Do Wearable Devices Accurately Track the Heart Rates for People of Color?

The green light used in some wearables, including Fitbit, makes it more difficult to get precise readings for those with darker skin.

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Millions of people wear Fitbits, Apple Watches and other gadgets to track their heart rate and much more. But these wearable trackers may yield inaccurate readings for people of color, STAT reports.

In recent years, the market for smartwatches and fitness trackers has mushroomed, causing concerns about their accuracy, especially among people with darker skin. Many of these individuals complain that there is often no reading when they wear these devices. Not only do these inaccuracies have implications for scientific research that relies on these wearables, but the problem also raises questions about whether these technologies are tainted by implicit prejudices that shape their development.

A majority of devices that track heart rate use optical sensors that constantly monitor an individual's blood volume. As STAT noted, less blood pools at your wrists in between beats, which reflects more light to the sensor.

Many wearable devices use only green light rather than infrared light because it's simple and cheap and works better when people are moving. In addition, green light is more effective in environments where light from other sources may impact the sensors that constantly monitor an individual's blood volume.

But green light, unlike infrared light—which penetrates more deeply into the skin—possesses a shorter wavelength and is more readily absorbed by melanin, thus making it harder to secure accurate readings for those with darker complexions.

There's been a lack of studies about the accuracy of heart rate trackers for dark-skinned people. Nevertheless, experts explained to STAT that plenty of research about how melanin absorbs green light is available, so companies that make these devices should know about this issue.

But the problem may be rooted in research traditions that don't require scientists to actively recruit diverse groups of people to participate in studies so that findings may be generalized to

people of different ethnic and racial minority backgrounds, observed Benjamin Nelson, a doctoral candidate in clinical psychology at the University of Oregon, who was interviewed by STAT.

It is vital, Nelson says, that future research collect and control for complexion, as skin tone has been shown to influence the accuracy of these devices. In addition, he also calls for larger sample sizes across different demographic groups to control for a variety of individual characteristics.

For now, Fitbit and Apple are among the brands actively trying to address imprecise readings from fitness trackers. Fitbit has increased the current of its green light, while the Apple says its device also takes measurements with an infrared light about every five minutes.

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