FROST & SULLIVAN

Healthcare Market Updates

Weekly Newsletter

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Wearables

Verily's smartwatch earns FDA clearance for an EKG feature – January 23, 2019 (1/2)

Applicable Product Categories: Wearables

Technologies	Wearable (Smartwatch + App)	**Therapeutic Areas**	Lifestyle Monitoring and Elderly Care
Applications	Remote Monitoring in remote and virtual clinical trials/research	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Competitive Intelligence
Companies	Verily (Alphabet/Google)	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Verily, Alphabet's life sciences arm, earned clearance from the US Food and Drug Administration (FDA) for an electrocardiogram (EKG) feature in its smartwatch that allows healthcare researchers to study cardiovascular conditions.
- **Industry Needs:** As per WHO estimates, 7.3 million people die of cardiovascular diseases (CVD), particularly heart attacks and strokes every year globally. For example, heart disease has been the biggest killer in America since 1920 and involves spending of more than $110 billion/year. However, among all the deaths caused by CVD, about two-thirds of them happen in out-of-hospital settings. This demands robust remote monitoring solutions such as wearables to promote preventive care practices. Furthermore, CVD remains a key therapeutic focus for innovative pharma companies. However, challenges with patient recruitment for clinical trials continue to be a bottleneck for the life science research industry. For example, about 80% of pharmaceutical trials do not meet enrolment deadlines, resulting an average loss up to $1.3 million per day for a given candidate drug. Integration of emerging wearable and mHealth technologies to enable remote/virtual trials provide the potential to increase the trial success through adaptive clinical trials—providing patient-centric trials, improving value-based care, and facilitating faster and more cost-effective outcomes.

Verily's smartwatch earns FDA clearance for an EKG feature – January 23, 2019 (2/2)

- **Value Proposition:** As per the company announcement, unlike consumer smartwatches, the Verily smartwatch has been designed keeping in mind research and clinical trial applications – as a investigational tool to collect health data from clinical research participants. Till date, the device has been used in a number of studies including Verily's Project Baseline, Aurora study and Personalized Parkinson's Project.
- The watch is a prescription-only device, and was designed to record, store, transfer and display single-channel ECG rhythms. The company said the device's ability to take on-demand, single-lead ECG can be used for individual patient care or for population-based research.
- FDA-cleared EKG feature should help Verily garner research partnerships from medical research institutions and providers

- Frost and Sullivan strongly believes that digitization will play a critical role in transforming the clinical trials model from traditional (centralized) high-cost and difficult-to-access settings to more patient-centric and efficient virtual models. Entailing this, Frost & Sullivan recognizes Verily's market positioning strategy to target less crowded and high growth segment such as research/clinical trial applications when compared against clinical/consumer use cases which is already crowded by big brands such as Apple, Rhythm Technologies, AliveCor, Fitbit, and Withings among others.
- As mentioned in our last week newsletter (Issue #35), this FDA approval announcement further validates our rational for recent acquisition of Fossil Group's smartwatch division by Google to make existing Verily Research Watch more consumer-centric leveraging the expertise of Fossil's R&D staff to monetize wearables/mHealth application across remote or virtual clinical trials, projected to be a $559.5 million market by 2020. Although the Verily Study Watch is designed specifically as an investigational tool, other smartwatches have also been used in research such as ActiGraph and Apple. However, Frost & Sullivan believes there is still enough room for new players to gain a share of this growing market.
- Despite Verily's current stand, not to sell its smartwatch to consumers, Frost & Sullivan anticipates that in the near future, Verily's-sister company Google may consider to borrow the EKG tech and join the fray with Apple and Fitbit in the growing wearable clinical/consumer market segments. No doubt Google would face an uphill battle on this front but with Android user-base on their kitty as the leading OS among smartphone users – Google is well positioned to drive sales among Android users looking for integration between their mobile devices and the smartwatch
- **Target End-User:** Pharma Clinical Trial, Academic Research (later may be Consumer and Clinical applications).

WEBLINK: https://bit.ly/2RbEcA4

New Wearable Gathers Data from Sweat – January 24, 2019

Applicable Product Categories: Wearables

Technologies	Wearable (Patch-based Sweat Sensor)	**Therapeutic Areas**	Cystic fibrosis, Diabetes or lack of oxygen
Applications	Remote Monitoring and Self Health Management	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Product Innovation
Companies	Northwestern University	**Others**	NA

ANALYST TAKE:

- **Synopsis:** A new device — wearable, wireless and battery free — improves the ability to monitor and diagnose health problems by analyzing the sweat on your skin.
- **Value Proposition:** Fitness trackers such as Fitbit and Apple Watch already track step counts, heart rate and sleep rhythms. But they tend to be rigid and bulky, and mostly gather mechanical metrics, rather than assess a person's underlying biology. A new generation of devices instead aims to analyze sweat for many chemicals at once, producing a real-time snapshot of the wearer's health or fitness. These devices also fit intimately against the skin, and are comfortable for anyone, from premature babies to the elderly. One version is already being advertised by Gatorade.
- The clinical validation of this technology published in journal Science Advances suggests – the device provides real-time information on the wearer's pH, sweat rate, and levels of chloride, glucose and lactate — high levels of which could signal cystic fibrosis, diabetes or a lack of oxygen.
- Given the early stage of this technology it is difficult to gauze its true future commercial impact. However, Frost & Sullivan believe, such device will have a very low price point (e.g. lees than $50) and if they are able to decode diabetes monitoring from sweet, it will be a game-changer in the wearable space.

WEBLINK: https://bit.ly/2FWL5mV

Rumors of AirPod health sensors resurface – January 23, 2019

Applicable Product Categories: Wearables

Technologies	Wearable/Hearable	**Therapeutic Areas**	Lifestyle Monitoring and Chronic Disease Management
Applications	Remote Monitoring and Self Health Management	**Geographic Focus**	US
Segment Focus	Clinical/ Consumer Grade	**Topics (News type)**	Product Innovation/ Competitive Intelligence
Companies	Apple	**Others**	NA

ANALYST TAKE:

- **Synopsis:** It's not the first time we've heard this rumor, but the time may be right for heart rate, blood pressure sensors.
- **Media Speculation:** Digitimes, a supply side electronics publication with a mixed track record on Apple rumors, **is reporting** that Apple plans to launch next-generation AirPods in 2019 which will include health monitoring features. Giving credence to the rumor is an older report from November that Apple **had updated certain trademarks** pertaining to the AirPods to include health sensors.
- In the absence of any details on the specifics on the features on this rumored AirPod, Frost & Sullivan views it more as speculation than substance. Theoretically, both heart rate and blood pressure could be monitored from the ear. In fact, Valencell, which just recently settled a drawn-out lawsuit with Apple, has been working on both, with earbud-based heart rate sensors available since at least 2014 and ear-based blood pressure sensors just announced at CES. On a different note – Frost & Sullivan views this as Apple's continued commitment to explore opportunity in the healthcare space and believes that wearable technologies will continue to be the key focus during 2019 for the company.

WEBLINK: https://bit.ly/2ReKa3h

Fitbit targets newest activity trackers at health, wellness plans – January 24, 2019

Applicable Product Categories: Wearables

Technologies	Wearable/Hearable	**Therapeutic Areas**	Lifestyle Monitoring and Chronic Disease Management
Applications	Remote Monitoring and Self Health Management	**Geographic Focus**	US/Global
Segment Focus	Clinical/ Consumer Grade	**Topics (News type)**	Competitive Intelligence
Companies	Fitbit	**Others**	NA

ANALYST TAKE:

- **Synopsis:** Fitbit has discreetly launched a new pair of wearable activity trackers well away from the public eye. Called the Fitbit Inspire and Fitbit Inspire HR, the devices are designed specifically for health plans, wellness plans, health systems and other enterprise partners — so much so that the two are completely unavailable for consumer purchase.
- **Value Proposition:** Given the low profile marketing around Fitbit's new launch for two fitness trackers – it seems, both Inspire and Inspire HR are the first Fitbit devices designed exclusively for health plans, employers and health systems. However, both Inspire and Fitbit Inspire HR are not too different from the company's existing fitness trackers, but as of now are unavailable for consumer purchase. According to the company's website, the Fitbit Inspire includes a number of the same features of consumer product lines like the Fitbit Alta. Meanwhile, the Fitbit Inspire HR adds a few more functionalities enabled by the heart rate monitor, such as round-the-clock heart rate tracking, sleep stage monitoring, and location and pace tracking enabled through a paired phone GPS. Frost & Sullivan views this as an innovative way to engage with B2B clients, and believes this strategy would have provided Fitbit the flexibility to pass on the cost saving from Sales and Marketing expenses to its B2B clients as part of high volume-discounted pricing engagement to beat competition.

WEBLINK: https://bit.ly/2CGTp73

Mobile Phones/ mHealth

Philips, NewYork-Presbyterian to roll out remote monitoring app platform to physicians, patients – January 24, 2019 (1/2)

Applicable Product Categories: Mobile Phones

Technologies	mHealth App; Virtual care; Digital Care Platforms	**Therapeutic Areas**	Remote Monitoring
Applications	mHealth app and medical device for remote monitoring of patients	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Vendor Provider Partnerships
Companies	Royal Philips	**Others**	NewYork-Presbyterian Hospital

ANALYST TAKE:

Synopsis: Philips has entered a partnership with NewYork-Presbyterian Hospital to enhance the health system's remote patient monitoring (RPM) and patient management capabilities through Philips' eCareCoordinator clinical dashboard and its accompanying eCareCompanion mHealth app for easy and real time vitals tracking by the patient as well as the care-giver.

Industry Need

- Frost & Sullivan believes that RPM is a key solution to enable a dynamic continuous care model, with specific focus on target population of older patients with leading chronic conditions, such as CHF, COPD, Diabetes, Hypertension and Obesity.
- Another potential opportunity for clinical-grade RPM is to support professional grade self-care. This population is not confined to the elderly, and RPM may be able to improve quality of life by tracking certain conditions and patient adherence to a health maintenance plan over a long period of time.

Philips, NewYork-Presbyterian to roll out remote monitoring app platform to physicians, patients – January 24, 2019 (2/2)

Value Proposition:

- As per the announcement, NewYork Presbyterian Hospital's affiliated doctors at Weill Cornell Medicine and Columbia University Irving Medical Center will utilize the Philips eCareCoordinator and eCareCompanion solutions to remotely track their patient-specific risk scores, facilitate care collaboration and enable two-way video communication with patients.
- The eCareCompanion tool would allow patients to use a tablet or smartphone and connected medical devices to share their health information (like weight, blood pressure and glucose levels) with their care team, without the need for a physical visit to the hospital facility.
- Frost & Sullivan believes this partnership, in line with the anticipated industry trend in the coming 1-2 years, is aimed at enhancing Philip's value based care models through effective, results driven partnerships with key health systems which command a significant reach and provide care to a considerable patient population. The partnership is a win-win for both the parties as the health system would be able to demonstrate lesser re-admission rates, reduce hospital stay lengths and fewer preventable emergency department visits, thereby significantly reduced costs to the healthcare system.
- **Target End-User:** Seniors, caregivers

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

Study: Pre-op patient engagement, education app decreased time in hospital – January 24, 2019

Applicable Product Categories: Mobile Phones

Technologies	mHealth App	**Therapeutic Areas**	Orthopedic; Joint Replacement Surgeries
Applications	Pre and post surgical care coordination for improved outcomes	**Geographic Focus**	US
Segment Focus	Clinical Grade	**Topics (News type)**	Care Delivery Innovation
Companies	Peerwell	**Others**	J&J

ANALYST TAKE:

- **Synopsis:** Peerwell's PreHab app, which offers patient engagement and education support on pre-surgical preparation by patients, has been reported to reduce total knee arthroplasty patient's time in the hospital and discharge disposition.
- As per the study, published in Annals of Translational Medicine, Peerwell's PreHab tool reported positive outcomes in a number of parameters like length of hospital stay, less frequent requirements of home assistance, an in-home health aide and reduced time at a skilled-nursing facility for patients preparing for total knee arthroplasty. The company has also launched a similar app named ReHab, for post-surgical recovery.
- Frost & Sullivan believes that effective pre and post acute care coordination in terms of managing aspects like patient motivation, anxiety and underlying drive to stay and get healthy as well as timely guidance on daily exercises, nutrition and pain management is often found to be the difference between negative and positive care outcomes of reduced hospital stays, re-interventions, reduced need for home-health support, re-admissions and potentially reduced care costs. In line with this, J&J launched the connected digital platform, called Health Partner, in November 2017, for patients preparing for, and recovering from, knee, hip or weight loss surgery. The trend is expected to continue in 2019 with increasing emphasis on value-based care models and industry players effectively moving towards digitized business models.

WEBLINK: https://bit.ly/2MvG5a6

Smart Home Devices & Appliances

One of Apple's Next Health Sensors for iDevices could save your Life by Detecting Invisible Deadly Gases – January 24, 2019

Applicable Product Categories: Sensors, Smart Home Devices, Air Purifiers

Technologies	Sensors	**Therapeutic Areas**	Respiratory Conditions
Applications	Air Quality Monitoring, Purification	**Geographic Focus**	US / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Competitive Intelligence
Companies	Apple	**Others**	-

ANALYST TAKE:

- Apple has filed for a patent for iDevices to be integrated with sensors that can detect poisonous gases – carbon monoxide, and several others. The objective maybe to integrate these sensors with the iPhone or Apple Watch.

- Frost & Sullivan believes that the same technology can also be integrated in smart homes. Air quality monitoring and purification is already a growing market ($6.5 billion by 2023, per some estimates), with the global levels of pollution having reached unprecedented high. Eco Experts list Cairo, New Delhi, Beijing, Moscow, Istanbul, Guangzhou, Shanghai, Buenos Aires, Paris and Los Angeles as the world's top 10 polluted cities; covering every single continent! Companies such as AirBox Labs, Awair, Speck, startup AerNos and so many more have made significant strides in indoor and outdoor air quality monitoring – an approach that tracks both indoor and outdoor air quality, along with insights for residents on when to open the windows and let fresh air in, versus keeping them closed to keep polluted air out would work best!

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

First care robot linked to smart homes tested for dementia patients – January 21, 2019

Applicable Product Categories: Smart Home Robots

Technologies	Robots, AI	**Therapeutic Areas**	Elderly care, Dementia
Applications	Aging-in-Place	**Geographic Focus**	United States / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	Washington State University (WSU)	**Others**	Nottingham Trent University, University of Bedfordshire

ANALYST TAKE:

- "The Robot Activity Support System (RAS) uses sensors embedded in a smart home to keep track of where patients are in the house, what they are doing and when they might need assistance." "The robot navigates the room to find patient on its own, provides video instructions on simple tasks and can even lead patients to their medication or food if they forget to do so themselves."

- Frost & Sullivan believes the use of companion robots is the right step in elderly care, and the approach employed by WSU is also noteworthy, of integrating with smart home sensors – the future lies in breaking tech silos, to collate information from multiple sensors and systems to yield rich insights to provide better care. While the companion robots is becoming a crowded segment with several companies such as BlueFrog Robotics' Buddy, Luvozo SAM, DreamFace Technologies' Ryan, MiRO, ElliQ by Intuition Robotics and Mabu by Catalia Health – the use cases, deployed sites (homes vs. senior living facilities) and applications make it a market with plenty of room for growth. The major challenge for the industry will be to provide this high-cost tech to the low-affordability, retired senior population!

WEBLINK: https://bit.ly/2Hr0WMM

Kepler Vision Technologies Monitors Elderly at Home: CES 2019 – January 18, 2019

Applicable Product Categories: Smart Home Devices

Technologies	Computer Vision	**Therapeutic Areas**	Elderly care
Applications	Aging-in-Place	**Geographic Focus**	Netherlands / Global
Segment Focus	Consumer Grade	**Topics (News type)**	Technology Innovation
Companies	Kepler Vision Technologies	**Others**	-

ANALYST TAKE:

- Cameras, computer vision and some more tech leads to the Kepler platform that can "monitor multiple people at the same time and identify the pose they're in, body language, type of activity, including eating, drinking, walking, and smoking, and compare this against recommended levels of liquid intake, exercise, sleep, and other activities." All geared towards the elderly care market.

- Frost & Sullivan believes that the use of cameras may deter people from using the tech, fearing privacy concerns. Instead MIT's tech (featured in Issue 6) is more likely to succeed – but the applications built by Kepler are pretty impressive. We think the need for prediction based insights will also improve care approaches – about to fall, summon nurse / caregiver; experiencing cardiac arrest, summon ambulance (also dependent on integrations with touchless vitals monitoring tech or wearables like Apple Watch), etc. However, the tech does address one major issue with senior care – the issue of dignity where elders prefer not to have devices on them to identify them as ones needing support, which is where touchless technologies help most. Also this technology can be incorporated in the several home robots being developed for use by seniors.

WEBLINK: https://bit.ly/2CNBY4W

Other Interesting Articles

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

News Title	Link	Remarks
Your Expensive Smart Appliance May Not Last A Decade	https://bit.ly/2HyqnvZ	The article mentions the Samsung Family Hub smart fridge – the warranty for which does not cover firmware updates, it is alleged. The point is, this trend of consumer electronics (expecting a user to change mobile phones every 2-3 years) won't work at all. There's an insurer who pays, a doctor who decides prescriptions – not just the end-user, the patient. So either continuous updates, or innovative business models around leasing the products might be required.
Hacked Nest camera warned of North Korean 'missile attack,' family says	https://fxn.ws/2SadUTz	While the hacked Nest camera's speakers broadcast the fake information, imagine a hacked device broadcasting a probably gullible and elderly person to take twice the medication prescribed, and you get the idea why cybersecurity from a healthcare perspective is even more crucial.
Microsoft admits that it can't beat Amazon and Google in the voice assistant war	https://read.bi/2RKNEj7	Satya Nadella now wants to position Cortana as a service that complements other voice platforms. Even from a ecosystem view – a large number of voice assistant platforms are only going to restrict market growth. Healthcare is struggling with the challenge of interoperability already, the last thing they want is another technology with several proprietary platforms!

Other Interesting Articles (continued)

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

News Title	Link	Remarks
New Bosch tech can turn your home into a touchscreen	https://bit.ly/2TcU7Qz	The technology certainly has a cool quotient, allowing any surface to be turned into a touchscreen – we can imagine a telemedicine call between a doctor and patient using this technology to exchange patient health data virtually from anywhere in the home, without the need for a touchscreen device! That is, if the technology catches on!
Whirlpool, GE and the dozens of cooking apps crowding the smart kitchen	https://cnet.co/2VXE4aV	“The smart kitchen needs a unifier. It needs one app, platform or voice assistant to take charge of connected devices and cooking needs. Like the early days of smart home platforms and assistants, kitchen-specific smarts still feel a bit jumbled.”
The Combination Of Blockchain And Smarthomes	https://bit.ly/2Tekvtg	To early to comment, but startup VeCap GmBH brings blockchain to the smart home setup!
Google’s Not-So-Secret Weapon in the Virtual Assistant Wars: Photos	https://bit.ly/2WiYP0P	Recommend reading the article, after watching the embedded video, to truly understand the power of emotions, how they can drive product choices. We can imagine an elderly senior person, living alone, who has access to ‘memories’ – why just photos, in the future, it could be an augmented reality solution as well. This of course, may not be true for the entire population, but for some (like elderly), it does the trick!

Other Interesting Articles (continued)

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

News Title	Link	Remarks
You can now buy an actual hospital room on Amazon	https://cnb.cx/2B3gQrc	While definitely not geared towards a smart home, (they are targeting hospitals), (a) it's an interesting approach (think modular rooms to a smart home), (b) if the price point was low enough, would this be part of a home health caring unit? – just some thoughts for the future!