

# Smartphone Apps for Noise Measurement - Accuracy Research



In previous issues of our *SoundBytes* newsletter, we have reported on tests of accuracy of smart phone "apps" designed to measure noise. Preliminary research by the National Institute of Occupational Safety & Health (NIOSH) indicated a select few commercially available apps could measure noise with reasonable accuracy. New studies have determined under what circumstances these smart phones and apps may be most useful.

Previous studies compared sound level readings recorded using smart phones to sound level values taken simultaneously with a standard precision sound level meter. Although some combinations of phones and apps appeared promising, problems related to calibration of the cell phone's internal microphone presented practical challenges to accuracy. More recently, researchers from the University of Michigan and NIOSH compared measurements taken via iOS phones using the internal microphone and two external microphone options. Their results indicated that certain combinations of phones and apps can provide noise measurements as accurately as a Type 2 sound level meter. However, use of a quality external microphone and a method of calibration are also required. For practical purposes, the researchers concluded that it is unlikely smartphones would be useful for regulatory compliance measurements in the near future. They do have value in documenting "crowd sourced" information about environmental noise and have potential for future development.

## For more information:

[Kardous, C. & Shaw, P. B. \(2013\). So How Good are These Smartphone Sound Apps? CAOHC Update, Vol. 25, Issue 3.](#)

[Benjamin Roberts, Chucri Kardous & Richard Neitzel \(2016\). Improving the Accuracy of Smart Devices to Measure Noise Exposure, Journal of Occupational and Environmental Hygiene.](#)

Kardous, C. & Shaw, P. B. (2014). Evaluation of smartphone sound measurement applications. *Journal of the Acoustical Society of America*. 135, EL186-EL192 and [NIOSH Science Blog, April 2014.](#)

[Nast, D., Speer, W. & LePrell, C. \(2014.\) Sound level measurements using smartphone "apps": Useful or inaccurate? Noise & Health, 16, 251-256.](#)

(photo: cdc.gov)