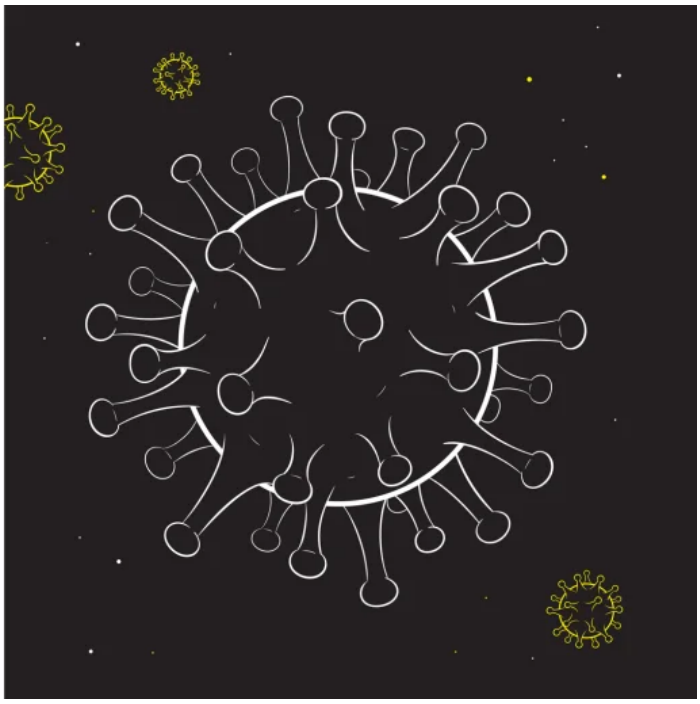
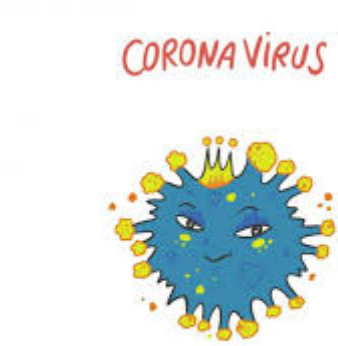
Are you in danger of being affected by Corona Virus?



What is Covid-19 Virus?

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.
Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.



The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing your hands or using an alcohol based rub frequently and not touching your face.

The COVID-19 virusspreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes, so it’s important that you also practice respiratory etiquette (for example, by coughing into a flexed elbow).

Note:

The data obtained is from the Mexican government and hence, the analysis is valid for Mexico or maybe North America. The pandemic stats and behaviours are extremely different for Asian countries when compared to North American or European countries owing to far lower case fatality rate for Asia.

Data Dictionary:

1. id: The identification number of the patient
   .
2. sex: Identify gender of the patient, 1 as female and 2 as male.
3. patient_type: Type of patient, 1 for not hospitalized and 2 for hosptalized.
4. entry_date: The date that the patient went to the hospital.
5. date_symptoms: The date that the patient started to show symptoms.
6. date_died: The date that the patient died, “9999-99-99” stands for recovered.
7. intubed: Intubation is a procedure that’s used when you can’t breathe on your own. Your doctor puts a tube down your throat and into your windpipe to make it easier to get air into and out of your lungs. A machine called a ventilator pumps in air with extra oxygen. Then it helps you breathe out air that’s full of carbon dioxide (CO2). “1” denotes that the patient used ventilator and “2” denotes that the patient did not, “97” “98” “99” means not specified.
8. pneumonia: Indicates whether the patient already have air sacs inflammation or not “1” for yes, “2” for no, “97” “98” “99” means not specified.
9. age: Specifies the age of the patient.
10. pregnancy: Indicates whether the patient is pregnant or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
11. diabetes: Indicates whether the patient has diabetes or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
12. copd: Indicates whether the patient has Chronic obstructive pulmonary disease (COPD) or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
13. asthma: Indiactes whether the patient has asthma or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
14. inmsupr: Indicates whether the patient is immunosuppressed or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
15. hypertension: Indicates whether the patient has hypertension or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
16. other_disease: Indicates whether the patient has other disease or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
17. cardiovascular: Indicates whether if the patient has heart or blood vessels realted disease, “1” for yes, “2” for no, “97” “98” “99” means not specified.
18. obesity: Indicates whether the patient is obese or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
19. renal_chronic: Indicates whether the patient has chronic renal disease or not, “1” for yes, “2” for no, “97” “98” “99” means not specified.
20. tobacco: Indicates whether if the patient is a tobacco user, “1” for yes, “2” for no, “97” “98” “99” means not specified.
21. contact_other_covid: Indicates whether if the patient has contacted another covid19 patient.
22. icu: Indicates whether the if the patient had been admitted to an Intensive Care Unit (ICU), “1” for yes, “2” for no, “97” “98” “99” means not specified.
23. covid_res: 1 indicates person is covid +ve,2 indicates person is covide -ve,3 indicates result is in awaiting process

In [1]:

```
# This Python 3 environment comes with many helpful analytics libraries installed
# It is defined by the kaggle/python Docker image: https://github.com/kaggle/docker-python
# For example, here's several helpful packages to load

import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)

# Input data files are available in the read-only "../input/" directory
# For example, running this (by clicking run or pressing Shift+Enter) will list all files u

import os
for dirname, _, filenames in os.walk('/kaggle/input'):
    for filename in filenames:
        print(os.path.join(dirname, filename))

# You can write up to 20GB to the current directory (/kaggle/working/) that gets preserved
# You can also write temporary files to /kaggle/temp/, but they won't be saved outside of t
```

```
/kaggle/input/covid19-patient-precondition-dataset/covid.csv
/kaggle/input/covid19-patient-precondition-dataset/Description.xlsx
/kaggle/input/covid19-patient-precondition-dataset/Catalogs.xlsx
```

In [2]:

```
import pandas as pd
import numpy as np
import matplotlib as mpl
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
from sklearn.model_selection import train_test_split

from sklearn.tree import DecisionTreeClassifier

from sklearn.metrics import classification_report, confusion_matrix
```

In [3]:

```
df=pd.read_csv('../input/covid19-patient-precondition-dataset/covid.csv')
```

In [4]:

```
df.head()
```

Out[4]:

	id	sex	patient_type	entry_date	date_symptoms	date_died	intubed	pneumonia	age
0	16169f	2	1	04-05-2020	02-05-2020	9999-99-99	97	2	27
1	1009bf	2	1	19-03-2020	17-03-2020	9999-99-99	97	2	24
2	167386	1	2	06-04-2020	01-04-2020	9999-99-99	2	2	54
3	0b5948	2	2	17-04-2020	10-04-2020	9999-99-99	2	1	30
4	0d01b5	1	2	13-04-2020	13-04-2020	22-04-2020	2	2	60

5 rows × 23 columns

In [5]:

```
df.describe()
```

Out[5]:

	sex	patient_type	intubed	pneumonia	age	pregnar
count	566602.000000	566602.000000	566602.000000	566602.000000	566602.000000	566602.000(
mean	1.506726	1.215165	76.562952	1.846262	42.622483	50.400(
std	0.499955	0.410937	39.058676	0.560939	16.659973	47.501(
min	1.000000	1.000000	1.000000	1.000000	0.000000	1.000(
25%	1.000000	1.000000	97.000000	2.000000	31.000000	2.000(
50%	2.000000	1.000000	97.000000	2.000000	41.000000	97.000(
75%	2.000000	1.000000	97.000000	2.000000	53.000000	97.000(
max	2.000000	2.000000	99.000000	99.000000	120.000000	98.000(

In [6]:

```
df.shape
```

Out[6]:

```
(566602, 23)
```

In [7]:

```
df.isnull().sum()
```

Out[7]:

```
id                    0
sex                   0
patient_type          0
entry_date            0
date_symptoms         0
date_died             0
intubed               0
pneumonia             0
age                   0
pregnancy             0
diabetes              0
copd                  0
asthma                0
inmsupr               0
hypertension          0
other_disease         0
cardiovascular        0
obesity               0
renal_chronic         0
tobacco               0
contact_other_covid   0
covid_res             0
icu                   0
dtype: int64
```

In [8]:

```
df.drop(columns={'entry_date','date_died','date_symptoms','id'},axis=1,inplace=True)
df.shape
```

Out[8]:

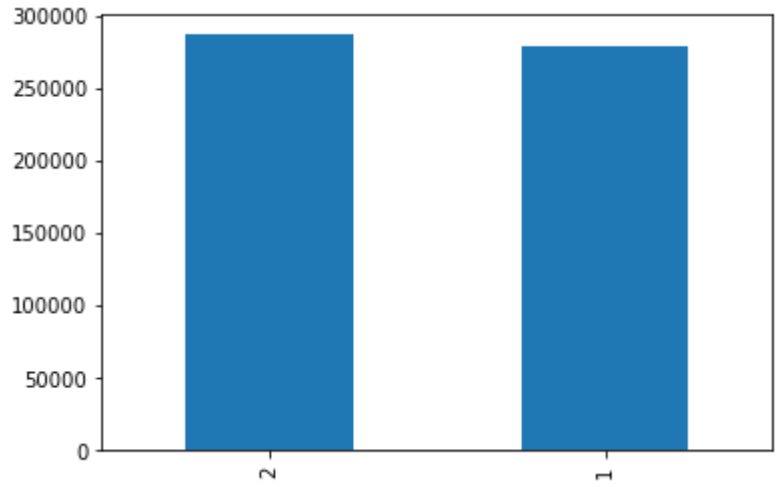
```
(566602, 19)
```

In [9]:

```
df["sex"].value_counts().plot.bar()
```

Out[9]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f2185c48f10>
```



In [10]:

```
df['covid_res'].value_counts().to_frame()
```

Out[10]:

	covid_res
2	279035
1	220657
3	66910

TEST RESULT

1. positive
2. negative
3. awaitinga

Now here,we are replacing 1 with 1,2 with 0 and 3 with 2

In [11]:

```
df['covid_res'].replace([1,2,3],[1,0,2],inplace=True)
df['covid_res'].value_counts().to_frame()
```

Out[11]:

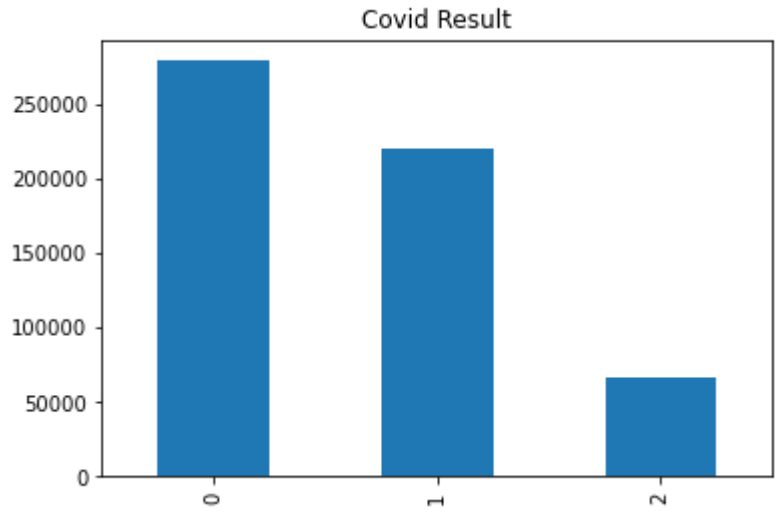
	covid_res
0	279035
1	220657
2	66910

In [12]:

```
df['covid_res'].value_counts().sort_index().plot.bar()
plt.title('Covid Result')
```

Out[12]:

```
Text(0.5, 1.0, 'Covid Result')
```



1. 0-negative
2. 1-positive
3. 2-awaiting

In [13]:

```
df.rename(columns={'covid_res':'Chance'},inplace=True)
df.head()
```

Out[13]:

	sex	patient_type	intubed	pneumonia	age	pregnancy	diabetes	copd	asthma	inmsupr
0	2	1	97	2	27	97	2	2	2	2
1	2	1	97	2	24	97	2	2	2	2
2	1	2	2	2	54	2	2	2	2	2
3	2	2	2	1	30	97	2	2	2	2
4	1	2	2	2	60	2	1	2	2	2

Since we are focusing on giving the chances of being affected by corona,so our main focus will be on either chance is positive or negative, hence we'll neglect awaiting chances..
Now here i am dropping all those rows which contains chance is awaiting i.e.2 value

In [14]:

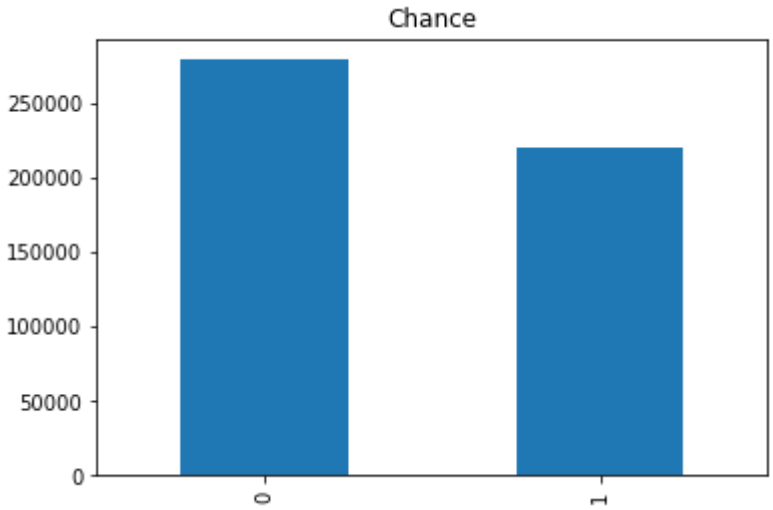
```
df=df[df['Chance']!=2]
```

In [15]:

```
df['Chance'].value_counts().sort_index().plot.bar()
plt.title('Chance')
```

Out[15]:

```
Text(0.5, 1.0, 'Chance')
```



In [16]:

```
lst=df.columns
for i in range(19):
    print(df[lst[i]].value_counts().to_frame())
    print("----------------")
```

```
      sex
2  253098
1  246594
----------------
   patient_type
1        392146
2        107546
----------------
    intubed
97   392146
2     98321
1      9103
99      122
----------------
    pneumonia
2      420965
1       78716
99         11
----------------
       age
30   12872
31   12298
36   12292
38   12259
37   12248
..     ...
115      1
111      1
107      1
118      1
105      1

[120 rows x 1 columns]
----------------
    pregnancy
97     253098
2      241644
1        3614
98       1336
----------------
    diabetes
2     435702
1      62349
98      1641
----------------
      copd
2   489970
1     8276
98    1446
----------------
    asthma
2   482036
1    16214
98    1442
```

```
----------------
    inmsupr
2    489959
1      8071
98     1662
----------------
    hypertension
2         416863
1          81340
98          1489
----------------
    other_disease
2          482107
1           15392
98           2193
----------------
    cardiovascular
2           486764
1            11419
98            1509
----------------
    obesity
2    416293
1     81929
98     1470
----------------
    renal_chronic
2          488197
1           10019
98           1476
----------------
    tobacco
2    455158
1     42955
98     1579
----------------
    contact_other_covid
1                196966
99               153675
2                149051
----------------
   Chance
0  279035
1  220657
----------------
       icu
97  392146
2    98414
1     9009
99     123
----------------
```

NOTE:-

As we are focusing on prediction of chances of being affected by corona virus,so here I'm dropping all those values which indicates NaN values
All those values except 1 and 2 are NaN

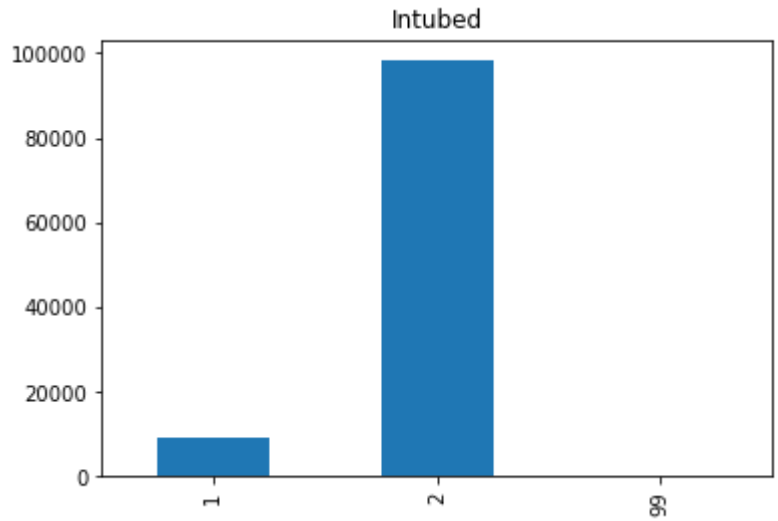
INTUBED

In [17]:

```
df=df[df['intubed']!=97]
df['intubed'].value_counts().sort_index().plot.bar()
plt.title('Intubed')
```

Out[17]:

```
Text(0.5, 1.0, 'Intubed')
```



In [18]:

```
df=df[df['intubed']!=99]
df['intubed'].value_counts().to_frame()
```

Out[18]:

	intubed
2	98321
1	9103

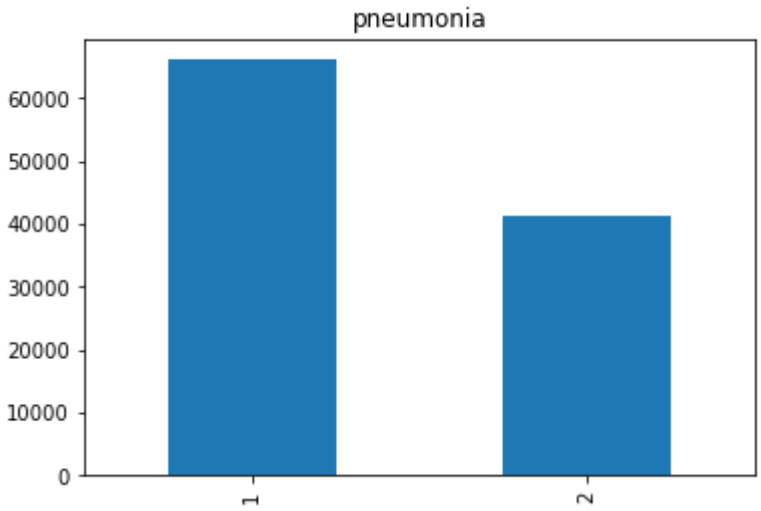
PNEUMONIA

In [19]:

```
df=df[df['pneumonia']!=99]
df['pneumonia'].value_counts().sort_index().plot.bar()
plt.title('pneumonia')
```

Out[19]:

```
Text(0.5, 1.0, 'pneumonia')
```



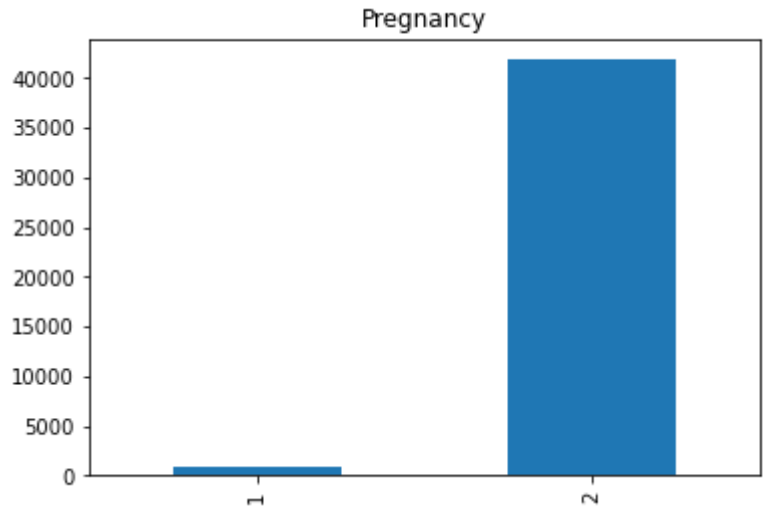
Pregnancy

In [20]:

```
df=df[df['pregnancy']!=97]
df=df[df['pregnancy']!=98]
df['pregnancy'].value_counts().sort_index().plot.bar()
plt.title('Pregnancy')
```

Out[20]:

```
Text(0.5, 1.0, 'Pregnancy')
```



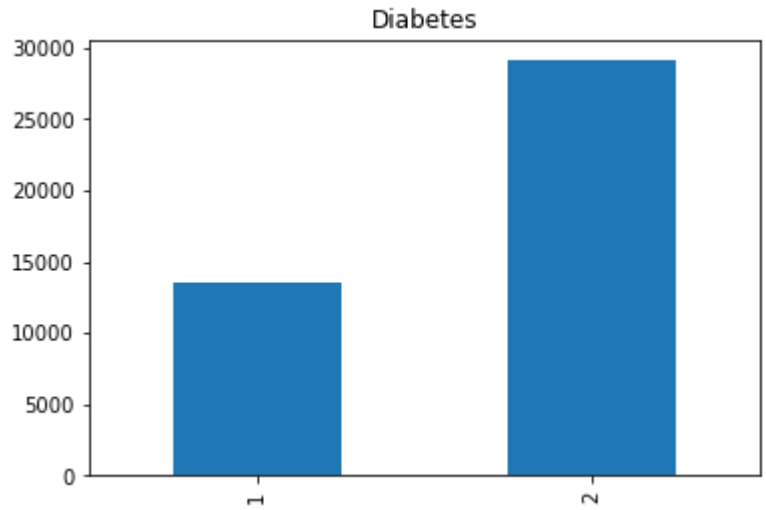
Diabetes

In [21]:

```
df=df[df['diabetes']!=98]
df['diabetes'].value_counts().sort_index().plot.bar()
plt.title('Diabetes')
```

Out[21]:

```
Text(0.5, 1.0, 'Diabetes')
```



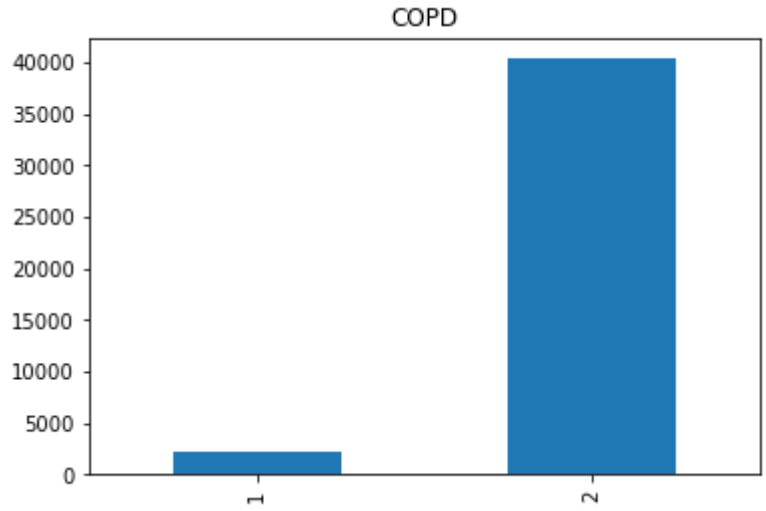
C.O.P.D.

In [22]:

```
df=df[df['copd']!=98]
df['copd'].value_counts().sort_index().plot.bar()
plt.title('COPD')
```

Out[22]:

```
Text(0.5, 1.0, 'COPD')
```



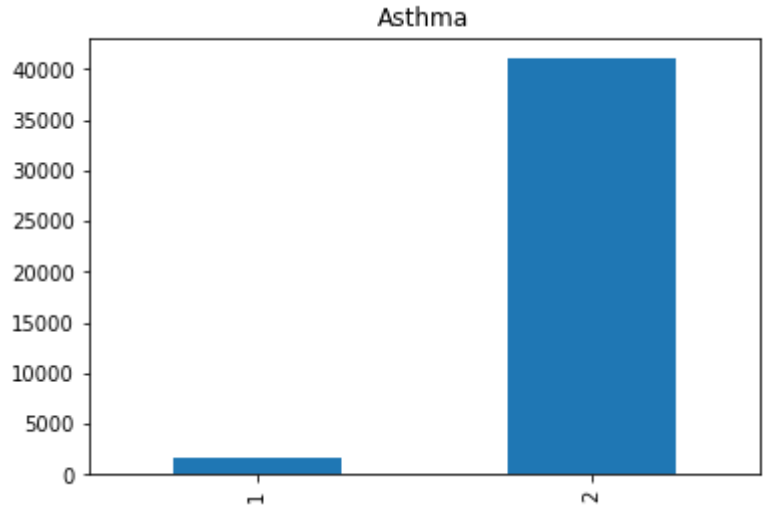
ASTHMA

In [23]:

```
df=df[df['asthma']!=98]
df['asthma'].value_counts().sort_index().plot.bar()
plt.title('Asthma')
```

Out[23]:

```
Text(0.5, 1.0, 'Asthma')
```



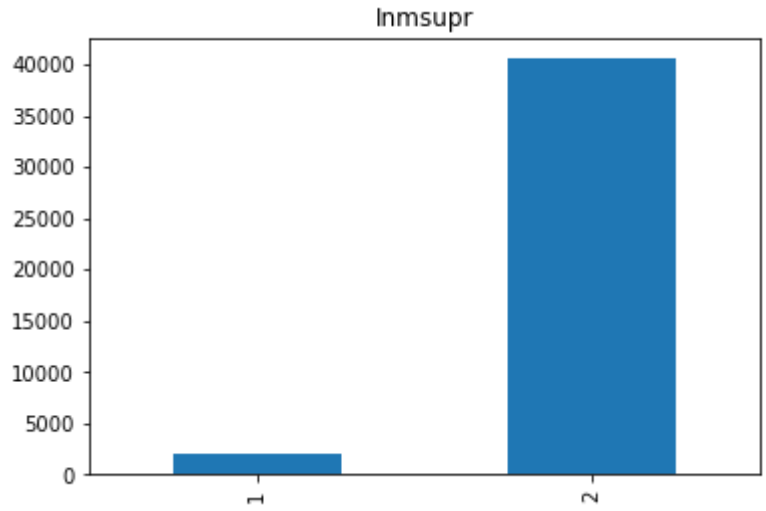
Inmsupr

In [24]:

```
df=df[df['inmsupr']!=98]
df['inmsupr'].value_counts().sort_index().plot.bar()
plt.title('Inmsupr')
```

Out[24]:

```
Text(0.5, 1.0, 'Inmsupr')
```



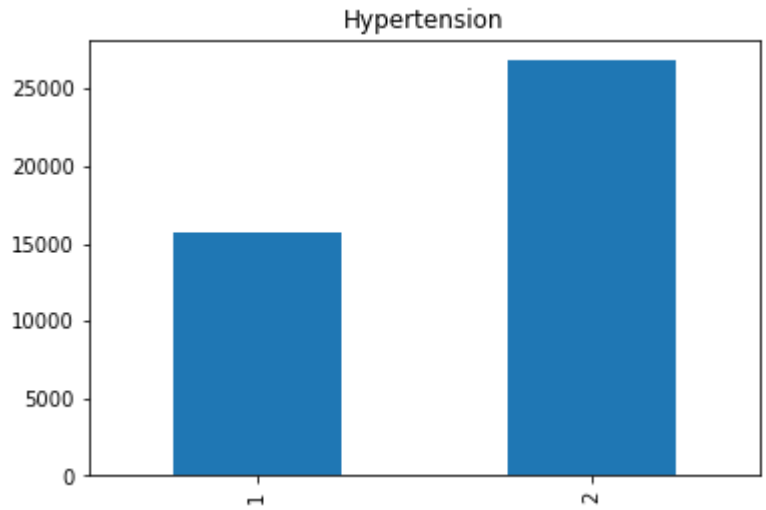
Hypertension

In [25]:

```
df=df[df['hypertension']!=98]
df['hypertension'].value_counts().sort_index().plot.bar()
plt.title('Hypertension')
```

Out[25]:

```
Text(0.5, 1.0, 'Hypertension')
```



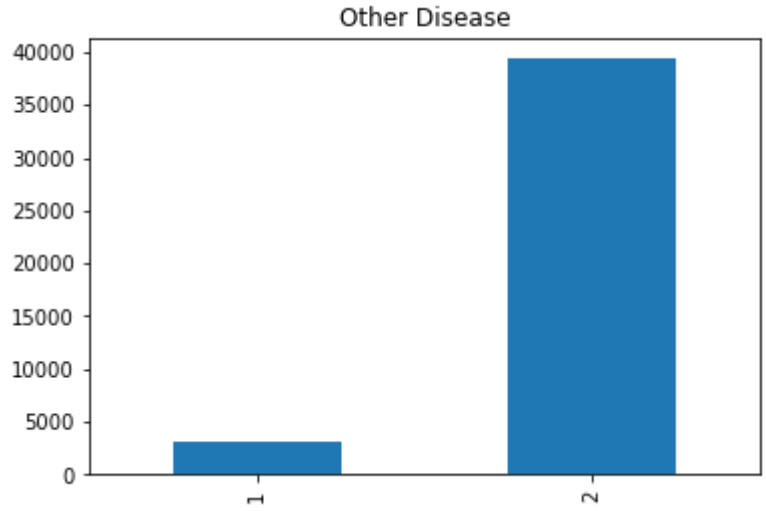
OTHER_DISEASE

In [26]:

```
df=df[df['other_disease']!=98]
df['other_disease'].value_counts().sort_index().plot.bar()
plt.title('Other Disease')
```

Out[26]:

```
Text(0.5, 1.0, 'Other Disease')
```



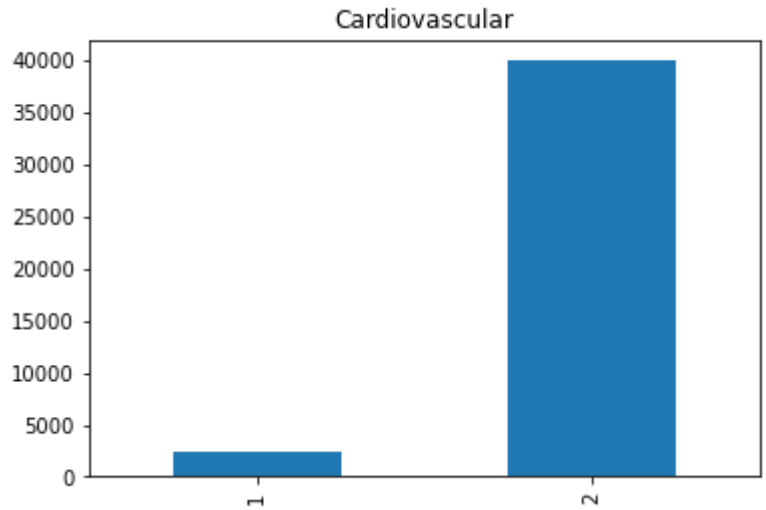
Cardiovascular

In [27]:

```
df=df[df['cardiovascular']!=98]
df['cardiovascular'].value_counts().sort_index().plot.bar()
plt.title('Cardiovascular')
```

Out[27]:

```
Text(0.5, 1.0, 'Cardiovascular')
```



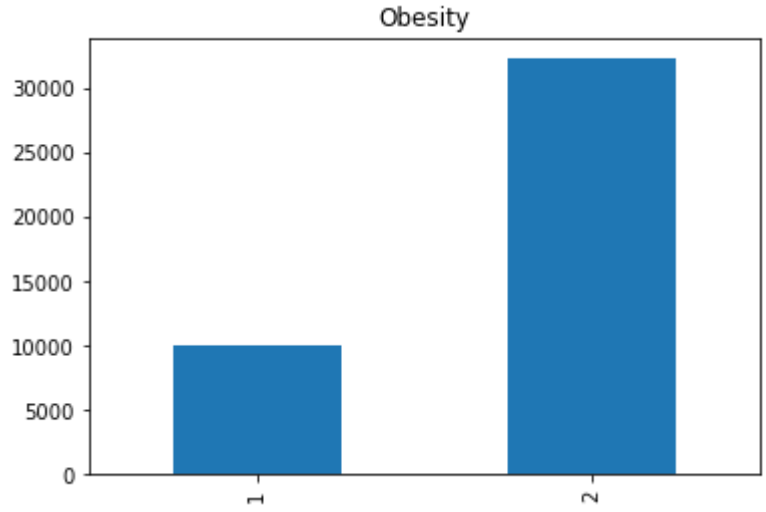
Obesity

In [28]:

```
df=df[df['obesity']!=98]
df['obesity'].value_counts().sort_index().plot.bar()
plt.title('Obesity')
```

Out[28]:

```
Text(0.5, 1.0, 'Obesity')
```



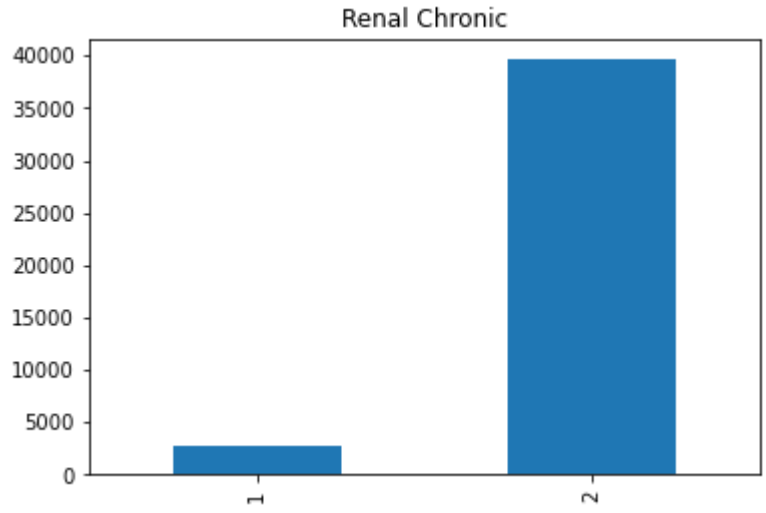
Renal Chronic

In [29]:

```
df=df[df['renal_chronic']!=98]
df['renal_chronic'].value_counts().sort_index().plot.bar()
plt.title('Renal Chronic')
```

Out[29]:

```
Text(0.5, 1.0, 'Renal Chronic')
```



Tobacco

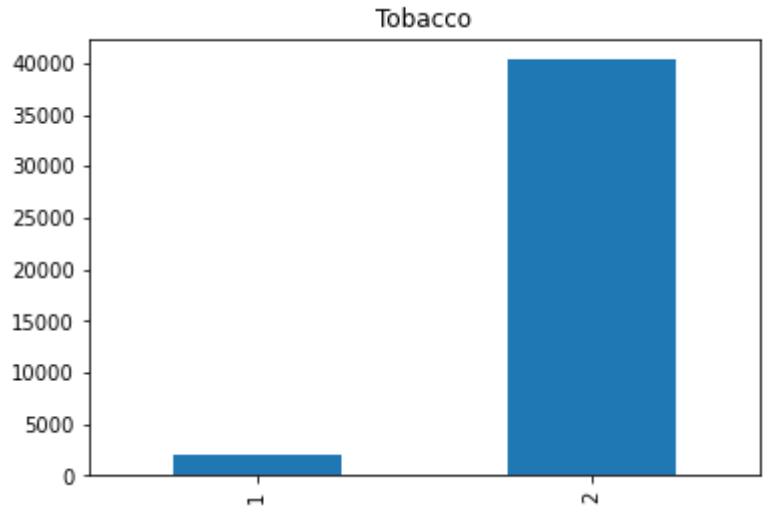
In [30]:

```
df=df[df['tobacco']!=98]
print(df['tobacco'].value_counts())
df['tobacco'].value_counts().sort_index().plot.bar()
plt.title('Tobacco')
```

```
2    40303
1     1988
Name: tobacco, dtype: int64
```

Out[30]:

```
Text(0.5, 1.0, 'Tobacco')
```



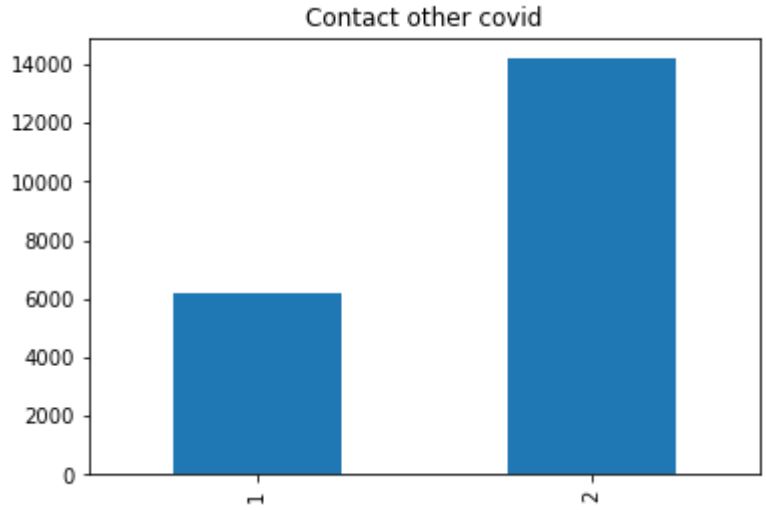
Contact with Covid Person

In [31]:

```
df=df[df['contact_other_covid']!=99]
df['contact_other_covid'].value_counts().sort_index().plot.bar()
plt.title('Contact other covid')
```

Out[31]:

```
Text(0.5, 1.0, 'Contact other covid')
```



ICU

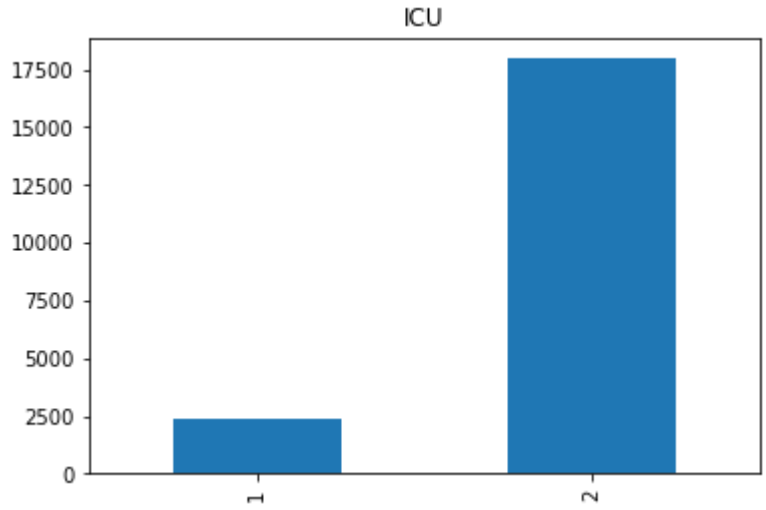
In [32]:

```
df=df[df['icu']!=99]
df=df[df['icu']!=97]

df['icu'].value_counts().sort_index().plot.bar()
plt.title('ICU')
```

Out[32]:

```
Text(0.5, 1.0, 'ICU')
```



As we have removed unwanted rows, now we'll reset index

In [33]:

```
df.reset_index(drop=True,inplace=True)
df.head(10)
```

Out[33]:

	sex	patient_type	intubed	pneumonia	age	pregnancy	diabetes	copd	asthma	inmsupr
0	1	2	2	2	25	2	2	2	2	2
1	1	2	2	2	52	2	2	2	2	2
2	1	2	2	1	51	2	2	2	2	2
3	1	2	1	1	67	2	1	2	2	2
4	1	2	2	1	59	2	1	2	2	2
5	1	2	2	2	52	2	1	2	2	2
6	1	2	2	1	54	2	2	2	2	2
7	1	2	2	1	78	2	2	2	2	2
8	1	2	2	1	80	2	1	2	2	2
9	1	2	2	2	40	2	2	2	2	2

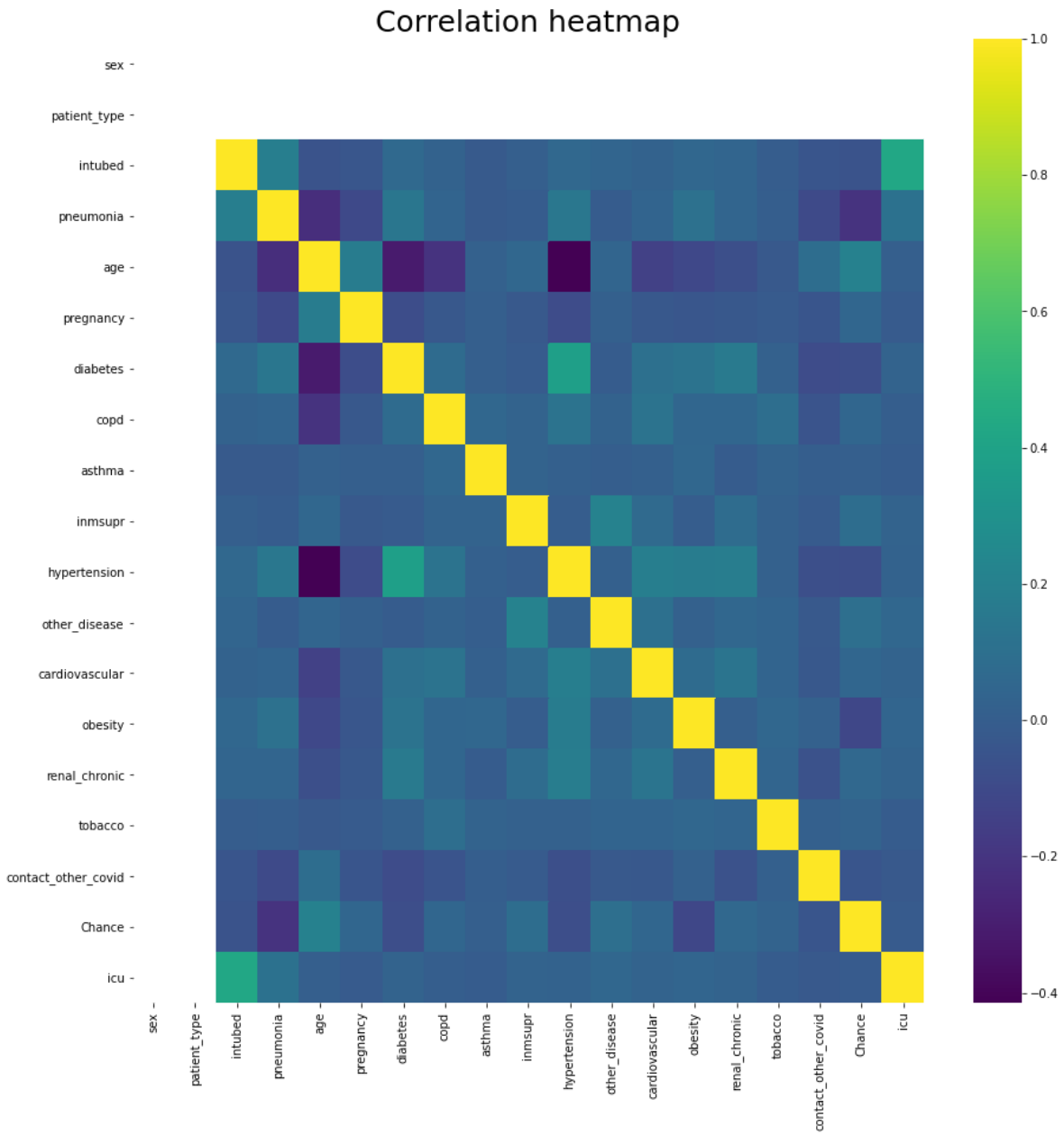
Data Visualization

In [34]:

```
plt.figure(figsize=(15,15))
sns.heatmap(df.corr(),cmap='viridis')
plt.title('Correlation heatmap',size=25)
```

Out[34]:

```
Text(0.5, 1.0, 'Correlation heatmap')
```



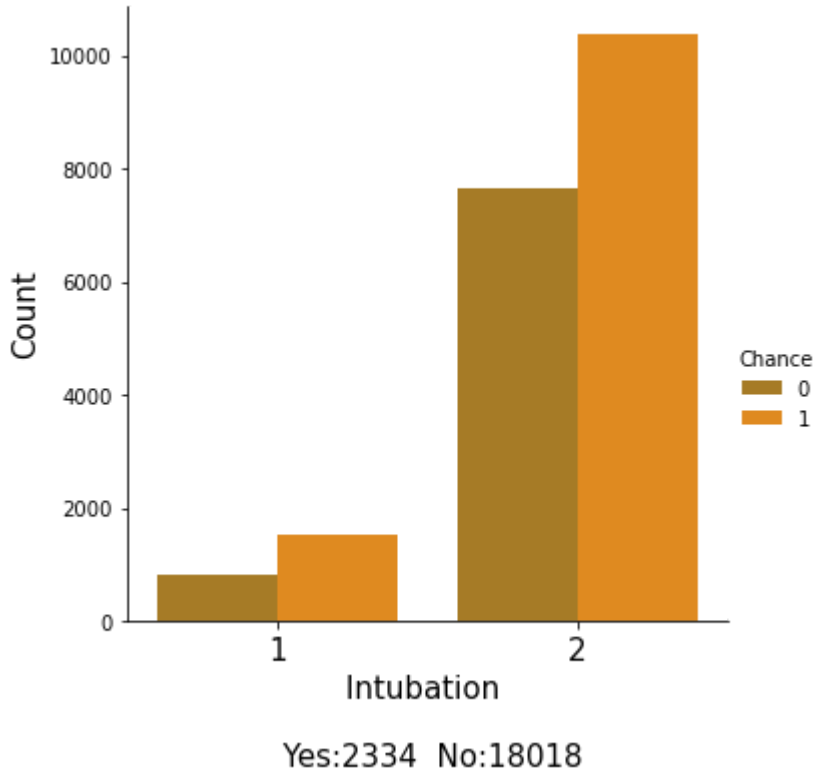
In [35]:

```
plt.figure(figsize=(7,5))
sns.catplot('intubed',data=df,kind='count',palette='autumn_d',hue='Chance')
plt.xticks(size=15,)
plt.xlabel('Intubation \n \n Yes:{}  No:{}'.format(df['intubed'].value_counts()[1] , df['in
plt.ylabel('Count',size=15)
```

Out[35]:

```
Text(13.06111979166667, 0.5, 'Count')
```

```
<Figure size 504x360 with 0 Axes>
```



In [36]:

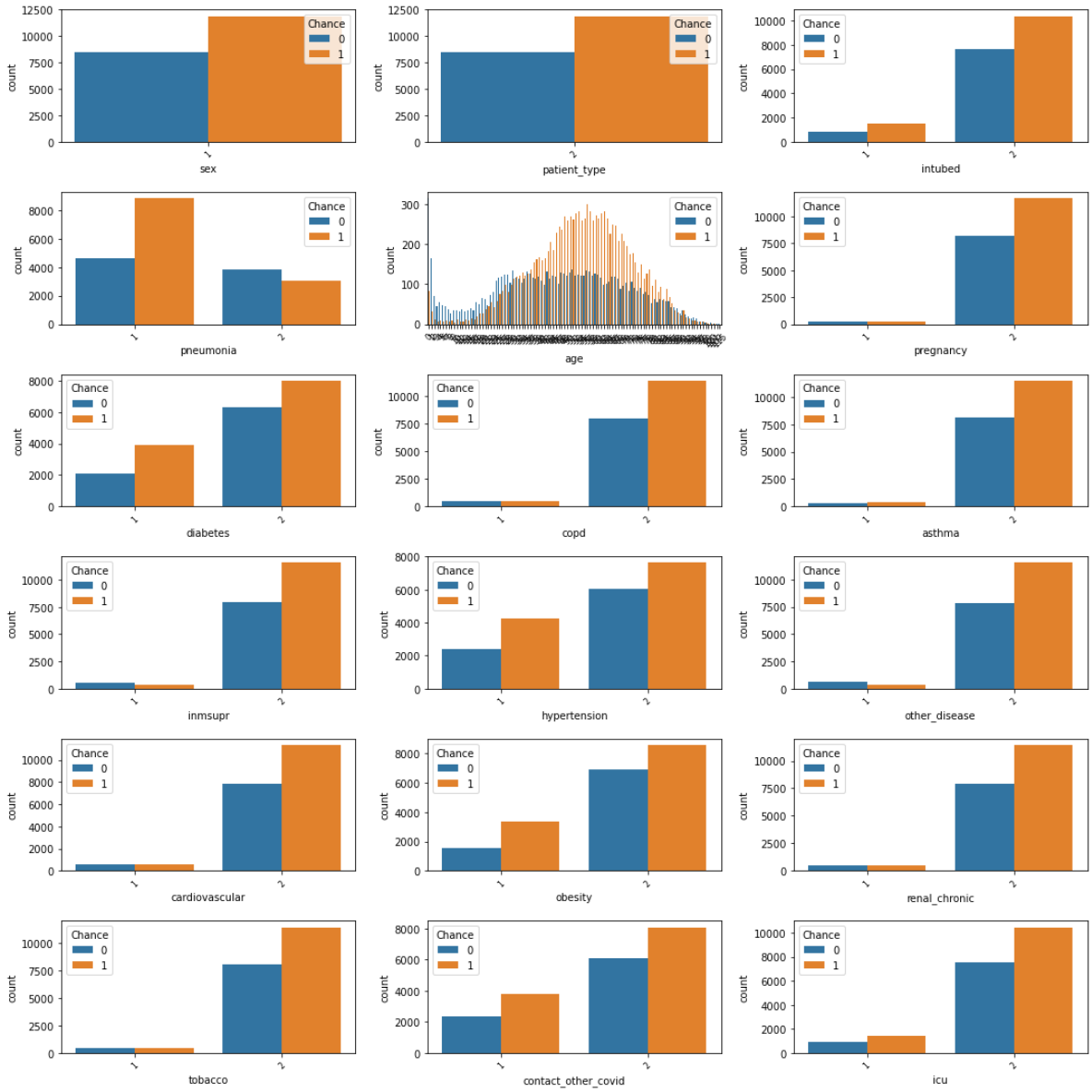
```
features=['sex', 'patient_type', 'intubed', 'pneumonia', 'age', 'pregnancy',
       'diabetes', 'copd', 'asthma', 'inmsupr', 'hypertension',
       'other_disease', 'cardiovascular', 'obesity', 'renal_chronic',
       'tobacco', 'contact_other_covid', 'icu']
list(enumerate(features))
```

Out[36]:

```
[(0, 'sex'),
 (1, 'patient_type'),
 (2, 'intubed'),
 (3, 'pneumonia'),
 (4, 'age'),
 (5, 'pregnancy'),
 (6, 'diabetes'),
 (7, 'copd'),
 (8, 'asthma'),
 (9, 'inmsupr'),
 (10, 'hypertension'),
 (11, 'other_disease'),
 (12, 'cardiovascular'),
 (13, 'obesity'),
 (14, 'renal_chronic'),
 (15, 'tobacco'),
 (16, 'contact_other_covid'),
 (17, 'icu')]
```

In [37]:

```
plt.figure(figsize=(15,15))
for i in enumerate(features):
    plt.subplot(6,3,i[0]+1)
    sns.countplot(i[1],hue='Chance',data=df)
    plt.xticks(rotation=45,size=8)
    plt.tight_layout()
```



Splitting the data into train and test

In [38]:

```
train=df[['sex', 'patient_type', 'intubed', 'pneumonia', 'age', 'pregnancy',
       'diabetes', 'copd', 'asthma', 'inmsupr', 'hypertension',
       'other_disease', 'cardiovascular', 'obesity', 'renal_chronic',
       'tobacco', 'contact_other_covid', 'icu']]
```

In [39]:

```
test=df['Chance']
train=train.values
test=np.array(test)
```

Splitting further into 8:2 ratio

In [40]:

```
x_train,x_test,y_train,y_test=train_test_split(train,test,test_size=0.2,random_state=42,str
print("Size of X_train is:{}\nSize of Y_train is:{}\nSize of X_test is:{}\nSize of Y_test i
                                    y_train.shape,
                                    x_test.shape,
                                    y_test.shape
                                    ))
```

```
Size of X_train is:(16281, 18)
Size of Y_train is:(16281,)
Size of X_test is:(4071, 18)
Size of Y_test is:(4071,)
```

In [41]:

```
acc=[]
```

Training the model using different algorithms

KNN

In [42]:

```
from sklearn.neighbors import KNeighborsClassifier
from sklearn import metrics

for i in range(1,25):

    neigh=KNeighborsClassifier(n_neighbors = i).fit(x_train,y_train)
    yhat = neigh.predict(x_test)
    KNN_score=metrics.accuracy_score(y_test, yhat)
    print("Train set Accuracy at {} is {}  ".format(i,metrics.accuracy_score(y_train, neigh
    print("Test set Accuracy at {} is {}".format(i,KNN_score))
    print("\n")
```

```
Train set Accuracy at 1 is 0.7602727105214667
Test set Accuracy at 1 is 0.5843773028739867


Train set Accuracy at 2 is 0.6857686874270622
Test set Accuracy at 2 is 0.5436010808155245


Train set Accuracy at 3 is 0.7184448129721761
Test set Accuracy at 3 is 0.6086956521739131


Train set Accuracy at 4 is 0.6944290891222897
Test set Accuracy at 4 is 0.5880619012527635


Train set Accuracy at 5 is 0.7052392359191696
Test set Accuracy at 5 is 0.6209776467698355


Train set Accuracy at 6 is 0.6967016768011793
Test set Accuracy at 6 is 0.6192581675264063


Train set Accuracy at 7 is 0.6997727412321111
Test set Accuracy at 7 is 0.6261360845001228


Train set Accuracy at 8 is 0.6960260426263744
Test set Accuracy at 8 is 0.6212232866617539


Train set Accuracy at 9 is 0.6961488852036116
Test set Accuracy at 9 is 0.6369442397445345


Train set Accuracy at 10 is 0.6951661445857135
Test set Accuracy at 10 is 0.6352247605011054


Train set Accuracy at 11 is 0.6935691910816288
Test set Accuracy at 11 is 0.6374355195283714


Train set Accuracy at 12 is 0.6968245193784166
Test set Accuracy at 12 is 0.6312945222304103
```

```
Train set Accuracy at 13 is 0.6917265524230698
Test set Accuracy at 13 is 0.6455416359616801


Train set Accuracy at 14 is 0.6922793440206375
Test set Accuracy at 14 is 0.6413657577990666


Train set Accuracy at 15 is 0.6884712241262821
Test set Accuracy at 15 is 0.6484893146647015


Train set Accuracy at 16 is 0.6887783305693753
Test set Accuracy at 16 is 0.6455416359616801


Train set Accuracy at 17 is 0.6876727473742399
Test set Accuracy at 17 is 0.6507000736919676


Train set Accuracy at 18 is 0.6873042196425281
Test set Accuracy at 18 is 0.6484893146647015


Train set Accuracy at 19 is 0.6864443216018672
Test set Accuracy at 19 is 0.6514369933677229


Train set Accuracy at 20 is 0.6877955899514772
Test set Accuracy at 20 is 0.6502087939081307


Train set Accuracy at 21 is 0.6848473680977827
Test set Accuracy at 21 is 0.6475067550970277


Train set Accuracy at 22 is 0.6841717339229777
Test set Accuracy at 22 is 0.6502087939081307


Train set Accuracy at 23 is 0.6808549843375714
Test set Accuracy at 23 is 0.6494718742323753


Train set Accuracy at 24 is 0.6816534610896137
Test set Accuracy at 24 is 0.6519282731515598
```

Note: at n_neighbours=11 we are getting max train and test accuracy i.e, 64% and 62% respectively.

In [43]:

```
acc.append(0.6290)
```

Decision Tree

In [44]:

```
for i in range(1,25):
    drugTree = DecisionTreeClassifier(criterion="entropy", max_depth = i)
    drugTree.fit(x_train,y_train)
    predTree = drugTree.predict(x_test)
    decisionTree_score=metrics.accuracy_score(y_test, predTree)
    print("DecisionTrees's Accuracy at {} is {}\n".format(i,metrics.accuracy_score(y_test,
```

```
DecisionTrees's Accuracy at 1 is 0.6408744780152297

DecisionTrees's Accuracy at 2 is 0.6408744780152297

DecisionTrees's Accuracy at 3 is 0.6443134365020879

DecisionTrees's Accuracy at 4 is 0.6475067550970277

DecisionTrees's Accuracy at 5 is 0.6575779906656841

DecisionTrees's Accuracy at 6 is 0.6548759518545811

DecisionTrees's Accuracy at 7 is 0.653647752394989

DecisionTrees's Accuracy at 8 is 0.6590518300171948

DecisionTrees's Accuracy at 9 is 0.6568410709899287

DecisionTrees's Accuracy at 10 is 0.658069270449521

DecisionTrees's Accuracy at 11 is 0.6494718742323753

DecisionTrees's Accuracy at 12 is 0.6502087939081307

DecisionTrees's Accuracy at 13 is 0.6435765168263325

DecisionTrees's Accuracy at 14 is 0.6428395971505773

DecisionTrees's Accuracy at 15 is 0.6455416359616801

DecisionTrees's Accuracy at 16 is 0.6389093588798821

DecisionTrees's Accuracy at 17 is 0.6330140014738393

DecisionTrees's Accuracy at 18 is 0.6261360845001228

DecisionTrees's Accuracy at 19 is 0.6219602063375093

DecisionTrees's Accuracy at 20 is 0.6190125276344879

DecisionTrees's Accuracy at 21 is 0.6172930483910587

DecisionTrees's Accuracy at 22 is 0.6121346106607713

DecisionTrees's Accuracy at 23 is 0.6126258904446082

DecisionTrees's Accuracy at 24 is 0.606484893146647
```

Note: we are getting max test accuracy at max_depth=4 i.e., 64%.

In [45]:

```
acc.append(0.6401)
```

Logistic Regression

In [46]:

```
from sklearn.linear_model import LogisticRegression
LR=LogisticRegression(C=0.03, solver='liblinear')
LR.fit(x_train,y_train)
yhat = LR.predict(x_test)
yhat_prob = LR.predict_proba(x_test)
logReg_score=metrics.accuracy_score(y_test, yhat)
print("LogisticRegression's Accuracy:{0}".format(metrics.accuracy_score(y_test, yhat)))
```

```
LogisticRegression's Accuracy:0.6590518300171948
```

In [47]:

```
acc.append(logReg_score)
```

SVM

In [48]:

```
from sklearn import svm
clf = svm.SVC(kernel='rbf')
clf.fit(x_train, y_train)
yhat = clf.predict(x_test)
svm_score=metrics.accuracy_score(y_test, yhat)
print("SVM's Accuracy:{0}".format(metrics.accuracy_score(y_test, yhat)))
```

```
SVM's Accuracy:0.6452959960697617
```

In [49]:

```
acc.append(svm_score)
```

Random Forest Classifier

In [50]:

```
from sklearn.ensemble import RandomForestClassifier
Random_forest = RandomForestClassifier(n_estimators=50)
Random_forest.fit(x_train,y_train)
randomForest_predict = Random_forest.predict(x_test)
randomForest_score = metrics.accuracy_score(y_test, randomForest_predict)
print("Random Forest Score :",randomForest_score)
```

```
Random Forest Score : 0.6266273642839597
```

In [51]:

```
acc.append(randomForest_score)
```

Gradient Boosting

In [52]:

```
from sklearn.ensemble import GradientBoostingClassifier

gbk = GradientBoostingClassifier(random_state=100, n_estimators=150,min_samples_split=100,
gbk.fit(x_train, y_train)
gbk_predict = gbk.predict(x_test)
gbk_score = gbk.score(x_test,y_test)
#print("Gradient Boosting Prediction :",gbk_predict)
print("Gradient Boosting Score :",gbk_score)
```

```
Gradient Boosting Score : 0.660280029476787
```

In [53]:

```
acc.append(gbk_score)
algo_name=['KNN','Decision Tree','Logistic Regression','SVM','Random Forest','Gradient Boos
acc=np.array(acc)
```

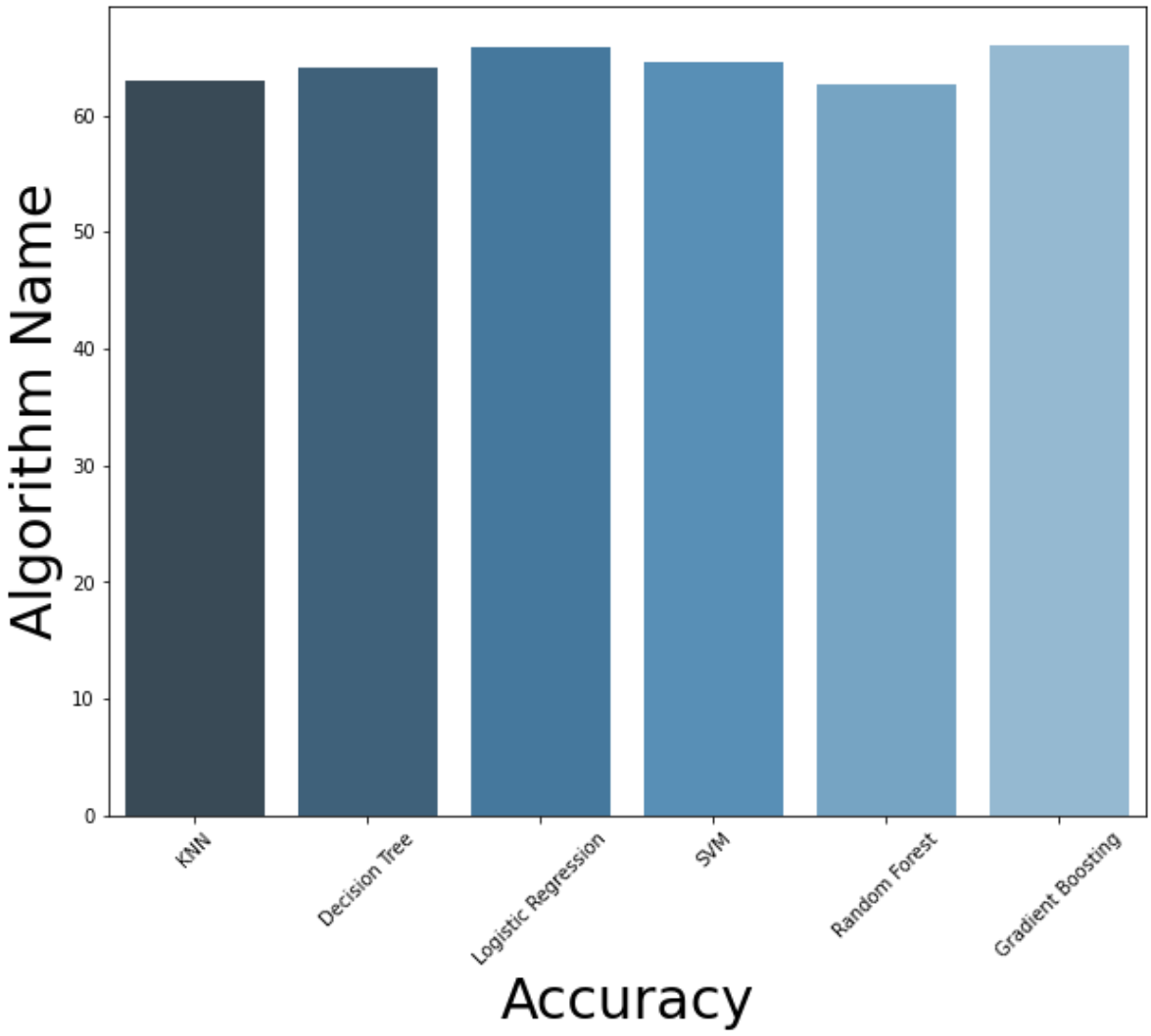
Conclusion

In [54]:

```
from numpy import median
plt.figure(figsize=(10,8))
sns.barplot(y=acc*100,x=algo_name,estimator=median,palette="Blues_d")
plt.xlabel('Accuracy',size=30)
plt.xticks(rotation=45)
plt.ylabel('Algorithm Name',size=30)
```

Out[54]:

```
Text(0, 0.5, 'Algorithm Name')
```



From different algo used, it is pretty clear that nearly 64% prediction is accurate for being known whether you are in danger or not from being affected by covid-19.

In [ ]:

```

```