In [17]:

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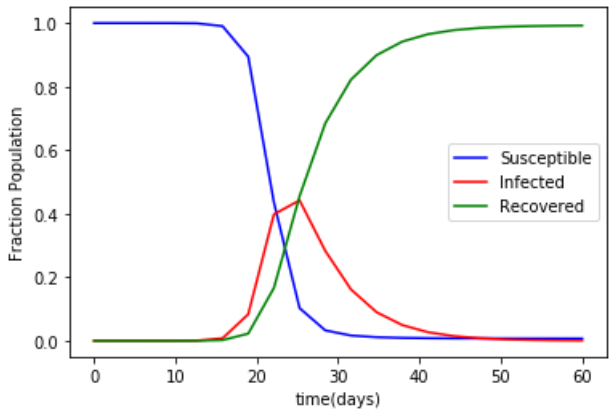
# EXERCISE ON COVID 19 ###Rwanda 2020#####
#
#Import the libraries
#
#
#
import numpy as np
import matplotlib.pyplot as plt
from scipy.integrate import odeint
#The Total population of Rwanda is 12 881 262
#Parameters
b=1.0#2.0
k=0.20#0.4#0.50#0.25#0.33#0.375
a=0.50#probability of being infected
#Initialization
y0=[1,2.0881262e-8,0.0]
t=np.linspace(0,60,20)
#t=np.arange(0,60)
#fucnction
def sir(y,t):
    S,I,R=y
    dsdt=-b*S*I
    didt=b*S*I-k*I
    drdt=k*I
    dndt=[dsdt,didt,drdt]
    return dndt


#solution
sol=odeint(sir,y0,t)
#ploting
plt.plot(t,sol[:,0],"b",label="Susceptible")
plt.plot(t,sol[:,1],"r",label="Infected")
plt.plot(t,sol[:,2],"g",label="Recovered")
#plt.plot(t,sol[:,0]+sol[:,1]+sol[:,2],"y",label="Total population")
plt.legend(loc="best")
plt.xlabel("time(days)")
plt.ylabel("Fraction Population")

plt.show()
```



In [31]:

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from matplotlib import pyplot as plt
############# Collect the Covid-19 data from Rwanda and plotting of data##########
T=['03/14','03/23','03/29','04/01','04/03','04/05','04/06','04/07','04/08','04/09','04/10','04/11'
,'04/12','04/13','04/14','04/15']
Inf=[1,36,70,82,89,104,105,105,110,113,118,120,126,127,134,136]
Recov=[0,0,0,0,0,4,7,7,7,7,7,18,25,42,49,54]
Dea=[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0]
Act=[0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0]
#Plot
plt.figure(1)
plt.plot(T,Inf,'r--',label="136 Total infected")
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plt.plot(T,Recov,'g-',label="054 Recovered")
plt.plot(T,Dea,'p-',label="000 Death")
plt.plot(T,Act,'b-',label="000 Active cases")
plt.legend(loc="best")
plt.xlabel("time(month/day in the year 2020)")
plt.ylabel("Number of people")
import numpy as np
import matplotlib.pyplot as plt
from scipy.integrate import odeint
b=1.0#2.0
k=0.20#0.4#0.50#0.25#0.33#0.375
a=0.50#probability of being infected
y0=[1,2.0881262e-8,0.0]
t=np.linspace(0,1,1)
def sir(y,t):
    S,I,R=y
    dsdt=-b*S*I
    didt=b*S*I-k*I
    drdt=k*I
    dndt=[dsdt,didt,drdt]
    return dndt
sol=odeint(sir,y0,t)
#ploting
plt.plot(t,sol[:,0],"y",label="Susceptible")
plt.plot(t,sol[:,1],"p",label="Infected")
plt.plot(t,sol[:,2],"o",label="Recovered")
#plt.plot(t,sol[:,0]+sol[:,1]+sol[:,2],"y",label="Total population")
plt.legend(loc="best")
plt.xlabel("time/days")
plt.ylabel("Fraction Population")
plt.show()
```

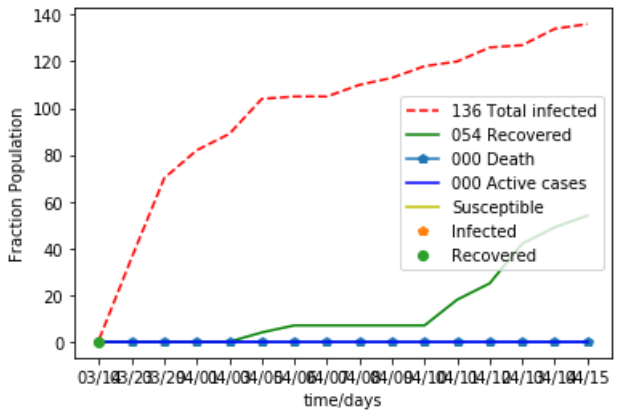

In [ ]:

the data has so many irregularities making it hard to predict as to when the numbers will decrease as of now only 1000 people are tested every day here in Rwanda against a population of 12 milion secondly most of the identified cases have a travel history abroad hence making it hard even furthe r for SIR model to work in these circumstances

In [ ]: