

```
In [53]: import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

```
In [54]: antibio_df = pd.read_csv('Antibiotics.csv')
```

```
In [55]: antibio_df
```

```
Out[55]:
```

	S.N.	Sector	District	Observation	Negative/Positive	Kind
0	1	Commercial	Kathmandu	≤ 27 ppb	Positive	Poultry
1	2	Commercial	Kathmandu	≤ 27 ppb	Positive	Poultry
2	3	Commercial	Kathmandu	≤ 1 ppb	Positive	Poultry
3	4	Commercial	Kathmandu	≤ 3 ppb	Positive	Poultry
4	5	Commercial	Kathmandu	≤ 9 ppb	Positive	Poultry
...	...	...	...	...	...	...
155	156	Health	Lalitpur	0 ppb	Negative	Egg
156	157	Health	Lalitpur	0 ppb	Negative	Egg
157	158	Health	Lalitpur	≥ 9 ppb	Positive	Egg
158	159	Health	Bhaktapur	≥ 27 ppb	Positive	Egg
159	160	Health	Bhaktapur	≥ 1 ppb	Positive	Egg

160 rows × 6 columns

```
In [56]: antibio_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 160 entries, 0 to 159
Data columns (total 6 columns):
#   Column                Non-Null Count  Dtype
---  -
0   S.N.                  160 non-null   int64
1   Sector                160 non-null   object
2   District              160 non-null   object
3   Observation            160 non-null   object
4   Negative/Positive     160 non-null   object
5   Kind                  160 non-null   object
dtypes: int64(1), object(5)
memory usage: 7.6+ KB
```

```
In [57]: antibio_df['Residual_Splits'] = antibio_df['Observation'].str.split()
```

```
In [58]: antibio_df['Residual_Antibiotics'] = [x[1] for x in antibio_df['Observation'].str.split()]
```

```
In [59]: antibio_df
```

Out[59]:

	S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_A
<b>0</b>	1	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>1</b>	2	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>2</b>	3	Commercial	Kathmandu	$\leq 1$ ppb	Positive	Poultry	$[\leq, 1, \text{ppb}]$	
<b>3</b>	4	Commercial	Kathmandu	$\leq 3$ ppb	Positive	Poultry	$[\leq, 3, \text{ppb}]$	
<b>4</b>	5	Commercial	Kathmandu	$\leq 9$ ppb	Positive	Poultry	$[\leq, 9, \text{ppb}]$	
...	...	...	...	...	...	...	...	
<b>155</b>	156	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>156</b>	157	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>157</b>	158	Health	Lalitpur	$\geq 9$ ppb	Positive	Egg	$[\geq, 9, \text{ppb}]$	
<b>158</b>	159	Health	Bhaktapur	$\geq 27$ ppb	Positive	Egg	$[\geq, 27, \text{ppb}]$	
<b>159</b>	160	Health	Bhaktapur	$\geq 1$ ppb	Positive	Egg	$[\geq, 1, \text{ppb}]$	

160 rows × 8 columns

In [63]: `antibio_df['unit'] = [x[-1] for x in antibio_df['Observation'].str.split()]`

In [64]: `antibio_df[antibio_df.loc[:, 'Residual_Antibiotics']=='ppm']`

Out[64]:

S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_Antibiotics	un
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In [65]: `updated_val = antibio_df.loc[:, 'Residual_Antibiotics']=='ppb'`  
`antibio_df.loc[updated_val, 'Residual_Antibiotics'] = 0`

In [66]: `antibio_df`

Out[66]:

	S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_A
<b>0</b>	1	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>1</b>	2	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>2</b>	3	Commercial	Kathmandu	$\leq 1$ ppb	Positive	Poultry	$[\leq, 1, \text{ppb}]$	
<b>3</b>	4	Commercial	Kathmandu	$\leq 3$ ppb	Positive	Poultry	$[\leq, 3, \text{ppb}]$	
<b>4</b>	5	Commercial	Kathmandu	$\leq 9$ ppb	Positive	Poultry	$[\leq, 9, \text{ppb}]$	
...	...	...	...	...	...	...	...	
<b>155</b>	156	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>156</b>	157	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>157</b>	158	Health	Lalitpur	$\geq 9$ ppb	Positive	Egg	$[\geq, 9, \text{ppb}]$	
<b>158</b>	159	Health	Bhaktapur	$\geq 27$ ppb	Positive	Egg	$[\geq, 27, \text{ppb}]$	
<b>159</b>	160	Health	Bhaktapur	$\geq 1$ ppb	Positive	Egg	$[\geq, 1, \text{ppb}]$	

160 rows × 9 columns

In [67]: `antibio_df[antibio_df.loc[:, 'unit']=='ppm']`

Out[67]:

	S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_A
<b>5</b>	6	Commercial	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>26</b>	27	Household	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>30</b>	31	Household	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>44</b>	45	Policy	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>54</b>	55	Education	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>57</b>	58	Education	Kathmandu	$\geq 1$ ppm	Positive	Poultry	$[\geq, 1, \text{ppm}]$	
<b>65</b>	66	Education	Bhaktapur	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>73</b>	74	Health	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>75</b>	76	Health	Lalitpur	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>113</b>	114	Household	Lalitpur	$\leq 2$ ppm	Positive	Egg	$[\leq, 2, \text{ppm}]$	
<b>127</b>	128	Policy	Kathmandu	$\leq 1$ ppm	Positive	Egg	$[\leq, 1, \text{ppm}]$	

In [51]: `antibio_df['Residual_Antibiotics'].value_counts()`

```
Out[51]: 1      36
          9      25
          3      22
          0      21
          27     18
          6      10
          18      8
          81      7
          54      7
          2       6
Name: Residual_Antibiotics, dtype: int64
```

```
In [68]: filt =antibio_df[antibio_df.loc[:, 'unit']=='ppm']
```

```
In [72]: filt
```

```
Out[72]:
```

	S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_A
<b>5</b>	6	Commercial	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>26</b>	27	Household	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>30</b>	31	Household	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>44</b>	45	Policy	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>54</b>	55	Education	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>57</b>	58	Education	Kathmandu	$\geq 1$ ppm	Positive	Poultry	$[\geq, 1, \text{ppm}]$	
<b>65</b>	66	Education	Bhaktapur	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>73</b>	74	Health	Kathmandu	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>75</b>	76	Health	Lalitpur	$\leq 1$ ppm	Positive	Poultry	$[\leq, 1, \text{ppm}]$	
<b>113</b>	114	Household	Lalitpur	$\leq 2$ ppm	Positive	Egg	$[\leq, 2, \text{ppm}]$	
<b>127</b>	128	Policy	Kathmandu	$\leq 1$ ppm	Positive	Egg	$[\leq, 1, \text{ppm}]$	

```
In [70]: antibio_df
```

Out[70]:

	S.N.	Sector	District	Observation	Negative/Positive	Kind	Residual_Splits	Residual_A
<b>0</b>	1	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>1</b>	2	Commercial	Kathmandu	$\leq 27$ ppb	Positive	Poultry	$[\leq, 27, \text{ppb}]$	
<b>2</b>	3	Commercial	Kathmandu	$\leq 1$ ppb	Positive	Poultry	$[\leq, 1, \text{ppb}]$	
<b>3</b>	4	Commercial	Kathmandu	$\leq 3$ ppb	Positive	Poultry	$[\leq, 3, \text{ppb}]$	
<b>4</b>	5	Commercial	Kathmandu	$\leq 9$ ppb	Positive	Poultry	$[\leq, 9, \text{ppb}]$	
<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	<b>...</b>	
<b>155</b>	156	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>156</b>	157	Health	Lalitpur	0 ppb	Negative	Egg	$[0, \text{ppb}]$	
<b>157</b>	158	Health	Lalitpur	$\geq 9$ ppb	Positive	Egg	$[\geq, 9, \text{ppb}]$	
<b>158</b>	159	Health	Bhaktapur	$\geq 27$ ppb	Positive	Egg	$[\geq, 27, \text{ppb}]$	
<b>159</b>	160	Health	Bhaktapur	$\geq 1$ ppb	Positive	Egg	$[\geq, 1, \text{ppb}]$	

160 rows × 9 columns



In [ ]: