PUBLIC HEALTH AWARENESS

TEAM MEMBERS

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PROJECT TITLE: Public health awareness

PHASE 5: Project Documentation & Submission

INTRODUCTION:

Promoting public health awareness for data analytics simply means spreading the word about how using data and technology can improve healthcare.

It involves educating people about how data is used to track diseases, make healthcare decisions, and ultimatelyenhance public well-being.

The objective of your project could be stated as: "Utilizing data analytics to promote public health awareness.

" This means you'll be using data analysis techniques to generate insights and information that can help raise awareness about public health issues.

DESIGN THINKING:

1.Analysis Objectives: Define specific objectives for analyzing public health awareness campaign data, such as measuring audience reach, awareness levels, and campaign impact.

2.Data Collection: Identify the sources and methods for collecting campaign data, including engagement metrics, audience demographics, and awareness surveys.

3.Visualization Strategy: Plan how to visualize the insights using IBM Cognos to create informative dashboards and reports.

4.Code Integration: Decide which aspects of the analysis can be enhanced using code, such as data cleaning, transformation, and statistical analysis.

DATA SHARING PLATFORM:

Our project objective can be summarized as: "Leveraging data analytics on a shared platform to enhance public health awareness.

" This means you'll be using data analytics on a platform where information is shared to effectively communicate and address public health issues.

INNOVATION:

Public health awareness have played a crucial role in improving the health and well-being of communities worldwide. These innovations leverage technology, communication strategies, and creative approaches to inform and empower individuals to make healthier choices and prevent illness.

ALGORITHM OR STEPS TO PERFORM THE PUBLIC HEALTH AWARENESS ON A GIVEN DATASET USING MEACHINE

LEARNING ALGORITHM:

1.Data Collection and Preparation:

Gather relevant datasets: Collect data related to the specific public health issue you want to address. This could include data on disease incidence, demographics, lifestyle factors, and more.

2.Exploratory Data Analysis (EDA):

Visualize the data: Create plots and charts to gain insights into the dataset's characteristics, trends, and relationships between variables. Perform statistical analysis: Calculate summary statistics and identify patterns in the data.

3.Feature Engineering:

Select relevant features: Identify the most important variables that can influence the public health issue.Create new features if necessary: Engineer additional features that may improve the performance of machine learning models.

4.Data Splitting:

Divide the dataset into training and testing sets: Typically, the data is split into a training set (used to train the model) and a testing set (used to evaluate the model's performance).

5.Model Selection:

Choose an appropriate machine learning algorithm: Select a model that is well-suited to the problem at hand. Common choices include logistic regression, decision trees, random forests, support vector machines, or neural networks.

6.Model Training:

Train the machine learning model on the training dataset using the selected algorithm.

7.Model Evaluation:

Evaluate the model's performance using appropriate evaluation metrics. The choice of metrics depends on the specific problem, but common metrics include accuracy,precision, recall, F1 score, and ROC AUC.

8.Hyperparameter Tuning:

Fine-tune the model's hyperparameters to optimize its performance. Techniques like grid search or random search can be used to find the best combination of hyperparameters.

9.Validation:

Validate the model's performance on a separate validation dataset to ensure it generalizes well beyond the training data.

10.Interpretability:

Depending on the algorithm used, you may need to interpret the model's results. Understand which features are most influential in making predictions.

11.Awareness Strategy Development:

Based on the model's insights, design a public health awareness strategy. This could include targeted messaging, educational campaigns, or resource allocation for interventions.

DATA SET LINK:

https://www.kaggle.com/datasets/osmi/mental-health-in-tech-survey/

PERFORMING PUBLIC HEALTH AWARENESS USING MACHINE LEARNING REQUIRES SPECIFIC HARDWARE AND SOFTWARE RESOURCES:

HARDWARE REQUIREMENTS:

1.Computer or Server:

You will need a computer or server with sufficient processing power to train and run machine learning models. The hardware requirements can vary based on the complexity of the models and the size of the dataset. For some simple models, a standard laptop may suffice, but more complex models may require high-performance workstations or cloud-based resources.

2.GPU (Graphics Processing Unit):

Many machine learning tasks, especially deep learning, benefit significantly from GPUs, which can accelerate model training. If you plan to work on deep learning projects, having a GPU or access to cloud-based GPU instances can be valuable.

3.RAM (Random Access Memory):

Sufficient RAM is essential to handle large datasets and complex models. The specific RAM requirements depend on the size of your data and the algorithms you use.

4.Storage:

You'll need ample storage for storing datasets, model checkpoints, and other resources. SSDs (Solid State Drives) are preferred for faster data access.

SOFTWARE REQUIREMENTS:

1.Operating System:

Most machine learning libraries and tools are compatible with various operating systems, including Linux, macOS, and Windows. Linux is a popular choice among machine learning practitioners due to its stability and compatibility with many tools.

2.Programming Languages:

Python is the predominant programming language for machine learning. You'll need Python and libraries such as NumPy, pandas, scikit-learn, TensorFlow, PyTorch, and others, depending on your project's requirements.

3.Machine Learning Frameworks:

Depending on your choice of algorithms, you may need to install machine learning frameworks like TensorFlow, PyTorch, scikit-learn, or others. These libraries provide pre-built tools and functions for training and deploying machine learning models.

4.Database Software:

If your project involves working with large datasets, you may need a database system (e.g., MySQL, PostgreSQL) to manage and query the data efficiently.

5.Cloud Computing Services (optional):

Cloud platforms like AWS, Google Cloud, and Azure provide scalable resources for machine learning. They offer GPU instances, pre-configured environments, and services for data storage and processing

6.Version Control:

Version control systems like Git are essential for tracking changes to your code and collaborating with team members.

7.Documentation and Collaboration Tools:

Tools like Jupyter Notebook, Markdown, and collaborative platforms like GitHub or GitLab can help document your work and collaborate with others.

8.Security and Privacy Tools:

If your project involves sensitive health data, you may need encryption and privacy tools to ensure data security and compliance with regulations like HIPAA (Health Insurance Portability and Accountability Act).

HARDWARE SPECIFICATIONS:

RAM : 8 GB

Hard disc or SSD: More than 16 GB

SOFTWARE SPECIFICATIONS:

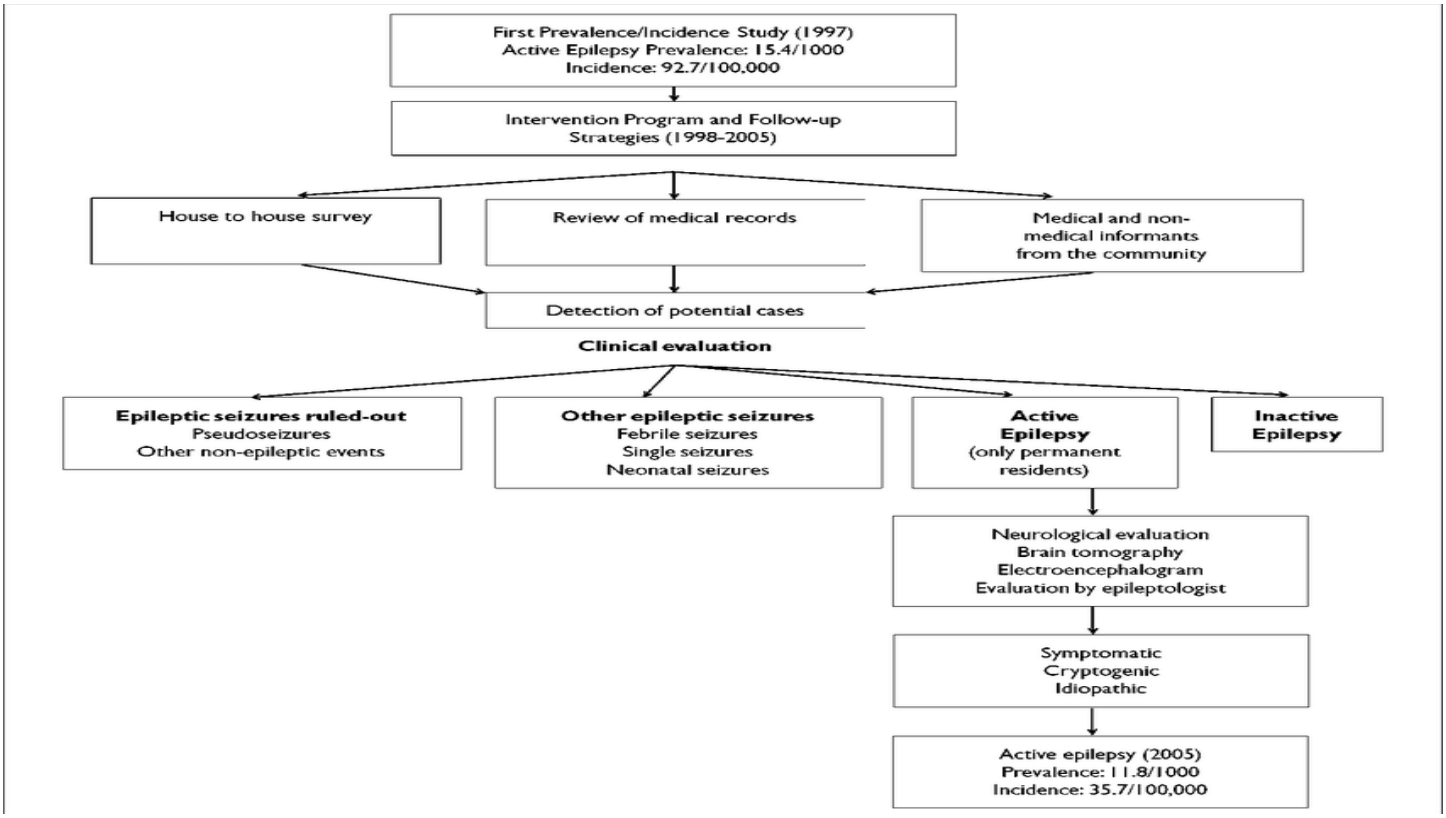
Operating system: Windows, Linux, Mac OS

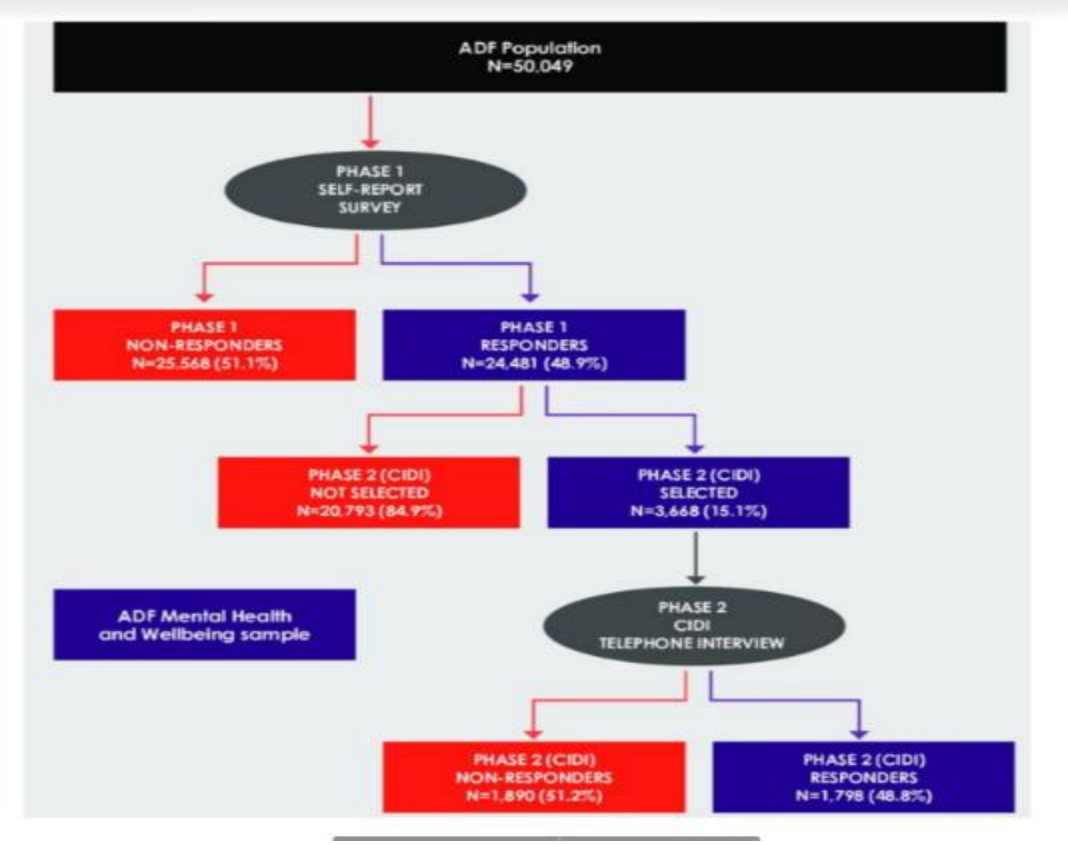
Processor : Ensure you have a modern multi-core processor (quad-

core or higher) to speed up data preprocessing and model training.

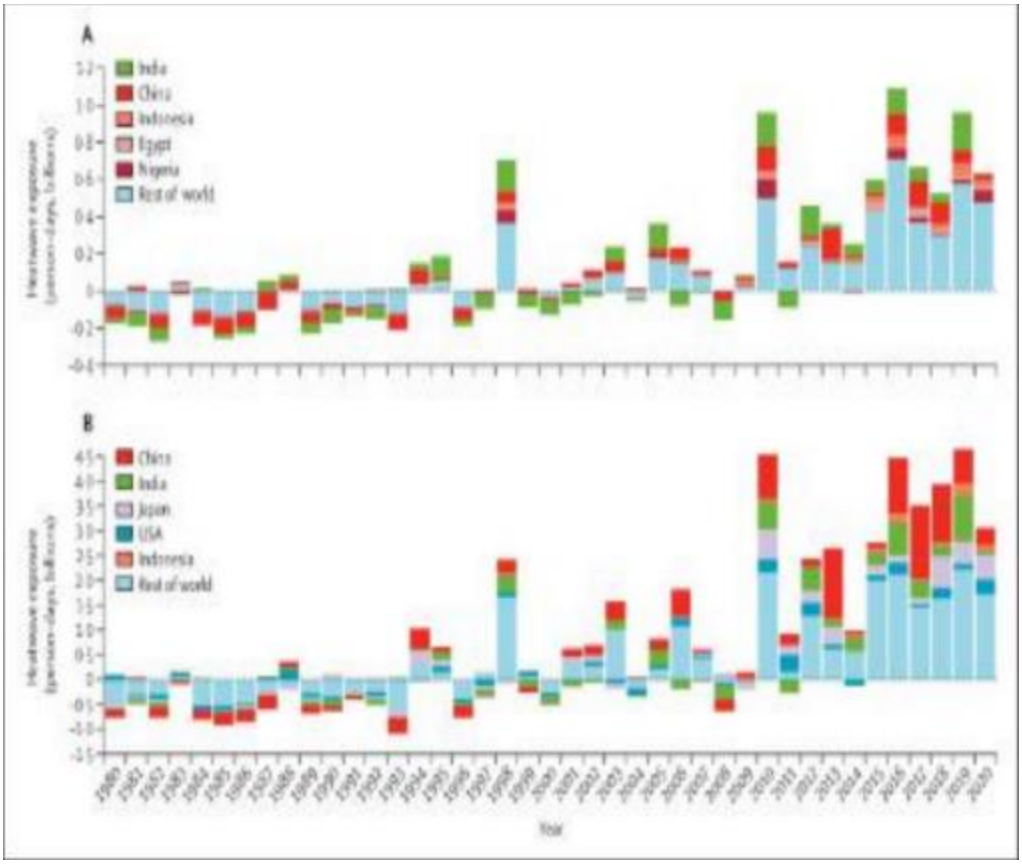
Framework: TensorFlow, PyTorch, Keras.

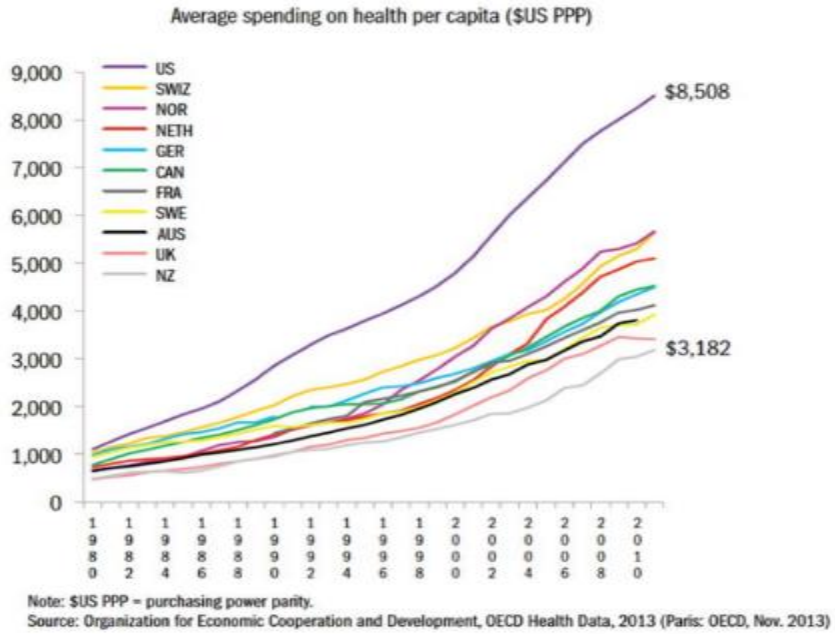
FLOWCHARTS :


First Prevalence/Incidence Study (1997)
Active Epilepsy Prevalence: 15.4/1000
Incidence: 92.7/100,000
Intervention Program and Follow-up Strategies (1998-2005)
House to house survey
Review of medical records
Medical and non-medical informants from the community
Detection of potential cases
Clinical evaluation
Epileptic seizures ruled-out
Pseudoseizures
Other non-epileptic events
Other epileptic seizures
Febrile seizures
Single seizures
Neonatal seizures
Active Epilepsy
(only permanent residents)
Inactive Epilepsy
Neurological evaluation
Brain tomography
Electroencephalogram
Evaluation by epileptologist
Symptomatic
Cryptogenic
Idiopathic
Active epilepsy (2005)
Prevalence: 11.8/1000
Incidence: 35.7/100,000


ADF Population
N=50,049
PHASE 1
SELF-REPORT
SURVEY
PHASE 1
NON-RESPONDERS
N=25,568 (51.1%)
PHASE 1
RESPONDERS
N=24,481 (48.9%)
PHASE 2 (CIDI)
NOT SELECTED
N=20,793 (84.9%)
PHASE 2 (CIDI)
SELECTED
N=3,668 (15.1%)
ADF Mental Health
and Wellbeing sample
PHASE 2
CIDI
TELEPHONE INTERVIEW
PHASE 2 (CIDI)
NON-RESPONDERS
N=1,890 (51.2%)
PHASE 2 (CIDI)
RESPONDERS
N=1,798 (48.8%)

EXPECTED OUTPUT :





PUBLIC HEALTH AWARENESS TOOLS ARE ESSENTIAL FOR EDUCATING AND INFORMING THE PUBLIC ABOUT HEALTH-RELATED ISSUES, PROMOTING HEALTHY BEHAVIORS, AND PREVENTING THE SPREAD OF DISEASES.

THESE TOOLS CAN TAKE VARIOUS FORMS AND MAY INCLUDE:

1. Health Education Campaigns: These can involve the use of posters, pamphlets, brochures, and other printed materials to provide information on specific health topics such as vaccinations, nutrition, sexual health, and disease prevention.
2. Social Media: Platforms like Facebook, Twitter, Instagram, and TikTok are powerful tools for disseminating public health information. Public health agencies and organizations often use these platforms to share news, updates, and health tips.
3. Websites: Public health agencies maintain websites with information on a wide range of health topics, including guidelines, resources, and links to further information.
4. Mobile Apps: Smartphone apps can provide users with real-time information, health monitoring tools, and access to telehealth services. These apps can address issues like nutrition, fitness, mental health, and more.
5. Public Service Announcements (PSAs): PSAs are short videos or audio messages that are broadcast on television, radio, or social media to raise awareness about specific health issues and promote positive behaviors.
6. Infographics: These visual representations of information are designed to simplify complex health messages and make them more accessible to a broader audience.
7. Community Workshops and Seminars: In-person or virtual workshops and seminars can provide an opportunity for experts to engage with the community, answer questions, and offer guidance on health-related topics.

8. Newsletters: Public health organizations often distribute newsletters with updates on current health issues, prevention tips, and resources.
9. Email Campaigns: Sending health-related information and resources via email can help reach a large audience.
10. Public Service Displays: Using public spaces, billboards, bus ads, and other forms of outdoor advertising to display health messages.
11. Helplines and Hotlines: Establishing phone hotlines for specific health issues, such as crisis helplines, can provide immediate support and information.
12. Interactive Websites and Tools: Online interactive quizzes, symptom checkers, and other tools can help individuals assess their health status and risks.
13. Public Health Videos: Creating and sharing informative and educational videos on platforms like YouTube can effectively convey health information.
14. Social Marketing Campaigns: Using marketing strategies to promote positive health behaviors, such as encouraging people to quit smoking or get vaccinated.
15. Collaborations with Influencers: Partnering with social media influencers and celebrities to spread public health messages and encourage healthy behaviors.
16. Partnerships with Schools and Educational Institutions: Collaborating with schools and colleges to incorporate health education into the curriculum.
17. Public Health Surveys: Gathering data through surveys to understand public knowledge, attitudes, and behaviors related to health issues.
18. Multimedia Campaigns: Combining various tools, such as videos, websites, and social media, to create comprehensive public health awareness campaigns.

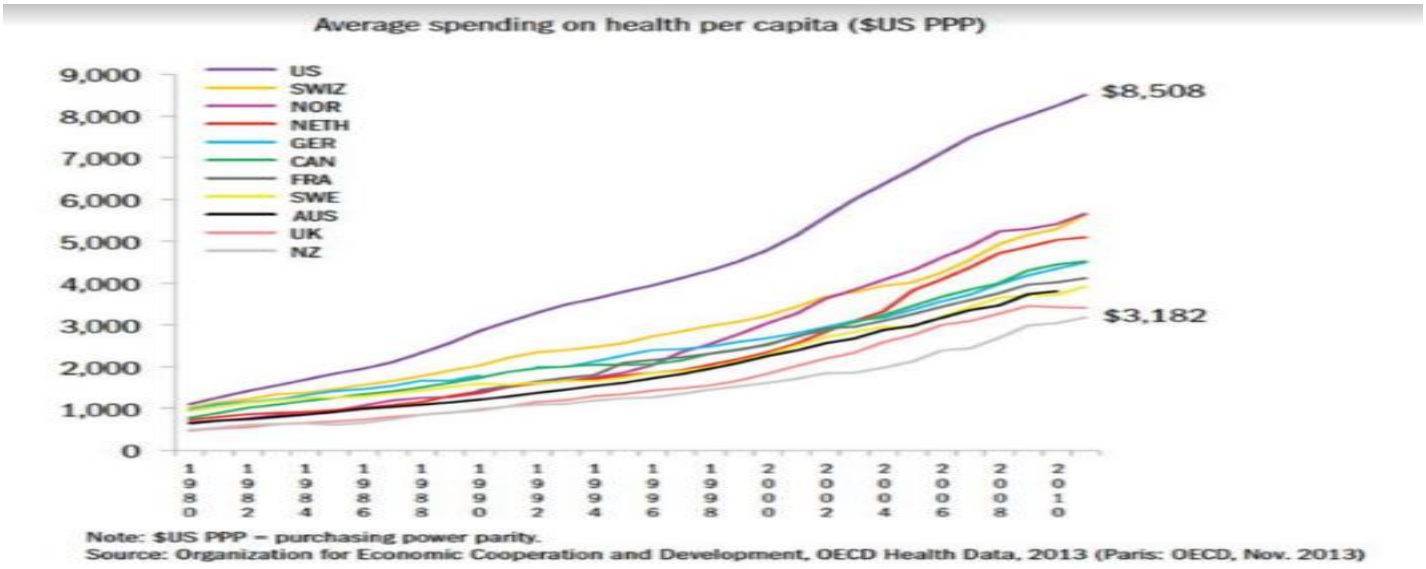
APPS USED :

Public health awareness applications, often referred to as public health apps, play a crucial role in disseminating information, promoting healthy behaviors, and assisting in disease prevention and management.

These apps can be used by individuals, public health organizations, and healthcare providers. Here are some types of public health awareness applications:

1. **COVID-19 Tracking and Information Apps**: These apps provide real-time information about the COVID-19 pandemic, including case counts, testing locations, and safety guidelines. Some apps also offer contact tracing and exposure notification features.
2. **Nutrition and Diet Apps**: These apps help users track their daily food intake, monitor their nutritional needs, and set dietary goals for better health.
3. **Fitness and Exercise Apps**: These apps encourage physical activity, provide workout routines, and track users' exercise progress.
4. **Mental Health and Well-being Apps**: Designed to address mental health issues like stress, anxiety, and depression, these apps offer resources, guided meditation, mood tracking, and coping strategies.
5. **Smoking Cessation Apps**: These apps assist individuals in quitting smoking by offering tips, support, and progress tracking.
6. **Vaccination Reminder Apps**: Designed to ensure that users stay up-to-date with their immunizations, these apps send reminders for vaccine appointments and provide information about vaccine schedules.
7. **Emergency Preparedness Apps**: Public health agencies often develop apps that provide information on emergency procedures, local disaster alerts, and evacuation routes.
8. **Water Quality Monitoring Apps**: Some regions offer apps that allow users to check the quality of their tap water and receive alerts about water safety.

CODING:



In [8]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
data = pd.read_csv(r"C:\Users\IT\Desktop\saranya\public health awareness.csv")
data.head()
```

Out[8]:

	Timestamp	Age	Gender	Country	state	self_employed	family_history	treatment	work_interfere	no_employees	...	leave	mental_health_consequence	phys_health_consequence	coworkers	s
0	2014-08-27 11:29:31	37	Female	United States	IL	NaN	No	Yes	Often	6-25	...	Somewhat easy	No	No	Some of them	
1	2014-08-27 11:29:37	44	M	United States	IN	NaN	No	No	Rarely	More than 1000	...	Don't know	Maybe	No	No	
2	2014-08-27 11:29:44	32	Male	Canada	NaN	NaN	No	No	Rarely	6-25	...	Somewhat difficult	No	No	Yes	
3	2014-08-27 11:29:46	31	Male	United Kingdom	NaN	NaN	Yes	Yes	Often	26-100	...	Somewhat difficult	Yes	Yes	Some of them	
4	2014-08-27 11:30:22	31	Male	United States	TX	NaN	No	No	Never	100-500	...	Don't know	No	No	Some of them	

5 rows × 27 columns

In [22]:
```
if data.isnull().sum().sum() == 0 :
    print ("There is no missing data in our dataset")
else:
    print('There is {} missing data in our dataset '.format(data.isnull().sum().sum()))
```

```
There is 1892 missing data in our dataset
```

In [23]:
```
frame = pd.concat([data.isnull().sum(), data.nunique(), data.dtypes], axis = 1, sort= False)
frame
```

Out[23]:

	0	1	2
Timestamp	0	1246	object
Age	0	53	int64
Gender	0	49	object
Country	0	48	object
state	515	45	object
self_employed	18	2	object
family_history	0	2	object
treatment	0	2	object
work_interfere	264	4	object
no_employees	0	6	object
remote_work	0	2	object
tech_company	0	2	object
benefits	0	3	object
care_options	0	3	object
wellness_program	0	3	object
seek_help	0	3	object
anonymity	0	3	object
leave	0	5	object
mental_health_consequence	0	3	object
phys_health_consequence	0	3	object
coworkers	0	3	object
supervisor	0	3	object
mental_health_interview	0	3	object
phys_health_interview	0	3	object
mental_vs_physical	0	3	object
obs_consequence	0	2	object
comments	1095	160	object

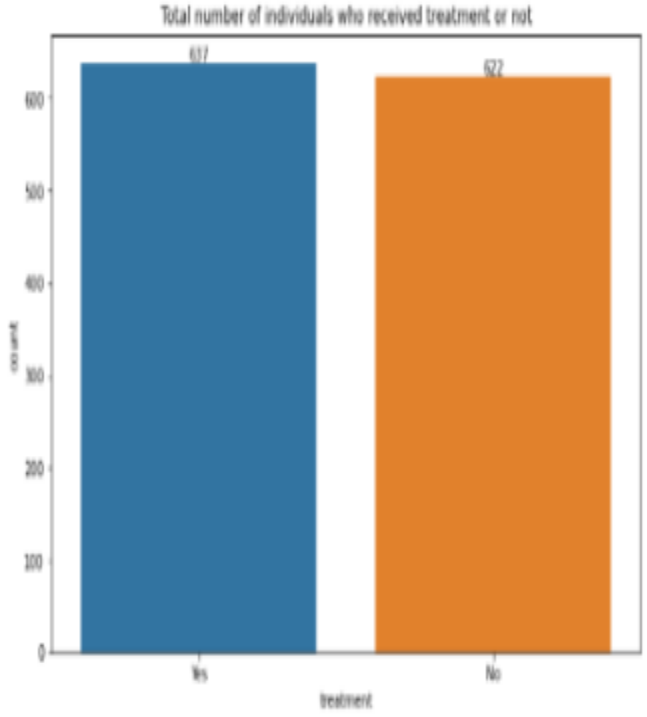
In [26]:
```
from sklearn.impute import SimpleImputer

data = data.drop(columns=['state', 'comments', 'Timestamp', ])
from sklearn.preprocessing import LabelEncoder

le = LabelEncoder()

columns_to_encode = ['Gender', 'Country', 'self_employed','family_history', 'treatment', 'work_interfere','no_employees',
                     'remote_work', 'tech_company','benefits','care_options', 'wellness_program',
                     'seek_help', 'anonymity', 'leave', 'mental_health_consequence', 'phys_health_consequence',
                     'coworkers', 'supervisor', 'mental_health_interview','phys_health_interview',
                     'mental_vs_physical', 'obs_consequence']
for columns in columns_to_encode:
    data[columns] = le.fit_transform(data[columns])

data.info()
data['work_interfere'] = SimpleImputer(strategy = 'most_frequent').fit_transform(data['work_interfere'].values.reshape(-1,1))
data['self_employed'] = SimpleImputer(strategy = 'most_frequent').fit_transform(data['self_employed'].values.reshape(-1,1))

data.head()
```

Out[26]:

	Age	Gender	Country	self_employed	family_history	treatment	work_interfere	no_employees	remote_work	tech_company	...	anonymity	leave	mental_health_consequence	phys_health_cons
0	37	Female	United States	No	No	Yes	Often	6-25	No	Yes	...	Yes	Somewhat easy	No	
1	44	M	United States	No	No	No	Rarely	More than 1000	No	No	...	Don't know	Don't know	Maybe	
2	32	Male	Canada	No	No	No	Rarely	6-25	No	Yes	...	Don't know	Somewhat difficult	No	
3	31	Male	United Kingdom	No	Yes	Yes	Often	26-100	No	Yes	...	No	Somewhat difficult	Yes	
4	31	Male	United States	No	No	No	Never	100-500	Yes	Yes	...	Don't know	Don't know	No	

5 rows × 24 columns

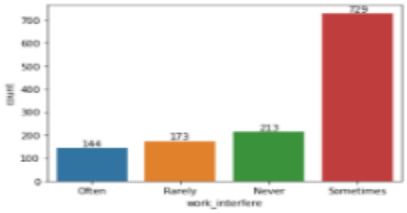
In [34]:
```
plt.figure(figsize = (10,6));
treat = sns.countplot(data = data,  x = 'treatment');
treat.bar_label(treat.containers[0]);
plt.title('Total number of individuals who received treatment or not');
```



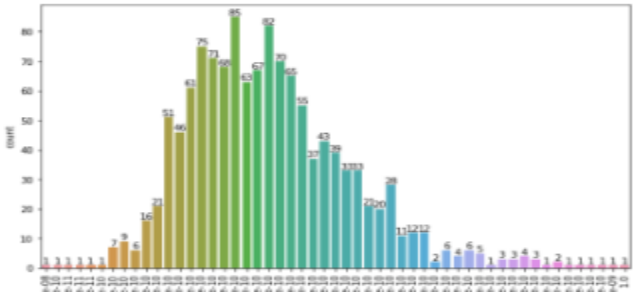
In [35]:
```
data['Age'].unique()
```

Out[35]:
```
array([ 3.700e-10,  4.400e-10,  3.200e-10,  3.100e-10,  3.300e-10,
        3.500e-10,  3.900e-10,  4.200e-10,  2.300e-10,  2.900e-10,
        3.600e-10,  2.700e-10,  4.600e-10,  4.100e-10,  3.400e-10,
        3.000e-10,  4.000e-10,  3.800e-10,  5.000e-10,  2.400e-10,
        1.800e-10,  2.800e-10,  2.600e-10,  2.200e-10,  1.900e-10,
        2.500e-10,  4.500e-10,  2.100e-10, -2.900e-10,  4.300e-10,
        5.600e-10,  6.000e-10,  5.400e-10,  3.290e-09,  5.500e-10,
        1.000e+00,  4.800e-10,  2.900e-10,  5.700e-10,  5.800e-10,
        4.700e-10,  6.200e-10,  5.100e-10,  6.500e-10,  4.900e-10,
       -1.726e-08,  5.000e-11,  5.300e-10,  6.100e-10,  8.000e-11,
        1.100e-10, -1.000e-11,  7.200e-10])
```

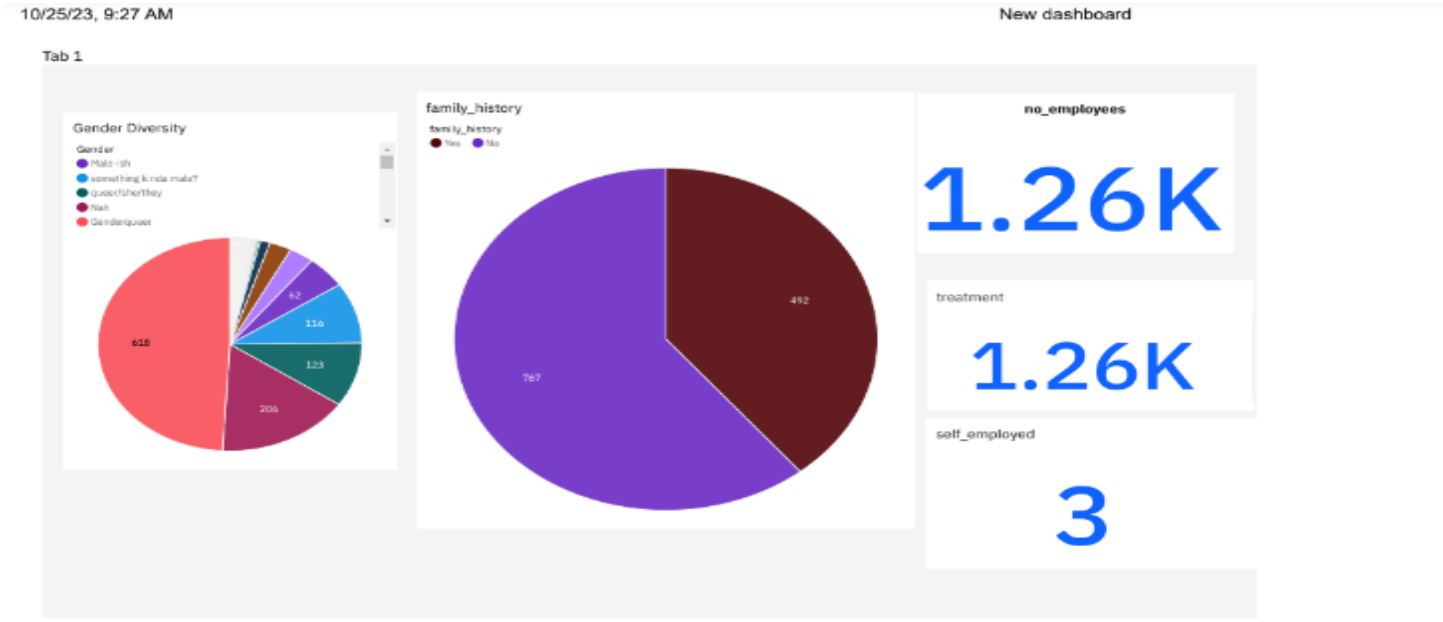
In [36]:
```
ax = sns.countplot(data=data, x='work_interfere');
ax.bar_label(ax.containers[0]);
```



In [37]:
```
plt.figure(figsize = (10,6))
age_range_plot = sns.countplot(data = data, x = 'Age');
age_range_plot.bar_label(age_range_plot.containers[0]);
plt.xticks(rotation=90);
```



VISUVALIZATION:



CONCLUSION:

Public health awareness is of paramount importance in safeguarding the well-being of individuals and communities.

It serves as a powerful tool to educate, inform, and engage the public, promoting healthy behaviors, preventing the spread of diseases, and improving overall health outcomes. In conclusion, here are some key points about the significance of public health awareness:

1. **Prevention and Education**: Public health awareness initiatives are fundamental in preventing diseases and health issues by providing individuals with the knowledge and resources needed to make informed decisions about their health.
2. **Early Detection:** By raising awareness about the signs and symptoms of diseases and the importance of regular screenings, public health campaigns can lead to early detection and treatment, often improving health outcomes.
3. **Behavioral Change:** These campaigns aim to change behaviors by emphasizing the benefits of healthy choices such as vaccinations, exercise, and balanced nutrition, which can reduce the burden of preventable illnesses.
4. **Empowerment:** Public health awareness empowers individuals to take control of their own health and that of their families. It encourages proactive engagement in health-related decisions.
5. **Community Resilience:** Raising awareness at a community level can lead to better community resilience, as individuals are more prepared to respond to public health emergencies and crises.
6. **Reducing Health Disparities**: Public health awareness efforts can address health disparities by ensuring that information and resources are accessible to all, regardless of socioeconomic or demographic factors.
7. **Technology and Innovation**: The use of technology, including mobile apps, social media, and digital platforms, has revolutionized the way public health awareness is disseminated, making it more engaging and accessible to a wider audience.
8. **Collaboration:** Effective public health awareness campaigns often involve collaboration between public health agencies, healthcare providers,

community organizations, and educational institutions. These partnerships strengthen the impact of such initiatives.

9. **Emergency Preparedness**: Public health awareness campaigns play a critical role in preparing individuals and communities for public health emergencies, natural disasters, and pandemics.

In conclusion, public health awareness is a multifaceted and dynamic field that continues to evolve with advances in technology, changes in healthcare practices, and shifts in public health priorities. It is a critical component of the global effort to enhance public health, promote well-being, and reduce the burden of preventable diseases. Public health awareness is an ongoing endeavor that demands the active involvement of governments, healthcare organizations, community leaders, and individuals in order to create healthier and more resilient communities.

PHASE LINKS:

Phase 1: https://github.com/KarthigaMariyappan/Publichealthawareness-/blob/2b6659e845934986fae211ca632f77db4150674d/KarthigaM%20public%20health%20awareness%20.pdf

Phase 2: https://github.com/KarthigaMariyappan/Publichealthawareness-/blob/2b6659e845934986fae211ca632f77db4150674d/DAC_phase2.pdf

Phase 3: https://github.com/KarthigaMariyappan/Publichealthawareness-/blob/2b6659e845934986fae211ca632f77db4150674d/DAC_phase3.pdf

Phase 4: https://github.com/KarthigaMariyappan/Publichealthawareness-/blob/2b6659e845934986fae211ca632f77db4150674d/DAC_Phase4.pdf