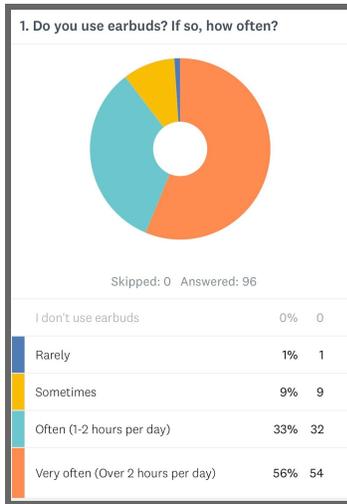


Capstone Project: WAXOFF

Element A

Problem Statement:

Overuse of unsanitary earbuds can cause dirt/wax build up in the ear canal, which may lead to ear infection. Consistently using unsanitary earbuds can lead to infection and disease, such as middle ear infections, fungus, or swimmer's ear. Hundreds of millions of people use earbuds every day which is there should be more attention given to the issue.



Problem Background/Statistics:

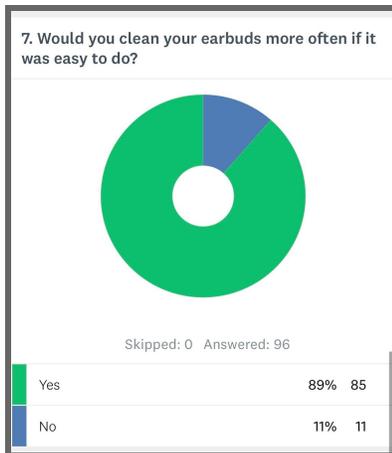
Earbuds sit in the area of the canal where wax is produced. By blocking the wax's natural path of exit, earbuds collect unsanitary wax, which can result in countless ear issues. The Malaysian Journal of Medical Sciences found that about 10% of earbud users developed ear diseases and 22% experienced hearing impairment over a 2-3 year period due to unsanitary earbuds.

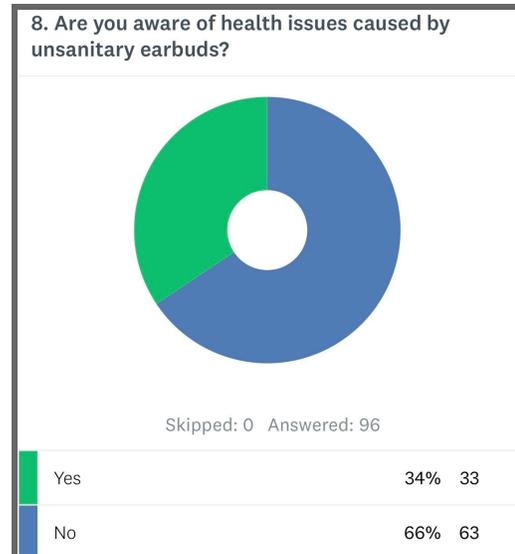
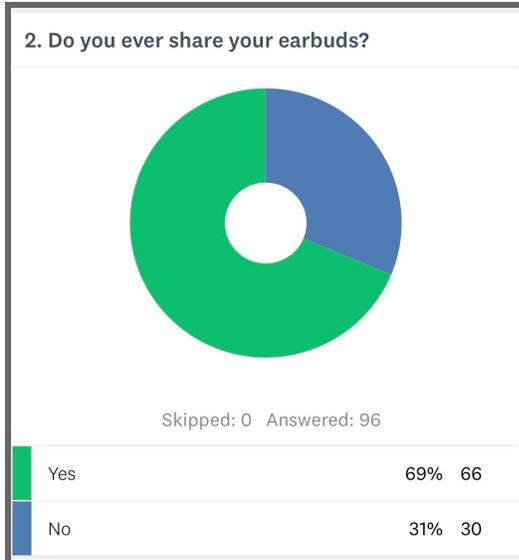
Validation of Problem:

According to Whittier Hospital Medical Center, "Nowadays, it's almost impossible to find a person who doesn't own a pair of earbuds... The moment you put them in, your earbuds can introduce dirt and bacteria into your ear."⁽¹⁾ On top of this, the New York Post states that, "...a 31-year-old man was left battling a deadly brain infection from using cotton buds (Q-tips) in his ears. Infections can also be reintroduced by soiled earphones..." They go on to say that, "Symptoms can include pain, odor, discharge and itching." This is even

more of a reason to pursue a solution to this problem as it proves just how harmful infections can be.

Blanca Andres - Family Medical Doctor - "It appEARs earbuds have some issues..."





Citations

1. Whittier Hospital Medical Center. "Are Earbuds Bad for My Ears?" *Whittier Hospital Medical Center*, 30 Sept. 2016, www.whittierhospital.com/WHMC-Blog/2016/September/Are-Earbuds-Bad-for-My-Ears-.aspx.
2. Ansari, Hossein, and Asghar Mohammadpoorasl. "Using Earphone and Its Complications: An Increasing Pattern in Adolescents and Young Adults." *Health Scape*, 5 Feb. 2016, pdfs.semanticscholar.org/67ad/10f81e3463bf86218f502fedfc0ebc40f257.pdf?_ga=2.106526913.331996947.1579291788-2009051738.1579291788.
3. Alva, Richard. "Why Prolonged Earphone Use Can Damage Your Ears." *Ear Hero*, 19 Nov. 2013, earhero.com/2013/11/19/why-prolonged-earphone-use-can-damage-your-ears/.
4. Mazlan, et al. "EAR INFECTION AND HEARING LOSS AMONGST HEADPHONE USERS." *Malaysian Journal of Medical Sciences*, July 2002, journal.usm.my/journal/MJMS-9-2-017.pdf.
5. Sun, The. "Wearing Earbuds Regularly Could Cause Ear Infections, Health Professionals Warn." *New York Post*, New York Post, 17 Oct. 2019, nypost.com/2019/10/17/wearing-earbuds-regularly-could-cause-ear-infections-health-professionals-warn/.