

Wearables	
Notable Health Closes \$13.5 Million Series A Financing to Expand AI Powered Physician-Patient Interaction Platform	
World's first hearing aid with integrated sensors and Al	
Bon voyage, jet lag? This smart sleep mask promises a cure	<u>8</u>
Mobile Phones/ mHealth	<u>9-15</u>
Meditation app Headspace acquires Alpine.Al	<u>10</u>
Pediatric vision test GoCheck Kids launches for iPhone	<u>12</u>
ResApp announces strong results from Australian pediatric trial of respiratory diagnostic tool	<u>14</u>
Smart Home Devices & Appliances	
Smart home technology needs to be a tool for self-care, too	<u>17</u>
Mirror launches its in-home fitness platform, raises another \$25M from lead investor	<u>18</u>
Al startup builds a Wi-Fi motion sensor that knows when you've fallen over	<u>19</u>
Humana's CEO says voice recognition will be a focus area for Studio H	<u>20</u>
Welcome Home to Wellness: Delos Launches World's First Residential Wellness Technology Platform	<u>21</u>
Other Interesting Articles	<u>22</u>



Notable Health Closes \$13.5 Million Series A Financing to Expand Al Powered Physician-Patient Interaction Platform – September 07, 2018 (1/2)

Applicable Product Categories: Wearable Lifestyle and chronic diseases management **Therapeutic Areas Technologies** Wearable (Device + App); Al (sleep disorders) **Applications Geographic Focus** Remote Patient Monitoring; Quantified-Self Global Segment Focus **Topics (News type)** Consumer Grade Tech Convergence **Others Companies** Notable Health Apple (smartwatch)

ANALYST TAKE:

- Synopsis: Notable Health, an artificial intelligence (AI) powered health care company that automates and digitizes physician-patient interactions, today announced it has closed \$13.5 million in a Series A funding round. Through the use of continually-learning AI, voice recognition, and wearables, Notable Health platform is empowering physicians to put appointments on autopilot, be more productive and improve patient outcomes.
- Industry Need: Recent surveys indicate that the implementation of EHRs increased burnout and job satisfaction among physicians. Based on industry estimates, up to 50% of physician time is spent on administration, not patient care. Furthermore, a 2017 Pew Charitable Trusts report also showed that increased EHR use has led to clinical efficiency improvements and unanticipated safety problems. Confluence of emerging technologies such as AI, wearables, and mHealth hold the potential to empower physicians by putting appointments on autopilot, be more productive and focus fully on patients rather than on computer screens.

Notable Health Closes \$13.5 Million Series A Financing to Expand Al Powered Physician-Patient Interaction Platform – September 07, 2018 (2/2)

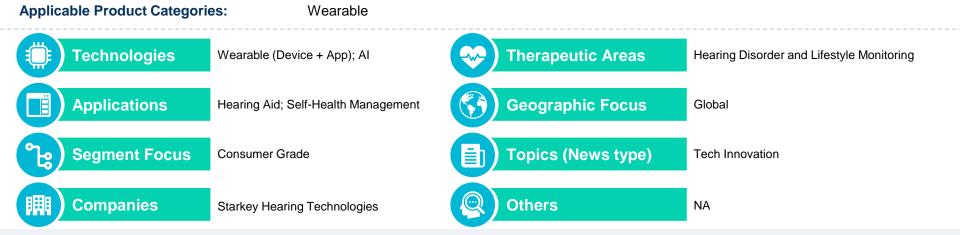
• Value Proposition: Notable Health's AI technology is addressing a long-standing challenge that physicians encounter when updating electronic health records (EHR) by having them speak directly into their Apple smartwatch rather than a PC or tablet – which can be difficult to work with, interfere with patient interaction, along with information often being captured incorrectly. Physicians using Notable Health are saving 70 minutes and 1000 clicks per day allowing them to schedule additional patient appointments resulting in a 15-20% increase in revenues, on average.

How it Works?

- Notable Health uses proprietary AI to learn physician behaviors and historical patterns of practice, and proactively assists with ICD-10 coding, E&M billing, improving adherence to quality measures, and streamlining the routing of orders.
- For in-visit findings, physicians can use their Notable Health-issued **Apple smartwatch device** to capture audio during and after a patient visit. Data is automatically structured and entered into the correct EHR fields, ensuring zero workflow interruption.
- The company's technology and operations are HIPAA compliant and use proprietary robotic process automation that allows for turnkey EHR integrations eliminating traditionally cumbersome IT projects and roadmaps.
- Frost & Sullivan believes that by addressing the traditional charting methods physicians currently use in their EHRs, Notable Health is in a unique position to help physicians operate more efficiently, see more patients, and help the industry continue to move to a more outcomes-based model. Emerging business modes such as Notable Health and Augmedix (which uses google glass) that are addressing the growing issue of physician burnout due to EHR/care documentation process provide a unique collaboration opportunity for wearable OEMs.
- · Target End-User: Hospitals, independent physician practices

WEBLINK: https://bit.ly/2CHae5d

World's first hearing aid with integrated sensors and Al September 03, 2018 (1/2)



ANALYST TAKE:

- Synopsis: Starkey® Hearing Technologies has reinvented both the hearing experience and the hearing aid with Livio AI. Livio AI is the world's first Healthable™ hearing aid to utilize integrated sensors and artificial intelligence and the first device that tracks physical activity and cognitive health as measured by hearing aid use in social situations.
- Industry Need: With the increasing commoditization of hearing aid medical devices and consumer wearables, OEMs are finding it difficult to lure consumer expectations solely through device differentiation factors. Progressive companies, that leverage the convergence potential of emerging technologies are able to provide superior features and functionality that can entice customers and increase stickiness.

World's first hearing aid with integrated sensors and Al-September 03, 2018 (2/2)

- Value Proposition: The launch is accompanied by a brand-new mobile app—Thrive™ Hearing; and three new wireless accessories—the Starkey Hearing Technologies TV, the Remote, and the Remote Microphone+. With the Remote Microphone+, Livio AI is also the first hearing aid to feature Amazon® Alexa connectivity. The new Hearing Reality™ technology provides an average 50% reduction in noisy environments, significant reduced listening effort, and newly enhanced clarity of speech, while the use of AI and integrated sensors enable it to optimize the hearing experience.
- The convergence of cutting edge AI with advanced hearing technology enable Livio AI to provide following unique features and benefits:
 - Understand and see the real-time health benefits of using hearing aids
 - Overall health and wellness tracking through the app's combined brain and body health score (Thrive Wellness Score)
 - Integration of the physical activity data measured by inertial sensors of the hearing aids with Apple Health and Google Fit apps
 - Personalized Control for customizable adjustments to sound and programs
 - · Remote programming by users' hearing professionals to put hearing healthcare in the hands of the users
 - Fall detection with inertial sensors integrated within the hearing aids (App support coming soon)
 - Natural user interface with tap control; unprecedented, natural listening and speech clarity in the noisiest environments with the new Hearing Reality technology
 - Integrated language translation
 - Dual-radio wireless platform: 2.4GHz radio for streaming of phone calls, music, media, apps, and connecting with various devices including TVs and Amazon Alexa; near-field magnetic induction technology for true ear-to-ear communication and binaural noise reduction
- Frost & Sullivan finds the Livio AI to be a true smart hearing aid that goes beyond the product mind-set. By leveraging AI and mHealth applications Livio AI will not only optimize users' hearing experiences but also enable them to continuously monitor and improve their overall health besides treating hearing loss, reducing the associated risks of dementia, anxiety and social isolation. Having said that given the increasing innovation currently happening in the hearable space from bigger names such as Google and Apple, moving forward, Frost & Sullivan anticipates increased competition for this space in next 2-3 years.
- End-Users: Consumers

WEBLINK: https://bit.ly/2NTKtQ5

Bon voyage, jet lag? This smart sleep mask promises a cure – September 2018



ANALYST TAKE:

- Synopsis: San Francisco, CA-based startup called LumosTech has developed a smart mask based on research from Stanford University that could be the closest thing yet to a fast cure for jet lag. The Lumos smart sleep mask uses light therapy while you sleep to help you adjust to a new time zone faster.
- **Industry Need:** Jet lag, also known as flight fatigue, or desynchronosis, is a temporary disorder that causes fatigue, headache, insomnia, and other symptoms when you travel rapidly across time zones. Till date, light therapy headsets which (often bulky in size) are the only solutions available to ease jet lag by constantly beaming blue light into users eyes, but one need to wear them at odd intervals through the day or night.
- Value Proposition: Based on the research at sleep sciences centre at Stanford University, LumosTech has created a much user-friendly smart sleep mask
 that delivers short pulses of light into the user's eyes to adjust circadian rhythm and potentially eliminate current light boxes and headsets. With
 convenience factors being the top features influencing consumer adoption/purchase decision for wearables, Frost & Sullivan believes LumosTech's smart
 sleep mask is an ideal product that can meet customer expectations.

WEBLINK: https://cnet.co/2PzBoMI



Mobile Phones/ mHealth

Meditation app Headspace acquires Alpine.Al – September 5, 2018 (1/2)



ANALYST TAKE:

Synopsis: Meditation app maker Headspace announced acquisition of voice-enabled AI system Alpine.AI for an undisclosed sum, in line with its strategy to move towards personalization and conversational products.

Industry Need:

- User retention of mHealth apps is a major issue with certain reports citing more than 60% of mHealth apps having less than 1,000 monthly active users (MAUs, a person using the app at-least once per month). Moreover, less than 10% of apps reported MAUs of more than 50,000.
- Amidst this background, mHealth app companies have been looking at various strategies to enhance user interaction, and engagement to enhance retention. Personalization and ease of use have been found to be the key ingredients of apps which report higher retention and hence, more and more mHealth apps are being developed with a smart conversational angle to them.

Meditation app Headspace acquires Alpine. Al – September 5, 2018 (2/2)

Value Proposition:

- Alpine.Al integration will allow users to have a more natural conversation with Headspace products thereby increasing their engagement levels with the
 apps. The company has also enabled conversations via voice assistants like Google Home or Alexa for customers wanting to experience Headspace
 without their phone.
- Headspace plans to create a healthy portfolio of FDA cleared products and launched its subsidiary Headspace Health to focus on creating a prescription mediation app by 2020. In line with this, the company recently kicked off randomized control trials on its first targeted disease state, with the intention to submit the company's plans to the FDA in 2019.
- Frost & Sullivan believes the overall mHealth space has seen some positive evolution in terms of enhancing clinical impact through use of AI powered conversational technologies which have evolved from a plain-vanilla Q&A responses to more evolved empathetic conversations and clinical guidance. The technology applications such as chatbots, virtual avatars, gamification and other smart conversational engines are critical to building a comprehensive guide to health through proactive disease screening and preventive management.
- Target End-User: Mental health patients, healthcare consumers, wellness, clinicians

Pediatric vision test GoCheck Kids launches for iPhone – September 5, 2018 (1/2)



ANALYST TAKE:

Synopsis: Gobiquity Mobile Health has launched an iPhone-compatible version of GoCheck Kids, its smartphone-based vision impairment photoscreener, a subscription service based app which could be used by pediatric providers to screen children for early symptoms of amblyopia.

Industry Need:

- Amblyopia is a pediatric disorder affecting 2-5% of children aged between 6 months to 10 years and leads to irreversible visual impairment if left untreated during early age. It causes more unilateral cases of reduced vision in childhood than all other causes combined.
- The key to treatment is early detection of risk factors and the US Preventive Services Task Force recommends vision screening for children aged 3-5. Early screening becomes difficult to lack of specificity in traditional visual acuity screening programs. Hence, development specialized, easily procureable and technology enabled tests will significantly enhance the detection and cure for amblyopia.

Pediatric vision test GoCheck Kids launches for iPhone – September 5, 2018 (2/2)

Value Proposition:

- GoCheck Kids is a HIPAA compliant and FDA cleared app which offers pediatricians a lower-cost alternative to purpose-built screening devices for amblyopia.
- The app is a low cost alternative to traditional hardware based visual screening tools, and is being offered for unlimited usage at monthly subscriptions ranging from \$80 to \$129. The app easily integrates with the provider's EHR system, wherein users select the patient's profile in the GoCheck Kids app and take a single photo of the patient's eyes. Afterward, the app automatically sends the image to a patient's EHR, and generates a sharable report with the patient's results.
- The cloud-based service allows for remote viewing and sharing of image results with compatibility to both the iOS and Windows versions of smartphones.
- GoCheck Kids has been clinically validated in three separate clinical trials and has a positive predictive rate of 68%, which has been found to be
 comparable with other commercial objective screeners. Currently, GoCheck Kids has been employed by roughly 3,500 pediatric providers to screen more
 than 500,000 children annually.
- The GoCheck Kids app, which has received funding from Salesforce.com as well as InterWest Partners, has been in the market since 2015. Frost & Sullivan believes that the company could explore its potential outside the US to scale business, which hasn't really picked up despite the huge potential due to the prevalence of amblyopia across the globe.
- · Target End-User: Pediatric providers, Government screening facilities, Hospitals, Health Systems

WEBLINK: https://bit.ly/2wP65FX

ResApp announces strong results from Australian pediatric trial of respiratory diagnostic tool – September 4, 2018 (1/2)



ANALYST TAKE:

Synopsis: Topline data from ResApp's Breathe Easy study, which used machine-learning algorithm based smartphone tool to diagnose respiratory disease from cough sounds for 585 patients aged up to 12 years old, has suggested that the tool's conclusions generally align with clinical diagnoses when employed for younger patients.

Industry Need:

- ResApp has been conducting a multi-site, prospective, double-blind study evaluating the efficacy of the ResAppDx smartphone application in the diagnosis of childhood acute respiratory disease using cough sounds.
- ResApp technology, if successfully validated, could potentially disrupt the respiratory disease diagnosis workflows and can replace traditional technologies such as stethoscope, x-ray and CT scans, spirometry, as well as blood and sputum tests in offering a rapid respiratory disease diagnosis.

ResApp announces strong results from Australian pediatric trial of respiratory diagnostic tool – September 4, 2018 (2/2)

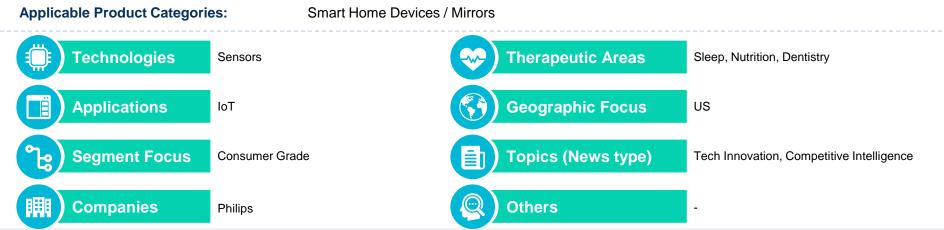
Value Proposition:

- ResApp's tool uses a smartphone's microphone to record the sound of a patient's cough, which then runs through the algorithm to reach a diagnosis. For many respiratory conditions, the tool also takes patient-reported symptoms into consideration. Researchers compared diagnoses made by the algorithm with those from a clinical adjudication committee to determine positive and negative percent agreement for a number of respiratory conditions.
- According to ResApp, positive percent agreement ranged from a high 97% for asthma and reactive airway disease decisions to a low 79% for primary
 upper respiratory tract disease decisions. These two conditions also comprised the highest and lowest negative percent agreement, with asthma and
 reactive airway disease reaching 91 percent and primary upper respiratory tract disease sitting at 80 percent.
- · With the positive results, the company now aims at EU and Australian regulatory submissions.
- Frost & Sullivan believes that the technology is the latest addition to an ever increasing list of innovative, and easily adoptable smartphone enabled diagnosis tests across a variety of disease categories. The technology, if validated, could be extremely useful at addressing the chronic unmet need of timely diagnosis of respiratory diseases such as pneumonia, lower respiratory tract infection, chronic obstructive pulmonary disease (COPD), cystic fibrosis, bronchitis, asthma and even fatal diseases such as lung cancer. It's successful integration into existing respiratory disease screening could save healthcare costs currently spent on complex tests and invasive sampling as well as improve care workflows.
- Target End-User: Patients, clinicians, path labs, hospital networks



Smart Home Devices & Appliances

Smart home technology needs to be a tool for self-care, too – September 6, 2018

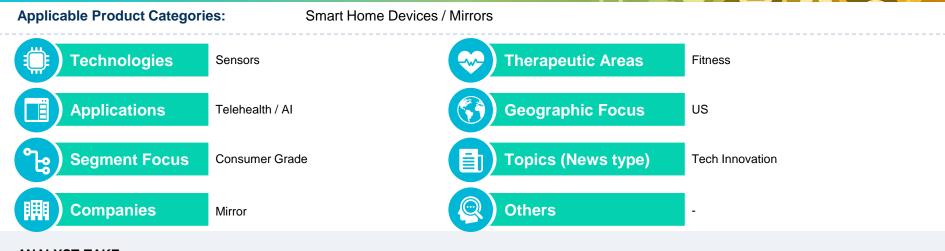


ANALYST TAKE:

- Synopsis: At IFA 2018, Philips introduced the SmartSleep headband, Intelligent Blender and smart DiamondClean Toothbrush.
- In our recent <u>analysis</u>, Frost & Sullivan covers Philips as a major vendor that could serve in the smart homes for care delivery space. Though we covered Philips (or Philips Healthcare to be precise) from a health tech perspective, Philips consumer products are also focused towards the same area. The sleep supporting headband, the nutrition sensing / guiding blender (similar to the NutriBullet covered in a previous issue), and the smart toothbrush (several such products are available) are all focused on overall wellness of residents. There probably are two major, and related key takeaways: every major company targeting smart homes for health and wellness applications is approaching the space differently, and building on their existing strengths; but what is lacking is the need for a singular platform that collates data from all such IoT devices in the smart home, to provide holistic insights in to resident health, which is where partnerships will become crucial.

WEBLINK: https://bit.ly/2MXEux4

Mirror launches its in-home fitness platform, raises another \$25M from lead investor – September 6, 2018

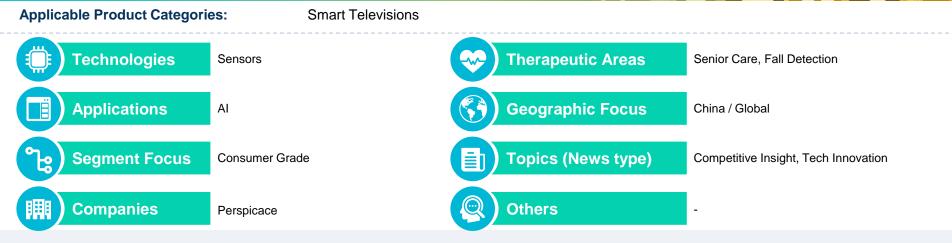


ANALYST TAKE:

- Synopsis: Mirror's \$1,495 smart mirror provides workouts and music on demand through it's large LCD panel that functions as a mirror when not in use.
- Without going into the considerations around cost, applicability, etc. of Peloton, Mirror and other live-streaming / on-demand workout session products and services (those with hardware and without), Frost & Sullivan believes that a smart mirror can be an effective tool for multiple health and wellness applications, such as skin care (covered in an earlier issue), emotion detection (and therefore mental health status), gait / posture analysis (indicating underlying issues from fatigue to bone or joint problems), or even (way in to the future), integrating eye-scanning technology for screening of eye conditions (which is available today from IDx-DR) in the smart mirror the possibilities beyond fitness are endless. For any product to be priced so high, the value proposition it brings, and the right monetization model (subscription services?) will be crucial for higher adoption.

WEBLINK: https://bit.ly/2wSbTiS

Al startup builds a Wi-Fi motion sensor that knows when you've fallen over-September 6, 2018

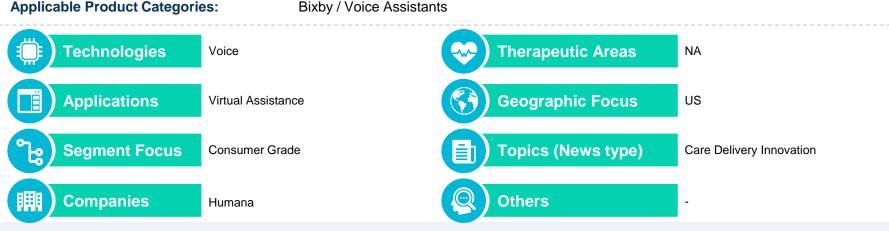


ANALYST TAKE:

- Synopsis: Assessing and identifying the specific pattern of how WiFi signals are disturbed by a person's presence and movement, the WiFi Bio-Detector's Al algorithms can identify when a person falls. The Bio-Detector plugs in to a standard wall socket
- Frost & Sullivan believes this is a move in the right direction, and has covered the same technology being developed by MIT in Issue 6. While the Bio-Detector is commercially available now (being installed in some residential projects), it may benefit from MIT's technology of 'sensing' people even through walls. A combination of Bio-detector's small design with no hardware installation challenges (simply plug-in) and the advanced algorithms from MIT will make it an even stronger value proposition.

WEBLINK: https://bit.ly/2NWbgeL

Humana's CEO says voice recognition will be a focus area for Studio (September 5, 2018



ANALYST TAKE:

- **Synopsis:** Humana's newly unveiled tech innovation hub dubbed 'Studio H' will look into three areas: "technology designed to manage provider workflow, expanding telehealth into the home health and primary care settings, and <u>bringing voice recognition tools to members in their homes</u>".
- Frost & Sullivan acknowledges Humana as probably the first insurance provider to at least publicly announce researching voice tech for health applications. While details are unknown, the obvious platform choices would be Amazon Alexa or Google Home (or support for both, and maybe even other players). As the article states, based on it's two acquisitions of Kindred Healthcare and Curo Healthcare in the post-acute and chronic care space, which is probably one area of focus. Chronic conditions are a huge cost to the US healthcare system [per Centers for Disease Control and Prevention, \$317 bn for cardiovascular disease, \$245 bn for diabetes]. We argue that insurance players (single-payer systems like UK's NHS, and private players] must become the driving force in adoption of such technologies to control costs.

WEBLINK: https://bit.ly/2wSAJ1j

Welcome Home to Wellness: Delos Launches World's First Residential Wellness Technology Platform – September 4, 2018





ANALYST TAKE:

- Synopsis: Delos, a wellness real estate player, launched the Darwin Home Wellness Intelligence platform that helps "create spaces that help reduce stress, improve sleep quality, increase performance and enhance overall well-being"
- Frost & Sullivan has identified individual air purifier and indoor environment testing device makers, but acknowledges Darwin as the first platform based product in this space. While Darwin focuses on "air filtration, water purification, circadian lighting and comfort-focused technologies, all of which simulate the natural outdoor condition", with core healthcare delivery products and services, Frost envisions building similar platforms (such as existing ones like Omada for chronic care wellness), but encompassing more parameters. For example, integrating a chronic care platform with the Darwin platform, especially for respiratory conditions can deliver significantly more personalized insights, enabling even the trend of precision health, where 'exogenous factors' such as the environment and it's effects are also considered while managing patients.

WEBLINK: https://bit.ly/2MUvyss

Other Interesting Articles

When available, other interesting articles will be covered here in short.

News Title	Link	Remarks
AI to be more widely adopted in smart homes and IoT	https://bit.ly/2NSzN 48	More than 100 Chinese firms are each expected to produce 1 mn Al-powered devices, expected to launch in 1 year in the ever-competitive Chinese Smart Home market.
Alexa now has more than 20,000 compatible smart home devices	https://bit.ly/2McSQ oo	Alexa has 20,000+ compatible smart home devices and over 50,000 skills, compared to 5,000+ for Google Home. When comparing smart voice devices – the number of device unit sales, along with these statistics must be compared to better understand the market dynamics.