Visualizing Health Awareness in the Middle East

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Abstract

We present an interactive tool that visualizes data on aware-ness of several health conditions in the Middle East. The un-derlying data is obtained via Facebook's Marketing API and includes rich demographic details. We discuss how this tool may be useful for planning more targeted public health cam-paigns and for monitoring campaign effectiveness.
Application URL: http://scdev5.qcri.org/sha/

Introduction

Poor health imposes a major economic and societal burden on most countries around the world. Globally, about 10% of GDP is spent on healthcare[1]. A large part of this burden is due to non-communicable diseases (NCDs) which claim 63% of all deaths worldwide.[2] To illustrate the scale of the problem, 39% of adults world-wide were overweight, and 13% were obese in 2014.[3] Countries in the Middle East feature prominently among the countries with the highest obesity rates (Qatar 41%, Kuwait 38%, United Arab Emi-rates 35%, Saudi Arabia 34%)[4]. These countries feature lifestyles coupling unhealthy, calorie-rich diets with avail-ability of housemaids and private cars (Kelishadi and others 2003). According to the "Transtheoretical Model of Behav-ior Change" (Prochaska and DiClemente 2005) and other "staged" models of behavior change, *awareness* of the health consequences of a behavior is a crucial element to taking action. Thus, numerous efforts have been implemented to raise awareness of these lifestyle choices, and to encourage behavior change. The assessment of health awareness has traditionally been done via surveys and community engage-ment. However, as social media platforms are beginning to permeate the daily interactions of users in the Arab world (Radcliffe 2016), we are presenting a tool that uses data from Facebook's advertising platform to visualize interest in health-related topics. Our tool falls under "Infodemiology and Infoveillance" (Eysenbach 2009) which "can be defined as the science of distribution and determinants of informa-tion in an electronic medium". The type of data set used by our tool has been used for scientific studies before (Gittel-man and others 2015; Chunara and others 2013), though not spanning several countries or involving any interactive data visualization. The dynamic interface we present here allows the application user to interact with the demographic and ge-ographic attributes of the Facebook user interest data, com-paring visually and numerically the health-related interests to a baseline of luxury-related ones.

Data Collection and Processing

Facebook's targeted advertising platform can be used to show ads to users matching certain demographic attributes and having certain topical interests[5], as inferred from their online behavior. Before launching the ad, and before any cost is incurred, the advertiser is provided with an audience estimate of the number of monthly active users matching the criteria. Facebook provides these so-called "reach esti-mates" via its Marketing API.[6] We use Facebook's API to collect data for interests related to eight diseases and con-ditions in 17 countries – all Arab League countries except Djibouti, Mauritania and Comoros, due to data sparsity, and South Sudan, due to ambiguity in the Facebook API con-cerning Sudan vs. South Sudan. The data is further broken down by gender, age group, education level and nationality. To help put the strength of interest in health topics into per-spective, we also collect data for five luxury related topics.

The Interface

The driving idea of the interface is to enable exploration of health awareness by comparing health and non-health inter-ests of Facebook (FB) users segmented by various charac-teristics (Figure 1). For instance, the number of FB users interested in health-related topics like *obesity*, can be put into perspective by comparing it to the ones interested in non-health-related topics like *shopping*. Once the interests are selected, demographic slices of the data are presented in tree maps on the left, with each segment colored with the *Health Awareness Score*. The user of our interface can se-lect a particular demographic (such as male gender), auto-

[1]https://goo.gl/DGioXt
[2]https://goo.gl/Gkvb3L
[3]https://goo.gl/dwpcdt
[4]https://goo.gl/zU9kDg
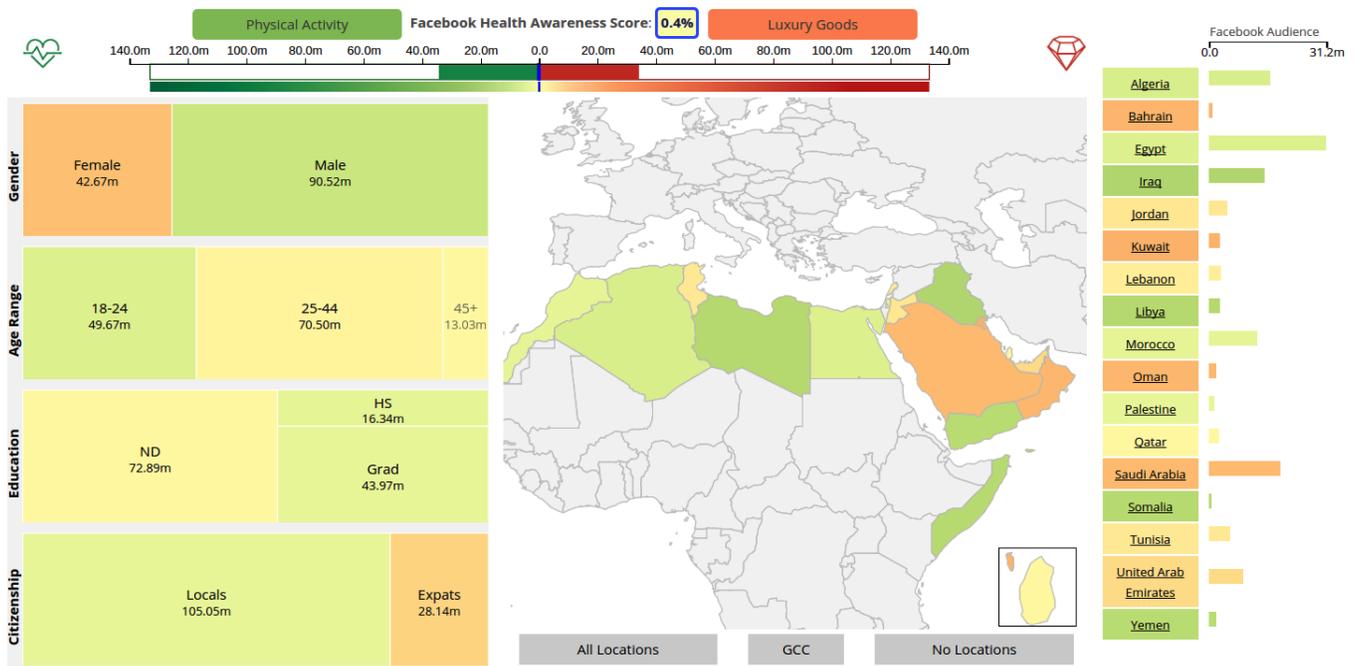
[5]https://goo.gl/209cQx
[6]https://goo.gl/LeAmkK

Figure 1: Our tool enables interactive exploration of Facebook user interests, here comparing relative levels of interest in "Physical Activity" and "Luxury Goods" in Arab countries. Green/Red colors indicate a higher interest in Health/Non-health related topics respectively. Hence, the user can contrast two categories of interest to have a baseline comparison.

matically updating all other demographic segments to correspond with the current selection.

Example Use Cases

Selecting the topic "Fast Food", the proportion of women is 50% higher than men on average in all countries. This reflects current studies (Alzaman and Ali 2016) highlighting fast food as one significant factor for the higher obesity among women compared to men in Arab countries. Selecting the topic "Luxury Goods", we notice that GCC [7] countries have a 60% relative higher proportion of people interested in this topic compared to other Arab countries. An explanation could lie in the fact that the GDP per capita in GCC is 8 times the average value in other Arab countries.[8]

Conclusions

Our tool can be used by health professionals to gauge the population's *health awareness*, hopefully leading to greater *health literacy* through more targeted campaigns for online health education (Nutbeam 2000). Using the application we notice that some observations can be backed up by official statistics, demonstrating the potential value of this tool.

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[7]Gulf Cooperation Council: Bahrain, Kuwait, Saudi Arabia, UAE, Oman, Qatar

[8]https://goo.gl/DXX7DI