Project - Phase 5

Public Health Awareness campaign Analysis

Team Name

Proj_212989_Team_1

Phase 5

PUBLIC HEALTH AWARENESS CAMPAIGN ANALYSIS

Introduction

Public health awareness campaigns play a pivotal role in safeguarding the well-being of individuals, communities, and nations at large. These campaigns serve as powerful tools for disseminating crucial information, fostering behavioral change, and addressing pressing health concerns. The analysis of such campaigns offers valuable insights into their effectiveness, impact, and the strategies employed to promote health awareness. This examination not only provides an opportunity to assess the success of public health initiatives but also identifies areas for improvement.

Analyzing public health awareness campaigns is crucial for several reasons. It allows for an in-depth assessment of their overall impact, enabling health organizations and policymakers to gauge the effectiveness of their strategies. By examining the reach and influence of these campaigns, we can identify the strengths and weaknesses in their messaging, which can lead to more targeted and efficient approaches in the future. Furthermore, analyzing these campaigns sheds light on the societal attitudes and behaviors related to public health issues, which can inform future public health strategies.

In the following sections, we will delve deeper into the strategies and methods used to evaluate the outcomes of public health awareness campaigns and provide concrete examples of successful campaigns that have made a significant impact on public health. Ultimately, this analysis serves as a comprehensive exploration of the vital role that public health awareness campaigns play in society, emphasizing their significance in promoting healthier and safer communities.

In this project phase 5 we have to discuss

1. Mental health benefits
2. Mental health benefits awareness
3. Mental health discussion
4. Data employer Mental health learning resources

5. Data anonymity

Phase-5:

1.Describe the analysis objectives, data collection process, data visualization using IBM Cognos, and Python code integration

2.Explain how the insights from the analysis can help website owners improve user experience.

Given Dataset:

s.no	year	Self employee	Number of employee	Tech company	Mental health benefits	Mental health awareness
1	2014	no	100-500	yes	yes	yes
2	2014	no	26-100	yes	yes	yes
3	2014	no	More than 1000	no	Don't know	no
4	2014	no	26-100	yes	yes	Not sure
5	2014	no	More than 1000	no	Don't know	yes
6	2014	no	26-100	yes	yes	Not sure
-	-	-	-	-	-	-
3479	2019	no	26-100	yes	no	N/A
3480	2019	no	100-500	yes	yes	no
3481	2019	no	26-100	yes	yes	no
3482	2019	no	More than 1000	no	Don't know	no
3483	2019	no	More than 1000	yes	yes	no
3484	2019	no	More than 1000	yes	yes	yes

Dataset link:
https://www.kaggle.com/code/manuntag/the-state-of-mental-health-support-in-tech

Here's a list of tools and software commonly used in process:

1.Programming language:

Python is the most popular language for machine learning due to its extensive libraries and frameworks. You can use libraries like NumPy, pandas, scikit-learn, and more.

2.Integrated Development Environment (IDE):

Choose an IDE for coding and running Visualization and machine learning experiments. Some popular options include Jupyter Notebook, Google Colab, or traditional IDEs like PyCharm.

3.Data visualization tools:

We mainly use IBM cognos for Visualization integrated with python code and additionally we use tools like Matplotlib, Seaborn, or Plotly that are essential for data exploration and visualization.

4.Data preprocessing tools:

Libraries like pandas help with data cleaning, manipulation, and preprocessing.

5.Version control:

Version control systems like Git are valuable for tracking changes in your code and collaborating with others.

6.Notebooks and Documentation:

Tools for documenting your work, such as Jupyter Notebooks or Markdown for creating README files and documentation.

Development Phases involved in this project:

1. Design Thinking Approach
2. Design into innovation
3. Build loading and processing the dataset
4. Perform different activities like Model training,Evaluation,Feature engineering
5. Data Visualization using IBM cognos
6. Advantages and Benefits to improve website owner
7. Disadvantages
8. Conclusion

1.Design Thinking Approach:

EMPATHIZE:

1. Public health awareness campaigns save lives by educating communities about health risks and promoting preventive measures.They rely on the dedication of healthcare professionals, organizations, and volunteers to create and implement effective messages and initiatives.
2. These campaigns play a crucial role in improving the overall well-being of individuals and communities by fostering healthier behaviors and choices.

DEFINE:

1. Public Health Awareness Campaign: A targeted and organized effort to inform and educate the public about health issues, emphasizing prevention, safety, and healthy behaviors.

2. Objectives: These campaigns aim to raise awareness, change behavior, and mobilize individuals and communities to take proactive steps towards improved health, such as vaccination, disease prevention, and healthy lifestyle choices.

3.Strategies: Public health awareness campaigns employ a variety of strategies, including media messaging, community engagement, partnerships with healthcare professionals, and data-driven analysis to effectively convey health information and encourage desired actions.

IDEATE:

1.Innovative Messaging: Develop creative and relatable content to capture the audience's attention, using social media trends, storytelling, and culturally sensitive approaches.

2. *Community Engagement:* Establish local partnerships and engage community leaders to ensure campaign relevance and trust, enabling grassroots support and participation.

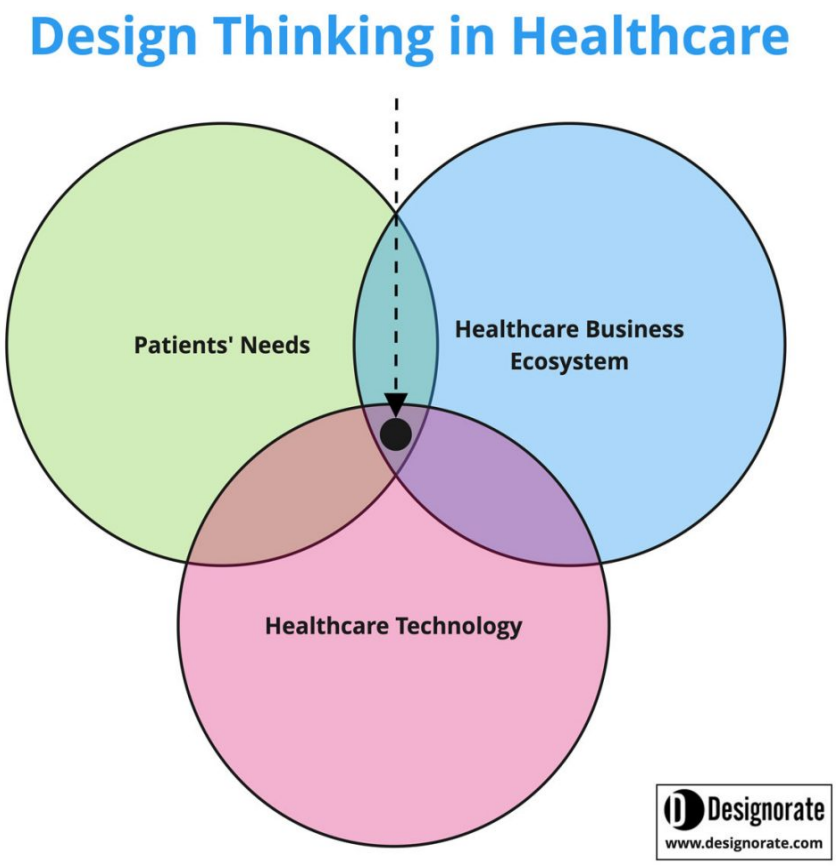
3.Data-Driven Insights: Utilize data analytics to continually assess campaign effectiveness, allowing for real-time adjustments and targeted interventions to maximize impact.

PROTOTYPE:

1. Mobile App: Create a user-friendly mobile app that provides health tips, tracks vaccination schedules, and allows users to report local health concerns.

2.Interactive Workshops: Conduct hands-on workshops in communities, teaching practical skills like handwashing techniques and healthy cooking.

3.Gamified Challenges: Develop a gamified challenge platform, encouraging participants to complete health-related tasks and earn rewards for their engagement.



TEST:

1.A/B Testing: Conduct A/B testing of campaign messages and visuals to determine which ones resonate best with the target audience.

2.Survey Feedback: Collect feedback from the public through surveys to assess their awareness of health issues and the campaign's impact on their behaviors.

3.Metrics Tracking: Continuously monitor key metrics such as website visits, app downloads, and social media engagement to gauge the campaign's reach and effectiveness.

IMPLEMENT:

1.Multichannel Promotion: Implement the campaign across various channels, including social media, community events, and local healthcare facilities to reach a diverse audience.

2.Collaboration with Healthcare Professionals: Partner with local doctors and nurses to ensure the campaign's medical accuracy and credibility.

3.Evaluate and Adjust: Regularly assess the campaign's impact through data analysis and adjust strategies based on feedback and changing health priorities.

EVALUATE:

1.Reach and Awareness: Measure the campaign's reach and awareness levels by tracking website traffic, social media engagement, and attendance at events.

2.Behavior Change: Evaluate the impact on target behaviors, such as increased vaccination rates, improved hygiene practices, or healthier eating habits.

3.Cost-Effectiveness: Analyze the campaign's cost-effectiveness by comparing the expenses to the achieved outcomes, ensuring efficient resource allocation.

ITERATE:

1.Refine Messaging: Continuously update and refine campaign messages to stay relevant and resonant with the evolving needs and concerns of the community.

2.Engage New Partners: Seek out new partnerships with local organizations, influencers, or healthcare professionals to expand the campaign's reach and credibility.

3. Adapt to Emerging Trends: Stay flexible and adaptable, embracing new communication technologies and strategies to effectively communicate public health information to the target audience.

SCALE AND DEPLOY:

1.Regional Expansion: Extend the campaign to neighboring regions and communities to maximize its impact and benefit a broader population.

2.Digital Outreach: Deploy an online platform to make campaign resources and information accessible to a wider audience, including remote or underserved areas.

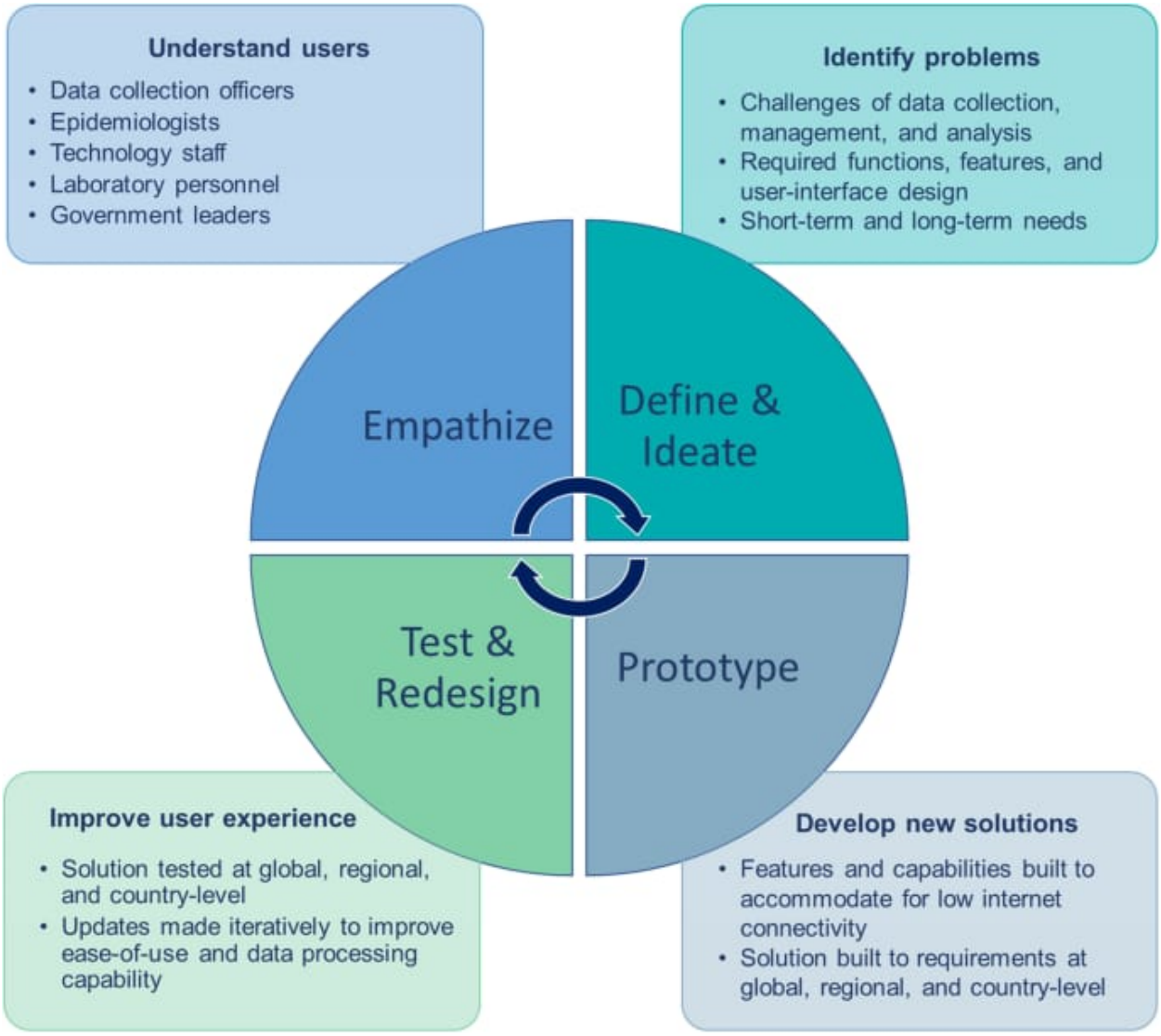
3.Resource Mobilization: Secure additional funding and resources to support the campaign's scalability, including hiring more staff, creating new materials, and expanding advertising efforts.

EDUCATE AND TRAIN:

1.Develop Educational Materials: Create informative pamphlets, videos, and online resources to educate the public on key health issues.

2.Community Workshops: Organize workshops and training sessions to empower individuals with practical health knowledge and skills.

3.Train Local Leaders: Provide training for community leaders and healthcare workers to become advocates and educators in their respective areas.



2.Design into innovation:

1.Data collection:

Gather a dataset that contains examples of the problem you want the model to solve. This data should include input features (variables) and corresponding output labels or target values.

AGE :
Define clear campaign goals for each age group, taking into account their unique health needs and challenges.

Collect age-specific data related to health behaviors, risk factors, and health outcomes. This data should be drawn from surveys, healthcare institutions, and government health records.

GENDER :
Define specific campaign objectives and health goals for both men and women, considering their unique health needs.

Divide your target population into distinct gender groups: male and female. Collect and analyze gender-specific health data, including risk factors, behaviors, and health outcomes, through surveys, healthcare institutions, and government health records. Develop educational materials and campaigns that focus on gender-specific health issues, such as:

For Women: Maternal health, reproductive health, breast cancer awareness, osteoporosis prevention, and mental health.

For Men: Prostate health, testicular cancer awareness, heart health, and mental health.

LOCALITY :
Define specific campaign objectives for each locality, considering its unique health challenges and needs. Collect and analyze health data specific to each locality, including local health trends, environmental factors, healthcare infrastructure, and population demographics.

Divide your target population into distinct segments based on locality, ensuring that each region receives tailored messages and interventions.

BEHAVIOURAL FACTORS :

Consider genetic predispositions to certain health conditions. Provide personalized recommendations for individuals based on their genetic profile, encouraging them to take preventative actions. Genetics can play a role in predisposing individuals to certain behaviors. For example, genetic factors can influence an individual's likelihood of developing addictive behaviors, such as substance abuse or compulsive overeating.

MEDICAL HISTORY :

Collect medical history data to understand an individual's health risks and challenges. Customize campaign messages and interventions to address specific health concerns.Promote awareness of the significance of family medical history.

Encourage individuals to discuss family medical histories with their healthcare providers to assess hereditary risks and take preventative measures.Stress the importance of early detection and preventive screenings based on an individual's medical history.

TREATMENT :

Create campaigns to encourage individuals to comply with treatment plans and follow-up appointments. Remind them of the long-term benefits of staying on course. Emphasize the benefits of early intervention and timely treatment. The campaign can stress that early detection and treatment often lead to better outcomes.

Run campaigns that educate people about the importance of medication adherence for managing chronic conditions. Provide tips and tools to help individuals remember to take their medications as prescribed.

WORK INTERFERE :

Work interference can be a significant barrier to individuals' ability to prioritize their health and well-being. When designing a public health campaign, it's essential to address how work interference can affect people's ability to engage in healthy behaviors and access treatment.

Collaborate with employers to implement workplace wellness programs that address health challenges that may interfere with work. These initiatives can promote a healthier work-life balance.

WELLNESS PROGRAM :

Use the campaign to raise awareness of existing wellness programs, whether they are offered by the government, employers, or healthcare providers. Highlight the benefits of participating in these programs.

Use data and assessments to provide personalized recommendations for individuals based on their health goals and needs.

FEATURE ENGINEERING INNOVATION CONTINUOUS IMPROVEMENT:

Utilize feature engineering techniques to extract valuable insights from available data, such as demographic information, health history, and behavioral patterns. These insights can be used to personalize campaign messaging, recommendations, and interventions for individuals.

Explore innovative data sources, such as wearables, mobile apps, and IoT devices, to gather real-time health data. This data can be used for more accurate assessments, personalized recommendations, and behavior tracking.

Embrace innovation by using AI and real-time data analysis to adapt the campaign's messaging and strategies as new information and insights become available. Continuous improvement ensures the campaign remains effective over time.

ETHICAL CONSIDERATIONS :

Ensure that data collection and analysis respect individuals' privacy and are conducted with informed consent. Ethical considerations should be at the forefront of any data-driven campaign.

Clearly define data ownership and usage rights. Individuals should have control over their data and understand who can access it and for what purpose.

Collect only the data that is essential for achieving the campaign's objectives. Minimize the amount of personal information gathered to reduce privacy risks.

MAINTENANCE AND MONITORING :

Define clear and measurable KPIs that align with the campaign's goals, such as increased awareness, behavior change, or health outcomes.

Continuously collect and analyze data related to the campaign's performance, participant engagement, and health outcomes. Utilize data analytics to track progress.

Create channels for individuals to provide feedback on the campaign. Gather input on what is working, what needs improvement, and any emerging issues.

Conduct regular assessments to evaluate the campaign's impact.

3.Build Loading and Preprocessing the dataset:

1.Data collection:

Importing data into IBM Cognos is a fundamental step in the business intelligence and analytics process, as it allows you to work with and analyze your data within the Cognos environment. Here's an explanation of how data import into IBM Cognos typically works:

- Loading and preprocessing the dataset is an important first step in building any machine learning model. However, it is especially important for public awareness campaign analysis models, as datasets are often complex and noisy.

2. Challenges involved in loading and preprocessing public Health awareness campaign analysis model:

- **Handling missing value:** Public awareness campaign datasets often contain missing values, which can be due to a variety of factors, such as human error or incomplete data collection. Common methods for handling missing values include dropping the rows with missing values, imputing the missing values with the mean or median of the feature, or using a more sophisticated method such as multiple imputation.

Data collection in IBM Cognos for a public health awareness campaign analysis would involve gathering relevant data to assess the effectiveness and impact of the campaign. Here are some steps to consider:

1. **Define Objectives:** Clearly define the goals and objectives of your public health awareness campaign analysis. What are you trying to achieve or measure?
2. **Data Sources:** Identify the sources of data, which could include surveys, social media, website analytics, health records, and more. Ensure that the data is accurate, reliable, and relevant to your analysis.
3. **Data Collection Methods:** Choose appropriate data collection methods, such as online surveys, data from social media platforms, or data from healthcare

institutions. Ensure that the data collection methods align with your campaign's objectives.

4. **Data Integration:** Use IBM Cognos to integrate data from various sources. This may involve data transformation, cleaning, and harmonization to create a unified dataset.
5. **Data Storage:** Store the collected data in a structured database or data warehouse within IBM Cognos for efficient retrieval and analysis.
6. **Data Analysis:** Utilize IBM Cognos tools to analyze the collected data. You can create reports, dashboards, and visualizations to gain insights into the campaign's performance.
7. **Key Metrics:** Define key performance indicators (KPIs) that are relevant to public health, such as awareness levels, website traffic, social media engagement, and health outcomes.
8. **Reporting:** Generate reports and visualizations using IBM Cognos to present the findings and insights in a clear and understandable format.

2.Data preprocessing:

1. Importance of loading and preprocessing dataset:

- Loading and preprocessing the dataset is an important first step in building any machine learning model. However, it is especially important for public awareness campaign analysis models, as datasets are often complex and noisy

2.Challenges involved in loading and preprocessing public Health awareness campaign analysis model:

- **Handling missing value:** Public awareness campaign datasets often contain missing values, which can be due to a variety of factors, such as human error or incomplete data collection. Common methods for handling missing values include dropping the rows with missing values, imputing the missing values with the mean or median of the feature, or using a more sophisticated method such as multiple imputation.

3. How to overcome the challenges of loading and preprocessing a Public Awareness dataset:

- **Use a data preprocessing library:**There are a number of libraries available that can help with data preprocessing tasks, such as handling missing values, encoding categorical variables, and scaling the features.
- **Validate the preprocessed data:** It is important to validate the preprocessed data to ensure that it is in a format that can be used by the model and that it is of high quality. This can be done by inspecting the data visually or by using statistical methods.

3.Design a dashboard in IBM cognos:

Designing a dashboard in IBM Cognos involves creating a set of interactive and visually appealing reports and visualizations to provide users with insights and data analysis. Here's a high-level overview of the steps involved in designing a dashboard in IBM Cognos:

- **Define the Dashboard Objectives:** Start by defining the purpose and objectives of the dashboard. What insights are you trying to convey, and who is the target audience?
- **Access IBM Cognos:** Log in to your IBM Cognos environment, whether it's on-premises or in the cloud.
- **Create a New Dashboard:** In Cognos, you typically use the Cognos Workspace or Cognos Dashboard application to create a new dashboard.
- **Select Data Sources:** Connect to the data sources you want to use in your dashboard. IBM Cognos can connect to various data sources, including databases, spreadsheets, and web services
- **Build Visualizations:** Drag and drop data elements onto the canvas to create visualizations like charts, tables, and maps. Customize the visualizations to represent your data effectively.
- **Add Filters and Prompts:** Allow users to interact with the data by adding filters and prompts. These can be used to refine the data displayed in the dashboard.
- **Create Reports:** Create individual reports within the dashboard, which can be tables, charts, or other visual elements that display specific data.
- **Arrange Objects:** Organize the layout of your dashboard by arranging the objects on the canvas. You can group them into sections and tabs for a better user experience.

- **Add Text and Annotations:** Include text elements and annotations to provide context and explanations for the data presented in the dashboard.
- **Apply Styles and Themes:** Customize the look and feel of your dashboard using styles and themes to match your organization's branding or design preferences.

4. Data import into IBM cognos:

- Use the data import and integration capabilities of IBM Cognos to load your preprocessed dataset.
- Importing into IBM cognos is a fundamental step in the business intelligence and analytical process,as it allows you to work and it involves various factors there are following steps:
- **Data Server:** The Data Server in IBM Cognos is responsible for managing data connections and data modules. It acts as an intermediary between Cognos and your data sources.
- **Connection:** You need to establish a connection to your data source. This involves specifying connection details like server addresses, login credentials, and other connection parameters.
- **Data Querying and Importing:** Once a connection is established, you can create queries to retrieve data from your data source. These queries can be simple or complex, depending on your data requirements.
- **Data Integration:** Data from multiple sources can be integrated within data modules to create a single coherent view of the data. This integration can involve joining tables, creating relationships, and aggregating data.
- **Data Exploration and Analysis:** Once the data is imported and prepared, you can use it for data exploration, analysis, and visualization within IBM Cognos to derive insights and create reports and dashboards.

Source code:

```
#IMPORT LIBRARIES

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

file = pd.read_csv('../input/mentalhealthintech20142019/Mental health in tech survey 2014-2019.csv')

#MENTAL HEALTH BENEFITS

data_mental_health_benefits = file.groupby('year'

print("2014 vs 2019 benefit access: {}% increase

".format(calc_difference_mental_health_benefit_coverage_2019_201

4))

print("Annual change to employees that have coverage: {}%

average".format(calc_average_annual_change))

print("Employees that don't know their coverage: {}%

average".format(calc_mean_mental_health_benefits_dont_know))

#data chart

#print(data_mental_health_benefits)

#MENTAL HEALTH BENEFITS AWARENESS

data_mental_health_benefits_awareness =

file.groupby('year')['mental_health_benefits_awareness'].value_c

ounts(normalize=True).unstack()[['Yes','No']]

calc_difference_mental_health_benefits_2019_2014 =
```

```
round((data_mental_health_benefits_awareness.iloc[-1]['No'] -
data_mental_health_benefits_awareness.iloc[0]['No']) * 100)
calc_mental_health_benefits_awareness_2019_no =
round(data_mental_health_benefits_awareness.iloc[-1]['No'] *
100)
data_mental_health_benefits_awareness.plot(marker='o')
plt.style.use('ggplot')
plt.legend(loc='upper right',bbox_to_anchor = (1.2, 1.0))
plt.title("Awareness of options available in mental health
coverage")
plt.show()
print("Employees unaware of benefits or options in their
coverage:
{}%".format(calc_mental_health_benefits_awareness_2019_no))
print("2014 vs 2019 employees not aware: {}%
increase".format(calc_difference_mental_health_benefits_2019_201
4))
#data chart
#print(data_mental_health_benefits_awareness)
#MENTAL HEALTH DISCUSSION
BHdata_mental_health_discussion =
file.groupby('year')['employer_mental_health_discussion'].value_
counts(normalize=True).unstack()[['Yes', 'No']]
calc_average_annual_improvement_employer_mental_health_discussio
```

```
n = round(((data_mental_health_discussion.iloc[-1]['Yes'] -
data_mental_health_discussion.iloc[0]['Yes']) * 100)/5)
calc_employer_mental_health_discussion_2019_no =
round(data_mental_health_discussion.iloc[-1]['No'] * 100)
data_mental_health_discussion.plot(kind='barh').invert_yaxis()
plt.legend(loc='upper right',bbox_to_anchor = (1.2, 1.0))
plt.title("Employer mental health discussion")
plt.ylabel("")
plt.style.use('ggplot')
plt.show()
print("Employers that do not formally discuss mental health in
2019:
{}%".format(calc_employer_mental_health_discussion_2019_no))
print("Average change in employer driven discussion: {}%
increase each
year.".format(calc_average_annual_improvement_employer_mental_he
alth_discussion))
# data chart
print(data_mental_health_discussion)
#DATA EMPLOYER MENTAL HEALTH LEARNING RESOURCES
data_employer_mental_health_learning_resources =
file.groupby('year')['employer_mental_health_learning_resources'
].value_counts(normalize=True).unstack()
data_employer_mental_health_learning_resources_filtered_yes =
```

```
data_employer_mental_health_learning_resources[['Yes']]
calc_difference_employer_mental_health_learning_resources_2019_2
014 =
int(round(((data_employer_mental_health_learning_resources_filte
red_yes.iloc[-1] -
data_employer_mental_health_learning_resources_filtered_yes.iloc
[0]) * 100)/5))
calc_employer_mental_health_learning_resources_2019_yes =
int(round(data_employer_mental_health_learning_resources_filtere
d_yes.iloc[-1]*100))
data_employer_mental_health_learning_resources_filtered_yes.plot
(marker='o', legend= None)
plt.style.use('ggplot')
plt.ylim(0.2,1.0)
plt.xlabel("")
plt.title('Employers that provide learning resources to help
address mental health')
plt.show()
print("Employers that provide educational resources in 2019:
{}%".format(calc_employer_mental_health_learning_resources_2019_
yes))
print("Average change in employers providing resources: {}%
average increase per
year".format(calc_difference_employer_mental_health_learning_res
```

```
ources_2019_2014))

#data chart

#print(data_employer_mental_health_learning_resources)

#DATA ANONYMITY

data_treatment_anonymity =
file.groupby('year')['mental_health_treatment_anonymity'].value_
counts(normalize=True).unstack()

data_treatment_anonymity_filtered_dont_know =
data_treatment_anonymity["Don't know"]
calc_mean_data_treatment_anonymity_filtered_dont_know =
round(data_treatment_anonymity_filtered_dont_know.mean() * 100)

data_treatment_anonymity_filtered_dont_know.plot(kind='bar',legend = None)
plt.style.use('ggplot')

plt.title("Employees uncertain if use of programs will be anonymous")

plt.ylabel("")

plt.xlabel("")

plt.xticks(rotation = 0)

plt.ylim(0,1)

plt.show()

print("Employees that don't know if treatment will remain anonymous: {}%
average".format(calc_mean_data_treatment_anonymity_filtered_dont _know))
#data chart #print(data_treatment_anonymity)
```

2.Source code:

This coding based on inherit data set from public health awareness campaign and visualize to the users

```
# Import necessary libraries
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
# Load campaign data into a DataFrame (assuming data is in a CSV file)
campaign_data = pd.read_csv('campaign_data.csv')
# 1. Campaign Objective
# Analyze the primary goal of the campaign
campaign_objective = campaign_data['campaign_objective'].value_counts()
# 2. Target Audience
# Analyze demographics and characteristics of the target audience
target_demographics = campaign_data.groupby('target_demographics').size()
# 3. Messaging and Content
# Analyze the effectiveness of messaging and content
# You can use sentiment analysis or text analytics here
# 4. Channels and Mediums
channel_engagement = campaign_data['channel'].value_counts()
# 5. Timing and Duration
# Analyze campaign timing and duration
# 6. Budget and Resources
# Analyze campaign budget and resource allocation
# 7. Measurable Goals # Analyze campaign KPIs and outcomes
# 8. Effectiveness
# Analyze the overall effectiveness of the campaign
```

```
# Plot relevant data (e.g., engagement over time)

# 9. Community Engagement

# Analyze community involvement in the campaign

# 10. Feedback and Adaptation

# Analyze feedback collection and campaign adaptation

# 11. Long-Term Impact

# Analyze any lasting effects of the campaign

# 12. Ethical Considerations # Analyze ethical aspects of the campaign

# 13. Lessons Learned # Summarize lessons learned from the campaign

# Visualizations

# You can create plots and visualizations to represent your analysis findings

# For example, you can use matplotlib and seaborn to create bar plots, line plots, or heatmaps.

# Create a bar plot for campaign objectives

plt.figure(figsize=(8, 6))

sns.barplot(x=campaign_objective.index, y=campaign_objective.values)

plt.xlabel('Campaign Objective')

plt.ylabel('Count')

plt.title('Distribution of Campaign Objectives')

plt.xticks(rotation=45)

plt.show()
```

4.Perform different activities like Model training, Evaluation, Feature engineering etc..

- Perform Advanced data analysis
- Demography Analysis
- Feature Engineering
- Model Training

1.Perform Advanced data analysis:

Performing advanced data analysis involves using complex techniques and tools to gain deeper insights from data.To perform advanced data analysis effectively, you need a solid understanding of statistics, programming, domain-specific knowledge, and access to appropriate tools and data. It's a multidisciplinary field that's crucial in various industries, including business, healthcare, finance, and science, for making data-driven decisions and predictions. This can include:

- **Statistical Analysis:** Utilizing advanced statistical methods like regression analysis, hypothesis testing, and ANOVA to understand relationships within the data.
- **Machine Learning:** Employing machine learning algorithms for predictive modeling, clustering, classification, and regression, using tools like Python libraries (e.g., scikit-learn, TensorFlow, or PyTorch).
- **Data Mining:** Extracting patterns, trends, and knowledge from large datasets, often involving techniques like association rule mining and decision tree analysis.
- **Big Data Analytics:** Handling and analyzing vast datasets using technologies like Hadoop and Spark, as well as distributed computing.
- **Text and Sentiment Analysis:** Analyzing text data for sentiment, topic modeling, or natural language processing (NLP) to extract valuable information from text documents.
- **Geospatial Analysis:** Using geographic information systems (GIS) to analyze and visualize data with location-based components
- **Network Analysis:** Exploring relationships and connections within data, such as social network analysis or network traffic analysis.
- **A/B Testing:** Conducting experiments to assess the impact of changes in a controlled way, often used in marketing and website optimization

2.Demography Analysis:

Demographic analysis is a fundamental component of public health awareness campaign analysis. It involves the systematic examination of population characteristics, such as age, gender, ethnicity, income, education, and geographical location, to better understand the specific needs, behaviors, and preferences of 10 different groups within a given population. Analyzing these demographics plays a crucial role in designing effective public health awareness campaigns, as it enables campaign planners to tailor their messages and strategies to the target audience, thereby increasing the campaign's overall impact

Here's a breakdown of how demographic analysis is applied in public health awareness campaigns:

1. **Identifying Target Audiences:** Demographic analysis helps campaign planners identify the key demographic groups that are most at risk or most affected by a particular health issue. For example, if the campaign is focused on preventing teenage pregnancy, it's important to identify the age group, gender, and socioeconomic status of individuals most at risk.
2. **Understanding Health Disparities:** Demographic analysis reveals health disparities within the population, which are often related to social determinants of health such as income, education, and access to healthcare. Identifying these disparities is essential for crafting messages and interventions that address the specific challenges faced by different demographic groups.
3. **Media and Channel Selection:** Understanding the demographic makeup of the target audience helps in selecting the most appropriate media and communication channels. For instance, younger populations might be more reachable through social media and digital platforms, while older populations may respond better to traditional media like radio or print.
4. **Geographical Insights:** Demographic analysis also includes geographic location. Campaign planners can identify areas with higher prevalence of a health issue and allocate resources accordingly. Geographical data can also inform decisions about where to set up clinics or distribution points for educational materials.
5. **Measuring Impact:** After the campaign is launched, demographic analysis continues to be important in evaluating its success. By tracking changes in health outcomes among different demographic groups, campaign planners

can assess whether the campaign is effectively reaching and impacting the intended audience.

6. **Iterative Campaign Improvement:** Demographic analysis is not a one-time activity. It should be an ongoing process. As new data becomes available and as campaigns progress, adjustments can be made to better target and engage the identified demographics.
7. **Equity and Inclusion:** Demographic analysis also ensures that campaigns are designed with equity and inclusion in mind. It helps identify marginalized or underserved populations that may require extra attention and resources to address health disparities.

3.Feature Engineering:

Feature engineering is the process of selecting, transforming, or creating specific features (variables) from raw data to improve the performance of machine learning models. It involves identifying the most relevant information within your data and presenting it in a format that is most suitable for your model to learn from. Feature engineering can include tasks like scaling, encoding categorical variables, creating new features, and reducing dimensionality. It plays a crucial role in optimizing the predictive power of machine learning algorithms.

key points about feature engineering:

Data Transformation: Feature engineering involves modifying or transforming raw data to make it more suitable for machine learning models.

Feature Selection: It's about choosing the most relevant attributes (features) from your dataset to enhance model performance and reduce noise.

Creating New Features: Engineers can generate new features based on existing data, which might provide additional information for the model.

Handling Categorical Data: Converting categorical variables into numerical format, often through techniques like one-hot encoding, is a common feature engineering task.

Scaling and Normalization: Ensuring that features are on a consistent scale, which can improve the performance of models sensitive to feature magnitudes.

Dimensionality Reduction: Techniques like Principal Component Analysis (PCA) can be used to reduce the number of features while retaining important information.

Domain Knowledge: Utilizing subject-matter expertise to identify and create features that are particularly relevant to the problem.

Iterative Process: Feature engineering often requires experimentation and iteration to find the best set of features for a specific machine learning task.

Impact on Model Performance: Effective feature engineering can significantly improve a model's accuracy, reduce overfitting, and enhance its ability to generalize to new data.

Critical for Success: Feature engineering is a critical step in the machine learning pipeline and can be just as important as selecting the right algorithm for the task.

4.Model Training:

Certainly, let's delve into each step of training a model for a public health awareness campaign analysis in more detail:

1. **Data Collection:**

Gather diverse data sources relevant to the public health campaign, such as social media posts, articles, surveys, website traffic data, or government health records. - Ensure the data collected is comprehensive and covers a sufficient time frame.

2. **Data Preprocessing:**

- Clean the data by removing duplicates, handling missing values, and correcting inconsistencies. - Normalize text data by converting it to lowercase, removing punctuation, and performing stemming or lemmatization to standardize words. - Tokenize text data into words or phrases for analysis.

3. **Feature Engineering:**

- Extract meaningful features from the data that can provide insights. For example: - Perform sentiment analysis to determine the sentiment (positive, negative, neutral) of social media posts or articles. - Extract keywords or topics using techniques like TF-IDF (Term Frequency-Inverse Document Frequency) or LDA (Latent Dirichlet Allocation). - Analyze user demographics, such as age, gender, location, if available.

4. **Data labeling:**

- Define the outcome variable (labels) for your analysis, such as campaign success categories. This may involve setting thresholds or criteria for success. - Categorize the data into these labels based on predefined criteria.

5. **Model selection:**

Choose an appropriate machine learning or deep learning model based on the nature of the data and the analysis goals. Common choices include logistic regression, decision trees, random forests, support vector machines, or neural networks. - Consider the model's ability to handle the data's dimensionality and complexity.

6. **Training the Model:**

- Split the dataset into a training set and a testing set. Common splits are 70-30 or 80-20, where the majority of data is used for training. - Train the selected model using the training data, adjusting model parameters as needed

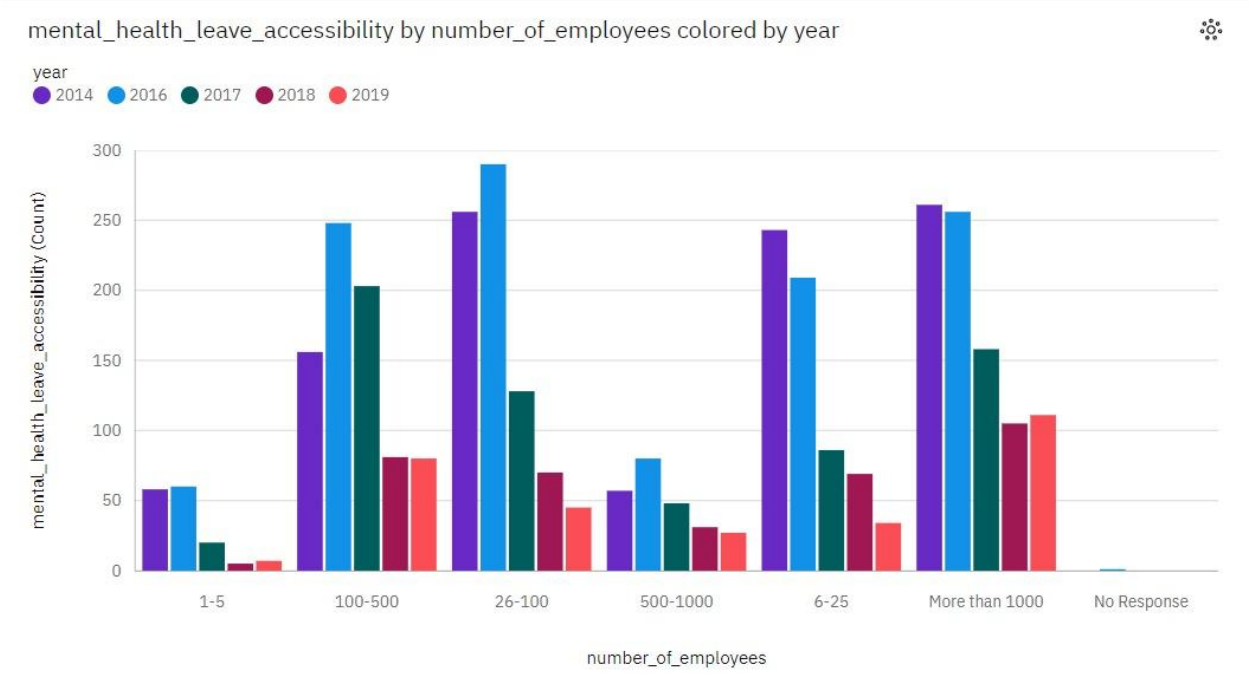
7. **Model Evaluation:**

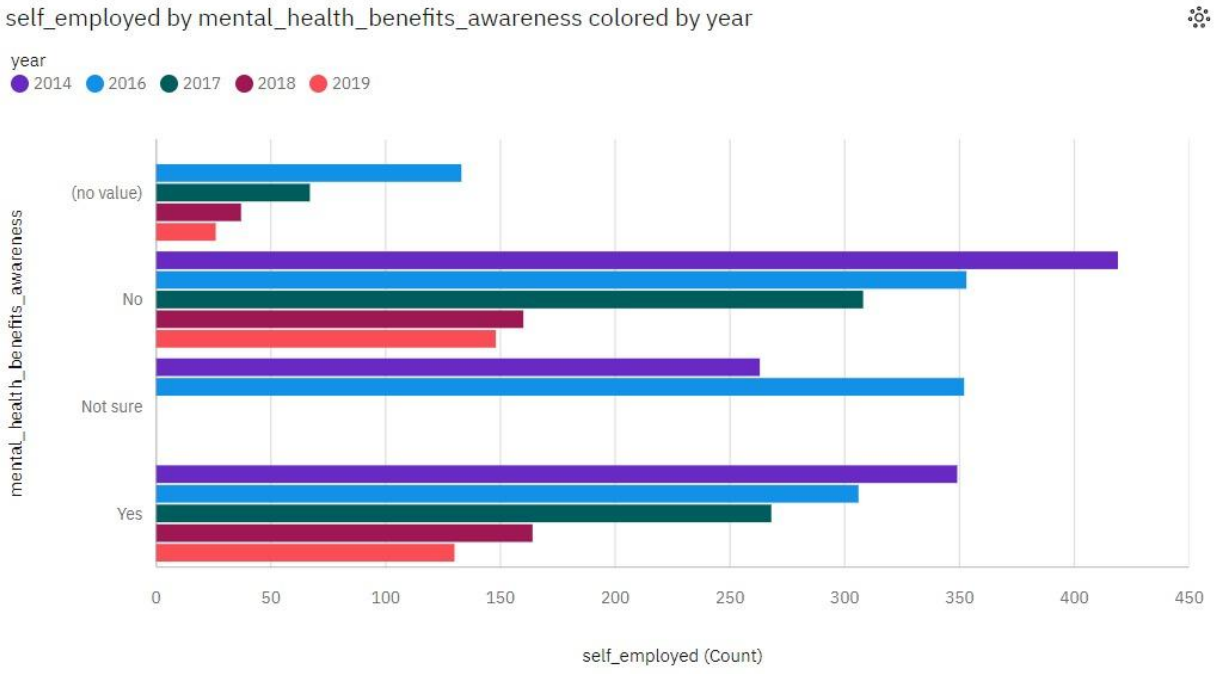
- Assess the model's performance using various metrics, including: - Accuracy: The proportion of correct predictions. - Precision: The ratio of true positive predictions to all positive predictions. - Recall: The ratio of true positive predictions to all actual positives. 14 - F1-score: A balance between precision and recall. - Use cross-validation to ensure robustness of the model's performance.

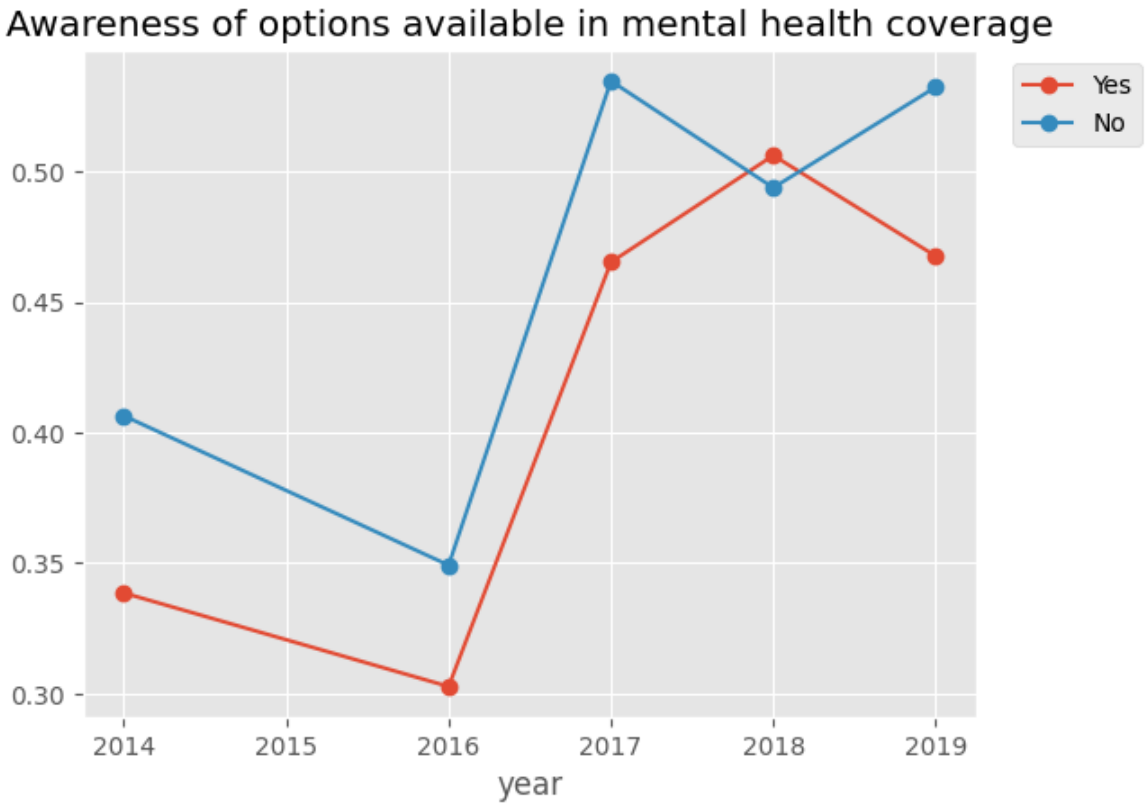
8. **Visualization:**

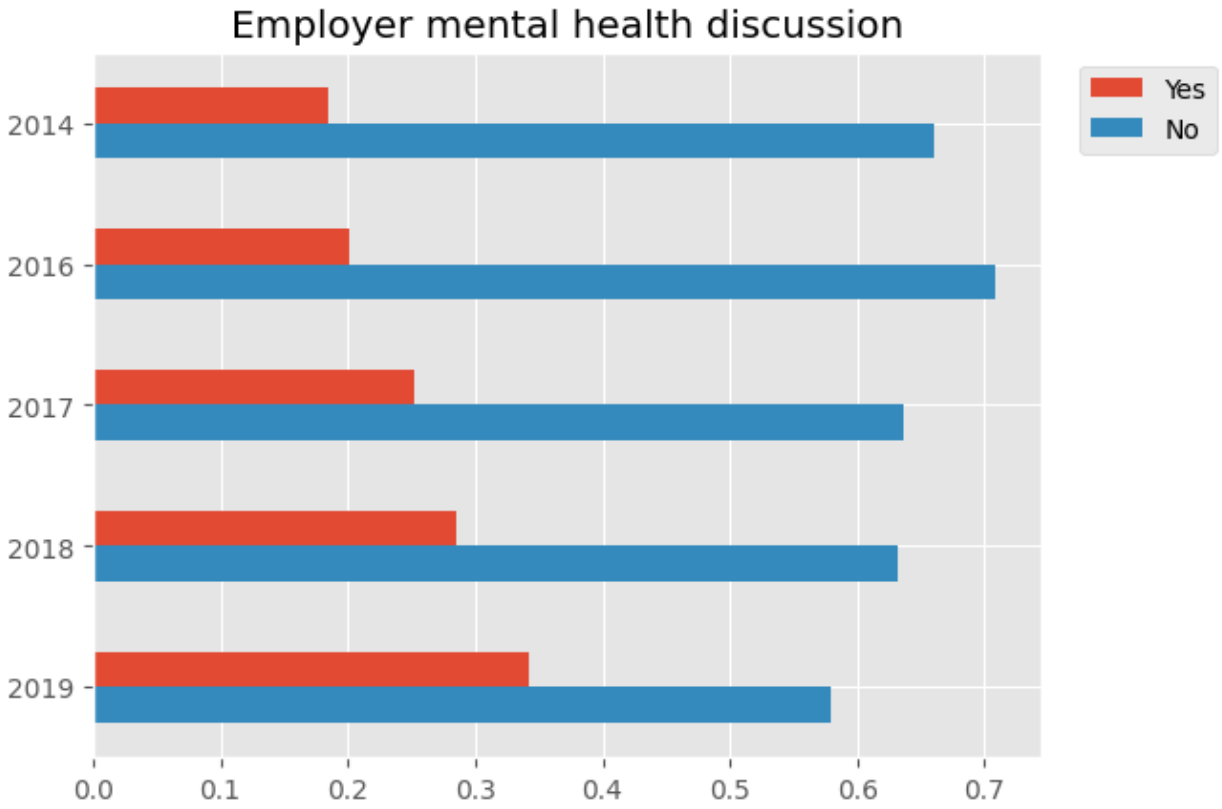
Create visual representations of the analysis results to communicate findings effectively. Common visualizations include bar charts, pie charts, scatter plots, and heatmaps.

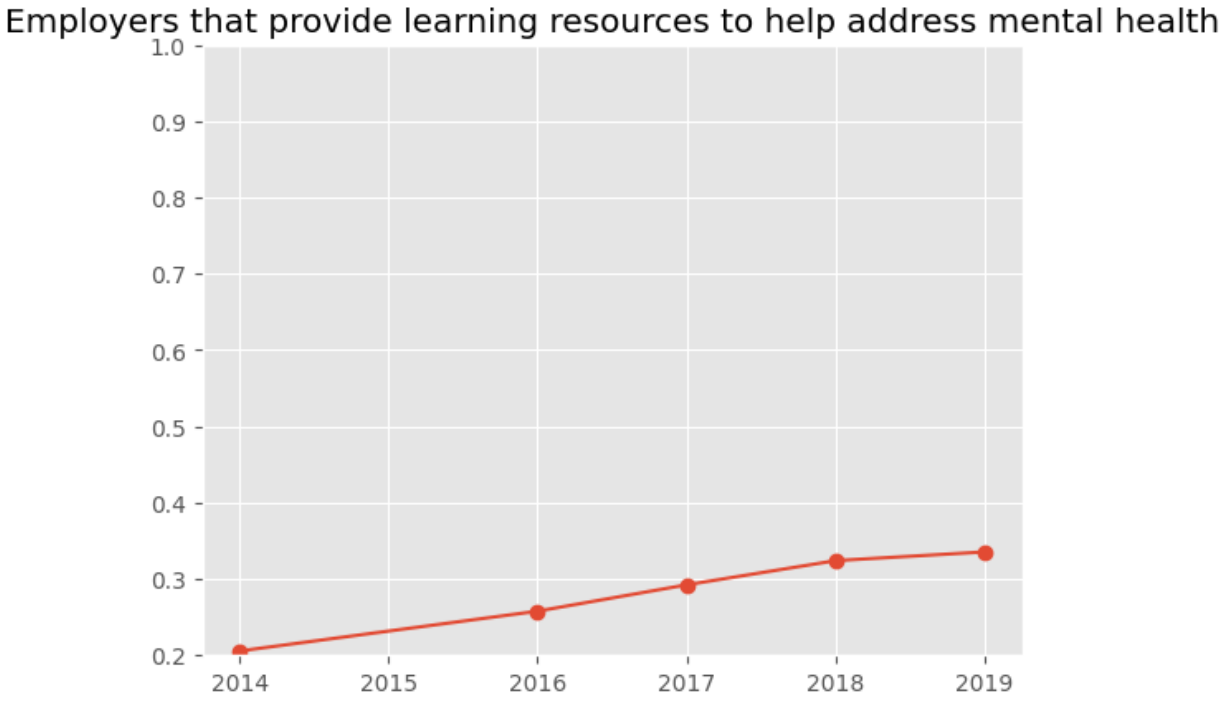
5. Data Visualization using IBM cognos:

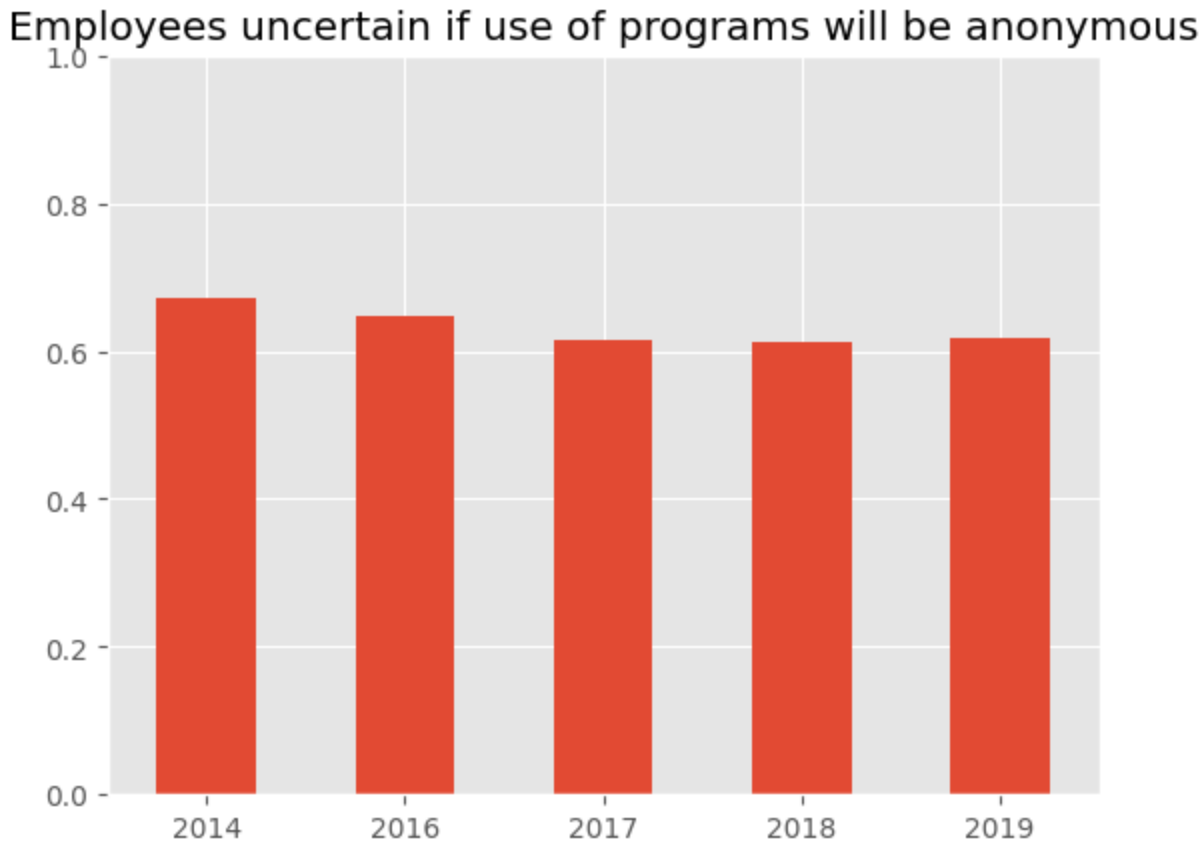


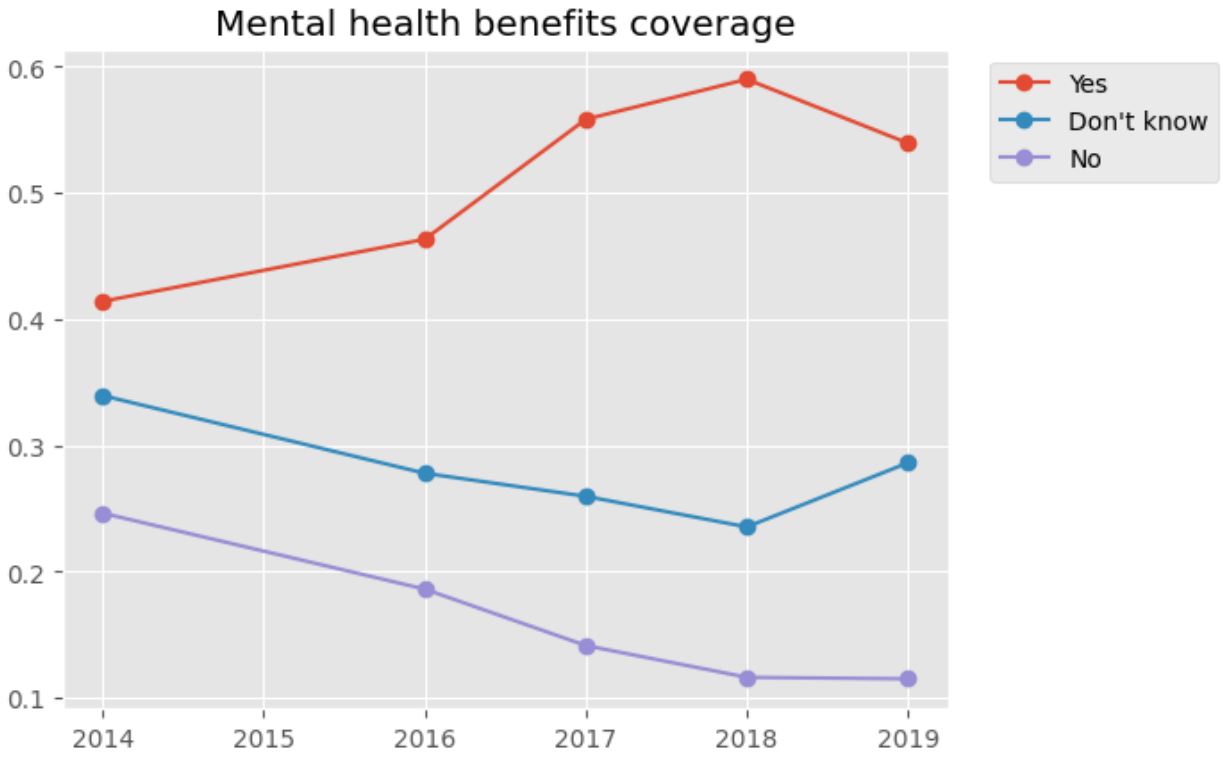



Awareness of options available in mental health coverage
Yes
No
0.50
0.45
0.40
0.35
0.30
2014
2015
2016
2017
2018
2019
year


Employer mental health discussion
Yes
No
2014
2016
2017
2018
2019
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7


Employers that provide learning resources to help address mental health
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
2014
2015
2016
2017
2018
2019


Employees uncertain if use of programs will be anonymous
1.0
0.8
0.6
0.4
0.2
0.0
2014
2016
2017
2018
2019


Mental health benefits coverage
0.6
0.5
0.4
0.3
0.2
0.1
2014
2015
2016
2017
2018
2019
Yes
Don't know
No

6.Advantages;

Increased awareness: Public health campaigns can help increase awareness about specific health issues and promote positive behaviors that can improve health outcomes.

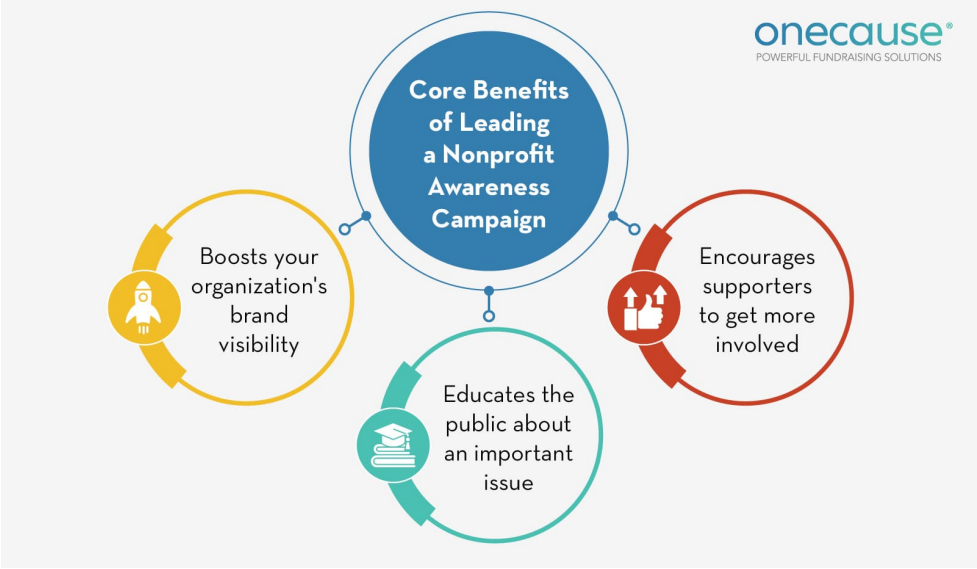
Improved health literacy: Public health campaigns can help improve health literacy among the public by providing accurate and clear information about health topics.

Targeted interventions: Public health campaigns can be targeted to specific populations or risk factors, making them more effective in achieving desired outcomes.

Cost-effective: Public health campaigns can be a cost-effective way to promote healthy behaviors and prevent disease outbreaks.

Transparency and Accountability: Analysis and reporting promote transparency, demonstrating accountability to stakeholders and the public.

Legacy and Continuity: Lessons learned from the analysis can be applied to future campaigns, leaving a positive and lasting impact on public health



7.Disadvantages:

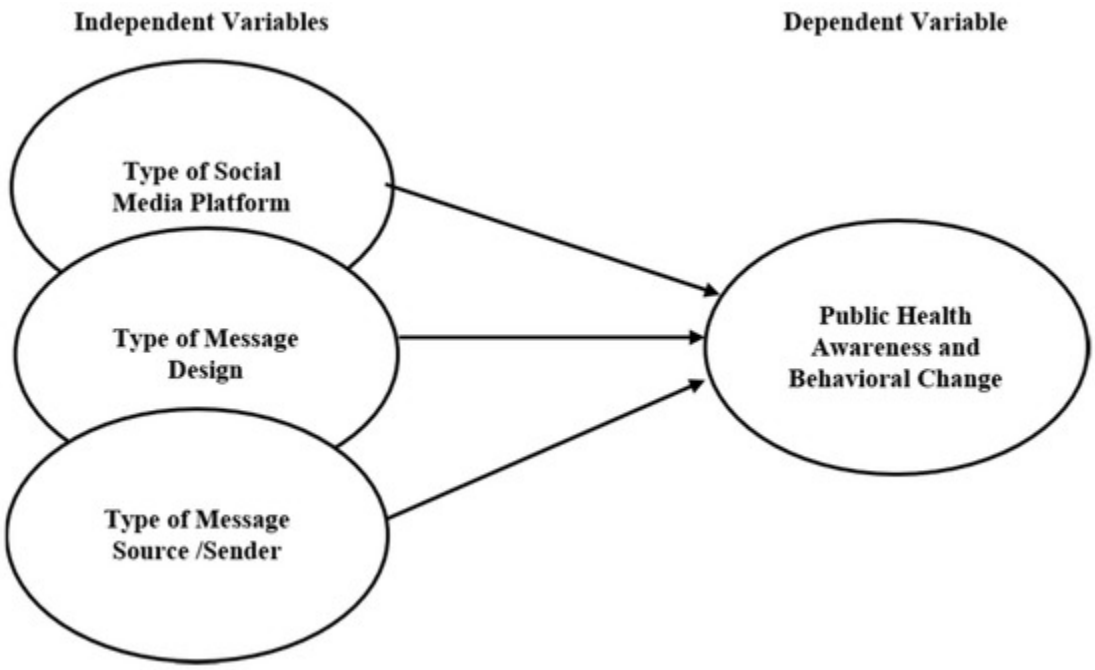
Limited impact: Public health campaigns may not be effective in reaching all members of the population, particularly those who are hard-to-reach or have limited access to information.

Lack of trust: Some members of the public may not trust public health campaigns due to a history of misinformation or negative experiences.

Unintended consequences: Public health campaigns may have unintended consequences, such as increasing stigma or discrimination against certain groups

Resource-intensive: Developing and implementing public health campaigns can be resource-intensive, requiring significant funding and staff time.

Sustainability : It can be difficult to sustain community engagement and behavior change once the campaign ends, leading to a decline in impact.



Data Privacy Concerns : Collecting and analyzing data may raise privacy concerns, especially in cases where individual health information is involved.

Conclusion

Public health awareness campaigns, like "Healthy Kids, Bright Futures," are crucial for addressing community health issues, offering informed decisions and behavioral impact. However, they can lead to campaign fatigue, cultural insensitivity, and sustainability challenges, while sometimes missing underlying health disparities, privacy concerns, and stakeholder opposition. Achieving a balance between their advantages and disadvantages requires data-driven and community-centric strategies, continuously adapting based on analysis and feedback. In the end, these campaigns empower communities and promote healthier practices, but it's vital to recognize both their potential and limitations for lasting positive change.