Missed Appointment Data Analysis

In [1]:
```
#import required modules
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

Loading Dataset

In [2]:
```
df1=pd.read_csv('c:\\users\\manu\\desktop\\appoint2.csv')
```

In [3]:
```
df1
```

Out[3]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	N
0	2.987250e+13	5642903	F	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	J F
1	5.589978e+14	5642503	M	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	J F
2	4.262962e+12	5642549	F	2016-04-29T16:19:04Z	2016-04-29T00:00:00Z	62	M
3	8.679512e+11	5642828	F	2016-04-29T17:29:31Z	2016-04-29T00:00:00Z	8	F C
4	8.841186e+12	5642494	F	2016-04-29T16:07:23Z	2016-04-29T00:00:00Z	56	J F
5	9.598513e+13	5626772	F	2016-04-27T08:36:51Z	2016-04-29T00:00:00Z	76	F
6	7.336882e+14	5630279	F	2016-04-27T15:05:12Z	2016-04-29T00:00:00Z	23	G
7	3.449833e+12	5630575	F	2016-04-27T15:39:58Z	2016-04-29T00:00:00Z	39	G

8	5.639473e+13	5638447	F	2016-04-29T08:02:16Z	2016-04-29T00:00:00Z	21	A
9	7.812456e+13	5629123	F	2016-04-27T12:48:25Z	2016-04-29T00:00:00Z	19	C
10	7.345362e+14	5630213	F	2016-04-27T14:58:11Z	2016-04-29T00:00:00Z	30	N F
11	7.542951e+12	5620163	M	2016-04-26T08:44:12Z	2016-04-29T00:00:00Z	29	N F
12	5.666548e+14	5634718	F	2016-04-28T11:33:51Z	2016-04-29T00:00:00Z	22	N F
13	9.113946e+14	5636249	M	2016-04-28T14:52:07Z	2016-04-29T00:00:00Z	28	N F
14	9.988472e+13	5633951	F	2016-04-28T10:06:24Z	2016-04-29T00:00:00Z	54	N F
15	9.994839e+10	5620206	F	2016-04-26T08:47:27Z	2016-04-29T00:00:00Z	15	N F
16	8.457439e+13	5633121	M	2016-04-28T08:51:47Z	2016-04-29T00:00:00Z	50	N F
17	1.479497e+13	5633460	F	2016-04-28T09:28:57Z	2016-04-29T00:00:00Z	40	C
18	1.713538e+13	5621836	F	2016-04-26T10:54:18Z	2016-04-29T00:00:00Z	30	N F
19	7.223289e+12	5640433	F	2016-04-29T10:43:14Z	2016-04-29T00:00:00Z	46	D
20	6.222575e+14	5626083	F	2016-04-27T07:51:14Z	2016-04-29T00:00:00Z	30	N F
21	1.215484e+13	5628338	F	2016-04-27T10:50:45Z	2016-04-29T00:00:00Z	4	C
22	8.632298e+14	5616091	M	2016-04-25T13:29:16Z	2016-04-29T00:00:00Z	13	C
23	2.137540e+14	5634142	F	2016-04-28T10:27:05Z	2016-04-29T00:00:00Z	46	C
24	8.734858e+12	5641780	F	2016-04-	2016-04-	65	T

				29T14:19:19Z	29T00:00:00Z		
25	5.819370e+12	5624020	M	2016-04-26T15:04:17Z	2016-04-29T00:00:00Z	46	C
26	2.578785e+10	5641781	F	2016-04-29T14:19:42Z	2016-04-29T00:00:00Z	45	E F
27	1.215484e+13	5628345	F	2016-04-27T10:51:45Z	2016-04-29T00:00:00Z	4	C
28	5.926172e+12	5642400	M	2016-04-29T15:48:02Z	2016-04-29T00:00:00Z	51	S
29	1.225776e+12	5642186	F	2016-04-29T15:16:29Z	2016-04-29T00:00:00Z	32	S
...	...	...	...	...	...	...	..
110497	7.935892e+14	5757745	M	2016-06-01T09:46:33Z	2016-06-01T00:00:00Z	76	M
110498	9.433654e+13	5787655	F	2016-06-08T10:21:14Z	2016-06-08T00:00:00Z	59	M
110499	8.219692e+14	5757697	F	2016-06-01T09:42:56Z	2016-06-01T00:00:00Z	66	M
110500	4.434384e+14	5787233	F	2016-06-08T09:35:13Z	2016-06-08T00:00:00Z	59	M
110501	4.544252e+11	5758133	M	2016-06-01T10:19:12Z	2016-06-01T00:00:00Z	44	M
110502	7.316229e+14	5787937	F	2016-06-08T10:50:42Z	2016-06-08T00:00:00Z	22	C
110503	2.362182e+13	5759473	F	2016-06-01T13:00:36Z	2016-06-01T00:00:00Z	64	S E
110504	9.947983e+12	5788052	F	2016-06-08T11:06:21Z	2016-06-08T00:00:00Z	4	M
110505	5.667344e+13	5758455	F	2016-06-01T10:45:50Z	2016-06-01T00:00:00Z	55	M
110506	8.973883e+11	5758779	M	2016-06-01T11:09:20Z	2016-06-01T00:00:00Z	5	M
110507	4.769462e+14	5786918	F	2016-06-	2016-06-	0	M

				08T09:04:18Z	08T00:00:00Z		
110508	9.433654e+13	5757656	F	2016-06-01T09:41:00Z	2016-06-01T00:00:00Z	59	M
110509	4.952968e+14	5786750	M	2016-06-08T08:50:51Z	2016-06-08T00:00:00Z	33	M
110510	2.362182e+13	5757587	F	2016-06-01T09:35:48Z	2016-06-01T00:00:00Z	64	S E
110511	8.235996e+11	5786742	F	2016-06-08T08:50:20Z	2016-06-08T00:00:00Z	14	M
110512	9.876246e+13	5786368	F	2016-06-08T08:20:01Z	2016-06-08T00:00:00Z	41	M
110513	8.674778e+13	5785964	M	2016-06-08T07:52:55Z	2016-06-08T00:00:00Z	2	A H
110514	2.695685e+12	5786567	F	2016-06-08T08:35:31Z	2016-06-08T00:00:00Z	58	M
110515	6.456342e+14	5778621	M	2016-06-06T15:58:05Z	2016-06-08T00:00:00Z	33	M
110516	6.923772e+13	5780205	F	2016-06-07T07:45:16Z	2016-06-08T00:00:00Z	37	M
110517	5.574942e+12	5780122	F	2016-06-07T07:38:34Z	2016-06-07T00:00:00Z	19	M
110518	7.263315e+13	5630375	F	2016-04-27T15:15:06Z	2016-06-07T00:00:00Z	50	M
110519	6.542388e+13	5630447	F	2016-04-27T15:23:14Z	2016-06-07T00:00:00Z	22	M
110520	9.969977e+14	5650534	F	2016-05-03T07:51:47Z	2016-06-07T00:00:00Z	42	M
110521	3.635534e+13	5651072	F	2016-05-03T08:23:40Z	2016-06-07T00:00:00Z	53	M
110522	2.572134e+12	5651768	F	2016-05-03T09:15:35Z	2016-06-07T00:00:00Z	56	M
110523	3.596266e+12	5650093	F	2016-05-03T07:27:33Z	2016-06-07T00:00:00Z	51	M

110524	1.557663e+13	5630692	F	2016-04-27T16:03:52Z	2016-06-07T00:00:00Z	21	M
110525	9.213493e+13	5630323	F	2016-04-27T15:09:23Z	2016-06-07T00:00:00Z	38	M
110526	3.775115e+14	5629448	F	2016-04-27T13:30:56Z	2016-06-07T00:00:00Z	54	M

110527 rows × 14 columns

In [4]:
```
type(df1)
```

Out[4]:
```
pandas.core.frame.DataFrame
```

Data:

- 'ScheduledDay' tells us on what day the patient set up their appointment.
- 'Neighbourhood' indicates the location of the hospital.
- 'Scholarship' indicates whether or not the patient is enrolled in the Brasilian scholarship program.
- 'No-show' says 'No' if the patient showed up to their appointment, and 'Yes' if they did not show up.

Exploratory Analysis

In [5]:
```
df1.head() # top 5 records
```

Out[5]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighb
0	2.987250e+13	5642903	F	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	JARDIM PENHA
1	5.589978e+14	5642503	M	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	JARDIM PENHA
2	4.262962e+12	5642549	F	2016-04-29T16:19:04Z	2016-04-29T00:00:00Z	62	MATA D
3	8.679512e+11	5642828	F	2016-04-29T17:29:31Z	2016-04-29T00:00:00Z	8	PONTA CAMBU

4	8.841186e+12	5642494	F	2016-04-29T16:07:23Z	2016-04-29T00:00:00Z	56	JARDIM PENHA

In [6]:
```
df1.head(2)
```

Out[6]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighb
0	2.987250e+13	5642903	F	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	JARDIM PENHA
1	5.589978e+14	5642503	M	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	JARDIM PENHA

In [7]:
```
df1.tail()#
```

Out[7]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	N
110522	2.572134e+12	5651768	F	2016-05-03T09:15:35Z	2016-06-07T00:00:00Z	56	N
110523	3.596266e+12	5650093	F	2016-05-03T07:27:33Z	2016-06-07T00:00:00Z	51	N
110524	1.557663e+13	5630692	F	2016-04-27T16:03:52Z	2016-06-07T00:00:00Z	21	N
110525	9.213493e+13	5630323	F	2016-04-27T15:09:23Z	2016-06-07T00:00:00Z	38	N
110526	3.775115e+14	5629448	F	2016-04-27T13:30:56Z	2016-06-07T00:00:00Z	54	N

In [8]:
```
# row wise selection
df1[100:300]
```

Out[8]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neig
100	1.663388e+14	5574764	F	2016-04-12T15:47:45Z	2016-04-29T00:00:00Z	20	BON

101	6.822847e+13	5642813	M	2016-04-29T17:24:19Z	2016-04-29T00:00:00Z	0	BON
102	4.225492e+13	5634093	F	2016-04-28T10:21:39Z	2016-04-29T00:00:00Z	54	MÁR CYPI
103	3.715425e+11	5639379	F	2016-04-29T09:01:27Z	2016-04-29T00:00:00Z	50	SAN ANT(
104	3.326985e+12	5632495	F	2016-04-28T08:04:48Z	2016-04-29T00:00:00Z	0	SAN ANT(
105	2.921558e+12	5639399	M	2016-04-29T09:02:40Z	2016-04-29T00:00:00Z	51	BELA
106	4.439514e+14	5639773	M	2016-04-29T09:34:00Z	2016-04-29T00:00:00Z	54	SAN ANT(
107	7.954396e+12	5608249	F	2016-04-20T13:30:12Z	2016-04-29T00:00:00Z	26	SAN ANT(
108	4.337498e+13	5638829	F	2016-04-29T08:28:16Z	2016-04-29T00:00:00Z	38	BELA
109	1.295988e+14	5572081	F	2016-04-12T10:01:23Z	2016-04-29T00:00:00Z	34	SAN ANT(
110	3.737430e+12	5574527	F	2016-04-12T15:10:45Z	2016-04-29T00:00:00Z	34	SAN ANT(
111	3.772422e+11	5574534	F	2016-04-12T15:11:24Z	2016-04-29T00:00:00Z	56	SAN ANT(
112	9.538868e+12	5594665	F	2016-04-18T11:05:04Z	2016-04-29T00:00:00Z	59	SAN ANT(
113	5.999817e+13	5600591	M	2016-04-19T10:55:18Z	2016-04-29T00:00:00Z	8	NOV/ PALE
114	3.585621e+13	5591384	F	2016-04-15T16:58:02Z	2016-04-29T00:00:00Z	15	BELA
115	8.472380e+11	5641363	F	2016-04-29T13:24:28Z	2016-04-29T00:00:00Z	54	SAN ANT(
116	4.673335e+12	5574680	F	2016-04-12T15:35:30Z	2016-04-29T00:00:00Z	18	SAN ANT(
117	7.444632e+08	5539219	F	2016-04-	2016-04-	34	SAN

				01T14:27:30Z	29T00:00:00Z		ANT
118	9.711616e+12	5539858	F	2016-04-01T16:01:28Z	2016-04-29T00:00:00Z	35	SAN ANT
119	3.293153e+11	5546448	F	2016-04-05T16:14:11Z	2016-04-29T00:00:00Z	33	MÁR CYPI
120	6.297229e+12	5590755	F	2016-04-15T14:54:29Z	2016-04-29T00:00:00Z	16	MÁR CYPI
121	4.564312e+14	5540024	F	2016-04-01T16:40:41Z	2016-04-29T00:00:00Z	18	MÁR CYPI
122	4.599699e+12	5642643	M	2016-04-29T16:34:59Z	2016-04-29T00:00:00Z	46	BELA
123	3.673278e+13	5621388	F	2016-04-26T10:12:46Z	2016-04-29T00:00:00Z	31	BELA
124	5.475453e+11	5642319	F	2016-04-29T15:35:28Z	2016-04-29T00:00:00Z	7	SAN ANT
125	9.997213e+13	5542592	F	2016-04-05T09:09:15Z	2016-04-29T00:00:00Z	36	MÁR CYPI
126	9.447582e+14	5633576	F	2016-04-28T09:37:22Z	2016-04-29T00:00:00Z	67	PRAI
127	4.224166e+12	5561194	M	2016-04-08T10:14:36Z	2016-04-29T00:00:00Z	42	PRAI
128	9.488697e+14	5571842	F	2016-04-12T09:41:01Z	2016-04-29T00:00:00Z	34	PRAI
129	5.537367e+13	5560735	F	2016-04-08T09:28:50Z	2016-04-29T00:00:00Z	22	PRAI
...	...	...	...	...	...	...	...
270	8.617228e+12	5620528	F	2016-04-26T09:08:53Z	2016-04-29T00:00:00Z	45	CAR
271	1.981635e+14	5612133	F	2016-04-25T07:58:09Z	2016-04-29T00:00:00Z	12	CAR
272	5.119616e+12	5594085	F	2016-04-18T10:12:57Z	2016-04-29T00:00:00Z	51	NOV PALE
273	8.442143e+12	5612157	F	2016-04-	2016-04-	44	SAN

				25T07:59:21Z	29T00:00:00Z		ANT
274	3.995366e+12	5641070	F	2016-04-29T12:16:28Z	2016-04-29T00:00:00Z	41	MAR
275	5.878159e+13	5641067	M	2016-04-29T12:15:33Z	2016-04-29T00:00:00Z	7	MAR
276	1.192393e+12	5641191	M	2016-04-29T12:47:35Z	2016-04-29T00:00:00Z	48	MAR
277	8.587449e+13	5641281	F	2016-04-29T13:11:41Z	2016-04-29T00:00:00Z	23	MAR
278	3.784661e+13	5641065	M	2016-04-29T12:14:41Z	2016-04-29T00:00:00Z	12	MAR
279	5.673474e+12	5638397	F	2016-04-29T07:59:32Z	2016-04-29T00:00:00Z	28	DA P
280	2.164857e+12	5640108	M	2016-04-29T10:08:02Z	2016-04-29T00:00:00Z	3	AND
281	3.198485e+11	5640366	M	2016-04-29T10:35:49Z	2016-04-29T00:00:00Z	79	ILHA
282	9.762242e+12	5541090	F	2016-04-05T07:39:33Z	2016-04-29T00:00:00Z	3	AND
283	5.567160e+12	5512177	F	2016-03-28T08:37:23Z	2016-04-29T00:00:00Z	2	AND
284	4.761172e+14	5520021	F	2016-03-29T09:28:01Z	2016-04-29T00:00:00Z	40	AND
285	6.342844e+10	5430959	F	2016-03-04T09:51:43Z	2016-04-29T00:00:00Z	20	SAN
286	8.386226e+12	5471716	F	2016-03-15T13:11:49Z	2016-04-29T00:00:00Z	3	AND
287	2.246214e+13	5532909	M	2016-03-31T12:39:06Z	2016-04-29T00:00:00Z	43	CAR
288	2.246214e+13	5532908	M	2016-03-31T12:39:06Z	2016-04-29T00:00:00Z	43	CAR
289	7.222383e+12	5566072	M	2016-04-11T09:50:19Z	2016-04-29T00:00:00Z	7	CAR

290	7.222383e+12	5566070	M	2016-04-11T09:50:18Z	2016-04-29T00:00:00Z	7	CAR
291	5.264573e+14	5642545	F	2016-04-29T16:17:16Z	2016-04-29T00:00:00Z	17	GUR
292	4.645238e+13	5642766	F	2016-04-29T17:06:22Z	2016-04-29T00:00:00Z	0	GUR
293	9.936998e+12	5637808	M	2016-04-29T07:24:33Z	2016-04-29T00:00:00Z	17	AND
294	6.492948e+12	5464289	M	2016-03-14T11:18:07Z	2016-04-29T00:00:00Z	60	AND
295	2.811753e+13	5470709	M	2016-03-15T10:57:15Z	2016-04-29T00:00:00Z	54	AND
296	9.984591e+13	5640119	F	2016-04-29T10:08:47Z	2016-04-29T00:00:00Z	83	ILHA MAR
297	1.412746e+13	5616693	F	2016-04-25T14:39:05Z	2016-04-29T00:00:00Z	16	AND
298	4.434592e+13	5473380	F	2016-03-15T16:51:57Z	2016-04-29T00:00:00Z	22	AND
299	9.532898e+13	5618957	M	2016-04-26T07:34:07Z	2016-04-29T00:00:00Z	1	AND

200 rows × 14 columns

In [9]:
```
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 110527 entries, 0 to 110526
Data columns (total 14 columns):
PatientId         110527 non-null float64
AppointmentID     110527 non-null int64
Gender            110527 non-null object
ScheduledDay      110527 non-null object
AppointmentDay    110527 non-null object
Age               110527 non-null int64
Neighbourhood     110527 non-null object
Scholarship       110527 non-null int64
Hipertension      110527 non-null int64
Diabetes          110527 non-null int64
Alcoholism        110527 non-null int64
```

```
Handcap           110527 non-null int64
SMS_received      110527 non-null int64
No-show           110527 non-null object
dtypes: float64(1), int64(8), object(5)
memory usage: 11.8+ MB
```

In [10]:
```
df1.columns
```

Out[10]:
```
Index(['PatientId', 'AppointmentID', 'Gender', 'ScheduledDay',
       'AppointmentDay', 'Age', 'Neighbourhood', 'Scholarship', 'Hipertensi
on',
       'Diabetes', 'Alcoholism', 'Handcap', 'SMS_received', 'No-show'],
      dtype='object')
```

In [11]:
```
df1.dtypes
```

Out[11]:
```
PatientId         float64
AppointmentID       int64
Gender             object
ScheduledDay       object
AppointmentDay     object
Age                 int64
Neighbourhood      object
Scholarship         int64
Hipertension        int64
Diabetes            int64
Alcoholism          int64
Handcap             int64
SMS_received        int64
No-show            object
dtype: object
```

Column Wise Selection

In [12]:
```
df1['Gender'].head()
```

Out[12]:
```
0    F
1    M
2    F
3    F
4    F
Name: Gender, dtype: object
```

In [13]:
```
df1[['Age','No-show','Diabetes']].head()
```

Out[13]:

	Age	No-show	Diabetes
0	62	No	0
1	56	No	0
2	62	No	0
3	8	No	0
4	56	No	1

Overall Patient Attendence

In [14]:
```
df1['No-show'].unique()
```

Out[14]:
```
array(['No', 'Yes'], dtype=object)
```

In [15]:
```
df1['No-show'].value_counts()
```

Out[15]:
```
No     88208
Yes    22319
Name: No-show, dtype: int64
```

In [16]:
```
df1['No-show'].value_counts()['No']/(df1['No-show'].value_counts()['Yes']+df1[
'No-show'].value_counts()['No'])*100
```

Out[16]:
```
79.8067440534892
```

Here, 79.8% patients have attended the appointment.

In [17]:
```
df1['No-show'].value_counts()['Yes']/(df1['No-show'].value_counts()['Yes']+df1
['No-show'].value_counts()['No'])*100
```

Out[17]:
```
20.193255946510806
```

Here, 20.19% patients have not attended the appointment.

Gender-wise analysis

In [18]:
```
df1['Gender'].value_counts()
```

Out[18]:
```
F    71840
```

```
M    38687
Name: Gender, dtype: int64
```

In [19]:
```
female=df1[df1.Gender=='F']['No-show'].value_counts()
```

In [20]:
```
female['No']/(female['Yes']+female['No'])*100
```

Out[20]:
```
79.68541202672606
```

Here, 79.68% females have attended the appointment.

In [21]:
```
male=df1[df1.Gender=='M']['No-show'].value_counts()
male['No']/(male['Yes']+male['No'])*100
```

Out[21]:
```
80.03205211052808
```

Here, 80.03% males have attended the appointment.

From above results, we cann say that there is no impact of gender on showing up for appoiontment.

Diabetes wise analysis

In [22]:
```
diabetes=df1['Diabetes'].value_counts()
```

In [23]:
```
diabetes
```

Out[23]:
```
0    102584
1      7943
Name: Diabetes, dtype: int64
```

In [24]:
```
diabetes[1]/(diabetes[0]+diabetes[1])*100
```

Out[24]:
```
7.186479321794674
```

In [25]:
```
df1.columns
```

Out[25]:
```
Index(['PatientId', 'AppointmentID', 'Gender', 'ScheduledDay',
       'AppointmentDay', 'Age', 'Neighbourhood', 'Scholarship', 'Hipertensi
on',
       'Diabetes', 'Alcoholism', 'Handcap', 'SMS_received', 'No-show'],
      dtype='object')
```

In [26]:
```
diabetes_no_show=df1[df1.Diabetes==1]['No-show'].value_counts()
```

In [27]:
```
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[27]:
```
18.00327332242226
```

Hipertension wise analysis

In [28]:
```
diabetes=df1['Hipertension'].value_counts()
diabetes[1]/(diabetes[0]+diabetes[1])*100
```

Out[28]:
```
19.72459218109602
```

In [29]:
```
diabetes_no_show=df1[df1.Hipertension==1]['No-show'].value_counts()
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[29]:
```
17.301958625751112
```

In [30]:
```
df1.columns
```

Out[30]:
```
Index(['PatientId', 'AppointmentID', 'Gender', 'ScheduledDay',
       'AppointmentDay', 'Age', 'Neighbourhood', 'Scholarship', 'Hipertensi
on',
       'Diabetes', 'Alcoholism', 'Handcap', 'SMS_received', 'No-show'],
      dtype='object')
```

Alcoholism wise analysis

In [31]:
```
diabetes=df1['Alcoholism'].value_counts()
diabetes[1]/(diabetes[0]+diabetes[1])*100
```

Out[31]:
```
3.039981181068879
```

In [32]:
```
diabetes_no_show=df1[df1.Alcoholism==1]['No-show'].value_counts()
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[32]:
```
20.148809523809526
```

Handcap wise analysis

In [33]:
```
diabetes=df1['Handcap'].value_counts()
diabetes[1]/(diabetes[0]+diabetes[1])*100
```

Out[33]: 1.8508447538249584

In [34]:
```
diabetes_no_show=df1[df1.Handcap==1]['No-show'].value_counts()
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[34]: 17.92360430950049

SMS_received

In [35]:
```
df1['SMS_received'].value_counts()
```

Out[35]:
```
0    75045
1    35482
Name: SMS_received, dtype: int64
```

In [36]:
```
diabetes=df1['SMS_received'].value_counts()
diabetes[0]/(diabetes[0]+diabetes[1])*100
```

Out[36]: 67.89743682539108

In [37]:
```
diabetes_no_show=df1[df1.SMS_received==1]['No-show'].value_counts()
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[37]: 27.574544839637

Here, 27% patients have not attended the appoiontment even after getting the SMS.

In [38]:
```
diabetes_no_show=df1[df1.SMS_received==0]['No-show'].value_counts()
diabetes_no_show['Yes']/(diabetes_no_show['No']+diabetes_no_show['Yes'])*100
```

Out[38]: 16.703311346525417

Age Wise Analysis

In [39]:
```
df1.Age.describe()
```

Out[39]:
```
count    110527.000000
mean         37.088874
std          23.110205
min          -1.000000
25%          18.000000
50%          37.000000
75%          55.000000
```

```
max          115.000000
Name: Age, dtype: float64
```

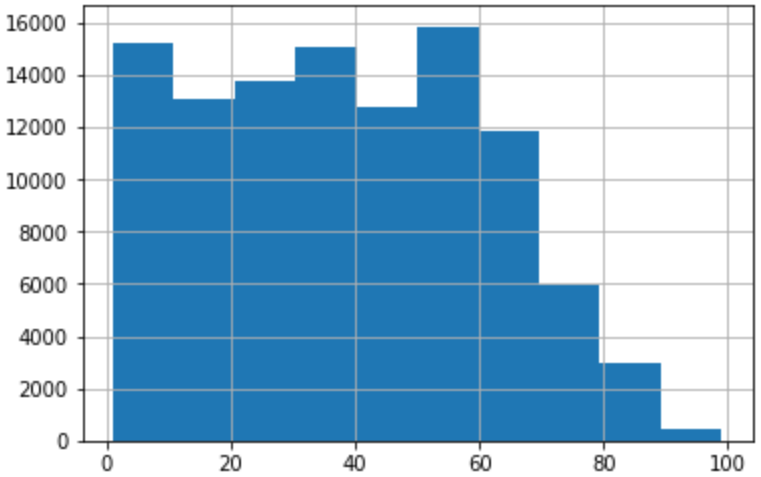
In [40]:
```
df1=df1[(df1.Age>0) & (df1.Age<100)]
```

In [41]:
```
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 106976 entries, 0 to 110526
Data columns (total 14 columns):
PatientId          106976 non-null float64
AppointmentID      106976 non-null int64
Gender             106976 non-null object
ScheduledDay       106976 non-null object
AppointmentDay     106976 non-null object
Age                106976 non-null int64
Neighbourhood      106976 non-null object
Scholarship        106976 non-null int64
Hipertension       106976 non-null int64
Diabetes           106976 non-null int64
Alcoholism         106976 non-null int64
Handcap            106976 non-null int64
SMS_received       106976 non-null int64
No-show            106976 non-null object
dtypes: float64(1), int64(8), object(5)
memory usage: 12.2+ MB
```

In [42]:
```
df1.Age.hist(bins=10)
```

Out[42]: <matplotlib.axes._subplots.AxesSubplot at 0x99f75f8>



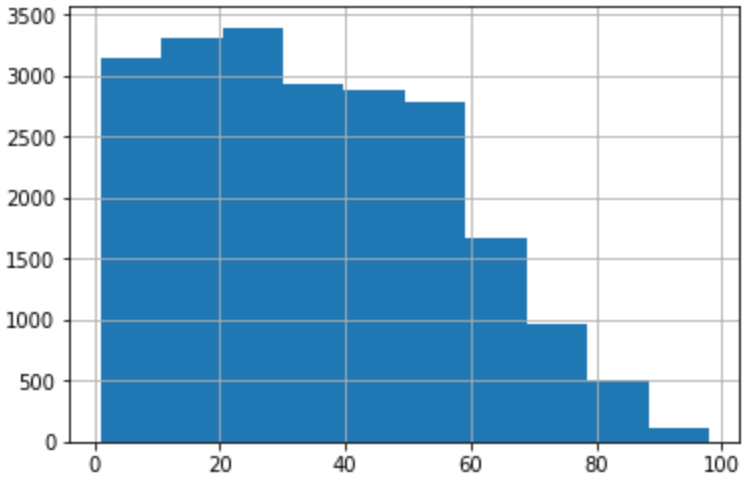
In [43]:
```
df1.columns
```

Out[43]:
```
Index(['PatientId', 'AppointmentID', 'Gender', 'ScheduledDay',
       'AppointmentDay', 'Age', 'Neighbourhood', 'Scholarship', 'Hipertensi
on',
       'Diabetes', 'Alcoholism', 'Handcap', 'SMS_received', 'No-show'],
      dtype='object')
```

In [44]:
```
df1.columns=['PatientId', 'AppointmentID', 'Gender', 'ScheduledDay',
       'AppointmentDay', 'Age', 'Neighbourhood', 'Scholarship', 'Hipertension'
,
       'Diabetes', 'Alcoholism', 'Handcap', 'SMS_received', 'No_show']
```

In [45]:
```
df1[df1.No_show=='Yes'].Age.hist(bins=10)
```

Out[45]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x99e3438>
```



In [46]:
```
df1['Gender'].replace('F',0,inplace=True)
df1['Gender'].replace('M',1,inplace=True)
```

```
C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\generic.py:5886: Set
tingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/
stable/indexing.html#indexing-view-versus-copy
  self._update_inplace(new_data)
```

In [47]:
```
df1['No_show'].replace('No',0,inplace=True)
df1['No_show'].replace('Yes',1,inplace=True)
```

```
C:\ProgramData\Anaconda3\lib\site-packages\pandas\core\generic.py:5886: Set
tingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/
stable/indexing.html#indexing-view-versus-copy
  self._update_inplace(new_data)
```

In [ ]:
```
df1.corr()
```

In [65]:
```
df1[df.No_show==1].Neighbourhood.value_counts().sort_values(ascending=False)[0
:20].plot(kind='bar')
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-65-b241c79d8aa8> in <module>()
----> 1 df1[df.No_show==1].Neighbourhood.value_counts().sort_values(ascendi
ng=False)[0:20].plot(kind='bar')

NameError: name 'df' is not defined
```

In [50]:
```
df1.head()
```

Out[50]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighb
0	2.987250e+13	5642903	0	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	JARDIM PENHA
1	5.589978e+14	5642503	1	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	JARDIM PENHA
2	4.262962e+12	5642549	0	2016-04-29T16:19:04Z	2016-04-29T00:00:00Z	62	MATA D
3	8.679512e+11	5642828	0	2016-04-29T17:29:31Z	2016-04-29T00:00:00Z	8	PONTA CAMBU
4	8.841186e+12	5642494	0	2016-04-29T16:07:23Z	2016-04-29T00:00:00Z	56	JARDIM PENHA

In [51]:
```
df1['PatientId']=df1['PatientId'].astype(int)
```

```
C:\ProgramData\Anaconda3\lib\site-packages\ipykernel_launcher.py:1: Setting
WithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
```

```
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-docs/
stable/indexing.html#indexing-view-versus-copy
  """Entry point for launching an IPython kernel.
```

In [52]:
```
df1.head()
```

Out[52]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbo
0	-2147483648	5642903	0	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	JARDIM PENHA
1	-2147483648	5642503	1	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	JARDIM PENHA
2	-2147483648	5642549	0	2016-04-29T16:19:04Z	2016-04-29T00:00:00Z	62	MATA DA
3	-2147483648	5642828	0	2016-04-29T17:29:31Z	2016-04-29T00:00:00Z	8	PONTAL CAMBUI
4	-2147483648	5642494	0	2016-04-29T16:07:23Z	2016-04-29T00:00:00Z	56	JARDIM PENHA

In [53]:
```
df1.describe()
```

Out[53]:

	PatientId	AppointmentID	Gender	Age	Scholarship	
count	1.069760e+05	1.069760e+05	106976.000000	106976.000000	106976.000000	1(
mean	-2.140303e+09	5.675432e+06	0.344629	38.309004	0.101041	0.
std	1.509123e+08	7.133383e+04	0.475249	22.456395	0.301385	0.
min	-2.147484e+09	5.030230e+06	0.000000	1.000000	0.000000	0.
25%	-2.147484e+09	5.640488e+06	0.000000	19.000000	0.000000	0.
50%	-2.147484e+09	5.680740e+06	0.000000	38.000000	0.000000	0.
75%	-2.147484e+09	5.725632e+06	1.000000	56.000000	0.000000	0.
max	2.141274e+09	5.790484e+06	1.000000	99.000000	1.000000	1.

In [54]:
```
df1.shape
```

Out[54]: (106976, 14)

In [55]:
```
df1.head()
```

Out[55]:

	PatientId	AppointmentID	Gender	ScheduledDay	AppointmentDay	Age	Neighbo
0	-2147483648	5642903	0	2016-04-29T18:38:08Z	2016-04-29T00:00:00Z	62	JARDIM PENHA
1	-2147483648	5642503	1	2016-04-29T16:08:27Z	2016-04-29T00:00:00Z	56	JARDIM PENHA
2	-2147483648	5642549	0	2016-04-29T16:19:04Z	2016-04-29T00:00:00Z	62	MATA DA
3	-2147483648	5642828	0	2016-04-29T17:29:31Z	2016-04-29T00:00:00Z	8	PONTAL CAMBUI
4	-2147483648	5642494	0	2016-04-29T16:07:23Z	2016-04-29T00:00:00Z	56	JARDIM PENHA

In [56]:
```
type(df1['ScheduledDay'][0])
```

Out[56]: str

In [63]:
```
# {0:'Mon',1:'Tues',2:'Weds',3:'Thurs',4:'Fri',5:'Sat',6:'Sun'}
pd.to_datetime(df1['ScheduledDay']).dt.dayofweek
```

Out[63]:
```
0         4
1         4
2         4
3         4
4         4
5         2
6         2
7         2
8         4
9         2
10        2
11        1
12        3
13        3
14        3
15        1
16        3
17        3
```

```
18        1
19        4
20        2
21        2
22        0
23        3
24        4
25        1
26        4
27        2
28        4
29        4
         ..
110496    0
110497    2
110498    2
110499    2
110500    2
110501    2
110502    2
110503    2
110504    2
110505    2
110506    2
110508    2
110509    2
110510    2
110511    2
110512    2
110513    2
110514    2
110515    0
110516    1
110517    1
110518    2
110519    2
110520    1
110521    1
110522    1
110523    1
110524    2
110525    2
110526    2
Name: ScheduledDay, Length: 106976, dtype: int64
```

In [64]:
```
df1['week_day'][df1.No_show==1].value_counts().plot(kind='bar')
```

Out[64]: <matplotlib.axes._subplots.AxesSubplot at 0xae7df28>