

OUTPUT 1: Snippet of the csv file containing data.

	Patient ID	Repeat or	New Report	Status	Source	Patient Name	\
0	9299004		New	Temp	Portal	Aaliyah Baker	
1	9213930		New	Approved	NaN	Aaqil Dennis	
2	4999748		New	Approved	Portal	Aaris Epps	
3	1552264		New	Approved	Portal	Aaron Belcher	
4	9207897		New	Approved	NaN	Aaron Flores	
...	
1798	7361644		New	Approved	NaN	Zachary Brown	
1799	8952282		New	Approved	Portal	Zachary Keller	
1800	7511552		New	Approved	Portal	Zahra Alzara	
1801	3151090		New	Approved	Portal	Zakir Ulfat	
1802	9163441		New	Approved	Portal	Zhane Williams	
	Location	Hospital-Laboratory-Corporate				Account Manager	\
0	Los Angeles		Disney-DTSS:AC:EAST			NaN	
1	San Antonio		TaskUs:DirHire			William Thilman	
2	San Antonio		St of TX:DIR:IT			Michael Henley	
3	New York City		CAI:NC:IT			Abhi Sagar	
4	San Antonio		TaskUs:DirHire			William Thilman	
...	
1798	San Jose	Verizon Call Ctr:Alt Chan				NaN	
1799	San Jose	Verizon Call Ctr:Alt Chan				NaN	
1800	Chicago	Knowledge Svcs:IN:AC:ISDH				Dana Schmitz-Mills	
1801	Phoenix		Meta-FB:AC			Shagun Gupta	
1802	San Jose	Verizon Call Ctr:5GH Desk				Cheryl Charlesworth	
	Phlebotomist				Test Name	Test Date	\
0	Joanie Roedel				Full Blood Count	5/10/2023	
1	Ravikant Kaushik				HbA1c Test	4/25/2023	
2	Ankit Bhardwaj				Urinalysis	1/6/2023	
3	Gary Kamboj				Vitamin D Test	2/17/2023	
4	Peter Singh				Calcium Blood Test	5/18/2023	
...	
1798	Amy Flotten		Cholesterol and Lipid Tests			5/10/2023	
1799	Amy Flotten		Full Blood Count			2/7/2023	
1800	Maria Pax		Blood Glucose Test			1/10/2023	
1801	Alexander Kueck	Prostate Specific Angiten (PSA) Test				2/23/2023	
1802	Amy Flotten		Blood Glucose Test			4/11/2023	
	Cost (\$)	Price (\$)					
0	15.0	19.20					
1	18.0	19.00					
2	65.0	82.00					
3	50.0	78.12					
4	17.0	18.00					
...					
1798	21.6	31.90					
1799	15.0	20.10					
1800	16.0	20.99					
1801	53.0	80.57					
1802	16.0	20.10					

[1803 rows x 13 columns]

Fig 2.2: Snippet of the csv file containing the data

OUTPUT 2: Analyze the data to find which city has the most patients taking a particular test.

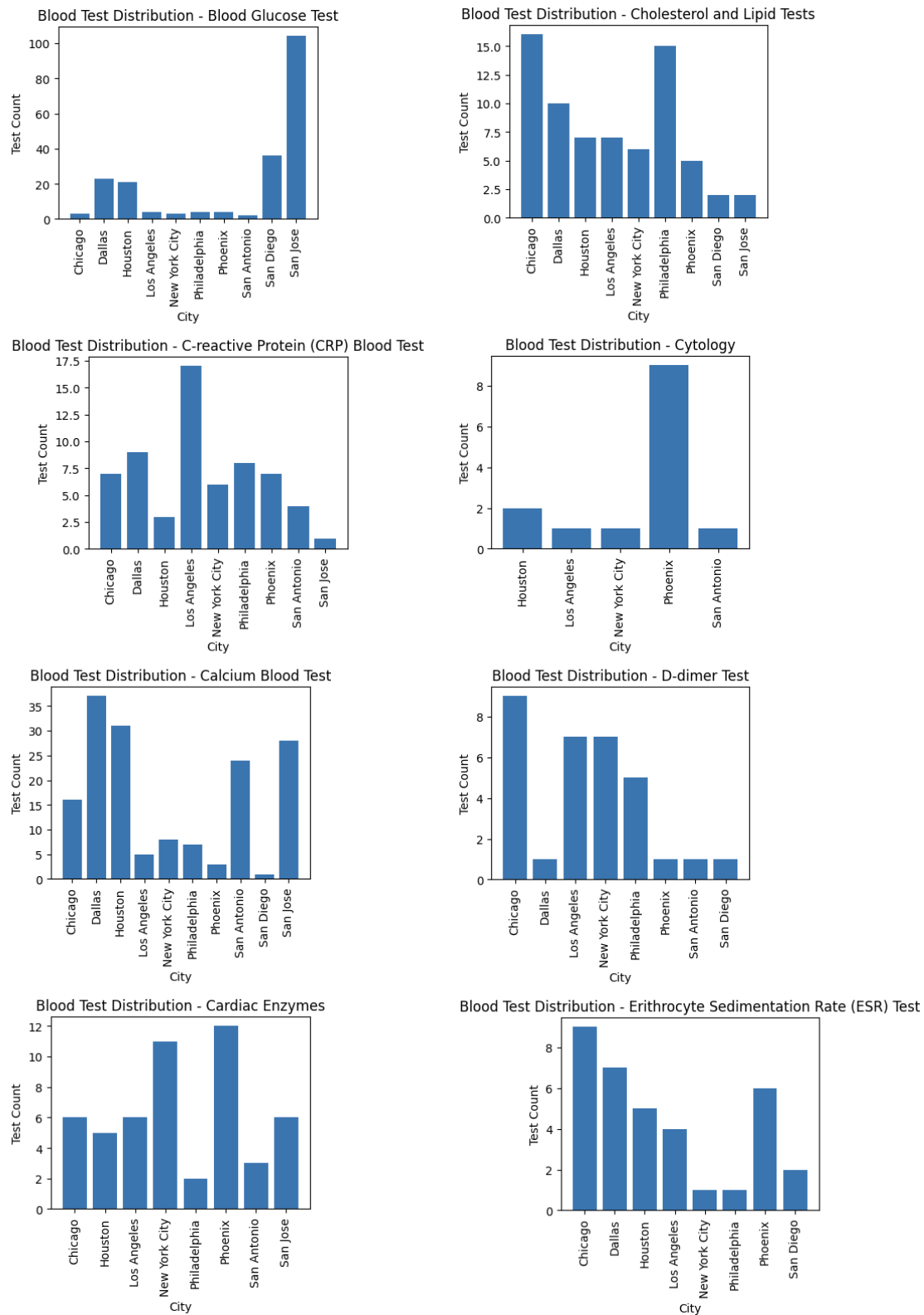


Fig 2.5: Analysis of popularity in different cities continued

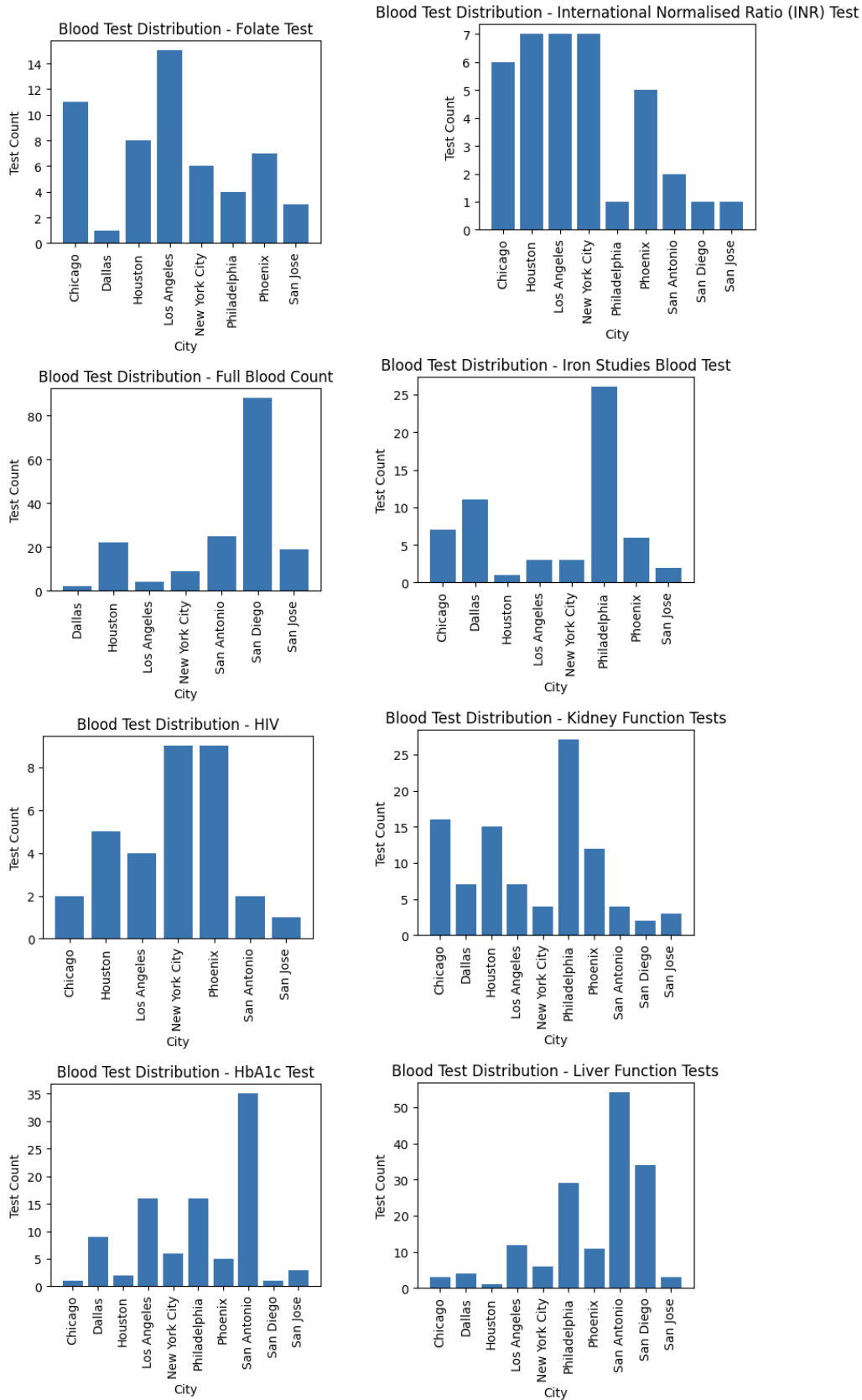


Fig 2.6: Analysis of popularity in different cities continued

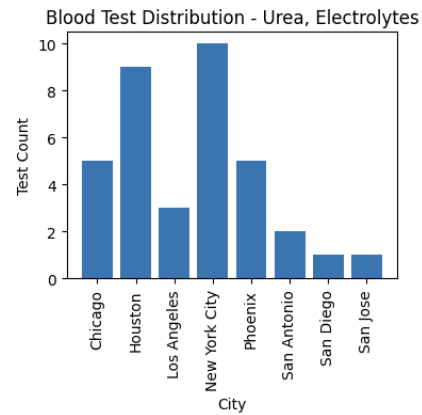
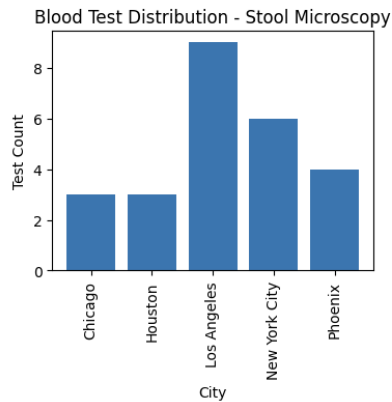
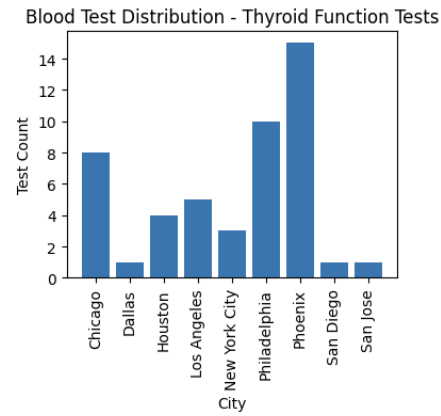
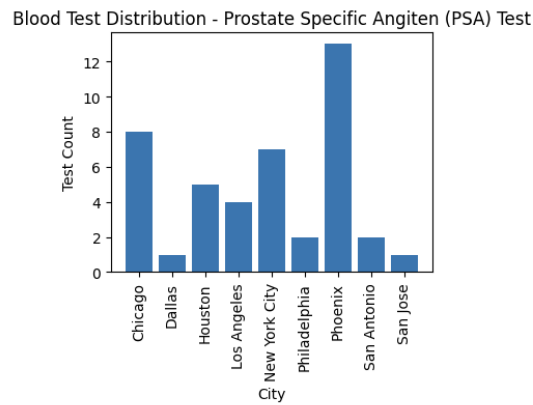
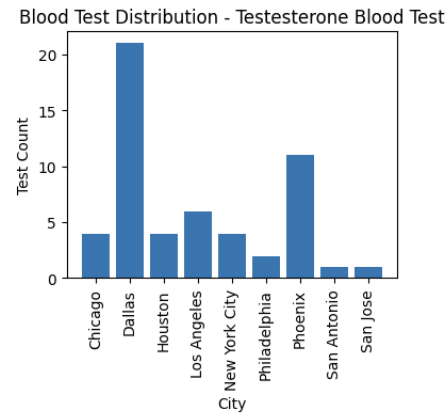
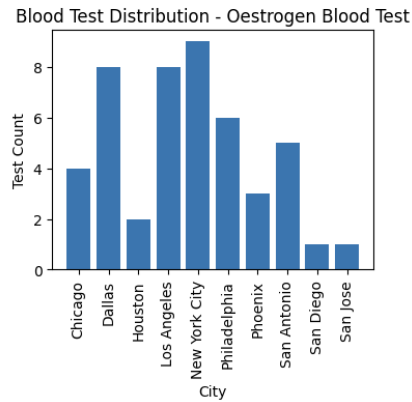
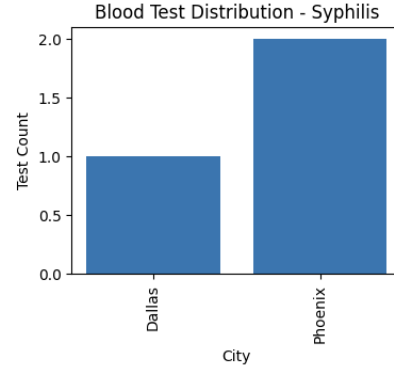
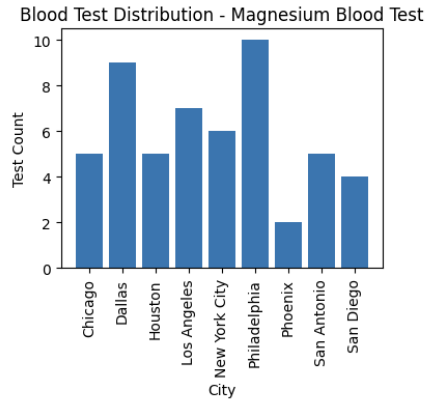


Fig 2.7: Analysis of popularity in different cities continued

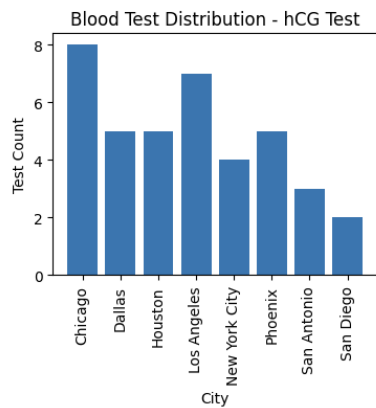
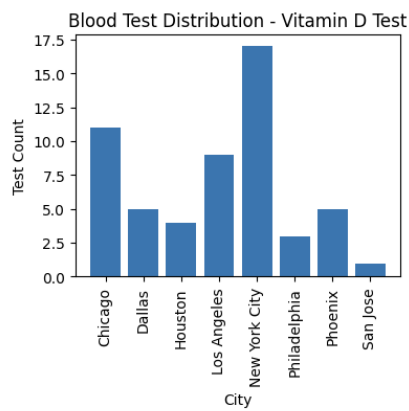
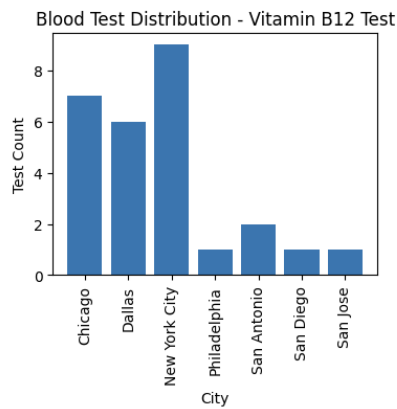
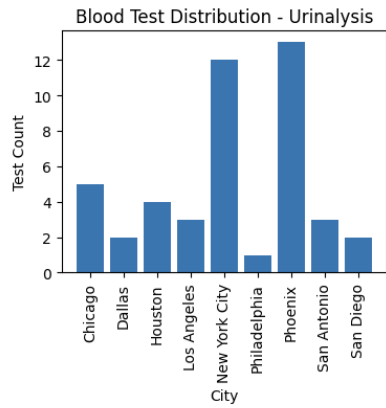


Fig 2.8: Analysis of popularity in different cities continued

OUTPUT 3: Analyze the data to find relative test pricing in different cities.

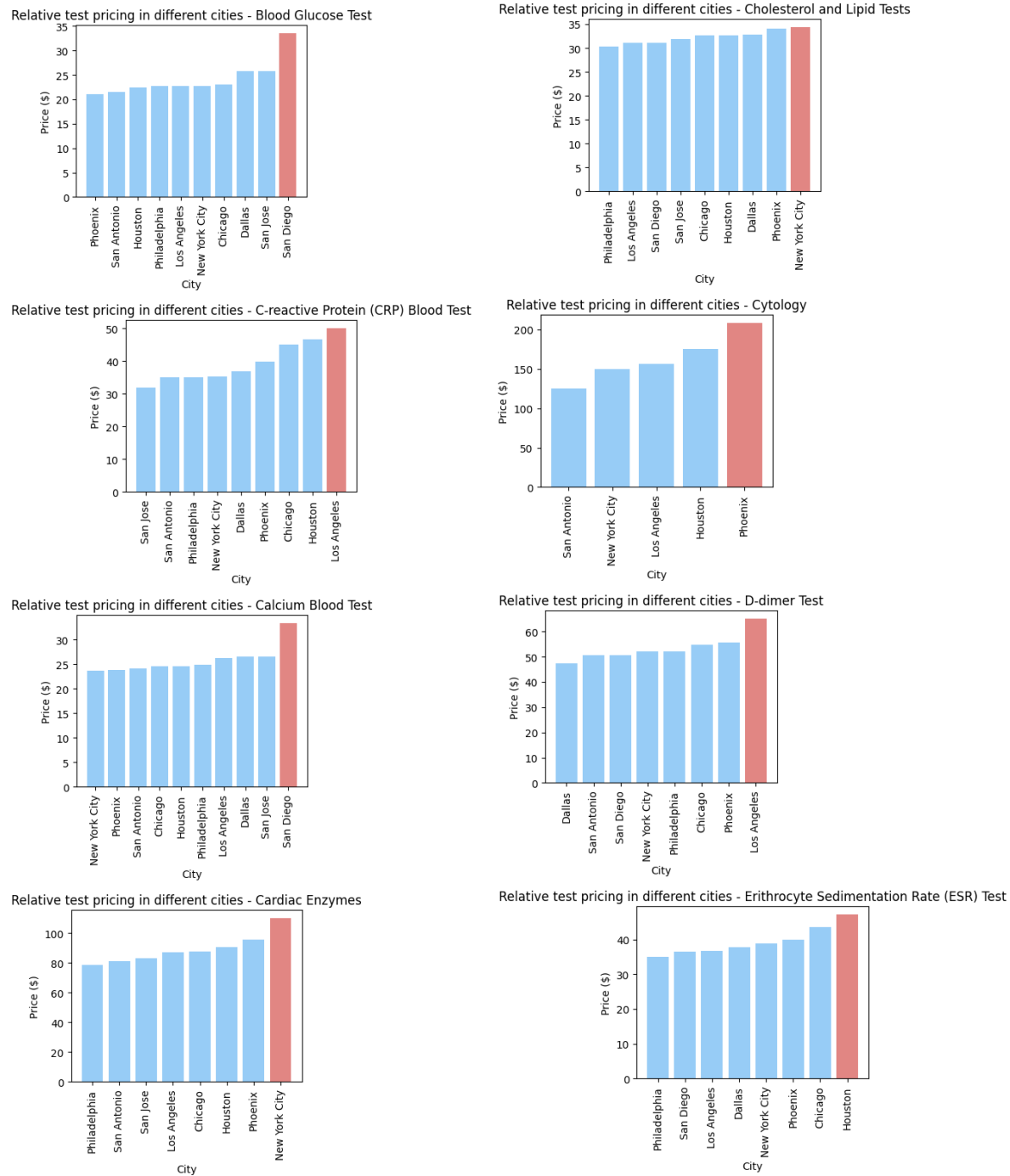
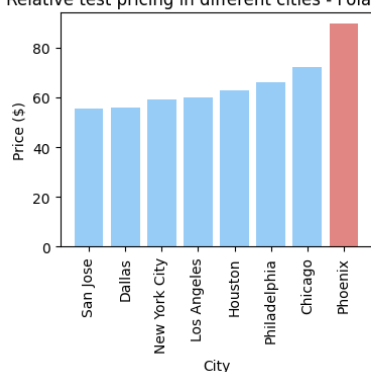
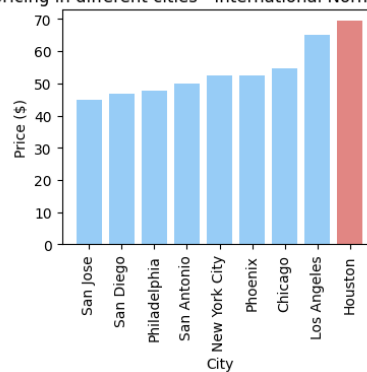


Fig 2.10: Analysis of relative test pricing in different cities.

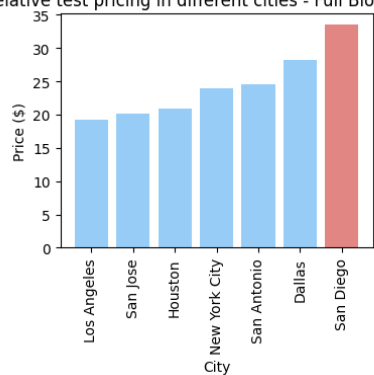
Relative test pricing in different cities - Folate Test



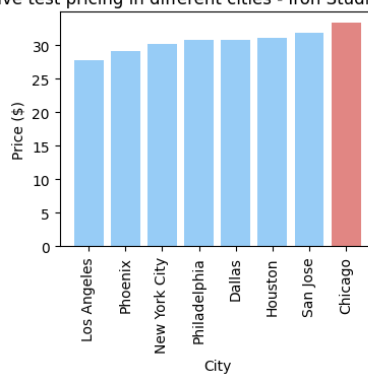
Relative test pricing in different cities - International Normalised Ratio (INR) Test



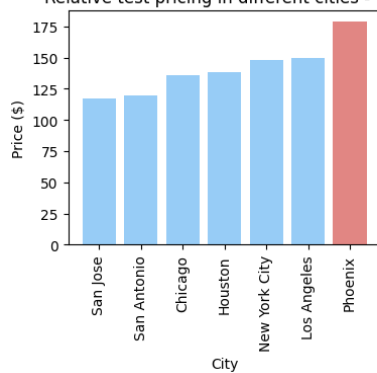
Relative test pricing in different cities - Full Blood Count



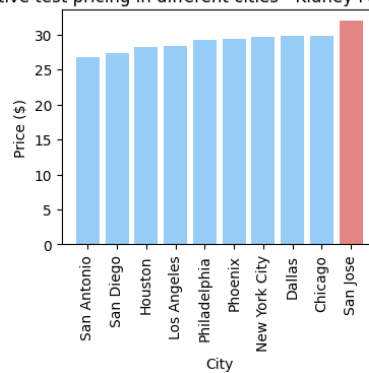
Relative test pricing in different cities - Iron Studies Blood Test



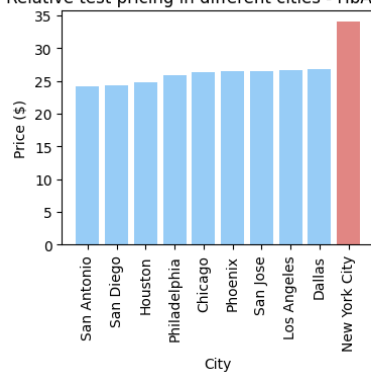
Relative test pricing in different cities - HIV



Relative test pricing in different cities - Kidney Function Tests



Relative test pricing in different cities - HbA1c Test



Relative test pricing in different cities - Liver Function Tests

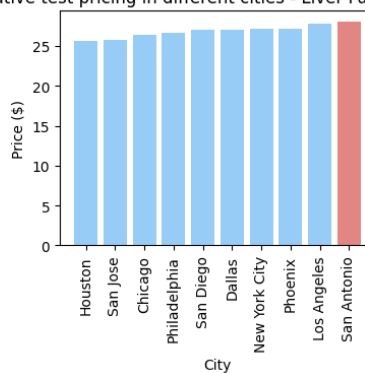
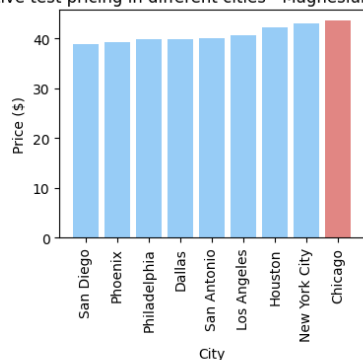
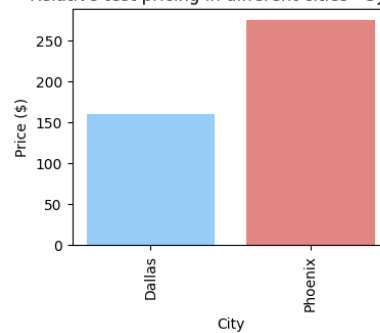


Fig 2.11: Analysis of relative test pricing in different cities continued

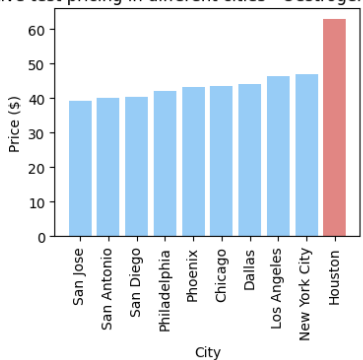
Relative test pricing in different cities - Magnesium Blood Test



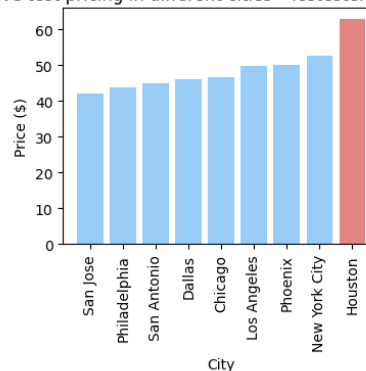
Relative test pricing in different cities - Syphilis



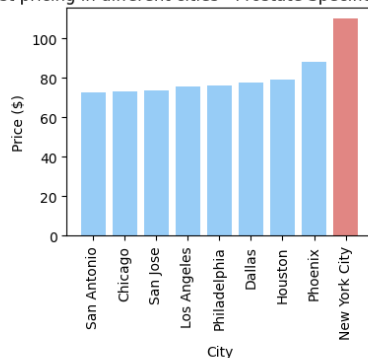
Relative test pricing in different cities - Oestrogen Blood Test



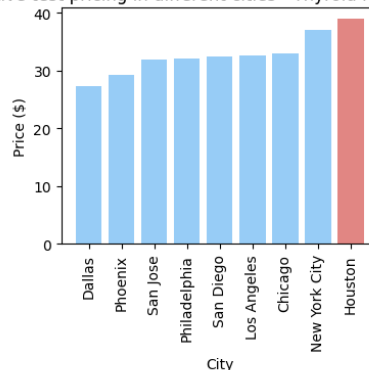
Relative test pricing in different cities - Testosterone Blood Test



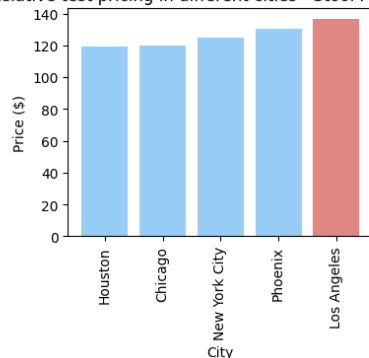
Relative test pricing in different cities - Prostate Specific Angiten (PSA) Test



Relative test pricing in different cities - Thyroid Function Tests



Relative test pricing in different cities - Stool Microscopy



Relative test pricing in different cities - Urea, Electrolytes

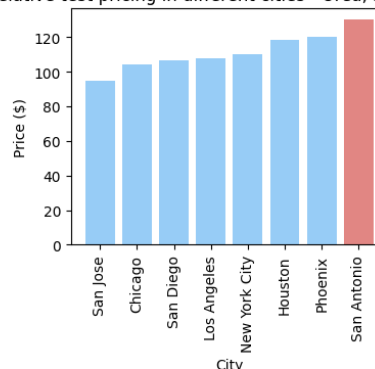
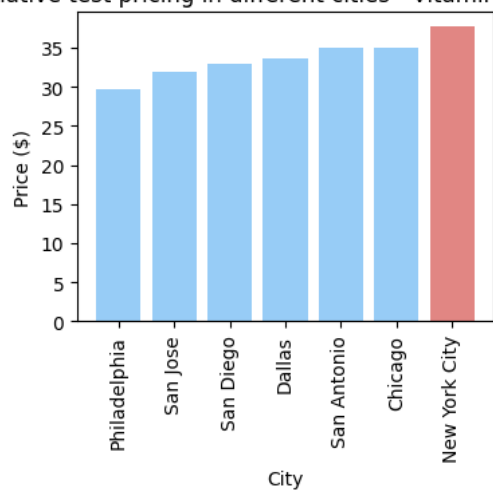
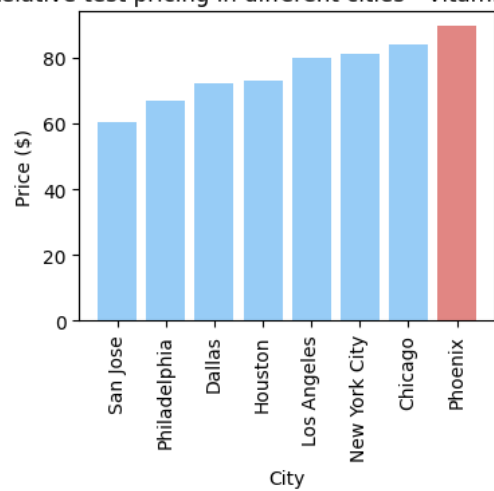


Fig 2.12: Analysis of relative test pricing in different cities continued

Relative test pricing in different cities - Vitamin B12 Test



Relative test pricing in different cities - Vitamin D Test



Relative test pricing in different cities - hCG Test

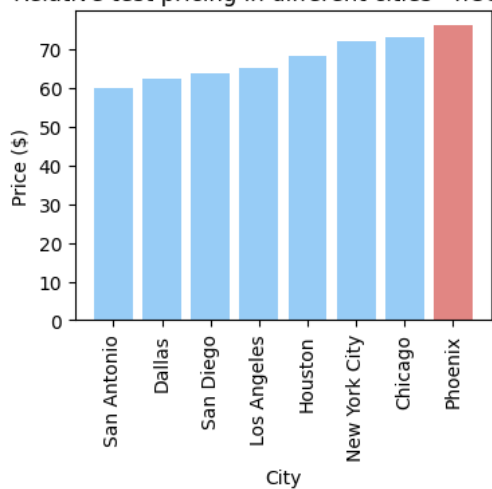


Fig 2.13: Analysis of relative test pricing in different cities continued

OUTPUT 4: Analyze the test results data to find healthy and unhealthy people in different cities.

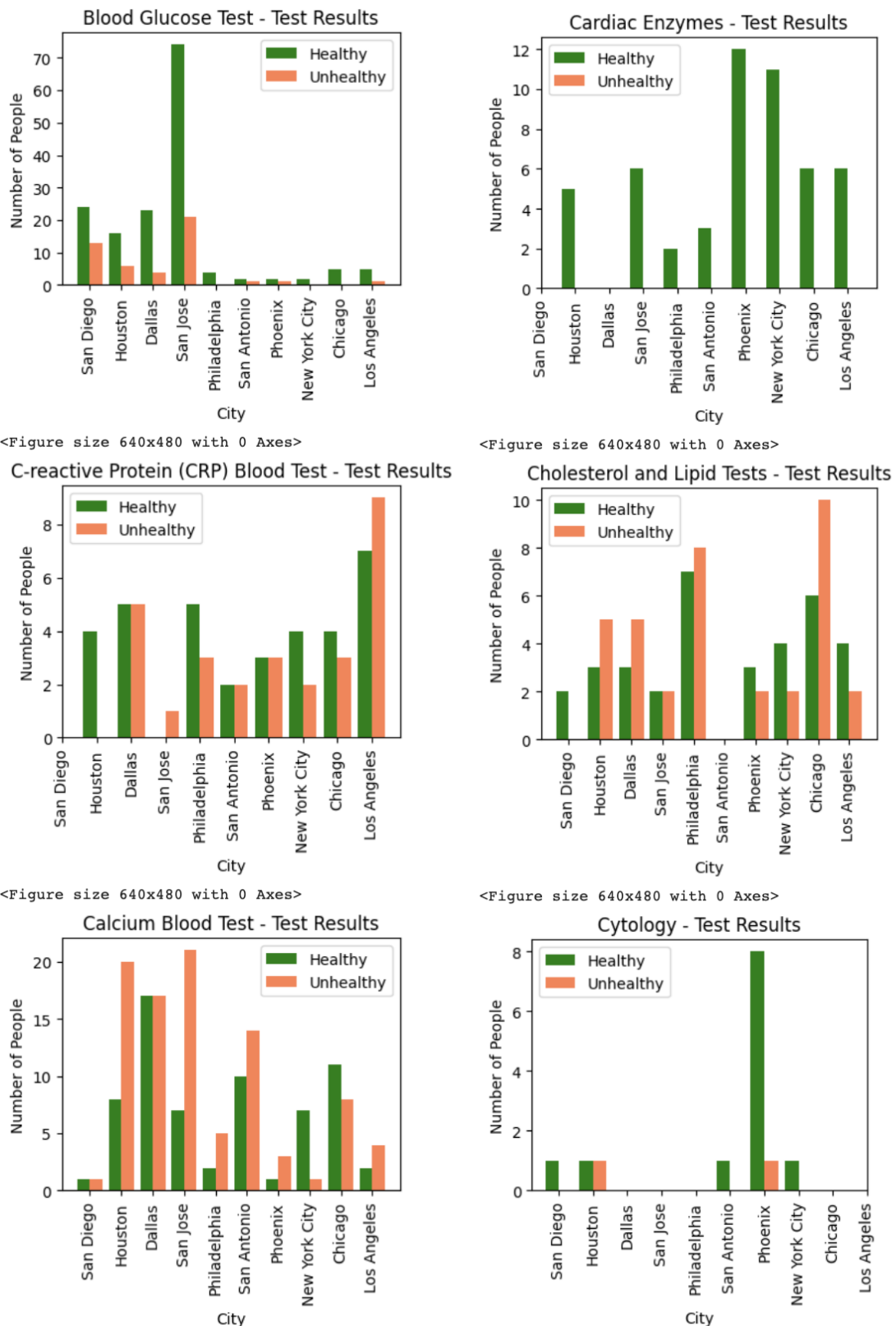
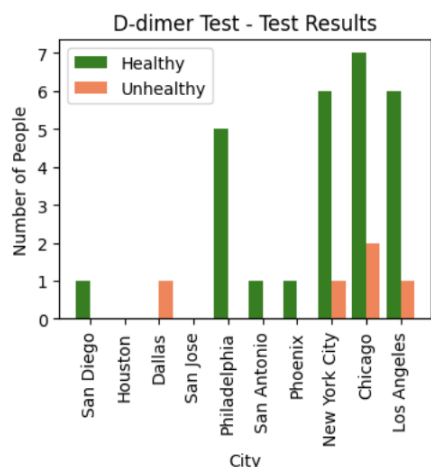
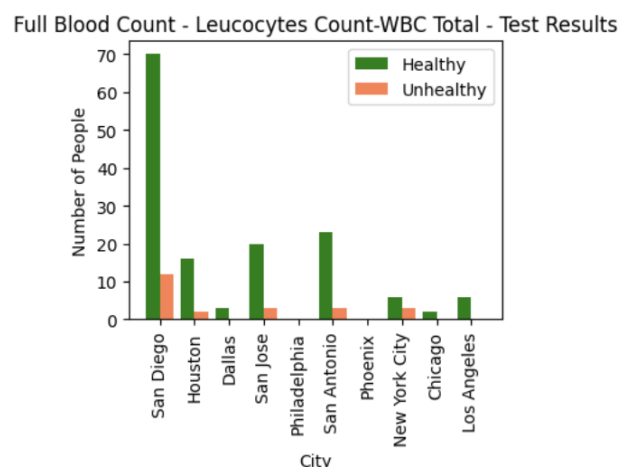


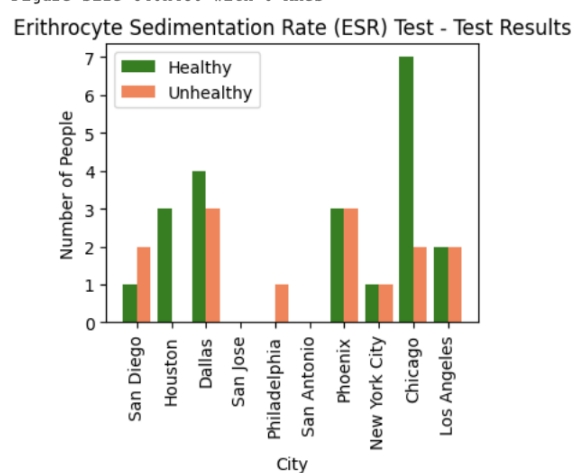
Fig 2.15: Analysis of the number of healthy and unhealthy people in different cities.



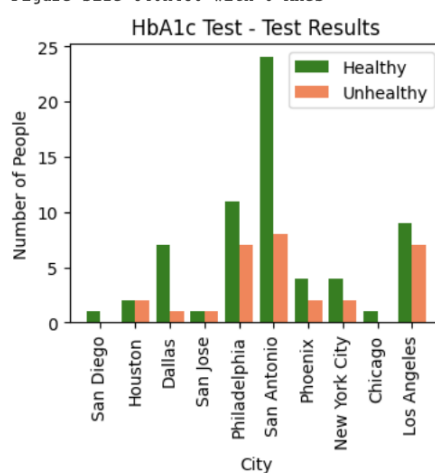
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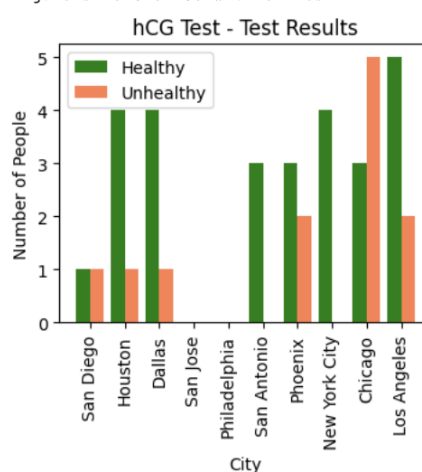
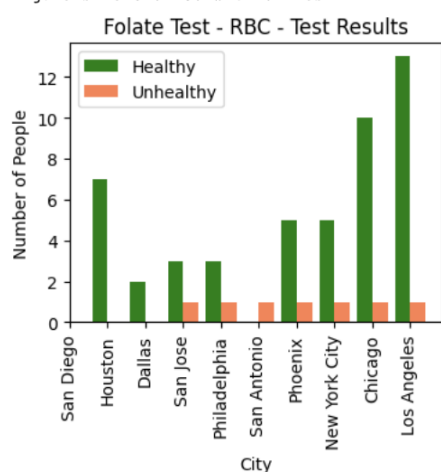
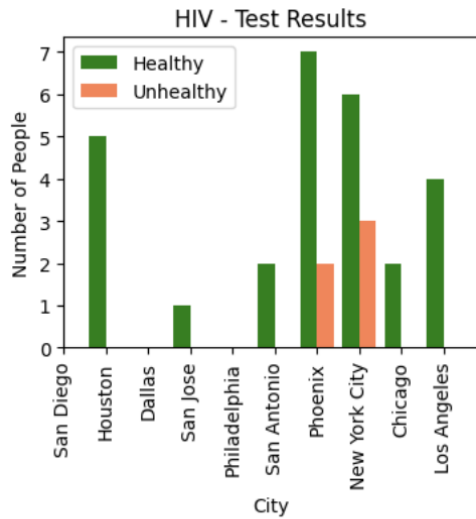
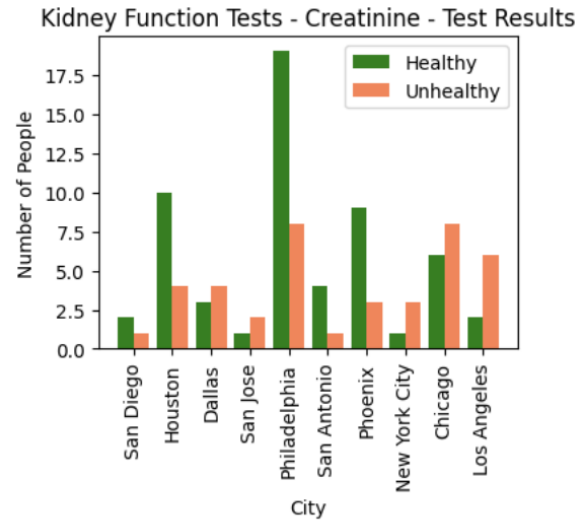


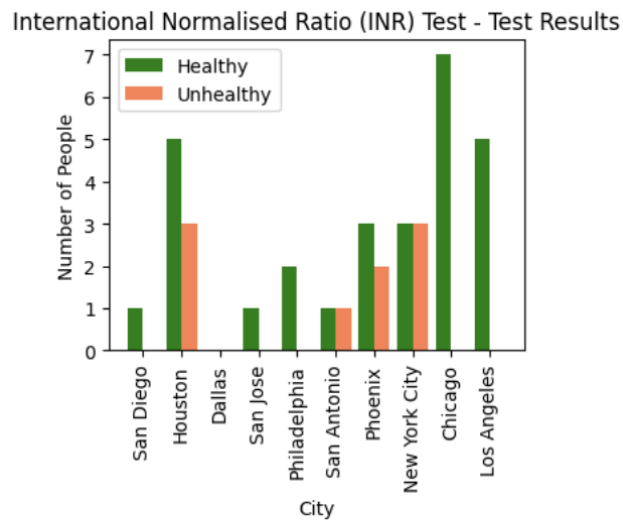
Fig 2.16: Analysis of the number of healthy and unhealthy people in different cities continued.



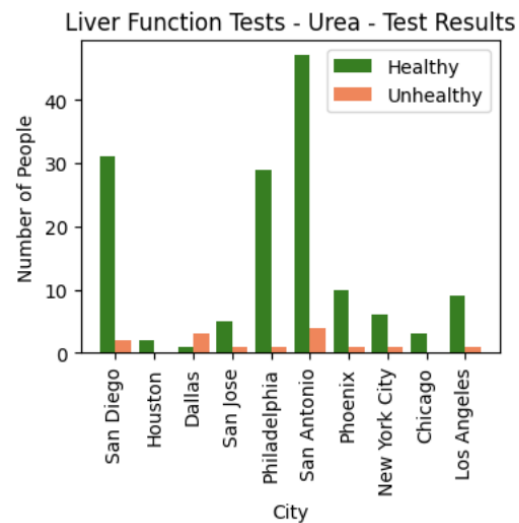
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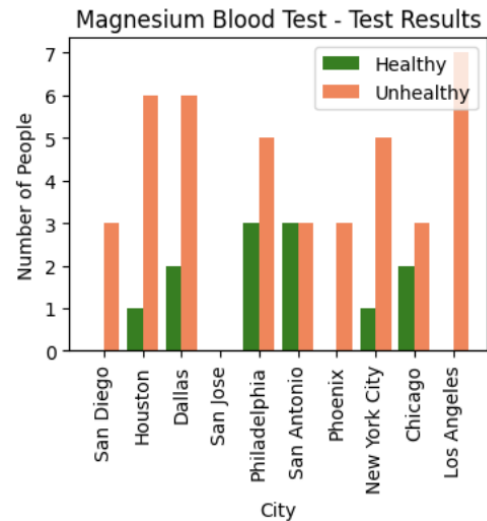
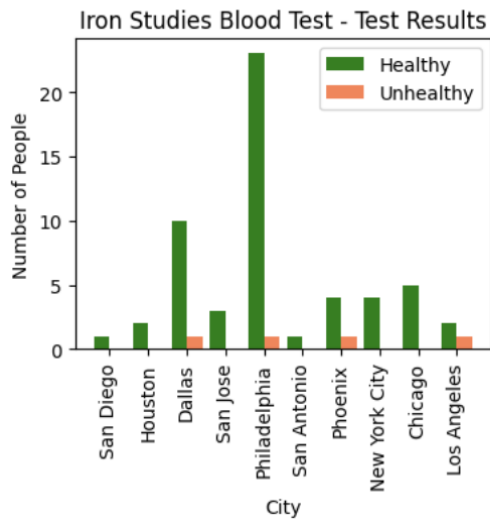
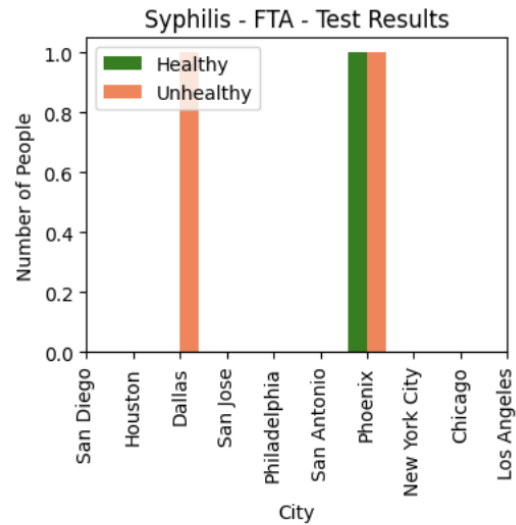
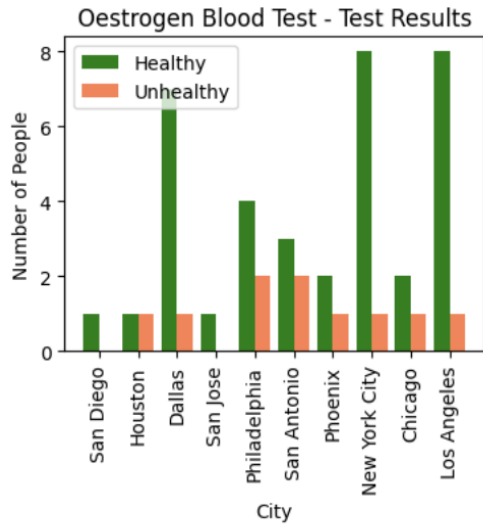
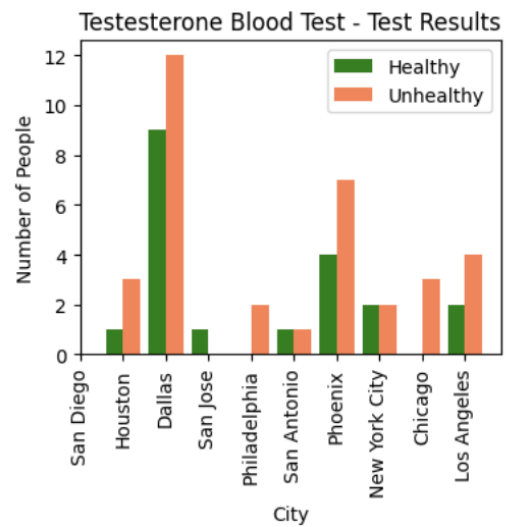
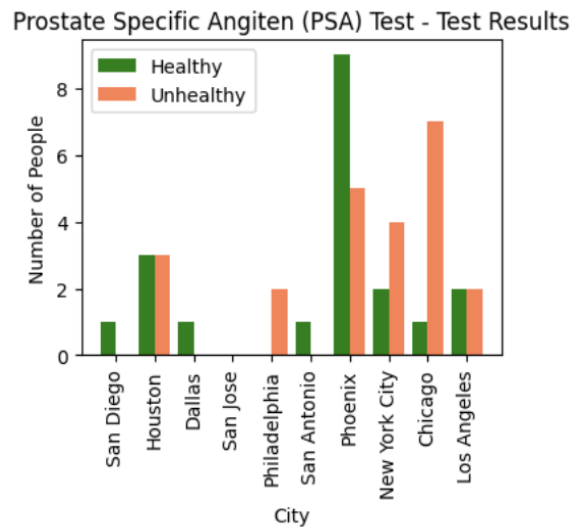


Fig 2.17: Analysis of the number of healthy and unhealthy people in different cities continued.



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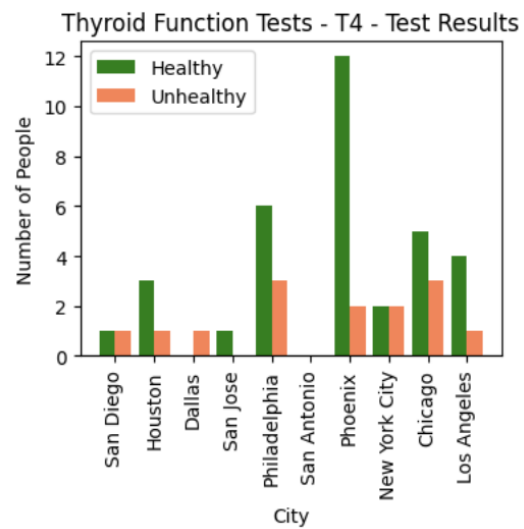
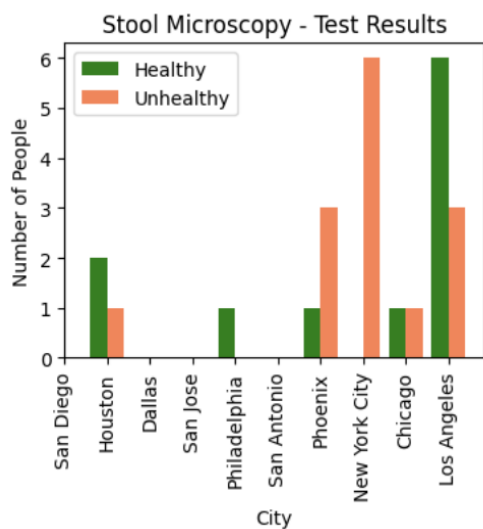
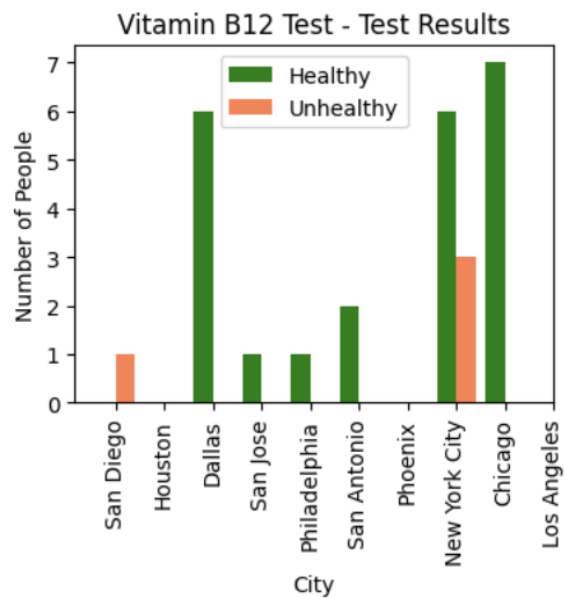
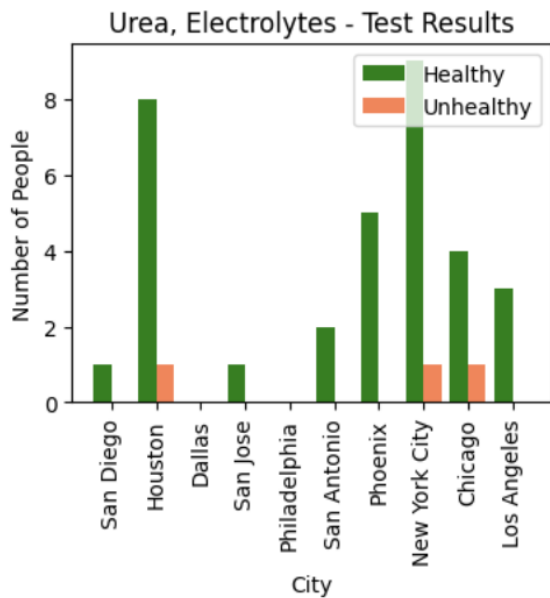


Fig 2.18: Analysis of the number of healthy and unhealthy people in different cities continued.



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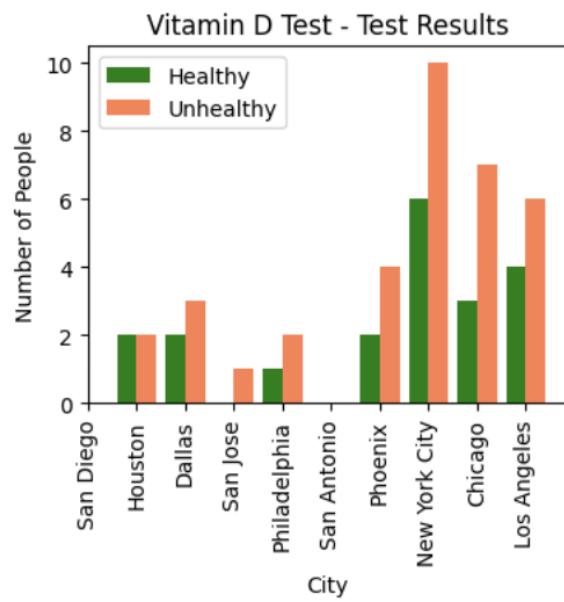
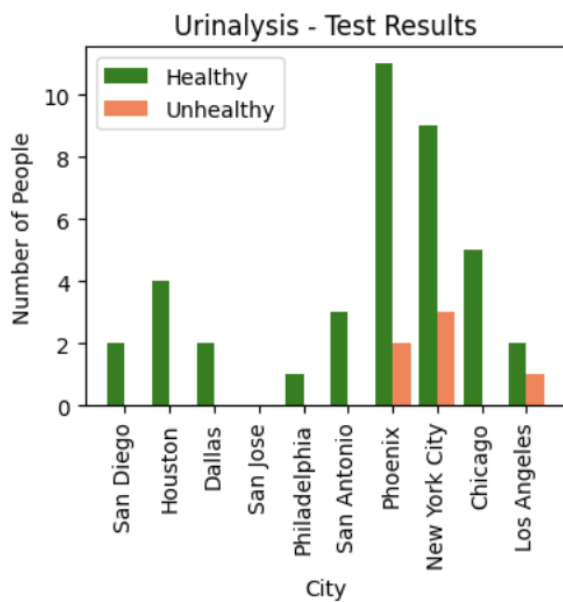


Fig 2.19: Analysis of the number of healthy and unhealthy people in different cities continued.

ANALYSIS OF THE BLOOD TEST REPORTS

S.No.	Blood Test Name	City with the highest pricing	City with highest count of test takers
1.	Blood Glucose Test	San Diego	San Jose
2.	C-reactive Protein (CRP) Blood Test	Los Angeles	Los Angeles
3.	Calcium Blood Test	San Diego	Dallas
4.	Cardiac Enzymes	New York City	Phoenix
5.	Cholesterol and Lipid Tests	New York City	Chicago
6.	Cytology	Phoenix	Phoenix
7.	D-dimer Test	Los Angeles	Chicago
8.	Erythrocyte Sedimentation Rate (ESR) Test	Houston	Chicago
9.	Folate Test - RBC	Phoenix	Los Angeles
10.	Full Blood Count - Leukocytes Count-WBC Total	San Diego	San Diego
11.	HbA1c Test	New York City	San Antonio
12.	hCG Test	Phoenix	Chicago
13.	HIV	Phoenix	New York City
14.	International Normalised Ratio (INR) Test	Houston	Houston
15.	Iron Studies Blood Test	Chicago	Philadelphia
16.	Kidney Function Tests - Creatinine	San Jose	Philadelphia
17.	Liver Function Tests - Urea	San Antonio	San Antonio
18.	Magnesium Blood Test	Chicago	Philadelphia
19.	Oestrogen Blood Test	Houston	New York City
20.	Prostate Specific Antigen (PSA) Test	New York City	Phoenix
21.	Stool Microscopy	Los Angeles	Los Angeles

22.	Syphilis - FTA	Phoenix	Phoenix
23.	Testosterone Blood Test	Houston	Dallas
24.	Thyroid Function Tests - T4	Houston	Phoenix
25.	Urea, Electrolytes	San Antonio	New York City
26.	Urinalysis	Phoenix	Phoenix
27.	Vitamin B12 Test	New York City	New York City
28.	Vitamin D Test	Phoenix	New York City

Table 1.1: Analysis of the blood test reports

Analysis of number of healthy and unhealthy people in a city

For the purpose of the internship, healthy people are specified as people whose test results lie in the normal range of the particular test. Unhealthy people are the ones whose results are either below or above the accepted range.

Blood Glucose Test		
San Diego	24 healthy	13 unhealthy
Houston	16 healthy	6 unhealthy
Dallas	23 healthy	4 unhealthy
San Jose	74 healthy	21 unhealthy
Philadelphia	4 healthy	0 unhealthy
San Antonio	2 healthy	1 unhealthy
Phoenix	2 healthy	1 unhealthy
New York City	2 healthy	0 unhealthy
Chicago	5 healthy	0 unhealthy
Los Angeles	5 healthy	1 unhealthy

Table 1.2: Blood Glucose Test

C-reactive Protein (CRP) Blood Test		
Houston	4 healthy	0 unhealthy
Dallas	5 healthy	5 unhealthy
San Jose	0 healthy	1 unhealthy
Philadelphia	5 healthy	3 unhealthy
San Antonio	2 healthy	2 unhealthy
Phoenix	3 healthy	3 unhealthy
New York City	4 healthy	2 unhealthy

Chicago	4 healthy	3 unhealthy
Los Angeles	7 healthy	9 unhealthy

Table 1.3: C-reactive Protein (CRP) Blood Test

Calcium Blood Test		
San Diego	1 healthy	1 unhealthy
Houston	8 healthy	20 unhealthy
Dallas	17 healthy	17 unhealthy
San Jose	7 healthy	21 unhealthy
Philadelphia	2 healthy	5 unhealthy
San Antonio	10 healthy	14 unhealthy
Phoenix	1 healthy	3 unhealthy
New York City	7 healthy	1 unhealthy
Chicago	11 healthy	8 unhealthy
Los Angeles	2 healthy	4 unhealthy

Table 1.4: Calcium Blood Test

Cardiac Enzymes		
Houston	5 healthy	0 unhealthy
San Jose	6 healthy	0 unhealthy
Philadelphia	2 healthy	0 unhealthy
San Antonio	3 healthy	0 unhealthy
Phoenix	12 healthy	0 unhealthy
New York City	11 healthy	0 unhealthy
Chicago	6 healthy	0 unhealthy
Los Angeles	6 healthy	0 unhealthy

Table 1.5: Cardiac Enzymes

Cholesterol and Lipid Tests		
San Diego	2 healthy	0 unhealthy
Houston	3 healthy	5 unhealthy
Dallas	3 healthy	5 unhealthy
San Jose	2 healthy	2 unhealthy
Philadelphia	7 healthy	8 unhealthy
Phoenix	3 healthy	2 unhealthy
New York City	4 healthy	2 unhealthy
Chicago	6 healthy	10 unhealthy
Los Angeles	4 healthy	2 unhealthy

Table 1.6: Cholesterol and Lipid Tests

Cytology		
San Diego	1 healthy	0 unhealthy
Houston	1 healthy	1 unhealthy
San Antonio	1 healthy	0 unhealthy
Phoenix	8 healthy	1 unhealthy
New York City	1 healthy	0 unhealthy

Table 1.7: Cytology

D-dimer Test		
San Diego	1 healthy	0 unhealthy
Dallas	0 healthy	1 unhealthy
Philadelphia	5 healthy	0 unhealthy
San Antonio	1 healthy	0 unhealthy
Phoenix	1 healthy	0 unhealthy
New York City	6 healthy	1 unhealthy
Chicago	7 healthy	2 unhealthy
Los Angeles	6 healthy	1 unhealthy

Table 1.8: D-dimer Test

Erythrocyte Sedimentation Rate (ESR) Test		
San Diego	1 healthy	2 unhealthy
Houston	3 healthy	0 unhealthy
Dallas	4 healthy	3 unhealthy
Philadelphia	0 healthy	1 unhealthy
Phoenix	3 healthy	3 unhealthy
New York City	1 healthy	1 unhealthy
Chicago	7 healthy	2 unhealthy
Los Angeles	2 healthy	2 unhealthy

Table 1.9: Erythrocyte Sedimentation Rate (ESR) Test

Folate Test - RBC		
Houston	7 healthy	0 unhealthy
Dallas	2 healthy	0 unhealthy
San Jose	3 healthy	1 unhealthy
Philadelphia	3 healthy	1 unhealthy
San Antonio	0 healthy	1 unhealthy
Phoenix	5 healthy	1 unhealthy
New York City	5 healthy	1 unhealthy

Chicago	10 healthy	1 unhealthy
Los Angeles	13 healthy	1 unhealthy

Table 1.10: Folate Test - RBC

Full Blood Count - Leukocytes Count-WBC Total		
San Diego	70 healthy	12 unhealthy
Houston	16 healthy	2 unhealthy
Dallas	3 healthy	0 unhealthy
San Jose	20 healthy	3 unhealthy
San Antonio	23 healthy	3 unhealthy
New York City	6 healthy	3 unhealthy
Chicago	2 healthy	0 unhealthy
Los Angeles	6 healthy	0 unhealthy

Table 1.11: Full Blood Count - Leukocytes Count-WBC Total

HbA1c Test		
San Diego	1 healthy	0 unhealthy
Houston	2 healthy	2 unhealthy
Dallas	7 healthy	1 unhealthy
San Jose	1 healthy	1 unhealthy
Philadelphia	11 healthy	7 unhealthy
San Antonio	24 healthy	8 unhealthy
Phoenix	4 healthy	2 unhealthy
New York City	4 healthy	2 unhealthy
Chicago	1 healthy	0 unhealthy
Los Angeles	9 healthy	7 unhealthy

Table 1.12: HbA1c Test

hCG Test		
San Diego	1 healthy	1 unhealthy
Houston	4 healthy	1 unhealthy
Dallas	4 healthy	1 unhealthy
San Antonio	3 healthy	0 unhealthy
Phoenix	3 healthy	2 unhealthy
New York City	4 healthy	0 unhealthy
Chicago	3 healthy	5 unhealthy
Los Angeles	5 healthy	2 unhealthy

Table 1.13: hCG Test

HIV		
Houston	5 healthy	0 unhealthy
San Jose	1 healthy	0 unhealthy
San Antonio	2 healthy	0 unhealthy
Phoenix	7 healthy	2 unhealthy
New York City	6 healthy	3 unhealthy
Chicago	2 healthy	0 unhealthy
Los Angeles	4 healthy	0 unhealthy

Table 1.14: HIV

International Normalised Ratio (INR) Test		
San Diego	1 healthy	0 unhealthy
Houston	5 healthy	3 unhealthy
San Jose	1 healthy	0 unhealthy
Philadelphia	2 healthy	0 unhealthy
San Antonio	1 healthy	1 unhealthy
Phoenix	3 healthy	2 unhealthy
New York City	3 healthy	3 unhealthy
Chicago	7 healthy	0 unhealthy
Los Angeles	5 healthy	0 unhealthy

Table 1.15: International Normalised Ratio (INR) Test

Iron Studies Blood Test		
San Diego	1 healthy	0 unhealthy
Houston	2 healthy	0 unhealthy
Dallas	10 healthy	1 unhealthy
San Jose	3 healthy	0 unhealthy
Philadelphia	23 healthy	1 unhealthy
San Antonio	1 healthy	0 unhealthy
Phoenix	4 healthy	1 unhealthy
New York City	4 healthy	0 unhealthy
Chicago	5 healthy	0 unhealthy
Los Angeles	2 healthy	1 unhealthy

Table 1.16: Iron Studies Blood Test

Kidney Function Tests - Creatinine		
San Diego	2 healthy	1 unhealthy
Houston	10 healthy	4 unhealthy
Dallas	3 healthy	4 unhealthy

San Jose	1 healthy	2 unhealthy
Philadelphia	19 healthy	8 unhealthy
San Antonio	4 healthy	1 unhealthy
Phoenix	9 healthy	3 unhealthy
New York City	1 healthy	3 unhealthy
Chicago	6 healthy	8 unhealthy
Los Angeles	2 healthy	6 unhealthy

Table 1.17: Kidney Function Tests - Creatinine

Liver Function Tests - Urea		
San Diego	31 healthy	2 unhealthy
Houston	2 healthy	0 unhealthy
Dallas	1 healthy	3 unhealthy
San Jose	5 healthy	1 unhealthy
Philadelphia	29 healthy	1 unhealthy
San Antonio	47 healthy	4 unhealthy
Phoenix	10 healthy	1 unhealthy
New York City	6 healthy	1 unhealthy
Chicago	3 healthy	0 unhealthy
Los Angeles	9 healthy	1 unhealthy

Table 1.18: Liver Function Tests - Urea

Magnesium Blood Test		
San Diego	0 healthy	3 unhealthy
Houston	1 healthy	6 unhealthy
Dallas	2 healthy	6 unhealthy
Philadelphia	3 healthy	5 unhealthy
San Antonio	3 healthy	3 unhealthy
Phoenix	0 healthy	3 unhealthy
New York City	1 healthy	5 unhealthy
Chicago	2 healthy	3 unhealthy
Los Angeles	0 healthy	7 unhealthy

Table 1.19: Magnesium Blood Test

Oestrogen Blood Test		
San Diego	1 healthy	0 unhealthy
Houston	1 healthy	1 unhealthy
Dallas	7 healthy	1 unhealthy
San Jose	1 healthy	0 unhealthy

Philadelphia	4 healthy	2 unhealthy
San Antonio	3 healthy	2 unhealthy
Phoenix	2 healthy	1 unhealthy
New York City	8 healthy	1 unhealthy
Chicago	2 healthy	1 unhealthy
Los Angeles	8 healthy	1 unhealthy

Table 1.20: Oestrogen Blood Test

Prostate Specific Antigen (PSA) Test		
San Diego	1 healthy	0 unhealthy
Houston	3 healthy	3 unhealthy
Dallas	1 healthy	0 unhealthy
Philadelphia	0 healthy	2 unhealthy
San Antonio	1 healthy	0 unhealthy
Phoenix	9 healthy	5 unhealthy
New York City	2 healthy	4 unhealthy
Chicago	1 healthy	7 unhealthy
Los Angeles	2 healthy	2 unhealthy

Table 1.21: Prostate Specific Antigen (PSA) Test

Stool Microscopy		
Houston	2 healthy	1 unhealthy
Philadelphia	1 healthy	0 unhealthy
Phoenix	1 healthy	3 unhealthy
New York City	0 healthy	6 unhealthy
Chicago	1 healthy	1 unhealthy
Los Angeles	6 healthy	3 unhealthy

Table 1.22: Stool Microscopy

Syphilis - FTA		
Dallas	0 healthy	1 unhealthy
Phoenix	1 healthy	1 unhealthy

Table 1.23: Syphilis - FTA

Testosterone Blood Test		
Houston	1 healthy	3 unhealthy
Dallas	9 healthy	12 unhealthy
San Jose	1 healthy	0 unhealthy

Philadelphia	0 healthy	2 unhealthy
San Antonio	1 healthy	1 unhealthy
Phoenix	4 healthy	7 unhealthy
New York City	2 healthy	2 unhealthy
Chicago	0 healthy	3 unhealthy
Los Angeles	2 healthy	4 unhealthy

Table 1.24: Testosterone Blood Test

Thyroid Function Tests - T4		
San Diego	1 healthy	1 unhealthy
Houston	3 healthy	1 unhealthy
Dallas	0 healthy	1 unhealthy
San Jose	1 healthy	0 unhealthy
Philadelphia	6 healthy	3 unhealthy
Phoenix	12 healthy	2 unhealthy
New York City	2 healthy	2 unhealthy
Chicago	5 healthy	3 unhealthy
Los Angeles	4 healthy	1 unhealthy

Table 1.25: Thyroid Function Tests - T4