning with European regulations and ESG requirements. Because the target of the index is a sustainable theme itself, the thematic criteria were designed to help meet the index’s sustainability objectives while the ESG DNSH criteria serve to ensure the exclusion of bad-actor companies. Details related to investability screening and component selection can be found in the official MVIS® Global Bionic Health Care ESG Index methodology guide.

Thematic Criteria

To be initially included in the **MVIS® Global Bionic Healthcare ESG Index**, companies must derive at least 50% of their revenue from the following sub-themes displayed in **Exhibit 3**. The sub-themes included in the index were chosen specifically to correlate the revenue exposures of the index with the UN SDGs described above. As the universe of investable publicly-traded companies in additional sub-themes emerge, they may be included in the index as well.

Exhibit 3: Sub-Themes Included in MVBION



ESG Factors

Companies must also pass MarketVector Indexes™’s (“MarketVector”) standard ESG screens, summarized in **Exhibit 4**, which outline 36 ESG factors across four key categories. While the ESG factors selected here are not designed specifically to achieve any single subjective overall ESG rating, they serve to ensure that companies included in our indexes are not egregiously bad actors and DNSH based on the provisions outlined by the EU Taxonomy Regulation.

Exhibit 4: Sample of ESG Factors Considered in MVBION

<p>Norm-Based Research</p>	<p>Examples include: Child labor violation, gender discrimination, racial discrimination, human rights violations, environmental protection violations.</p>
<p>Controversial Weapons Involvement</p>	<p>Examples include: Biological weapons, chemical weapons, cluster munitions, depleted uranium.</p>
<p>Sector Involvement or Revenue Exposure</p>	<p>Examples Include: Civilian firearms, gambling, tobacco, military equipment.</p>
<p>Energy Extractives Through Revenue Exposure</p>	<p>Examples Include: Fossil fuels, coal mining, nuclear power, oil sands.</p>

MarketVector has partnered with Institutional Shareholder Services (ISS) to use ISS ESG data in designing targeted Thematic ESG indices. Combining MarketVector’s deep Thematic index experience with ISS broad ESG expertise will allow clients to build Thematic ESG indexes that target companies based on very specific and granular E-S-G criteria.

Index Exposures

As seen in **Exhibit 5**, companies in the United States compose the majority of the index's weight, and 69.92% of the index's weight is held by large-cap stocks, as shown in **Exhibit 6**. Furthermore, quantitative data on sustainability and ESG factors are displayed in **Exhibit 8**.

Exhibit 5: Country Exposure in MVBION **Exhibit 7: MVBION Constituent Weights**
(As of 2022 Q3) (As of 2022 Q3)

Country	Weight
United States	64.79%
Ireland	10.00%
Switzerland	9.88%
United Kingdom	3.83%
Australia	3.27%
Cayman Islands	2.50%
South Korea	2.27%
Italy	2.20%
Denmark	1.26%

Exhibit 6: Weight by Market Cap
(As of 2022 Q3)

Size	Weight
Micro-Cap (<\$2M)	0.00%
Small-Cap (<\$1.5B and >\$2M)	2.74%
Mid-Cap (<\$6B and >\$1.5B)	27.34%
Large-Cap (>\$6B)	69.92%

Company	Weight (Capped)
MEDTRONIC PLC SHS	10.00%
STRYKER CORPORATION COM	10.00%
EDWARDS LIFESCIENCES CORP COM	10.00%
DEXCOM INC COM	10.00%
ZIMMER BIOMET HOLDINGS INC COM	7.04%
SONOVA HOLDING AG (REGD)	5.52%
INSULET CORP COM	4.64%
STRAUMANN HLDG (REGD) (POST SPLIT)	4.36%
SMITH & NEPHEW PLC SPDN ADR NEW	3.83%
COCHLEAR LTD NPV	3.27%
INSPIRE MED SYS INC COM	3.14%
GLOBUS MED INC CL A NEW	3.00%
AXONICS INC COM	2.80%
STAAR SURGICAL CO COM PAR	2.64%
TANDEM DIABETES CARE INC COM NEW	2.59%
NUVASIVE INC COM	2.46%
GLAUKOS CORP COM	2.44%
MICROPORT SCIENTIF	2.31%
OSSTEM IMPLANT CO	2.27%
NEVRO CORP COM	2.25%
AMPLIFON	2.20%
INTEGER HLDGS CORP COM	1.31%
DEMANT A/S	1.26%
TREACE MED CONCEPTS INC COM	0.47%
LIFETECH SCIENTIFI	0.19%

Exhibit 8: MVBION Sustainability and ESG Data

Sustainability		Business Involvement	
Overall ESG Rating (1-4)	2.24	Fossil Fuels	0.00%
Weighted Average Environmental Rating (1-4)	1.65	Tobacco	0.00%
Weighted Average Social Rating (1-4)	2.58	Coal	0.00%
Weighted Average Governance Rating (1-4)	2.83	Oil sands	0.00%
Greenhouse Gas Intensity (Scope 1+2 total carbon emissions per 1 million EUR of rev.)	17.86	Gambling	0.00%
Weighted Average Revenue Exposure to SDG Solutions (stated in introduction)*	99.8%	Military Equipment	0.07%
Weighted Average Revenue Exposure to SDG Solutions (all SDGs)*	100.0%		

Source of exhibit 5-8: ISS, MarketVector Indexes™.

*Based on companies covered by ISS

Company Examples

STAAR Surgical

STAAR Surgical is accredited as developing and licensing the first “foldable intraocular lens (IOL) for cataract surgery”. The IOL implants are used to fix myopia (nearsightedness), cataracts, astigmatism (cornea imperfection), and hyperopia (blurriness). The company has sold over 2,000,000 lenses and has been “dedicated solely to ophthalmic surgery” for 30 years. Their vision is to provide “visual freedom to patients” and revolutionize “the standard of care of cataract surgery throughout the world”

Edwards Lifesciences

Edwards Lifesciences is a “global leader in patient-focused medical innovations for structural heart disease” with objectives of “improving patient outcomes and enhancing lives.” One interesting product the company offers is a tissue oximetry sensor, as well as a monitoring platform, allowing patients to measure and monitor hemoglobin and StO₂ levels through noninvasive means. The company was founded in 1958 and is most known for their heart valve technologies which continue to advance the standard for modern day bionic healthcare innovations.

Nevro

Nevro, based out of Redwood City, California, is the creator of HFX, a “comprehensive solution for individualized relief of chronic pain”. HFX is a “versatile neuromodulation platform” that helps patients “find relief without from chronic pain without drugs or major surgery”. One compelling aspect about their product is the remote support for their cloud product, enabling therapy program customization and optimization. The 10kHz therapy works by stimulating the “dorsal column, providing pain relief without paresthesia.”

Index Risk and Return Profile

The **MVIS® Global Bionic Healthcare ESG Index (MVBION)** has back-tested history beginning at the end of 2020.

Exhibit 9: Historical Returns of MVBION

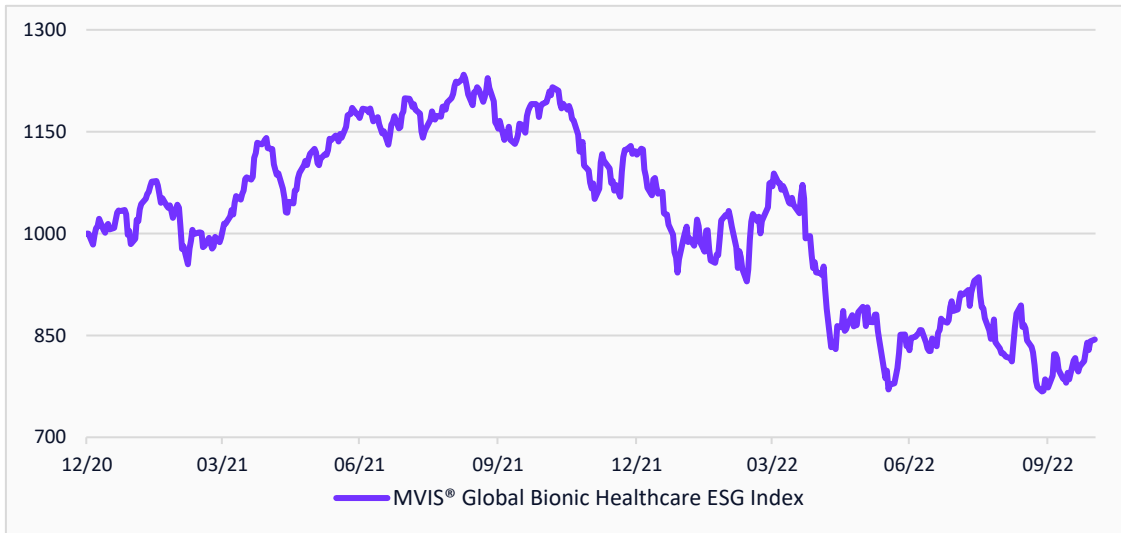
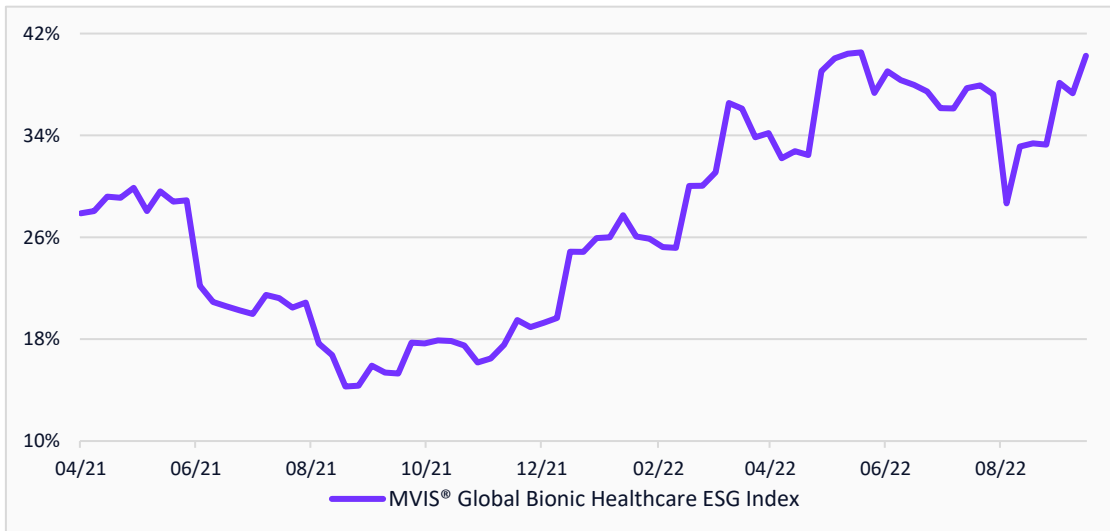


Exhibit 10: Rolling Annualized 3-Month Volatility of Weekly Returns



Source: MarketVector Indexes™.

Conclusion

The **MVIS® Global Bionic Healthcare ESG Index** offers investors distinctive insight and precise exposure to companies developing the next generation of medical devices and technology. Innovations in prosthesis, medical implants and bioprinting are providing a new lease on life to people with physical disabilities or urgent life-threatening medical conditions.

This index adds to MarketVector's growing line-up of ESG indexes focused on facilitating the delivering an investment thesis tied to the UN's Sustainable Development Goals. Other such indexes include the **MVIS® Global Future Healthcare ESG Index**, the **MVIS® Global Future of Food ESG Index**, and the **MVIS® Global Hydrogen Economy ESG Index**, and the **MVIS® Global Circular Economy ESG Index**. The MarketVector suite of thematic ESG indexes follow the EU SFDR principal of "Do No Significant Harm" (DNSH) and target sustainable objectives mapped to the United Nations Sustainable Development Goals (SDGs), allowing investors to target growth opportunities aligned a sustainable objective.

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