# AMERICAN HEART ASSOCIATION

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# Executive Summary

The purpose of this report is to analyze American Heart Association's social media data and evaluate successful and unsuccessful content. In doing so, our primary goal is to provide relevant and effective recommendations to boost social media activity and engagement while maintaining the integrity of AHA's mission through using Brandwatch and Nodexl data.

# AHA Mission

To be a relentless force for a world of longer, healthier lives.

# Business Problem

While AHA has a large audience on social media with 310.3k followers on Twitter, they struggle to maintain engagement among posts in comparison to their following as well as their competitors. Their lack of engagement on posts hinders AHA's connection to its audience and its goal of raising awareness for heart disease.

# Questions

## Owned Data

- What accounts are interacting with AHA content?
- How do hashtags affect the success of a post?
- What types of posts lead to the highest engagement?

## Earned Data

- Who is participating in the conversation?
- How do our competitors compare in sentiment?
- Which theme portrays the most positive sentiment?

## Topic Data

- Who is the main demographic of the conversation about heart disease prevention?
- What is the general sentiment among posts regarding this conversation?
- What theme of preventing heart disease garnishes the most positive conversation?

# Data Overview

## Owned Data:

**Timeframe: March 21, 2022 - August 31, 2022**

**Volume: 356 Tweets**

**Platforms: Twitter**

## Earned Data:

**Timeframe: March 21, 2022 - August 31, 2022**

**Platforms: Twitter, Instagram, Blogs, Tumblr, Forums, Reddit, YouTube**

**Volume: 54,849 tweets**

**Themes: Stroke, Heart, Health, Risk**

**Competitors: The Heart Truth, World Heart Federation, Cardiovascular Research Foundation, Heart Rhythm Society**

## Topic Data:

**Timeframe: March 21 ,2022 - August 31 ,2022**

**Platforms: Twitter, Instagram, Blogs, Tumblr, Forums, Reddit, Youtube**

**Volume: 201,083 Tweets**

**Themes: Exercise, Mental Health, Healthy Eating**

# Data Limitations

We experienced data limitations as we collected our data via Brandwatch. This is because Brandwatch has limited access to Facebook and Instagram data.

# Key Performance Indicators (KPIs)

**Awareness (reach, impressions)**
**Engagement (followers, likes, retweets, mentions, hashtags, comments)**
**Sentiment (positive conversation, negative conversation, neutral conversation)**
**Share of voice (competitors)**

# Owned Data Recommendations

| What to do | How to do it | Why |
|---|---|---|
| Increase engagement on call-to-action posts, focusing on short, straight to the point content. | Post content that is easy to understand and short in length to keep the audience's attention. An example of this could be a post with a link to the nearest testing centers. | Twitter favors minimalism. Holiday and informative posts are short and to the point, gaining higher levels of engagement (page 9). |
| Boost website traffic by continuing to post health facts and other higher engagement combinations with AHA URL attached. | Continue to post successful health facts image content while linking AHA website in addition. | Combining high-engagement categories with less effective categories can boost average engagement (page 9). |
| Post more collaborative material with news outlets and affiliated organizations. | Develop weekly opportunities to work with or tag other organizations, mutually benefitting from increased user traffic. | Followers of a collaborating organization have the potential to see and interact with the AHA Twitter account (page 11). |
| Find creative ways to tie in mental health with heart health. | Develop informative mental health videos with heart information tied in. | The topic of mental health shows very strong levels of engagement, and can potentially lift up less engaging topics (page 10). |
| Include more hashtags within each post and find ways to incorporate broader hashtags. | Make it a goal to use 10 hashtags a week. Experiment with broad and popular hashtags like #CPR, #Heart, and #Health. | Hashtags can lead to more likes, retweets, etc. People like simple hashtags that can route them toward more content (page 10). |

# Earned Data Recommendations

| What to do | How to do it | Why |
|---|---|---|
| Increase female engagement. | Post content that resonates more with the female crowd. Specifically mention ways females are affected by heart disease and steps they can take to prevent it. | Heart disease is the leading cause of death for women. AHA should focus on evening its reach between men and women (page 13). |
| Generate more positive sentiment. | Contribute to conversations about outside benefits and fundraisers related to AHA. | Interacting with the audience will create a sense of authenticity among the AHA name, thus creating a more positive sentiment (page 14). |
| Collaborate with influential users. | Partner with industry leaders and celebrities by tagging them in AHA posts. For example, having a celebrity recipe or workout routine of the month. | AHA does not have any influential users that are mentioning AHA. Partnering with Influencers will reach a wider audience and get people talking on social media. In terms of our competitors, most mentions come from tweets from respected doctors and industry leaders (page 13). |
| Host and advertise AHA events. | Create event hashtags that attendees can use while posting about the event. | Our competitors receive the most buzz around the time that they hold events. Attendees get involved on social media to promote the event on their own (page 24). |

# Topic Data Recommendations

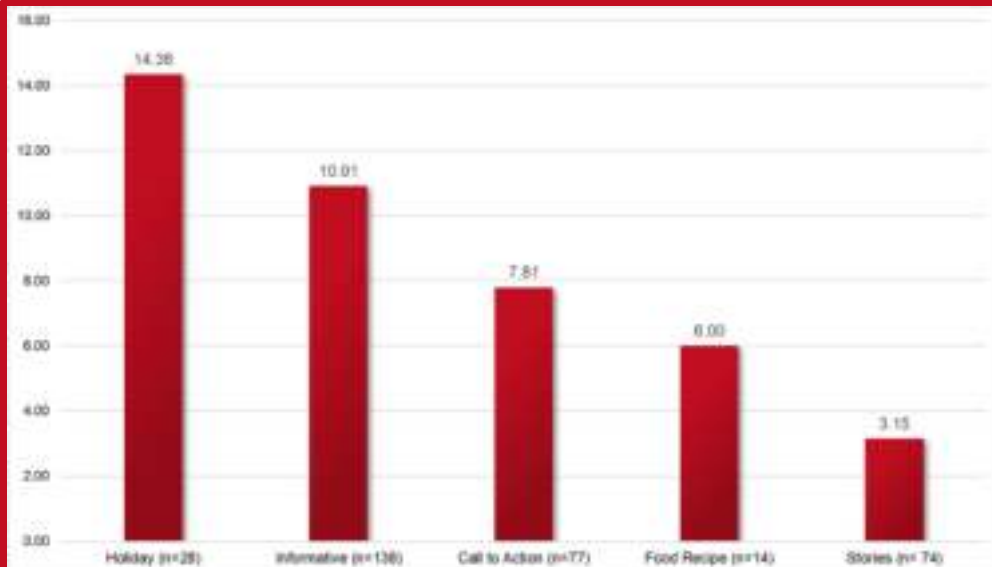| What to do | How to do it | Why |
|---|---|---|
| **Focus on promoting the different ways to prevent heart disease equally (exercise, mental health, and healthy eating).** | **Incorporate the use of hashtags such as #mentalhealth, #hearthealthy, and #exercise and graphics to spread awareness of all ways to prevent heart disease.** | **There is a disproportionate amount of conversation surrounding healthy eating (n= 72,878) compared to other themes such as mental health and exercise. It is important to have a conversation surrounding all themes, not just one in particular in order to raise the most awareness (page 32).** |
| **Incorporate the discussion of other diseases and conditions that can have negative effects on or result from heart disease.** | **Partner with other organizations to create informative posts detailing the ways diseases can have secondary effects on someone.** | **In many posts concerning heart disease, there are other conditions mentioned. Oftentimes, these conditions are the theme of the post, and heart disease is a subtopic (page 29).** |
| **Continue to post healthy recipes and diets that promote heart health.** | **Post healthy recipes in tweets or post an image including a recipe at least twice a week.** | **Healthy eating was the biggest theme among the topic data, making up 83% of the data. It is popularly talked about on Twitter and recipe posts have the potential for high engagement (page 32).** |
| **Consider incorporating smaller, more niche topics that users might not be familiar with.** | **Post up-to-date research as it develops, ensuring AHA is at the heart of viral posts sharing new information on the topic of cardiovascular health.** | **Spikes in activity surrounding heart disease, mental health, exercise, and eating often dealt with lesser-known topics, going viral due to their new and informative position (page 30).** |

# Owned Data American Heart Association

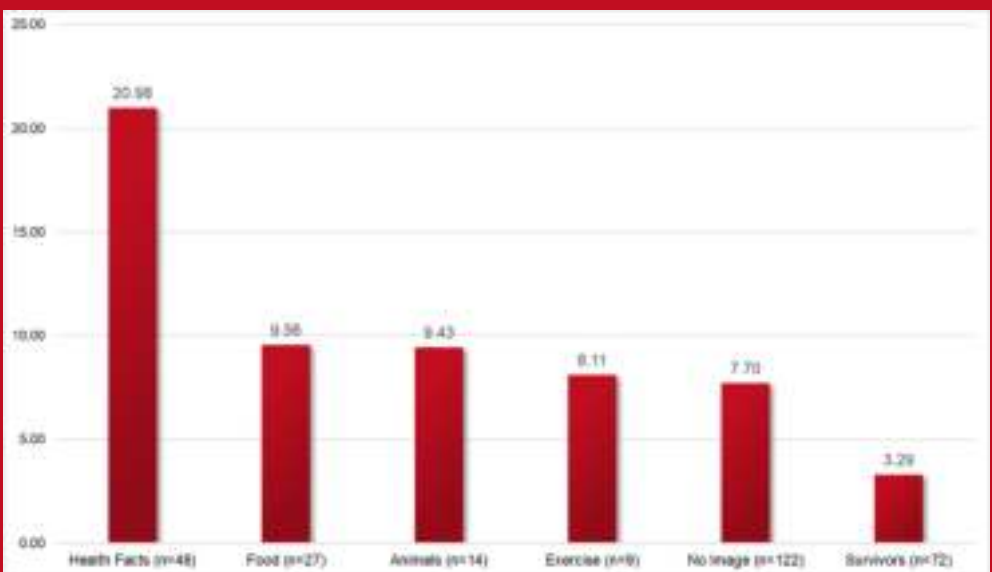# Actionable Insights

## Average Engagement by Theme



n=356
Not shown: Other (n=25)

Looking at the theme of posts, the holiday category received the highest engagement with an average engagement of 14.36. Although the holiday category has the second lowest total (n=28), it has a significantly higher average engagement than the rest of the categories. In general, the holiday-related tweets displayed spontaneity among the rest of the AHA feed. Among some of the holidays were national dog day, Father's Day, and National Avocado Day. In each case, the holiday was related back to AHA or heart health. It is evident that the audience responds well to short and sweet content as holiday and informative performed the best with a combined average of 25.27. On the other hand themes such as food recipes and stories require more attention and time and thus, received lower engagement. An example from the stories category is a survivor sharing their experience with heart disease, heart attacks, or stroke.

## Average Engagement by Image Type



n=356
Not shown: Other (n=64)

Looking at image types, the health facts category received the highest engagement with an average of 20.98 engagements per post. Health fact images typically contain facts and information regarding heart health (heart disease, stroke, CPR, etc.) Health facts overwhelmingly surpass the engagement of all other image types. Survivors have the lowest engagement, while having the largest total of posts. This shows that although survivors are posted more often, t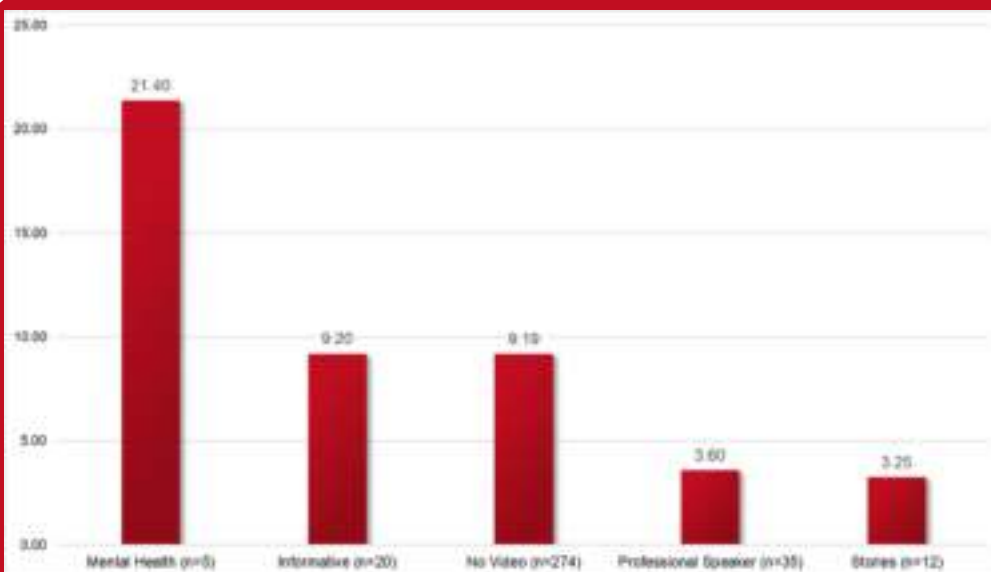he audience cares more about posts with health facts. This could be due to the fact that one of the goals of the American Heart Association is to inform the public about heart health. Another factor could be that health fact images are filled with information and graphics, which grabs the attention of the audience because it could possibly relate to them.

# Average Engagement by Hashtag



n=356
Not shown: Other (n=7)

Out of all hashtag types, information hashtags have the highest engagement with an average engagement of 17.25. An example of what an information hashtag that American Heart Association would use is #strokewarningsigns. Hashtags like this are most likely linked to tweets containing more information about the stroke warning signs. It is a possibility that informational hashtags perform well because they are broad and can reach a wide audience. It is noteworthy that the total of no hashtags within the dataset is 244.

That means that a big majority of the posts we analyzed did not include hashtags. This could be an area of improvement for the American Heart Association's Twitter, because using hashtags would expose their tweets to a large audience while also driving more engagement. Event hashtags have the second-highest engagement of 12.12. An example of an event hashtag is #bestfriendfridays. Call-to-action hashtags had the lowest engagement of 6.5. An example of this is #knowyournumbers2022.

# Average Engagement by Video Type



n=356
Not shown: Other (n=6)

Roughly one in five tweets posted by the American Heart Association contain video content. The topic of mental health has proven to be quite a talking point, with over twice the level of engagement when compared to other video categories. Shorter videos focused on sharing information and quick facts have also shown their worth, procuring a reasonable amount of engagement. Professional speaker videos do not gain much traction on the AHA Twitter feed. The fast-paced environment of Twitter might have users hesitant to interact with a 12-minute video, regardless of its subject matter. Stories and survival testimonials gain the least traction. While these stories tend to be heart-warming and or uplifting, Twitter is a fast-paced platform, and is often checked while on break, riding a bus, etc. Users might not have the appropriate time or desire to stop their scrolling and watch a full testimonial video. Therefore, AHA should post videos with a maximum length of 3 minutes on Twitter.

# Average Engagement by URL Type
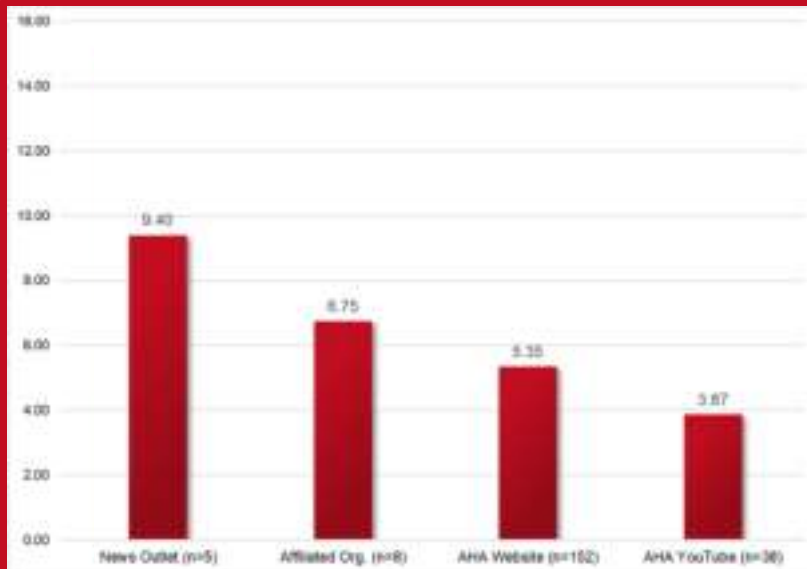


n=356
Not shown: Other (n=16)

Looking at posts containing URLs, news outlets and affiliated organizations received the most traction among users. This is potentially due to the overlapping audience from organizations tagged in AHA tweets. Additionally, these organizations might make posts of their own during collaborative ventures with the AHA, leading users to explore the AHA Twitter account. News outlets also tend to share more captivating stories, which can result in higher levels of engagement. While tagging organizations in collaborative posts has been beneficial for engagement, the AHA only has 13 tweets mentioning news outlets and affiliated organizations. The AHA Website has the second lowest engagement among URLs despite having a large number of posts (n=152). This could be the case because the tweets posted with the website tend to be not engaging or exciting as tweets linked to news outlets. In addition, the content of tweets linked to AHA tend to have repeated information.

# High Engagement Post Examples

# Earned Data American Heart Association

# Earned Data Overview

Timeframe:
March 21st, 2022 to
August 31st, 2022

Total mentions: 65,400

## Top Platforms

Tumblr 10%
Blogs 6%
Twitter 84%

n= 54,849
n= 6,514
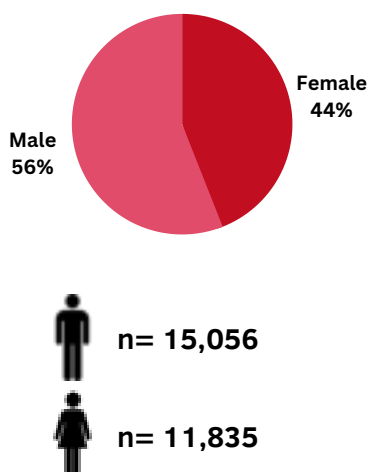n= 4,037
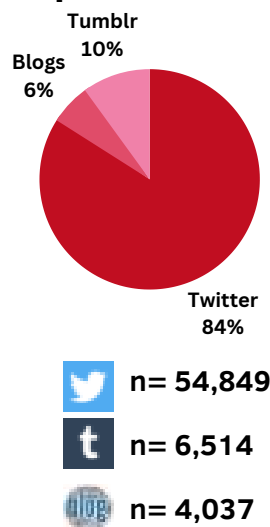
The American Heart Association receives the most attention on Twitter, with almost 60,00 mentions since March of 2022. Some of the biggest external fundraisers and survivor stories have gained traction on Twitter. Tumblr and blog posts make up only 17% of mentions.

## Gender Breakdown

Female 44%
Male 56%

n= 15,056
n= 11,835

Based on heart health being a gender-neutral topic, it is easy to understand why the volume of posts between men and women only differs by 6%.

## Sentiment Breakdown

Positive 20%
Negative 11%
Neutral 69%

n= 13, 693
n= 48,016
n= 7,782
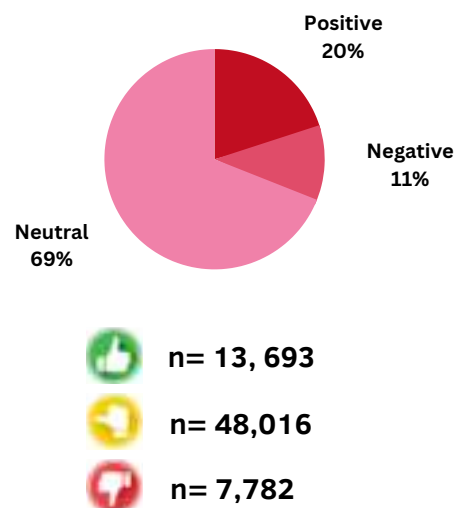
Roughly two-thirds of all mentions are neutral, meaning the conversation was not emotionally charged. Positive and negative mentions share a similar amount of mentions.

# Influential Users

The American Heart Association does receive social media attention from other organizations at times but receives very little if any, attention from influential users. At times, doctors or health specialists with a few thousand followers might make a post in regard to the AHA. This insight is very important because AHA is missing out on a lot of potential new audiences that they could reach if more influencers were mentioning them. Influential users have a big power on social media today, and more conversation about AHA from influential users would be very beneficial.
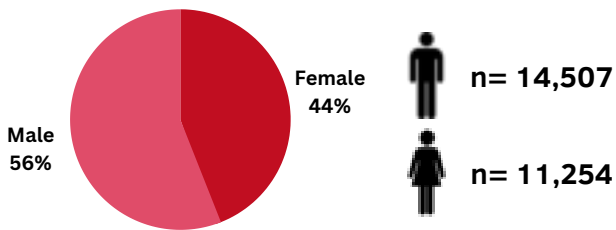
# Twitter Breakdown

## Gender Breakdown

Female 44%

Male 56%

n= 14,507
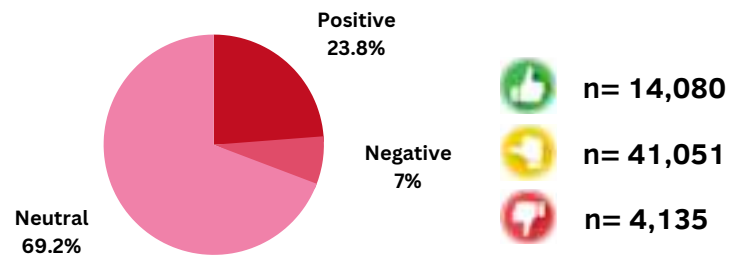
n= 11,254

Gender breakdown on Twitter is parallel with the overall breakdown, indicating a consistent divide among genders across platforms.

## Sentiment Breakdown

Positive 23.8%

Negative 7%

Neutral 69.2%

n= 14,080

n= 41,051

n= 4,135

Twitter sentiment also follows a similar trend as overall earned data sentiment, with the only noticeable difference for the platform being the 4% increase in positivity.
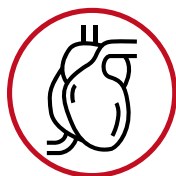
## Trending Topics

Heart Walk

Heart Health

Cardiovascular Health

Scientific Statement

Cardiovascular Disease

## Top Links

### FTR: Fight Like an 8 Year Old Girl T-shirt Link

The most popular link shared sends users to an online shop selling a shirt with the message: "Fight Like an 8-Year-Old Girl." Professional Wrestler Dax Hardwood created these shirts for his daughter who deals with a heart condition. All proceeds go to American Heart Association.

### American Heart Association Spotify Playlist Link

Another popular shared link brings up a Spotify Playlist curated by the American Heart Association. The playlist includes songs with a BPM (beat per minute) of 102, the number of compressions you should complete per minute when performing CPR

## Narrative Sentiment Breakdown

Survivor Stories   Donations

Happy Heart

Benefits   Charity

Studies   Factual Information

Lowering Risk of Heart   Problems

Heart Attack

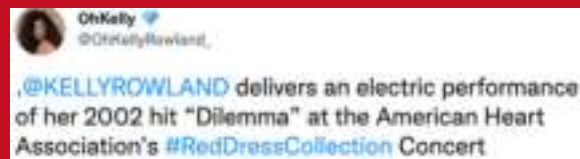Blood Clots   Stroke   Hospitalization

Death

Positive sentiment involved conversations of uplifting stories of raising money for research and survivors. An example of this is the fight like an 8-year-old girl campaign. Neutral sentiment involved conversation surrounding scientific studies and fact-based knowledge. An example of this is new information regarding heart disease research. Negative sentiment involved conversation surrounding the negative effect of heart disease such as death and hospitalization.
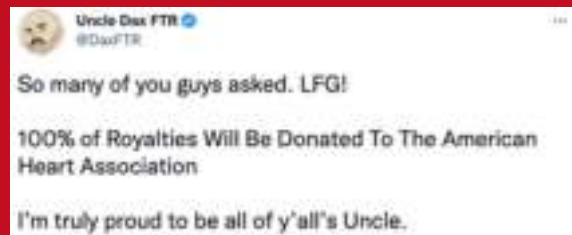
# Spike Analysis - Twitter



Spike A
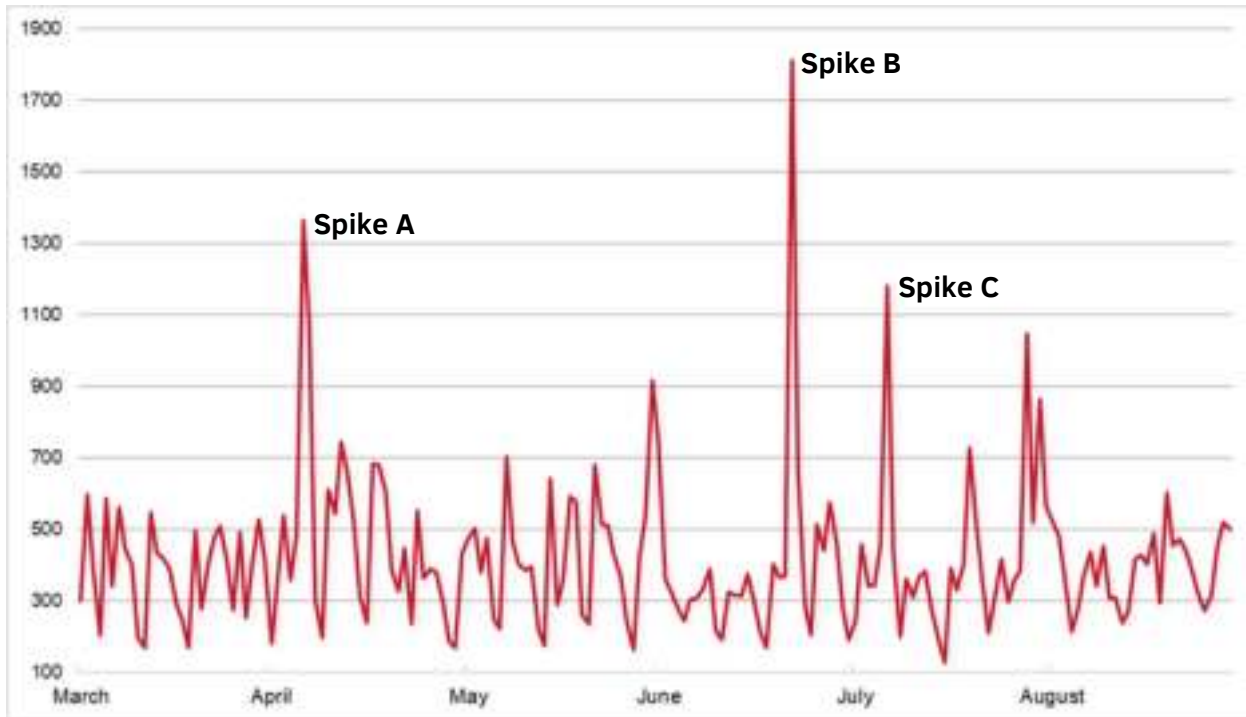
Spike B

Spike C

**Spike A | Occurred on May 5th, with 1,306 mentions. Famous Artist Kelly Roland performed at American Heart Associations Red Dress Collection Concert.**

OhKelly
@OtKellyRowland,

,@KELLYROWLAND delivers an electric performance of her 2002 hit "Dilemma" at the American Heart Association's #RedDressCollection Concert

**Spike B | Occurred on July 21st, with 1,577 mentions. Professional wrestler Dax Hardwood tweets about his 8-year-old daughter's heart condition. He tweeted a link to a shirt he designed where 100% of the royalties will be donated to the AHA.**

Uncle Dax FTR
@DaxFTR

So many of you guys asked. LFG!

100% of Royalties Will Be Donated To The American Heart Association

I'm truly proud to be all of y'all's Uncle.

**Spike C | Occurred on August 5th, with 1,072 mentions. Another tweet from wrestler Dax Hardwood became popular. In his tweet, he shouted out his daughter Finley and issued a thank you for making the "Fight Like an 8-Year Old" shirt the number 1 selling shirt of the week.**

FIGHT LIKE AN 8 YEAR OLD GIRL

Uncle Dax FTR
@DaxFTR · Follow

She's the most badass person I know.

100% of all royalties are directly donated to the American Heart Association. Thank you guys for making it the #1 selling shirt of the week. Finley thanks you too!!

# Blog and Tumblr Breakdown

## Blog Sentiment

Negative 4%  Positive 2%

Neutral 94%

n= 85
n= 3,796
n= 156
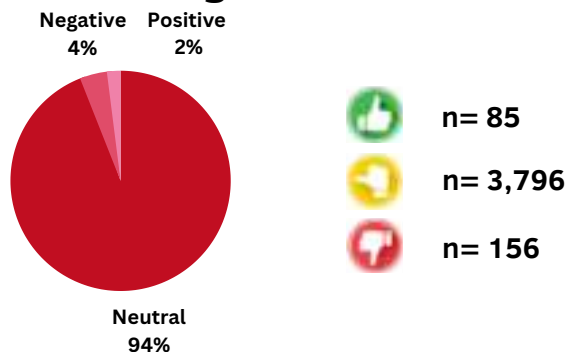
Blog posts are almost entirely neutral. This is likely due to the longer, more complex type of posts seen on blogs in comparison to short Twitter posts. The more complex a post, the harder it is to tag a single sentiment to a post.

## Tumblr Sentiment

Positive 2%

Neutral 52%

Negative 46%

n= 93
n= 3,397
n= 3,024
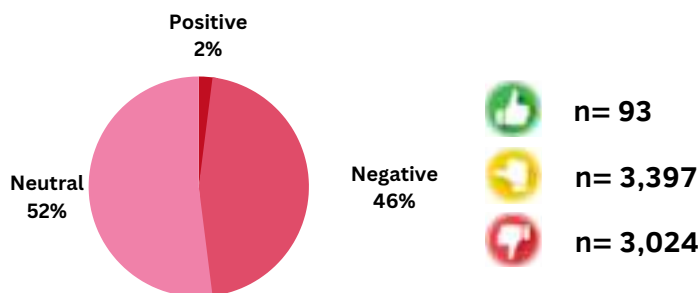
A vast majority of Tumblr posts are also emotionally neutral. There are very few emotionally positive posts on Tumblr, with 1 in every 4 posts seen as negative.

# Trending Topics

## Blog Trending Topics

Cardiovascular Disease

AHA Guidelines

AHA Task Force

High Blood Pressure

## Tumblr Trending Topics

Weight Loss

Heart Health

New Study

Cardiovascular Health

The trending topics for blogs relate more closely to AHA, whereas Tumblr trending topics relate to more broad ideas. This could be the case because blogs are referring to certain actions taken by AHA with personal knowledge of the subject matter, whereas Tumblr might be just quick posts relating to the broader topics.

# Spike Analysis - Blog
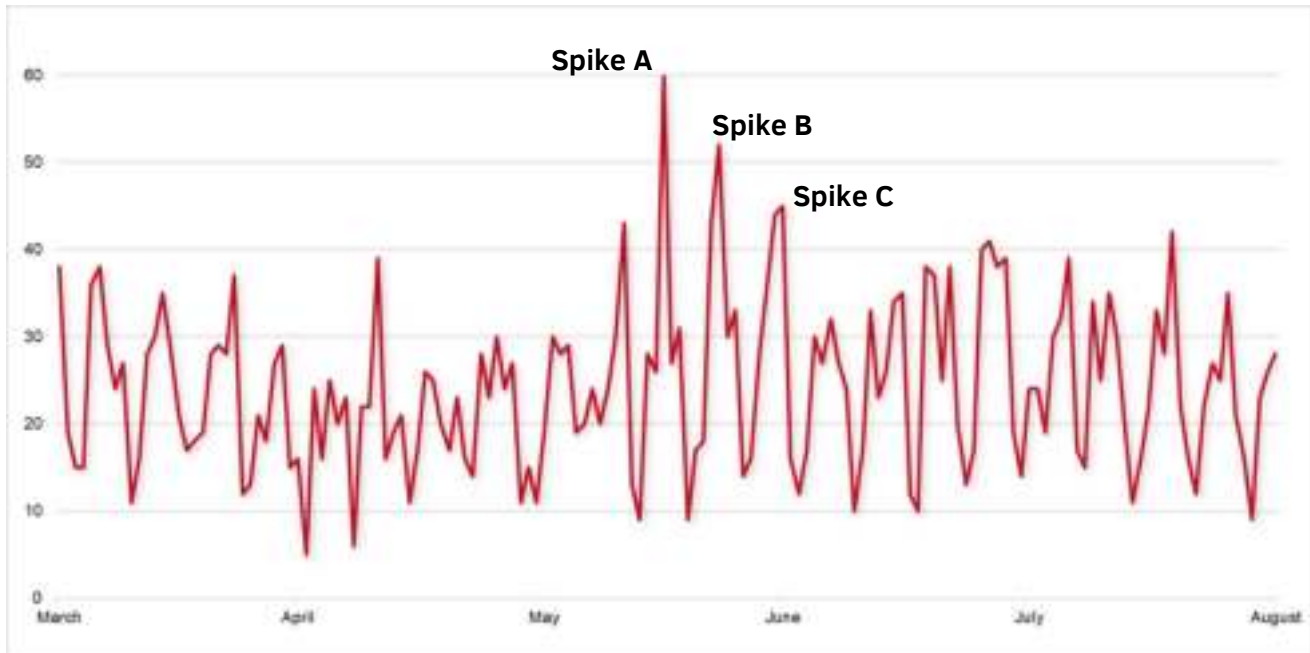


Spikes A, B, and C, occurring on June 15th, June 22nd, and June 30th respectively, all stem from a single user by the name of *Edzelco* on a medical website: Wikidoc.org. User *Edzelco* is known formally as Dr. Edzel Lorraine Co, an accomplished doctor with a hand in hundreds of research papers and publications.

All three spikes occurred within a span of 15 days as Dr. Co mentioned The Hearth Rythm Society, World Heart Federation, and most notably, The American Heart Association over 75 times in multiple wikidoc.org research papers covering congestive heart failure, which included an extensive list of suggestions to combat the condition.

Dr. Edzel Lorraine Co

# Spike Analysis - Tumblr
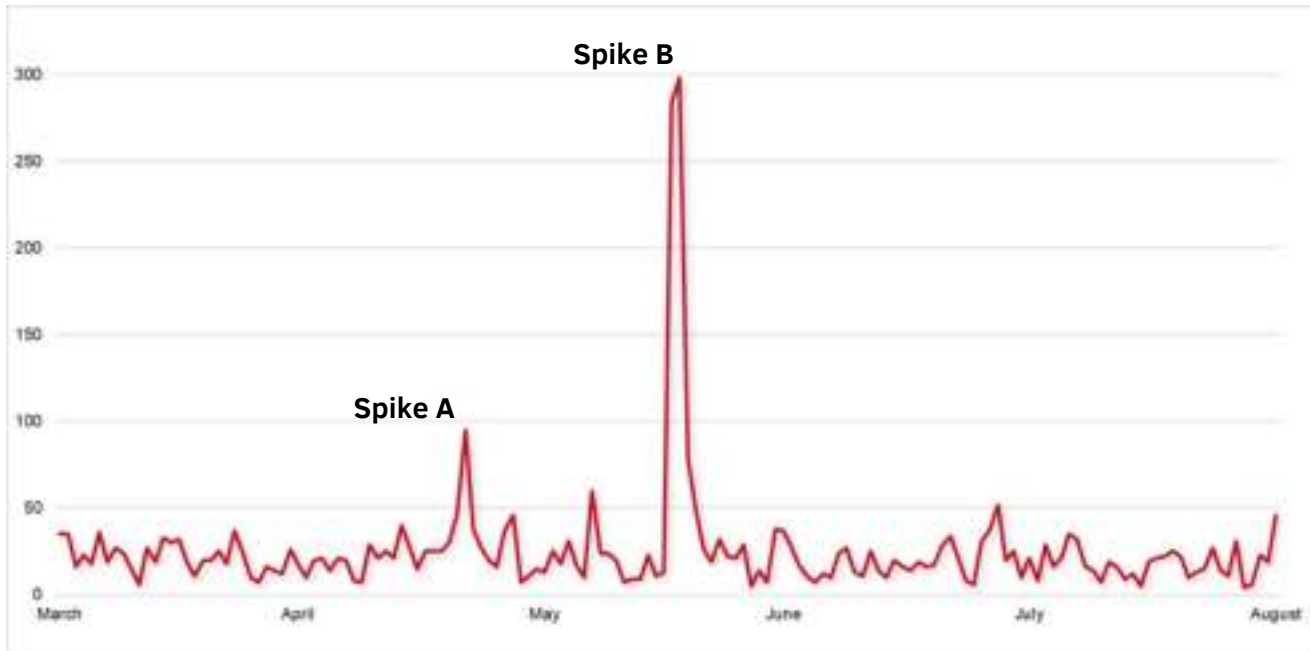


**Spike A | Occurred on May 21st, when Tumblr user _prozdvoices_ posted about his fundraising goal to raise money for the American Heart Association and Play F.A.S.T. with PRIDE,** a movement to raise awareness for stroke prevention. _Prozdvoices_' post was reblogged 95 times on the platform.

**Spike B | Occurred on June 18th, as 660 users reblogged a post from Tumblr user _ms-demeanor_. The original post was made in regard to misinformation surrounding weight loss. _ms-demeanor_ mentions that losing one pound a day is actually quite a fast track for individuals, criticizing the American Heart Association's more progressive stance on the topic.**
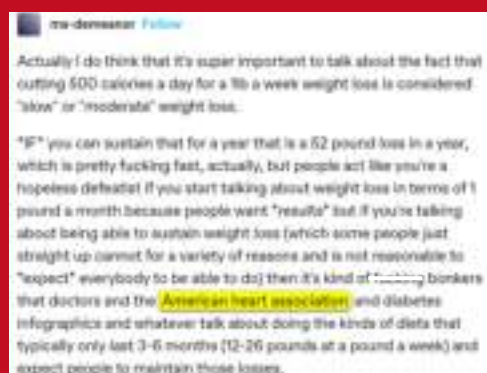
# AHA Earned Data
# Theme Analysis

# Theme Analysis

## Stroke

### Sentiment Breakdown

Positive 13%
Negative 8%
Neutral 79%
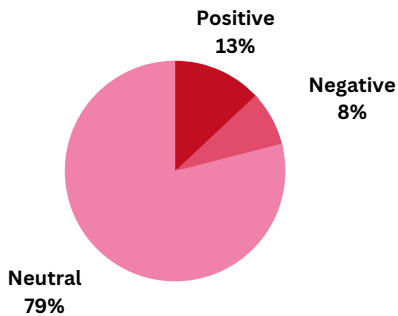
**3,374 mentions**

### Gender Breakdown

Female 43%
Male 57%
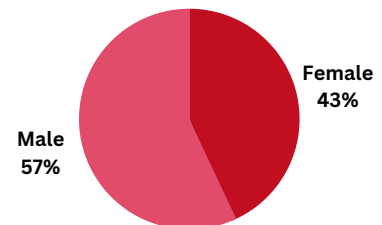
Posts surrounding the theme *Stroke* typically involve conversations about stroke survivors, research, and guidelines. Using the boolean code *stroke OR #stroke*, the theme had 3,374 total mentions making up 5.16% of the data. Of the 3,374 posts, more males were involved in the conversation (n=794) compared to females (n=592). Conversation is similar between genders. In terms of sentiment, the majority of conversation is neutral (n=2,662) with smaller numbers in positive (n=426) and negative (n=286). Positive sentiment conversations revolved around the celebration of doctors, researchers, and institutions regarding their advancement of stroke research and treatments. For negative sentiment, conversation was focused on warning signs and the effects of strokes.

## Health

### Sentiment Breakdown

Positive 12%
Negative 7%
Neutral 81%
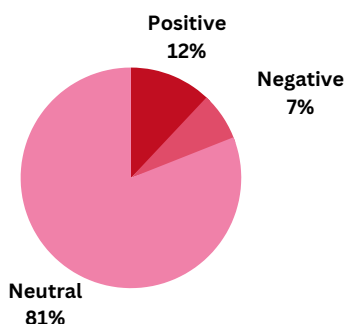
**5,523 mentions**

### Gender Breakdown
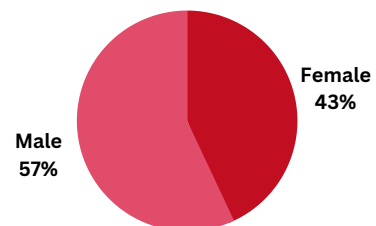
Female 43%
Male 57%

The theme H*ealth* relates to conversation surrounding heart health, ways to improve health and health research. Using the boolean code *health OR #health*, the theme had 5,523 total mentions making up 8.44% of the data. Males (n=1,247) and females (n=939) were similar in their contribution to this theme with a 14% difference. Conversation was similar among genders. In regard to sentiment, neutral (n=4,487) conversation took the majority followed by positive (n=671) and negative (n=365). Positive conversation mentions AHA and its improvements to health research, guidelines, and their advocacy of heart health. Negative conversations are about negative topics such as death and heart attacks. However, the conversation itself is not a negative reflection of AHA, rather it just deals with topics with a naturally negative connotation.
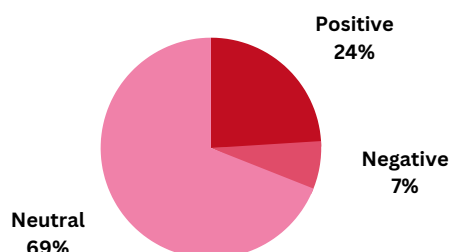
# Heart



## Sentiment Breakdown



Positive
24%

Negative
7%

Neutral
69%

**34,433 mentions**

## Gender Breakdown



Male
45.5%

Female
54.5%
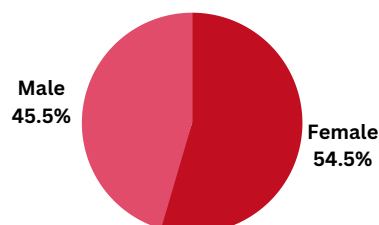
The most popular theme of the data set is *Heart*. Using the boolean code *heart OR #heart*, the theme had **34,433 total mentions making up 52.65% of the data. The theme heart has overall conversation about heart disease, AHA, and health regulations. Males (n=8,634) have the majority in conversation compared to females (n=7,221). Females tend to talk more about promoting fundraisers compared to males. In the sentiment breakdown, there is a much larger percentage of positive (n=8,207) conversation. The majority is still neutral (n=23,769) and some negative (2,457). Positive conversation largely involved the fundraiser "Fight Like an 8-Year-Old Girl" as well as other fundraisers for AHA. Negative conversation is similar to the health theme where it talks about the effects of heart disease, which tend to be more of a negative subject. The actual conversation, however, is not negative as a whole.**

# Risk



## Sentiment Breakdown



Negative
9%

Positive
2%

Neutral
89%
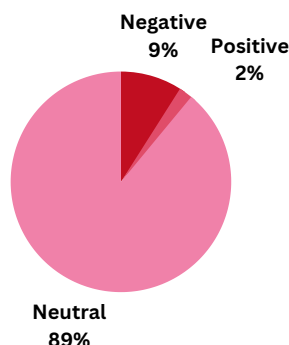
**2,571 mentions**

## Gender Breakdown



Female
37%

Male
63%
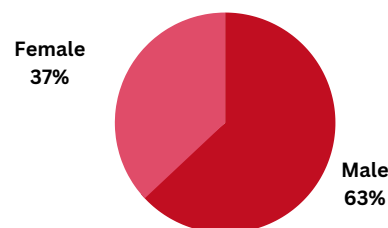
*Risk* **refers to conversation about health risks, warning signs, and risk factors. Using the boolean code** *risk OR #risk OR "health risk" OR "warning signs"* **the theme had 2,571 total mentions making up 3.93% of the data. Men (n=724) overwhelmingly contributed to the conversation, posting twice as much compared to women (n=427). Conversation is similar between genders. In the sentiment breakdown, neutral (n=2,280) conversation is the clear majority with negative (n=230) leading over positive (n=61). Negative conversation is about factors that increase the risk for heart disease. Positive conversation involves ways to reduce risk as well as scientific advancements.**
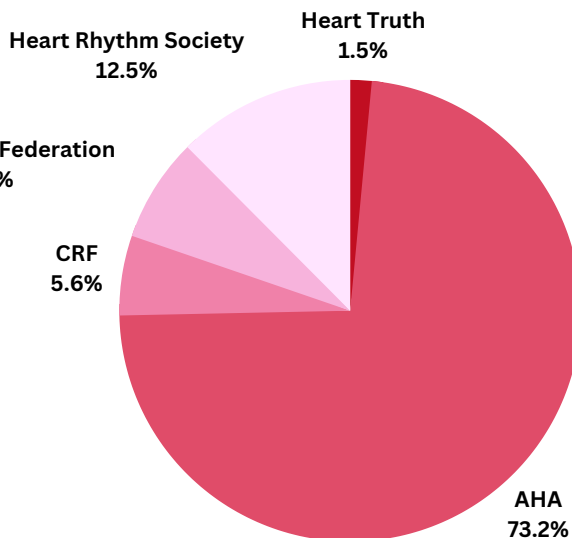
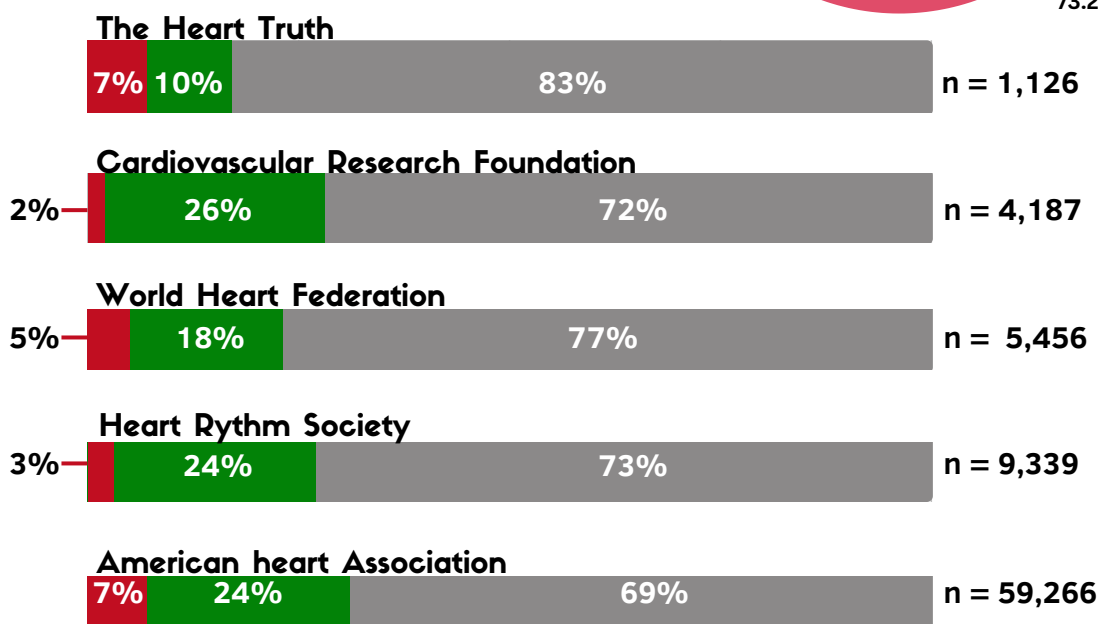# AHA Comparable Organizations

# Comparable Organization Overview

## Share of Voice

American Heart Association: n = 54,849
World Heart Federation: n = 5,456
Heart Rhythm Society: n= 9,339
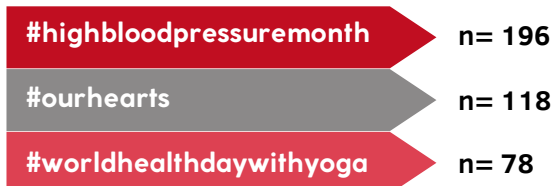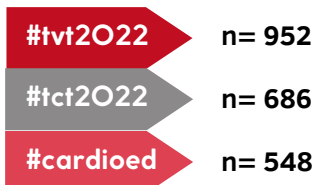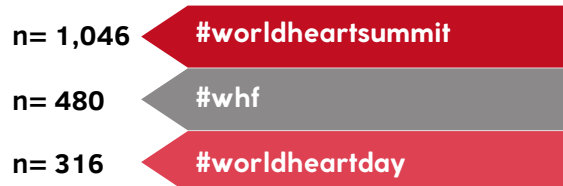Cardiovascular Research Foundation: n= 4,187
Heart Truth: n = 1,126

**Heart Rhythm Society**
**12.5%**

**Heart Truth**
**1.5%**

**World Heart Federation**
**7.3%**

**CRF**
**5.6%**

**AHA**
**73.2%**

## Sentiment Analysis

**The Heart Truth**

| 7% | 10% | 83% | n = 1,126 |

**Cardiovascular Research Foundation**

2% — | 26% | 72% | n = 4,187 |

**World Heart Federation**

5% — | 18% | 77% | n = 5,456 |

**Heart Rythm Society**

3% — | 24% | 73% | n = 9,339 |

**American heart Association**

| 7% | 24% | 69% | n = 59,266 |

## Hashtag Analysis

### The Heart Truth

#highbloodpressuremonth    n= 196
#ourhearts    n= 118
#worldhealthdaywithyoga    n= 78

### World Heart Federation

n= 1,046    #worldheartsummit
n= 480    #whf
n= 316    #worldheartday

### Cardiovascular Research Foundation

#tvt2O22    n= 952
#tct2O22    n= 686
#cardioed    n= 548

### Heart Rythm Society

n= 2,639    #epeeps
n= 2,614    #hrs2O22
n= 1,884    #hrs
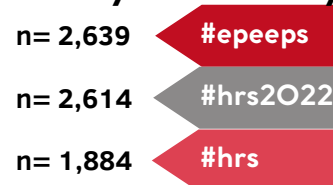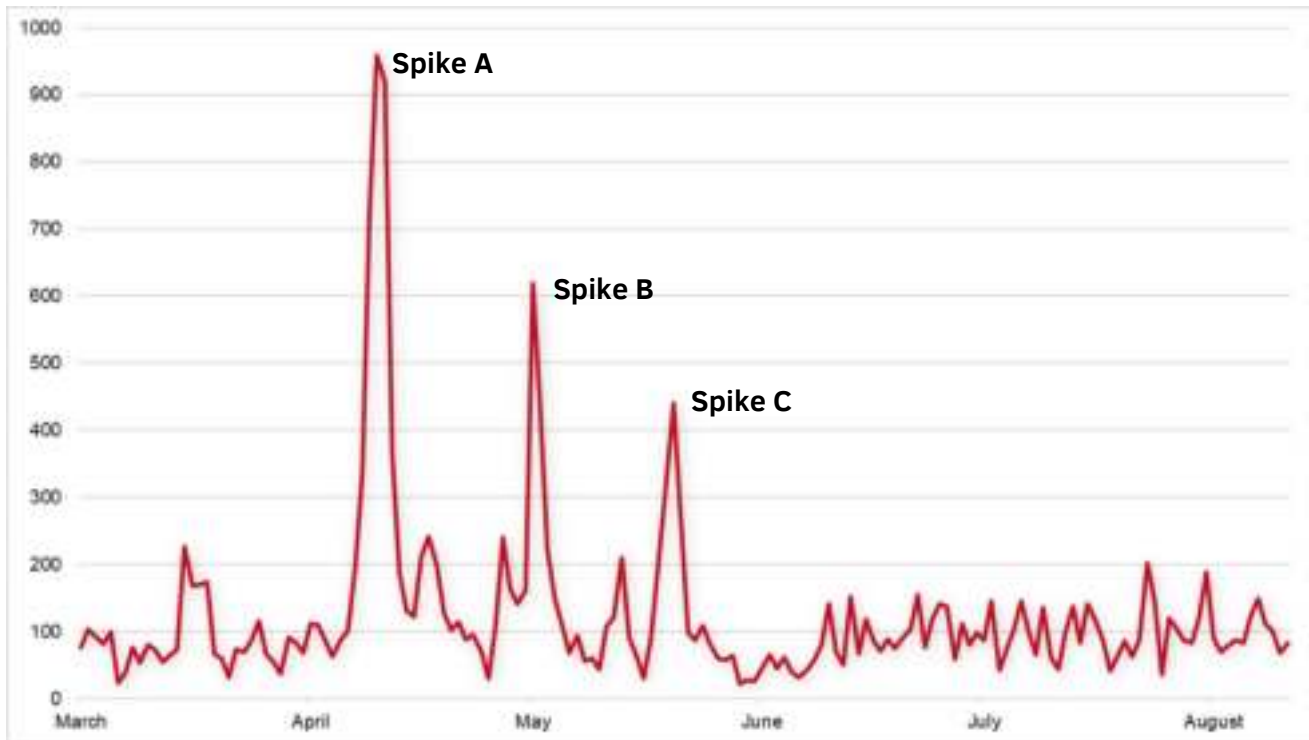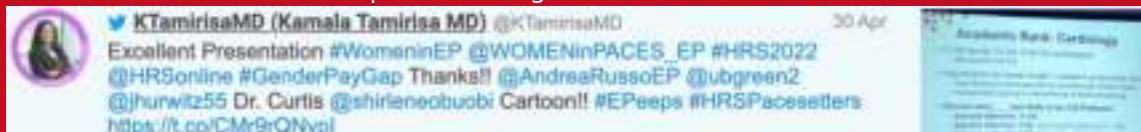
# Competitive Spike Analysis



**Spike A | Occurred on April 30th, with a 977% increase in activity and 959 mentions about The Heart Rhythm Societies' annual event. HRS2022 is an exhibition about electrophysiology. Attendees promoting the event and congratulating speakers created a Twitter buzz.**

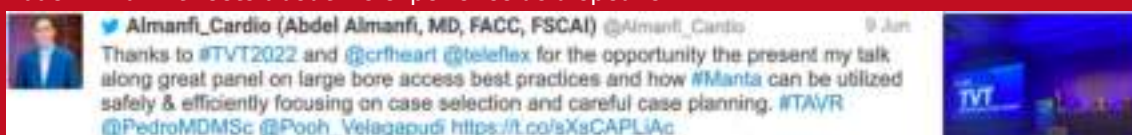Kamala Tamirisa commends a presentation given at the event:



**Spike B | Occurred on May 21st, with 721 mentions using the hashtag #worldheartsummit. The event happens annually and brings together professionals from all over the world. Attendees tweeted live during the event, giving updates on the content shared.**
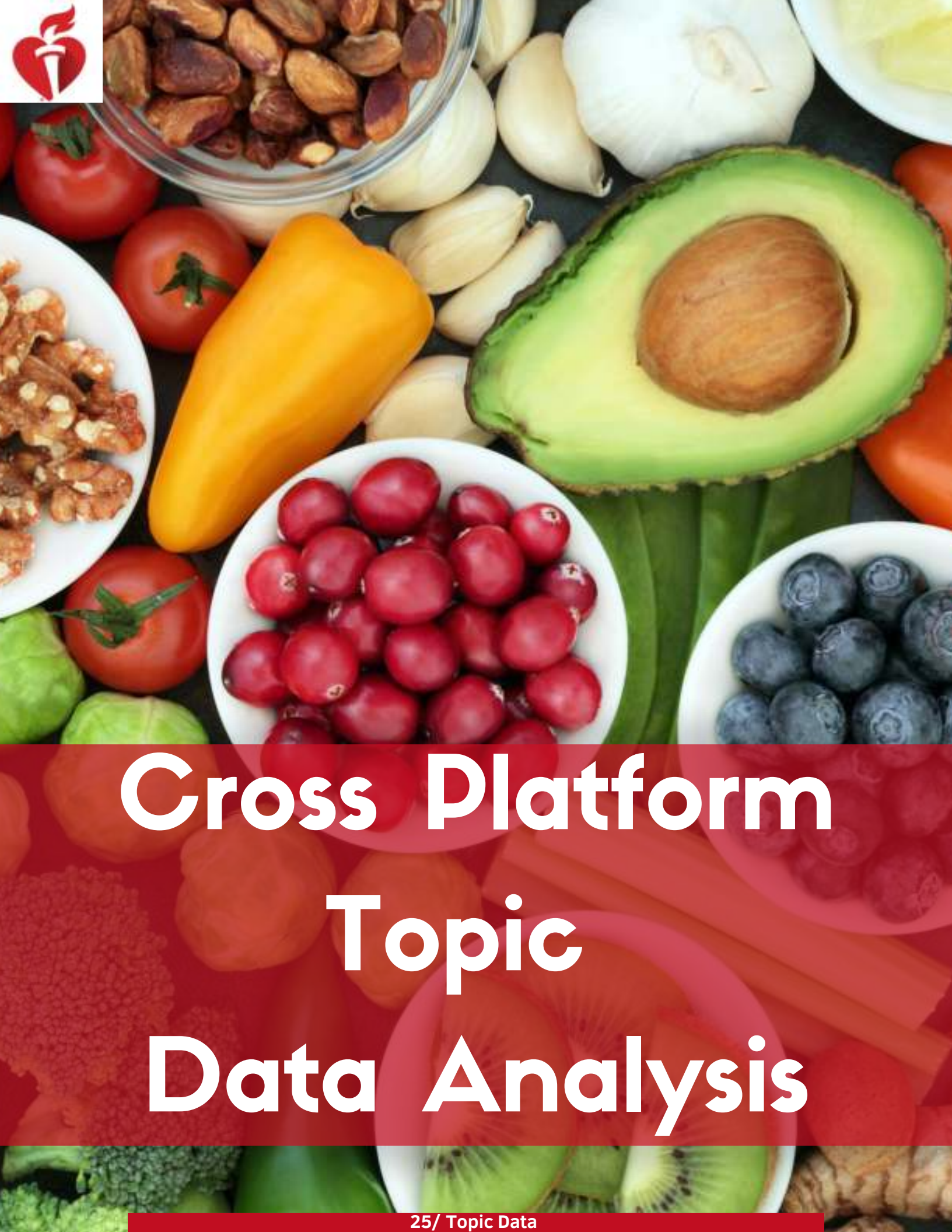
Lilian Mbau tweets about the opening ceremony of the summit:
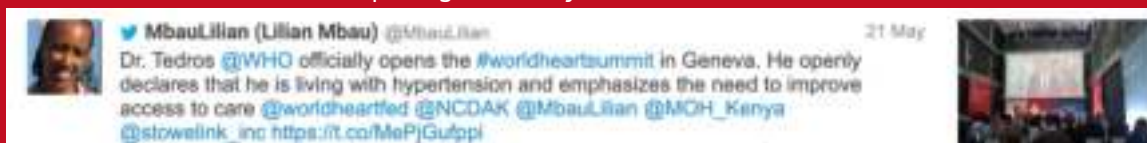


**Spike C | Occurred on June 9th, with a 394% increase in activity from the hashtag #tvt2022. TVT represents the Structural Heart Summit which occurs annually in Chicago, Il. The networking event put on by the Cardiovascular Research Fund had 440 mentions. Speakers and attendees provided recaps of the event via Twitter, causing a spike.**

Abdel Almanfi tweets about his experience as a speaker:
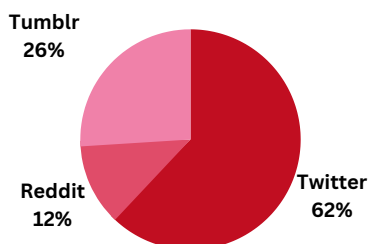
# Cross Platform Topic Data Analysis

# Topic Data Overview

## Top Platforms

Tumblr
26%

Reddit
12%

Twitter
62%

n= 201,083

n= 85,337

n= 38,879

Of the 382,058 mentions, Twitter, Tumblr, and Reddit make up the majority of the conversation. Twitter has a strong majority of mentions with 62% while Tumblr and Reddit have a combined 38% of mentions.

## Gender Breakdown
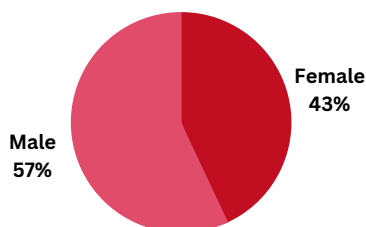
Female
43%

Male
57%

n= 53,374

n= 40,944

Males make up the majority of conversation surrounding heart disease prevention, but not by a lot. There is only a 12% difference between males and females due to the fact that heart disease affects both genders.

## Sentiment Breakdown

Negative
25%

Positive
2%
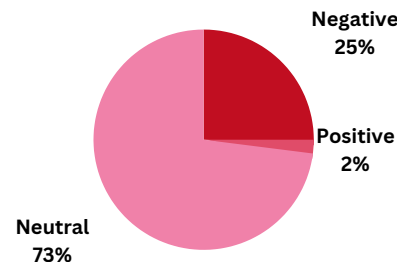
Neutral
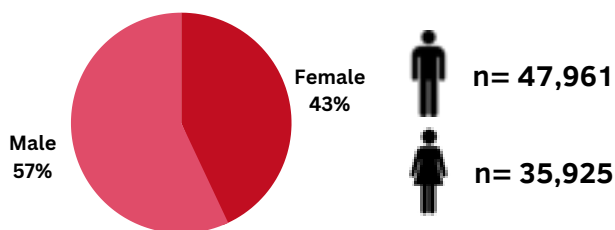73%

n= 8,661

n= 278,353

n= 95,043

Neutral sentiment covers an overwhelming majority of posts with negative sentiment being close behind. Positive sentiment only makes up 2%. Most positive conversation involves good news surrounding progression in the fight against heart disease. While neutral conversation involves what to do to prevent heart disease. Negative sentiment talks about the risks of not taking preventative steps

# Twitter Breakdown
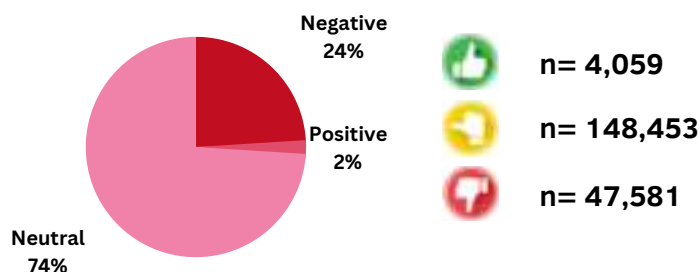
## Gender Breakdown

Female
43%

Male
57%

n= 47,961

n= 35,925

Gender breakdown is the same on Twitter as on all platforms. This makes sense given the fact that preventing heart disease is a gender-neutral topic for the most part.

## Sentiment Breakdown

Negative
24%

Positive
2%

Neutral
74%

n= 4,059

n= 148,453

n= 47,581

Sentiment breakdown is also very similar to all platforms with a 1% difference in neutral and negative conversation.

**Top Hashtags:**
#health, #heart, #heartdisease, #hearthealth, #harvardhealth
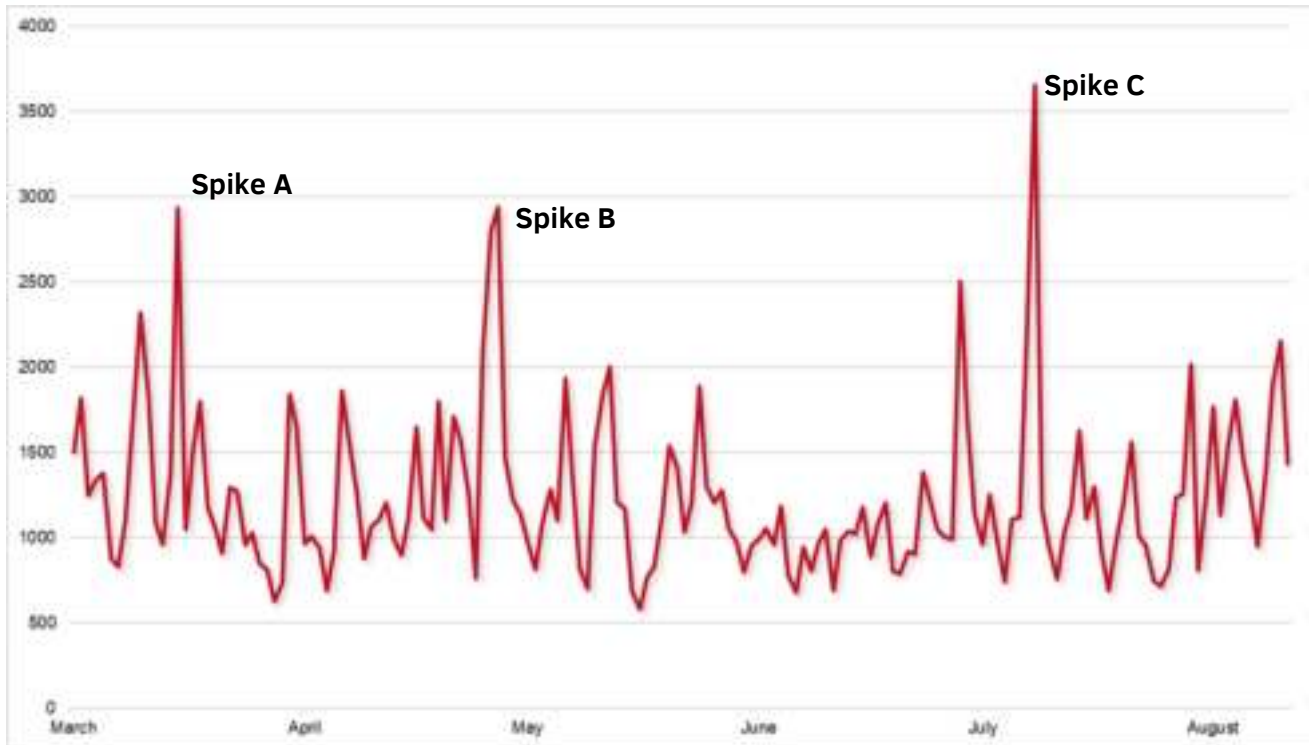**Top Links:**
Nature article: Heart disease after COVID, Harvard Health Article: COVID-19 diagnosis raises risk of heart attack, stroke, New York Times article: How to Master the Push UP
**Trending Topics:**
high blood pressure, risk of heart attack, type 2 diabetes, COVID 19, weight gain, excessive stress

# Spike Analysis - Twitter



**Spike A** | Occurred on April 4th, with **1979 retweets** of Twitter user kikiwaht's post concerning the negative correlation between the COVID-19 vaccine and a heart attack suffered by a 29-year-old man who was fully vaxxed.

**Spike B** | Occurred on May 15th. Two tweets stirred up activity to **164% more than usual**. One focused on chronic loneliness and an increased risk of heart disease, gaining **1756 retweets**. The second popular tweet that day, posted by *abraarkaran* expressed concern over potential heart problems caused by repeat COVID-19 infections.
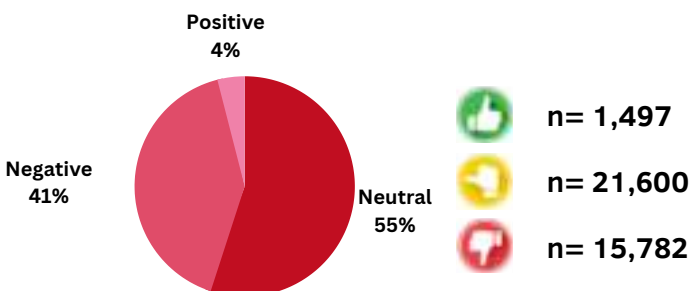
**Spike C** | Occurred on July 27th, when Twitter user *mpickle* tweeted the negative effects of a poor sleep schedule; two of the biggest being increased chance of heart attack and high blood pressure. *mpickle*'s tweet was retweeted **3139 times**.
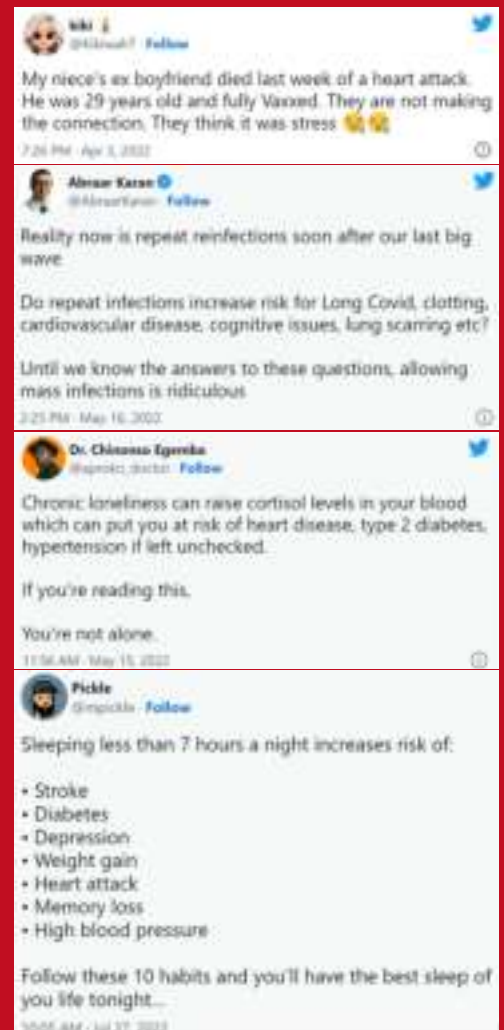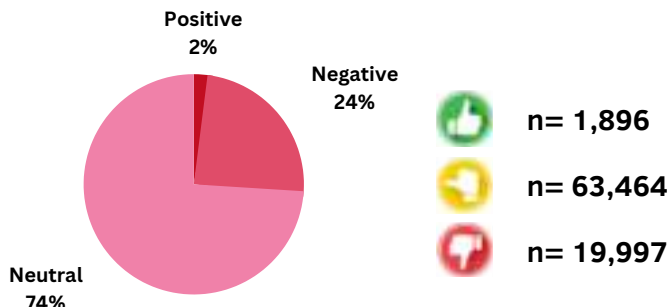
# Reddit and Tumblr Breakdown

## Reddit Sentiment

Positive 4%

Negative 41%

Neutral 55%

n= 1,497

n= 21,600

n= 15,782

Reddit differs from all platform and Twitter data with an increase in negative sentiment of 17%. Although there is still a neutral majority, positive sentiment also increases by 2%.

## Tumblr Sentiment

Positive 2%

Negative 24%

Neutral 74%

n= 1,896

n= 63,464

n= 19,997

Tumblr follows the same sentiment breakdown as earned twitter data. Conversation among sentiments is also similar to neutral conversation surrounding fact-based research and ways to prevent heart disease.

# Trending Topics

## Reddit Trending Topics
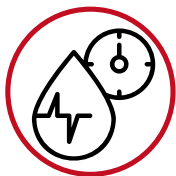
Cancer and Heart Disease

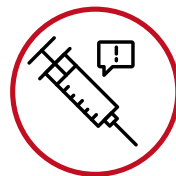Risk of Heart Disease

Risk Factors

Health Problems

## Tumblr Trending Topics

Blood Pressure

Risk of Cardiovascular Disease
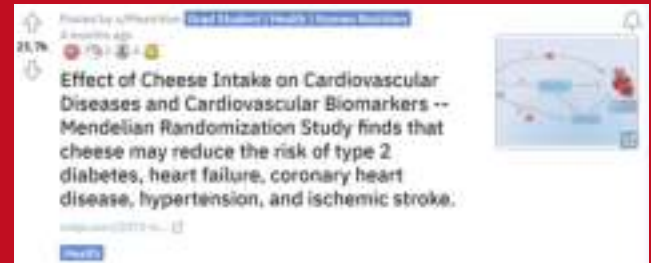
Side Effects

Health Craze

Trending topics for both Reddit and Tumblr are similar. All of the trending topics relate back to heart disease. One main idea that they have in common is the risk associated with heart disease in particular. For Tumblr, the trending topics are more niche compared to the broader trending topics on Reddit
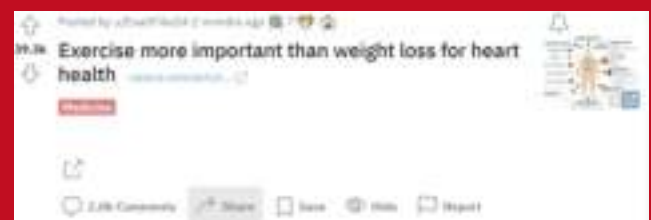
# Spike Analysis - Reddit
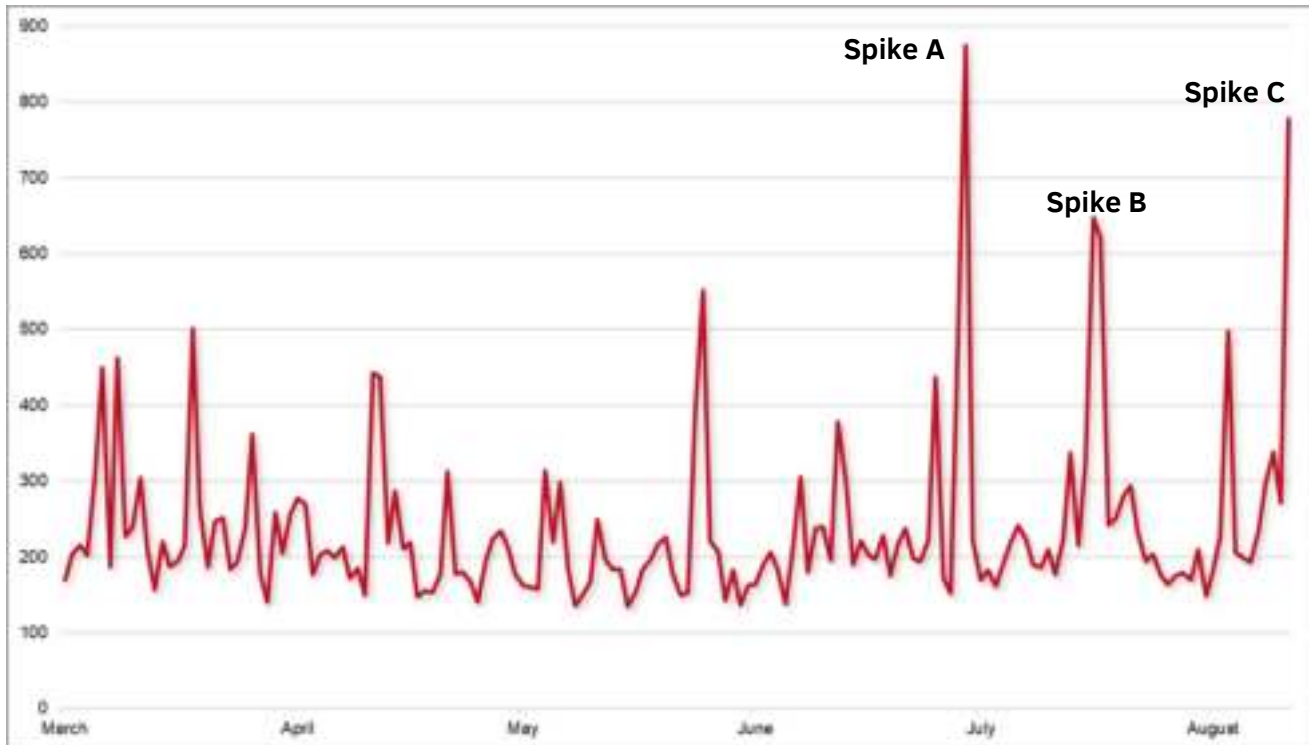


**Spike A** | Occurred on July 18th, with 913 mentions and 1.5k comments on a discussion post concerning the consumption of cheese and the resulting effects on cardiovascular health.

**Spike B** | Occurred on August 6th, with a 216% increase in mention volume. The subreddit r/science stirred up lots of conversation over a post noting the negative effects on cardiovascular health of consuming red meat.
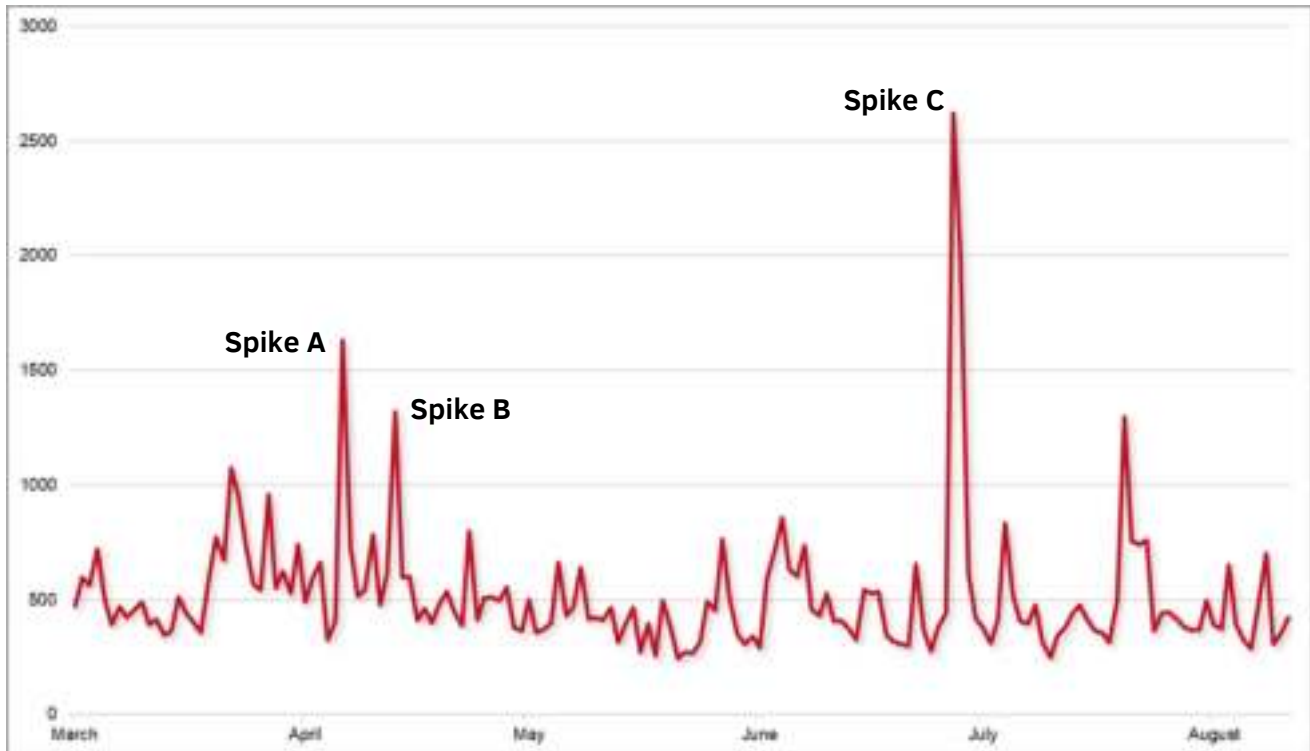
**Spike C** | Occurred on August 31st, with another viral post on r/science. 39.3k upvotes were awarded to a post on the subreddit pointing out research on the superiority of exercising over weight loss alone for improving cardiovascular health.
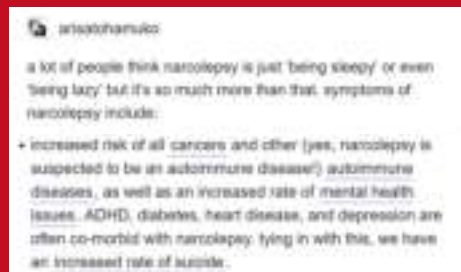
# Spike Analysis - Tumblr



**Spike A** | Occurred on April 26th, with a 263% increase in mention volume thanks to many reposts of user *arisatohamuko*'s post educating others on the true signs and symptoms of narcolepsy.

**Spike B** | Occurred on May 3rd. A post sharing information about the health benefits of yoga was trending. While the post was focused more so on the spiritual healing of yoga, it also touched on the activity's ability to lower the risk of heart disease.
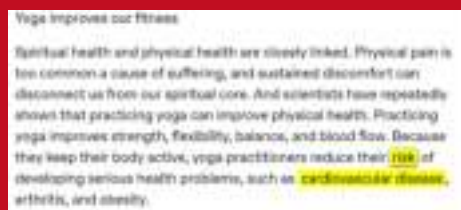
**Spike C** | Occurred on July 17th, stirring up a 483% increase in mention volume. The post, from user *phoenixonwheels*, argued against the false assumption that staying fit and eating certain foods will guarantee good health.

# AHA Topic Data Theme Analysis

# Theme Analysis
# Healthy Eating

**72,878 mentions**

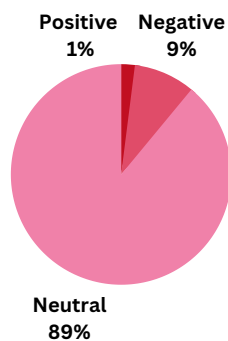**Top Hashtags:**
 #nutrition, #healthyeating, #food

**Top URLs:**
- Health Benefits of Turmeric; the Golden Spice of Life
- One Avocado a Week Cuts Risk of Heart Disease by 20%

The most popular theme, *Healthy Eating* refers to conversation about what food choices to make to prevent heart disease. Using custom classifiers, we categorized tweets that involved food, diets, and healthy lifestyle choices. The theme had 72,878 total mentions making up 83.3% of the data. Men (n=16,834) contributed to conversation more than women (n=11,923) with an 18% difference. Conversation among gender is unified about discussing foods that help decrease risk in heart disease. In the sentiment break down, neutral (n=65,100) conversation is the clear majority with negative (n=6,353) leading over positive (n=1,419). Negative conversation is about the risk of not eating healthy and how it can lead to heart disease. Positive conversation involves the positive benefits of eating certain foods.

## Gender Breakdown

Female 41%
Male 59%

## Sentiment Breakdown

Positive 1%
Negative 9%
Neutral 89%
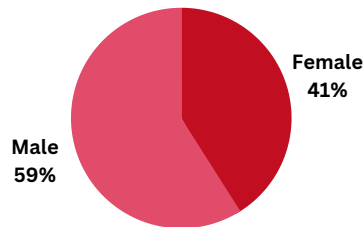
# Mental Health

**8,780 mentions**

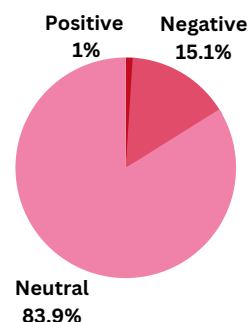**Top Hashtags:**
 #stress, #depression, #mentalhealthmonth

**Top URLs:**
- Everything From Bad Sleep to Stress Can Hurt Your Heart and Wreck Your Health
- Chronic Stress: Can Stress Weaken your Immune System?
- Links Connecting Stress, Depression and Heart Disease Risk

The topic of mental health focuses on the correlation between heart health and mental well-being. In recent years, scientists have devoted thousands of hours towards researching what ways stress can deteriorate or bring about the risk for cardiovascular systems. Custom classifiers were able to home in on the stressful and negative aspects of mental health. While there was a vast majority of neutral conversation on the topic, it should come as no surprise that negative posts outweighed positive posts 15-fold. Males spoke more on the topic, possibly due to the increased awareness for mental health among men in recent years.

## Gender Breakdown

Female 44.5%
Male 55.5%

## Sentiment Breakdown

Positive 1%
Negative 15.1%
Neutral 83.9%
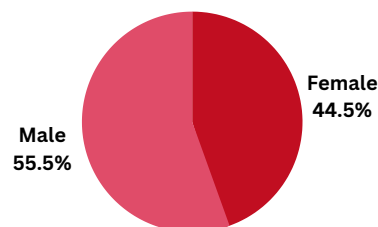
# Exercise

 **16,334 mentions**

**Top Hashtags:**
#fitnessfriday, #exercise, #cardiovascular

**Top URLs:**
- How to Master the Pushup
- More Exercise to Combat Heart Disease

The theme exercise refers to conversations about exercise habits and healthy lifestyle facts that can help prevent heart disease. Using custom classifiers we trained the exercise category to include tweets relating to physical activity, workout routines, and exercise facts. The theme had 16,334 total mentions making up 16.6% of the data. Men (n=3,934) contributed to the conversation a little more than women (n=2,791). Conversation is mainly similar between genders, but males tend to talk more about the risks involved in not exercising, while females tend to focus more on combining exercise with a healthy diet to prevent heart disease. In the sentiment breakdown, neutral (n=13, 764) conversation dominates, with negative (n=2,268) leading over positive (n=302). Negative conversation is about deaths and heart disease related to obesity. Positive conversation involves the benefits of exercising and good heart health.
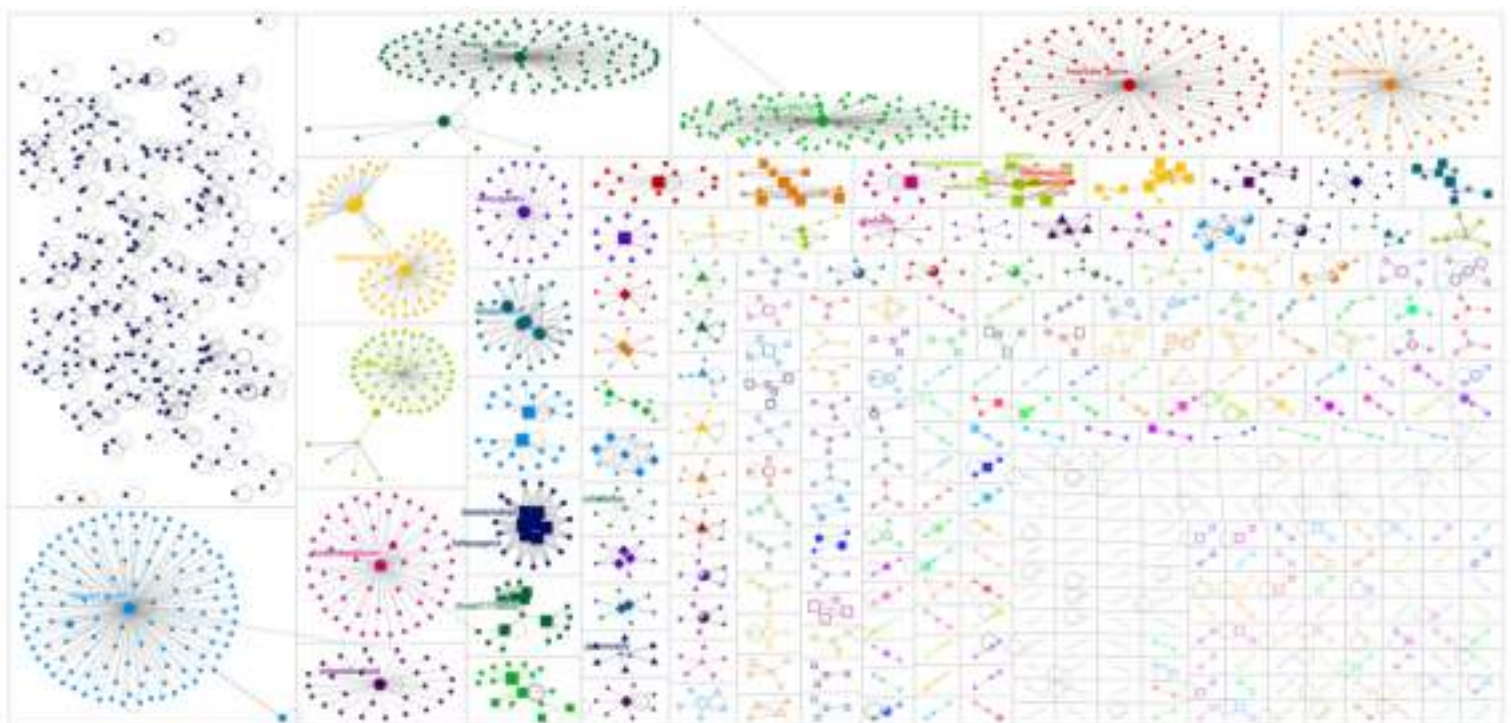
## Gender Breakdown



- Female 42%
- Male 58%



## Sentiment Breakdown



- Positive 2%
- Negative 14%
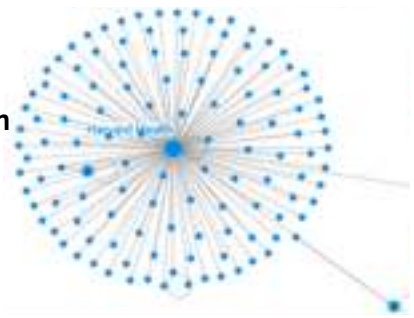- Neutral 84%
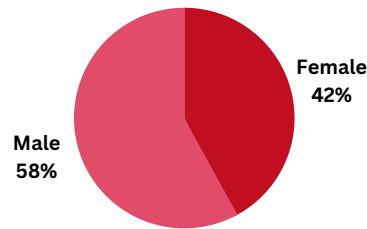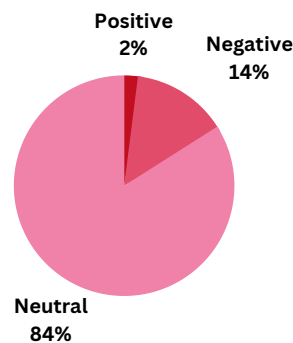


# NodeXL Graph Overview

# NodeXL Analysis

Based on the NodeXL analysis, there are a few key players in the conversation about heart health. The three accounts with the most interactions are @harvardhealth, @milan_reports, and @kiran7956787 respectively. While these accounts have numerous popularly retweeted posts, the clusters hardly interact with other main clusters. This could be in part due to the topic we have chosen. Unlike hot topics such as the presidential election, there is not very much discord over heart attacks and cardiovascular health as a subject matter. Rather, users formed small communities around hub outlets, such as Harvard Health, instead of forming hubs around a topic alone.

A second reason the topic was so widespread with less meshing of conversation is due to the geographic spread of posts. Milan_reports is based out of India while Harvard Health posts from the U.S. The world wide web does have lots of mingling regardless of location, but geographics can factor into the formation of communities, especially when the conversation is less of a debated or popular topic. Cardiovascular health is a worldwide area of discussion but seems to generate semi-regional audiences.

**Harvard Health**



**milan_reports**



**kiran7956789**



# NodeXL Recomendations

To increase conversation around heart health, the AHA might investigate collaborating with the Harvard Health Twitter account. By doing so, the AHA and Harvard Health could shift the conversation focus from independent accounts to a more meshed conversation on the topic itself. Additionally, the AHA should encourage conversation by asking questions in tweets and gaining involvement from users. Again, this would shift towards a more topic-based conversation by meshing account interaction among many different users.
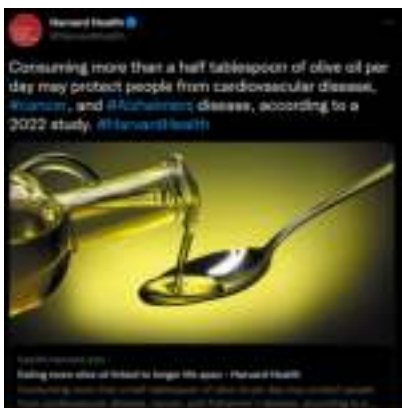






Popular Harvard Health tweets revolved around health facts and informant posts regarding new studies. The post above outlines a new research study sharing the potential linkage between olive oil and cardiovascular disease, among other sicknesses.

milan_reports had less of an informative feed, sharing breaking news about personal stories. Her most popular tweet, among other similar stories, points out the dangers of overworking one's body in the wake of recovering from COVID-19

@kiran**7956787** is a personal Twitter account with a passion for tweeting about healthy lifestyles. kiran**7956787** does not have a large following but has gained popularity through his content being retweeted by others pursuing a healthy lifestyle. His post above covers the link between meditation and cardiovascular health.

# Appendix

**Organization Query:**
@american_heart OR "american heart association" OR "american heart" OR americanheartassociation OR americanheart OR #americanheart OR #americanheartassociation

**Comparable Organizations Query:**
@TheHeartTruth OR "The heart truth" OR #hearttruth OR @crfheart OR "cardiovascular research foundation" OR @worldheartfed OR "world heart federation" OR #WHF OR @HRSonline OR #HRS OR "heart rhythm society"

**Theme - Stroke:**
stroke OR #stroke

**Theme - Health:**
 health OR #health

**Theme - Heart:**
heart OR #heart

**Theme - Risk:**
 risk OR #risk OR "health risk" OR "warning signs"

**Topic Query:**
("Heart disease" OR "heart attack" OR "heart health" OR "heart disease symptoms" OR "cardiovascular disease" OR arteriosclerosis OR "coronary heart disease" OR "cardiac arrest")
AND
(Prevention OR prevent OR "warning signs" OR risk OR #warningsigns OR exercise OR "healthy recipes" OR recipes OR stress OR "healthy diet" OR exercising OR "manage stress" OR #stressfree OR #healthydiet OR #prevention)

# AMERICAN HEART ASSOCIATION

Madison Schaechter, Abby Shorter, Cameron Bland