Assessment of Marginal Workers in Tamil Nadu – A Socioeconomic Analysis

Team Member

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Applied Data Science Phase-4 document

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Phase 4: Development Part 2

Problem Statement:

In this part you will continue building your project.

- **Perform the demographic analysis**
- **Calculate the distribution of marginal workers based on age, industrial category, and sex using data aggregation and manipulation.**

Create visualizations.

- **Create visualizations using data visualization libraries (e.g., Matplotlib, Seaborn).**

ASSESSMENT OF MARGINAL WORKERS IN TAMILNADU

Applied Data Science **Phase-4** document

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Google Collab link :

https://colab.research.google.com/drive/1yl7FN8HGHvhWCTr5EzqdhMWYtGkJwq4x?usp=sharing

STEP 1 : Demographic Analysis

In [3]:
```
#Load the dataset

import pandas as pd
df=pd.read_csv('marginal_workers_tamil_nadu.csv.csv')
df
```

Out[3]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Industrial Category - N to O - Females	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	In Ca -
0	B0706	`33	`000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	...	14495	58788	19892	38896	
1	B0706	`33	`000	State - TAMIL NADU	Total	`5-9	48238	24511	23727	2051	...	20	312	169	143	
2	B0706	`33	`000	State - TAMIL NADU	Total	`10-14	76288	39191	37097	6993	...	44	506	256	250	
3	B0706	`33	`000	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	...	768	2114	695	1419	
4	B0706	`33	`000	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	...	2267	11529	2861	8668	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	`33	`633	District - Tiruppur	Urban	50-59	4965	2800	2165	901	...	25	111	51	60	
1382	B0706	`33	`633	District - Tiruppur	Urban	60-69	2827	1590	1237	578	...	7	21	6	15	
1383	B0706	`33	`633	District - Tiruppur	Urban	70-79	920	581	339	204	...	2	6	6	0	
1384	B0706	`33	`633	District - Tiruppur	Urban	80+	191	104	87	47	...	0	2	0	2	
1385	B0706	`33	`633	District - Tiruppur	Urban	Age not stated	31	23	8	9	...	0	0	0	0	

1386 rows × 69 columns

In [5]:
```
# Clean the dataset by removing '`' from the columns of Age group, state code ,Dsitrict Code
df['Age group'] = df['Age group'].str.replace('`', '')
df['State Code'] = df['State Code'].str.replace('`','')
df['District Code']= df['District Code'].str.replace('`','')
df
```

Out[5]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Industrial Category - N to O - Females	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	In Ca -
0	B0706	33	000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	...	14495	58788	19892	38896	
1	B0706	33	000	State - TAMIL NADU	Total	5-9	48238	24511	23727	2051	...	20	312	169	143	
2	B0706	33	000	State - TAMIL NADU	Total	10-14	76288	39191	37097	6993	...	44	506	256	250	
3	B0706	33	000	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	...	768	2114	695	1419	
4	B0706	33	000	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	...	2267	11529	2861	8668	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	33	633	District - Tiruppur	Urban	50-59	4965	2800	2165	901	...	25	111	51	60	
1382	B0706	33	633	District - Tiruppur	Urban	60-69	2827	1590	1237	578	...	7	21	6	15	
1383	B0706	33	633	District - Tiruppur	Urban	70-79	920	581	339	204	...	2	6	6	0	
1384	B0706	33	633	District - Tiruppur	Urban	80+	191	104	87	47	...	0	2	0	2	
1385	B0706	33	633	District - Tiruppur	Urban	Age not stated	31	23	8	9	...	0	0	0	0	

1386 rows × 69 columns

In [ ]:
```
# first few rows
df.head()
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Industrial Category - N to O - Females	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	Industri Categor - R to U HHI Persor
0	B0706	33	000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	...	14495	58788	19892	38896	897(
1	B0706	33	000	State - TAMIL NADU	Total	5-9	48238	24511	23727	2051	...	20	312	169	143	84
2	B0706	33	000	State - TAMIL NADU	Total	10-14	76288	39191	37097	6993	...	44	506	256	250	152
3	B0706	33	000	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	...	768	2114	695	1419	534
4	B0706	33	000	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	...	2267	11529	2861	8668	1065

5 rows × 69 columns

In [ ]:
```
import pandas as pd

# Assuming 'df' is your cleaned DataFrame
df.to_csv('cleaned_dataset.csv', index=False)
```

In [ ]:
```
# Check for missing values
missing_values = df.isnull().sum()
print(missing_values)
```

```
Table Code                                          0
State Code                                          0
District Code                                       0
Area Name                                           0
Total/ Rural/ Urban                                 0
                                                   ..
Industrial Category - R to U - HHI - Males          0
Industrial Category - R to U - HHI - Females        0
Industrial Category - R to U - Non HHI - Persons    0
Industrial Category - R to U - Non HHI - Males      0
Industrial Category - R to U - Non HHI - Females    0
Length: 69, dtype: int64
```

In [ ]:
```
df.columns
```

Out[ ]:
```
Index(['Table Code', 'State Code', 'District Code', 'Area Name',
       'Total/ Rural/ Urban', 'Age group',
       'Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females',
       'Industrial Category - A - Cultivators - Persons',
       'Industrial Category - A - Cultivators - Males',
       'Industrial Category - A - Cultivators - Females',
       'Industrial Category - A - Agricultural labourers - Persons',
       'Industrial Category - A - Agricultural labourers - Males',
       'Industrial Category - A - Agricultural labourers - Females',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
       'Industrial Category - B - Persons', 'Industrial Category - B - Males',
       'Industrial Category - B - Females',
       'Industrial Category - C - HHI - Persons',
       'Industrial Category - C - HHI - Males',
       'Industrial Category - C - HHI - Females',
       'Industrial Category - C - Non HHI - Persons',
       'Industrial Category - C - Non HHI - Males',
       'Industrial Category - C - Non HHI - Females',
       'Industrial Category - D & E - Persons',
       'Industrial Category - D & E - Males',
       'Industrial Category - D & E - Females',
       'Industrial Category - F - Persons', 'Industrial Category - F - Males',
       'Industrial Category - F - Females',
       'Industrial Category - G - HHI - Persons',
       'Industrial Category - G - HHI - Males',
       'Industrial Category - G - HHI - Females',
       'Industrial Category - G - Non HHI - Persons',
       'Industrial Category - G - Non HHI - Males',
       'Industrial Category - G - Non HHI - Females',
       'Industrial Category - H - Persons', 'Industrial Category - H - Males',
       'Industrial Category - H - Females',
       'Industrial Category - I - Persons', 'Industrial Category - I - Males',
       'Industrial Category - I - Females',
       'Industrial Category - J - HHI - Persons',
       'Industrial Category - J - HHI - Males',
       'Industrial Category - J - HHI - Females',
       'Industrial Category - J - Non HHI - Persons',
       'Industrial Category - J - Non HHI - Males',
       'Industrial Category - J - Non HHI - Females',
       'Industrial Category - K to M - Persons',
       'Industrial Category - K to M - Males',
       'Industrial Category - K to M - Females',
       'Industrial Category - N to O - Persons',
       'Industrial Category - N to O - Males',
       'Industrial Category - N to O - Females',
       'Industrial Category - P to Q - Persons',
       'Industrial Category - P to Q - Males',
       'Industrial Category - P to Q - Females',
       'Industrial Category - R to U - HHI - Persons',
       'Industrial Category - R to U - HHI - Males',
       'Industrial Category - R to U - HHI - Females',
       'Industrial Category - R to U - Non HHI - Persons',
       'Industrial Category - R to U - Non HHI - Males',
       'Industrial Category - R to U - Non HHI - Females'],
      dtype='object')
```

In [ ]:
```
df.isnull()
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Industrial Category - N to O - Females	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	Indus Cate - R t H Per
0	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
1	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
2	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
3	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
4	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
1382	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
1383	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
1384	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	
1385	False	False	False	False	False	False	False	False	False	False	...	False	False	False	False	

1386 rows × 69 columns

Unique Values in Categorical Columns

In [ ]:
```
# Unique Values in Categorical Columns
for column in df.select_dtypes(include=['object']):
    print(f"Unique values in {column}: {df[column].nunique()}")
```

```
Unique values in Table Code: 1
Unique values in State Code: 1
Unique values in District Code: 33
Unique values in Area Name: 33
Unique values in Total/ Rural/ Urban: 3
Unique values in Age group: 14
```

In [ ]:
```
# finding correlation
correlation_matrix = df.corr()
print(correlation_matrix)
```

	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	Worked for less than 3 months - Females	Industrial Category - A - Cultivators - Persons	Industrial Category - A - Cultivators - Males
Worked for 3 months or more but less than 6 mon...	1.000000	0.998829	0.998825	0.999108	0.994988	0.997591	0.974229	0.974465
Worked for 3 months or more but less than 6 mon...	0.998829	1.000000	0.995311	0.998599	0.998280	0.993884	0.963718	0.964569
Worked for 3 months or more but less than 6 mon...	0.998825	0.995311	1.000000	0.997273	0.989355	0.998962	0.982470	0.982091
Worked for less than 3 months - Persons	0.999108	0.998599	0.997273	1.000000	0.996781	0.997719	0.972156	
Worked for less than 3 months - Males	0.994988	0.998280	0.989355	0.996781	1.000000	0.989097	0.952209	
...	...	...	...	...	...	...	...	
Industrial Category - R to U - HHI - Males	0.990432	0.995125	0.983406	0.991516	0.997250	0.981738	0.942469	
Industrial Category - R to U - HHI - Females	0.980585	0.987377	0.971479	0.982091	0.991624	0.969162	0.916917	
Industrial Category - R to U - Non HHI - Persons	0.894684	0.913023	0.874213	0.894641	0.924417	0.865105	0.781018	
Industrial Category - R to U - Non HHI - Males	0.902864	0.919946	0.883634	0.902575	0.930383	0.874656	0.797561	
Industrial Category - R to U - Non HHI - Females	0.884780	0.904020	0.863430	0.884929	0.916108	0.854260	0.765093	

```
Worked for less than 3 months - Persons                                            0.973186
Worked for less than 3 months - Males                                              0.953968
...                                                                                     ...
Industrial Category - R to U - HHI - Males                                         0.944032
Industrial Category - R to U - HHI - Females                                       0.918081
Industrial Category - R to U - Non HHI - Persons                                   0.783215
Industrial Category - R to U - Non HHI - Males                                     0.799391
Industrial Category - R to U - Non HHI - Females                                   0.767566

                                                    Industrial Category - A - Cultivators - Females  \
Worked for 3 months or more but less than 6 mon...                                    0.972546
Worked for 3 months or more but less than 6 mon...                                    0.961274
Worked for 3 months or more but less than 6 mon...                                    0.981553
Worked for less than 3 months - Persons                                               0.969472
Worked for less than 3 months - Males                                                 0.948633
...                                                                                        ...
Industrial Category - R to U - HHI - Males                                            0.939155
Industrial Category - R to U - HHI - Females                                          0.914142
Industrial Category - R to U - Non HHI - Persons                                      0.777132
Industrial Category - R to U - Non HHI - Males                                        0.794115
Industrial Category - R to U - Non HHI - Females                                      0.760882

                                                    Industrial Category - A - Agricultural labourers - Persons  \
Worked for 3 months or more but less than 6 mon...                                       0.976938
Worked for 3 months or more but less than 6 mon...                                       0.966549
Worked for 3 months or more but less than 6 mon...                                       0.985051
Worked for less than 3 months - Persons                                                  0.975133
Worked for less than 3 months - Males                                                    0.955123
...                                                                                           ...
Industrial Category - R to U - HHI - Males                                               0.944333
Industrial Category - R to U - HHI - Females                                             0.920040
Industrial Category - R to U - Non HHI - Persons                                         0.782905
Industrial Category - R to U - Non HHI - Males                                           0.798867
Industrial Category - R to U - Non HHI - Females                                         0.767424

                                                    ...  \
Worked for 3 months or more but less than 6 mon...  ...
Worked for 3 months or more but less than 6 mon...  ...
Worked for 3 months or more but less than 6 mon...  ...
Worked for less than 3 months - Persons             ...
Worked for less than 3 months - Males               ...
...                                                 ...
Industrial Category - R to U - HHI - Males          ...
Industrial Category - R to U - HHI - Females        ...
Industrial Category - R to U - Non HHI - Persons    ...
Industrial Category - R to U - Non HHI - Males      ...
Industrial Category - R to U - Non HHI - Females    ...

                                                    Industrial Category - N to O - Females  \
Worked for 3 months or more but less than 6 mon...                                0.872107
Worked for 3 months or more but less than 6 mon...                                0.890596
Worked for 3 months or more but less than 6 mon...                                0.851539
Worked for less than 3 months - Persons                                           0.872193
Worked for less than 3 months - Males                                             0.901865
...                                                                                    ...
Industrial Category - R to U - HHI - Males                                        0.908918
Industrial Category - R to U - HHI - Females                                      0.937359
Industrial Category - R to U - Non HHI - Persons                                  0.974178
Industrial Category - R to U - Non HHI - Males                                    0.957497
Industrial Category - R to U - Non HHI - Females                                  0.983205

                                                    Industrial Category - P to Q - Persons  \
Worked for 3 months or more but less than 6 mon...                                0.921899
Worked for 3 months or more but less than 6 mon...                                0.937061
Worked for 3 months or more but less than 6 mon...                                0.904547
Worked for less than 3 months - Persons                                           0.922799
Worked for less than 3 months - Males                                             0.946852
...                                                                                    ...
Industrial Category - R to U - HHI - Males                                        0.950798
Industrial Category - R to U - HHI - Females                                      0.972449
Industrial Category - R to U - Non HHI - Persons                                  0.977079
Industrial Category - R to U - Non HHI - Males                                    0.969548
Industrial Category - R to U - Non HHI - Females                                  0.979011

                                                    Industrial Category - P to Q - Males  \
Worked for 3 months or more but less than 6 mon...                              0.934037
Worked for 3 months or more but less than 6 mon...                              0.947751
Worked for 3 months or more but less than 6 mon...                              0.918106
Worked for less than 3 months - Persons                                         0.934927
Worked for less than 3 months - Males                                           0.956228
...                                                                                  ...
Industrial Category - R to U - HHI - Males                                      0.960045
Industrial Category - R to U - HHI - Females                                    0.978942
Industrial Category - R to U - Non HHI - Persons                                0.973794
Industrial Category - R to U - Non HHI - Males                                  0.966616
Industrial Category - R to U - Non HHI - Females                                0.975466

                                                    Industrial Category - P to Q - Females  \
Worked for 3 months or more but less than 6 mon...                                0.914128
Worked for 3 months or more but less than 6 mon...                                0.929994
Worked for 3 months or more but less than 6 mon...                                0.896089
Worked for less than 3 months - Persons                                           0.915031
Worked for less than 3 months - Males                                             0.940432
...                                                                                    ...
Industrial Category - R to U - HHI - Males                                        0.944437
```

```
Industrial Category - R to U - HHI - Females                                0.967442
Industrial Category - R to U - Non HHI - Persons                            0.977007
Industrial Category - R to U - Non HHI - Males                              0.969311
Industrial Category - R to U - Non HHI - Females                            0.979068

                                                    Industrial Category - R to U - HHI - Persons  \
Worked for 3 months or more but less than 6 mon...                                       0.984285
Worked for 3 months or more but less than 6 mon...                                       0.990587
Worked for 3 months or more but less than 6 mon...                                       0.975662
Worked for less than 3 months - Persons                                                  0.985693
Worked for less than 3 months - Males                                                    0.994335
...                                                                                           ...
Industrial Category - R to U - HHI - Males                                               0.995568
Industrial Category - R to U - HHI - Females                                             0.999570
Industrial Category - R to U - Non HHI - Persons                                         0.947750
Industrial Category - R to U - Non HHI - Males                                           0.948669
Industrial Category - R to U - Non HHI - Females                                         0.943257

                                                    Industrial Category - R to U - HHI - Males  \
Worked for 3 months or more but less than 6 mon...                                     0.990432
Worked for 3 months or more but less than 6 mon...                                     0.995125
Worked for 3 months or more but less than 6 mon...                                     0.983406
Worked for less than 3 months - Persons                                                0.991516
Worked for less than 3 months - Males                                                  0.997250
...                                                                                         ...
Industrial Category - R to U - HHI - Males                                             1.000000
Industrial Category - R to U - HHI - Females                                           0.992382
Industrial Category - R to U - Non HHI - Persons                                       0.937578
Industrial Category - R to U - Non HHI - Males                                         0.943996
Industrial Category - R to U - Non HHI - Females                                       0.928868

                                                    Industrial Category - R to U - HHI - Females  \
Worked for 3 months or more but less than 6 mon...                                       0.980585
Worked for 3 months or more but less than 6 mon...                                       0.987377
Worked for 3 months or more but less than 6 mon...                                       0.971479
Worked for less than 3 months - Persons                                                  0.982091
Worked for less than 3 months - Males                                                    0.991624
...                                                                                           ...
Industrial Category - R to U - HHI - Males                                               0.992382
Industrial Category - R to U - HHI - Females                                             1.000000
Industrial Category - R to U - Non HHI - Persons                                         0.949204
Industrial Category - R to U - Non HHI - Males                                           0.948407
Industrial Category - R to U - Non HHI - Females                                         0.946034

                                                    Industrial Category - R to U - Non HHI - Persons  \
Worked for 3 months or more but less than 6 mon...                                         0.894684
Worked for 3 months or more but less than 6 mon...                                         0.913023
Worked for 3 months or more but less than 6 mon...                                         0.874213
Worked for less than 3 months - Persons                                                    0.894641
Worked for less than 3 months - Males                                                      0.924417
...                                                                                             ...
Industrial Category - R to U - HHI - Males                                                 0.937578
Industrial Category - R to U - HHI - Females                                               0.949204
Industrial Category - R to U - Non HHI - Persons                                           1.000000
Industrial Category - R to U - Non HHI - Males                                             0.997095
Industrial Category - R to U - Non HHI - Females                                           0.998259

                                                    Industrial Category - R to U - Non HHI - Males  \
Worked for 3 months or more but less than 6 mon...                                       0.902864
Worked for 3 months or more but less than 6 mon...                                       0.919946
Worked for 3 months or more but less than 6 mon...                                       0.883634
Worked for less than 3 months - Persons                                                  0.902575
Worked for less than 3 months - Males                                                    0.930383
...                                                                                           ...
Industrial Category - R to U - HHI - Males                                               0.943996
Industrial Category - R to U - HHI - Females                                             0.948407
Industrial Category - R to U - Non HHI - Persons                                         0.997095
Industrial Category - R to U - Non HHI - Males                                           1.000000
Industrial Category - R to U - Non HHI - Females                                         0.990867

                                                    Industrial Category - R to U - Non HHI - Females
Worked for 3 months or more but less than 6 mon...                                         0.884780
Worked for 3 months or more but less than 6 mon...                                         0.904020
Worked for 3 months or more but less than 6 mon...                                         0.863430
Worked for less than 3 months - Persons                                                    0.884929
Worked for less than 3 months - Males                                                      0.916108
...                                                                                             ...
Industrial Category - R to U - HHI - Males                                                 0.928868
Industrial Category - R to U - HHI - Females                                               0.946034
Industrial Category - R to U - Non HHI - Persons                                           0.998259
Industrial Category - R to U - Non HHI - Males                                             0.990867
Industrial Category - R to U - Non HHI - Females                                           1.000000

[63 rows x 63 columns]
<ipython-input-10-edeeab342ee8>:2: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future version, it will default to False. Select only valid columns or specify the value of numeric_only to silence this warning.
  correlation_matrix = df.corr()
```

Demographic analysis

In [ ]:
```
print(df.info())
```

```
print(df.describe())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1386 entries, 0 to 1385
Data columns (total 69 columns):
 #   Column                                                                                                   Non-N
ull Count  Dtype
---  ------                                                                                                   -----
---------  -----
 0   Table Code                                                                                               1386
non-null   object
 1   State Code                                                                                               1386
non-null   object
 2   District Code                                                                                            1386
non-null   object
 3   Area Name                                                                                                1386
non-null   object
 4   Total/ Rural/ Urban                                                                                      1386
non-null   object
 5   Age group                                                                                                1386
non-null   object
 6   Worked for 3 months or more but less than 6 months -  Persons                                            1386
non-null   int64
 7   Worked for 3 months or more but less than 6 months - Males                                               1386
non-null   int64
 8   Worked for 3 months or more but less than 6 months - Females                                             1386
non-null   int64
 9   Worked for less than 3 months - Persons                                                                  1386
non-null   int64
 10  Worked for less than 3 months - Males                                                                    1386
non-null   int64
 11  Worked for less than 3 months - Females                                                                  1386
non-null   int64
 12  Industrial Category - A - Cultivators - Persons                                                          1386
non-null   int64
 13  Industrial Category - A - Cultivators - Males                                                            1386
non-null   int64
 14  Industrial Category - A - Cultivators - Females                                                          1386
non-null   int64
 15  Industrial Category - A - Agricultural labourers - Persons                                               1386
non-null   int64
 16  Industrial Category - A - Agricultural labourers - Males                                                 1386
non-null   int64
 17  Industrial Category - A - Agricultural labourers - Females                                               1386
non-null   int64
 18  Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons  1386
non-null   int64
 19  Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males    1386
non-null   int64
 20  Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females  1386
non-null   int64
 21  Industrial Category - B - Persons                                                                        1386
non-null   int64
 22  Industrial Category - B - Males                                                                          1386
non-null   int64
 23  Industrial Category - B - Females                                                                        1386
non-null   int64
 24  Industrial Category - C - HHI - Persons                                                                  1386
non-null   int64
 25  Industrial Category - C - HHI - Males                                                                    1386
non-null   int64
 26  Industrial Category - C - HHI - Females                                                                  1386
non-null   int64
 27  Industrial Category - C - Non HHI - Persons                                                              1386
non-null   int64
 28  Industrial Category - C - Non HHI - Males                                                                1386
non-null   int64
 29  Industrial Category - C - Non HHI - Females                                                              1386
non-null   int64
 30  Industrial Category - D & E - Persons                                                                    1386
non-null   int64
 31  Industrial Category - D & E - Males                                                                      1386
non-null   int64
 32  Industrial Category - D & E - Females                                                                    1386
non-null   int64
 33  Industrial Category - F - Persons                                                                        1386
non-null   int64
 34  Industrial Category - F - Males                                                                          1386
non-null   int64
 35  Industrial Category - F - Females                                                                        1386
non-null   int64
 36  Industrial Category - G - HHI - Persons                                                                  1386
non-null   int64
 37  Industrial Category - G - HHI - Males                                                                    1386
non-null   int64
 38  Industrial Category - G - HHI - Females                                                                  1386
non-null   int64
 39  Industrial Category - G - Non HHI - Persons                                                              1386
non-null   int64
 40  Industrial Category - G - Non HHI - Males                                                                1386
non-null   int64
 41  Industrial Category - G - Non HHI - Females                                                              1386
non-null   int64
 42  Industrial Category - H - Persons                                                                        1386
non-null   int64
 43  Industrial Category - H - Males                                                                          1386
non-null   int64
```

```
 44  Industrial Category - H - Females                                  1386
non-null   int64
 45  Industrial Category - I - Persons                                  1386
non-null   int64
 46  Industrial Category - I - Males                                    1386
non-null   int64
 47  Industrial Category - I - Females                                  1386
non-null   int64
 48  Industrial Category - J - HHI - Persons                            1386
non-null   int64
 49  Industrial Category - J - HHI - Males                              1386
non-null   int64
 50  Industrial Category - J - HHI - Females                            1386
non-null   int64
 51  Industrial Category - J - Non HHI - Persons                        1386
non-null   int64
 52  Industrial Category - J - Non HHI - Males                          1386
non-null   int64
 53  Industrial Category - J - Non HHI - Females                        1386
non-null   int64
 54  Industrial Category - K to M - Persons                             1386
non-null   int64
 55  Industrial Category - K to M - Males                               1386
non-null   int64
 56  Industrial Category - K to M - Females                             1386
non-null   int64
 57  Industrial Category - N to O - Persons                             1386
non-null   int64
 58  Industrial Category - N to O - Males                               1386
non-null   int64
 59  Industrial Category - N to O - Females                             1386
non-null   int64
 60  Industrial Category - P to Q - Persons                             1386
non-null   int64
 61  Industrial Category - P to Q - Males                               1386
non-null   int64
 62  Industrial Category - P to Q - Females                             1386
non-null   int64
 63  Industrial Category - R to U - HHI - Persons                       1386
non-null   int64
 64  Industrial Category - R to U - HHI - Males                         1386
non-null   int64
 65  Industrial Category - R to U - HHI - Females                       1386
non-null   int64
 66  Industrial Category - R to U - Non HHI - Persons                   1386
non-null   int64
 67  Industrial Category - R to U - Non HHI - Males                     1386
non-null   int64
 68  Industrial Category - R to U - Non HHI - Females                   1386
non-null   int64
dtypes: int64(63), object(6)
memory usage: 747.3+ KB
None
       Worked for 3 months or more but less than 6 months -  Persons  \
count                                        1.386000e+03
mean                                         2.435142e+04
std                                          1.530754e+05
min                                          0.000000e+00
25%                                          8.372500e+02
50%                                          3.985000e+03
75%                                          1.251725e+04
max                                          4.218884e+06

       Worked for 3 months or more but less than 6 months - Males  \
count                                        1.386000e+03
mean                                         1.233409e+04
std                                          7.669251e+04
min                                          0.000000e+00
25%                                          4.637500e+02
50%                                          2.047500e+03
75%                                          6.273000e+03
max                                          2.136881e+06

       Worked for 3 months or more but less than 6 months - Females  \
count                                        1.386000e+03
mean                                         1.201733e+04
std                                          7.656262e+04
min                                          0.000000e+00
25%                                          3.792500e+02
50%                                          1.812000e+03
75%                                          6.255500e+03
max                                          2.082003e+06

       Worked for less than 3 months - Persons  \
count                              1386.000000
mean                               4178.303030
std                               26234.919027
min                                   0.000000
25%                                 123.000000
50%                                 650.500000
75%                                2071.750000
max                              723891.000000

       Worked for less than 3 months - Males  \
count                            1386.000000
```

```
       Worked for less than 3 months - Females  \
count                                1386.000000
mean                                 2231.590188
std                                 14281.201871
min                                     0.000000
25%                                    51.250000
50%                                   337.500000
75%                                  1091.250000
max                                386623.000000

       Industrial Category - A - Cultivators - Persons  \
count                                        1386.000000
mean                                         2268.871573
std                                         15445.653849
min                                             0.000000
25%                                            56.000000
50%                                           215.500000
75%                                          1068.000000
max                                        393082.000000

       Industrial Category - A - Cultivators - Males  \
count                                      1386.000000
mean                                       1271.653680
std                                        8627.700716
min                                           0.000000
25%                                          32.000000
50%                                         129.500000
75%                                         584.250000
max                                      220314.000000

       Industrial Category - A - Cultivators - Females  \
count                                      1386.000000
mean                                        997.217893
std                                        6827.658762
min                                           0.000000
25%                                          21.000000
50%                                          88.500000
75%                                         491.500000
max                                      172768.000000

       Industrial Category - A - Agricultural labourers - Persons  ...  \
count                                       1.386000e+03           ...
mean                                        1.369377e+04           ...
std                                         9.330282e+04           ...
min                                         0.000000e+00           ...
25%                                         2.135000e+02           ...
50%                                         1.282000e+03           ...
75%                                         6.713750e+03           ...
max                                         2.372446e+06           ...

       Industrial Category - N to O - Females  \
count                              1386.000000
mean                                 83.665224
std                                 543.170274
min                                   0.000000
25%                                   0.000000
50%                                   6.000000
75%                                  29.000000
max                                14495.000000

       Industrial Category - P to Q - Persons  \
count                               1386.000000
mean                                 339.324675
std                                 2114.109688
min                                    0.000000
25%                                    5.000000
50%                                   44.000000
75%                                  166.000000
max                                58788.000000

       Industrial Category - P to Q - Males  \
count                              1386.000000
mean                                114.816739
std                                 710.763665
min                                   0.000000
25%                                   0.000000
50%                                  18.000000
75%                                  60.000000
max                                19892.000000

       Industrial Category - P to Q - Females  \
count                               1386.000000
mean                                 224.507937
std                                 1405.839106
min                                    0.000000
25%                                    0.000000
50%                                   26.000000
```

```
75%                                 112.000000
max                               38896.000000

       Industrial Category - R to U - HHI - Persons  \
count                                   1386.000000
mean                                     517.766234
std                                     3177.844267
min                                        0.000000
25%                                       18.000000
50%                                       80.000000
75%                                      243.500000
max                                    89703.000000

       Industrial Category - R to U - HHI - Males  \
count                                  1386.000000
mean                                    123.324675
std                                     756.489766
min                                       0.000000
25%                                       6.000000
50%                                      21.000000
75%                                      62.000000
max                                   21366.000000

       Industrial Category - R to U - HHI - Females  \
count                                   1386.000000
mean                                     394.441558
std                                     2425.750623
min                                        0.000000
25%                                       11.000000
50%                                       57.500000
75%                                      187.000000
max                                    68337.000000

       Industrial Category - R to U - Non HHI - Persons  \
count                                        1386.000000
mean                                         3609.523810
std                                         22377.933258
min                                             0.000000
25%                                           208.500000
50%                                           593.000000
75%                                          1548.000000
max                                        625350.000000

       Industrial Category - R to U - Non HHI - Males  \
count                                       1386.000000
mean                                        1586.210678
std                                         9787.231574
min                                            0.000000
25%                                           96.000000
50%                                          260.000000
75%                                          695.750000
max                                       274811.000000

       Industrial Category - R to U - Non HHI - Females
count                                        1386.000000
mean                                         2023.313131
std                                         12641.139629
min                                             0.000000
25%                                           104.000000
50%                                           317.500000
75%                                           820.000000
max                                        350539.000000

[8 rows x 63 columns]
```

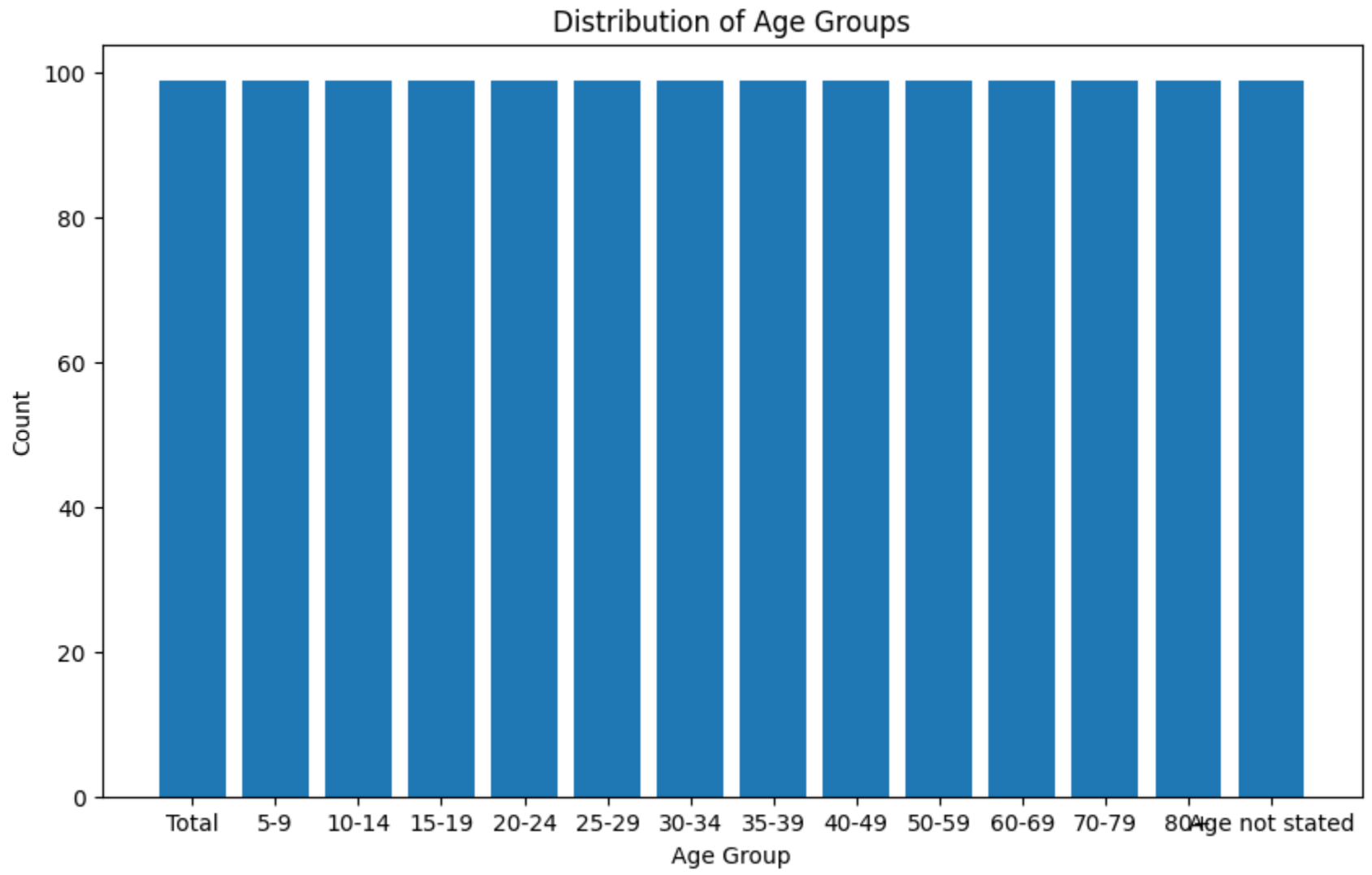
In [ ]:
```
df.columns
```

Out[ ]:
```
Index(['Table Code', 'State Code', 'District Code', 'Area Name',
       'Total/ Rural/ Urban', 'Age group',
       'Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females',
       'Industrial Category - A - Cultivators - Persons',
       'Industrial Category - A - Cultivators - Males',
       'Industrial Category - A - Cultivators - Females',
       'Industrial Category - A - Agricultural labourers - Persons',
       'Industrial Category - A - Agricultural labourers - Males',
       'Industrial Category - A - Agricultural labourers - Females',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
       'Industrial Category - B - Persons', 'Industrial Category - B - Males',
       'Industrial Category - B - Females',
       'Industrial Category - C - HHI - Persons',
       'Industrial Category - C - HHI - Males',
       'Industrial Category - C - HHI - Females',
       'Industrial Category - C - Non HHI - Persons',
       'Industrial Category - C - Non HHI - Males',
       'Industrial Category - C - Non HHI - Females',
       'Industrial Category - D & E - Persons',
       'Industrial Category - D & E - Males',
       'Industrial Category - D & E - Females',
       'Industrial Category - F - Persons', 'Industrial Category - F - Males',
       'Industrial Category - F - Females',
       'Industrial Category - G - HHI - Persons',
       'Industrial Category - G - HHI - Males',
       'Industrial Category - G - HHI - Females',
       'Industrial Category - G - Non HHI - Persons',
       'Industrial Category - G - Non HHI - Males',
       'Industrial Category - G - Non HHI - Females',
       'Industrial Category - H - Persons', 'Industrial Category - H - Males',
       'Industrial Category - H - Females',
       'Industrial Category - I - Persons', 'Industrial Category - I - Males',
       'Industrial Category - I - Females',
       'Industrial Category - J - HHI - Persons',
       'Industrial Category - J - HHI - Males',
       'Industrial Category - J - HHI - Females',
       'Industrial Category - J - Non HHI - Persons',
       'Industrial Category - J - Non HHI - Males',
       'Industrial Category - J - Non HHI - Females',
       'Industrial Category - K to M - Persons',
       'Industrial Category - K to M - Males',
       'Industrial Category - K to M - Females',
       'Industrial Category - N to O - Persons',
       'Industrial Category - N to O - Males',
       'Industrial Category - N to O - Females',
       'Industrial Category - P to Q - Persons',
       'Industrial Category - P to Q - Males',
       'Industrial Category - P to Q - Females',
       'Industrial Category - R to U - HHI - Persons',
       'Industrial Category - R to U - HHI - Males',
       'Industrial Category - R to U - HHI - Females',
       'Industrial Category - R to U - Non HHI - Persons',
       'Industrial Category - R to U - Non HHI - Males',
       'Industrial Category - R to U - Non HHI - Females'],
      dtype='object')
```

Distribution of Age Groups:

In [ ]:
```
import matplotlib.pyplot as plt

# Assuming 'Age group' is a column in your DataFrame
age_distribution = df['Age group'].value_counts()
plt.figure(figsize=(10, 6))
plt.bar(age_distribution.index, age_distribution.values)
plt.xlabel('Age Group')
plt.ylabel('Count')
plt.title('Distribution of Age Groups')
plt.show()
```



In [ ]:
```
age_stats = df.groupby('Age group')['Area Name'].describe()
print(age_stats)
```

```
               count unique                 top freq
Age group
10-14             99     33  State - TAMIL NADU    3
15-19             99     33  State - TAMIL NADU    3
20-24             99     33  State - TAMIL NADU    3
25-29             99     33  State - TAMIL NADU    3
30-34             99     33  State - TAMIL NADU    3
35-39             99     33  State - TAMIL NADU    3
40-49             99     33  State - TAMIL NADU    3
5-9               99     33  State - TAMIL NADU    3
50-59             99     33  State - TAMIL NADU    3
60-69             99     33  State - TAMIL NADU    3
70-79             99     33  State - TAMIL NADU    3
80+               99     33  State - TAMIL NADU    3
Age not stated    99     33  State - TAMIL NADU    3
Total             99     33  State - TAMIL NADU    3
```

District wise analyis

In [ ]:
```
grouped_data = df.groupby(['Area Name', 'Age group', 'Total/ Rural/ Urban'])['Industrial Category - A - Cultivators - P

# Create a separate plot for each district
districts = grouped_data['Area Name'].unique()
grouped_data.head(30)
```

Out[ ]:

	Area Name	Age group	Total/ Rural/ Urban	Industrial Category - A - Cultivators - Persons
0	District - Ariyalur	10-14	Rural	68
1	District - Ariyalur	10-14	Total	74
2	District - Ariyalur	10-14	Urban	6
3	District - Ariyalur	15-19	Rural	411
4	District - Ariyalur	15-19	Total	425
5	District - Ariyalur	15-19	Urban	14
6	District - Ariyalur	20-24	Rural	926
7	District - Ariyalur	20-24	Total	950
8	District - Ariyalur	20-24	Urban	24
9	District - Ariyalur	25-29	Rural	1358
10	District - Ariyalur	25-29	Total	1402
11	District - Ariyalur	25-29	Urban	44
12	District - Ariyalur	30-34	Rural	1308
13	District - Ariyalur	30-34	Total	1346
14	District - Ariyalur	30-34	Urban	38
15	District - Ariyalur	35-39	Rural	1412
16	District - Ariyalur	35-39	Total	1470
17	District - Ariyalur	35-39	Urban	58
18	District - Ariyalur	40-49	Rural	2617
19	District - Ariyalur	40-49	Total	2756
20	District - Ariyalur	40-49	Urban	139
21	District - Ariyalur	5-9	Rural	33
22	District - Ariyalur	5-9	Total	34
23	District - Ariyalur	5-9	Urban	1
24	District - Ariyalur	50-59	Rural	1867
25	District - Ariyalur	50-59	Total	1969
26	District - Ariyalur	50-59	Urban	102
27	District - Ariyalur	60-69	Rural	1303
28	District - Ariyalur	60-69	Total	1365
29	District - Ariyalur	60-69	Urban	62

Visualization District wise

In [ ]:
```
import matplotlib.pyplot as plt


# 'Area Name' represents the districts, 'Age group' represents the age groups, 'Total/ Rural/ Urban' represents rural or
# 'Industrial Category - A - Cultivators - Persons' represents the number of workers taken as sample'

# Grouping by 'Area Name', 'Age group', 'Total/ Rural/ Urban' and summing up the number of workers
grouped_data = df.groupby(['Area Name', 'Age group', 'Total/ Rural/ Urban'])['Industrial Category - A - Cultivators - P

# Create a separate plot for each district
districts = grouped_data['Area Name'].unique()

for district in districts:
    district_data = grouped_data[grouped_data['Area Name'] == district]
    plt.figure(figsize=(20, 10))
    bars = plt.bar(district_data['Age group'] + ' - ' + district_data['Total/ Rural/ Urban'], district_data['Industrial

    # Adding numbers on top of the bars
    for bar in bars:
        yval = bar.get_height()
        plt.text(bar.get_x() + bar.get_width()/2, yval, round(yval), va='bottom', ha='center', fontsize=8, color='black

    plt.title(f'Distribution of workers in {district}')
    plt.xlabel('Age Group and Area Type')
    plt.ylabel('Number of Workers')
    plt.xticks(rotation=70)
    plt.show()
```

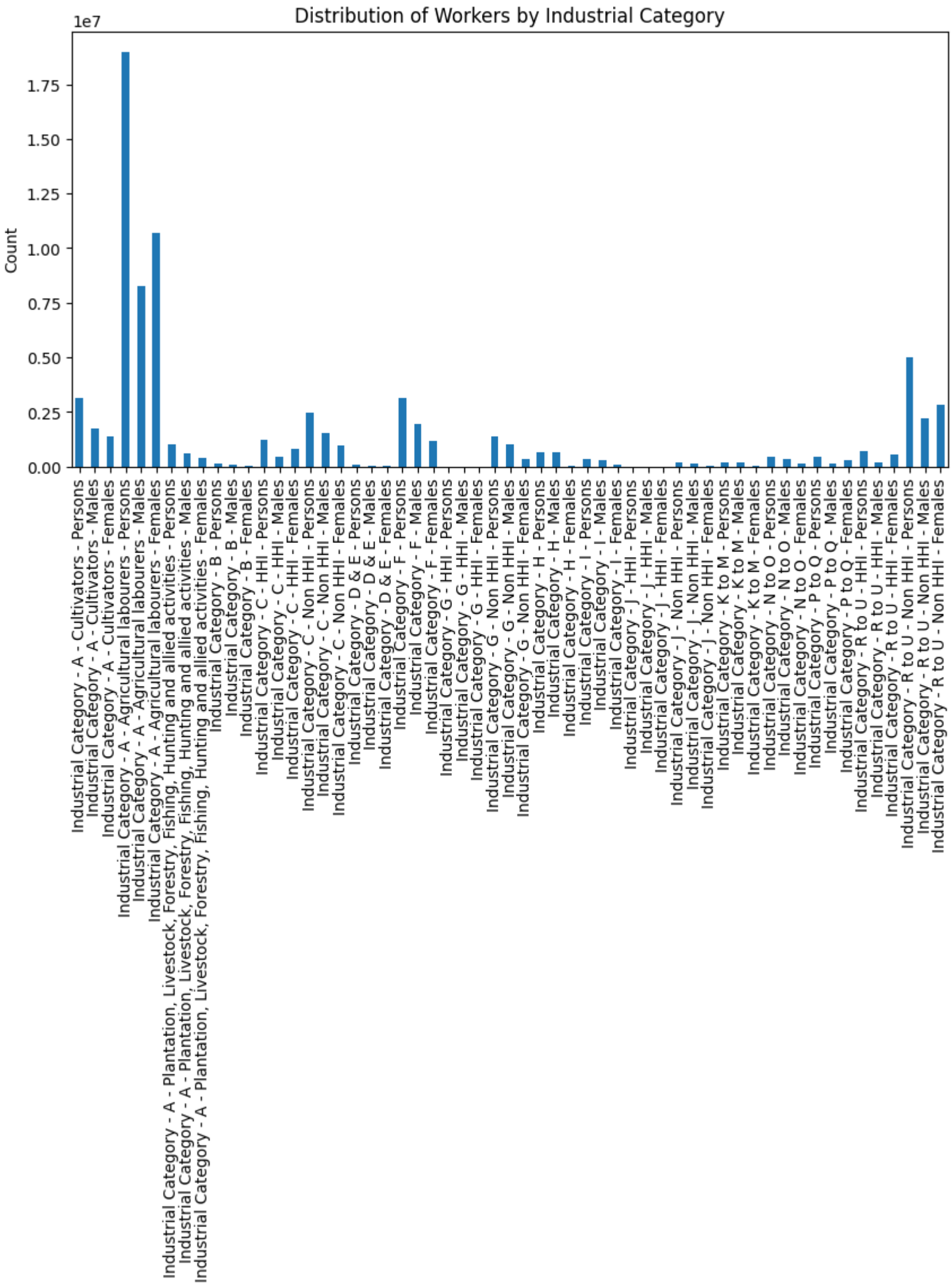
In [ ]:
```
import matplotlib.pyplot as plt

# Combine all the relevant columns for industrial categories
industrial_columns = ['Industrial Category - A - Cultivators - Persons',
       'Industrial Category - A - Cultivators - Males',
       'Industrial Category - A - Cultivators - Females',
       'Industrial Category - A - Agricultural labourers - Persons',
```

```
        'Industrial Category - A - Agricultural labourers - Males',
        'Industrial Category - A - Agricultural labourers - Females',
        'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
        'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
        'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
        'Industrial Category - B - Persons', 'Industrial Category - B - Males',
        'Industrial Category - B - Females',
        'Industrial Category - C - HHI - Persons',
        'Industrial Category - C - HHI - Males',
        'Industrial Category - C - HHI - Females',
        'Industrial Category - C - Non HHI - Persons',
        'Industrial Category - C - Non HHI - Males',
        'Industrial Category - C - Non HHI - Females',
        'Industrial Category - D & E - Persons',
        'Industrial Category - D & E - Males',
        'Industrial Category - D & E - Females',
        'Industrial Category - F - Persons', 'Industrial Category - F - Males',
        'Industrial Category - F - Females',
        'Industrial Category - G - HHI - Persons',
        'Industrial Category - G - HHI - Males',
        'Industrial Category - G - HHI - Females',
        'Industrial Category - G - Non HHI - Persons',
        'Industrial Category - G - Non HHI - Males',
        'Industrial Category - G - Non HHI - Females',
        'Industrial Category - H - Persons', 'Industrial Category - H - Males',
        'Industrial Category - H - Females',
        'Industrial Category - I - Persons', 'Industrial Category - I - Males',
        'Industrial Category - I - Females',
        'Industrial Category - J - HHI - Persons',
        'Industrial Category - J - HHI - Males',
        'Industrial Category - J - HHI - Females',
        'Industrial Category - J - Non HHI - Persons',
        'Industrial Category - J - Non HHI - Males',
        'Industrial Category - J - Non HHI - Females',
        'Industrial Category - K to M - Persons',
        'Industrial Category - K to M - Males',
        'Industrial Category - K to M - Females',
        'Industrial Category - N to O - Persons',
        'Industrial Category - N to O - Males',
        'Industrial Category - N to O - Females',
        'Industrial Category - P to Q - Persons',
        'Industrial Category - P to Q - Males',
        'Industrial Category - P to Q - Females',
        'Industrial Category - R to U - HHI - Persons',
        'Industrial Category - R to U - HHI - Males',
        'Industrial Category - R to U - HHI - Females',
        'Industrial Category - R to U - Non HHI - Persons',
        'Industrial Category - R to U - Non HHI - Males',
        'Industrial Category - R to U - Non HHI - Females']

# Sum the counts across all the industrial category columns
industrial_counts = df[industrial_columns].sum()

# Create a bar chart to visualize the distribution of workers in each industrial category
plt.figure(figsize=(10, 5))
industrial_counts.plot(kind='bar', title='Distribution of Workers by Industrial Category')
plt.xlabel('Industrial Category')
plt.ylabel('Count')
plt.show()
```



In [ ]:
```python
#  CLUSTERING OF AGE GROUPS AND INDUSTRIAL GROUPS INCLUDING MALES AND FEMALES CATEGORIES

import pandas as pd
from sklearn.preprocessing import StandardScaler
from sklearn.cluster import KMeans
import matplotlib.pyplot as plt

# Load your dataset into a DataFrame (replace 'your_dataset_path' with the actual path)
df = pd.read_csv('marginal_workers_tamil_nadu.csv.csv')

# Data Cleaning and Exploration
numeric_columns = ['Industrial Category - A - Cultivators - Persons', 'Industrial Category - A - Cultivators - Males',
    'Industrial Category - A - Cultivators - Females', 'Industrial Category - B - Persons',
    'Industrial Category - B - Males', 'Industrial Category - B - Females',
    'Industrial Category - C - HHI - Males',
    'Industrial Category - C - HHI - Females',
    'Industrial Category - D & E - Males',
    'Industrial Category - D & E - Females',
    'Industrial Category - F - Persons',
    'Industrial Category - F - Males',
    'Industrial Category - F - Females',
    'Industrial Category - G - HHI - Persons',
```

```
    'Industrial Category - G - HHI - Males',
    'Industrial Category - G - HHI - Females',
    'Industrial Category - G - Non HHI - Persons',
    'Industrial Category - G - Non HHI - Males',
    'Industrial Category - G - Non HHI - Females',
    'Industrial Category - H - Persons',
    'Industrial Category - H - Males',
    'Industrial Category - H - Females',
    'Industrial Category - I - Persons',
    'Industrial Category - I - Males',
    'Industrial Category - I - Females',
    'Industrial Category - J - HHI - Persons',
    'Industrial Category - J - HHI - Males',
    'Industrial Category - J - HHI - Females',
    'Industrial Category - J - Non HHI - Persons',
    'Industrial Category - J - Non HHI - Males',
    'Industrial Category - J - Non HHI - Females',
    'Industrial Category - K to M - Persons',
    'Industrial Category - K to M - Males',
    'Industrial Category - K to M - Females',
    'Industrial Category - N to O - Persons',
    'Industrial Category - N to O - Males',
    'Industrial Category - N to O - Females',
    'Industrial Category - P to Q - Persons',
    'Industrial Category - P to Q - Males',
    'Industrial Category - P to Q - Females',
    'Industrial Category - R to U - HHI - Persons',
    'Industrial Category - R to U - HHI - Males',
    'Industrial Category - R to U - HHI - Females',
    'Industrial Category - R to U - Non HHI - Persons',
    'Industrial Category - R to U - Non HHI - Males',
    'Industrial Category - R to U - Non HHI - Females'
    # List of your numeric column names

]

# Convert columns to numeric, handling errors as NaN
df[numeric_columns] = df[numeric_columns].apply(pd.to_numeric, errors='coerce')

# Drop rows with NaN values in numeric columns
df.dropna(subset=numeric_columns, inplace=True)

# Exclude rows where 'Age group' is "Total"
df = df[df['Age group'] != 'Total']

# Standardizing Data
scaler = StandardScaler()
features = numeric_columns[1:]  # Use all the industrial categories (starting from the 2nd column)

df[features] = scaler.fit_transform(df[features])

# Applying K-Means Algorithm
n_clusters = 3  # Assuming you've determined the optimal number of clusters
kmeans = KMeans(n_clusters=n_clusters, random_state=0)
df['Cluster'] = kmeans.fit_predict(df[features])

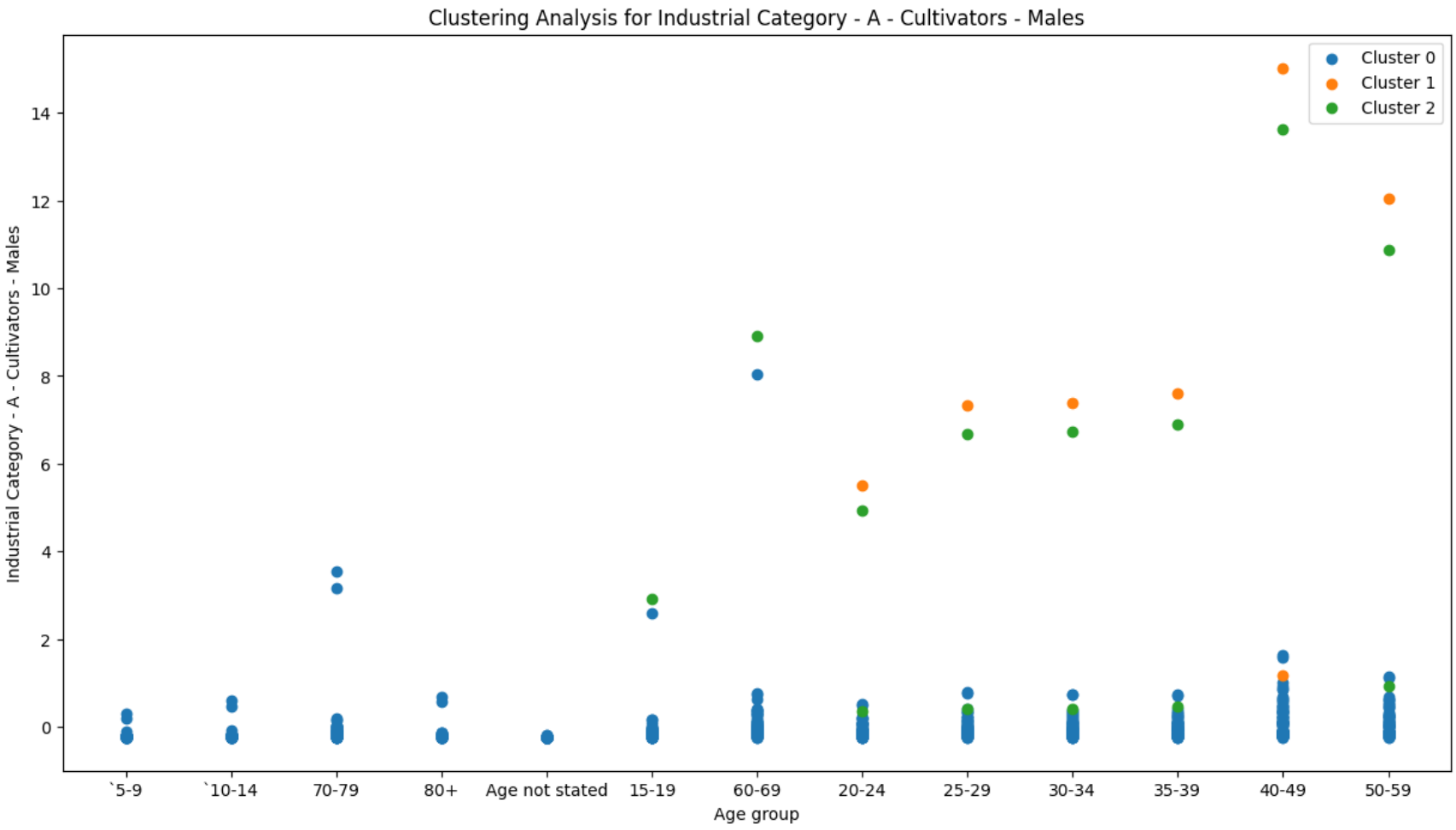
# Scatter Plots for All Industrial Categories
for feature in features:
    plt.figure(figsize=(15, 8))

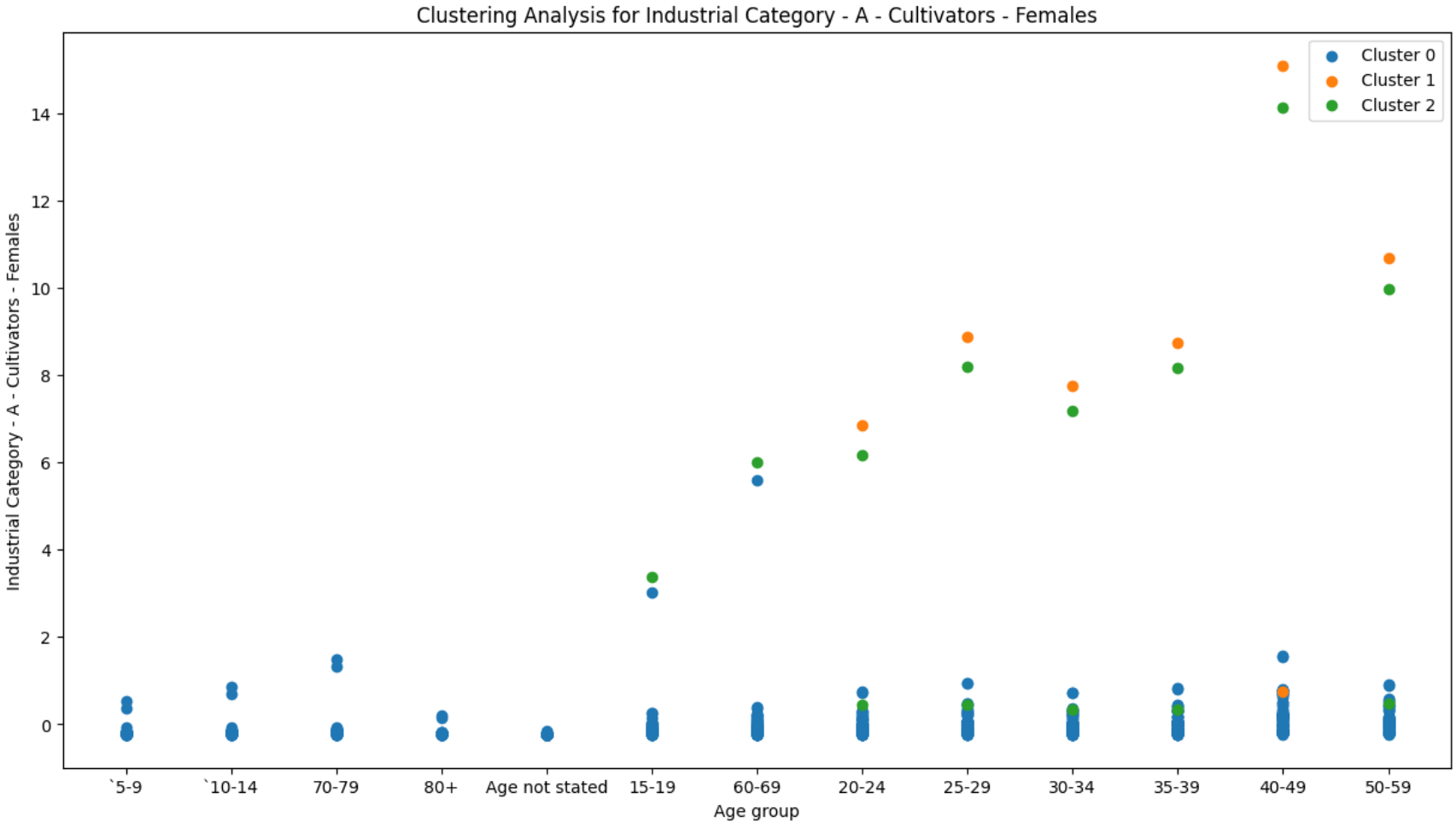
    for cluster in range(n_clusters):
        cluster_df = df[df['Cluster'] == cluster]
        plt.scatter(cluster_df['Age group'], cluster_df[feature], label=f'Cluster {cluster}')

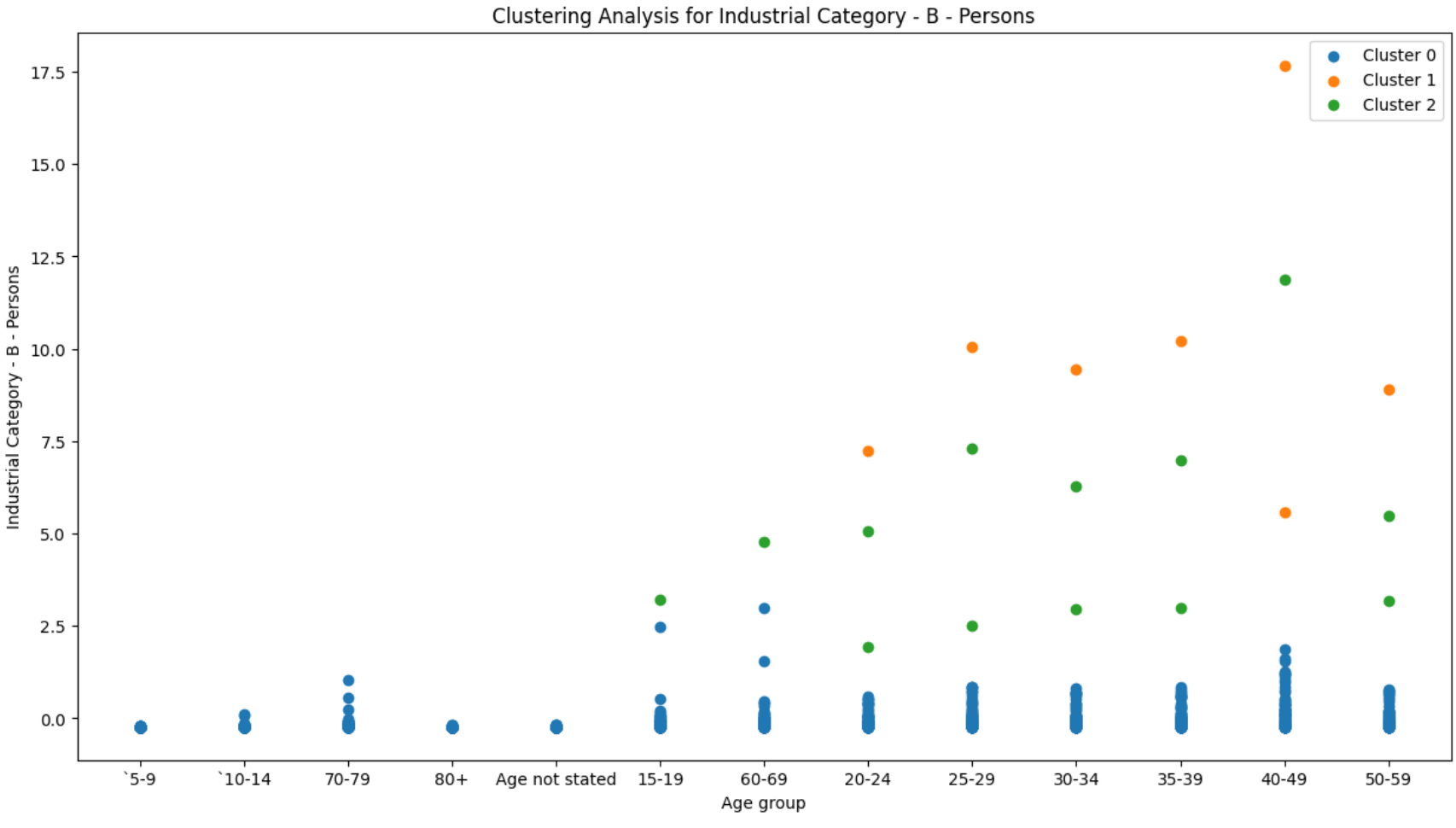
    plt.xlabel('Age group')
    plt.ylabel(feature)
    plt.title(f'Clustering Analysis for {feature}')
    plt.legend()
    plt.show()

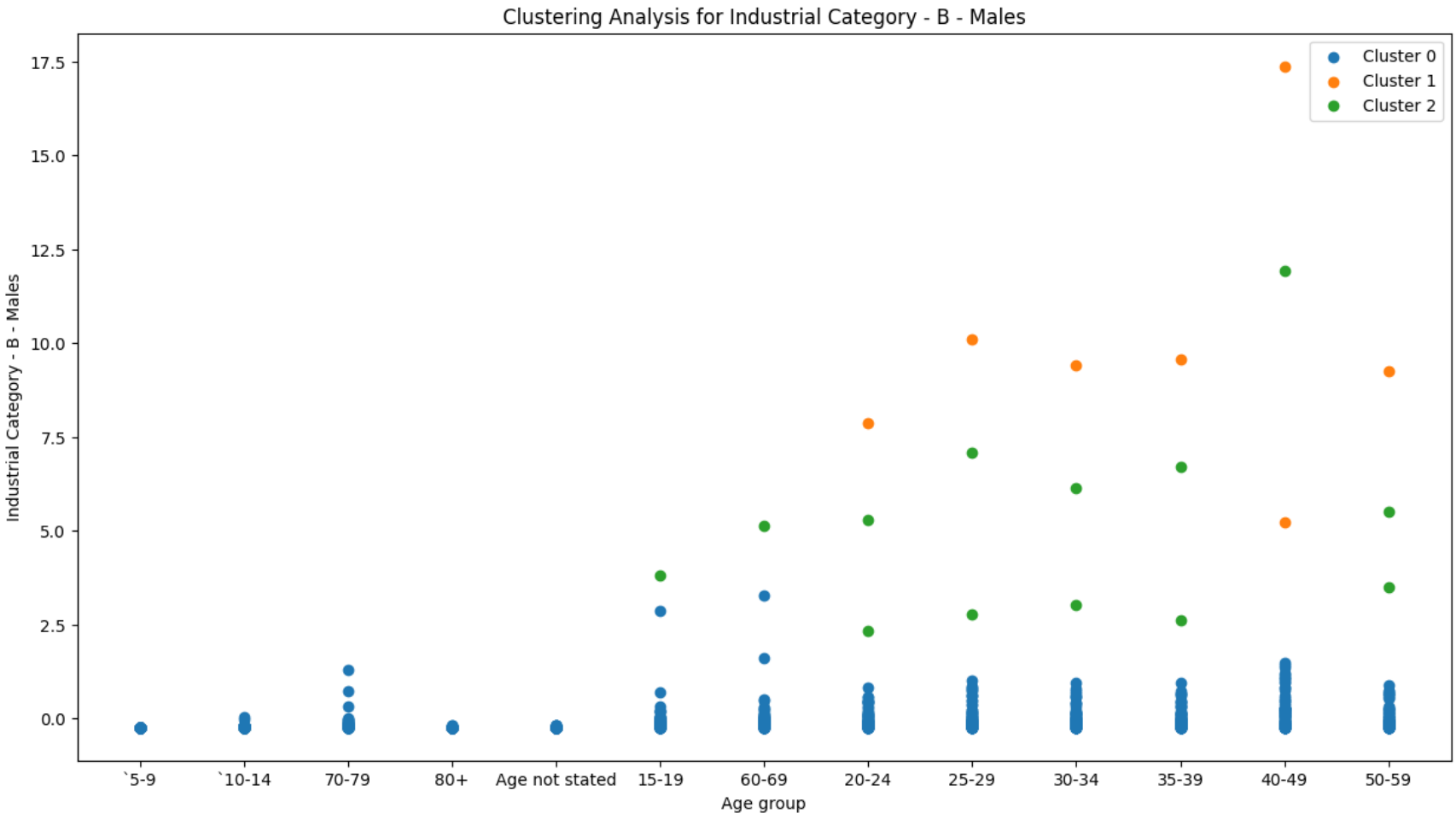
# Further steps for analysis and recommendations can be done here
```

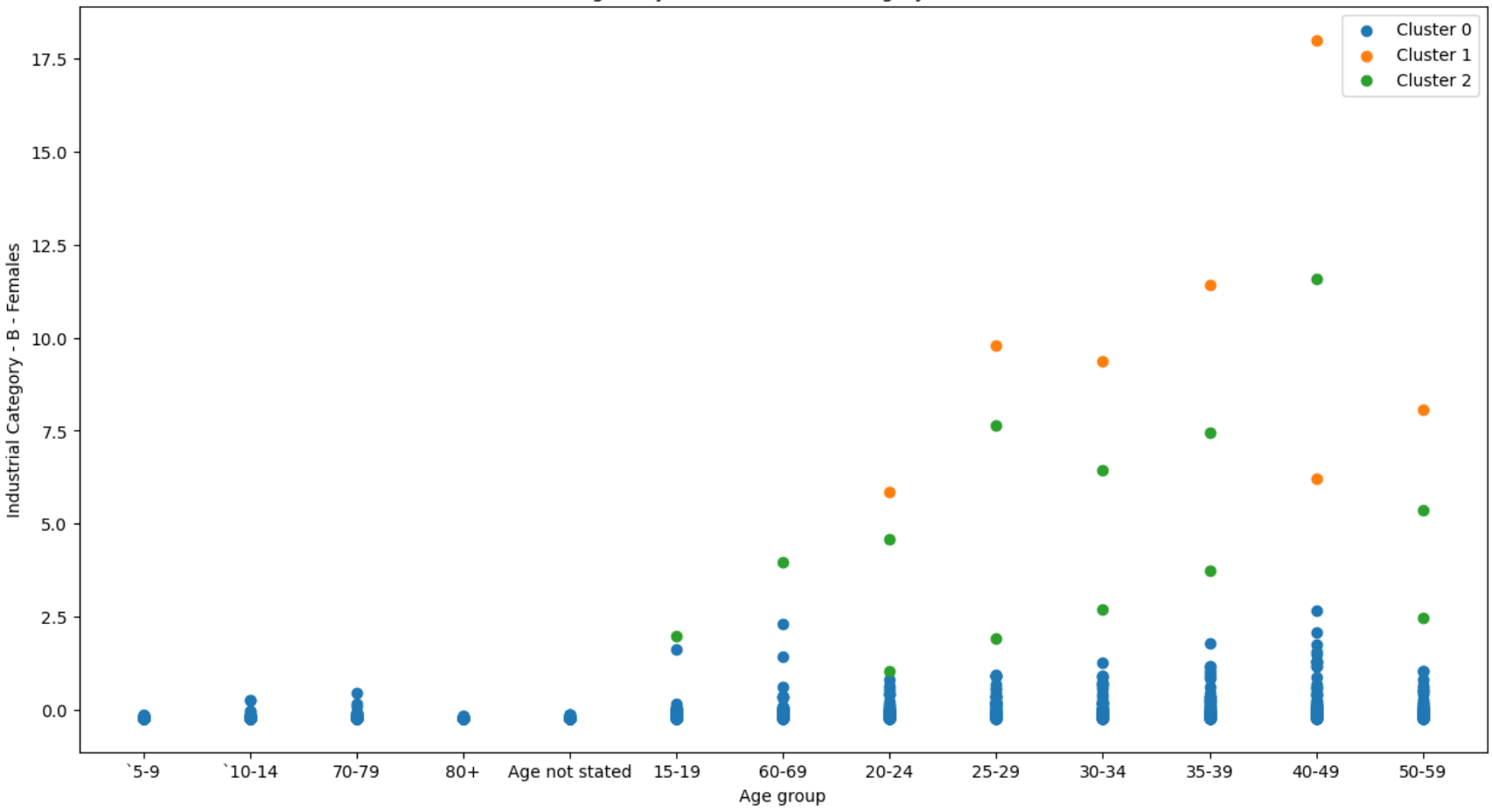
```
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/_kmeans.py:870: FutureWarning: The default value of `n_init` wi
ll change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly to suppress the warning
  warnings.warn(
```


Clustering Analysis for Industrial Category - A - Cultivators - Males
Cluster 0
Cluster 1
Cluster 2
Industrial Category - A - Cultivators - Males
0
2
4
6
8
10
12
14
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - A - Cultivators - Females
Cluster 0
Cluster 1
Cluster 2
Industrial Category - A - Cultivators - Females
0
2
4
6
8
10
12
14
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - B - Persons
Cluster 0
Cluster 1
Cluster 2
Industrial Category - B - Persons
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - B - Males
Cluster 0
Cluster 1
Cluster 2
Industrial Category - B - Males
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - B - Females
Cluster 0
Cluster 1
Cluster 2
Industrial Category - B - Females
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
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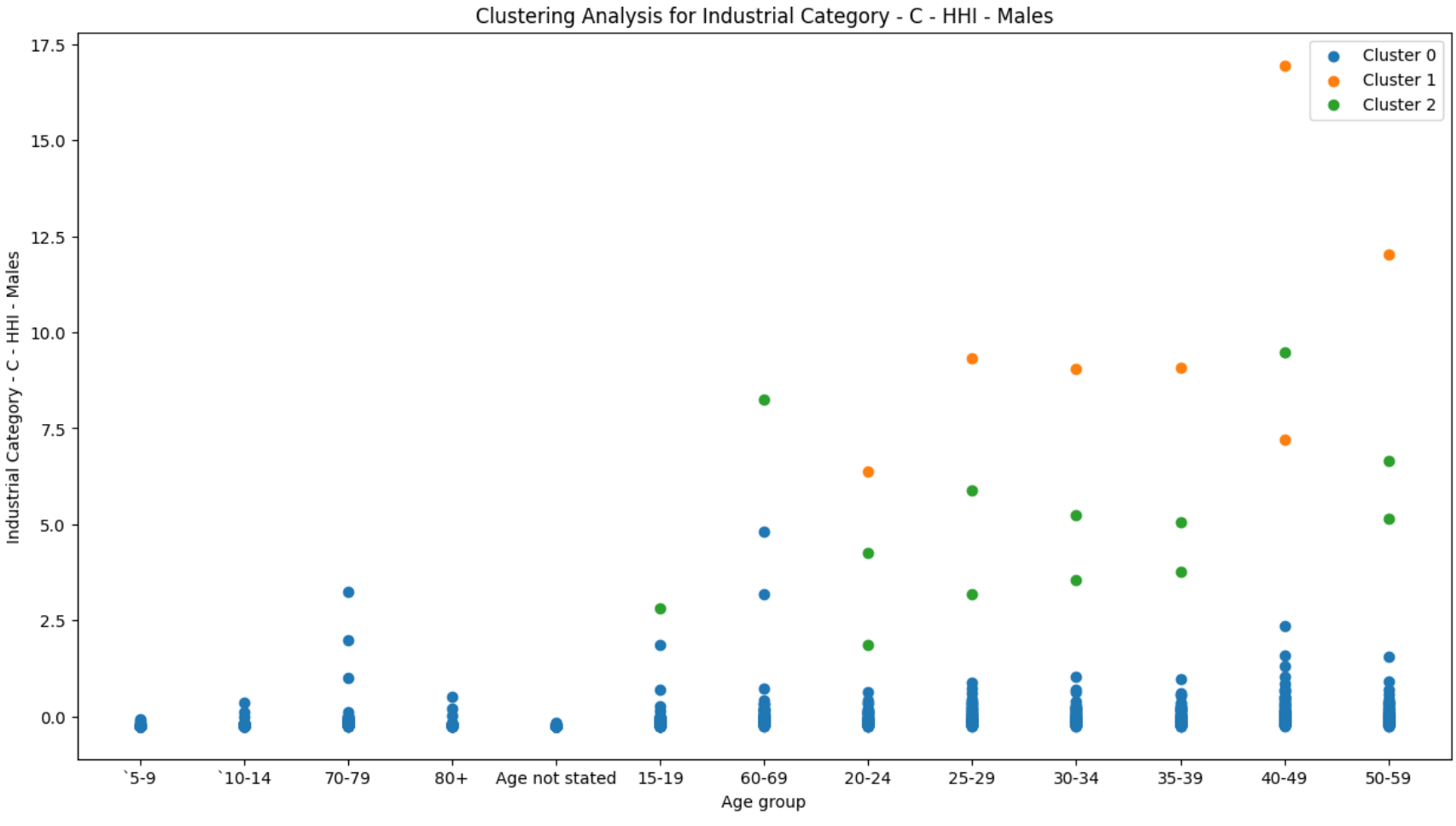
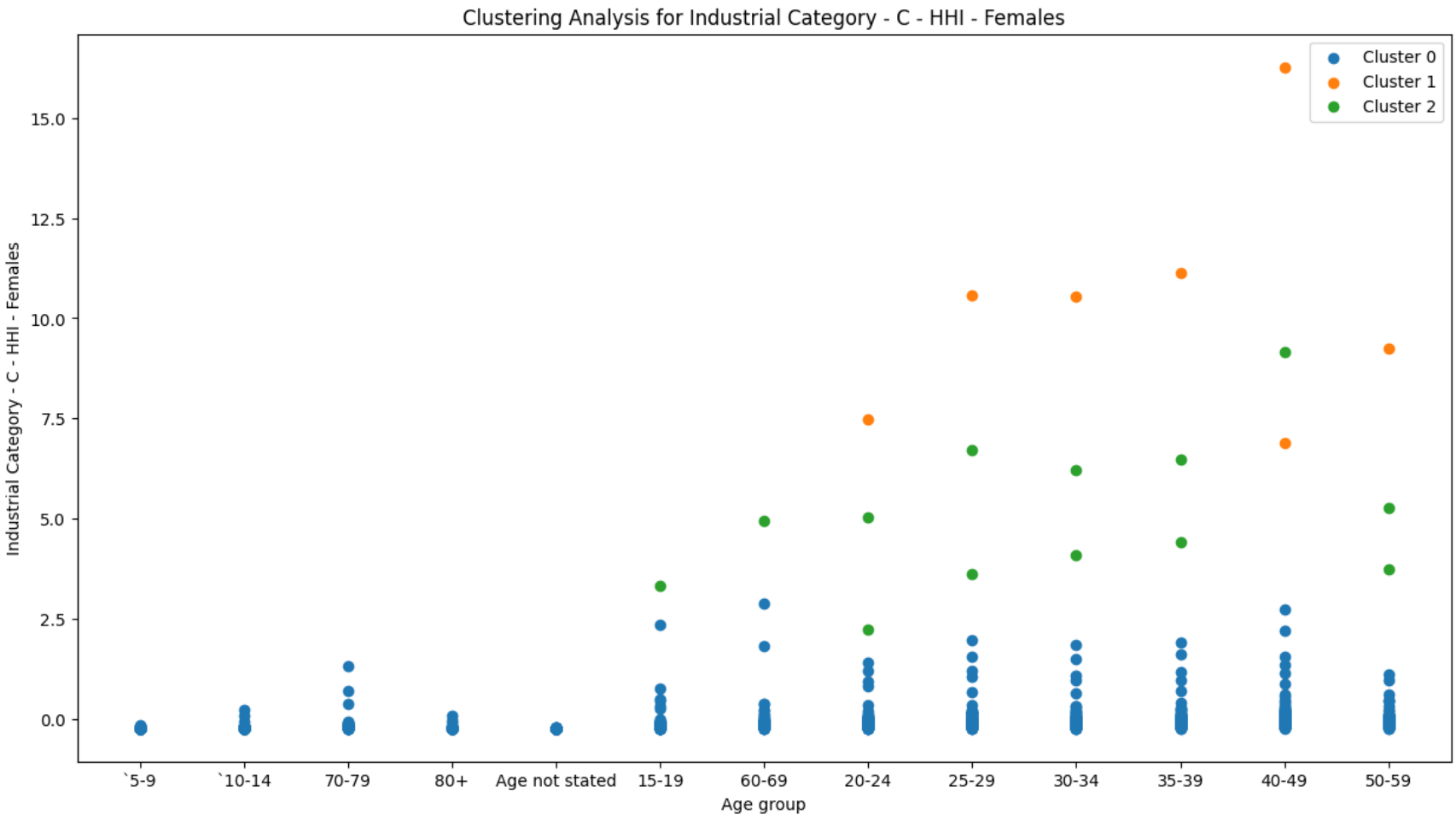
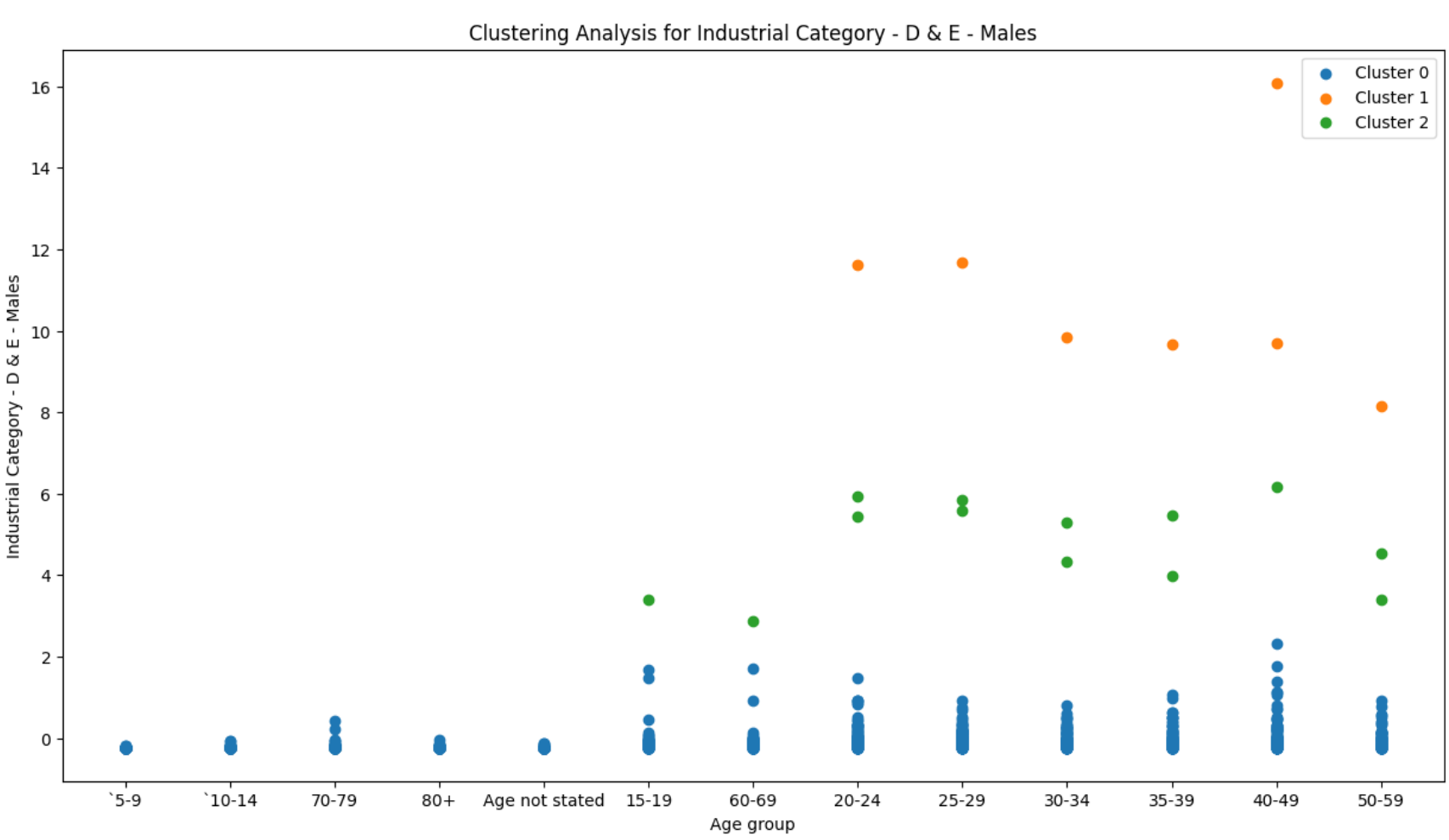
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - C - HHI - Males
Cluster 0
Cluster 1
Cluster 2
Industrial Category - C - HHI - Males
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - C - HHI - Females
Industrial Category - C - HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59


Clustering Analysis for Industrial Category - D & E - Males
Industrial Category - D & E - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
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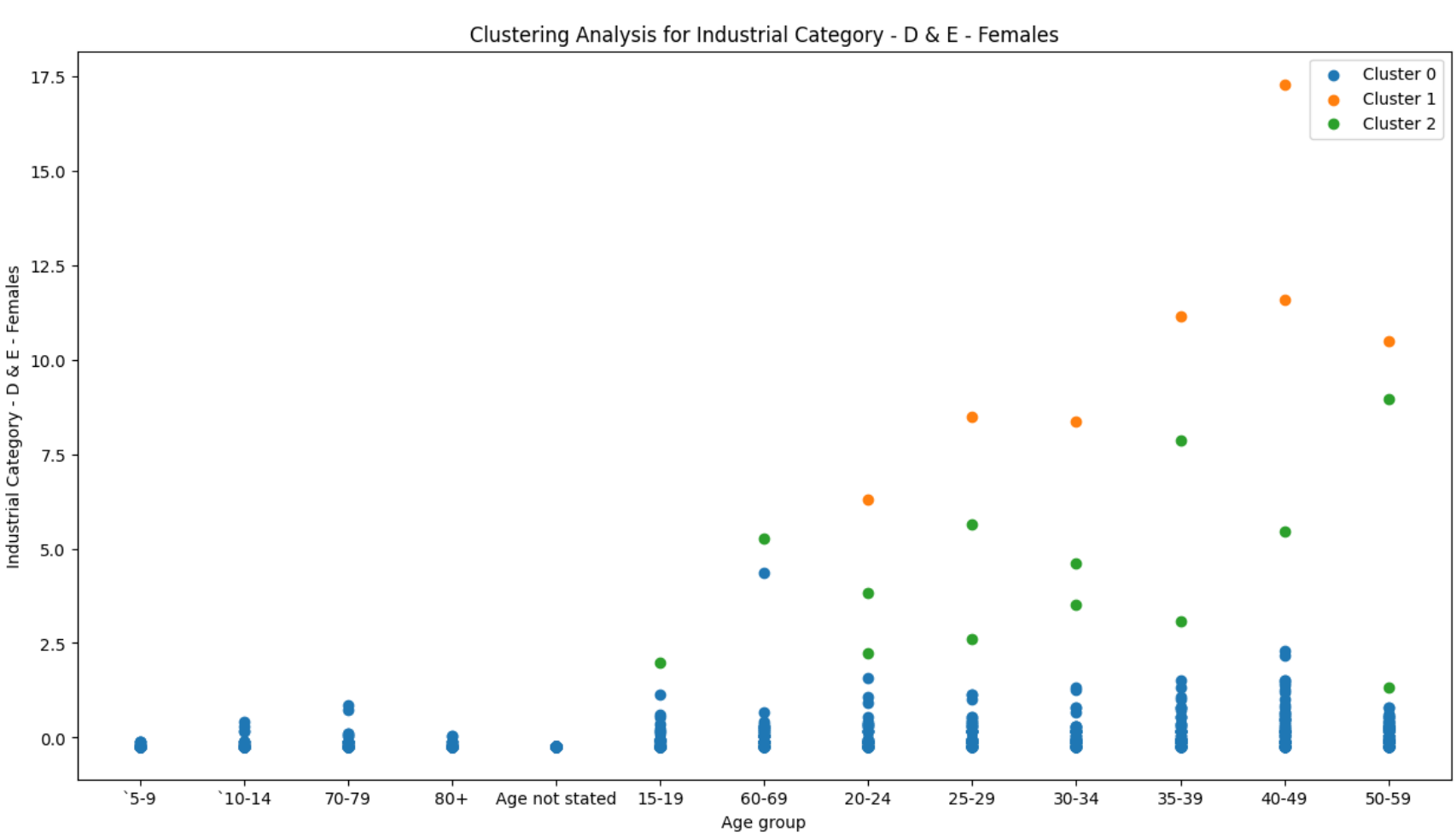
40-49
50-59


Clustering Analysis for Industrial Category - D & E - Females
Industrial Category - D & E - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
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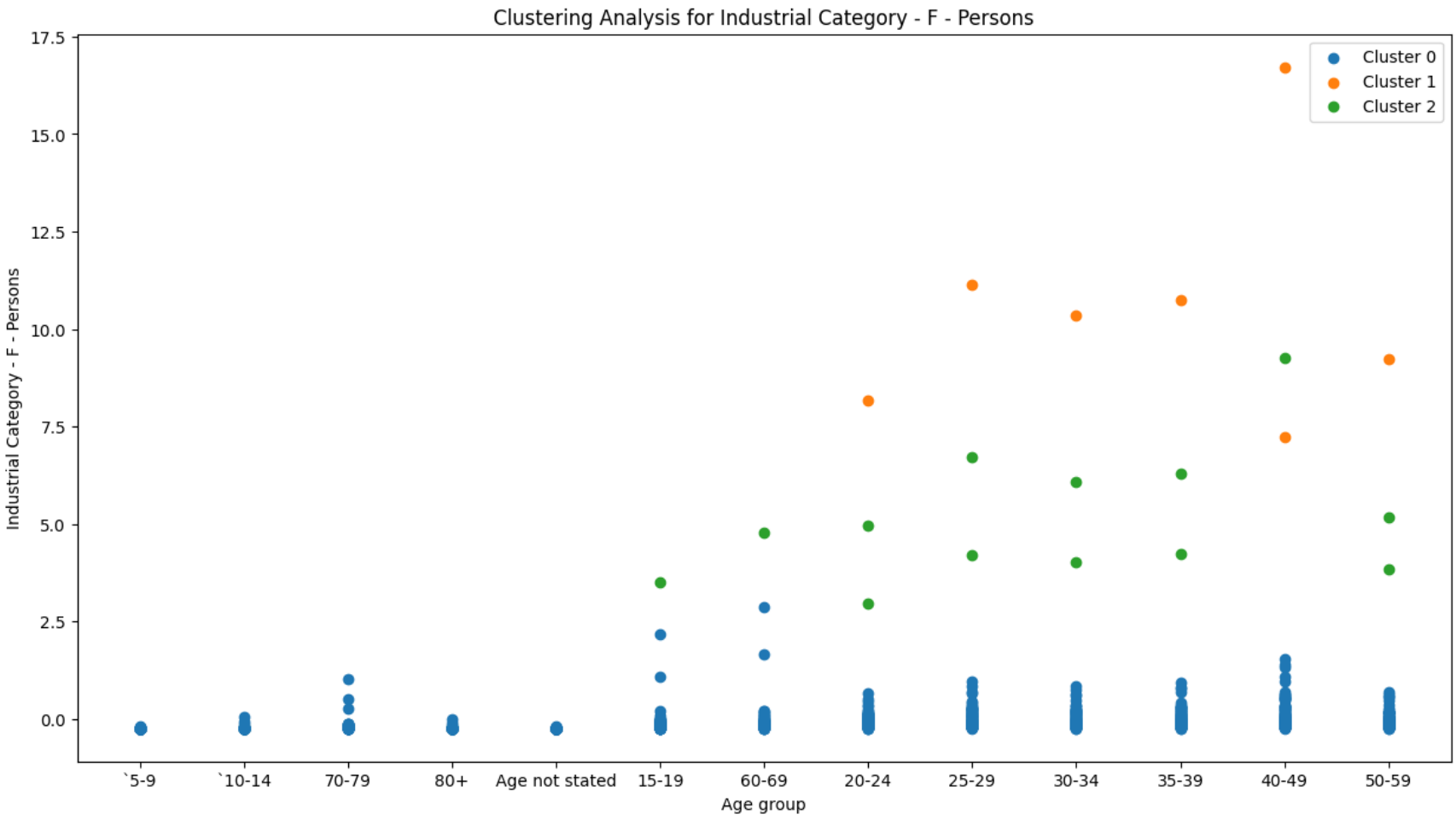
40-49
50-59


Clustering Analysis for Industrial Category - F - Persons
Industrial Category - F - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
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20-24
25-29
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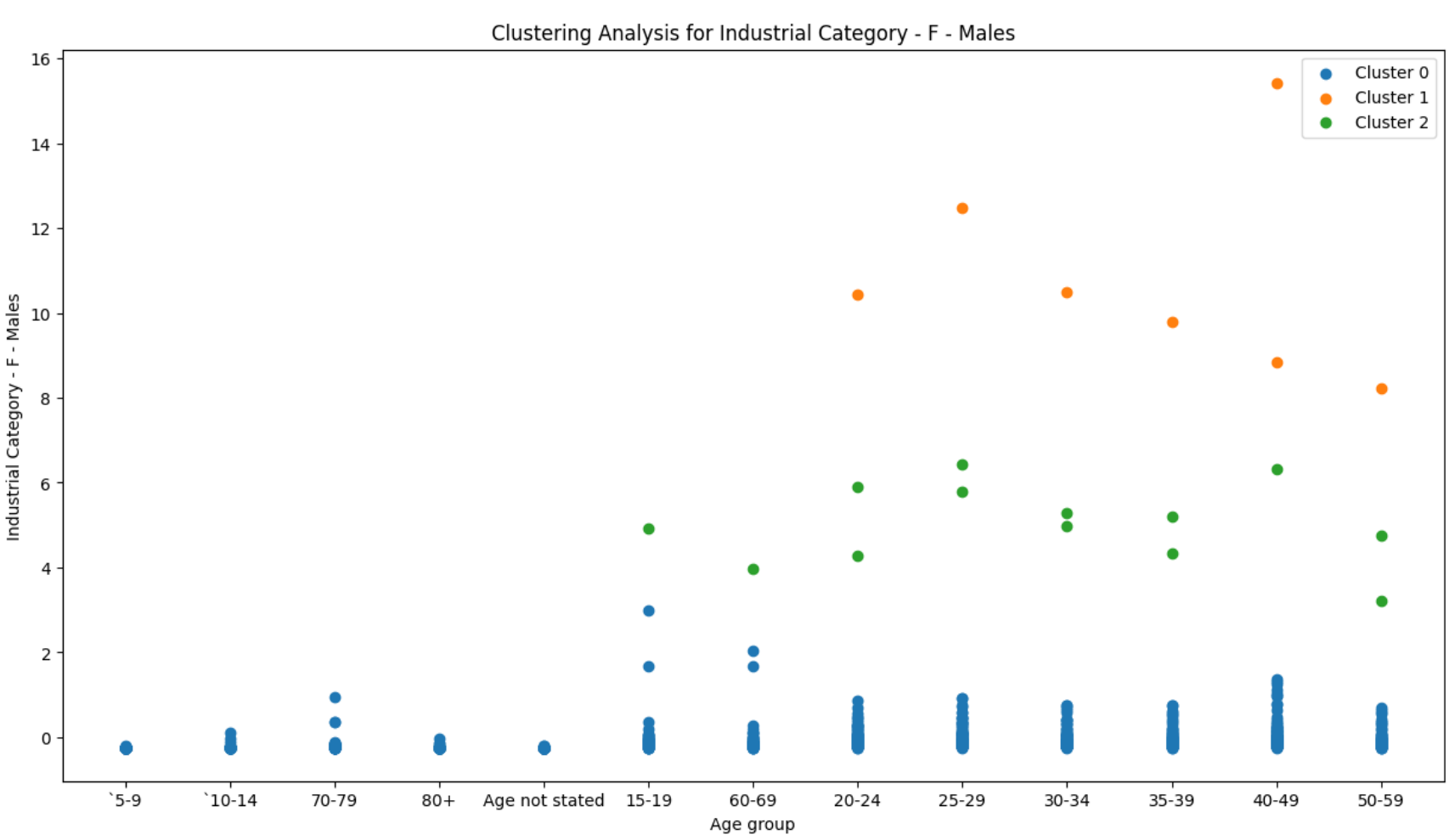
50-59


Clustering Analysis for Industrial Category - F - Males
Industrial Category - F - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
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70-79
80+
Age not stated
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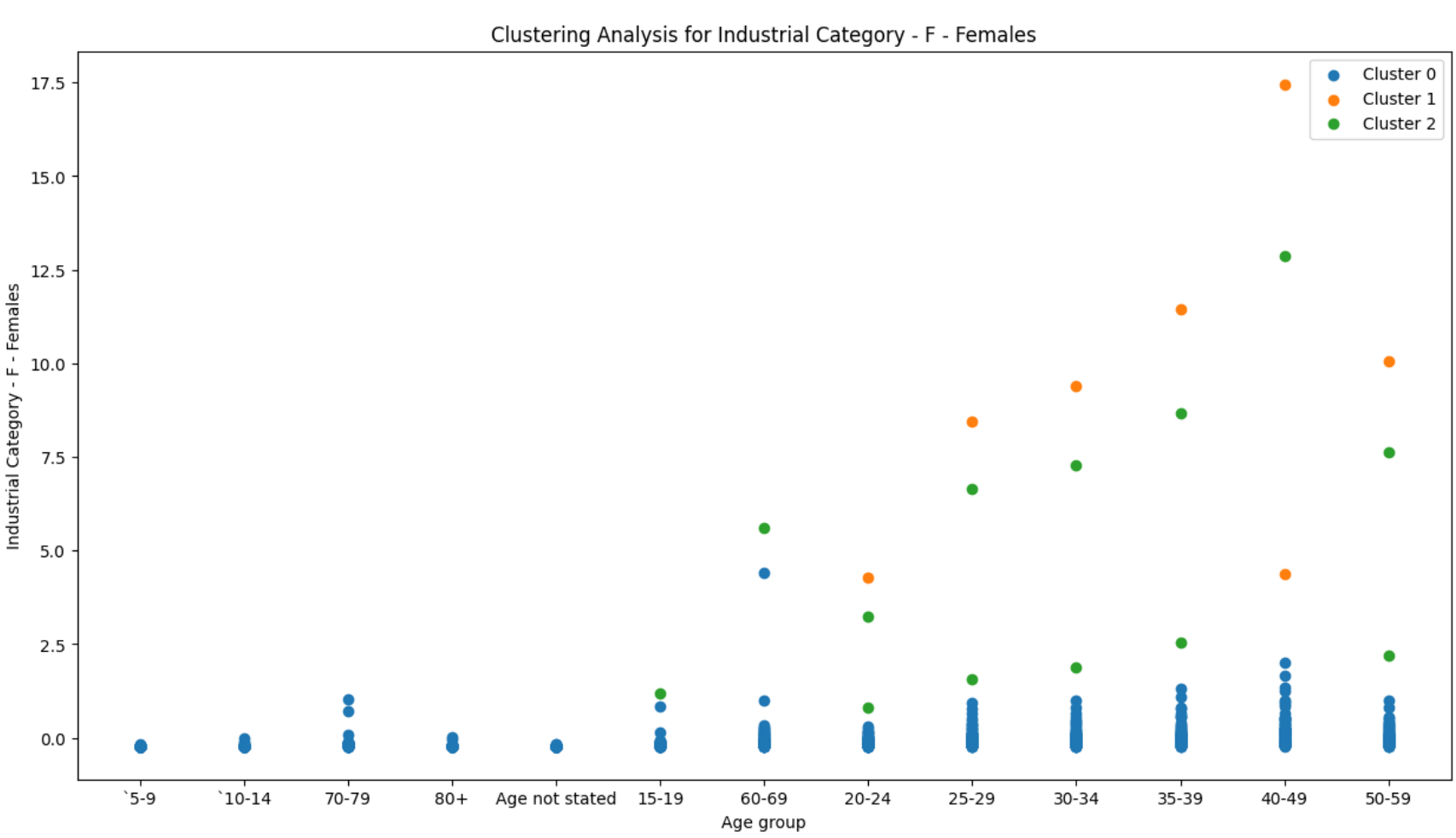
Clustering Analysis for Industrial Category - F - Females
Industrial Category - F - Females
Age group
Cluster 0
Cluster 1
Cluster 2
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80+
Age not stated
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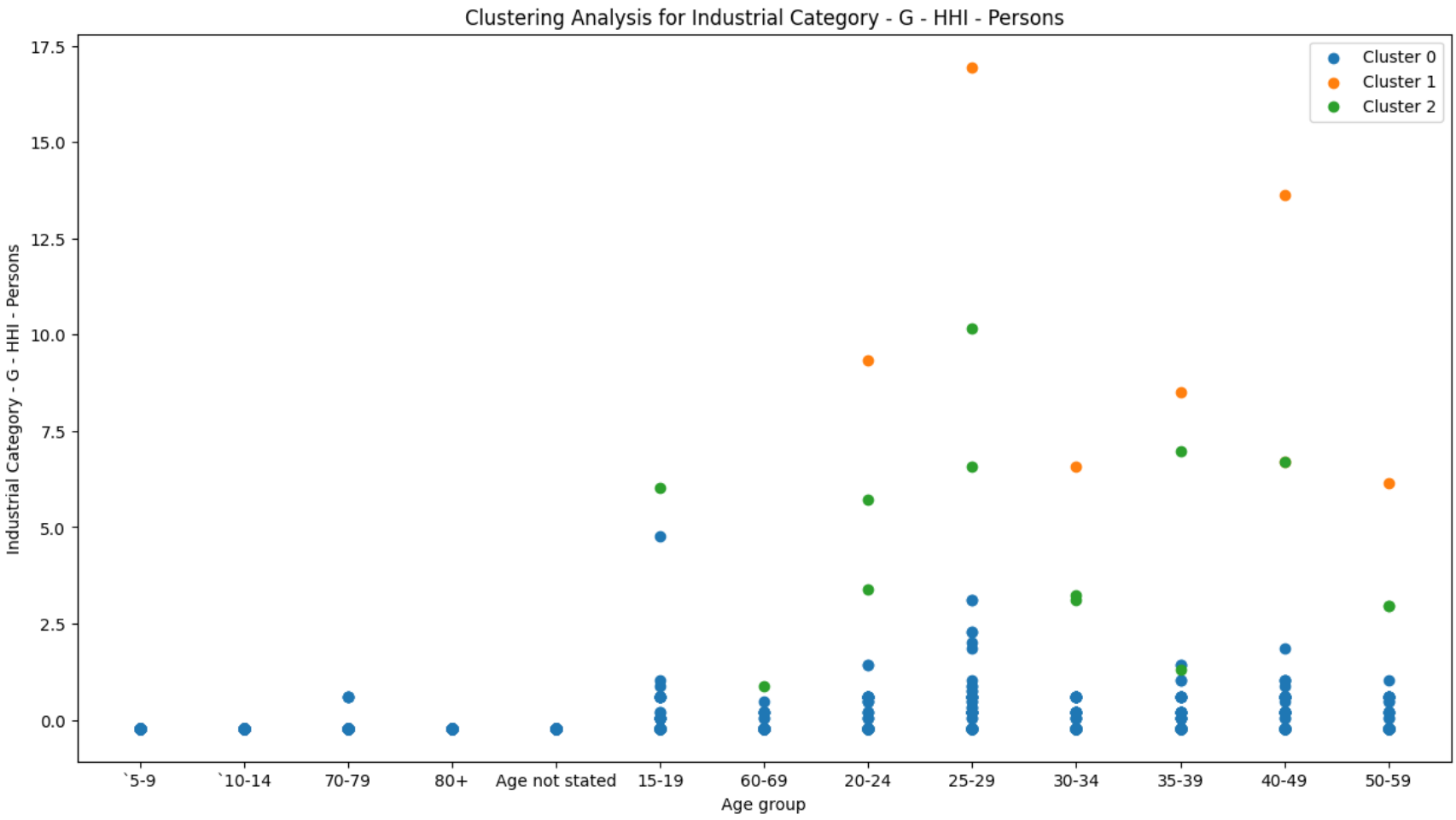
50-59


Clustering Analysis for Industrial Category - G - HHI - Persons
Industrial Category - G - HHI - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
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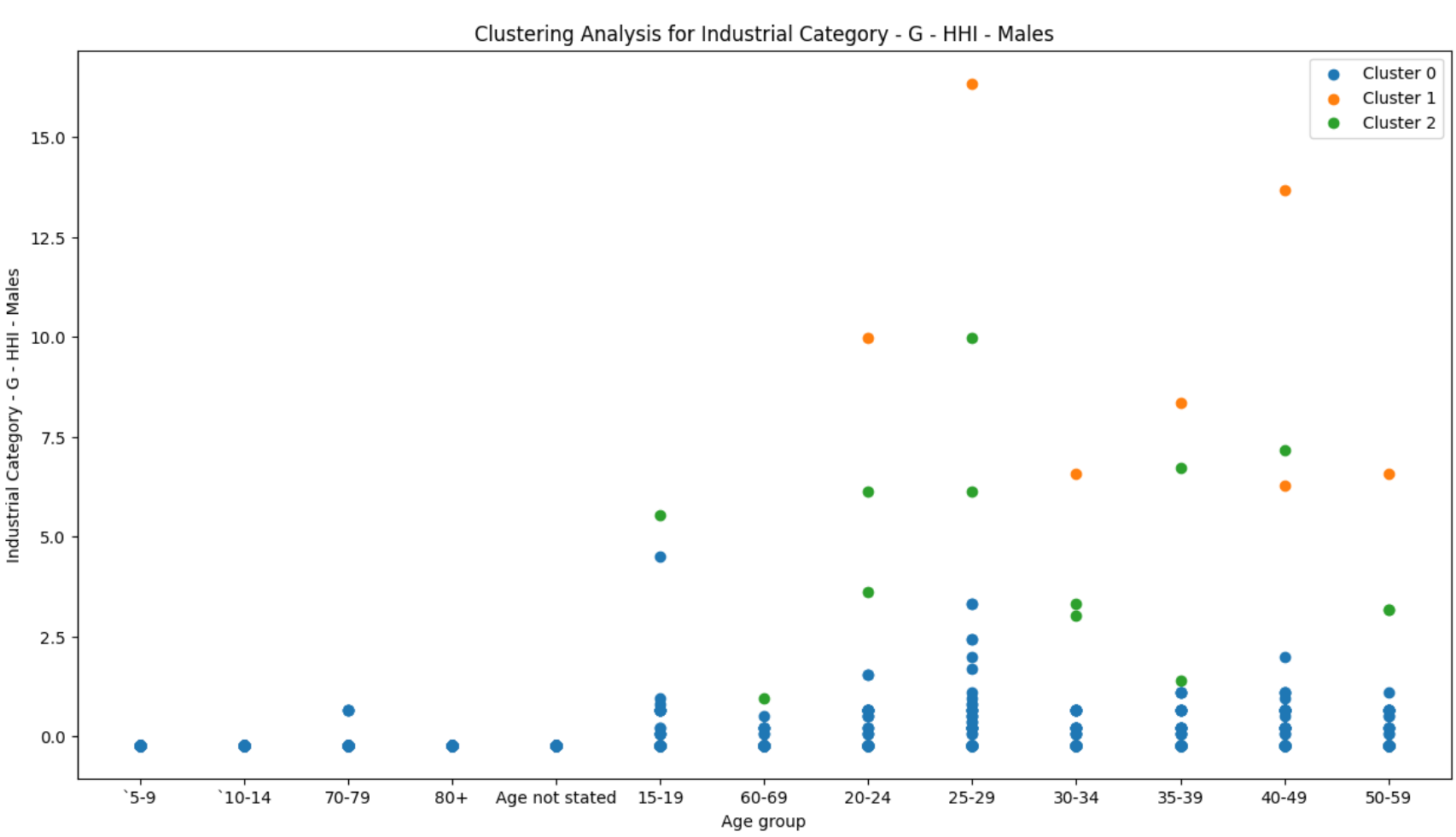
35-39
40-49
50-59


Clustering Analysis for Industrial Category - G - HHI - Males
Industrial Category - G - HHI - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
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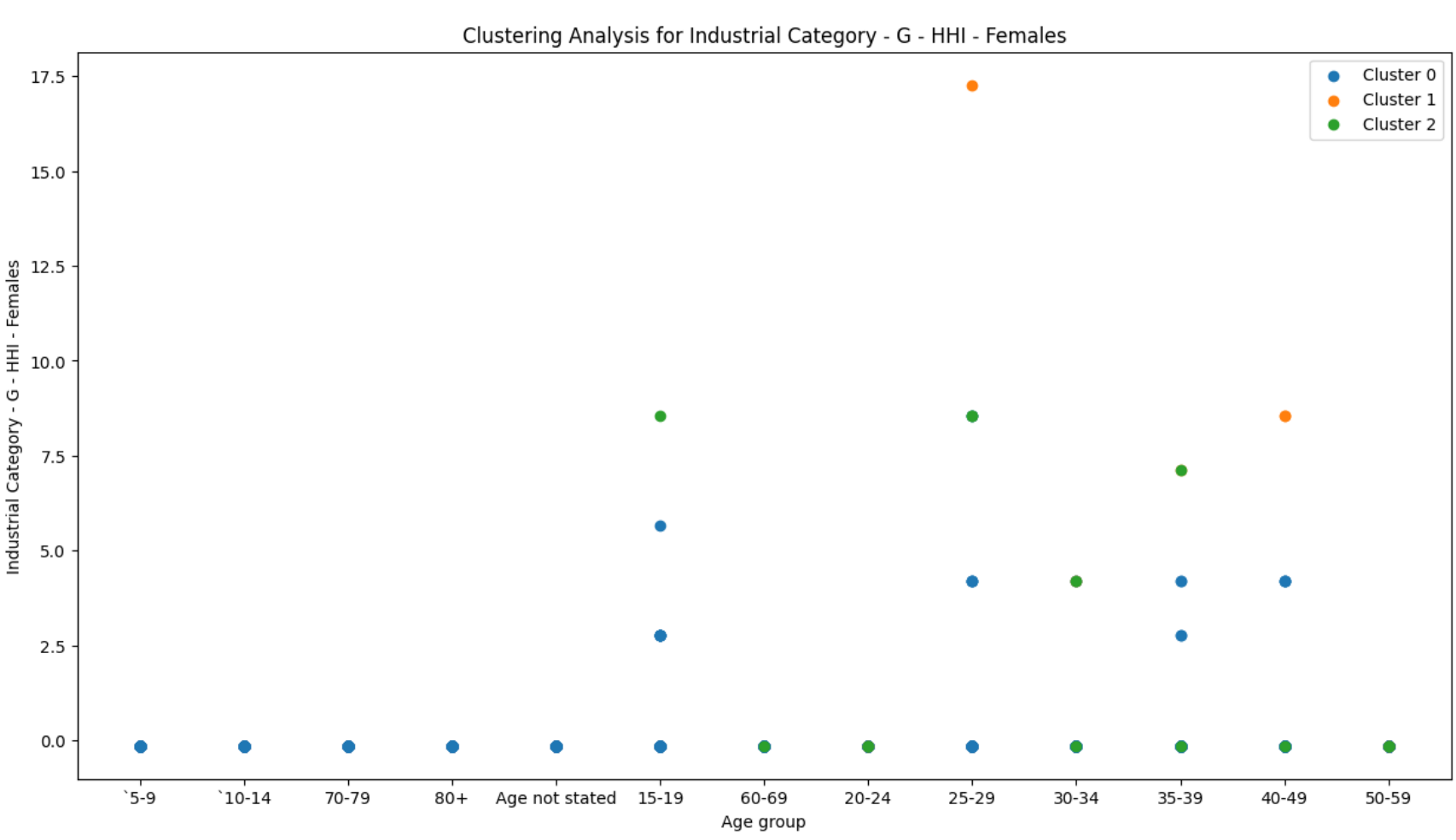
50-59


Clustering Analysis for Industrial Category - G - HHI - Females
Industrial Category - G - HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
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80+
Age not stated
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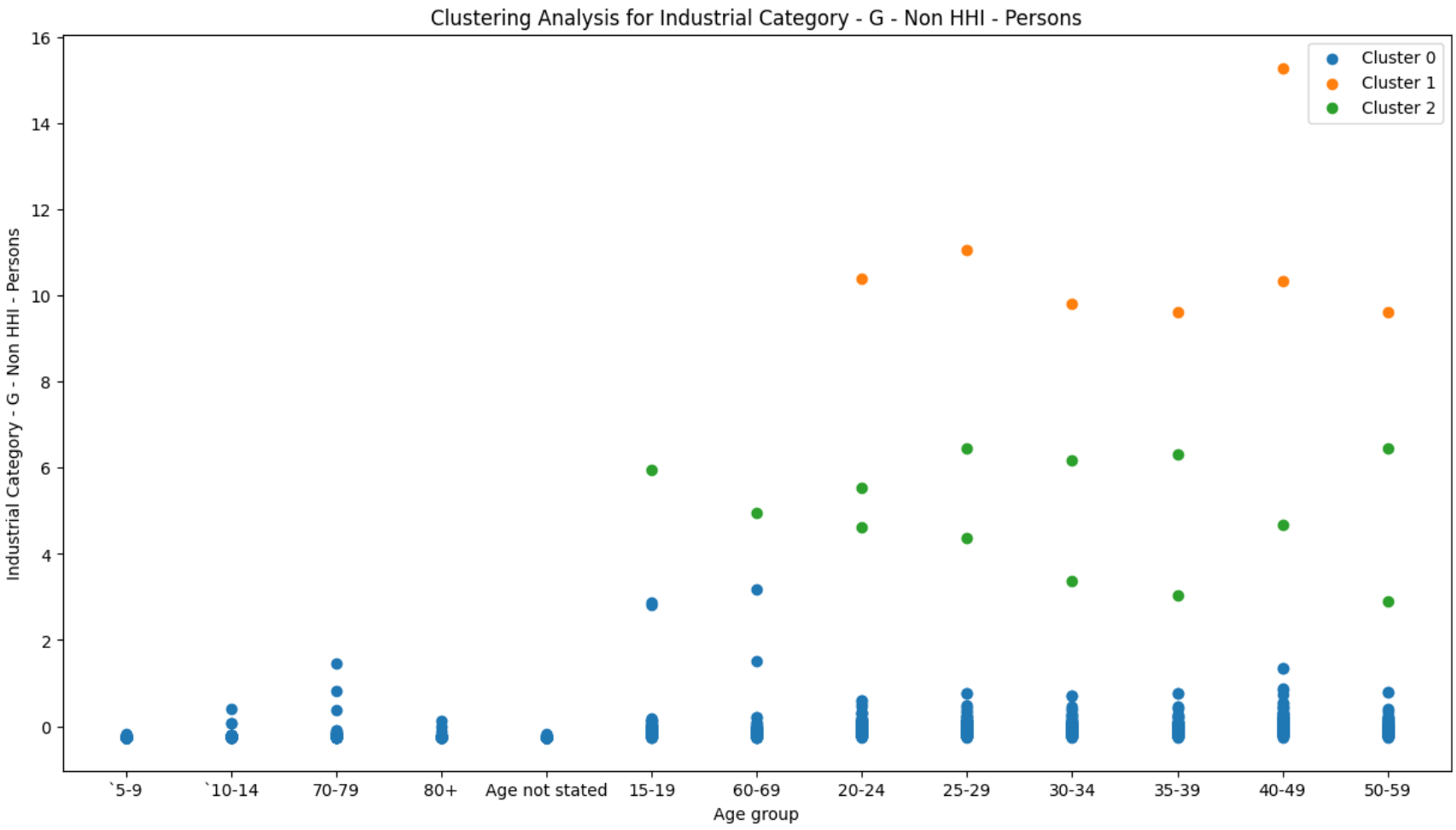
Clustering Analysis for Industrial Category - G - Non HHI - Persons
Industrial Category - G - Non HHI - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
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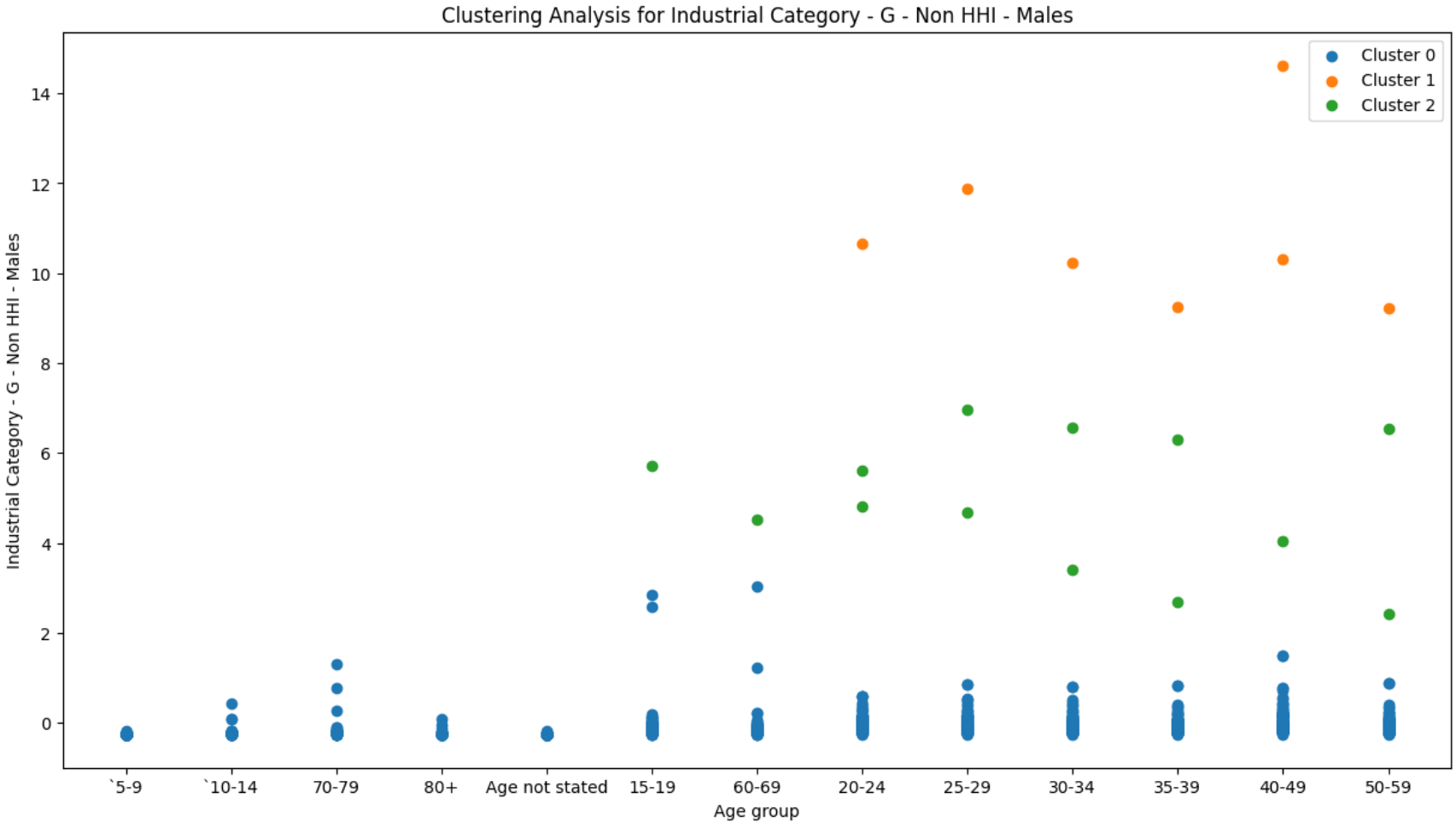
50-59


Clustering Analysis for Industrial Category - G - Non HHI - Males
Industrial Category - G - Non HHI - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
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80+
Age not stated
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60-69
20-24
25-29
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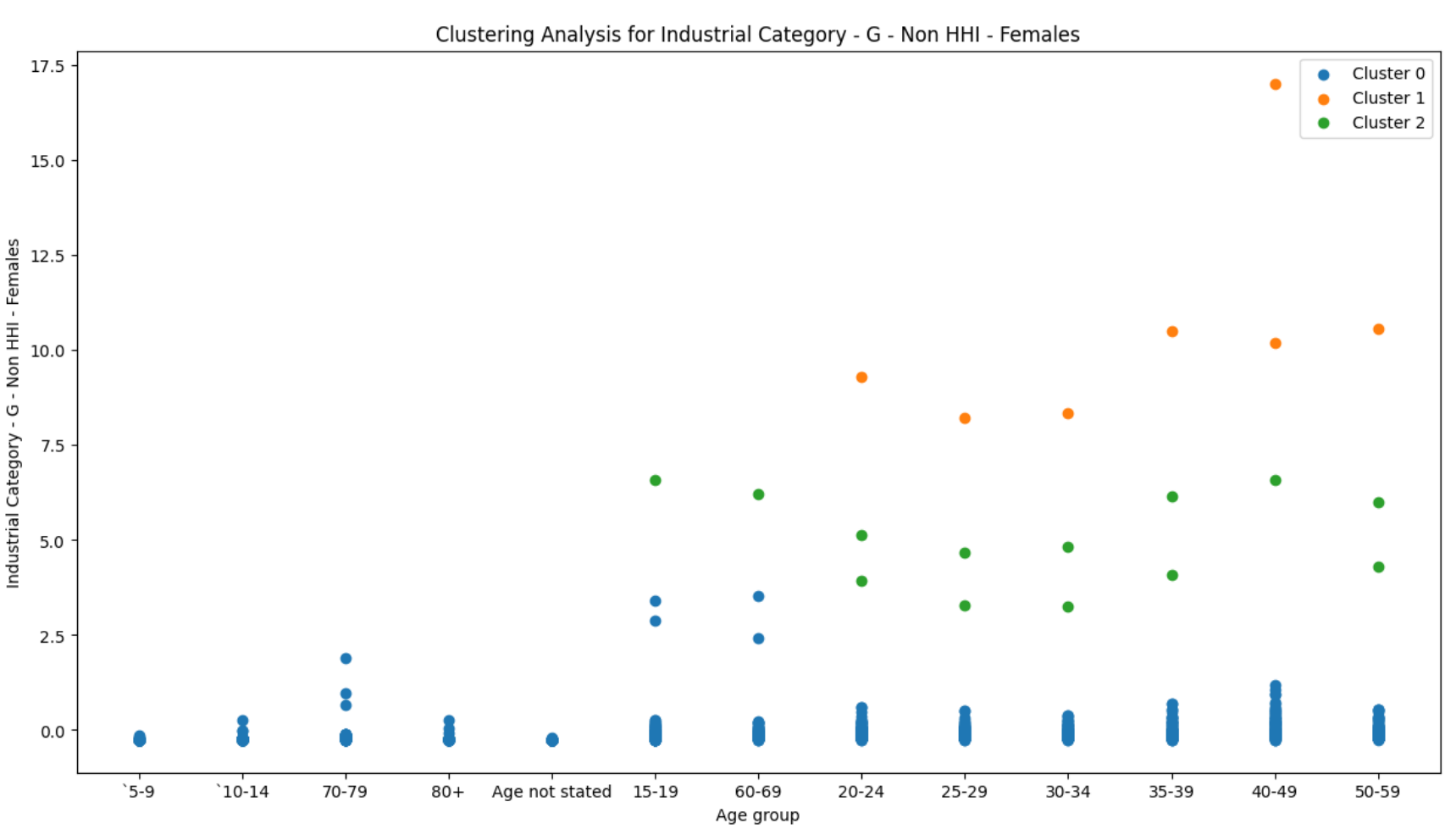
40-49
50-59


Clustering Analysis for Industrial Category - G - Non HHI - Females
Industrial Category - G - Non HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
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70-79
80+
Age not stated
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60-69
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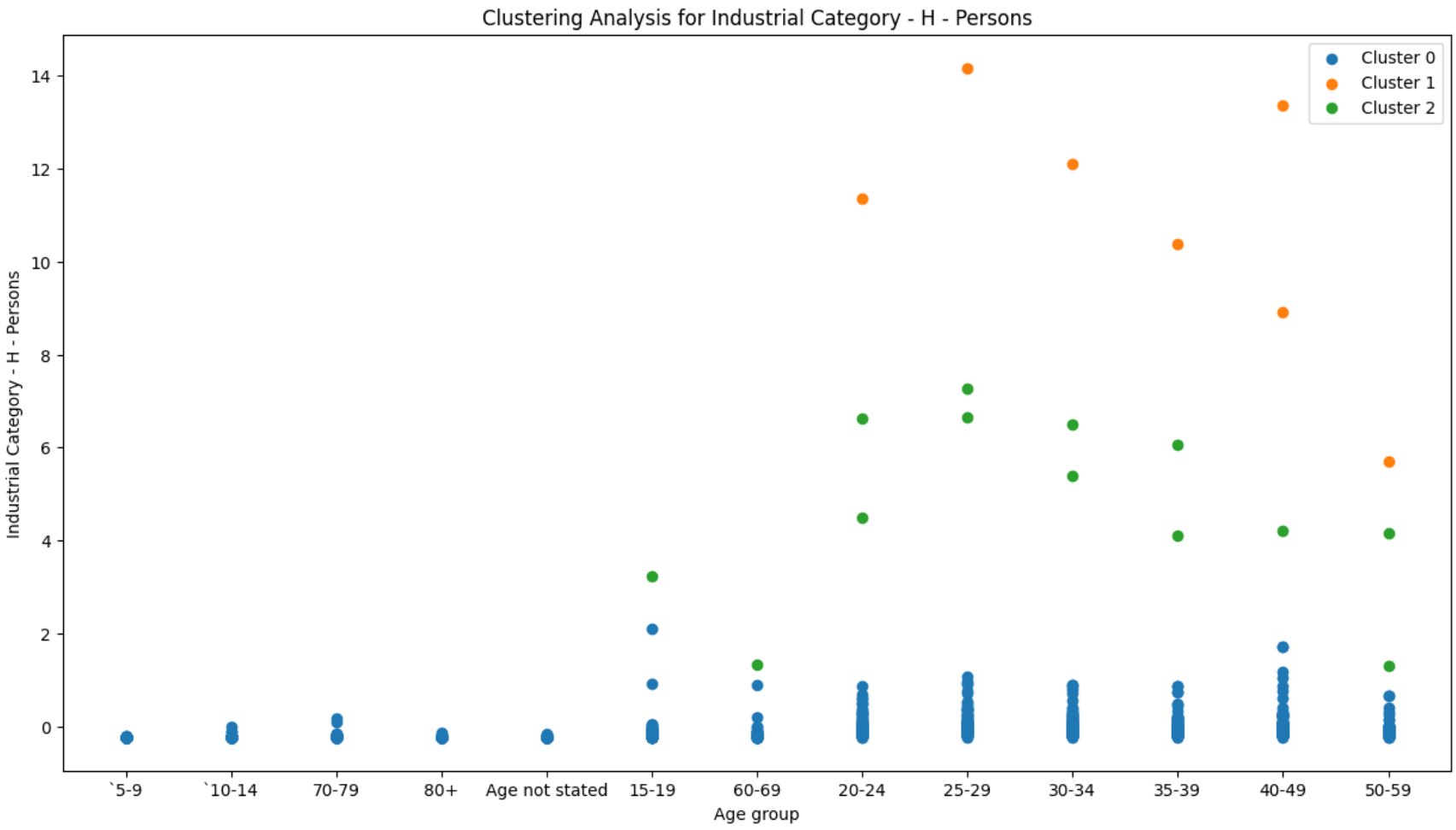
50-59


Clustering Analysis for Industrial Category - H - Persons
Industrial Category - H - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
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70-79
80+
Age not stated
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60-69
20-24
25-29
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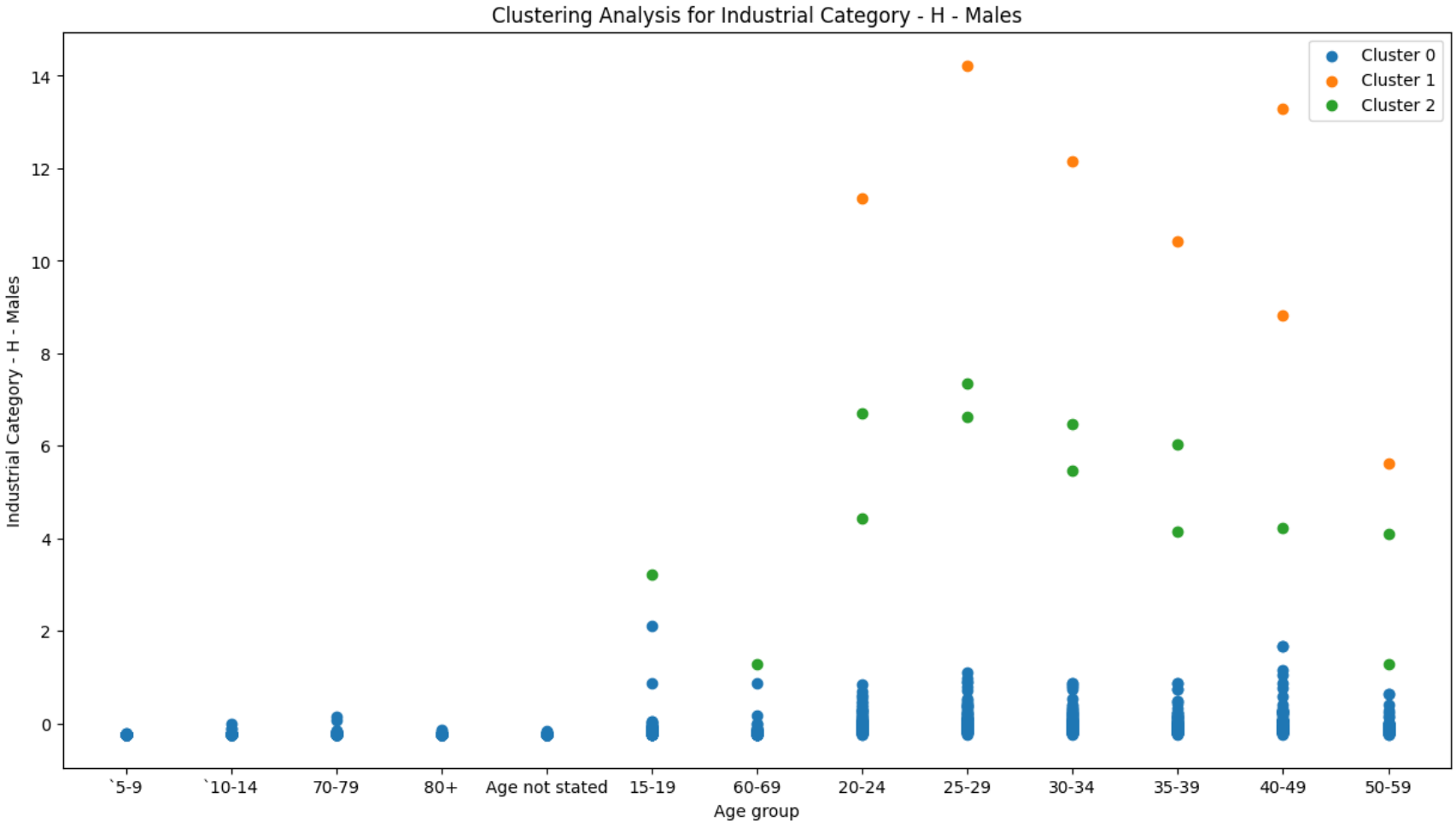
50-59


Clustering Analysis for Industrial Category - H - Males
Industrial Category - H - Males
Age group
Cluster 0
Cluster 1
Cluster 2
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80+
Age not stated
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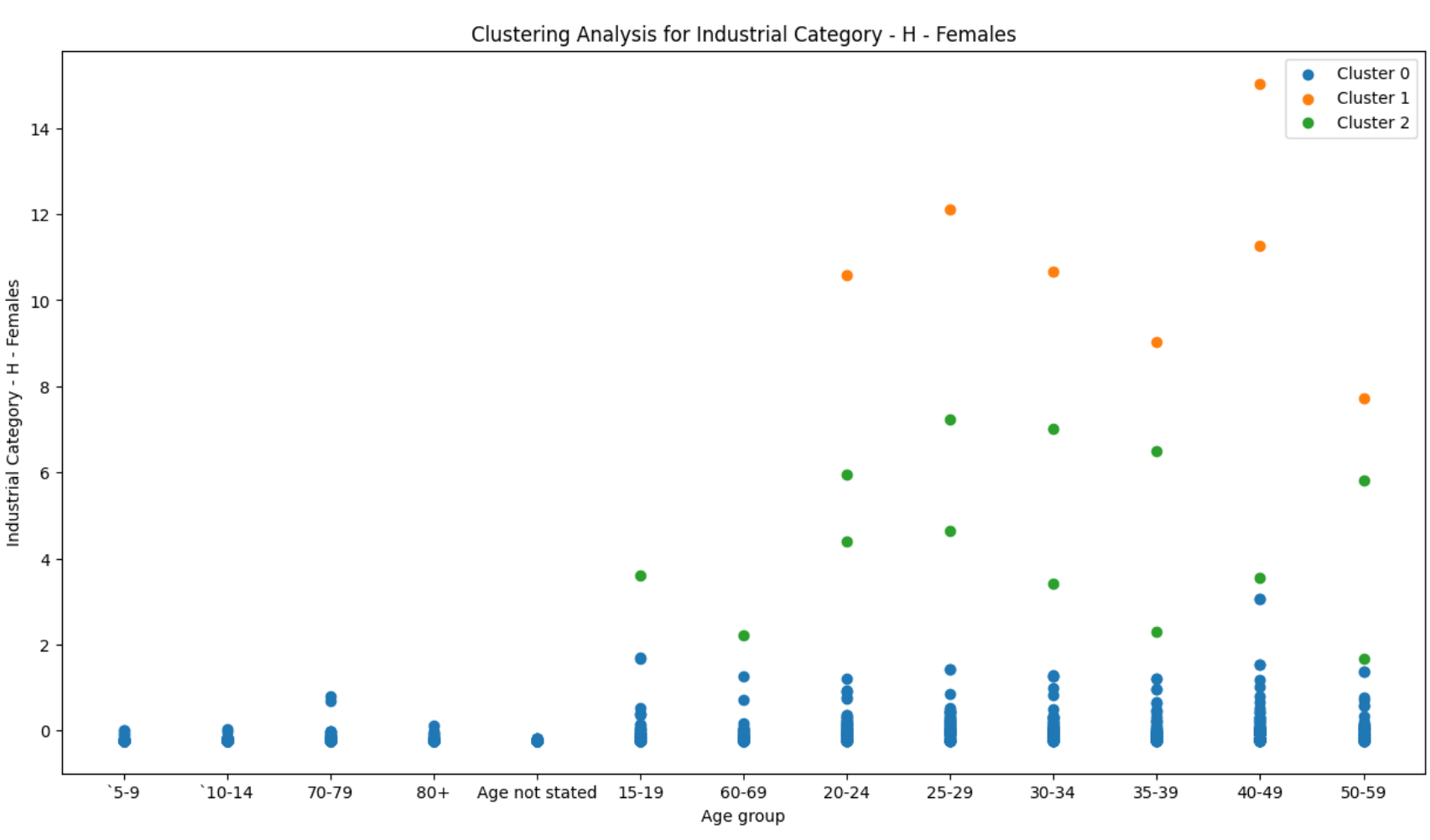
50-59


Clustering Analysis for Industrial Category - H - Females
Industrial Category - H - Females
Age group
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Cluster 1
Cluster 2
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Age not stated
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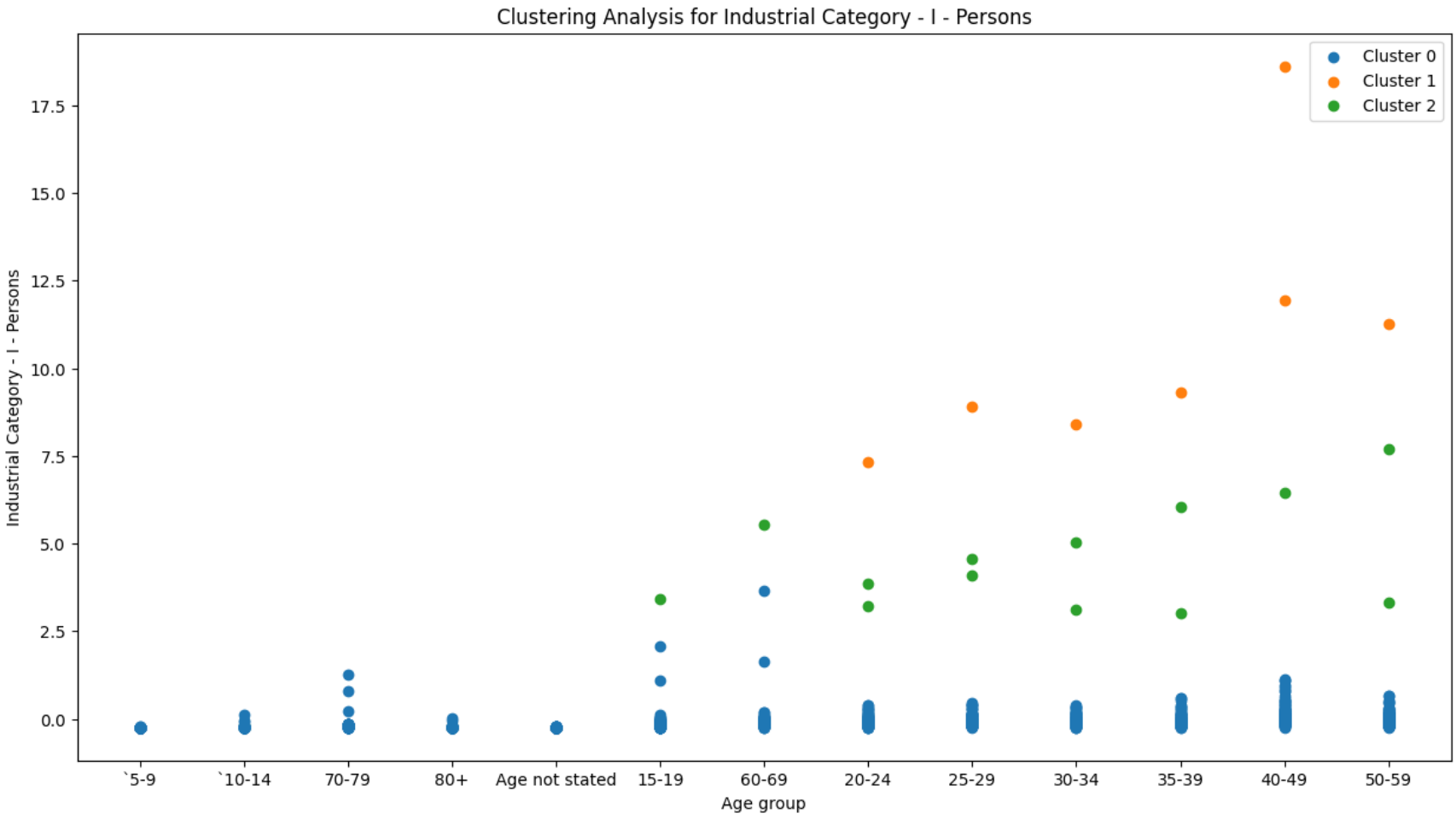
Clustering Analysis for Industrial Category - I - Persons
Cluster 0
Cluster 1
Cluster 2
Industrial Category - I - Persons
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
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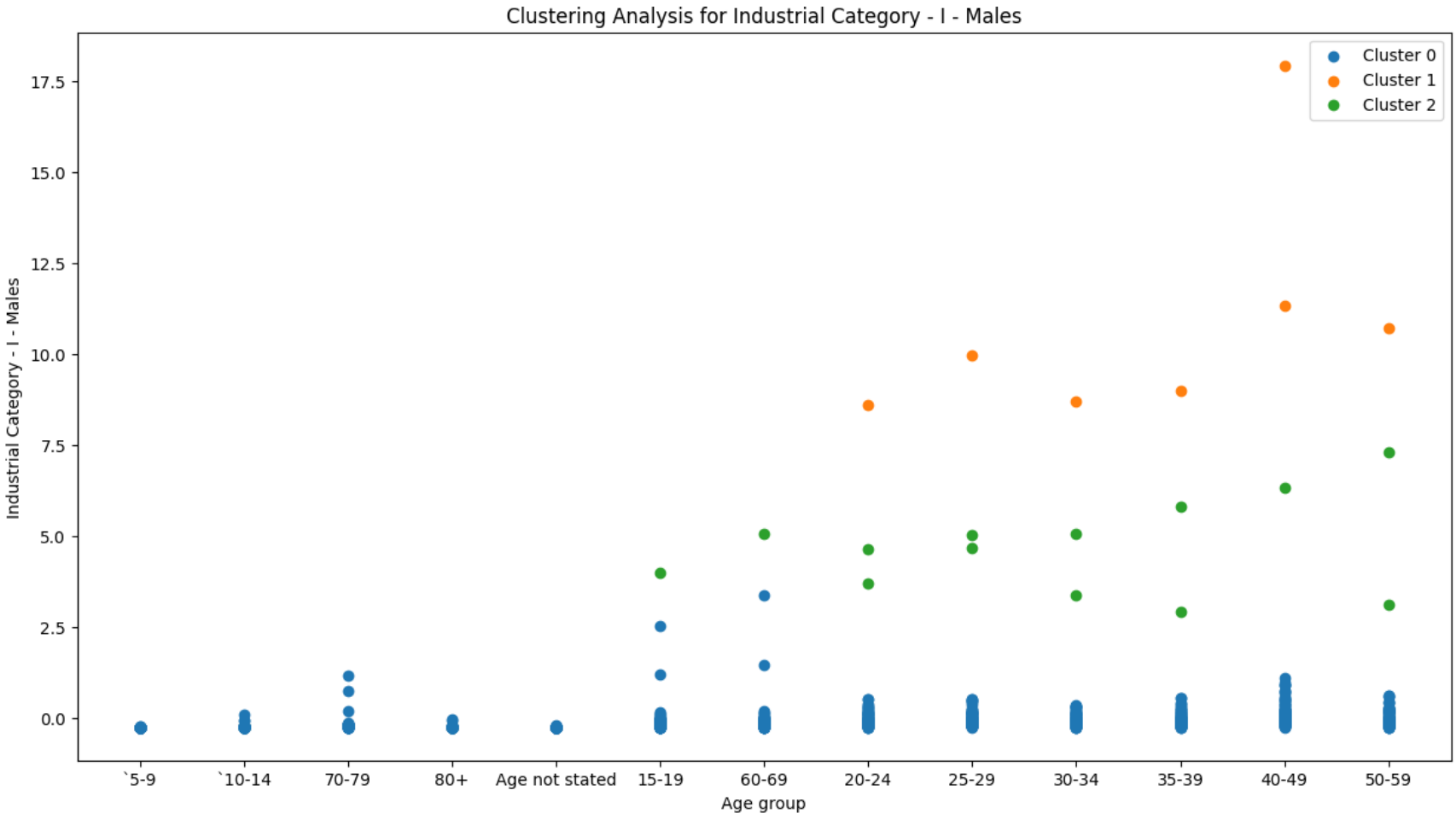
30-34
35-39
40-49
50-59
Age group


Clustering Analysis for Industrial Category - I - Males
Cluster 0
Cluster 1
Cluster 2
Industrial Category - I - Males
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
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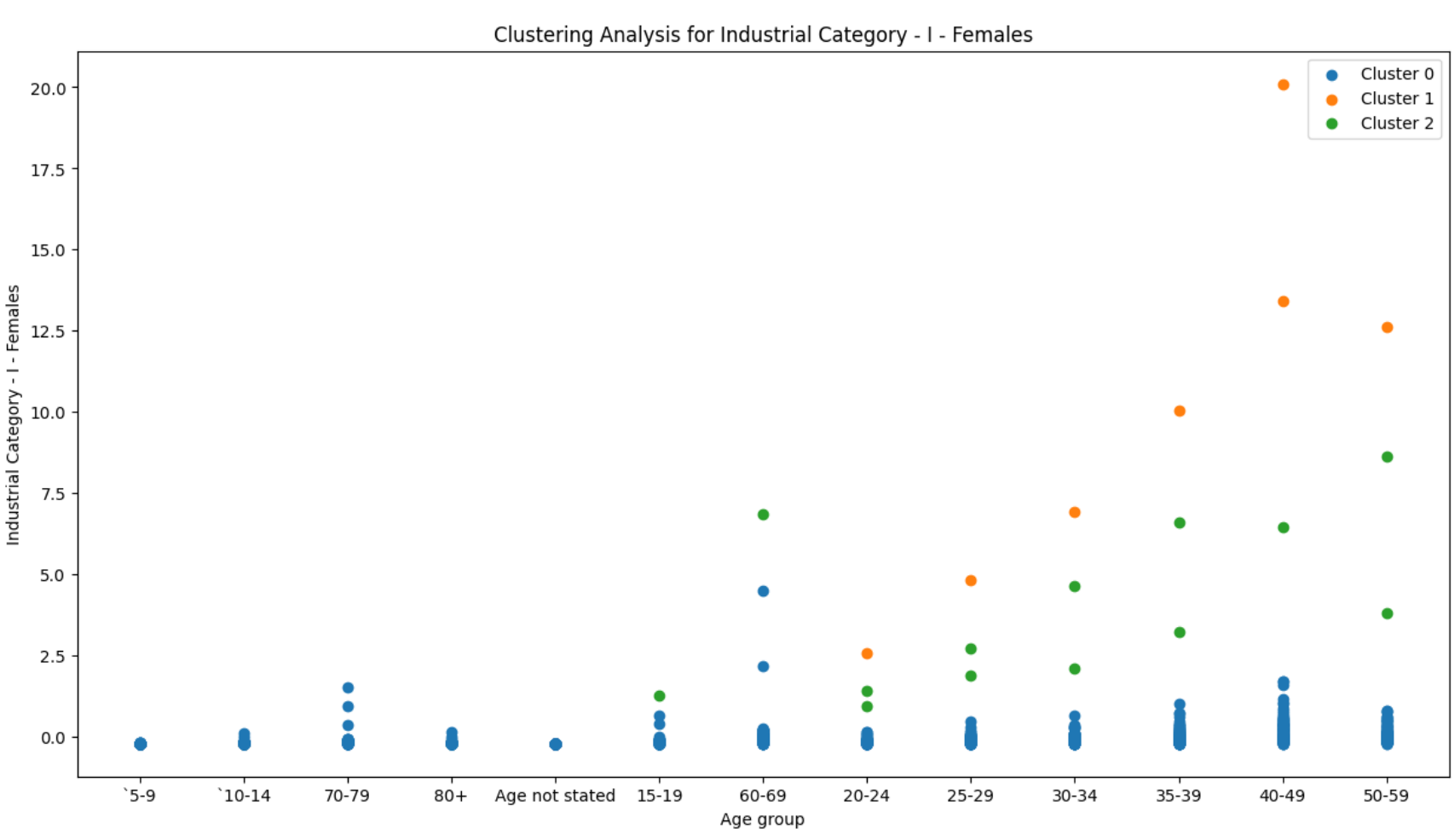
50-59
Age group


Clustering Analysis for Industrial Category - I - Females
Cluster 0
Cluster 1
Cluster 2
Industrial Category - I - Females
20.0
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15.0
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10.0
7.5
5.0
2.5
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`5-9
`10-14
70-79
80+
Age not stated
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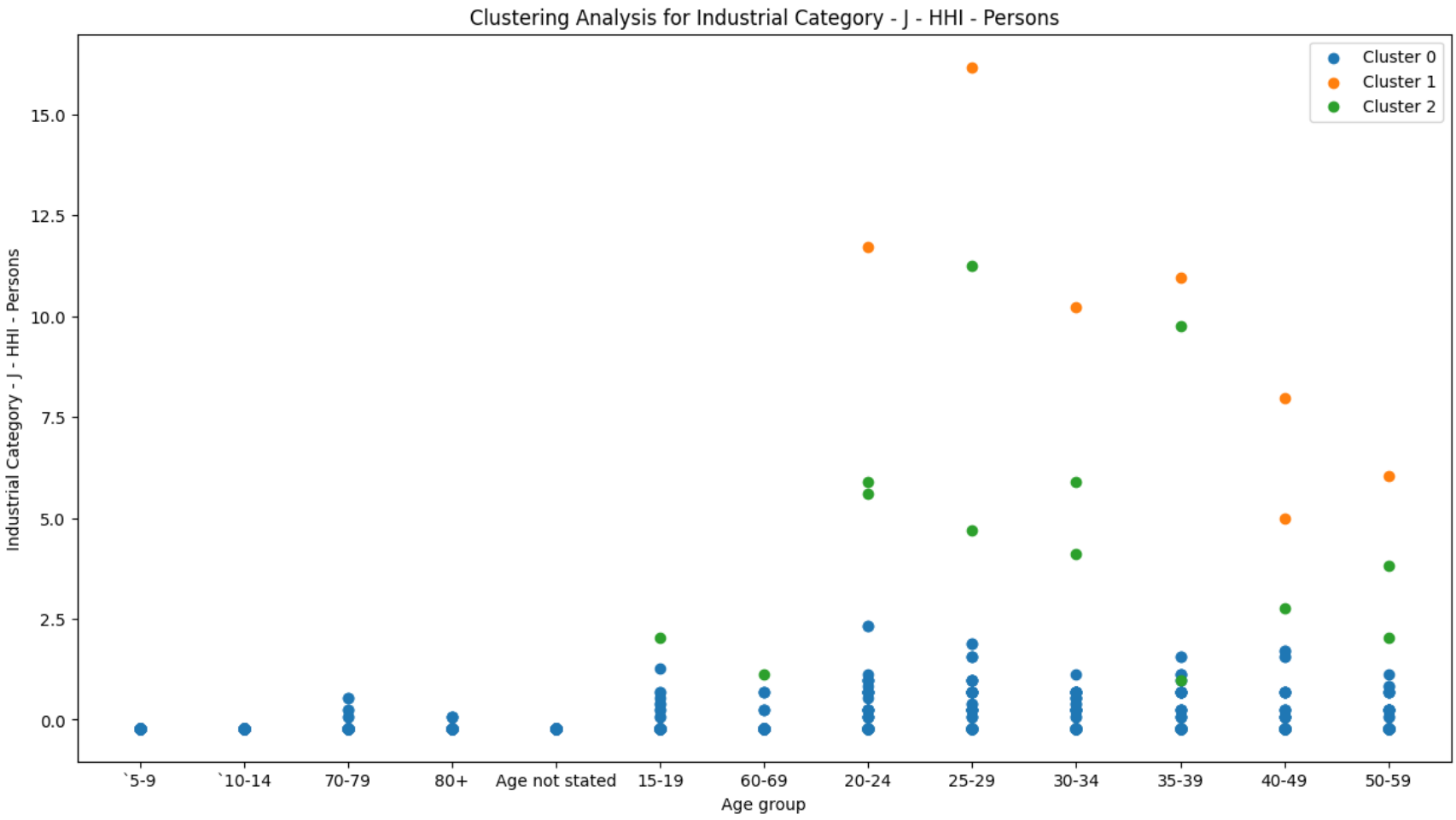
50-59
Age group


Clustering Analysis for Industrial Category - J - HHI - Persons
Industrial Category - J - HHI - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
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80+
Age not stated
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60-69
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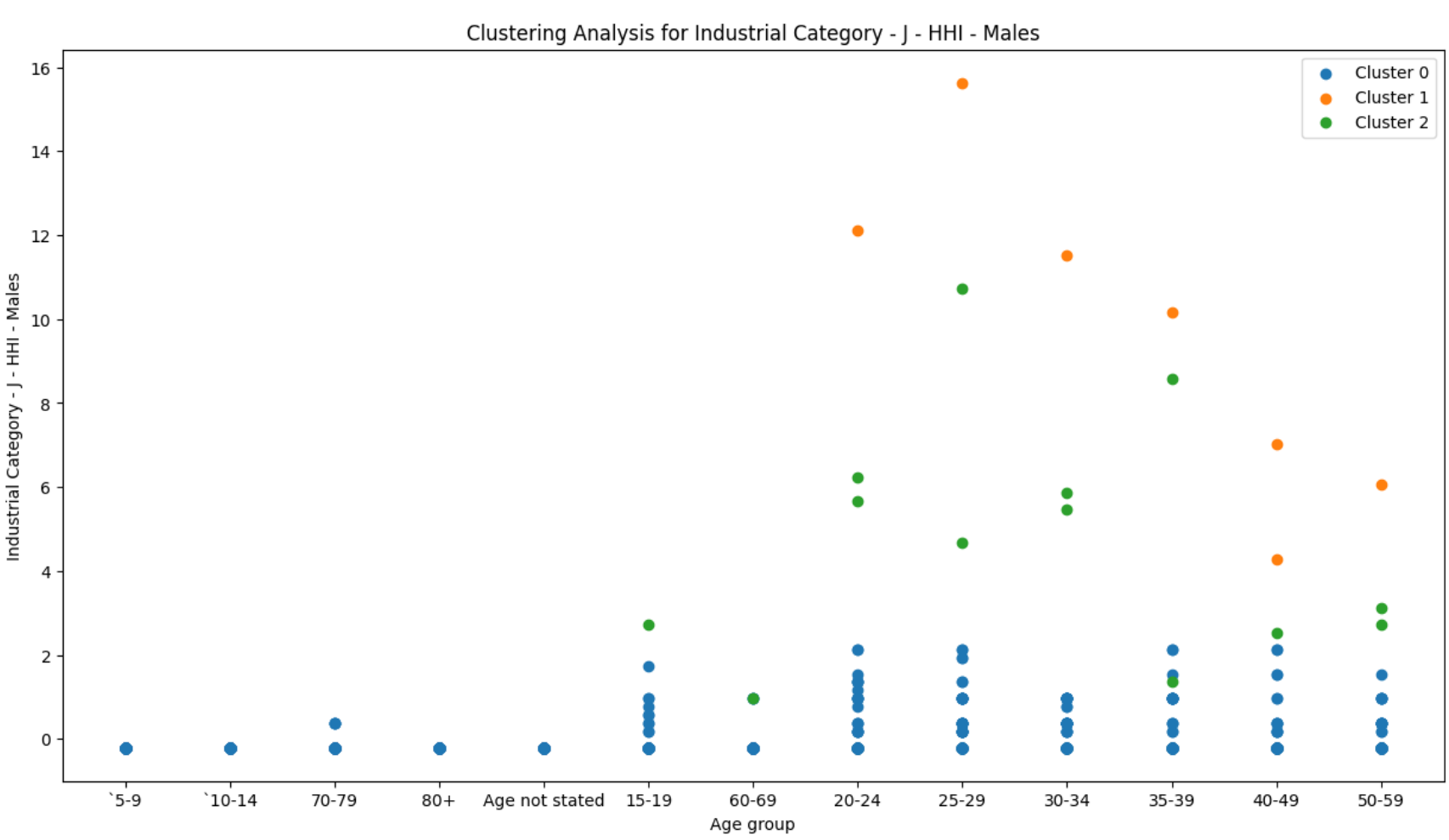
50-59


Clustering Analysis for Industrial Category - J - HHI - Males
Industrial Category - J - HHI - Males
Age group
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Cluster 1
Cluster 2
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`10-14
70-79
80+
Age not stated
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60-69
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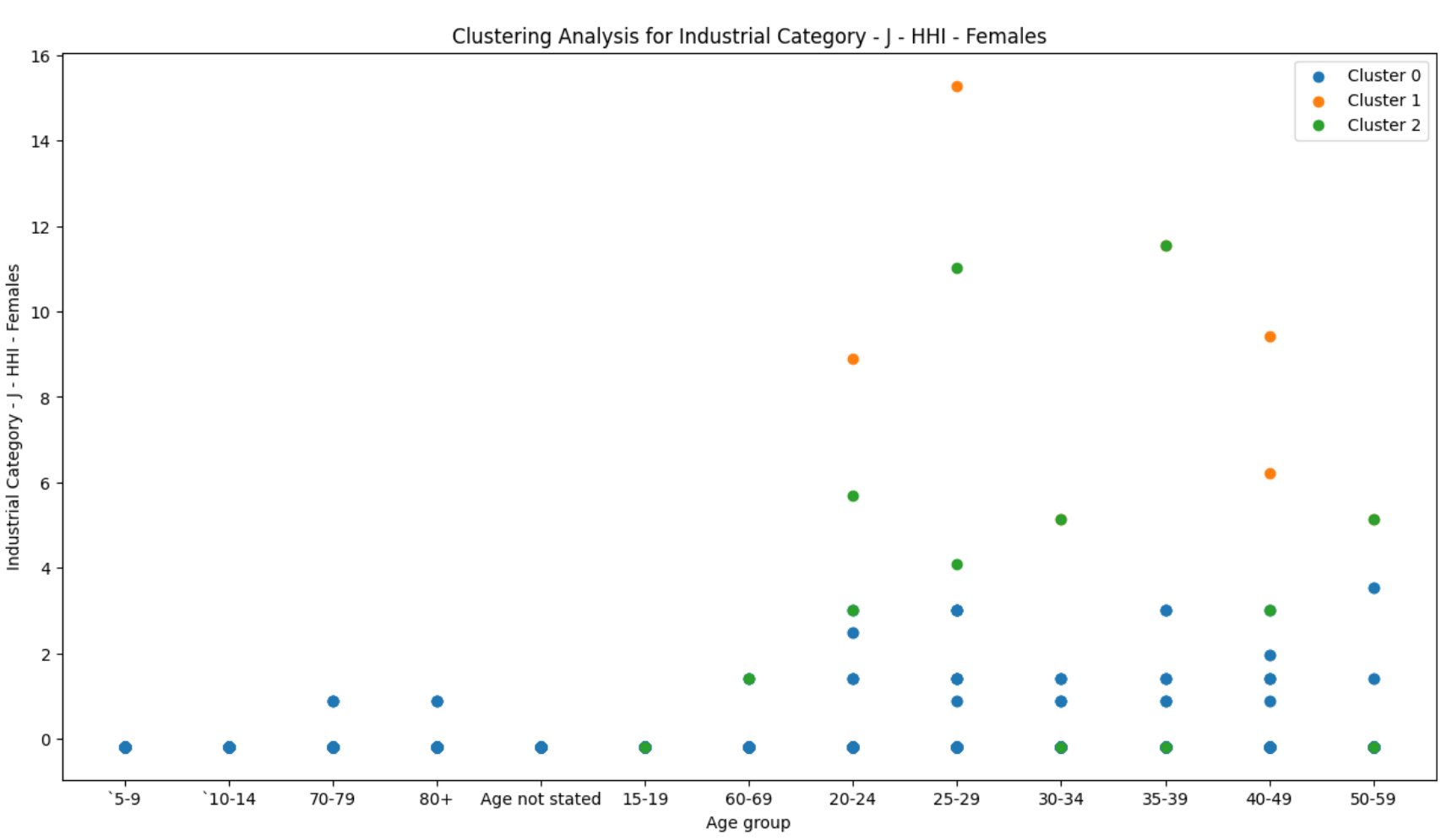
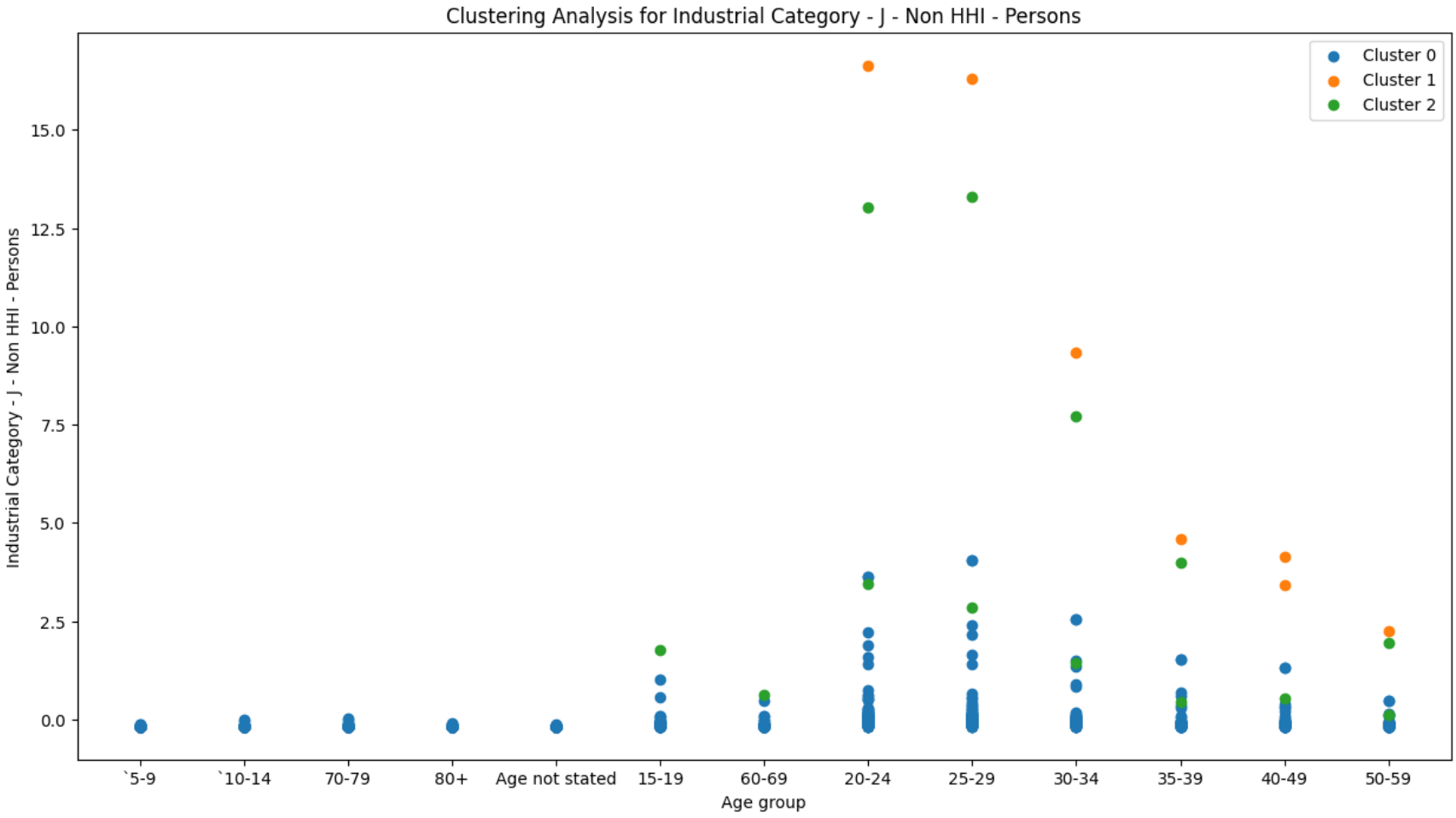
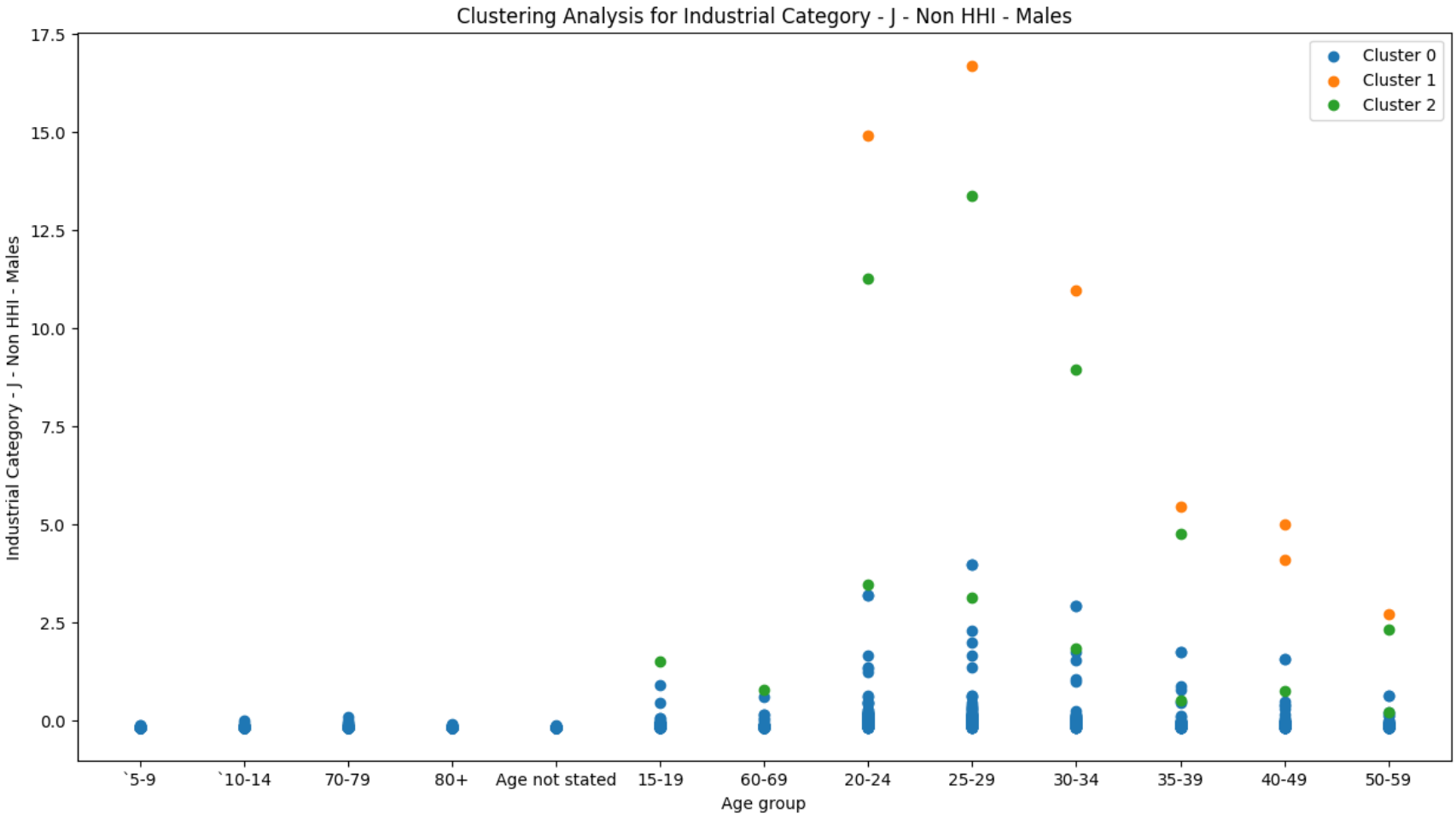
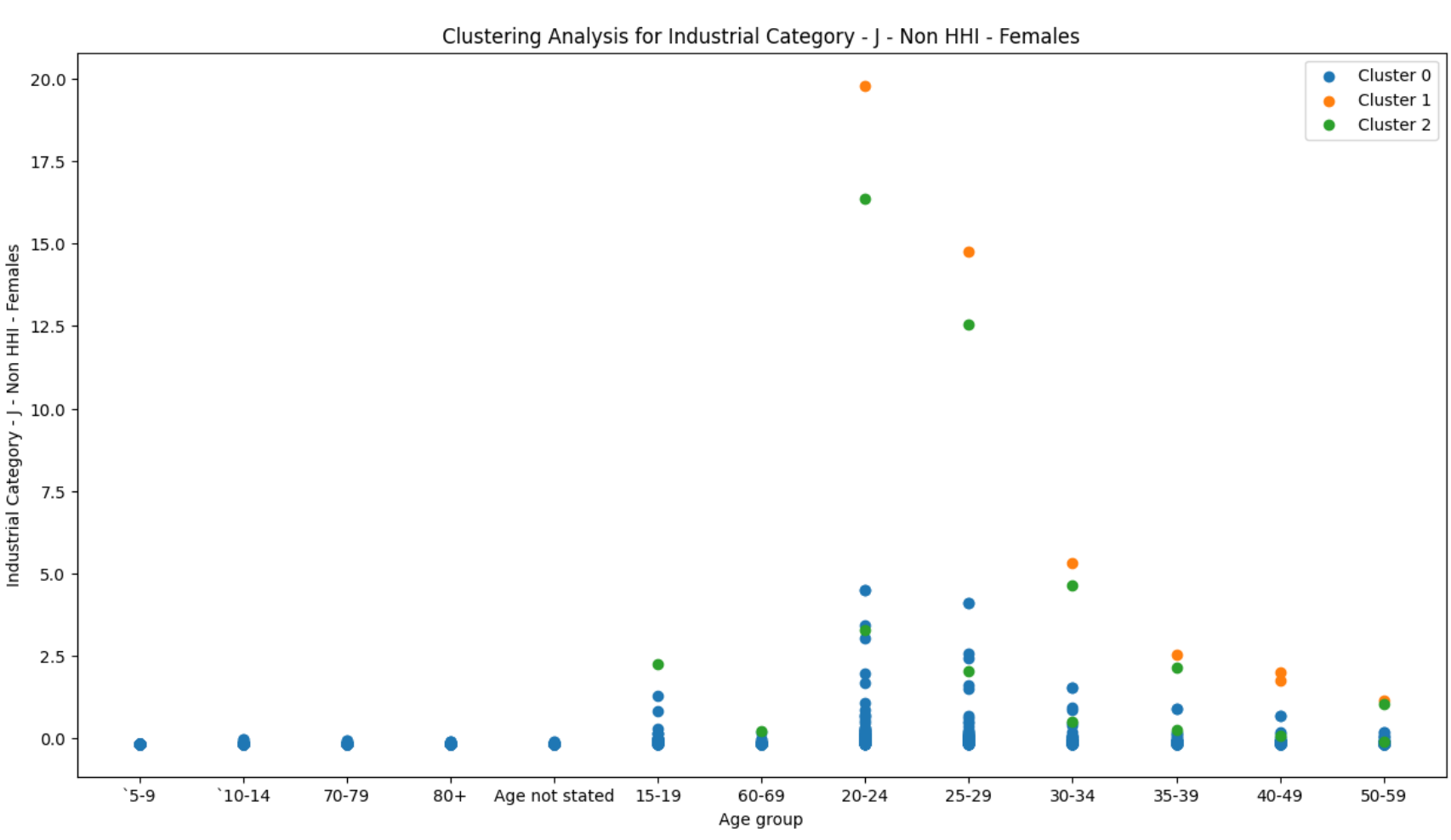
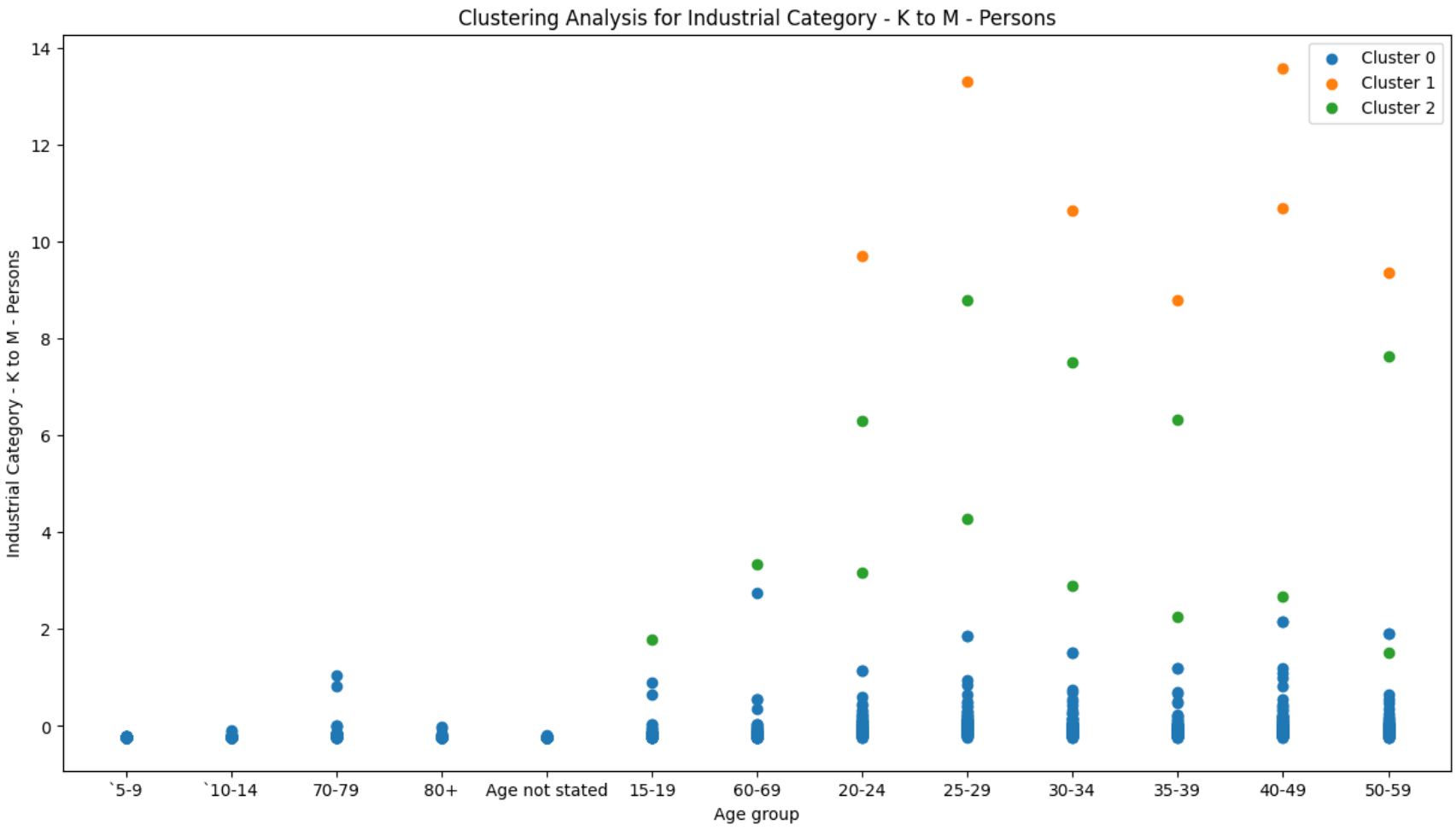
40-49
50-59

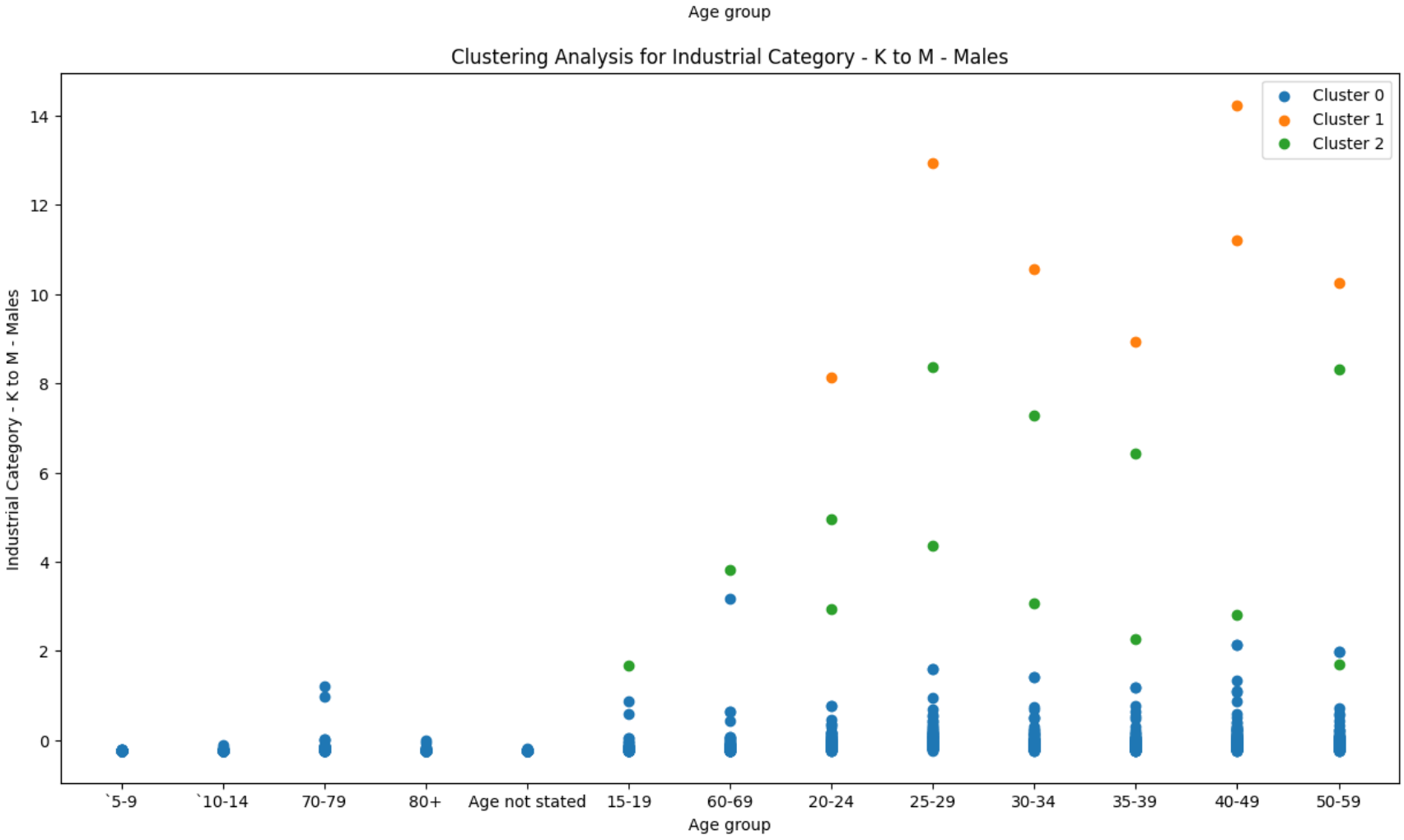

Clustering Analysis for Industrial Category - J - HHI - Females
Industrial Category - J - HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

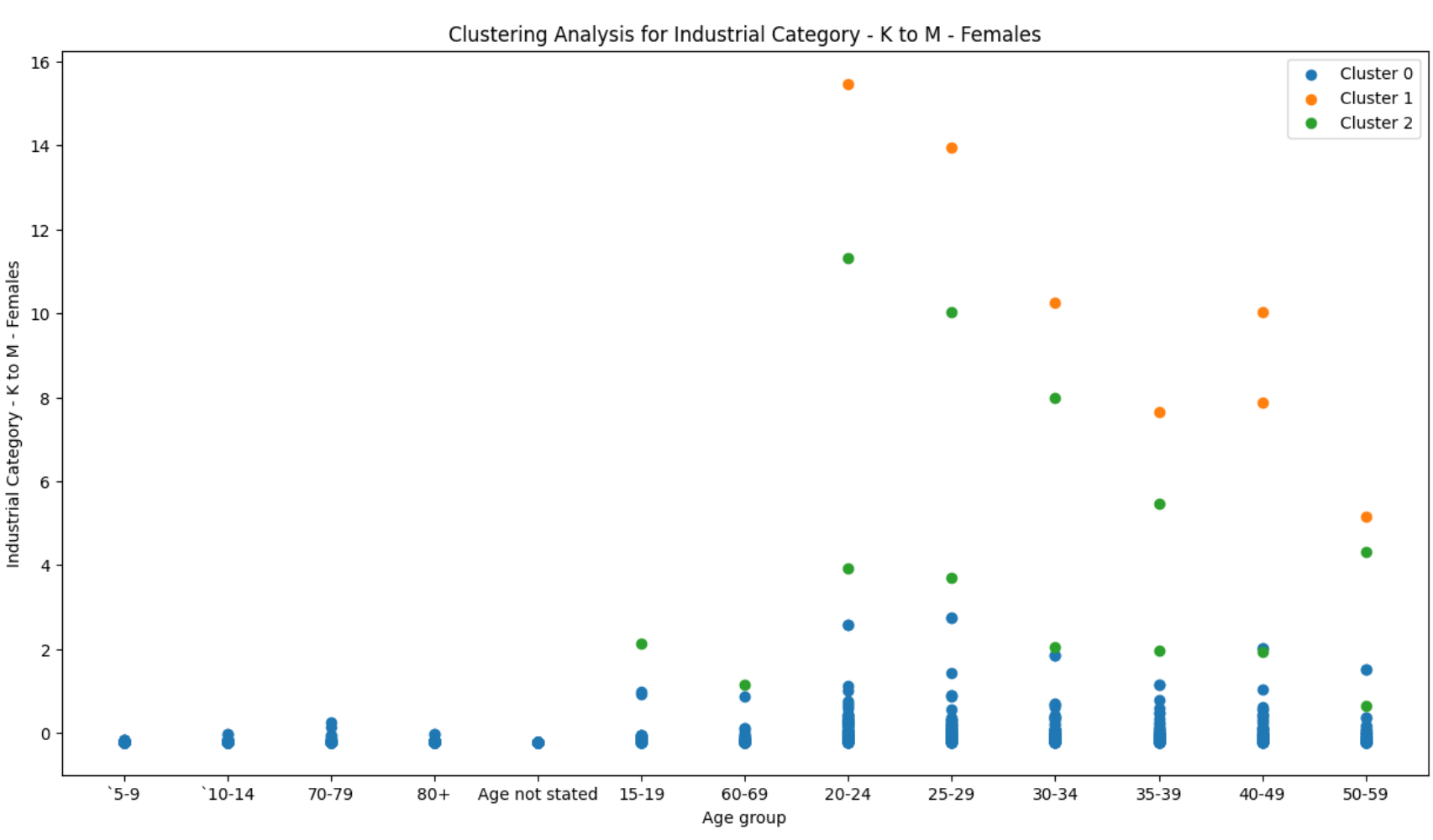

Clustering Analysis for Industrial Category - J - Non HHI - Persons
Industrial Category - J - Non HHI - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
0.0
2.5
5.0
7.5
10.0
12.5
15.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

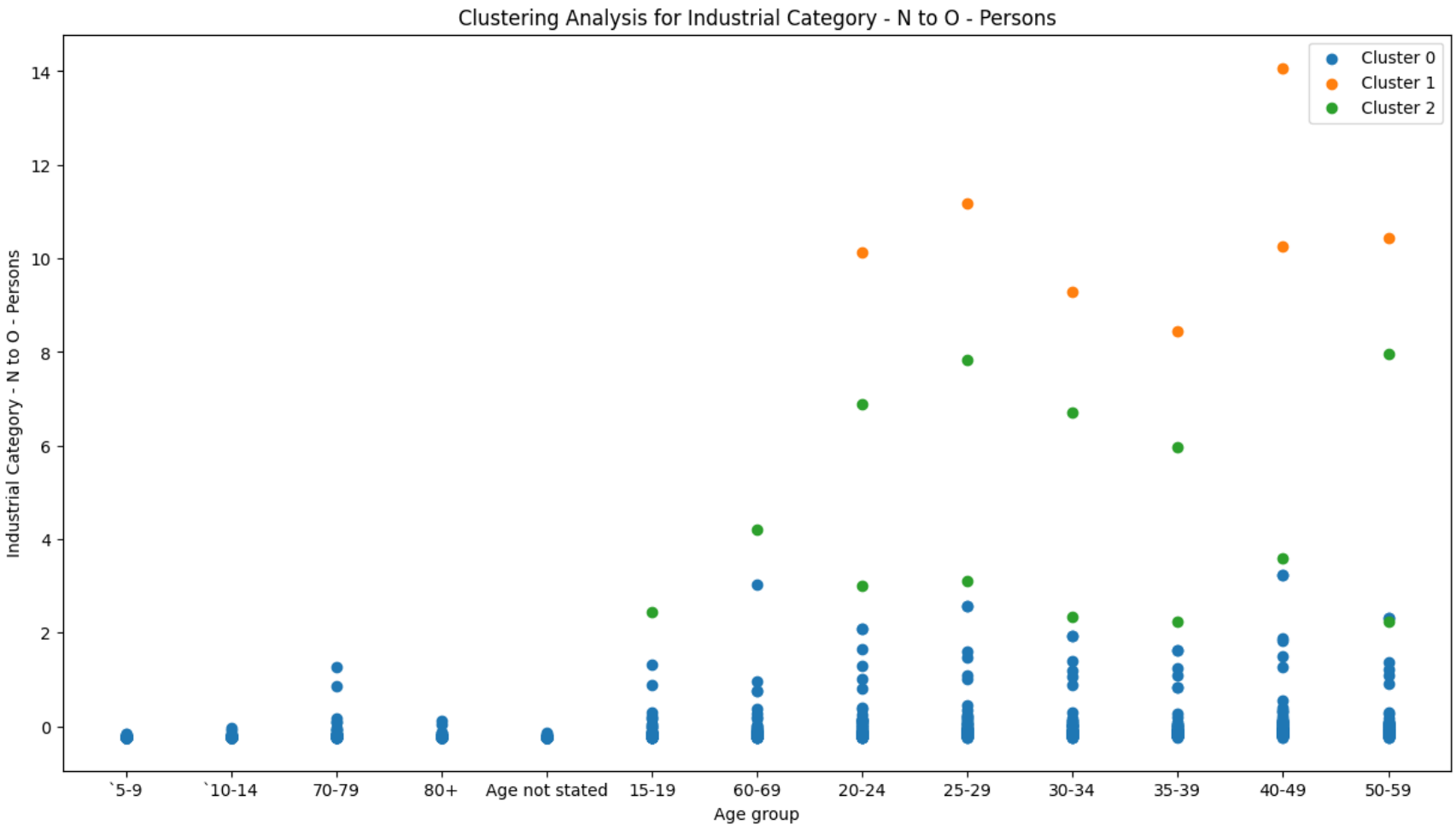

Clustering Analysis for Industrial Category - J - Non HHI - Males
Industrial Category - J - Non HHI - Males
Age group
Cluster 0
Cluster 1
Cluster 2
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

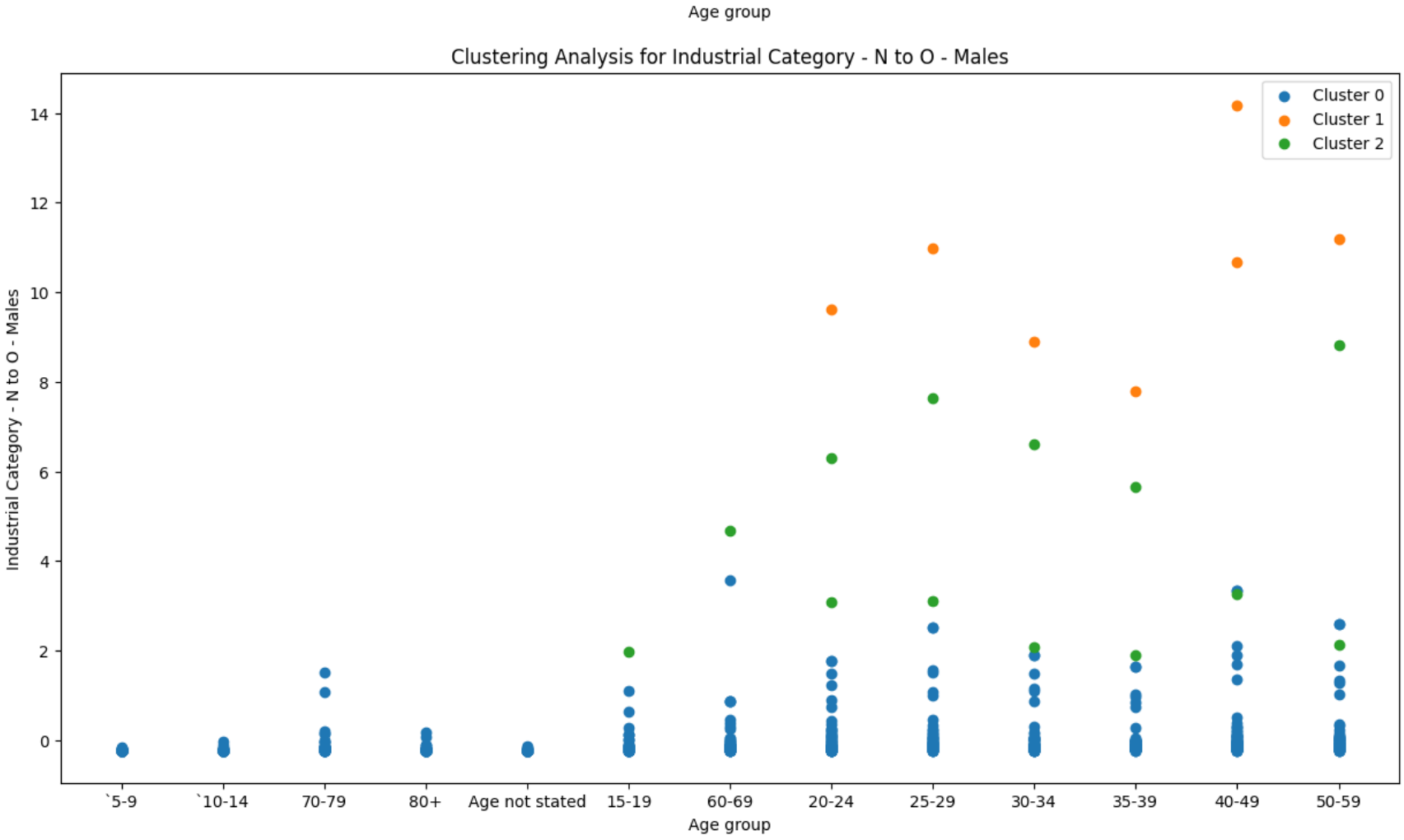

Clustering Analysis for Industrial Category - J - Non HHI - Females
Industrial Category - J - Non HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

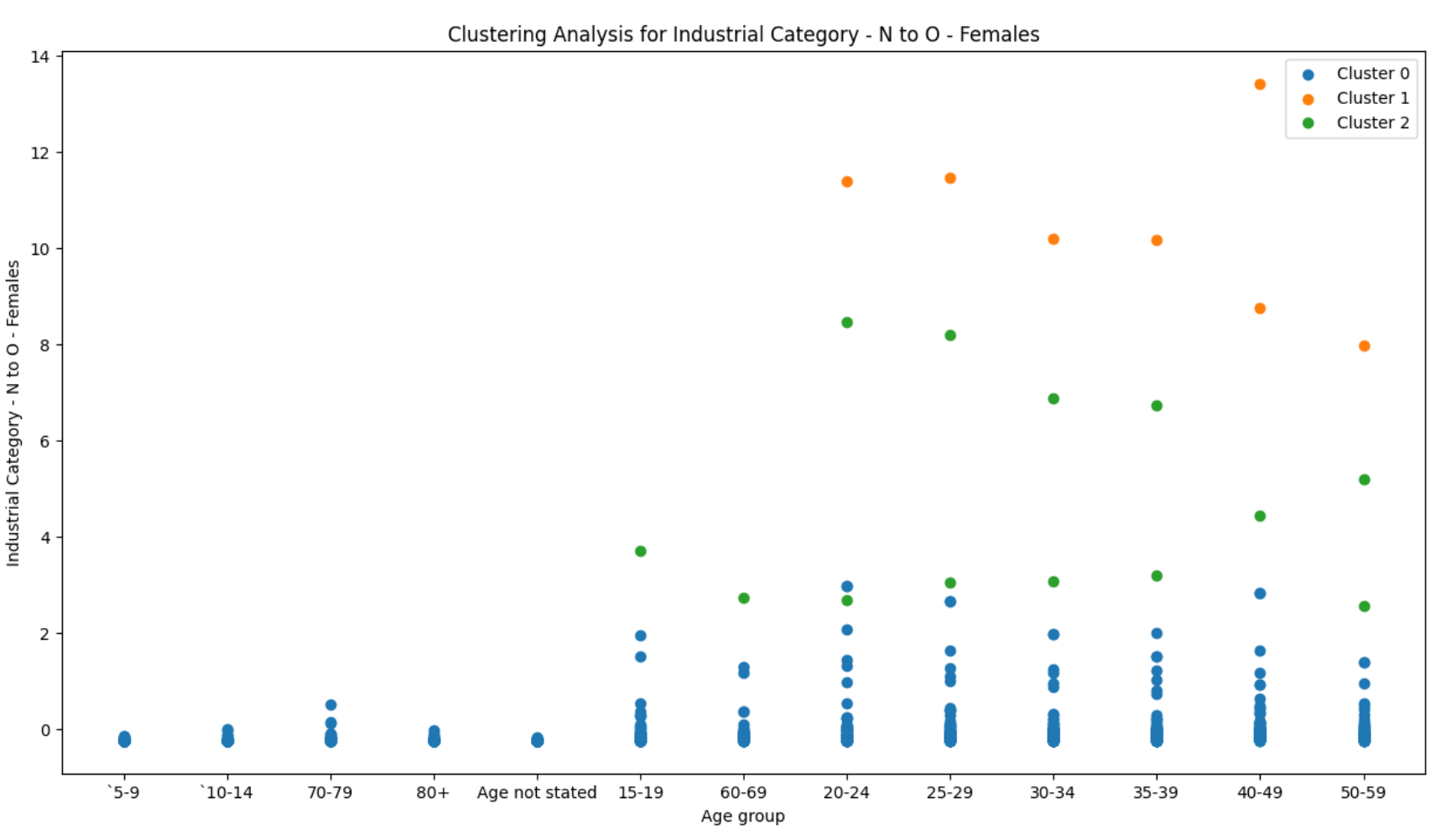

Clustering Analysis for Industrial Category - K to M - Persons
Industrial Category - K to M - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

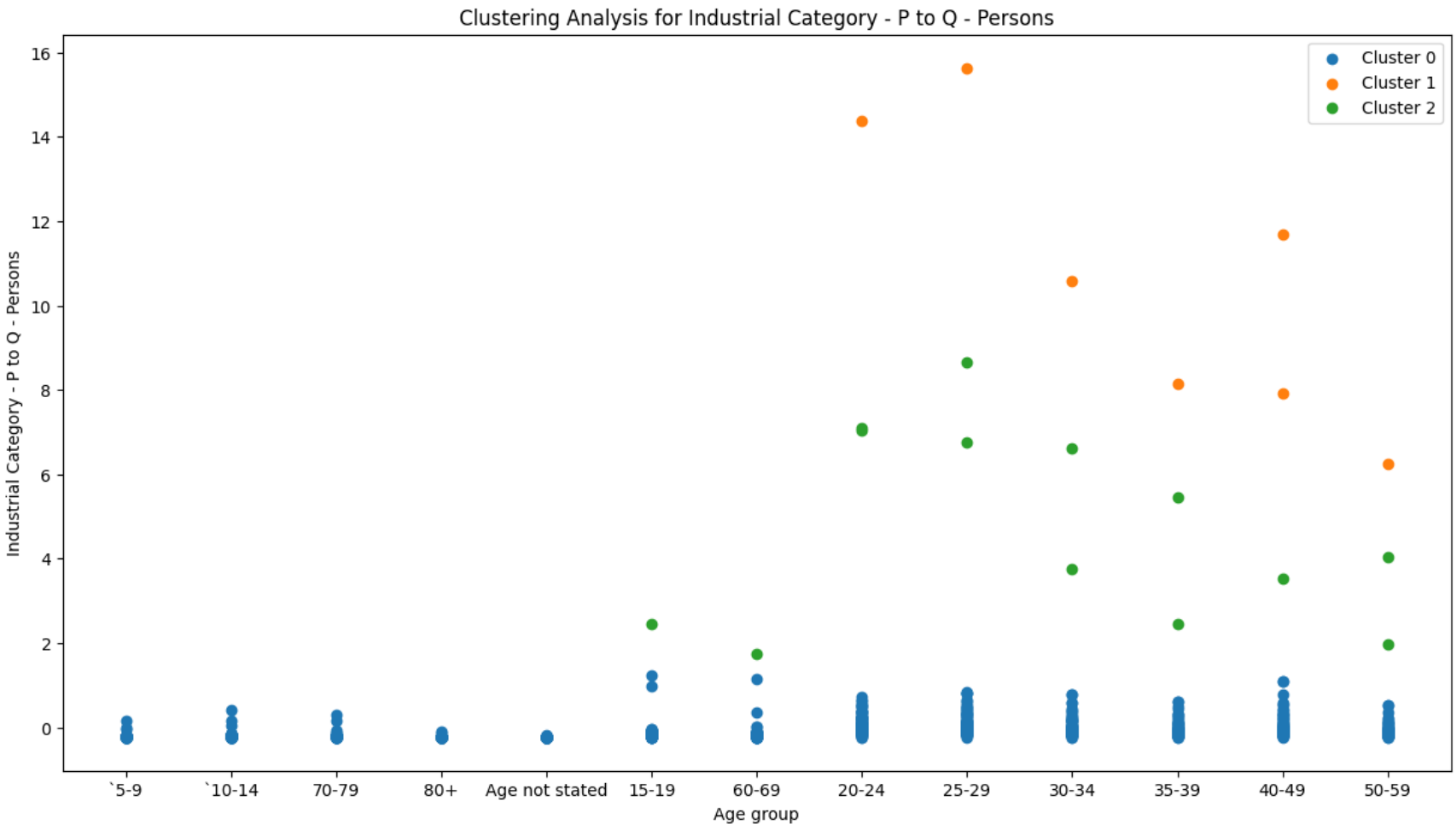

Clustering Analysis for Industrial Category - K to M - Males
Industrial Category - K to M - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

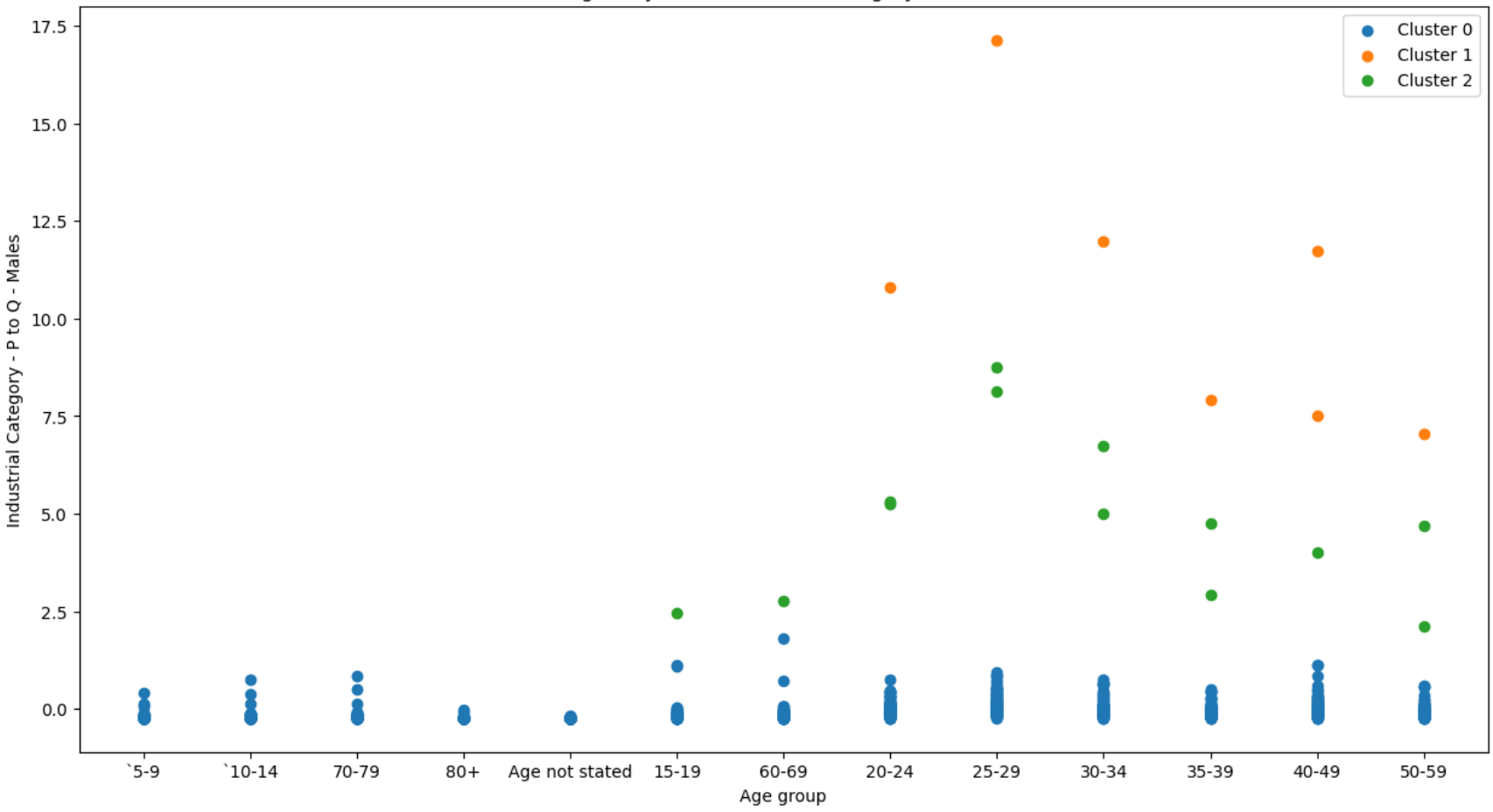

Clustering Analysis for Industrial Category - K to M - Females
Industrial Category - K to M - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

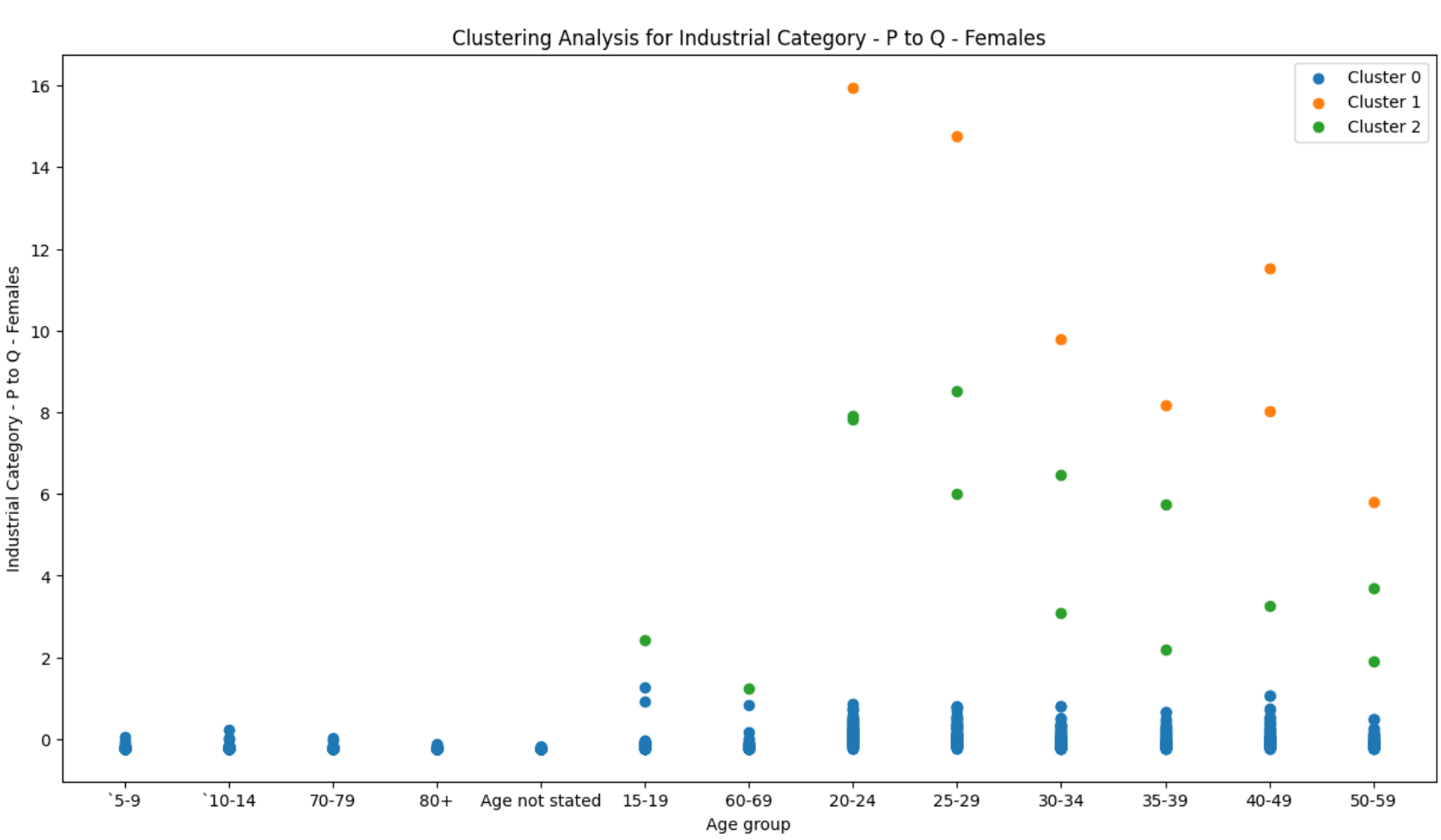

Clustering Analysis for Industrial Category - N to O - Persons
Cluster 0
Cluster 1
Cluster 2
Industrial Category - N to O - Persons
0
2
4
6
8
10
12
14
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group

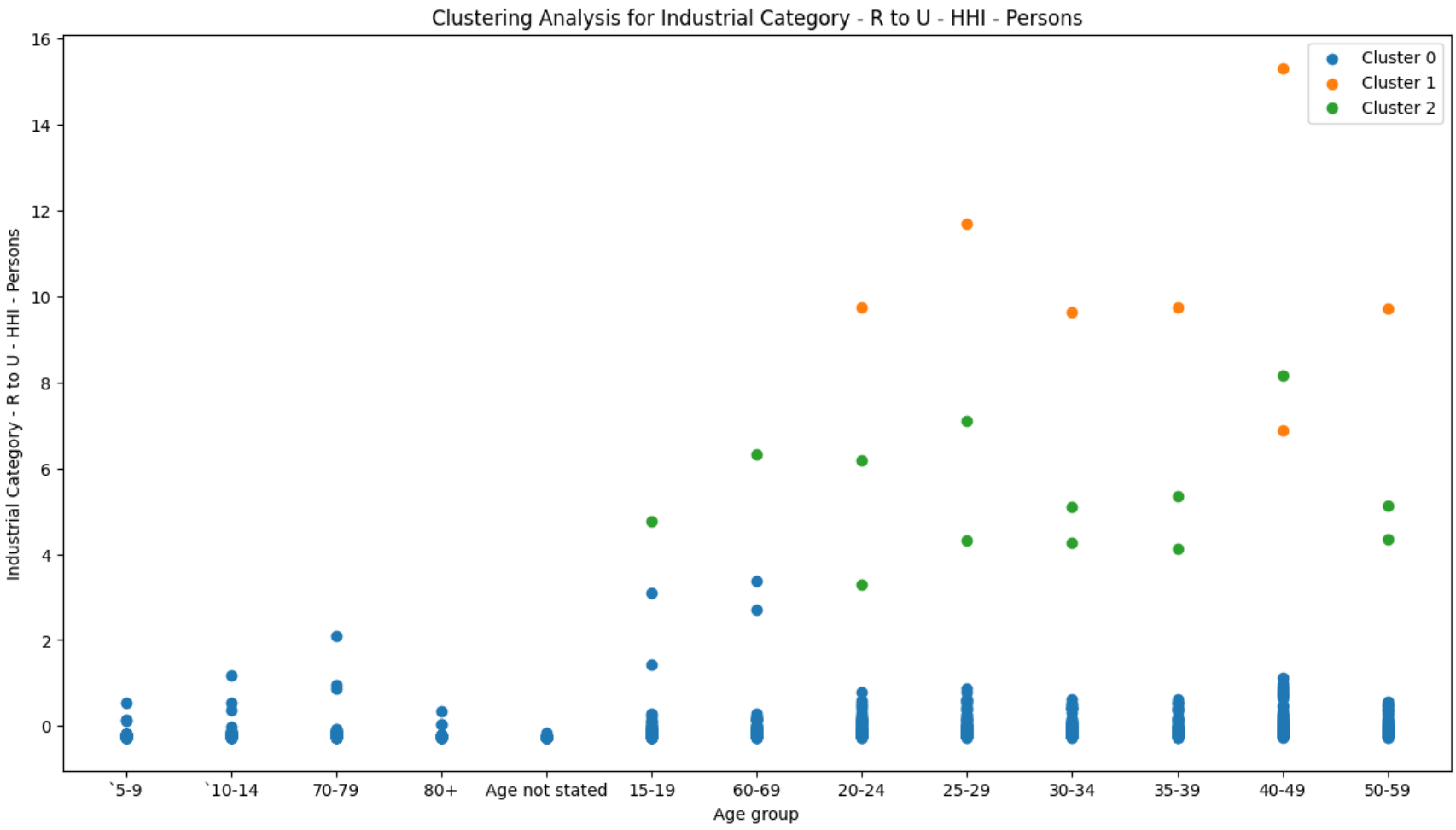

Clustering Analysis for Industrial Category - N to O - Males
Cluster 0
Cluster 1
Cluster 2
Industrial Category - N to O - Males
0
2
4
6
8
10
12
14
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group

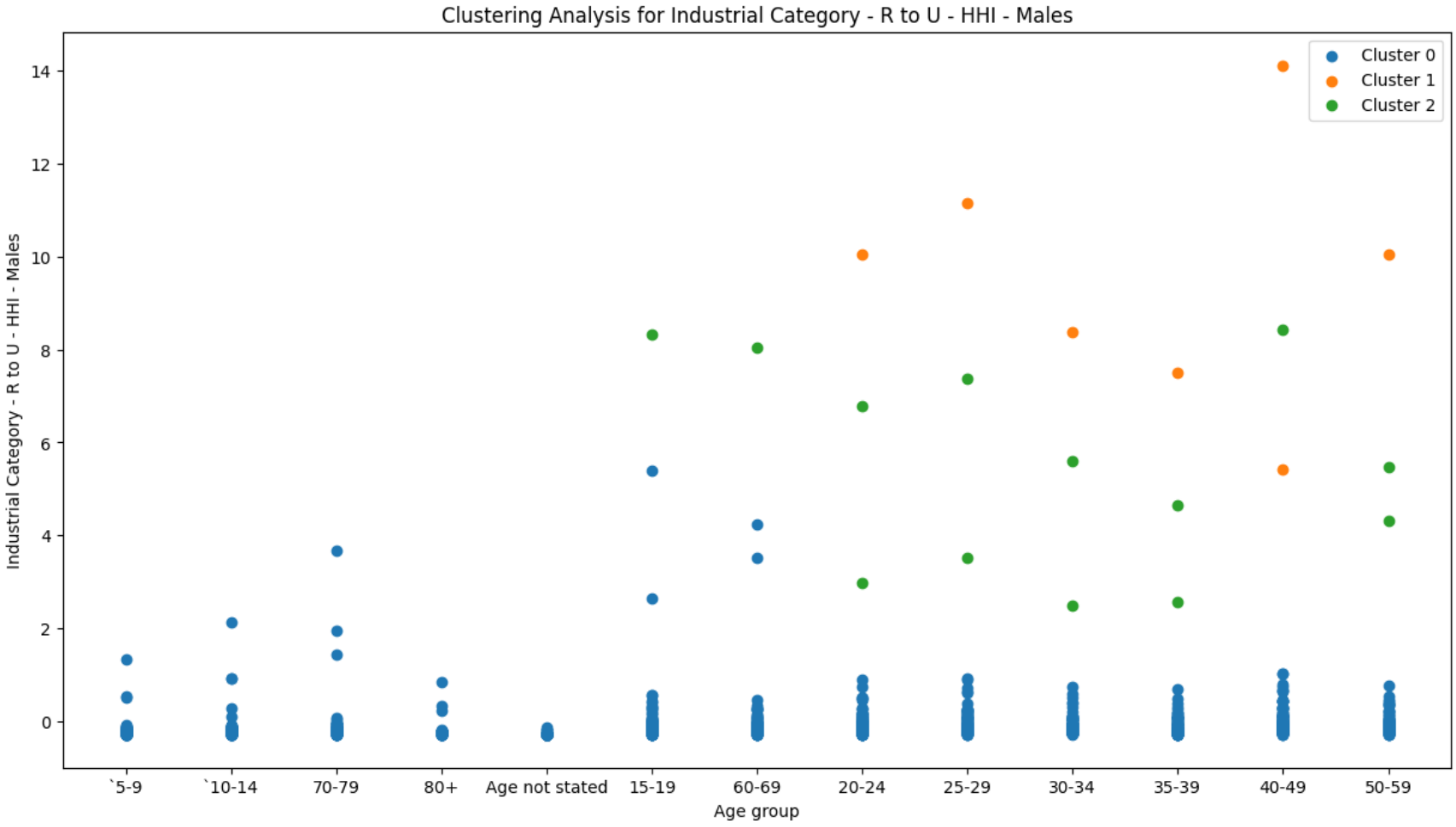

Clustering Analysis for Industrial Category - N to O - Females
Cluster 0
Cluster 1
Cluster 2
Industrial Category - N to O - Females
0
2
4
6
8
10
12
14
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59
Age group

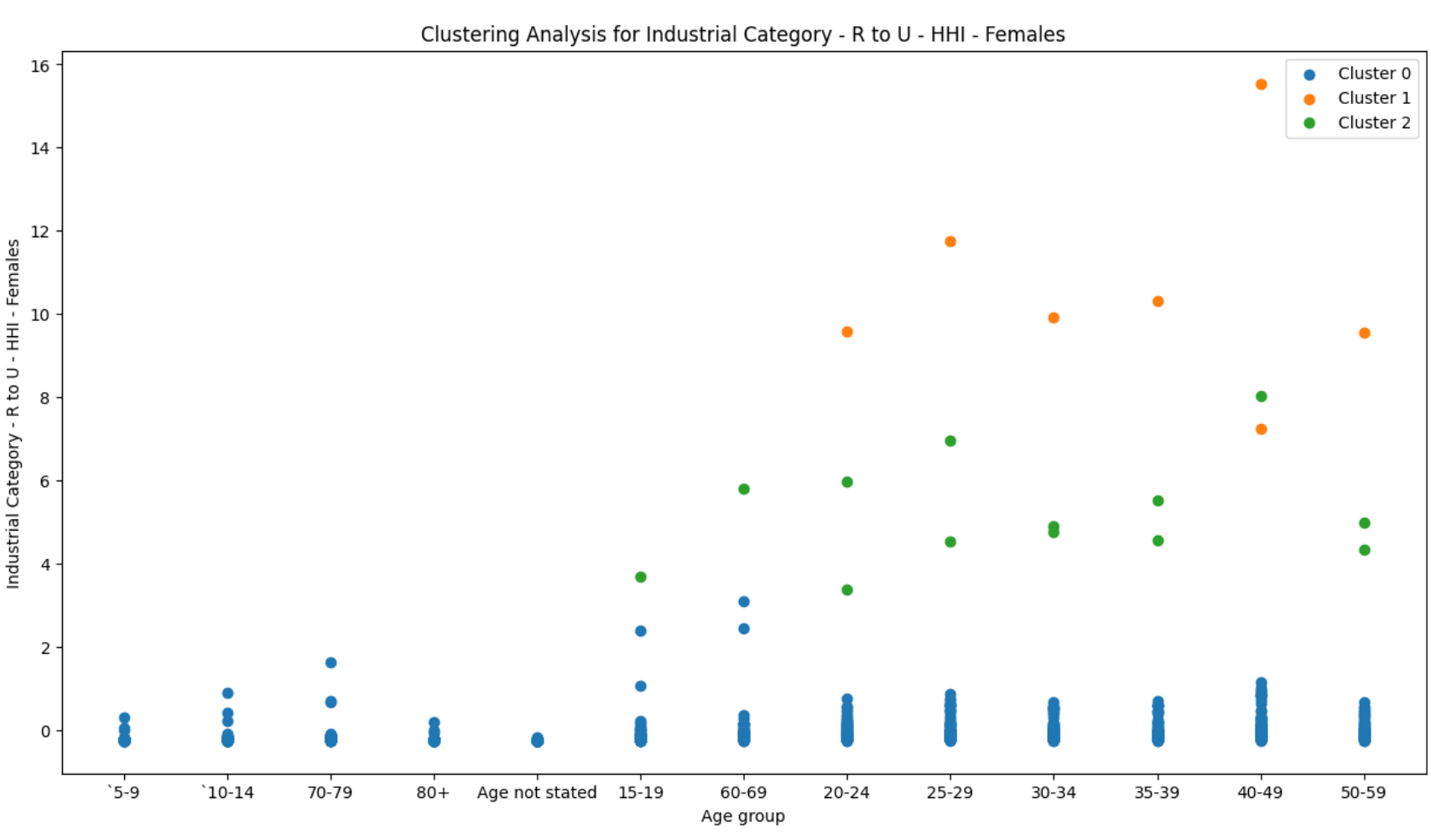

Clustering Analysis for Industrial Category - P to Q - Persons
Industrial Category - P to Q - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

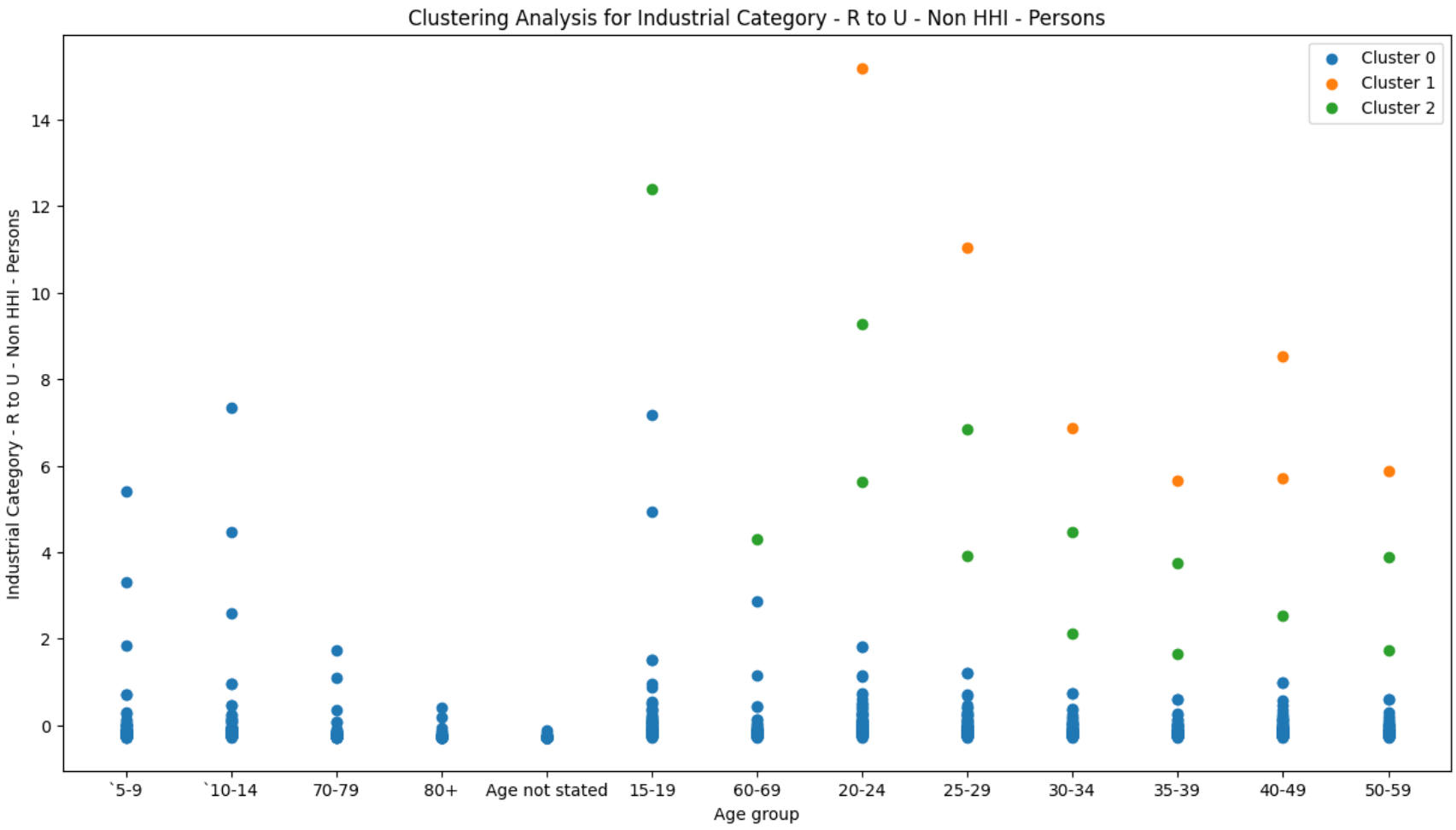

Clustering Analysis for Industrial Category - P to Q - Males
Industrial Category - P to Q - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

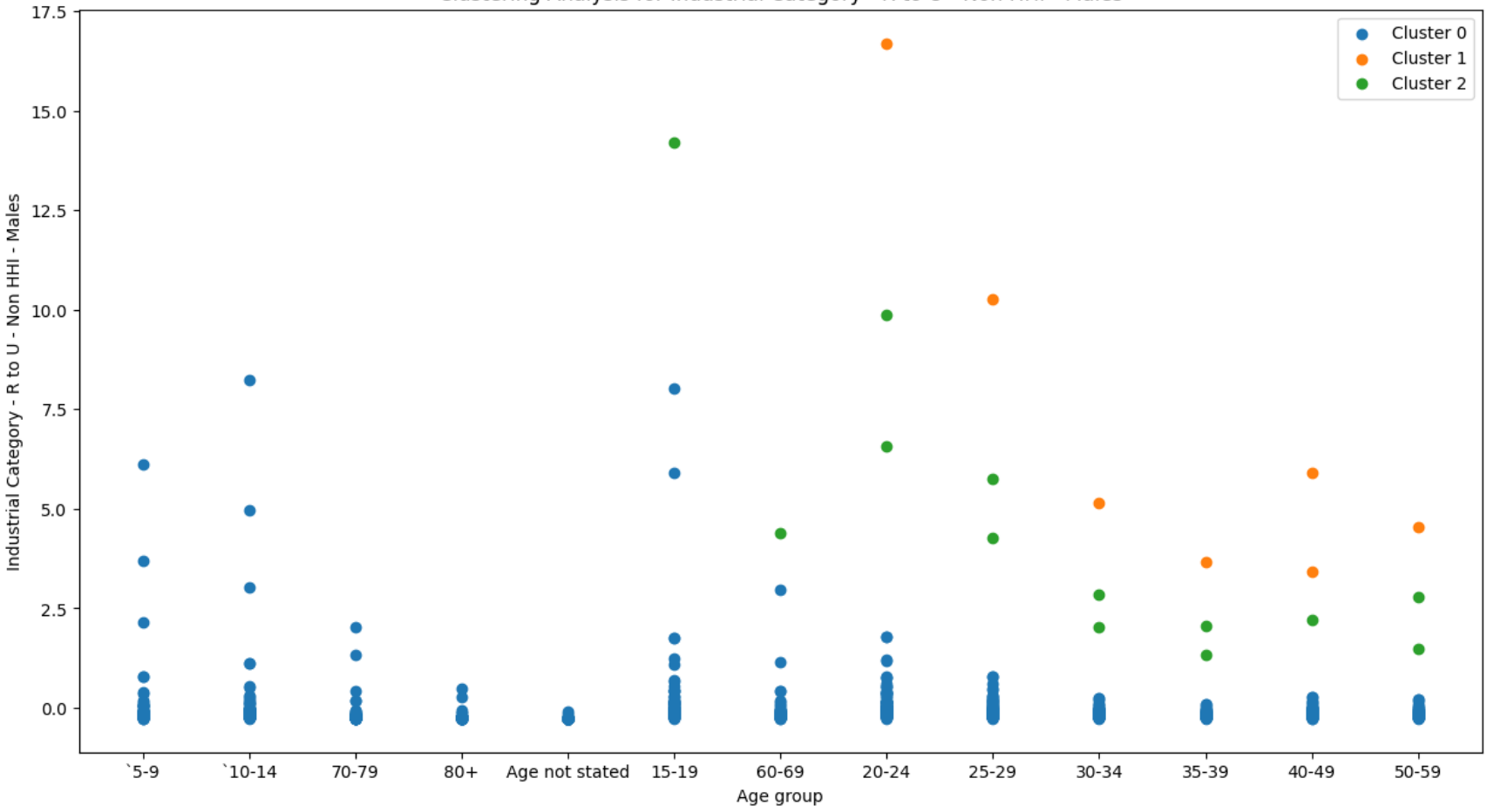

Clustering Analysis for Industrial Category - P to Q - Females
Industrial Category - P to Q - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59

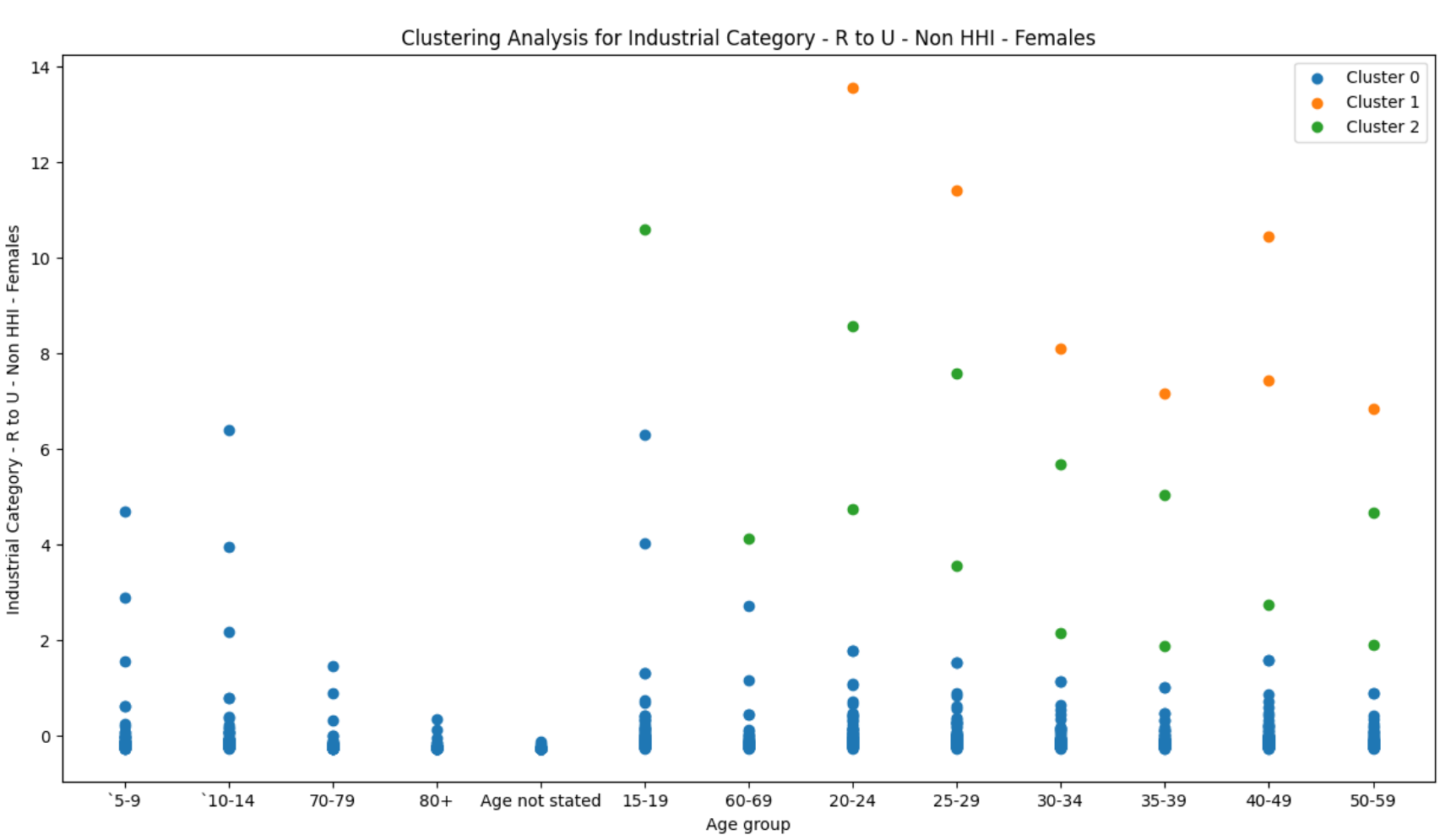

Clustering Analysis for Industrial Category - R to U - HHI - Persons
Industrial Category - R to U - HHI - Persons
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59


Clustering Analysis for Industrial Category - R to U - HHI - Males
Industrial Category - R to U - HHI - Males
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59


Clustering Analysis for Industrial Category - R to U - HHI - Females
Industrial Category - R to U - HHI - Females
Age group
Cluster 0
Cluster 1
Cluster 2
`5-9
`10-14
70-79
80+
Age not stated
15-19
60-69
20-24
25-29
30-34
35-39
40-49
50-59







In [ ]:
```
districts = df['Area Name'].unique()
print(districts)
```

```
['State - TAMIL NADU' 'District - Thiruvallur' 'District - Chennai'
 'District - Kancheepuram' 'District - Vellore'
 'District - Tiruvannamalai' 'District - Viluppuram' 'District - Salem'
 'District - Namakkal' 'District - Erode' 'District - The Nilgiris'
 'District - Dindigul' 'District - Karur' 'District - Tiruchirappalli'
 'District - Perambalur' 'District - Ariyalur' 'District - Cuddalore'
 'District - Nagapattinam' 'District - Thiruvarur' 'District - Thanjavur'
 'District - Pudukkottai' 'District - Sivaganga' 'District - Madurai'
 'District - Theni' 'District - Virudhunagar' 'District - Ramanathapuram'
 'District - Thoothukkudi' 'District - Tirunelveli'
 'District - Kanniyakumari' 'District - Dharmapuri'
 'District - Krishnagiri' 'District - Coimbatore' 'District - Tiruppur']
```

In [ ]:
```
df.columns
```

Out[ ]:
```
Index(['Table Code', 'State Code', 'District Code', 'Area Name',
       'Total/ Rural/ Urban', 'Age group',
       'Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females',
       'Industrial Category - A - Cultivators - Persons',
       'Industrial Category - A - Cultivators - Males',
       'Industrial Category - A - Cultivators - Females',
       'Industrial Category - A - Agricultural labourers - Persons',
       'Industrial Category - A - Agricultural labourers - Males',
       'Industrial Category - A - Agricultural labourers - Females',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
       'Industrial Category - B - Persons', 'Industrial Category - B - Males',
       'Industrial Category - B - Females',
       'Industrial Category - C - HHI - Persons',
       'Industrial Category - C - HHI - Males',
       'Industrial Category - C - HHI - Females',
       'Industrial Category - C - Non HHI - Persons',
       'Industrial Category - C - Non HHI - Males',
       'Industrial Category - C - Non HHI - Females',
       'Industrial Category - D & E - Persons',
       'Industrial Category - D & E - Males',
       'Industrial Category - D & E - Females',
       'Industrial Category - F - Persons', 'Industrial Category - F - Males',
       'Industrial Category - F - Females',
       'Industrial Category - G - HHI - Persons',
       'Industrial Category - G - HHI - Males',
       'Industrial Category - G - HHI - Females',
       'Industrial Category - G - Non HHI - Persons',
       'Industrial Category - G - Non HHI - Males',
       'Industrial Category - G - Non HHI - Females',
       'Industrial Category - H - Persons', 'Industrial Category - H - Males',
       'Industrial Category - H - Females',
       'Industrial Category - I - Persons', 'Industrial Category - I - Males',
       'Industrial Category - I - Females',
       'Industrial Category - J - HHI - Persons',
       'Industrial Category - J - HHI - Males',
       'Industrial Category - J - HHI - Females',
       'Industrial Category - J - Non HHI - Persons',
       'Industrial Category - J - Non HHI - Males',
       'Industrial Category - J - Non HHI - Females',
       'Industrial Category - K to M - Persons',
       'Industrial Category - K to M - Males',
       'Industrial Category - K to M - Females',
       'Industrial Category - N to O - Persons',
       'Industrial Category - N to O - Males',
       'Industrial Category - N to O - Females',
       'Industrial Category - P to Q - Persons',
       'Industrial Category - P to Q - Males',
       'Industrial Category - P to Q - Females',
       'Industrial Category - R to U - HHI - Persons',
       'Industrial Category - R to U - HHI - Males',
       'Industrial Category - R to U - HHI - Females',
       'Industrial Category - R to U - Non HHI - Persons',
       'Industrial Category - R to U - Non HHI - Males',
       'Industrial Category - R to U - Non HHI - Females', 'Cluster'],
      dtype='object')
```

In [6]:
```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Assuming df is your DataFrame after data cleaning and clustering

# List of industrial category columns
industrial_categories = [
    'Industrial Category - A - Cultivators - Persons',
    'Industrial Category - A - Cultivators - Males',
    'Industrial Category - A - Cultivators - Females',
    # Add all other industrial category columns here
]

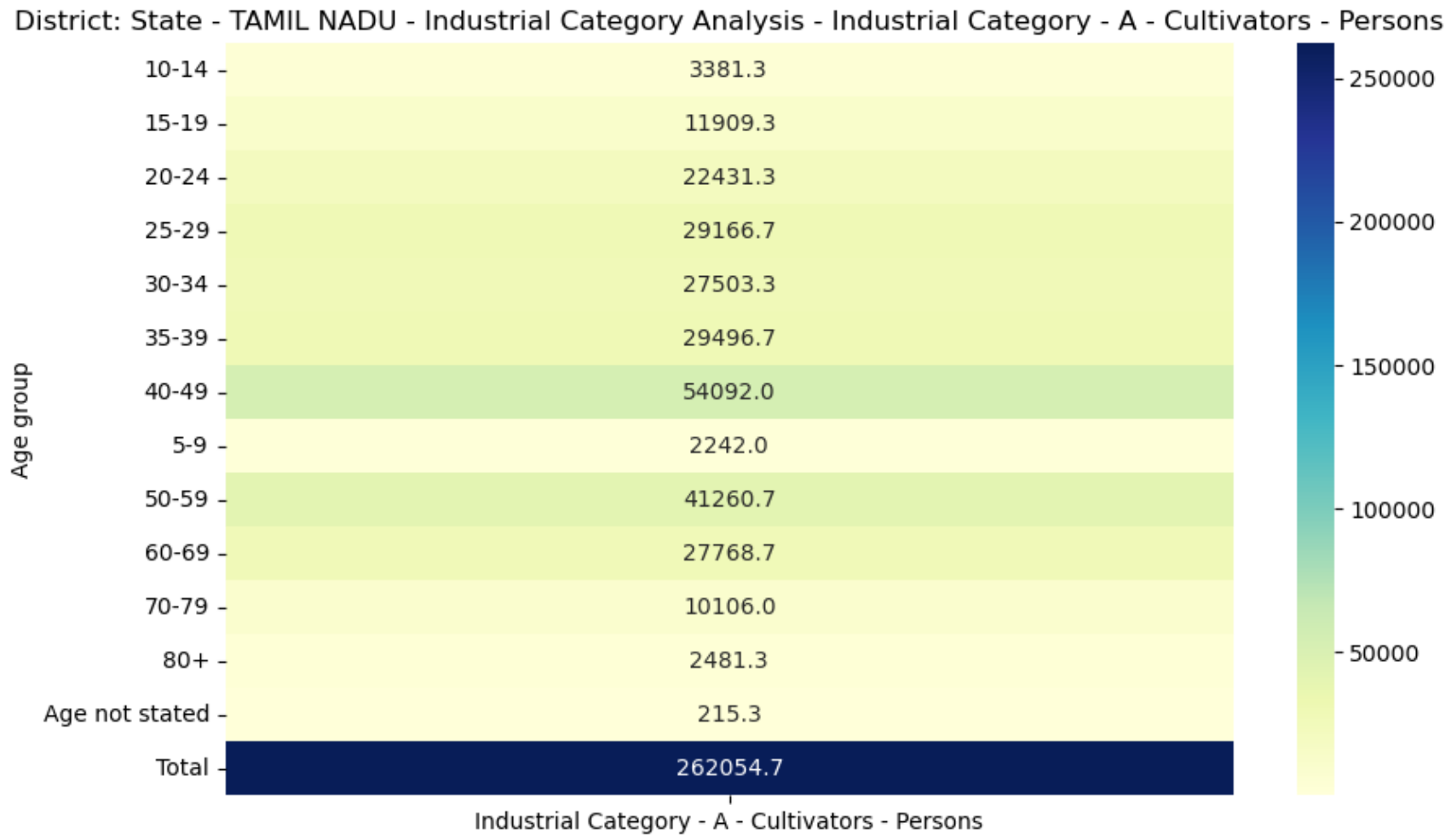
# List of district names
districts = df['Area Name'].unique()

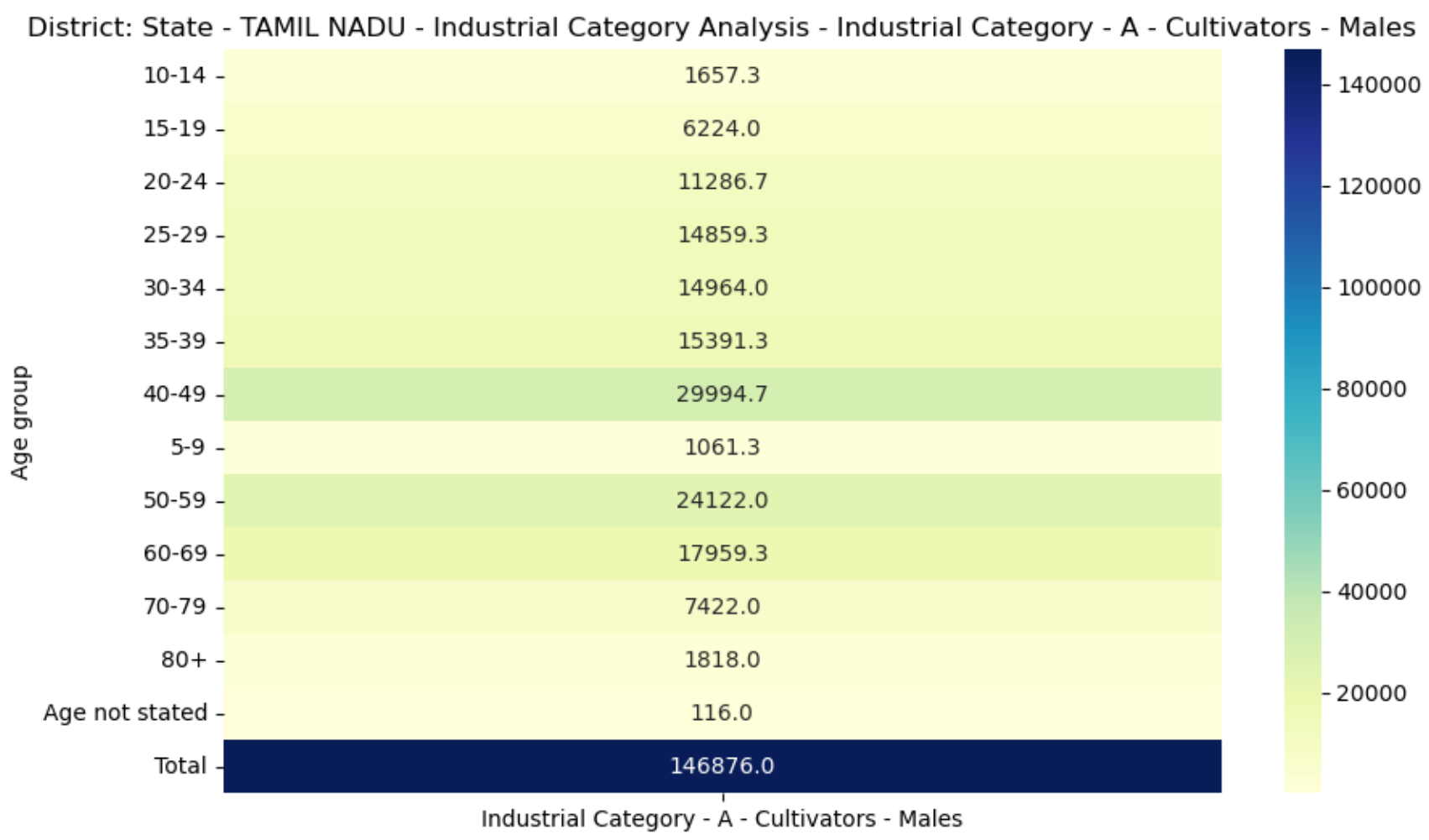
# Loop through districts
```

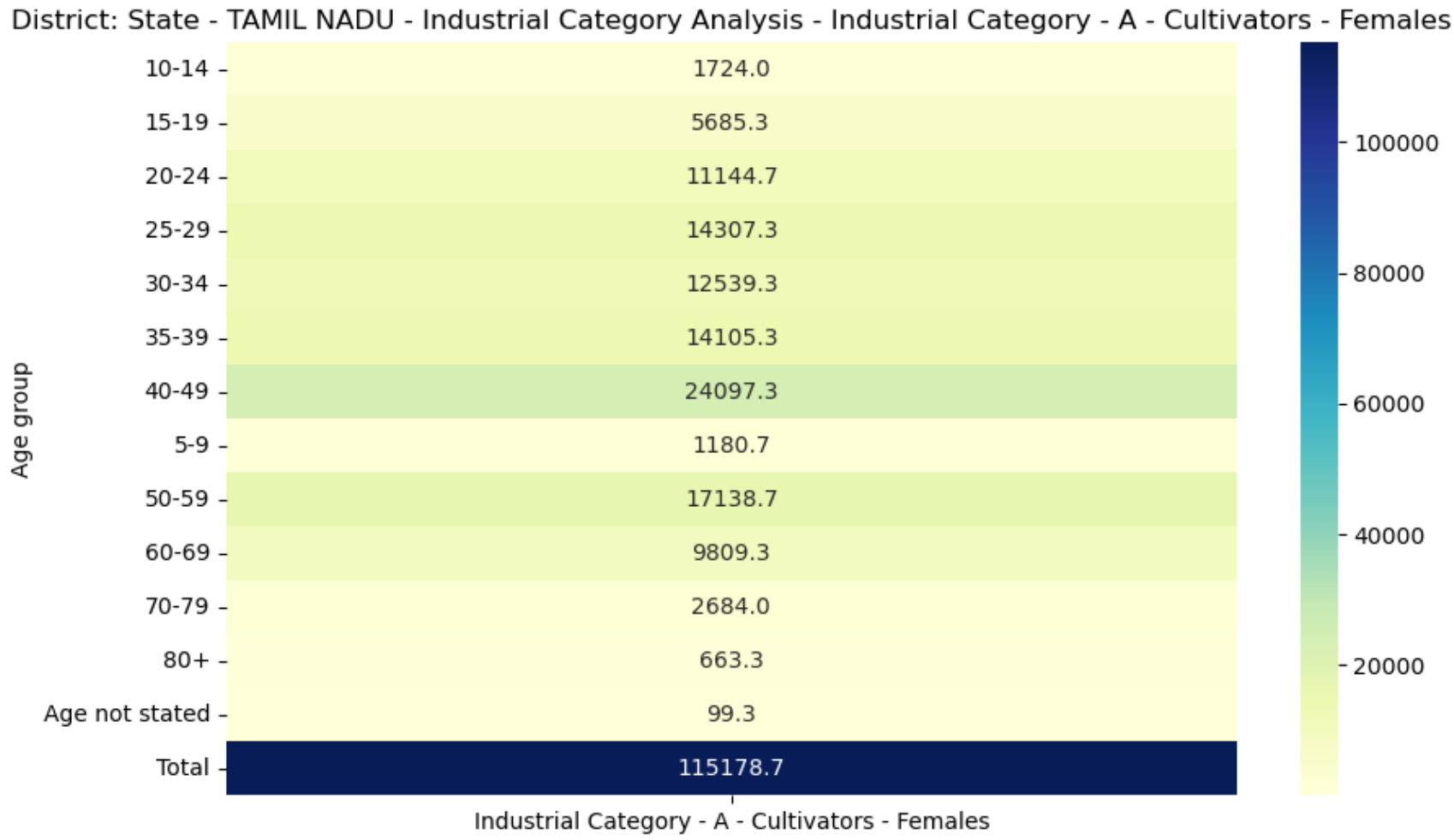
```
for district in districts:
    district_df = df[df['Area Name'] == district]

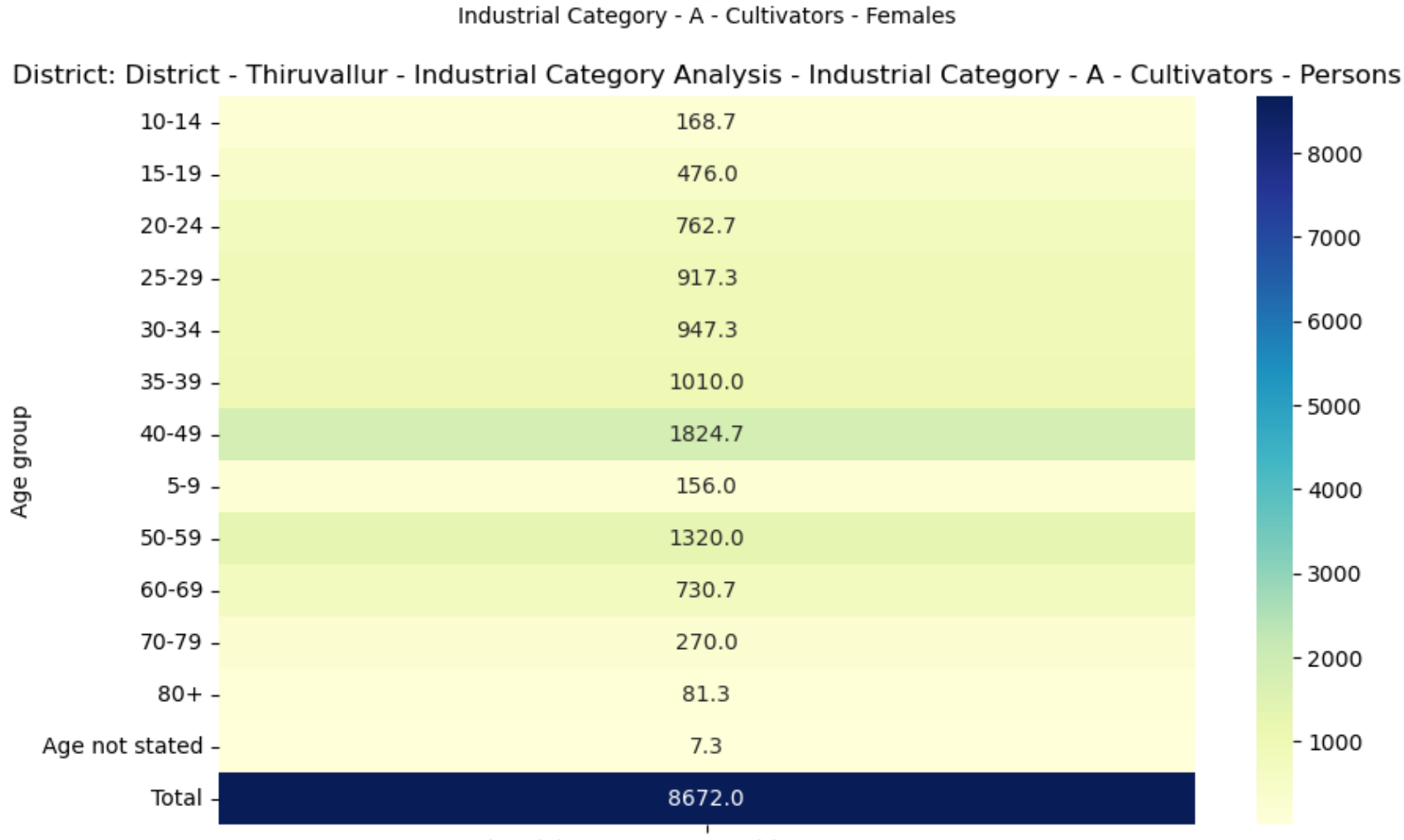
    # Loop through industrial categories
    for category in industrial_categories:
        # Create a pivot table for the specific category in the district
        pivot_table = district_df.pivot_table(index='Age group', values=category, aggfunc='mean')

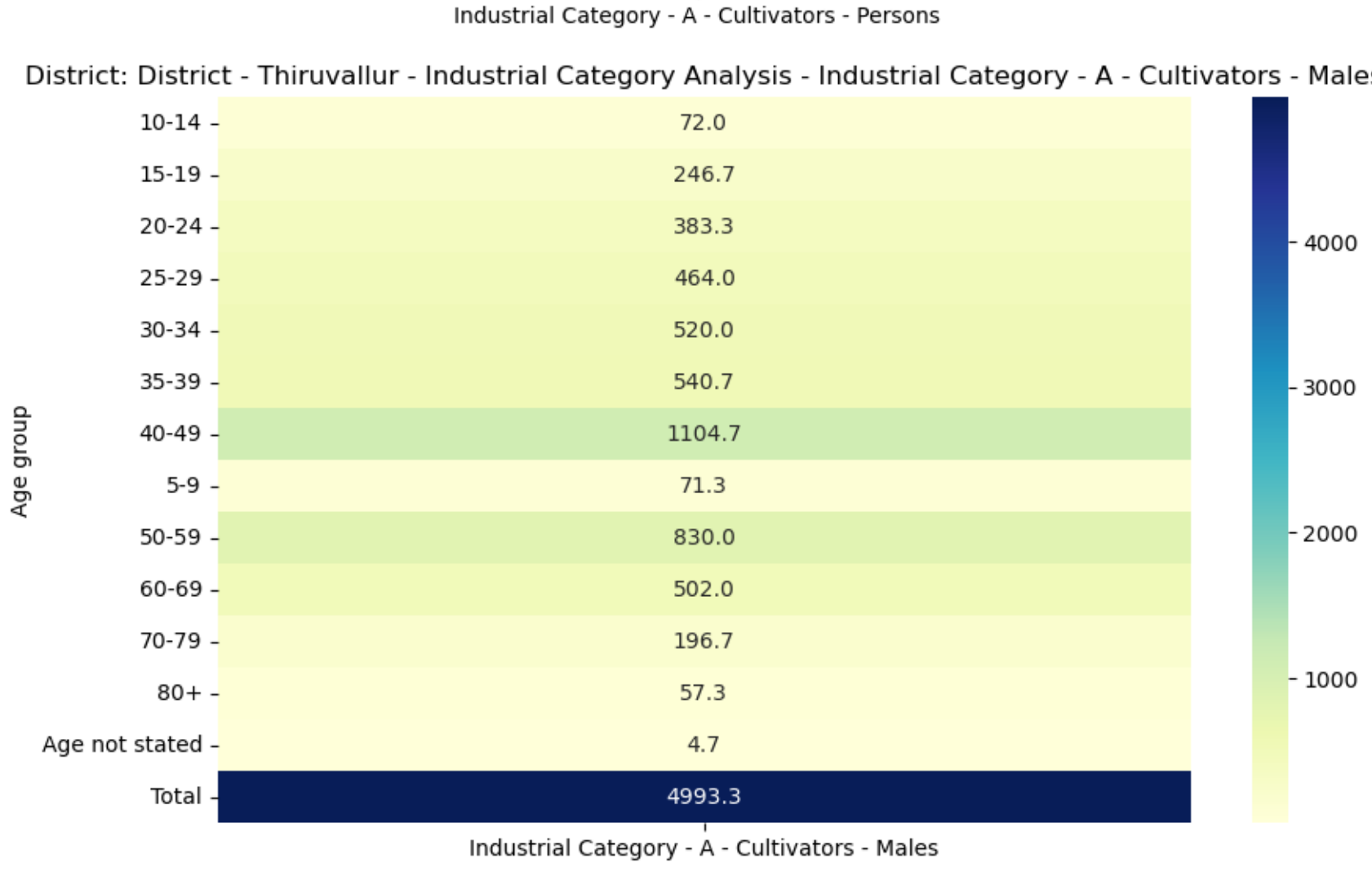
        # Create a heatmap
        plt.figure(figsize=(10, 6))
        sns.heatmap(pivot_table, annot=True, fmt=".1f", cmap='YlGnBu')
        plt.title(f'District: {district} - Industrial Category Analysis - {category}')
        plt.show()
```

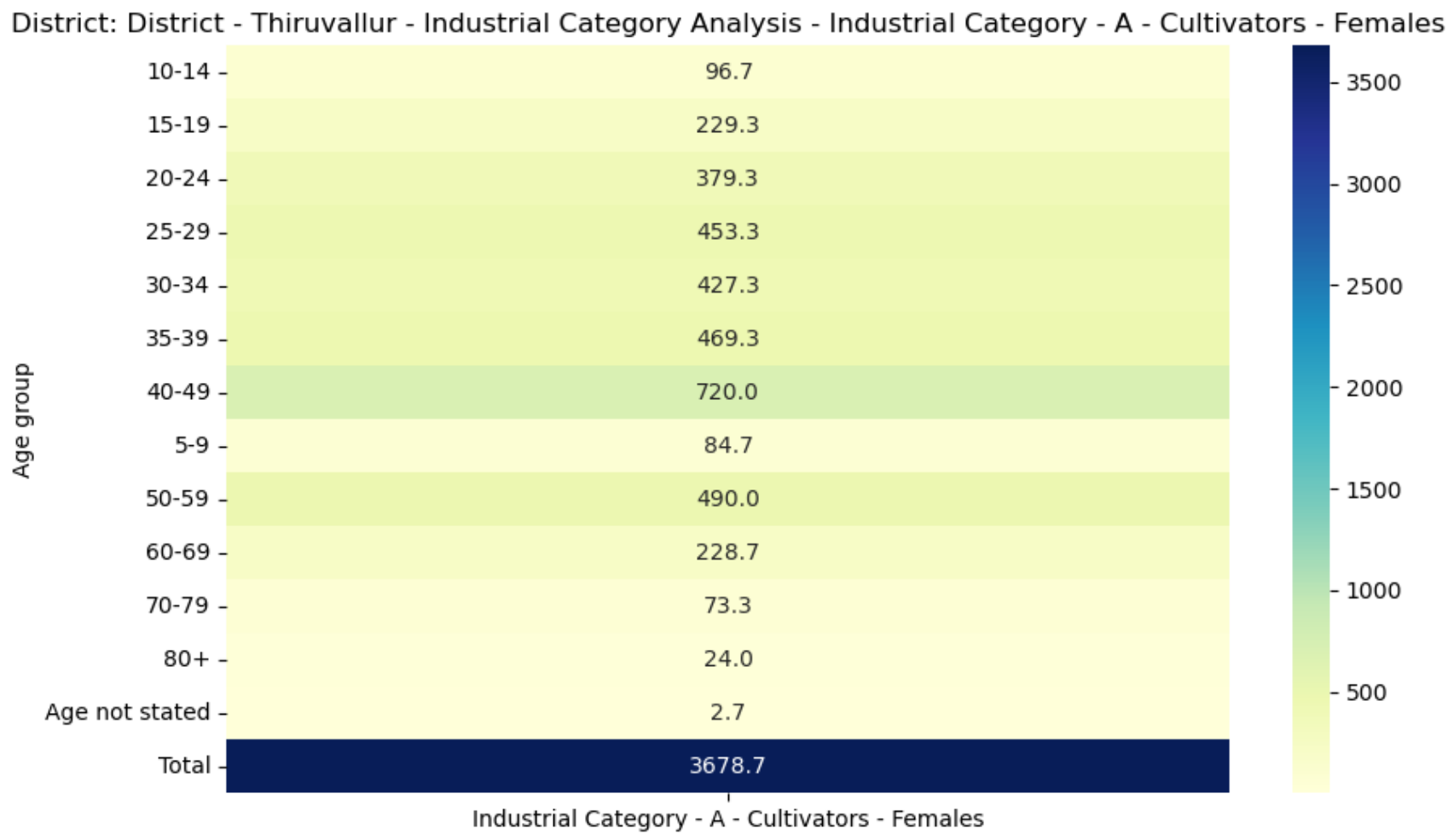


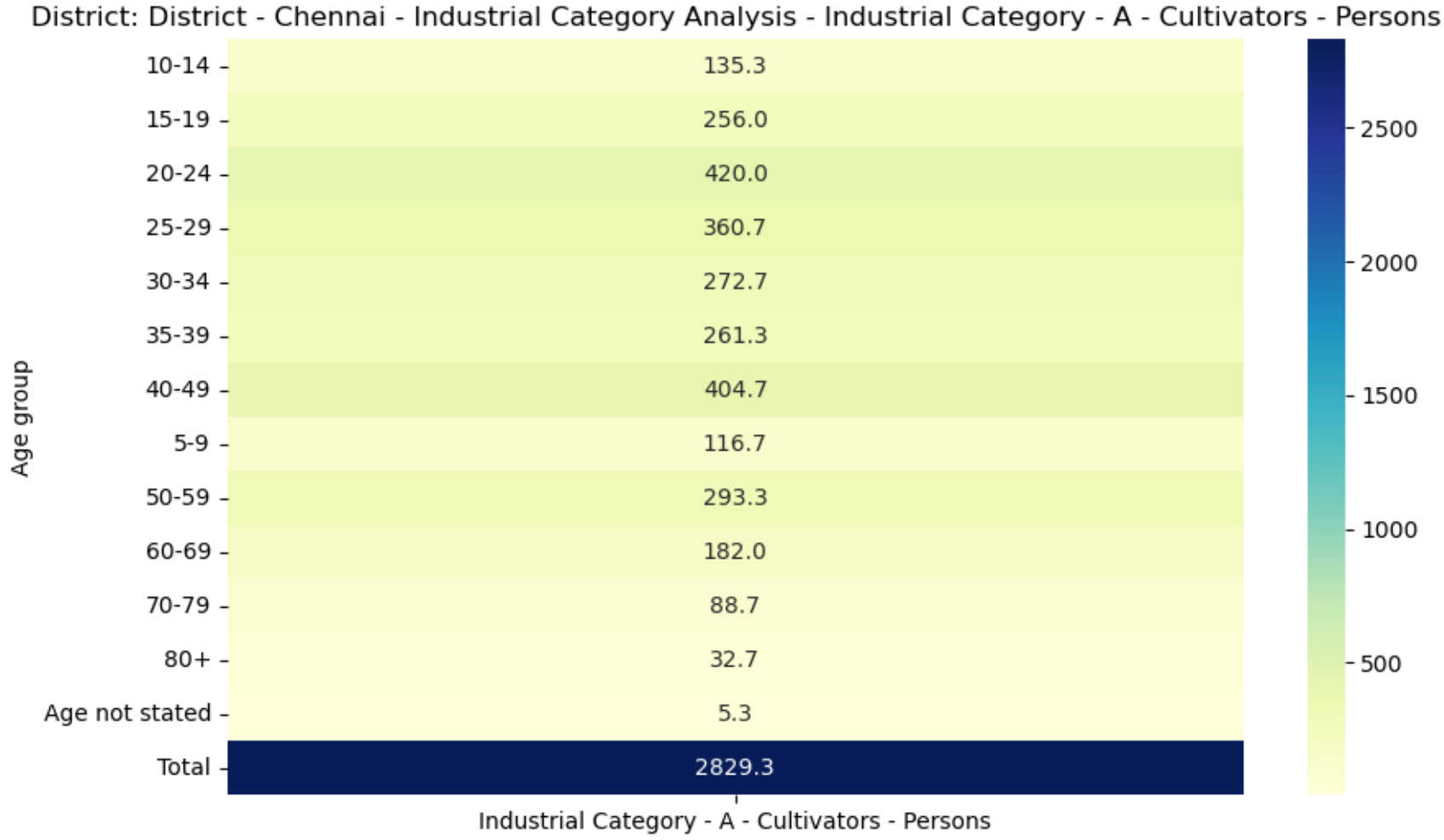


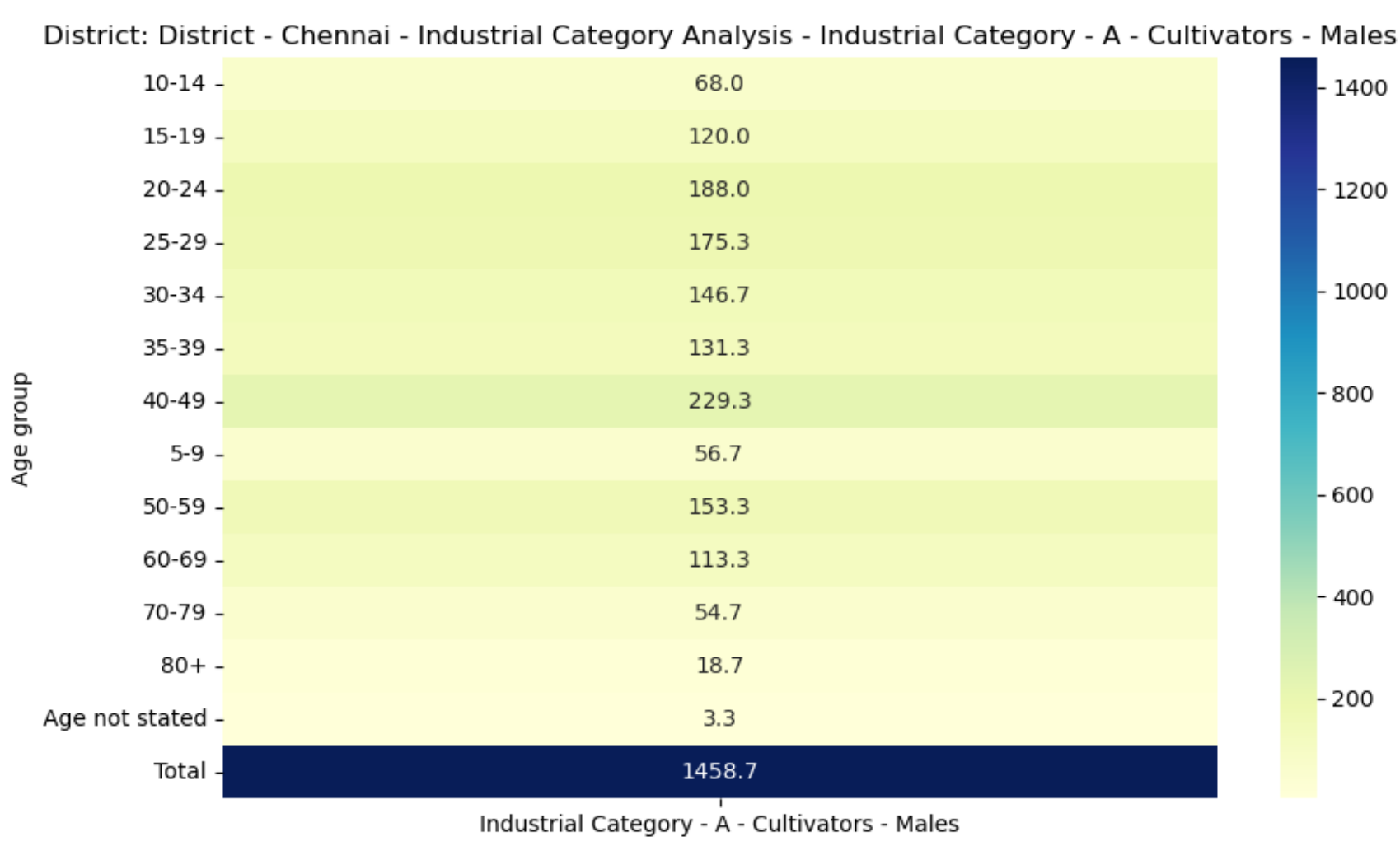

District: State - TAMIL NADU - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
1724.0
5685.3
11144.7
14307.3
12539.3
14105.3
24097.3
1180.7
17138.7
9809.3
2684.0
663.3
99.3
115178.7
Age group
Industrial Category - A - Cultivators - Females
100000
80000
60000
40000
20000

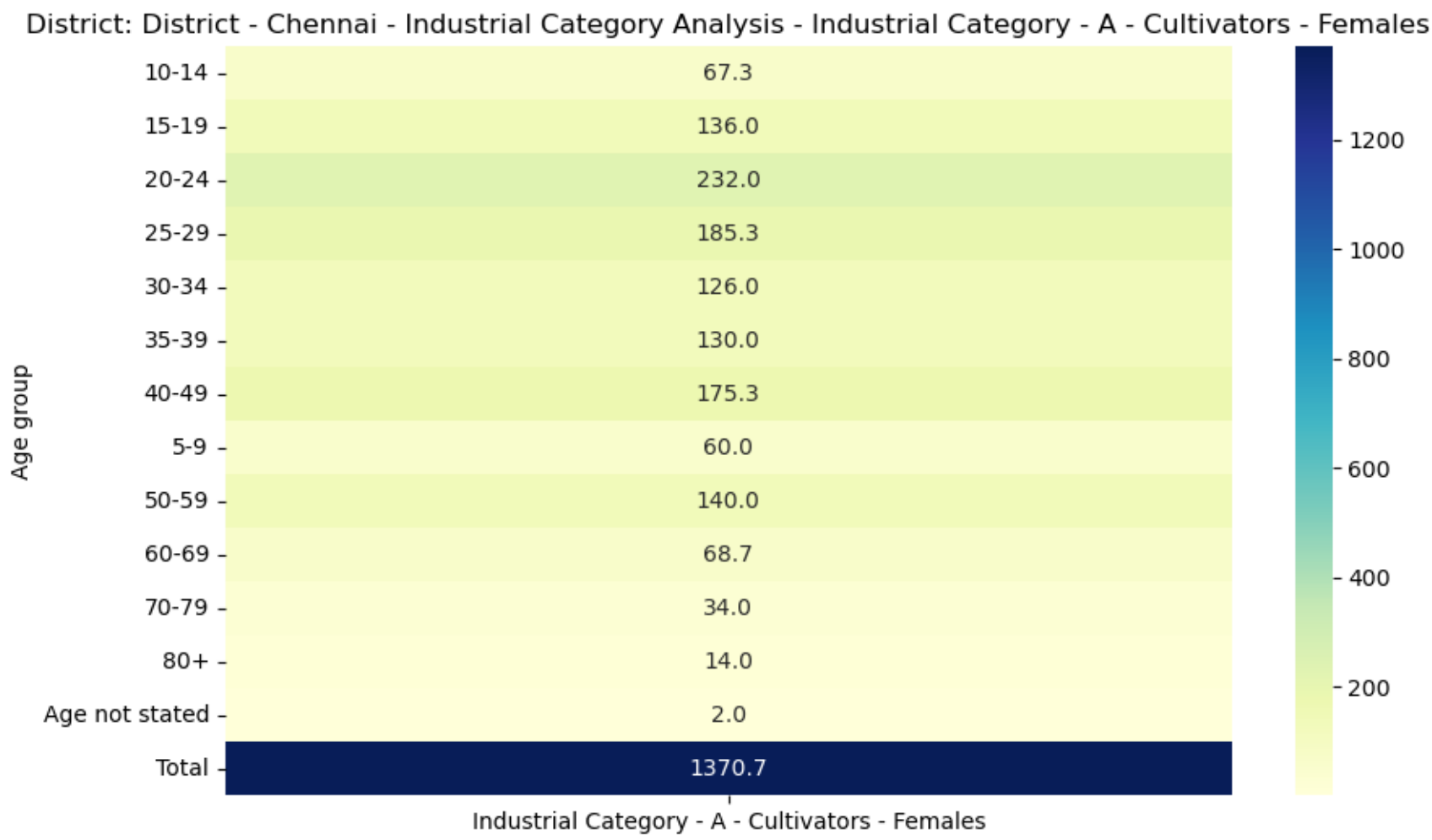

District: District - Thiruvallur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
168.7
476.0
762.7
917.3
947.3
1010.0
1824.7
156.0
1320.0
730.7
270.0
81.3
7.3
8672.0
Age group
Industrial Category - A - Cultivators - Persons
8000
7000
6000
5000
4000
3000
2000
1000

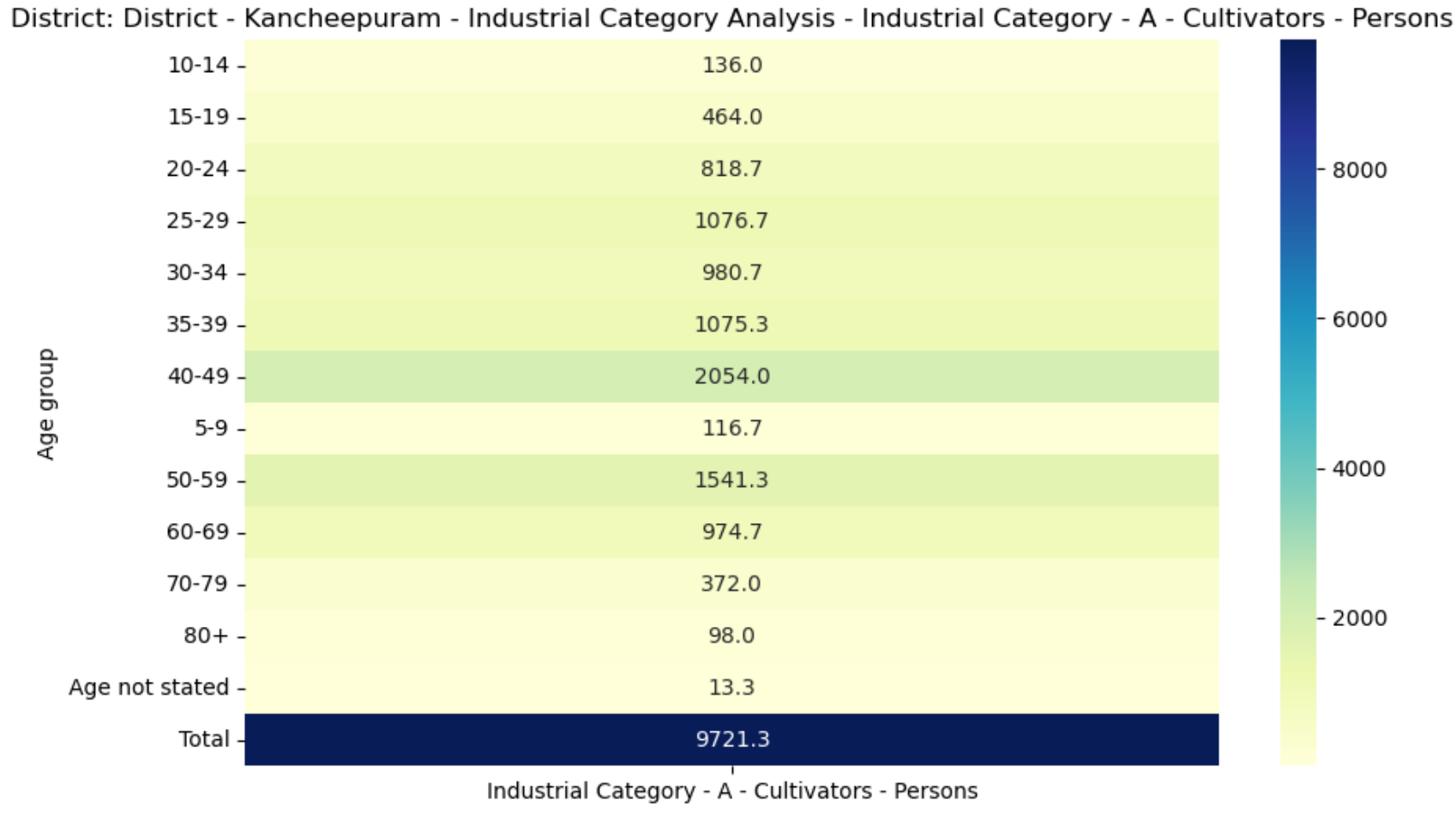

District: District - Thiruvallur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
72.0
246.7
383.3
464.0
520.0
540.7
1104.7
71.3
830.0
502.0
196.7
57.3
4.7
4993.3
Age group
Industrial Category - A - Cultivators - Males
4000
3000
2000
1000

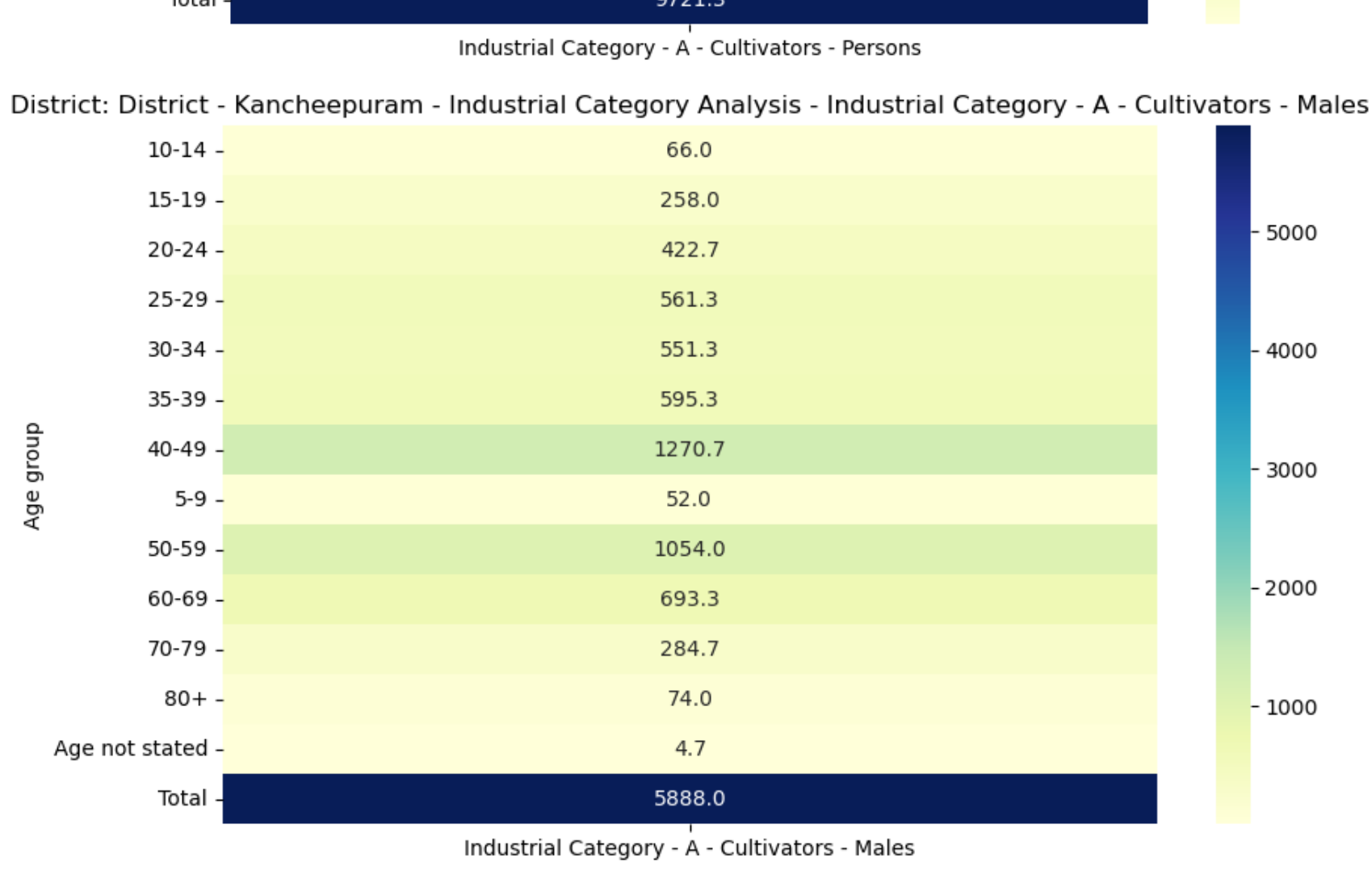

District: District - Thiruvallur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
96.7
229.3
379.3
453.3
427.3
469.3
720.0
84.7
490.0
228.7
73.3
24.0
2.7
3678.7
3500
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Females

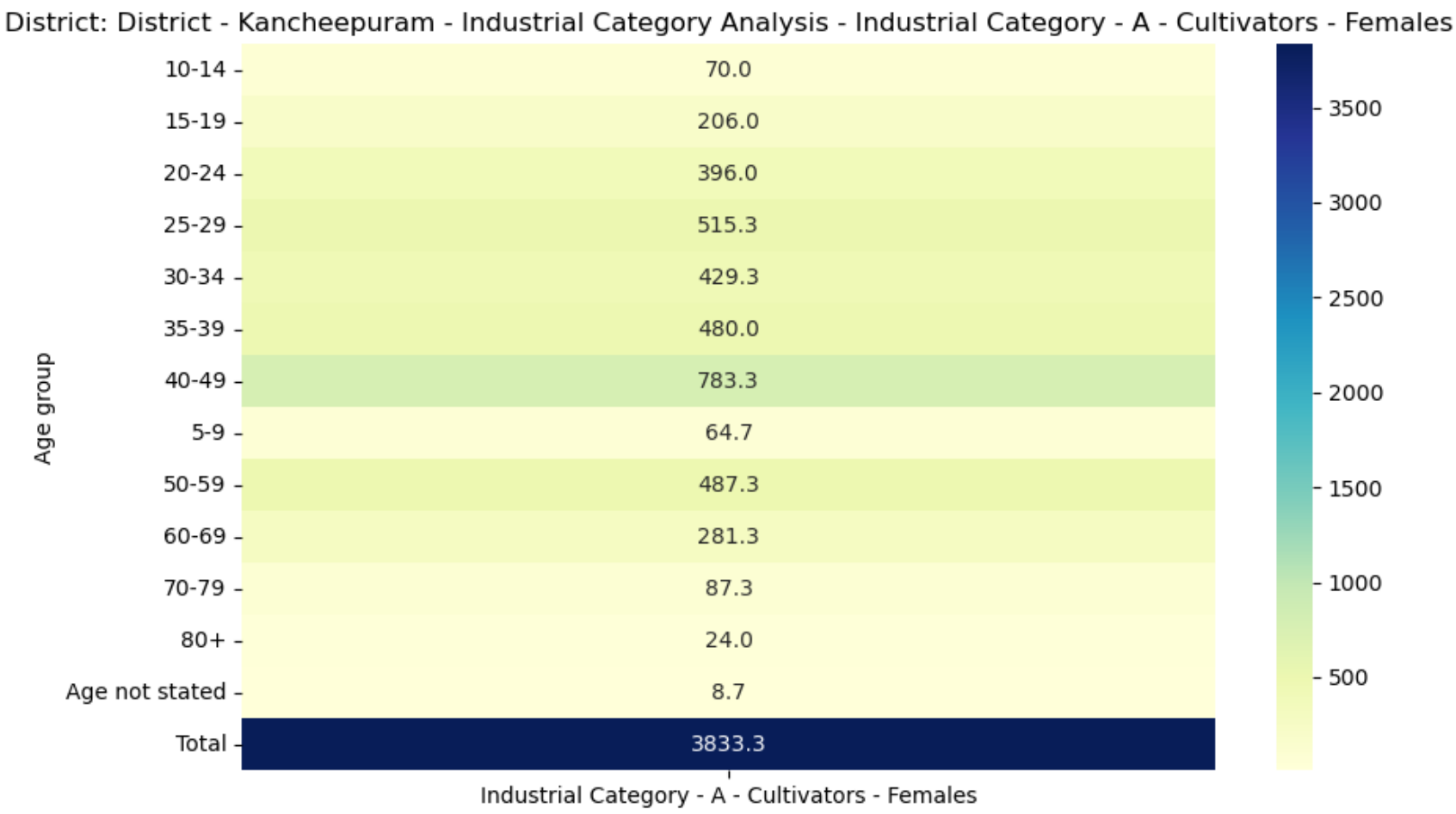

District: District - Chennai - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
135.3
256.0
420.0
360.7
272.7
261.3
404.7
116.7
293.3
182.0
88.7
32.7
5.3
2829.3
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Persons

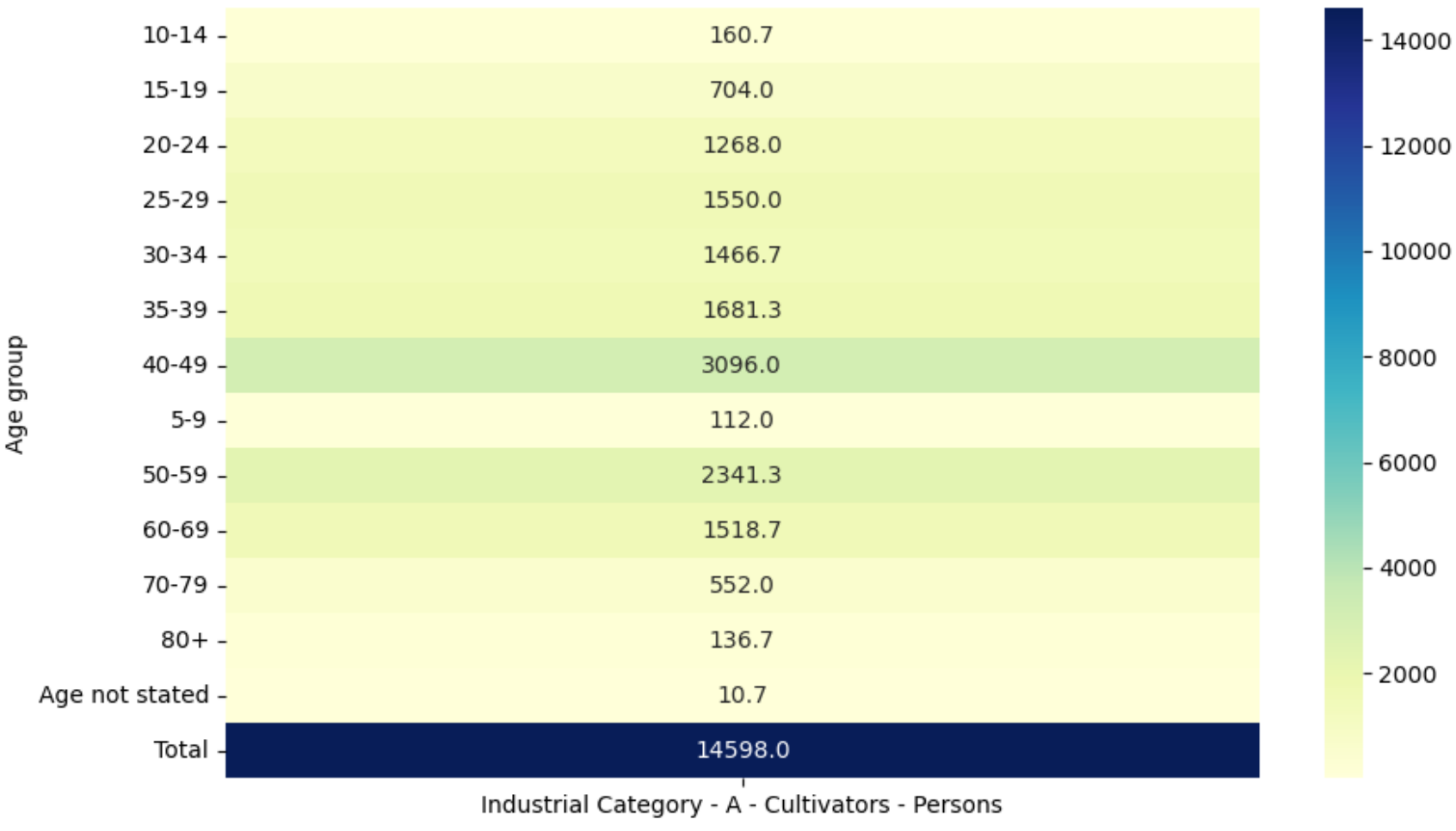

District: District - Chennai - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
68.0
120.0
188.0
175.3
146.7
131.3
229.3
56.7
153.3
113.3
54.7
18.7
3.3
1458.7
1400
1200
1000
800
600
400
200
Industrial Category - A - Cultivators - Males

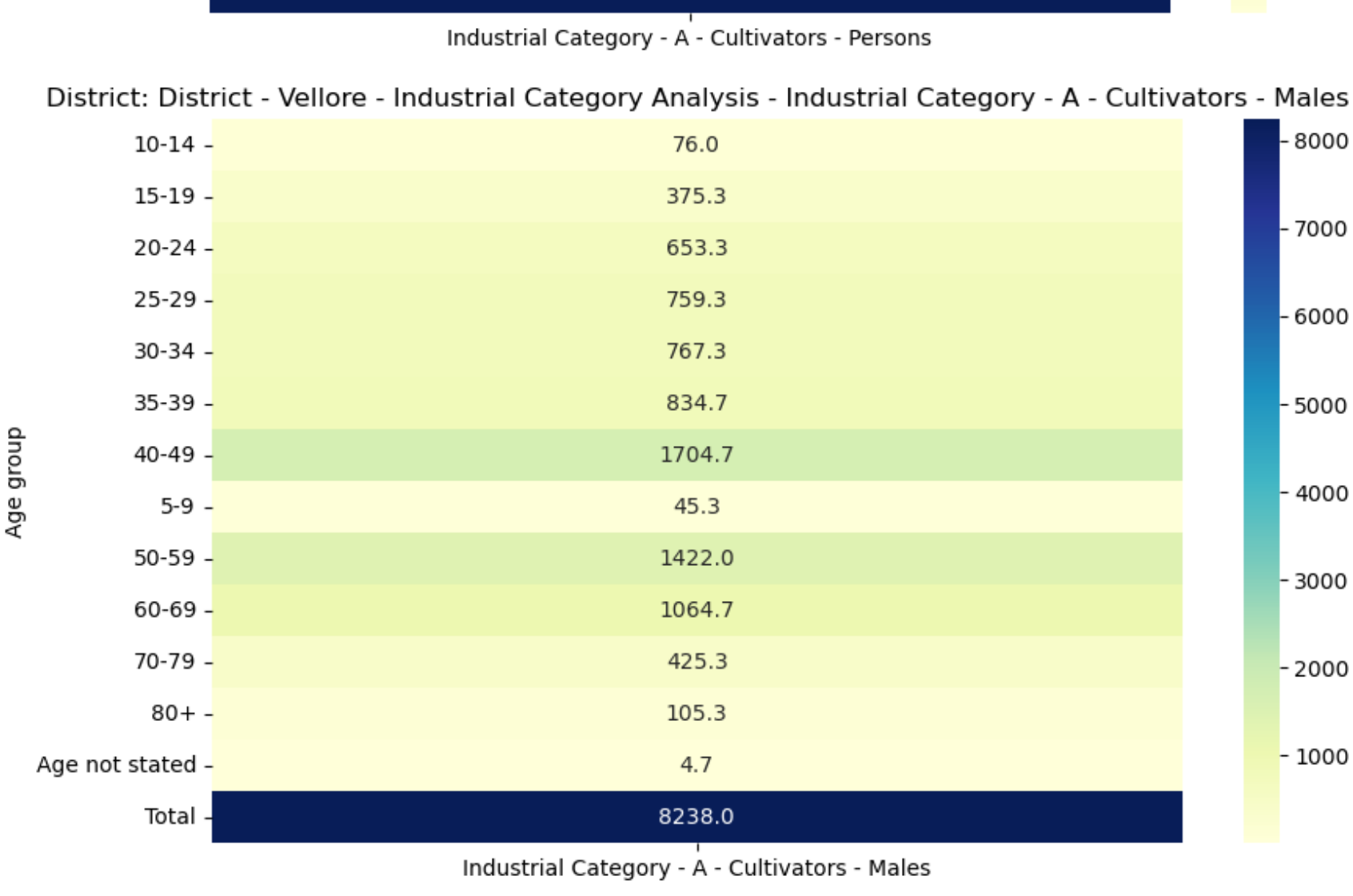

District: District - Chennai - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
67.3
136.0
232.0
185.3
126.0
130.0
175.3
60.0
140.0
68.7
34.0
14.0
2.0
1370.7
Age group
Industrial Category - A - Cultivators - Females
1200
1000
800
600
400
200

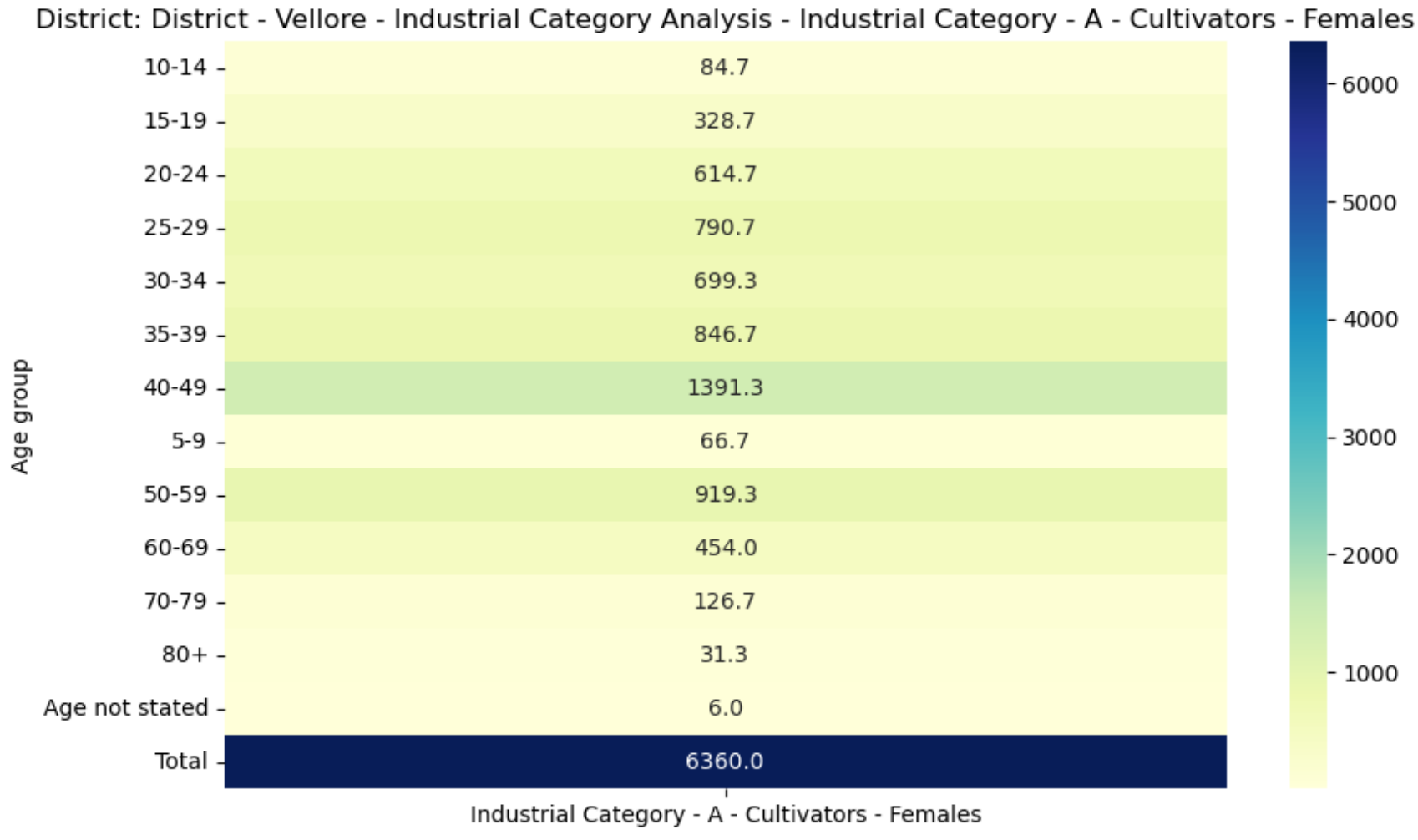

District: District - Kancheepuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
136.0
464.0
818.7
1076.7
980.7
1075.3
2054.0
116.7
1541.3
974.7
372.0
98.0
13.3
9721.3
Age group
Industrial Category - A - Cultivators - Persons
8000
6000
4000
2000

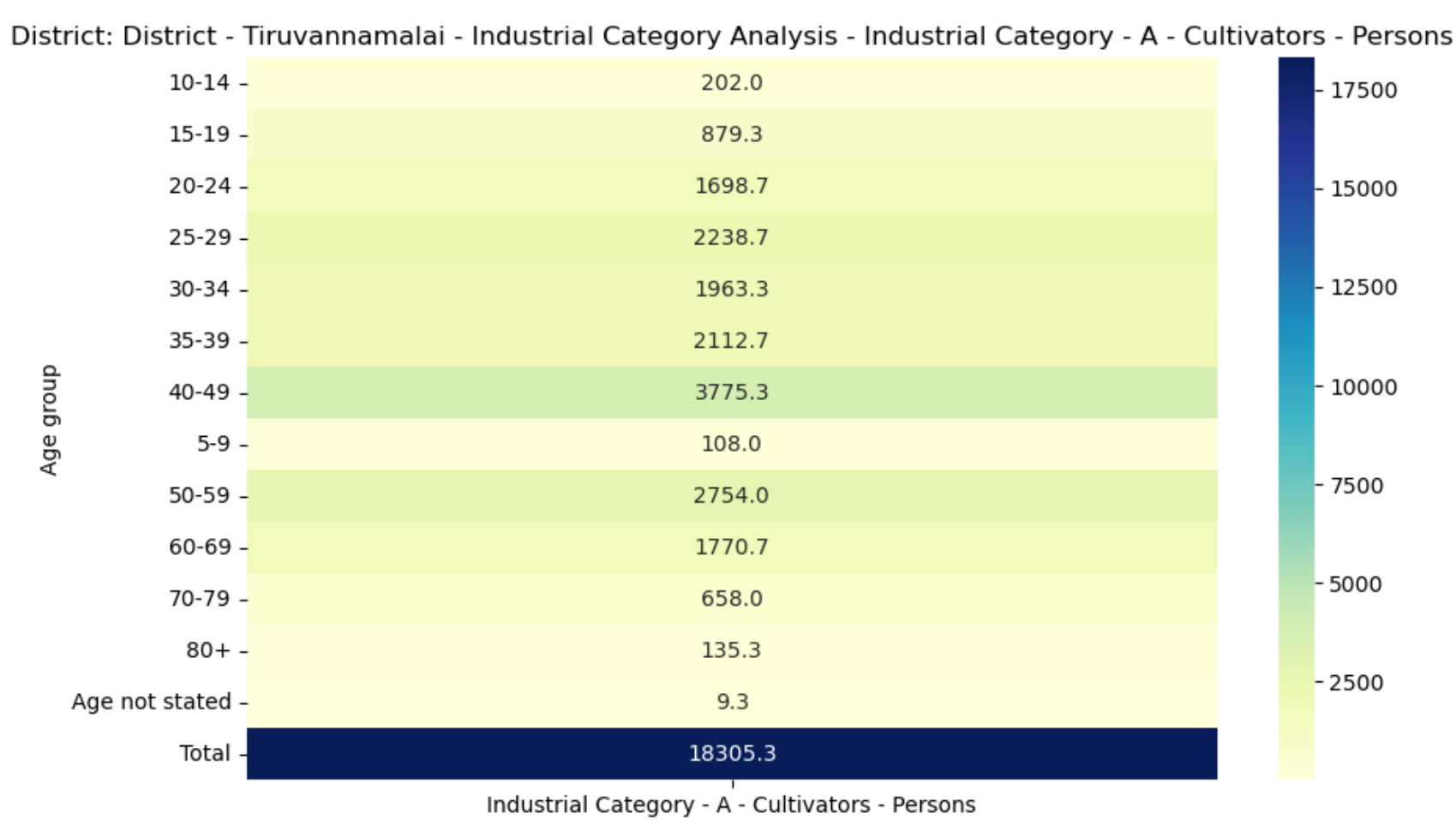

District: District - Kancheepuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
66.0
258.0
422.7
561.3
551.3
595.3
1270.7
52.0
1054.0
693.3
284.7
74.0
4.7
5888.0
Age group
Industrial Category - A - Cultivators - Males
5000
4000
3000
2000
1000

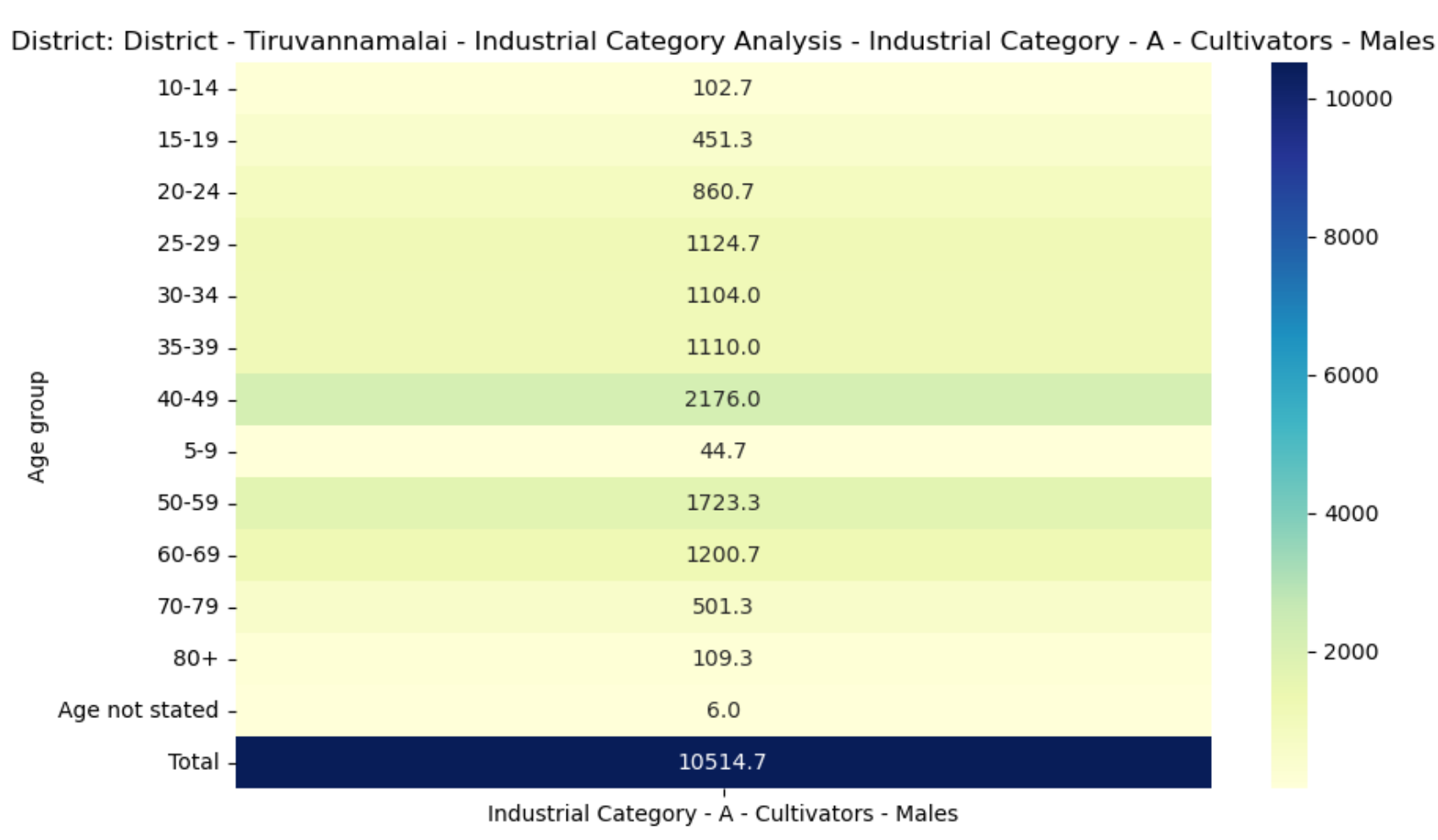

District: District - Kancheepuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
70.0
206.0
396.0
515.3
429.3
480.0
783.3
64.7
487.3
281.3
87.3
24.0
8.7
3833.3
Age group
Industrial Category - A - Cultivators - Females
3500
3000
2500
2000
1500
1000
500

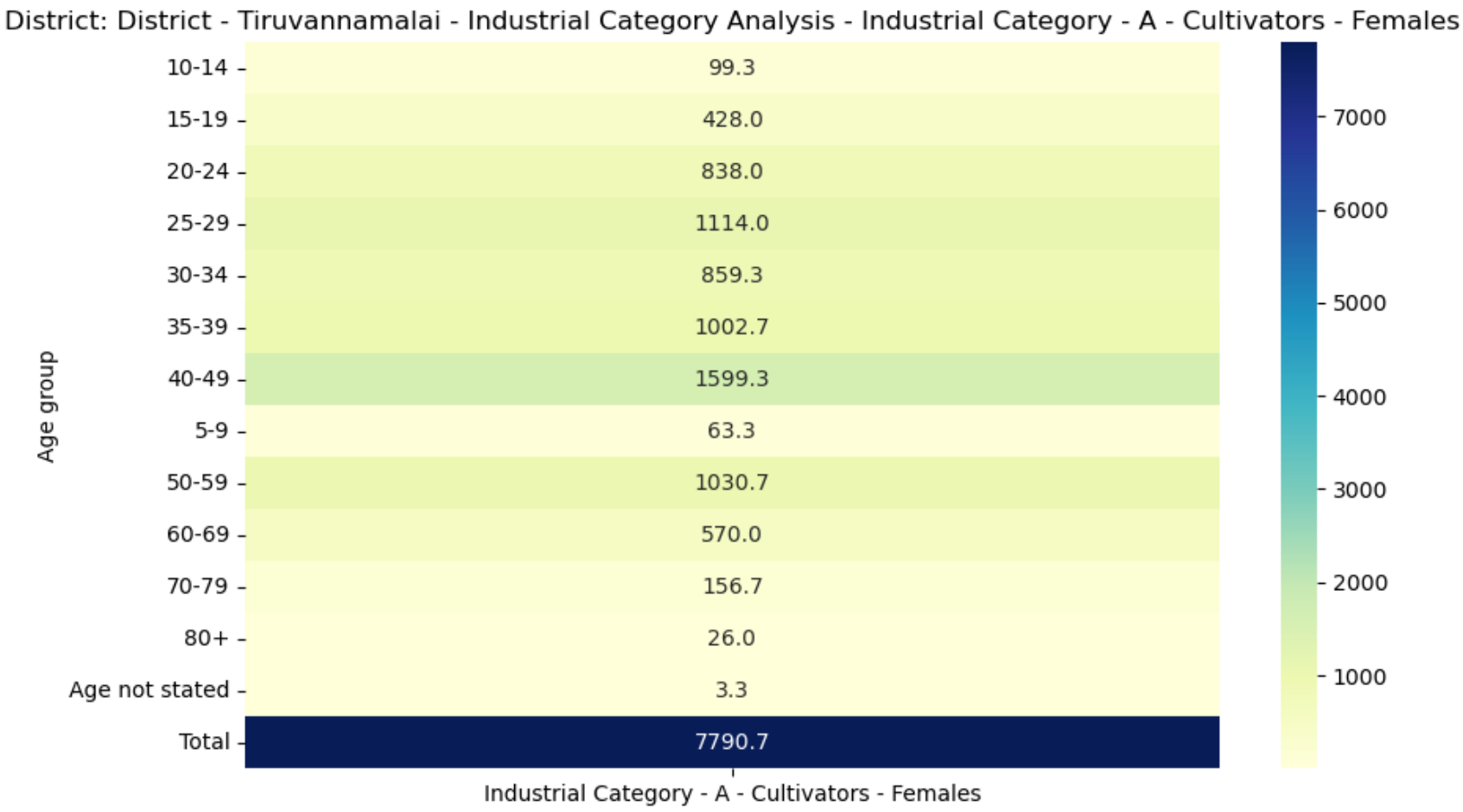

District: District - Vellore - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
160.7
704.0
1268.0
1550.0
1466.7
1681.3
3096.0
112.0
2341.3
1518.7
552.0
136.7
10.7
14598.0
Age group
Industrial Category - A - Cultivators - Persons
14000
12000
10000
8000
6000
4000
2000

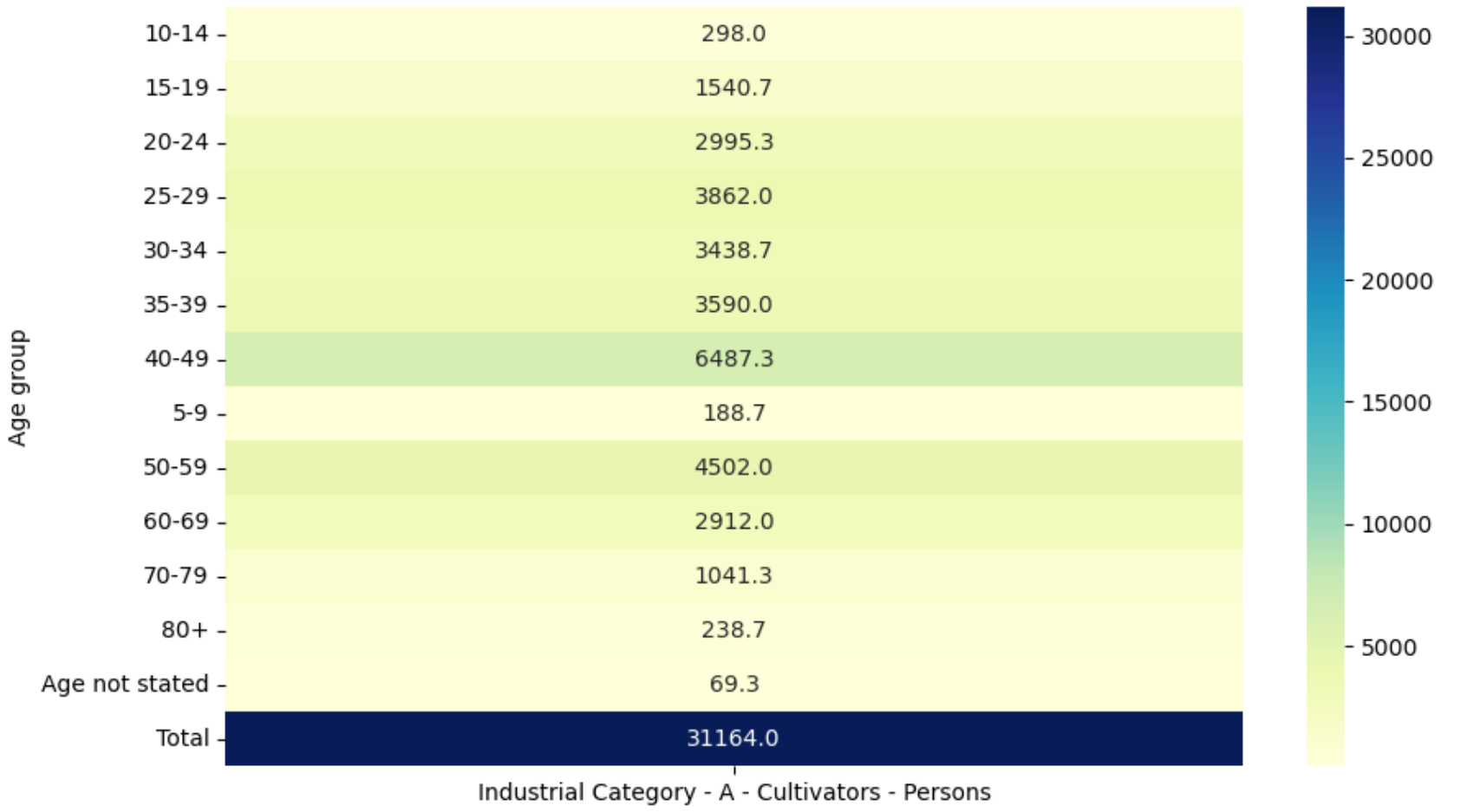

District: District - Vellore - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
76.0
375.3
653.3
759.3
767.3
834.7
1704.7
45.3
1422.0
1064.7
425.3
105.3
4.7
8238.0
Age group
Industrial Category - A - Cultivators - Males
8000
7000
6000
5000
4000
3000
2000
1000

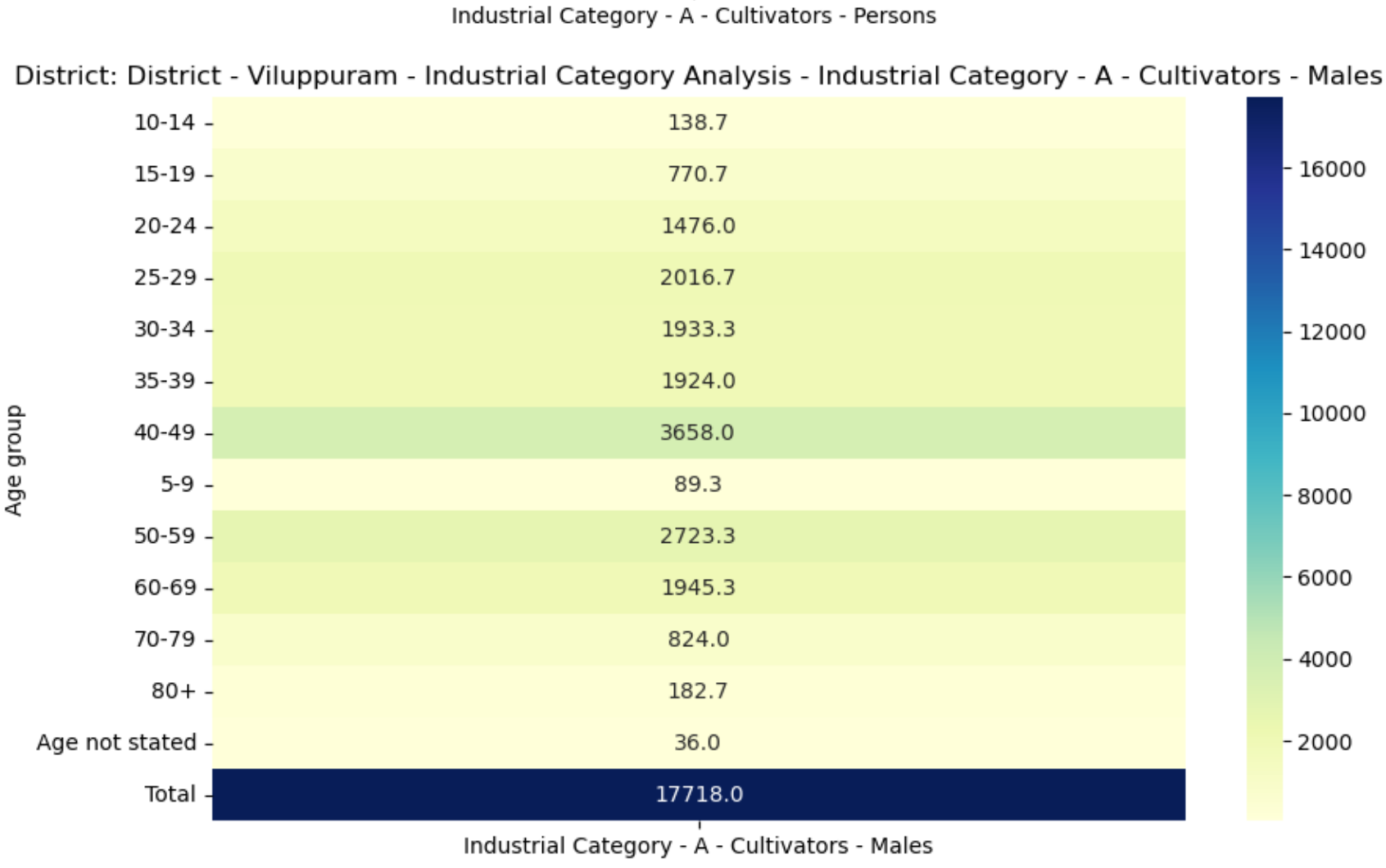

District: District - Vellore - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
84.7
328.7
614.7
790.7
699.3
846.7
1391.3
66.7
919.3
454.0
126.7
31.3
6.0
6360.0
Age group
Industrial Category - A - Cultivators - Females
6000
5000
4000
3000
2000
1000

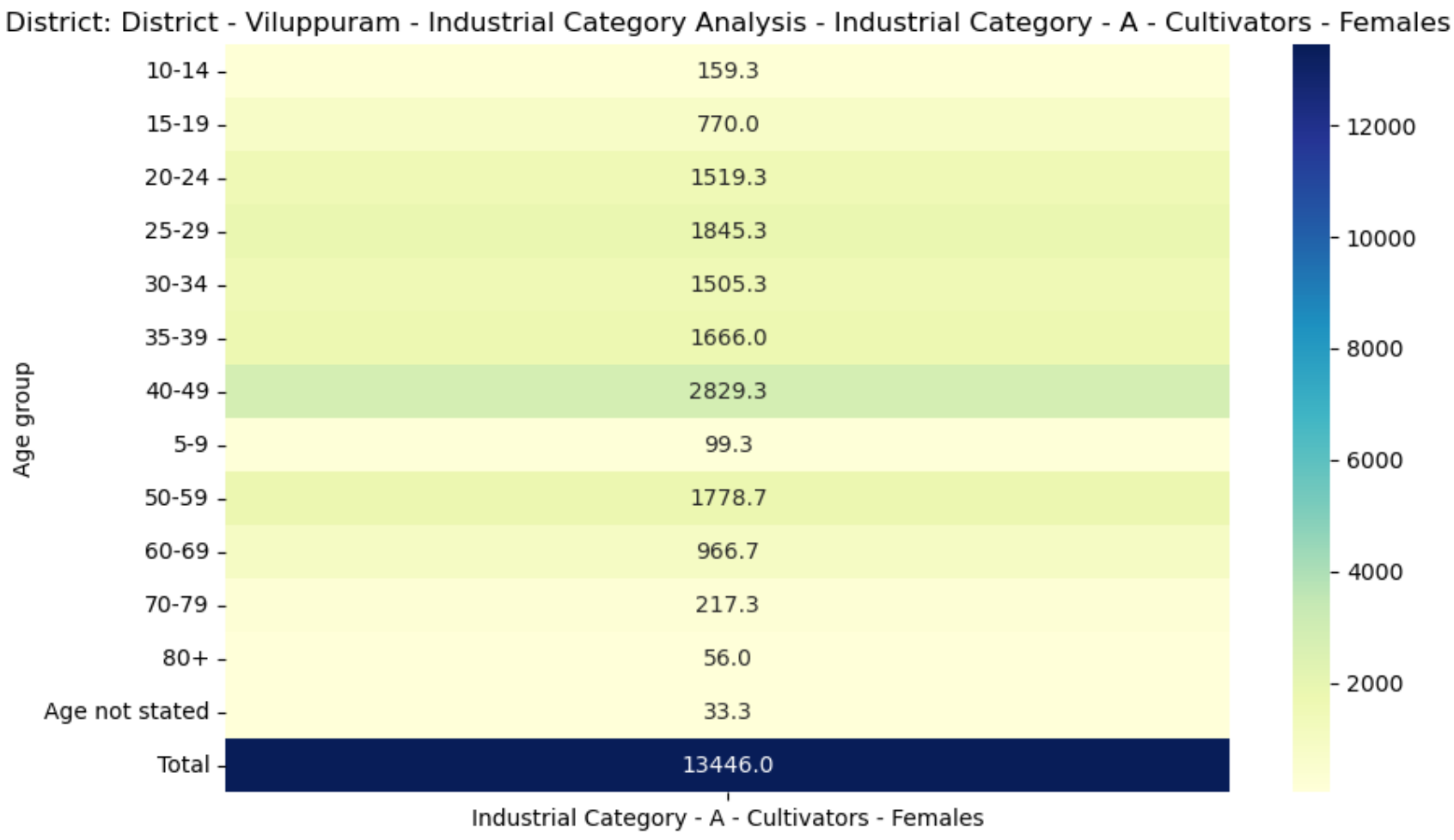

District: District - Tiruvannamalai - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
202.0
879.3
1698.7
2238.7
1963.3
2112.7
3775.3
108.0
2754.0
1770.7
658.0
135.3
9.3
18305.3
Age group
Industrial Category - A - Cultivators - Persons
17500
15000
12500
10000
7500
5000
2500

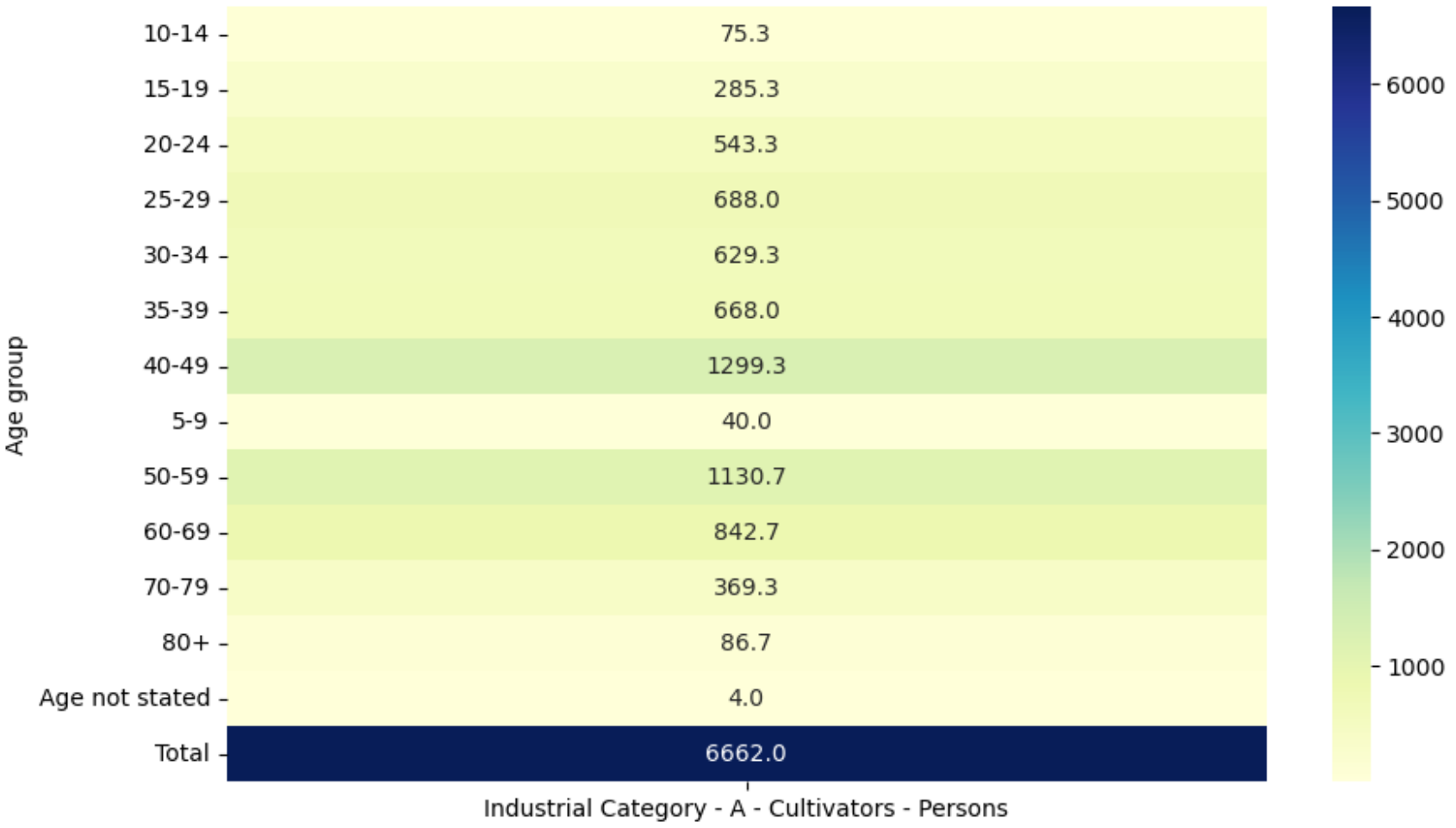

District: District - Tiruvannamalai - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
102.7
451.3
860.7
1124.7
1104.0
1110.0
2176.0
44.7
1723.3
1200.7
501.3
109.3
6.0
10514.7
Age group
Industrial Category - A - Cultivators - Males
10000
8000
6000
4000
2000

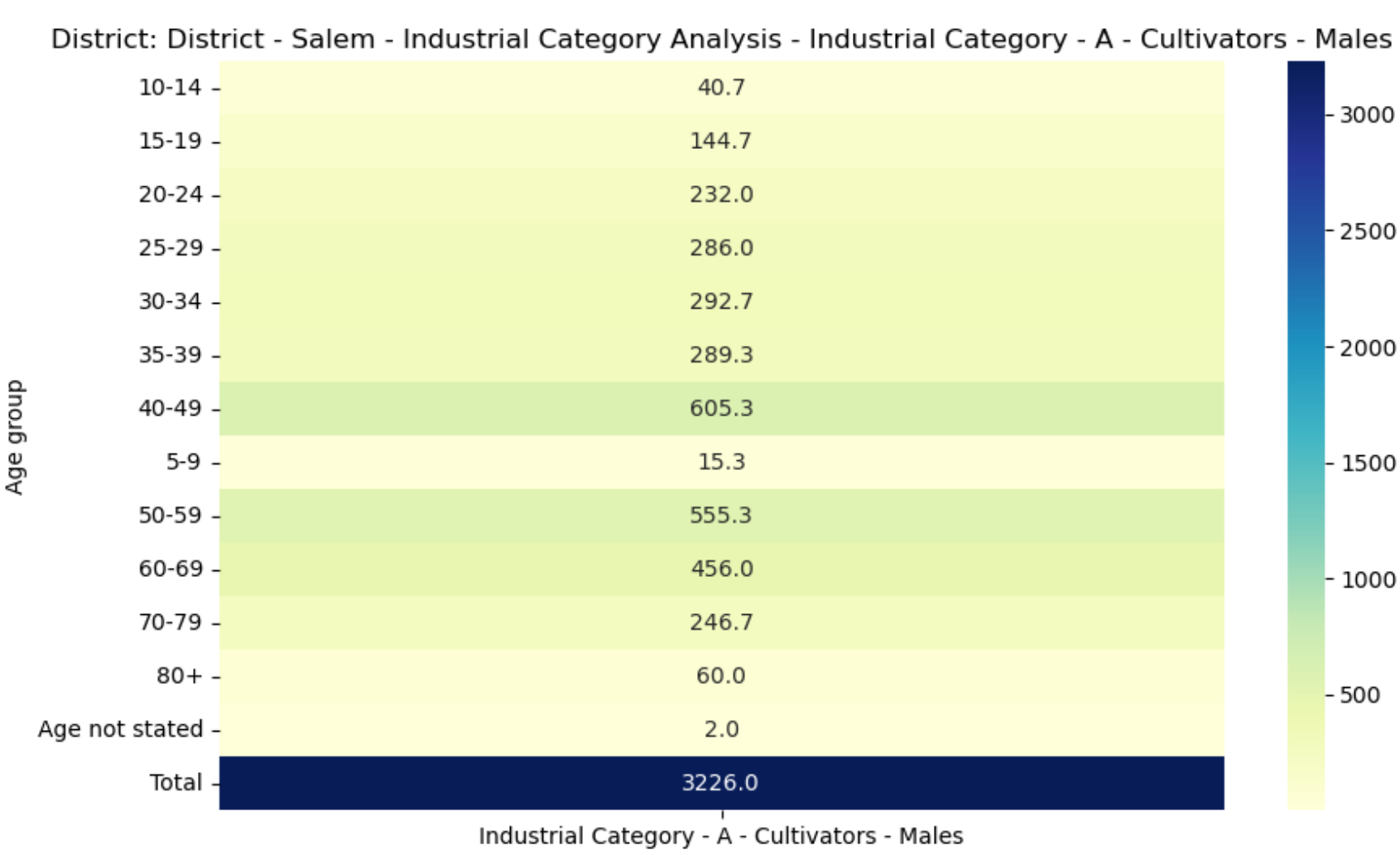

District: District - Tiruvannamalai - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
99.3
428.0
838.0
1114.0
859.3
1002.7
1599.3
63.3
1030.7
570.0
156.7
26.0
3.3
7790.7
Age group
Industrial Category - A - Cultivators - Females
7000
6000
5000
4000
3000
2000
1000

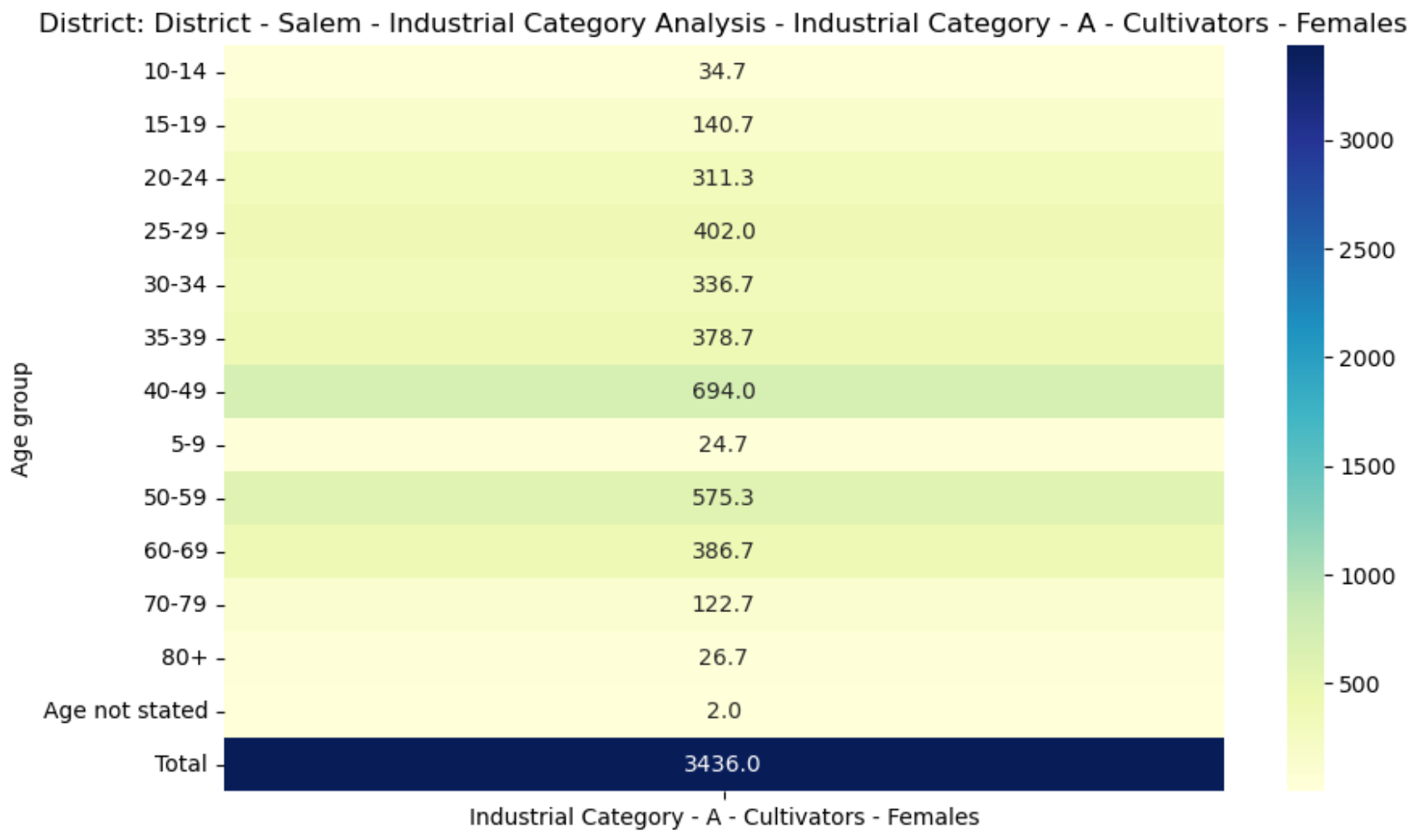

District: District - Viluppuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
298.0
1540.7
2995.3
3862.0
3438.7
3590.0
6487.3
188.7
4502.0
2912.0
1041.3
238.7
69.3
31164.0
Age group
Industrial Category - A - Cultivators - Persons
30000
25000
20000
15000
10000
5000

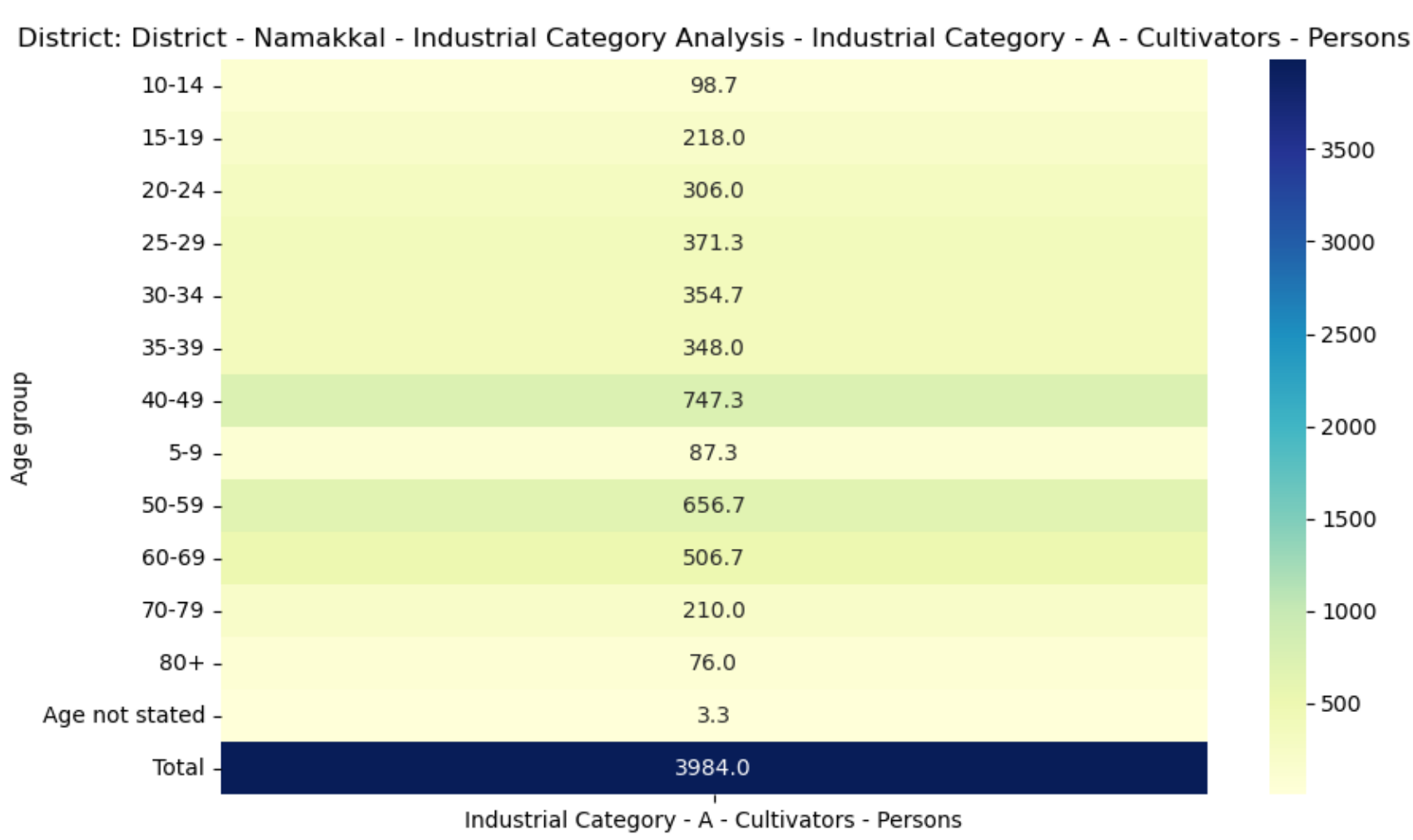

District: District - Viluppuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
138.7
770.7
1476.0
2016.7
1933.3
1924.0
3658.0
89.3
2723.3
1945.3
824.0
182.7
36.0
17718.0
Age group
Industrial Category - A - Cultivators - Males
16000
14000
12000
10000
8000
6000
4000
2000

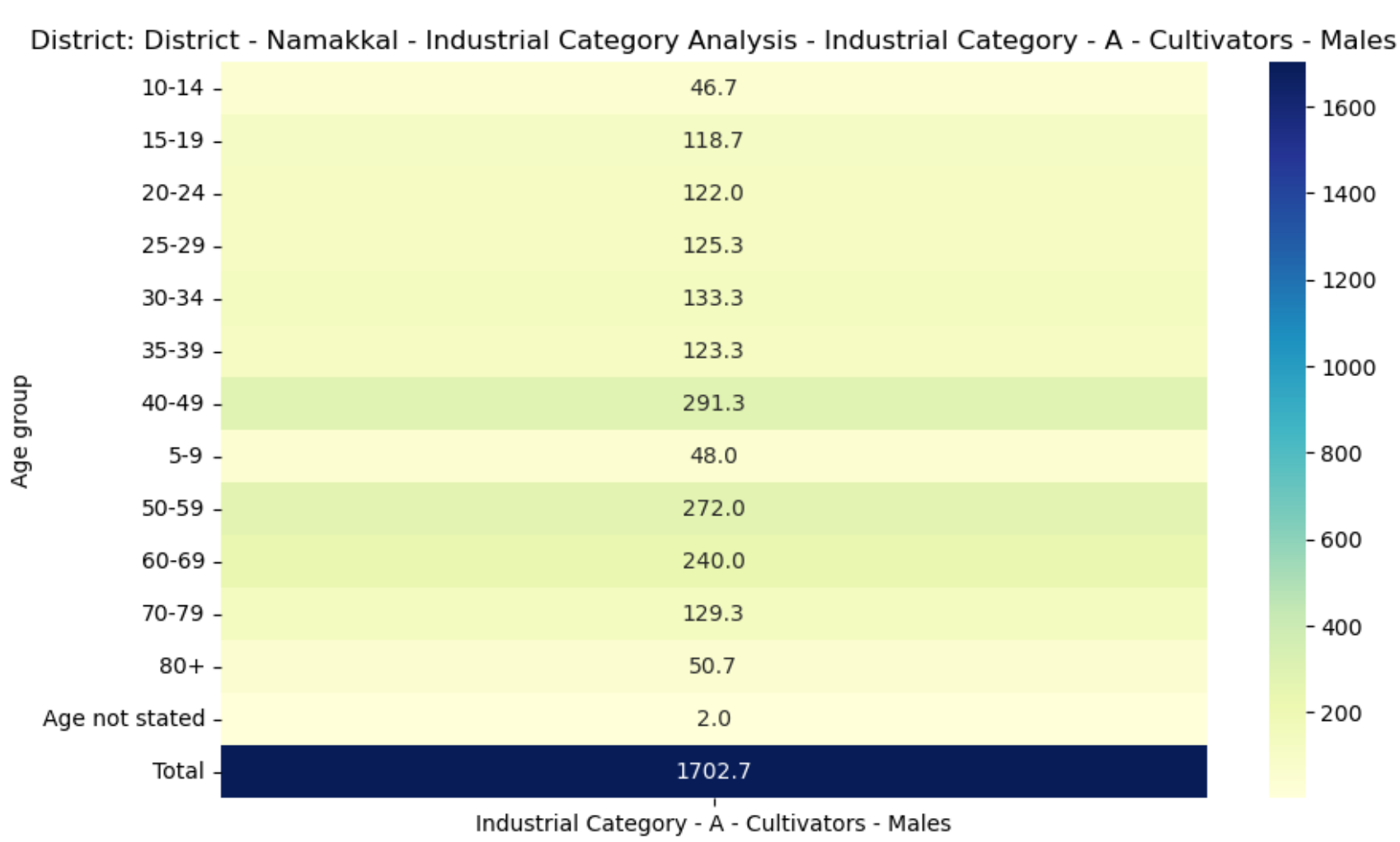

District: District - Viluppuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
159.3
770.0
1519.3
1845.3
1505.3
1666.0
2829.3
99.3
1778.7
966.7
217.3
56.0
33.3
13446.0
Age group
Industrial Category - A - Cultivators - Females
12000
10000
8000
6000
4000
2000

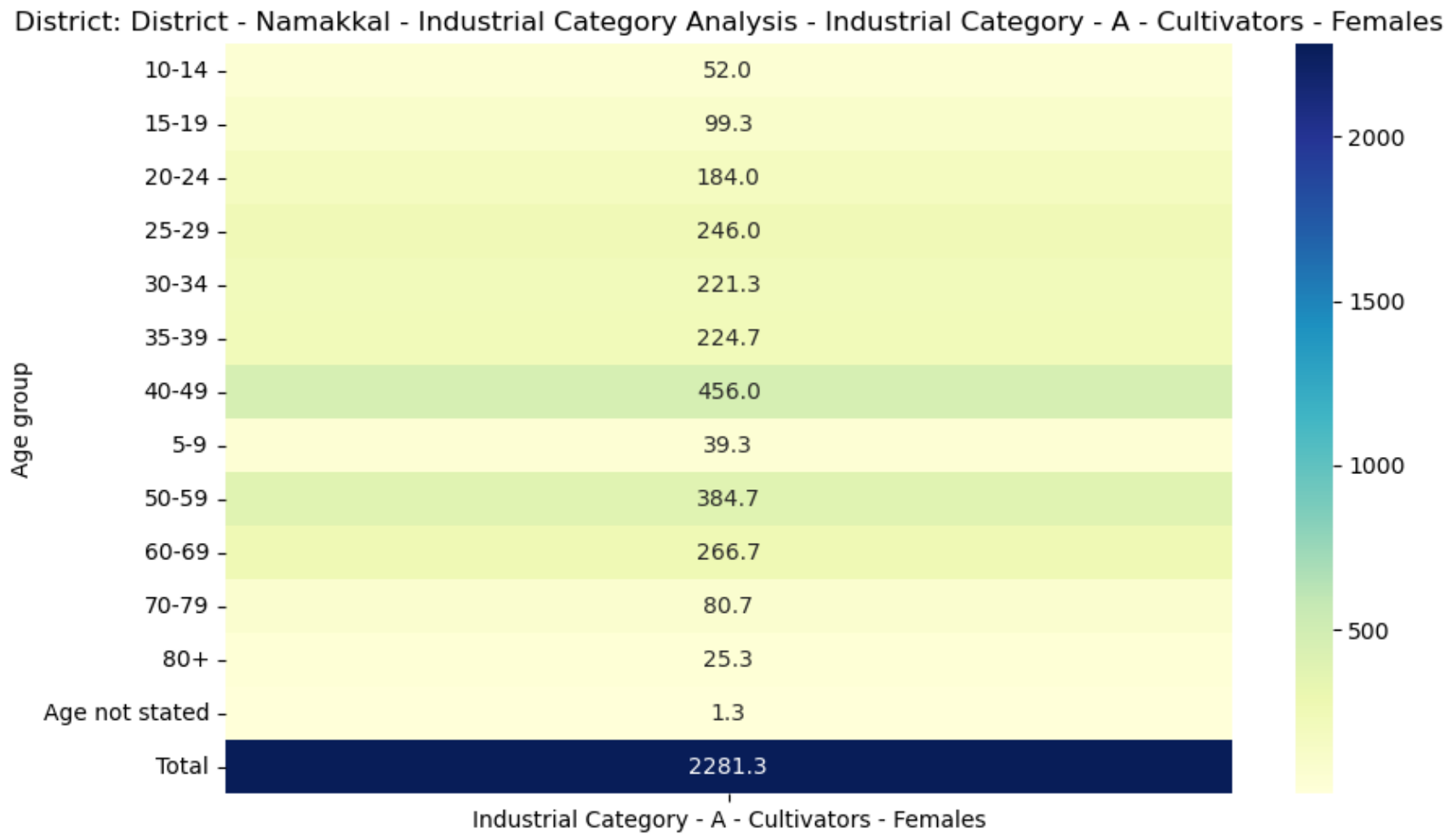

District: District - Salem - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
75.3
285.3
543.3
688.0
629.3
668.0
1299.3
40.0
1130.7
842.7
369.3
86.7
4.0
6662.0
Age group
Industrial Category - A - Cultivators - Persons
6000
5000
4000
3000
2000
1000

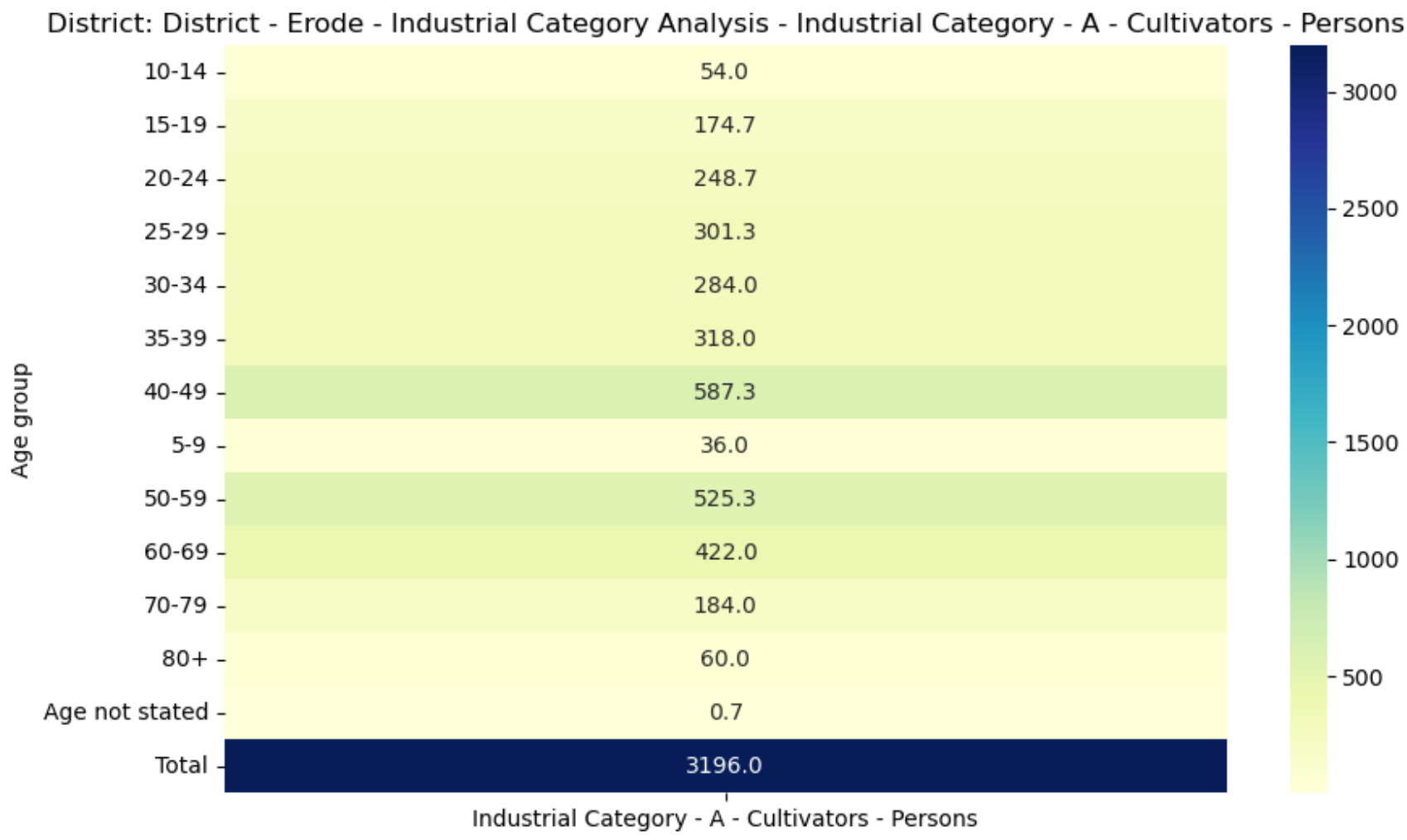

District: District - Salem - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
40.7
144.7
232.0
286.0
292.7
289.3
605.3
15.3
555.3
456.0
246.7
60.0
2.0
3226.0
Age group
Industrial Category - A - Cultivators - Males
3000
2500
2000
1500
1000
500

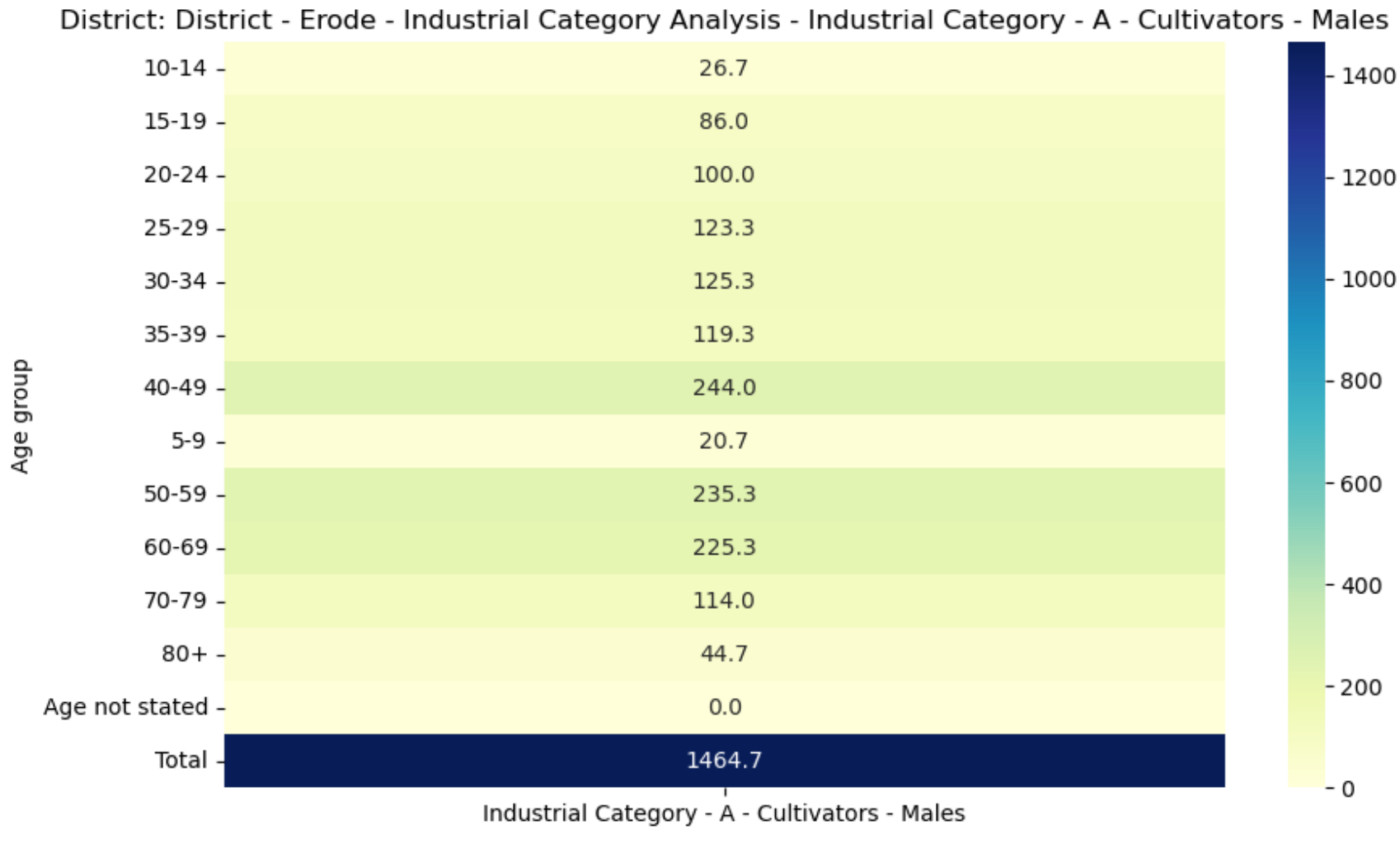

District: District - Salem - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
34.7
140.7
311.3
402.0
336.7
378.7
694.0
24.7
575.3
386.7
122.7
26.7
2.0
3436.0
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Females

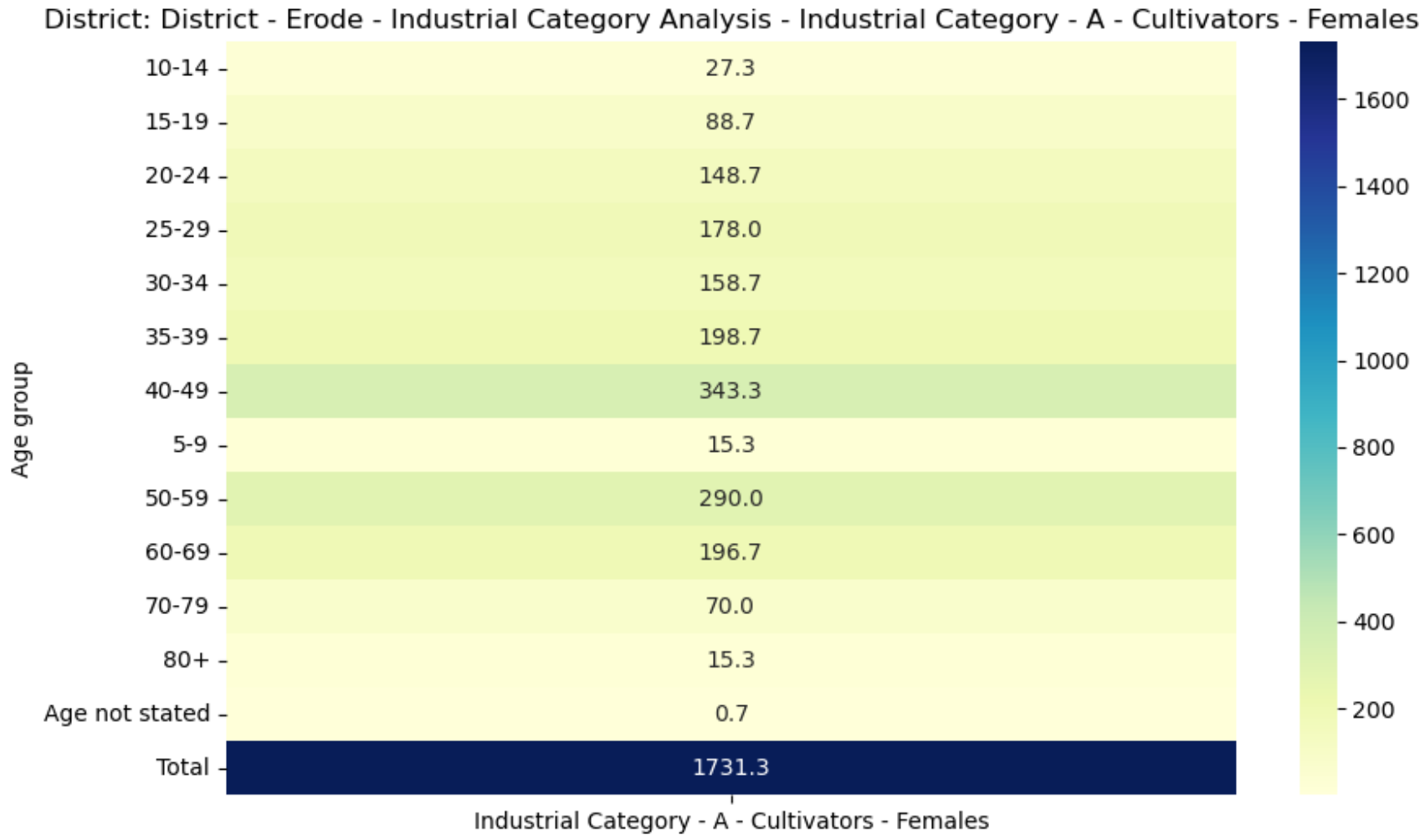

District: District - Namakkal - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
98.7
218.0
306.0
371.3
354.7
348.0
747.3
87.3
656.7
506.7
210.0
76.0
3.3
3984.0
3500
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Persons

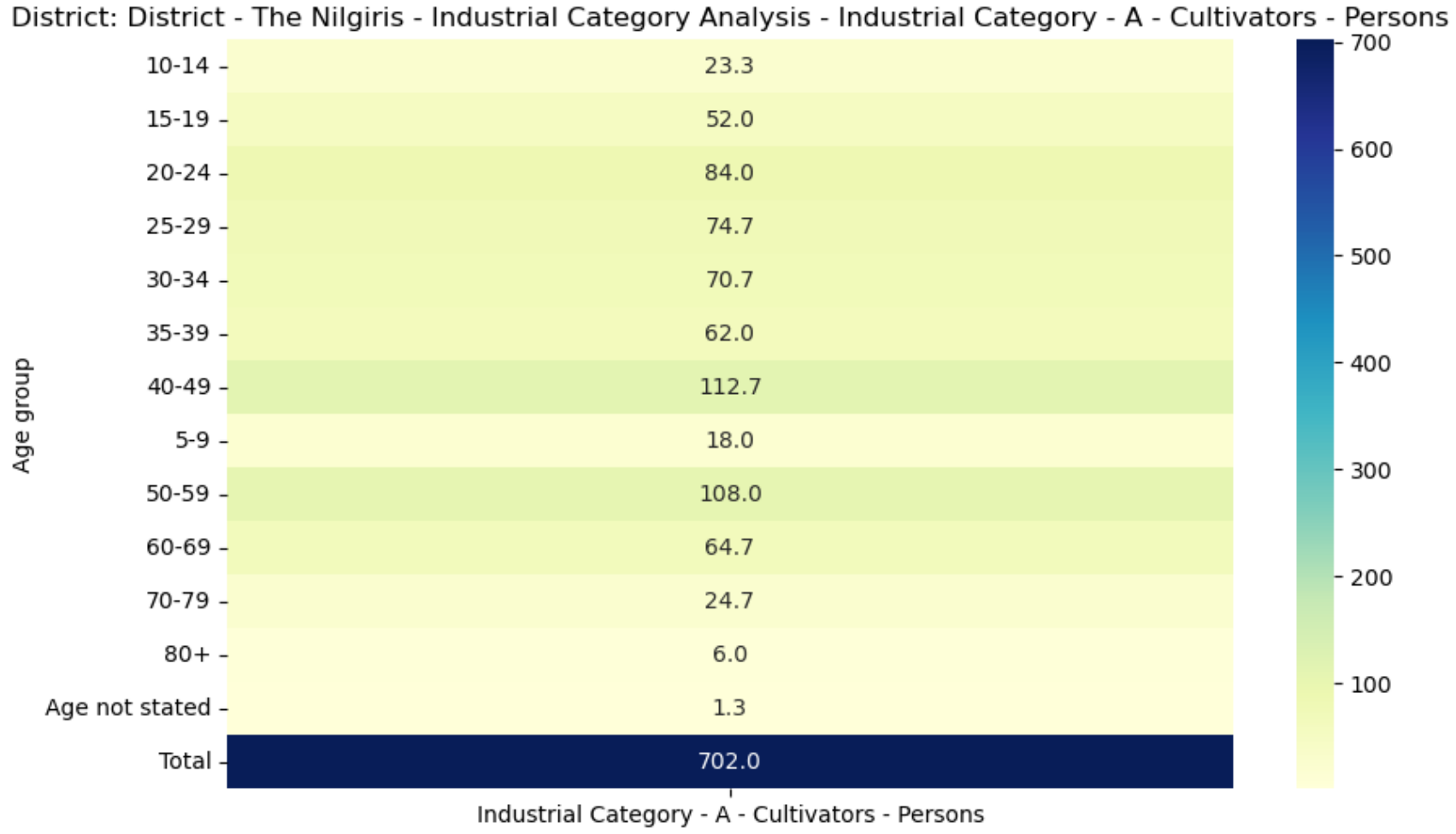

District: District - Namakkal - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
46.7
118.7
122.0
125.3
133.3
123.3
291.3
48.0
272.0
240.0
129.3
50.7
2.0
1702.7
1600
1400
1200
1000
800
600
400
200
Industrial Category - A - Cultivators - Males

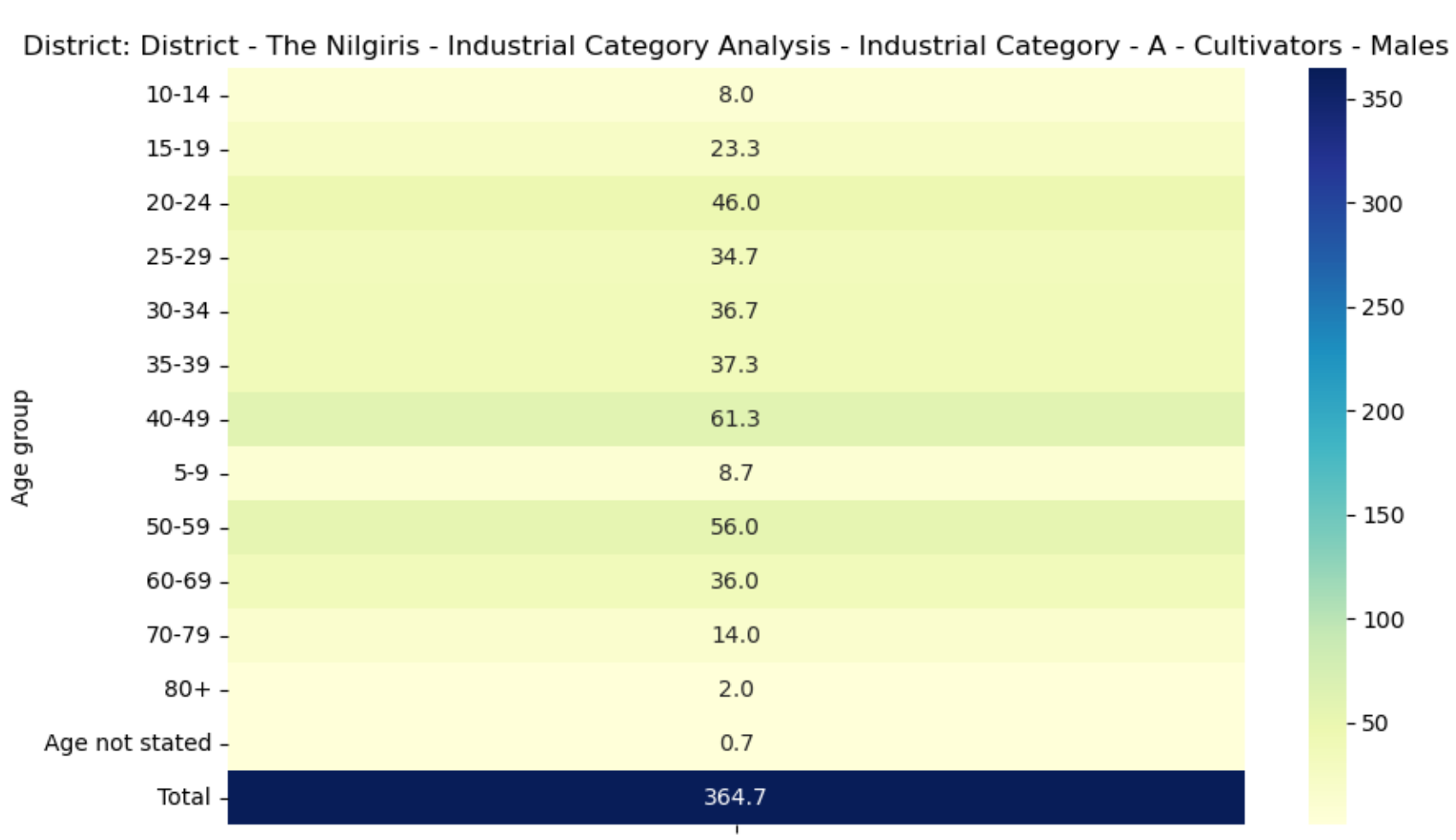

District: District - Namakkal - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
52.0
99.3
184.0
246.0
221.3
224.7
456.0
39.3
384.7
266.7
80.7
25.3
1.3
2281.3
Age group
Industrial Category - A - Cultivators - Females
2000
1500
1000
500

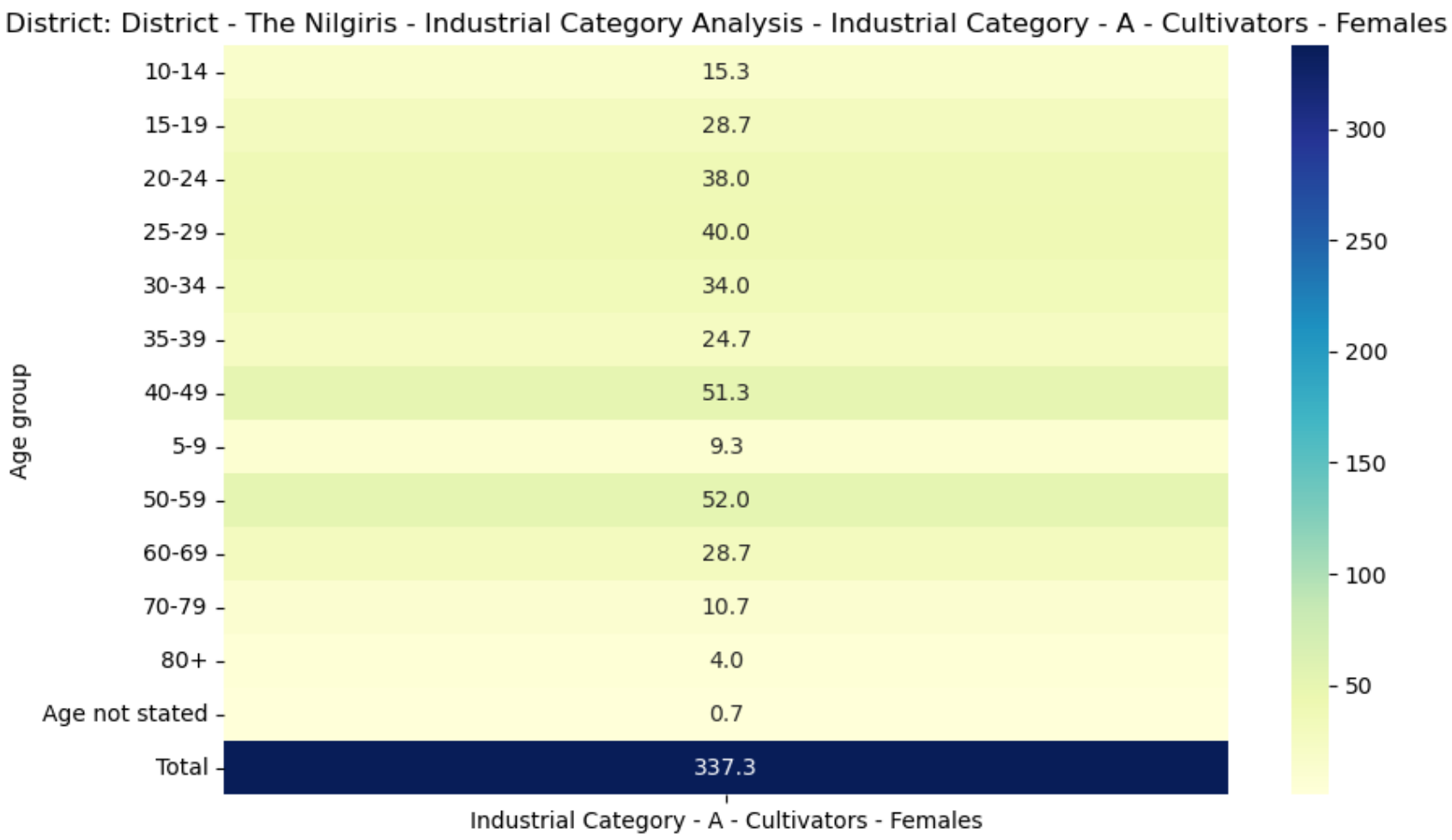

District: District - Erode - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
54.0
174.7
248.7
301.3
284.0
318.0
587.3
36.0
525.3
422.0
184.0
60.0
0.7
3196.0
Age group
Industrial Category - A - Cultivators - Persons
3000
2500
2000
1500
1000
500

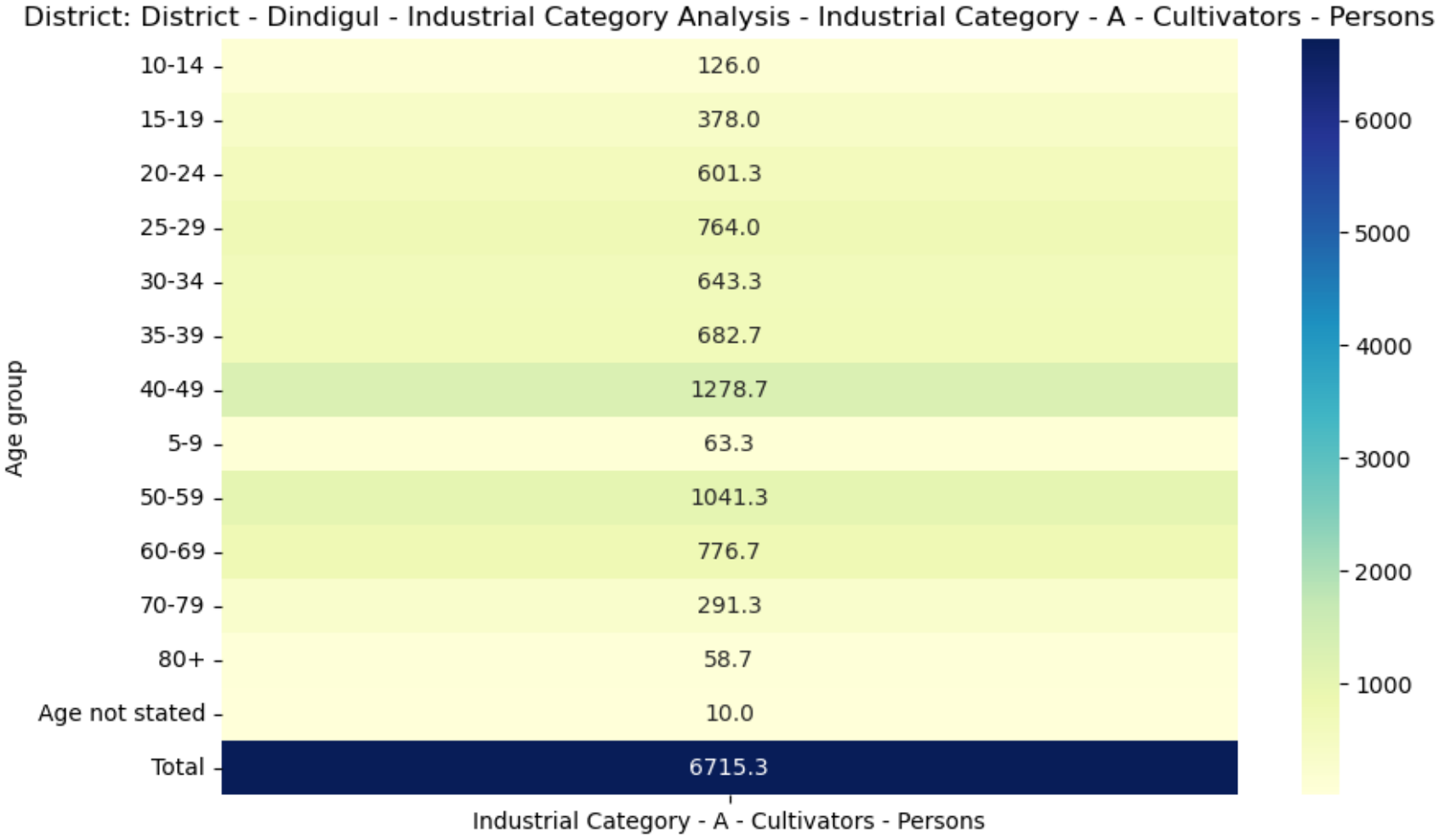

District: District - Erode - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
26.7
86.0
100.0
123.3
125.3
119.3
244.0
20.7
235.3
225.3
114.0
44.7
0.0
1464.7
Age group
Industrial Category - A - Cultivators - Males
1400
1200
1000
800
600
400
200
0

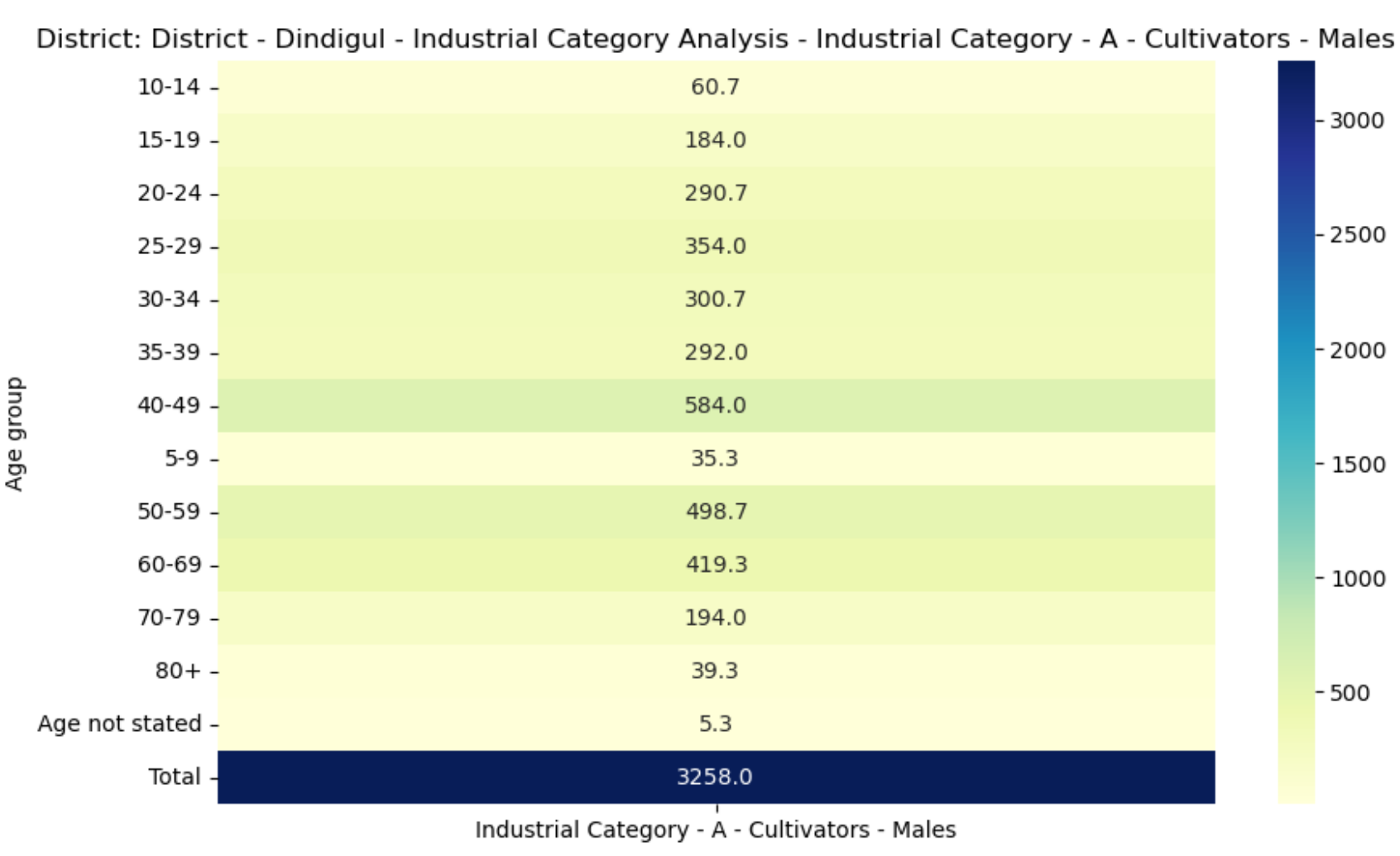

District: District - Erode - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
27.3
88.7
148.7
178.0
158.7
198.7
343.3
15.3
290.0
196.7
70.0
15.3
0.7
1731.3
Age group
Industrial Category - A - Cultivators - Females
1600
1400
1200
1000
800
600
400
200

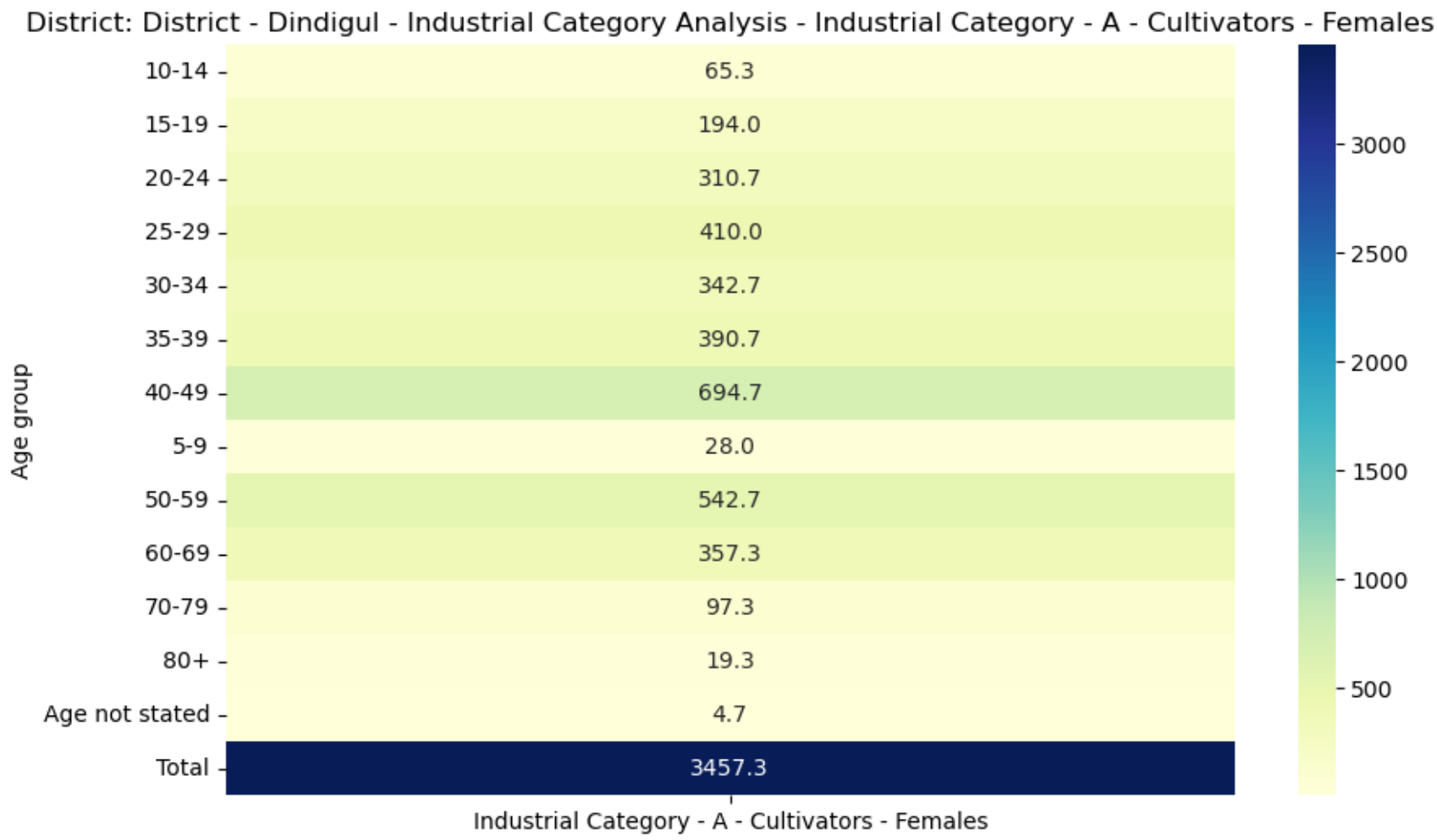

District: District - The Nilgiris - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
23.3
52.0
84.0
74.7
70.7
62.0
112.7
18.0
108.0
64.7
24.7
6.0
1.3
702.0
Age group
Industrial Category - A - Cultivators - Persons
700
600
500
400
300
200
100

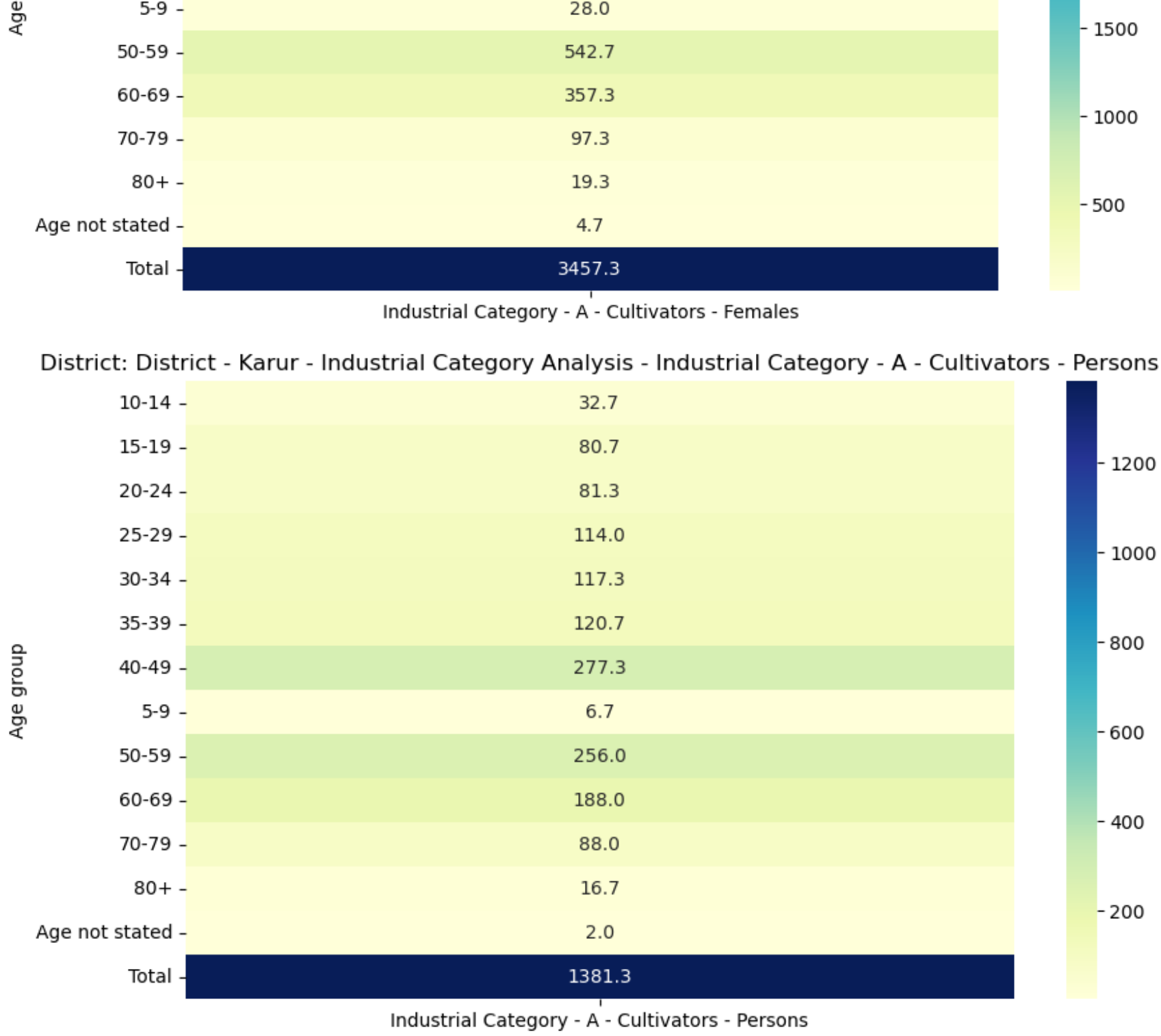

District: District - The Nilgiris - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
8.0
23.3
46.0
34.7
36.7
37.3
61.3
8.7
56.0
36.0
14.0
2.0
0.7
364.7
Age group
Industrial Category - A - Cultivators - Males
350
300
250
200
150
100
50

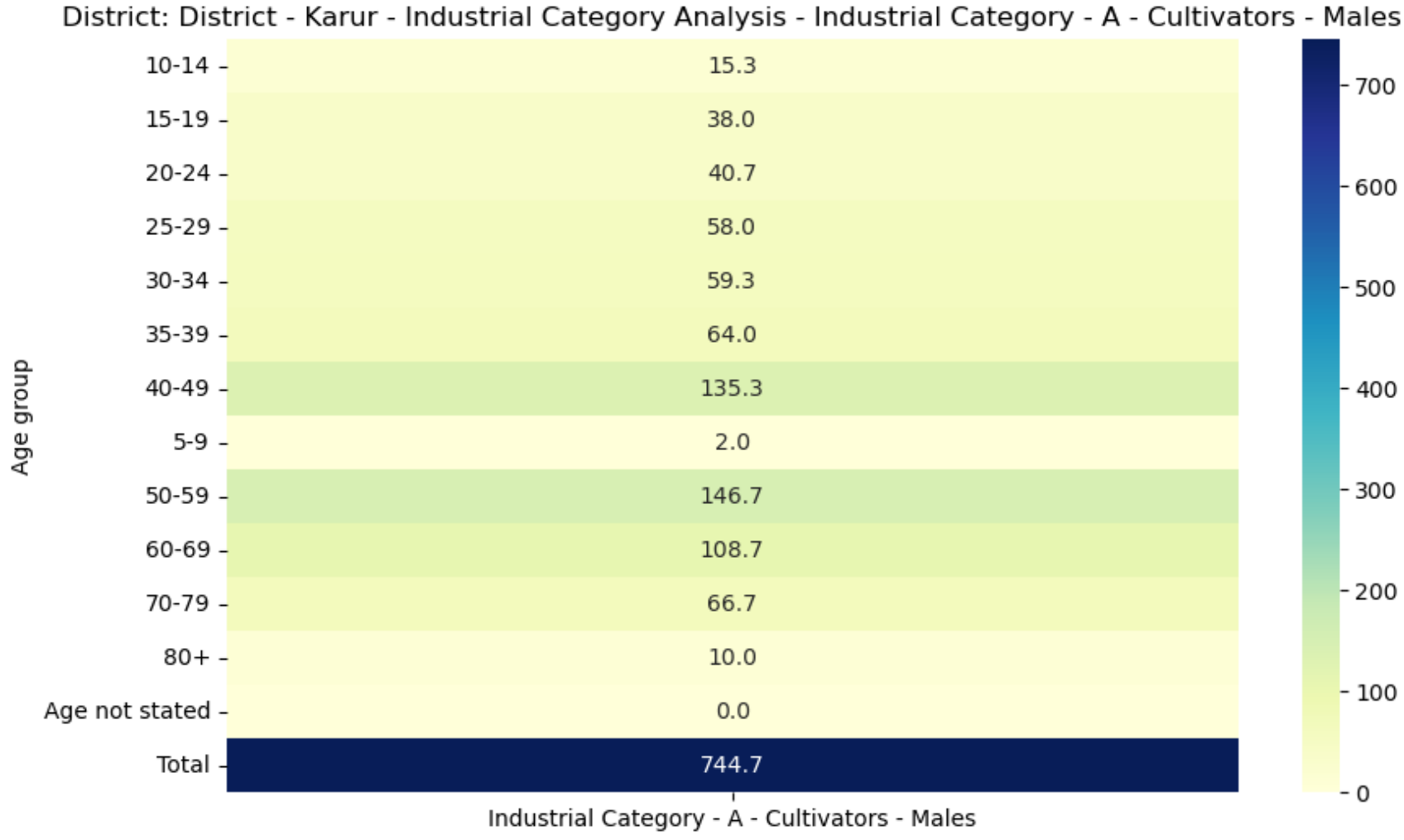

District: District - The Nilgiris - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
15.3
28.7
38.0
40.0
34.0
24.7
51.3
9.3
52.0
28.7
10.7
4.0
0.7
337.3
300
250
200
150
100
50
Industrial Category - A - Cultivators - Females

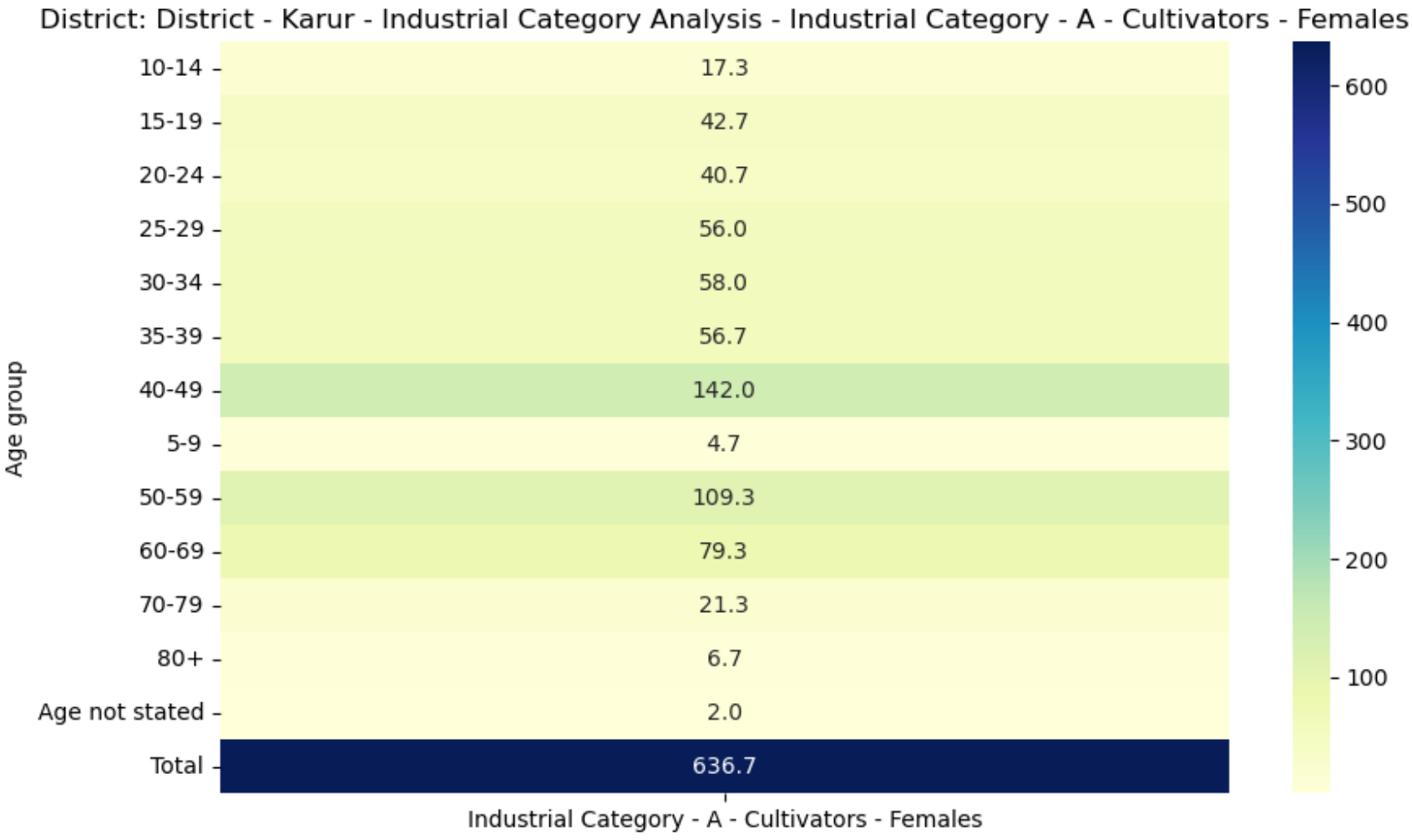

District: District - Dindigul - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
126.0
378.0
601.3
764.0
643.3
682.7
1278.7
63.3
1041.3
776.7
291.3
58.7
10.0
6715.3
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

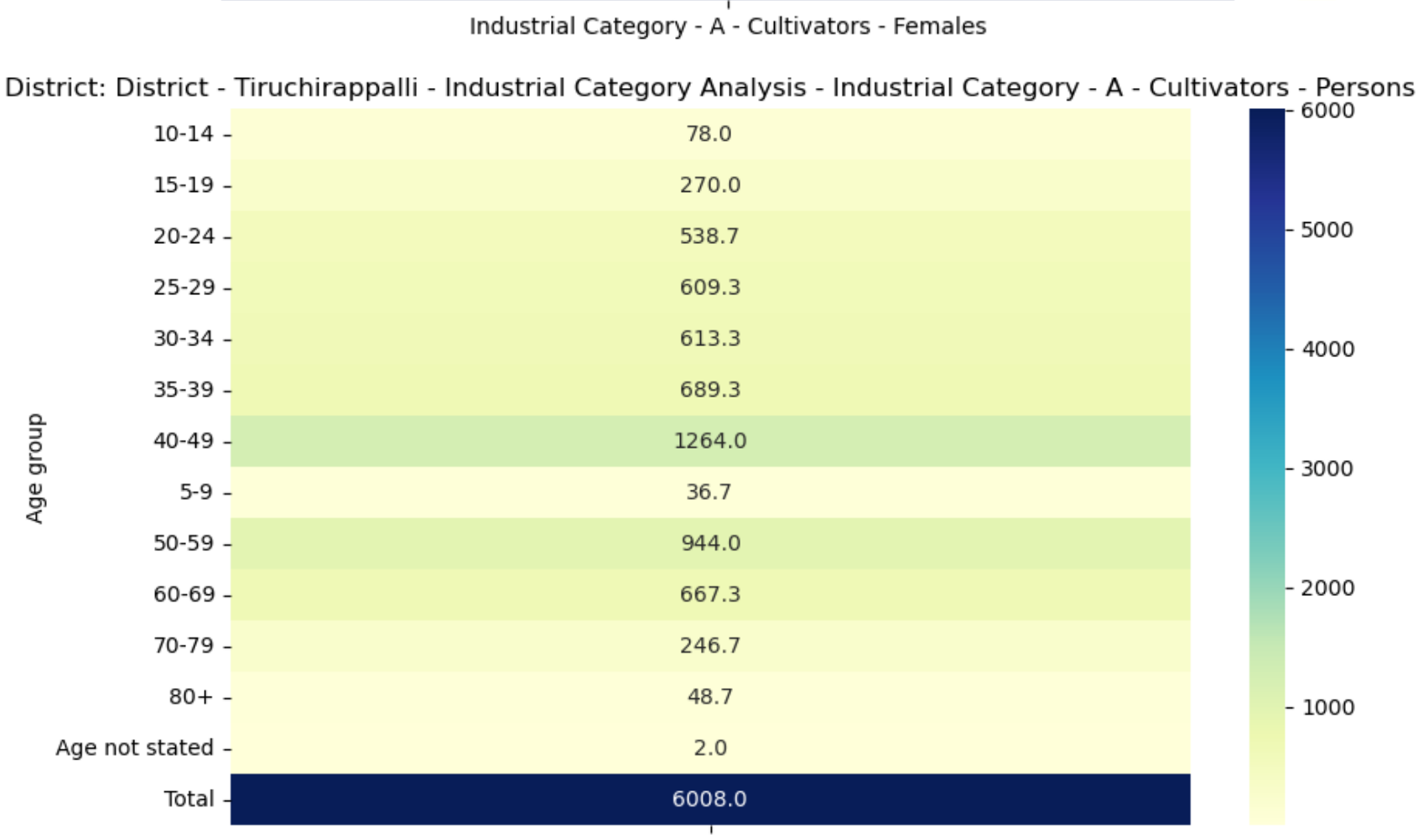

District: District - Dindigul - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
60.7
184.0
290.7
354.0
300.7
292.0
584.0
35.3
498.7
419.3
194.0
39.3
5.3
3258.0
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

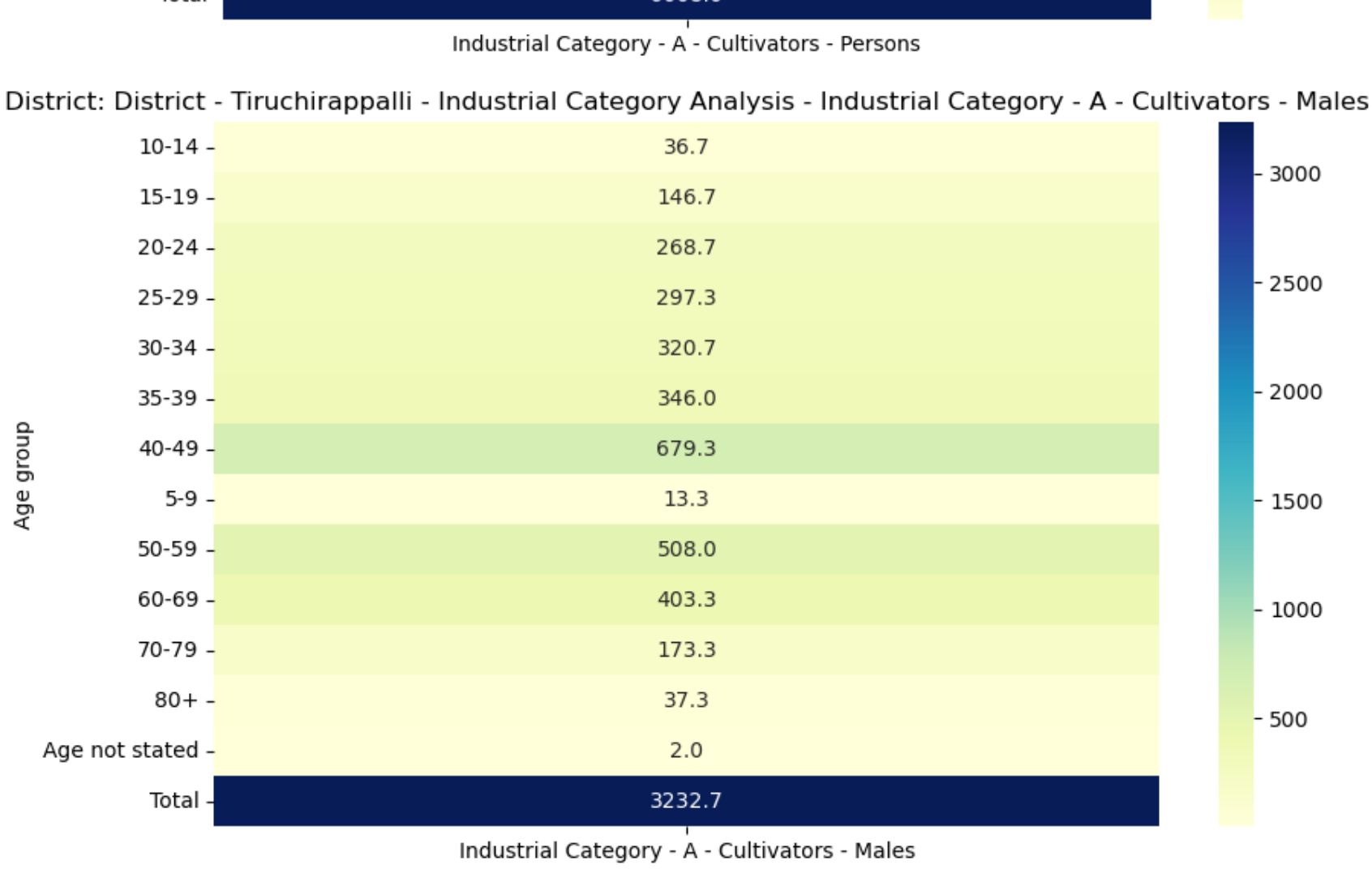

District: District - Dindigul - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
65.3
194.0
310.7
410.0
342.7
390.7
694.7
28.0
542.7
357.3
97.3
19.3
4.7
3457.3
Age group
Industrial Category - A - Cultivators - Females
3000
2500
2000
1500
1000
500

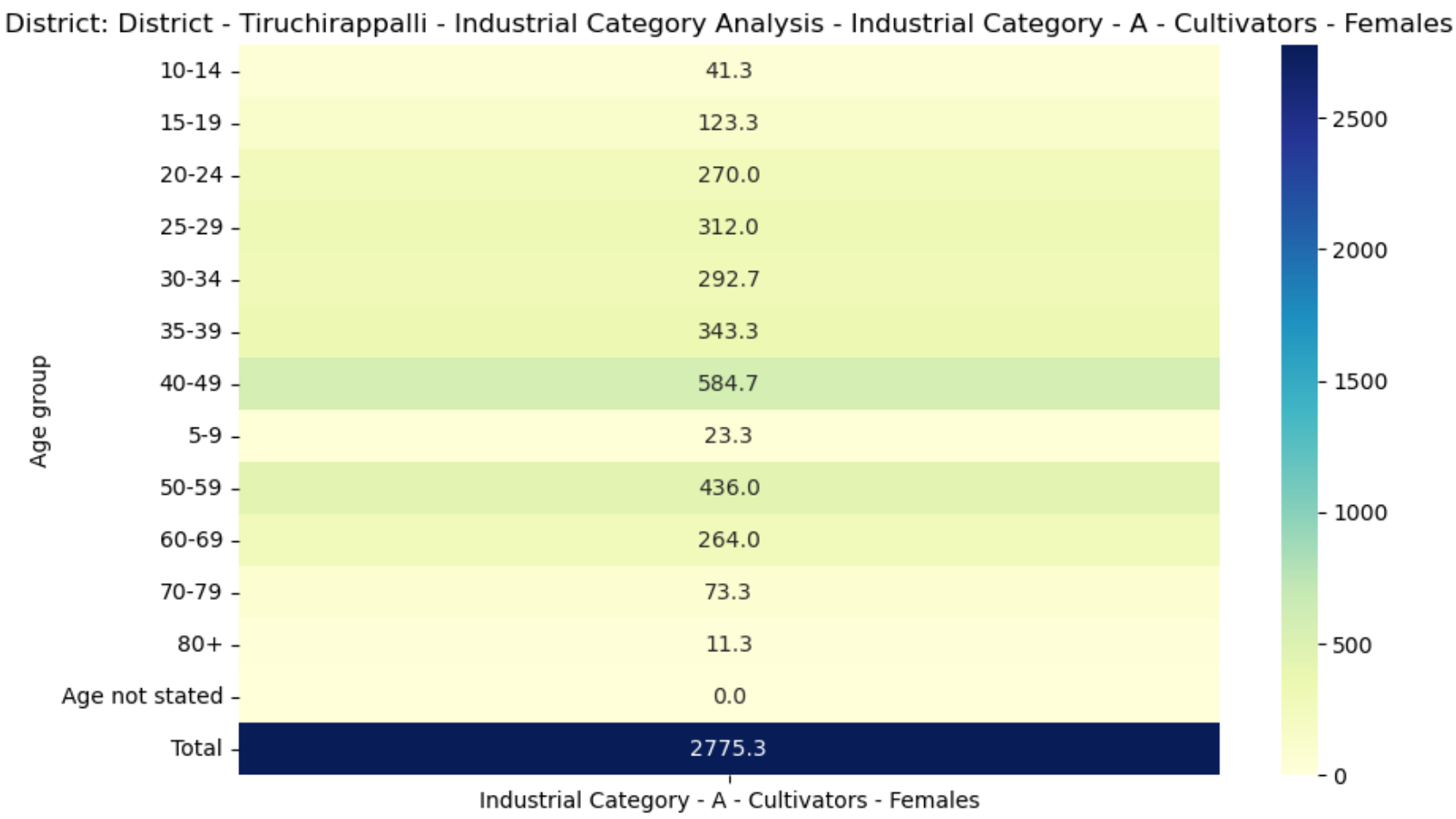

District: District - Karur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
32.7
80.7
81.3
114.0
117.3
120.7
277.3
6.7
256.0
188.0
88.0
16.7
2.0
1381.3
Age group
Industrial Category - A - Cultivators - Persons
1200
1000
800
600
400
200

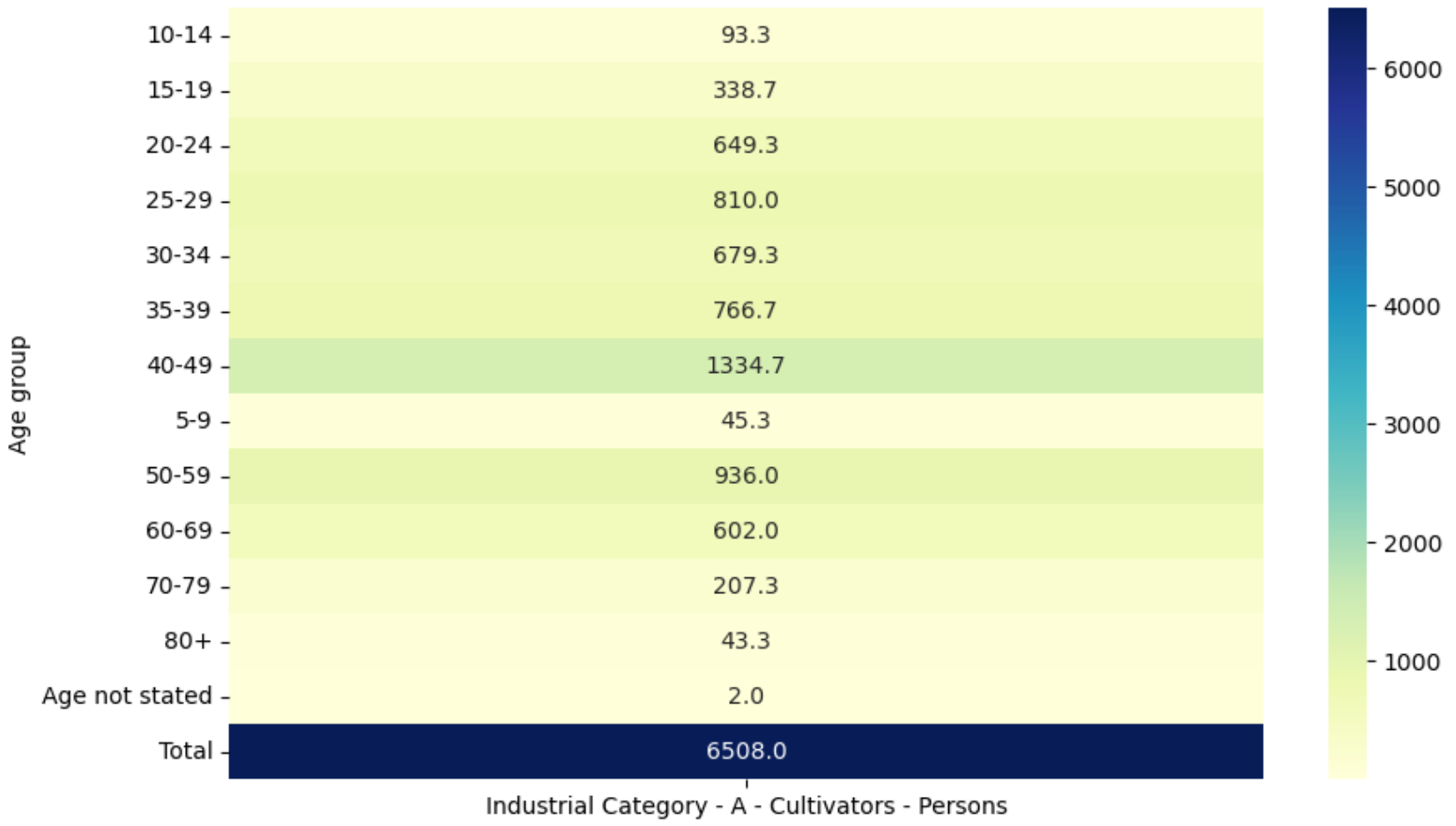

District: District - Karur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
15.3
38.0
40.7
58.0
59.3
64.0
135.3
2.0
146.7
108.7
66.7
10.0
0.0
744.7
Age group
Industrial Category - A - Cultivators - Males
700
600
500
400
300
200
100
0

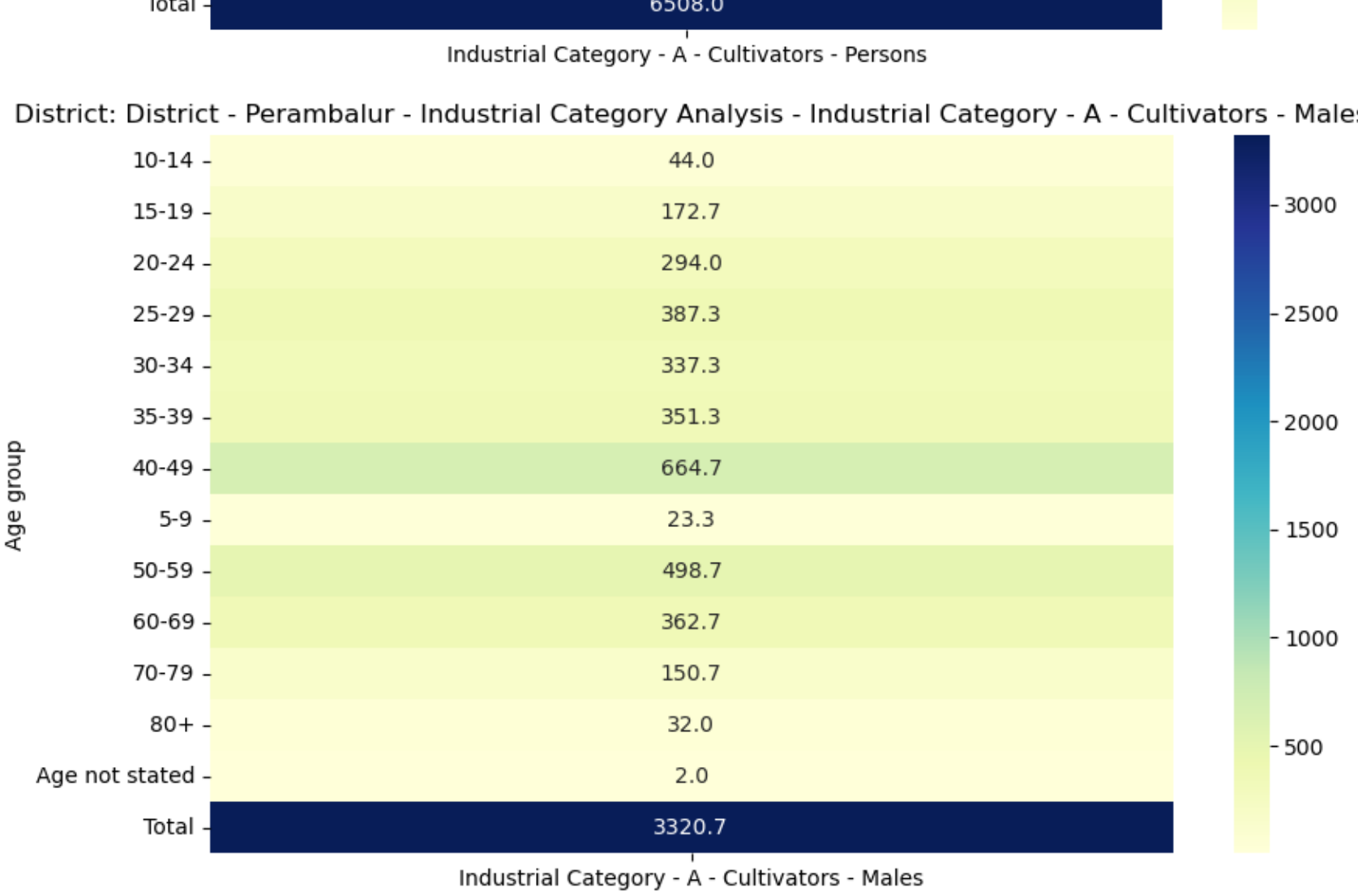

District: District - Karur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
17.3
42.7
40.7
56.0
58.0
56.7
142.0
4.7
109.3
79.3
21.3
6.7
2.0
636.7
Age group
Industrial Category - A - Cultivators - Females
600
500
400
300
200
100

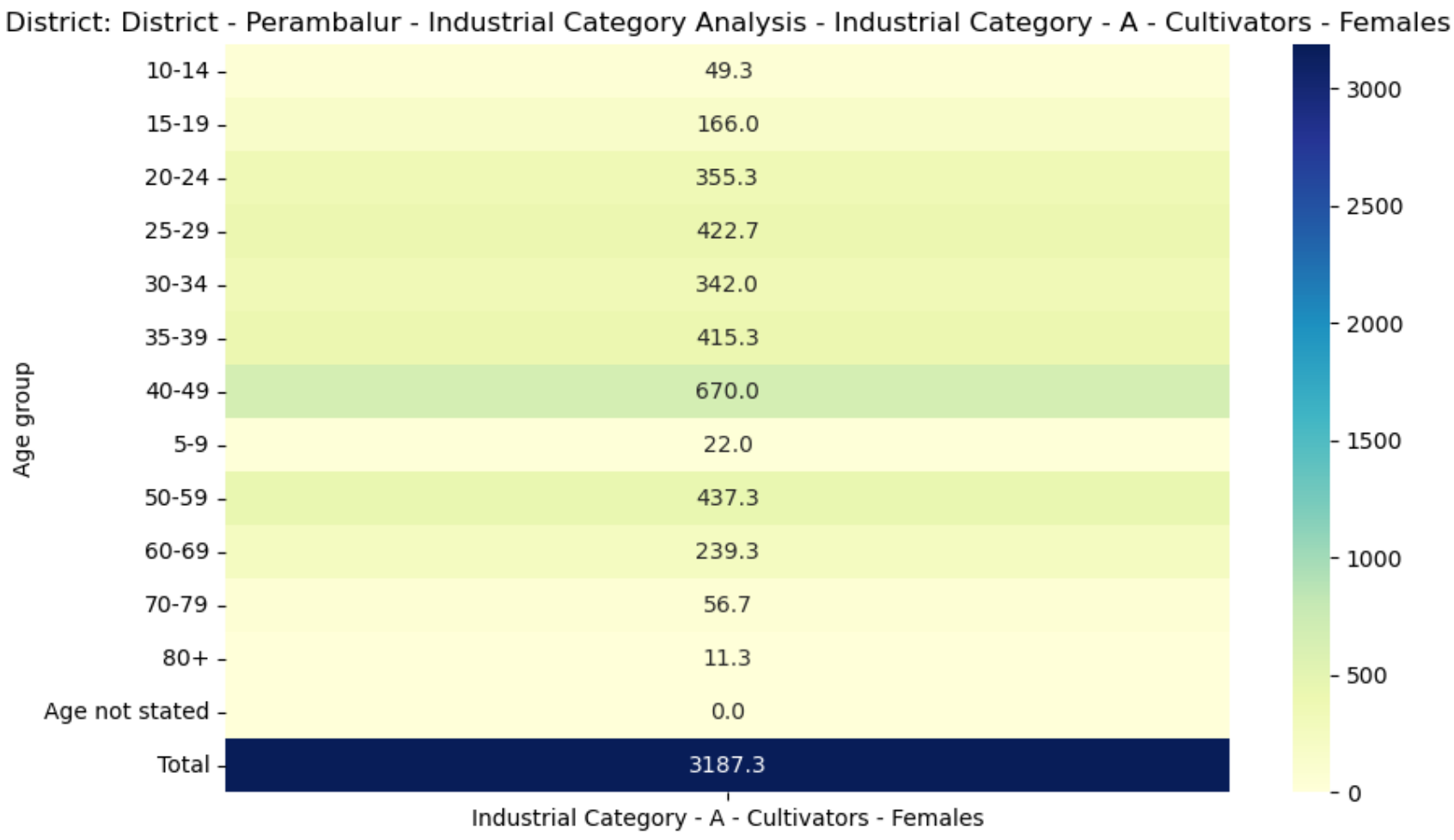

District: District - Tiruchirappalli - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
78.0
270.0
538.7
609.3
613.3
689.3
1264.0
36.7
944.0
667.3
246.7
48.7
2.0
6008.0
Age group
Industrial Category - A - Cultivators - Persons
6000
5000
4000
3000
2000
1000

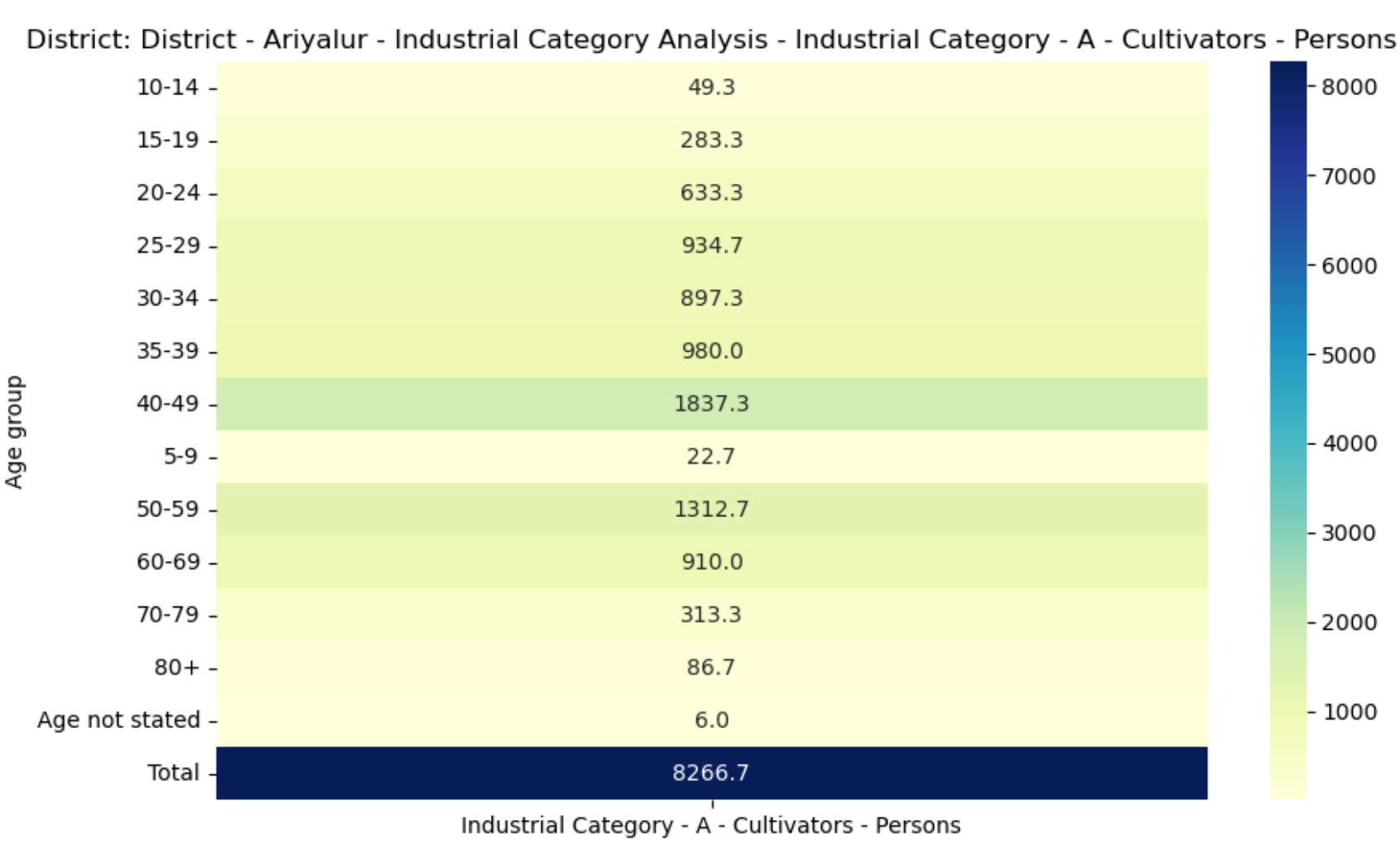

District: District - Tiruchirappalli - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
36.7
146.7
268.7
297.3
320.7
346.0
679.3
13.3
508.0
403.3
173.3
37.3
2.0
3232.7
Age group
Industrial Category - A - Cultivators - Males
3000
2500
2000
1500
1000
500

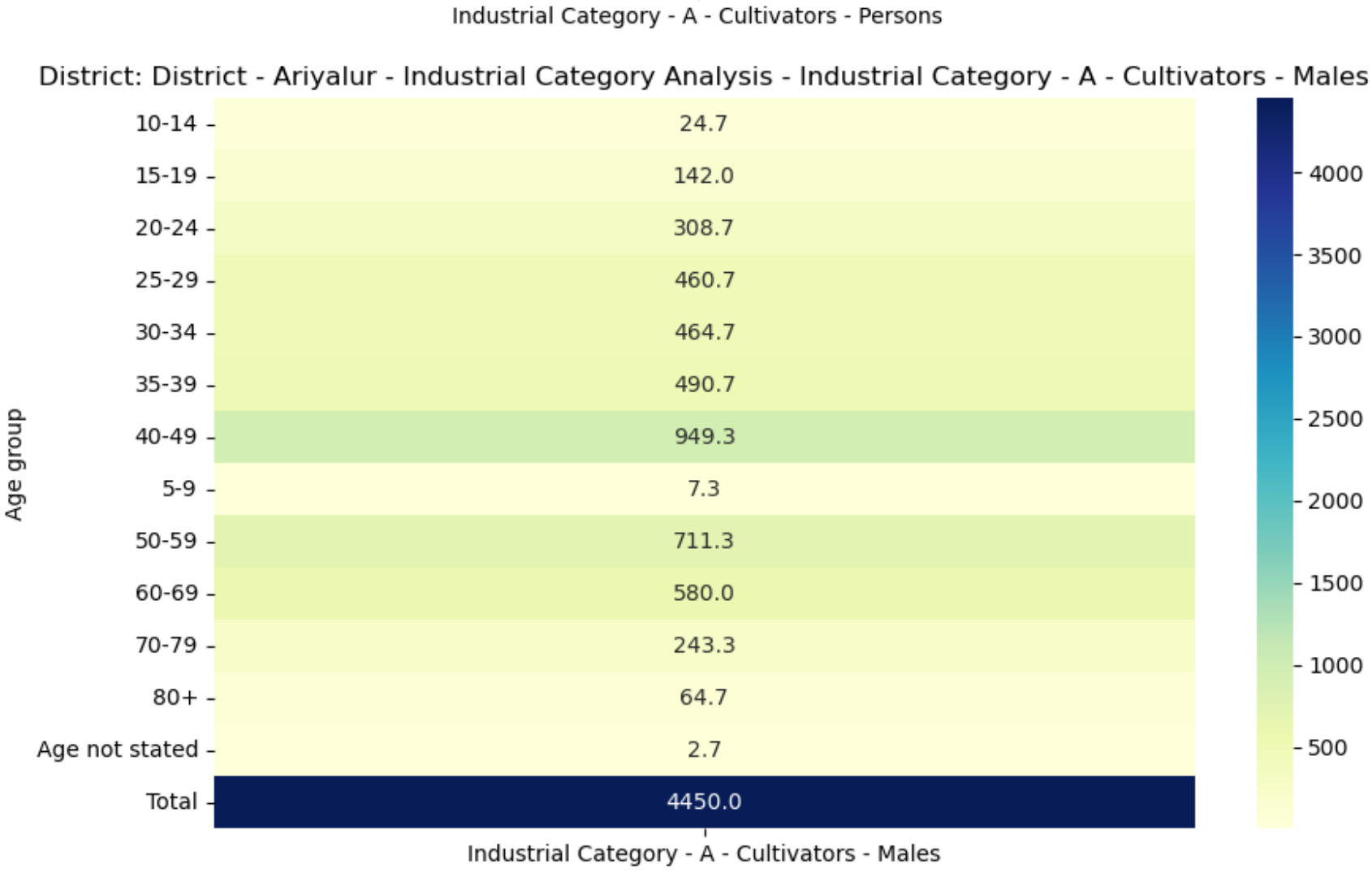

District: District - Tiruchirappalli - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
41.3
123.3
270.0
312.0
292.7
343.3
584.7
23.3
436.0
264.0
73.3
11.3
0.0
2775.3
2500
2000
1500
1000
500
0
Industrial Category - A - Cultivators - Females

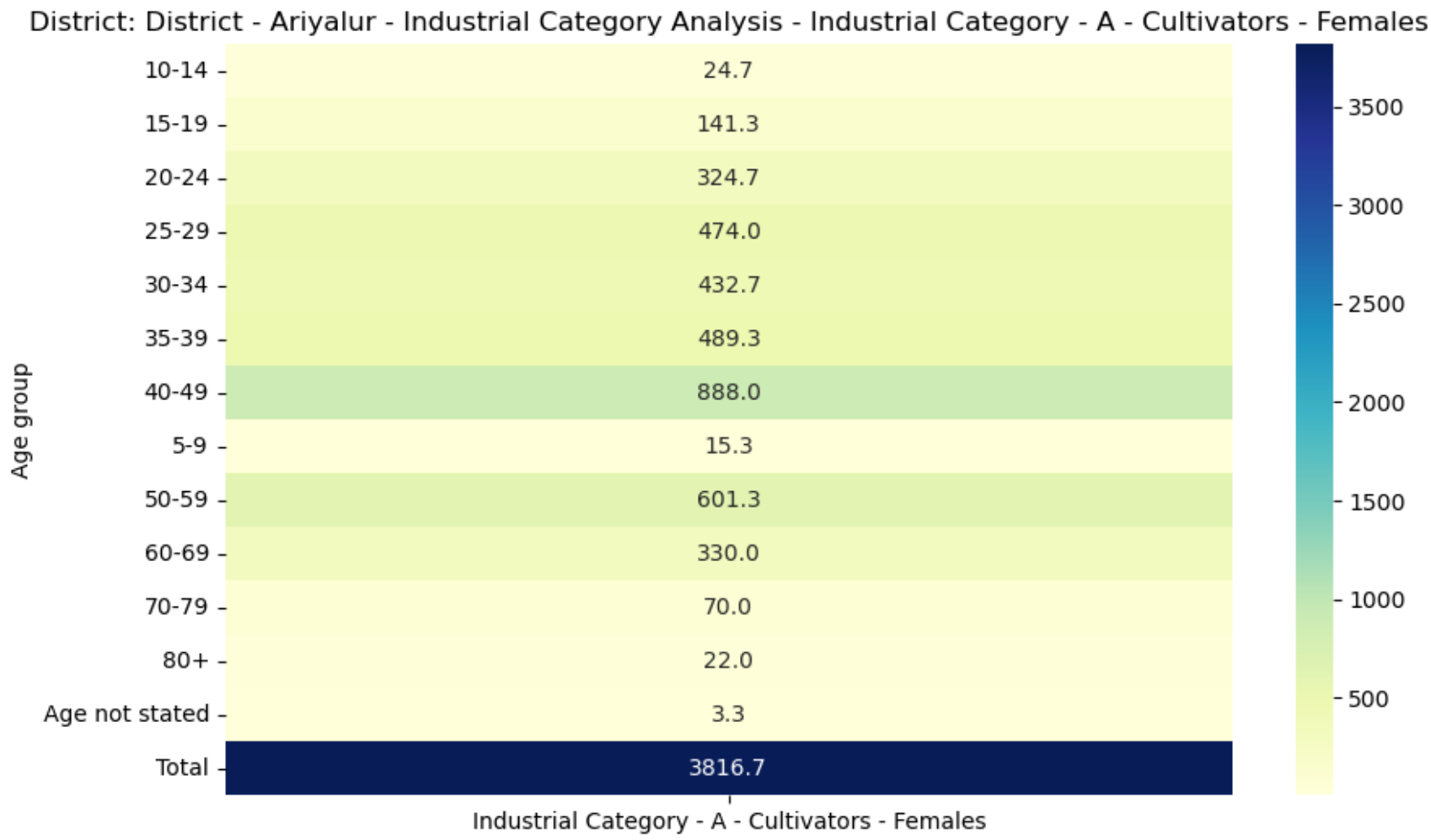

District: District - Perambalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
93.3
338.7
649.3
810.0
679.3
766.7
1334.7
45.3
936.0
602.0
207.3
43.3
2.0
6508.0
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

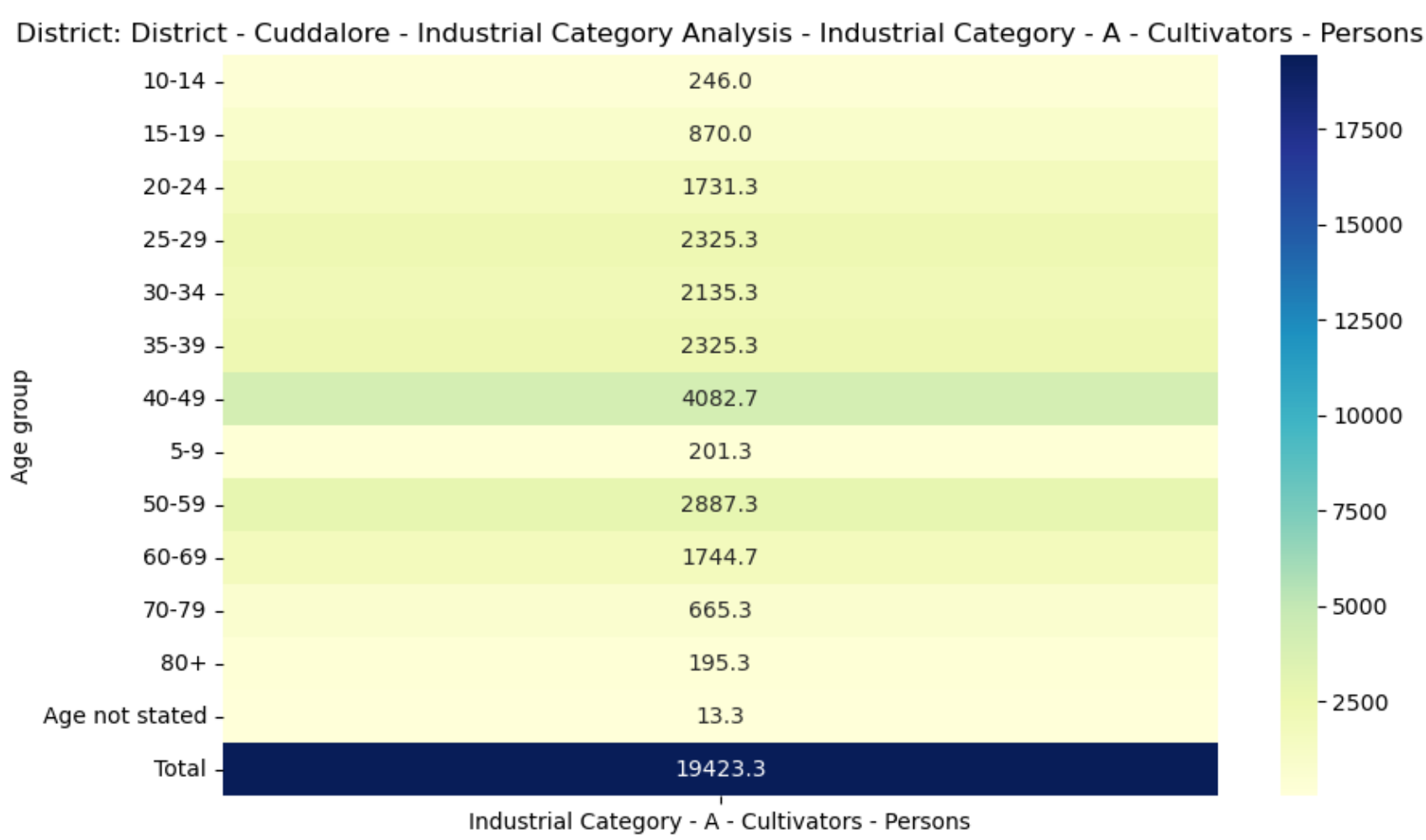

District: District - Perambalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
44.0
172.7
294.0
387.3
337.3
351.3
664.7
23.3
498.7
362.7
150.7
32.0
2.0
3320.7
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

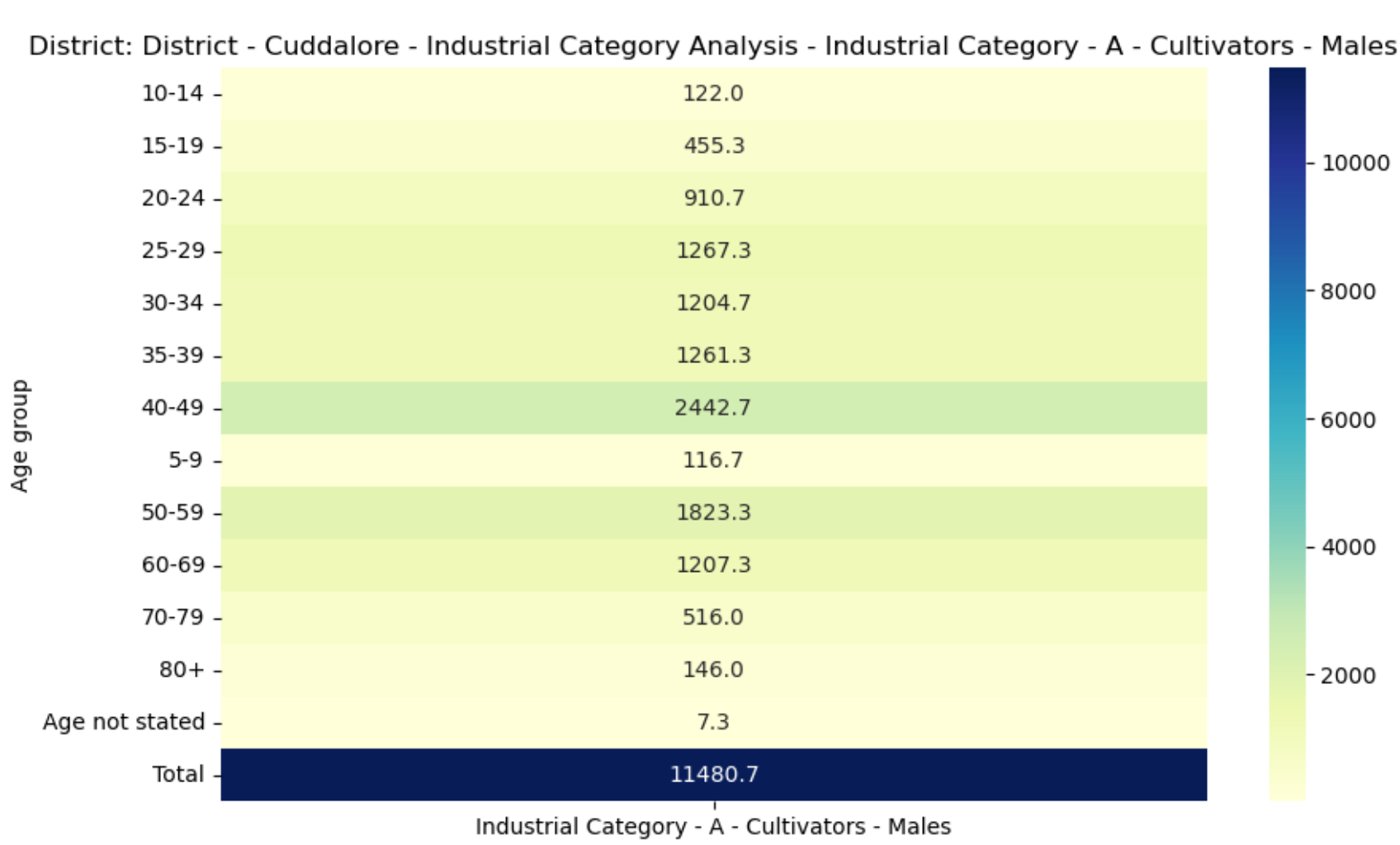

District: District - Perambalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
49.3
166.0
355.3
422.7
342.0
415.3
670.0
22.0
437.3
239.3
56.7
11.3
0.0
3187.3
3000
2500
2000
1500
1000
500
0
Industrial Category - A - Cultivators - Females

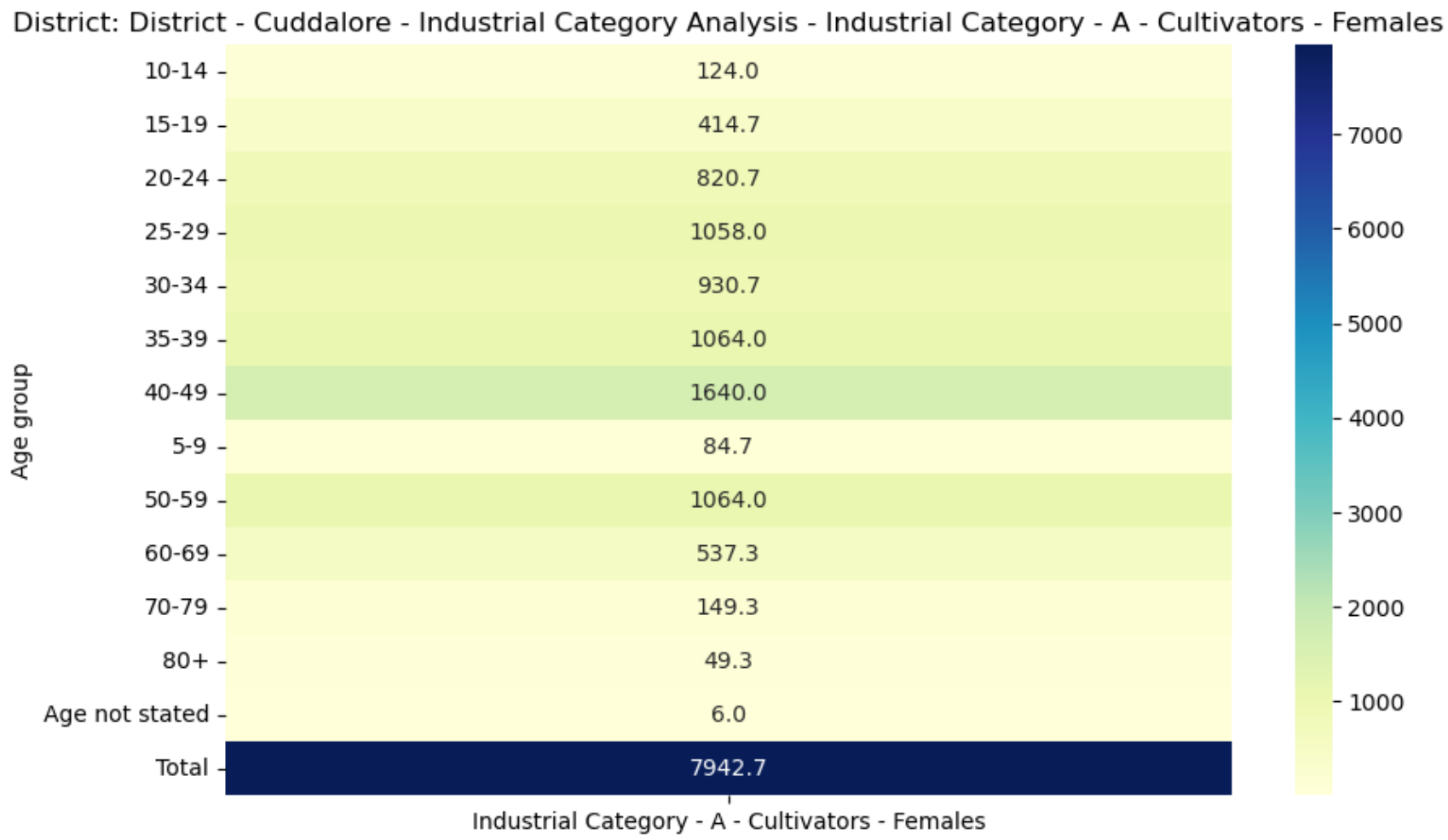

District: District - Ariyalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
49.3
283.3
633.3
934.7
897.3
980.0
1837.3
22.7
1312.7
910.0
313.3
86.7
6.0
8266.7
8000
7000
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

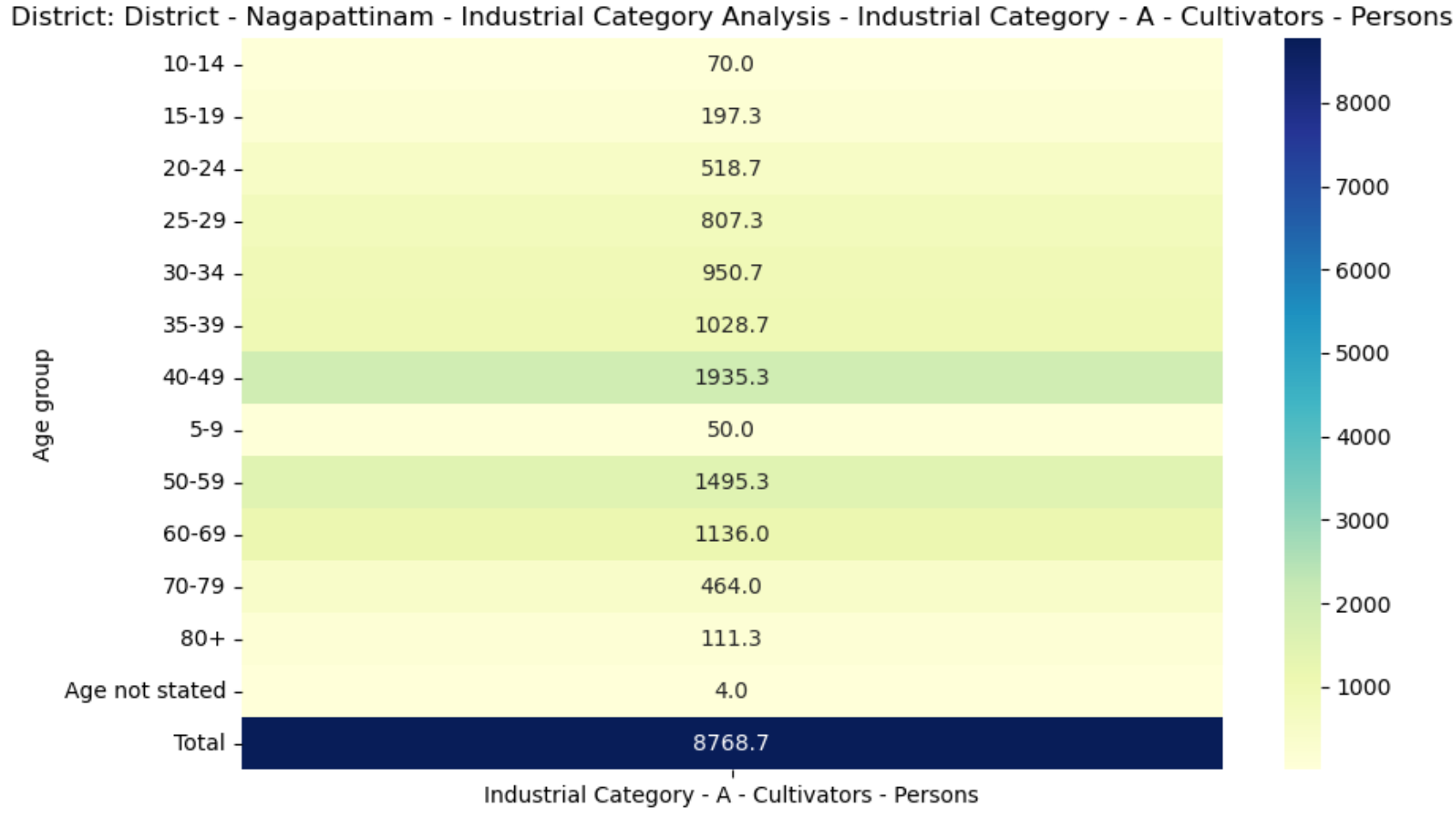

District: District - Ariyalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
24.7
142.0
308.7
460.7
464.7
490.7
949.3
7.3
711.3
580.0
243.3
64.7
2.7
4450.0
4000
3500
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

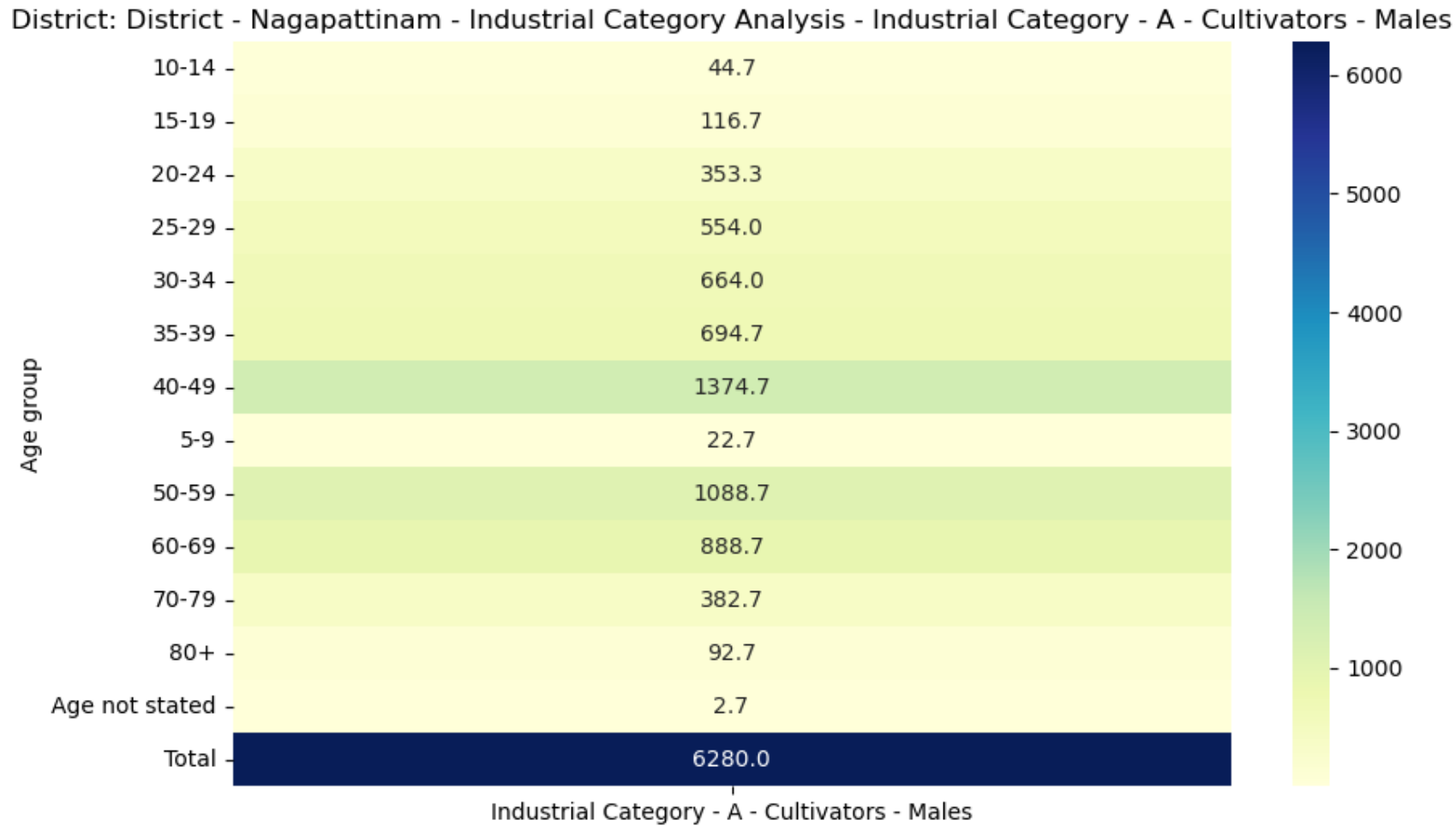

District: District - Ariyalur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
24.7
141.3
324.7
474.0
432.7
489.3
888.0
15.3
601.3
330.0
70.0
22.0
3.3
3816.7
Age group
Industrial Category - A - Cultivators - Females
3500
3000
2500
2000
1500
1000
500

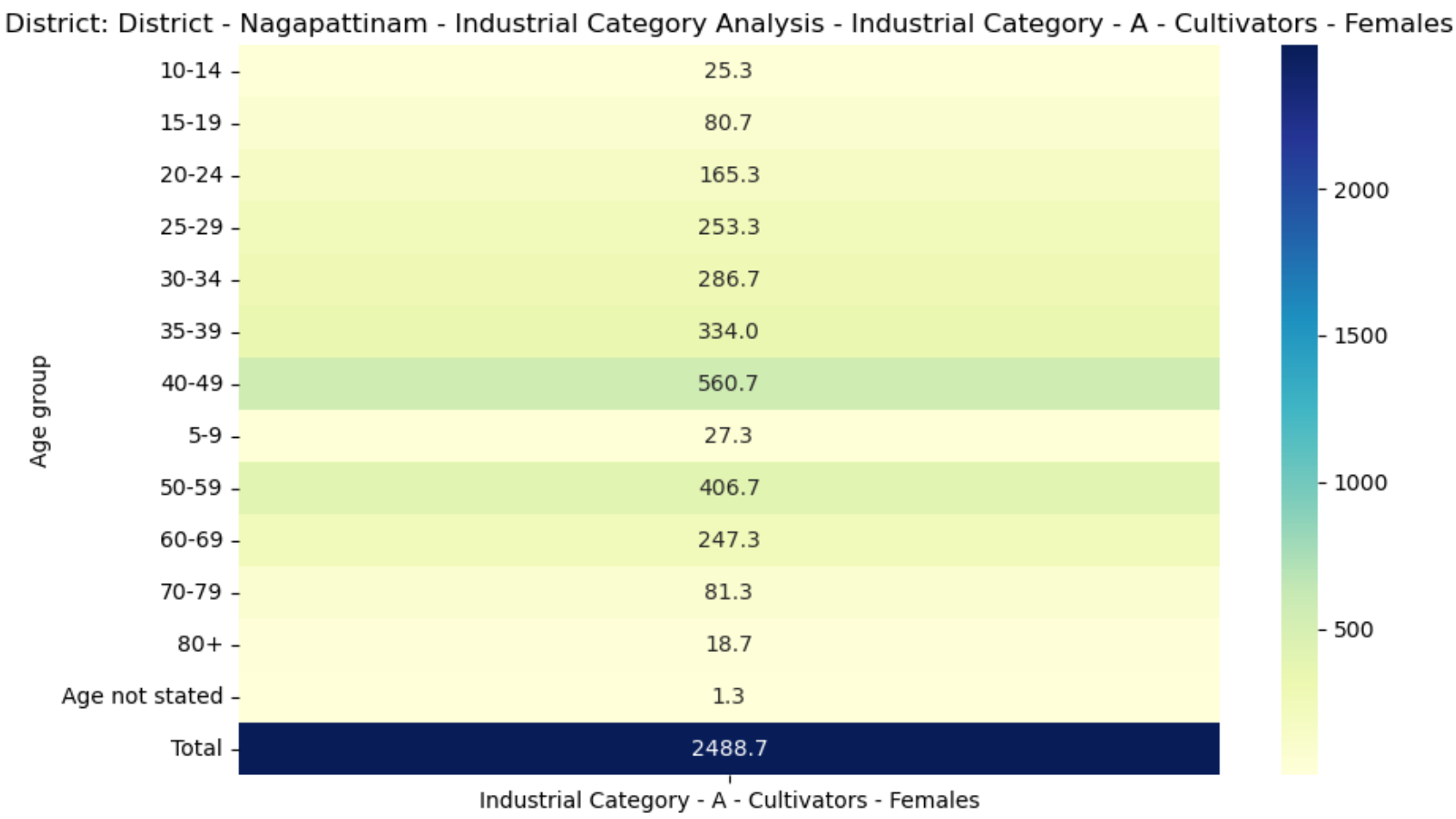

District: District - Cuddalore - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
246.0
870.0
1731.3
2325.3
2135.3
2325.3
4082.7
201.3
2887.3
1744.7
665.3
195.3
13.3
19423.3
Age group
Industrial Category - A - Cultivators - Persons
17500
15000
12500
10000
7500
5000
2500

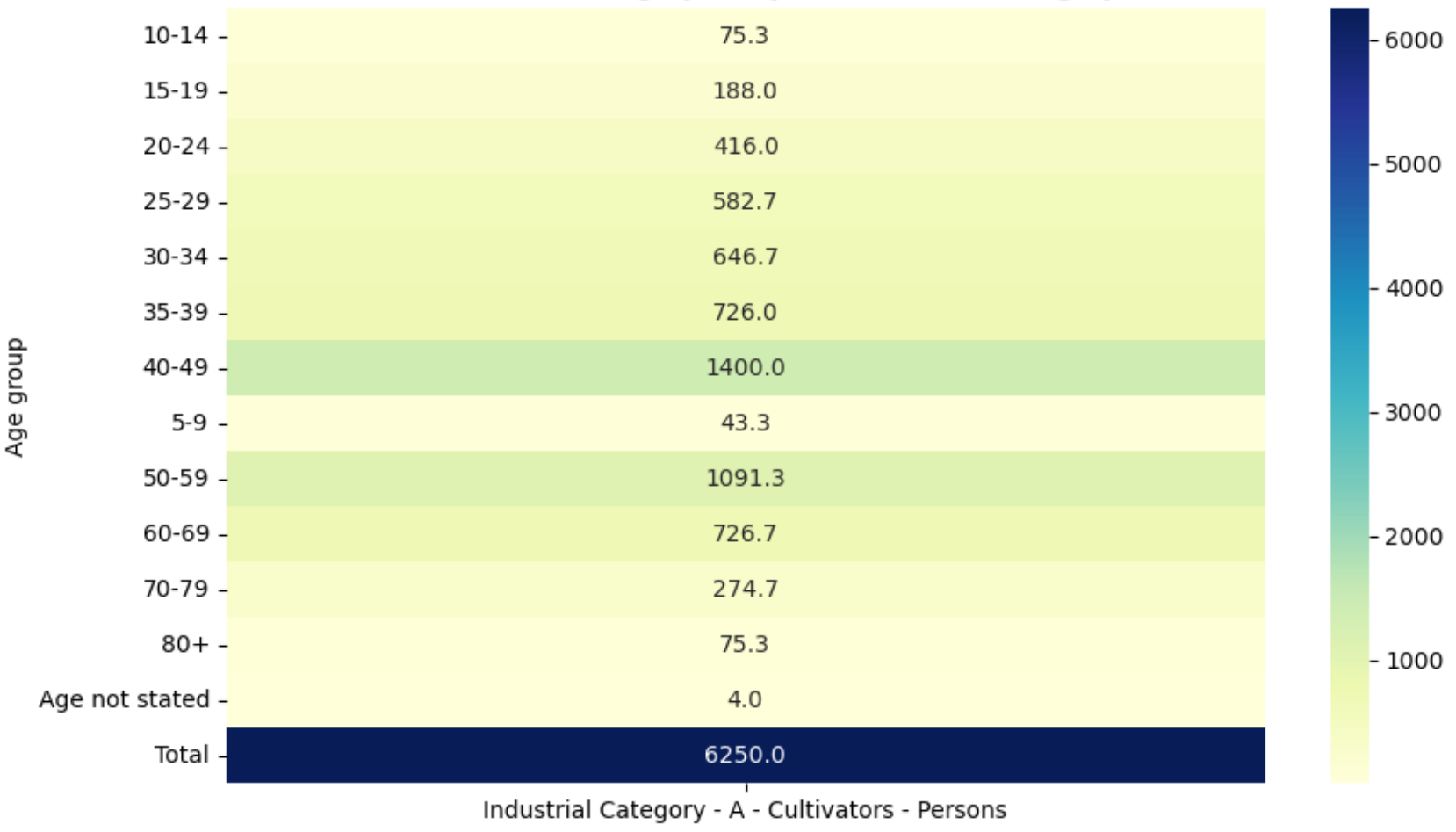

District: District - Cuddalore - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
122.0
455.3
910.7
1267.3
1204.7
1261.3
2442.7
116.7
1823.3
1207.3
516.0
146.0
7.3
11480.7
Age group
Industrial Category - A - Cultivators - Males
10000
8000
6000
4000
2000

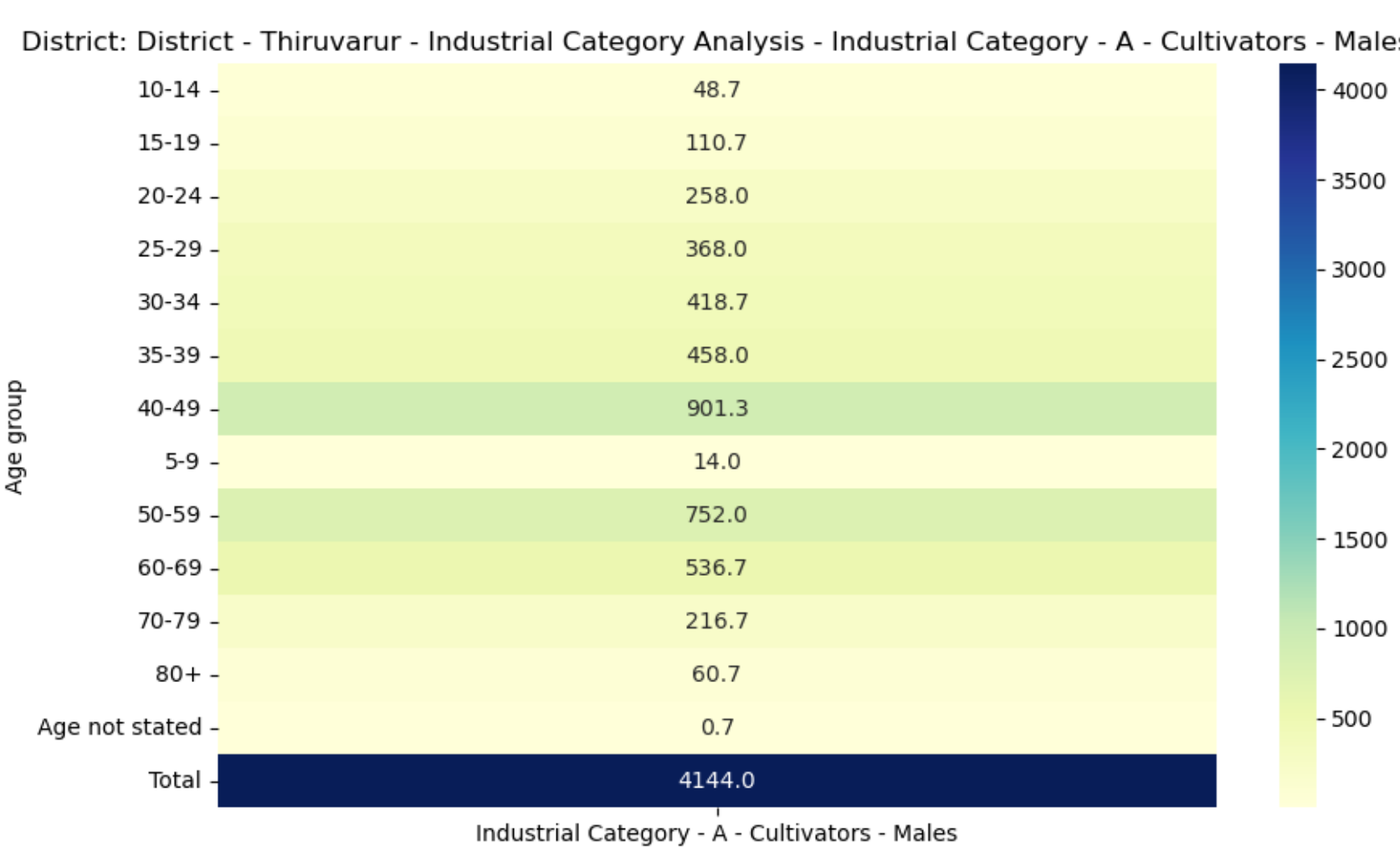

District: District - Cuddalore - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
124.0
414.7
820.7
1058.0
930.7
1064.0
1640.0
84.7
1064.0
537.3
149.3
49.3
6.0
7942.7
Age group
Industrial Category - A - Cultivators - Females
7000
6000
5000
4000
3000
2000
1000

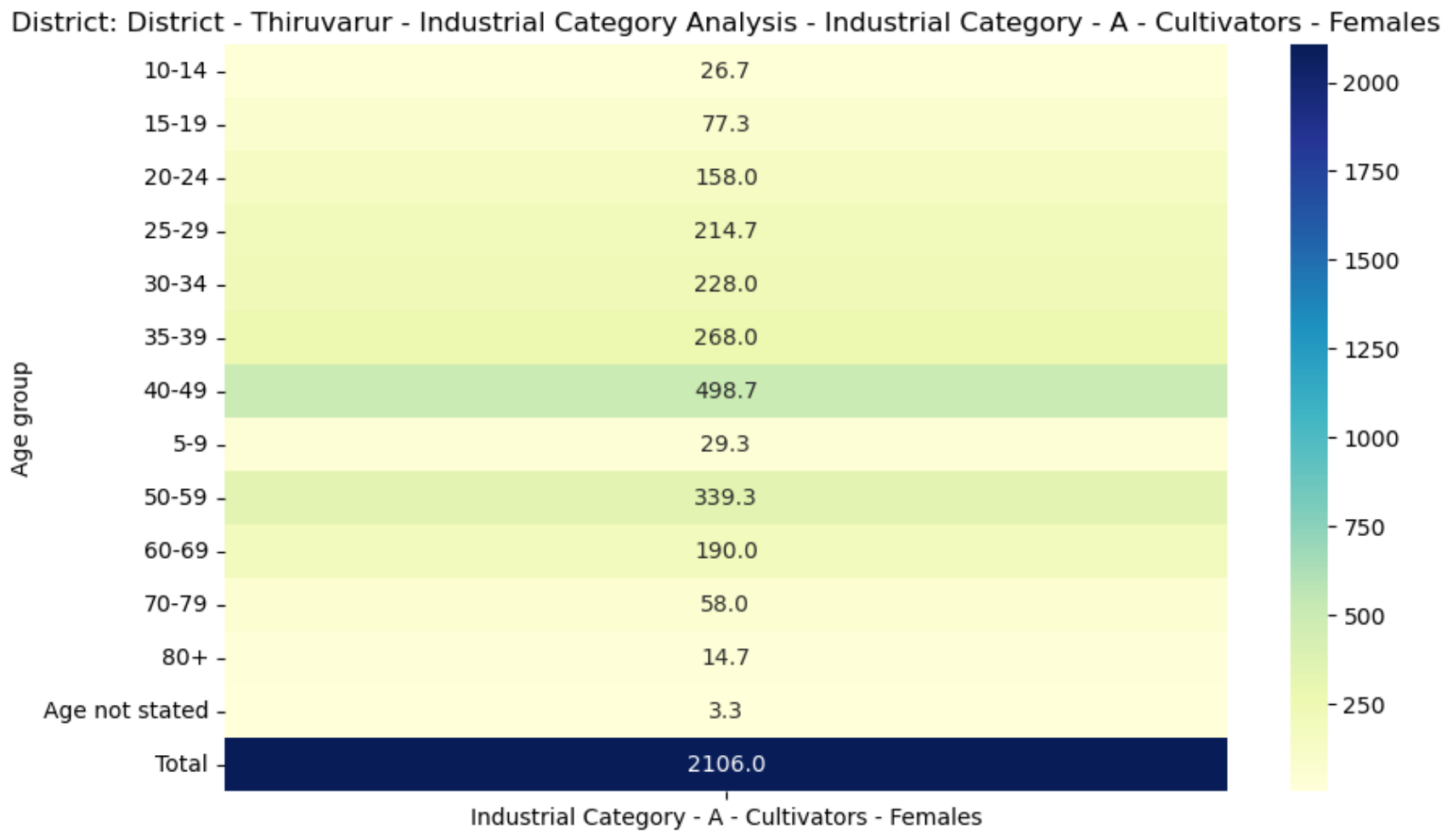

District: District - Nagapattinam - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
70.0
197.3
518.7
807.3
950.7
1028.7
1935.3
50.0
1495.3
1136.0
464.0
111.3
4.0
8768.7
Age group
Industrial Category - A - Cultivators - Persons
8000
7000
6000
5000
4000
3000
2000
1000

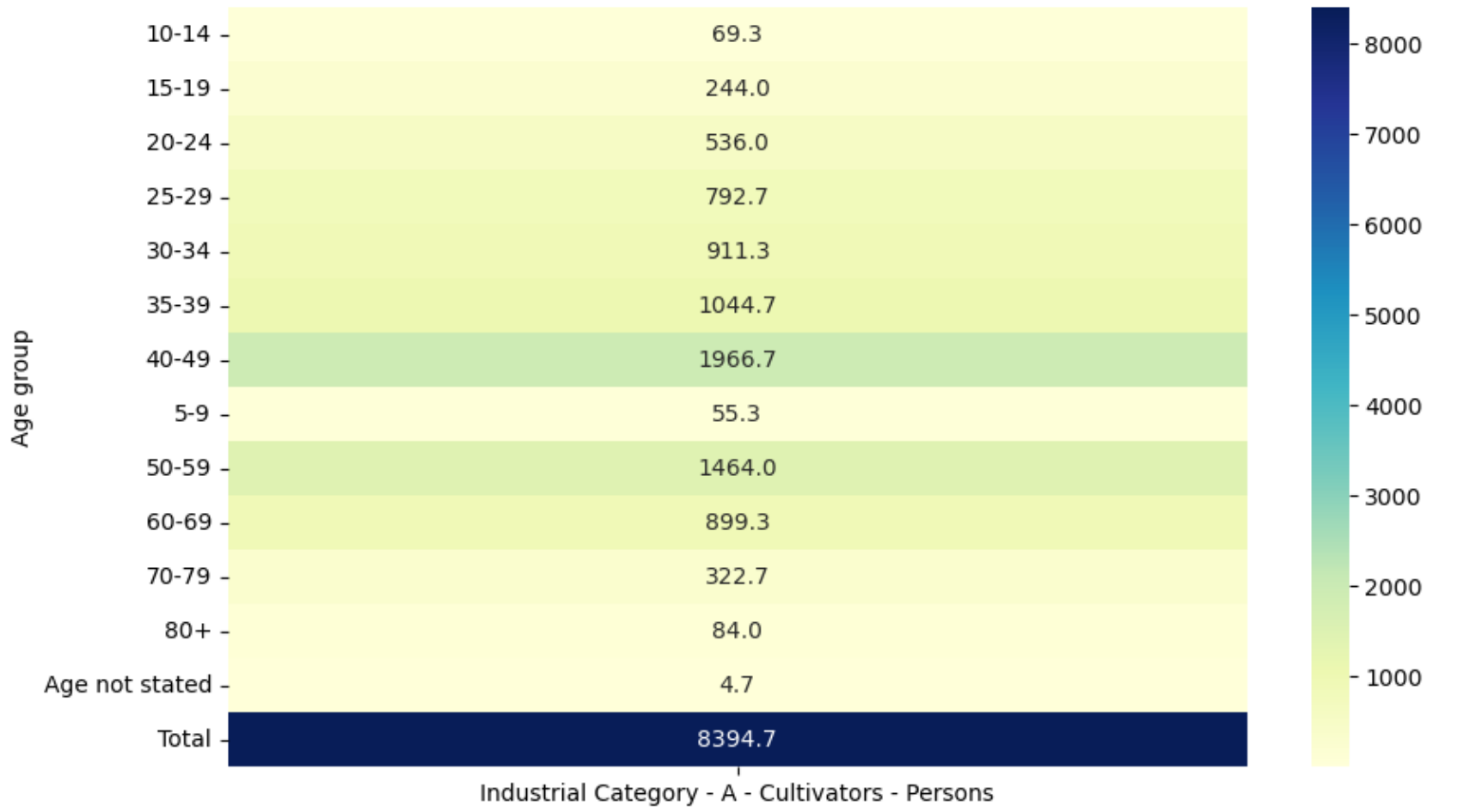

District: District - Nagapattinam - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
44.7
116.7
353.3
554.0
664.0
694.7
1374.7
22.7
1088.7
888.7
382.7
92.7
2.7
6280.0
Age group
Industrial Category - A - Cultivators - Males
6000
5000
4000
3000
2000
1000

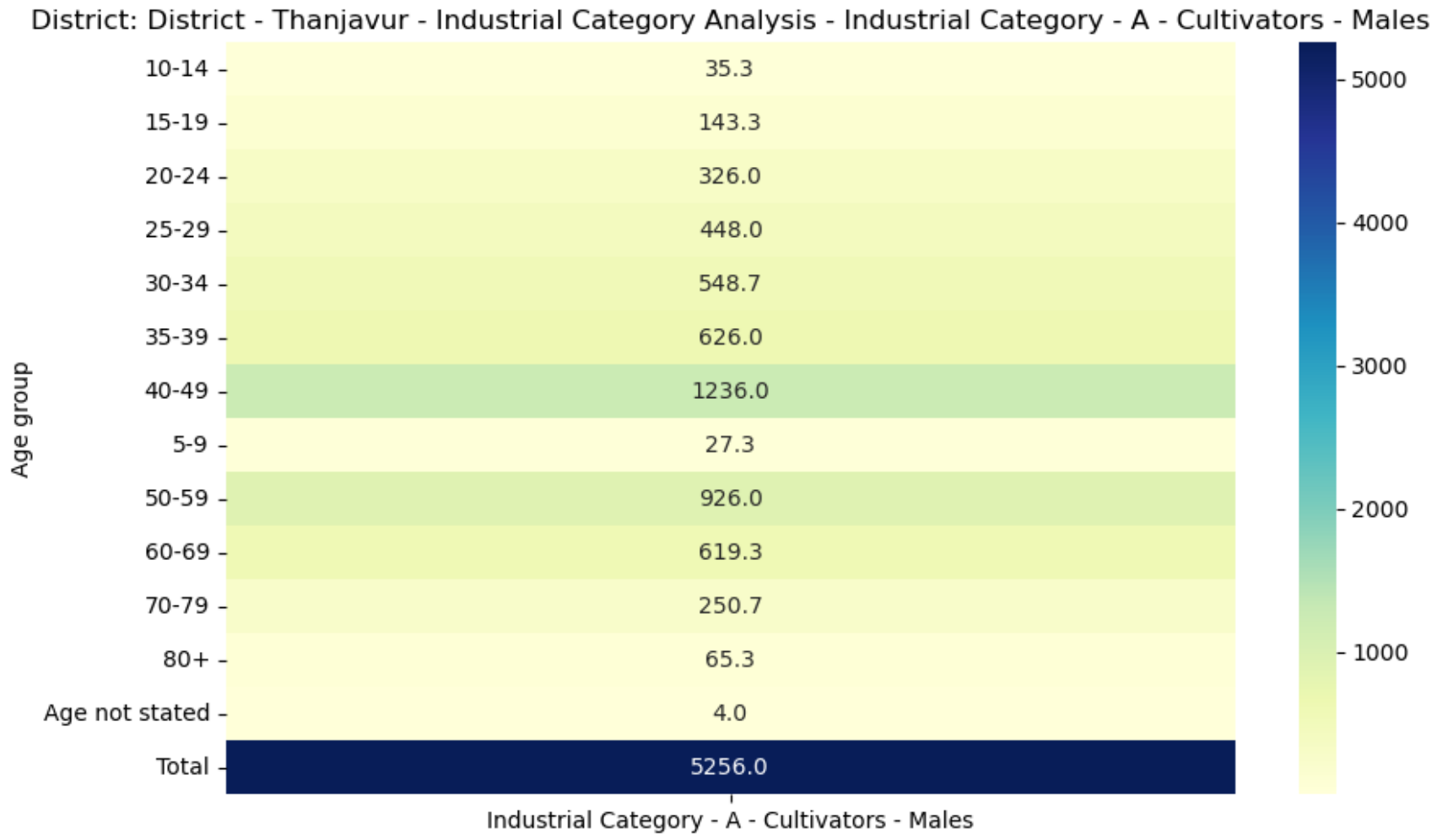

District: District - Nagapattinam - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
25.3
80.7
165.3
253.3
286.7
334.0
560.7
27.3
406.7
247.3
81.3
18.7
1.3
2488.7
Age group
2000
1500
1000
500
Industrial Category - A - Cultivators - Females

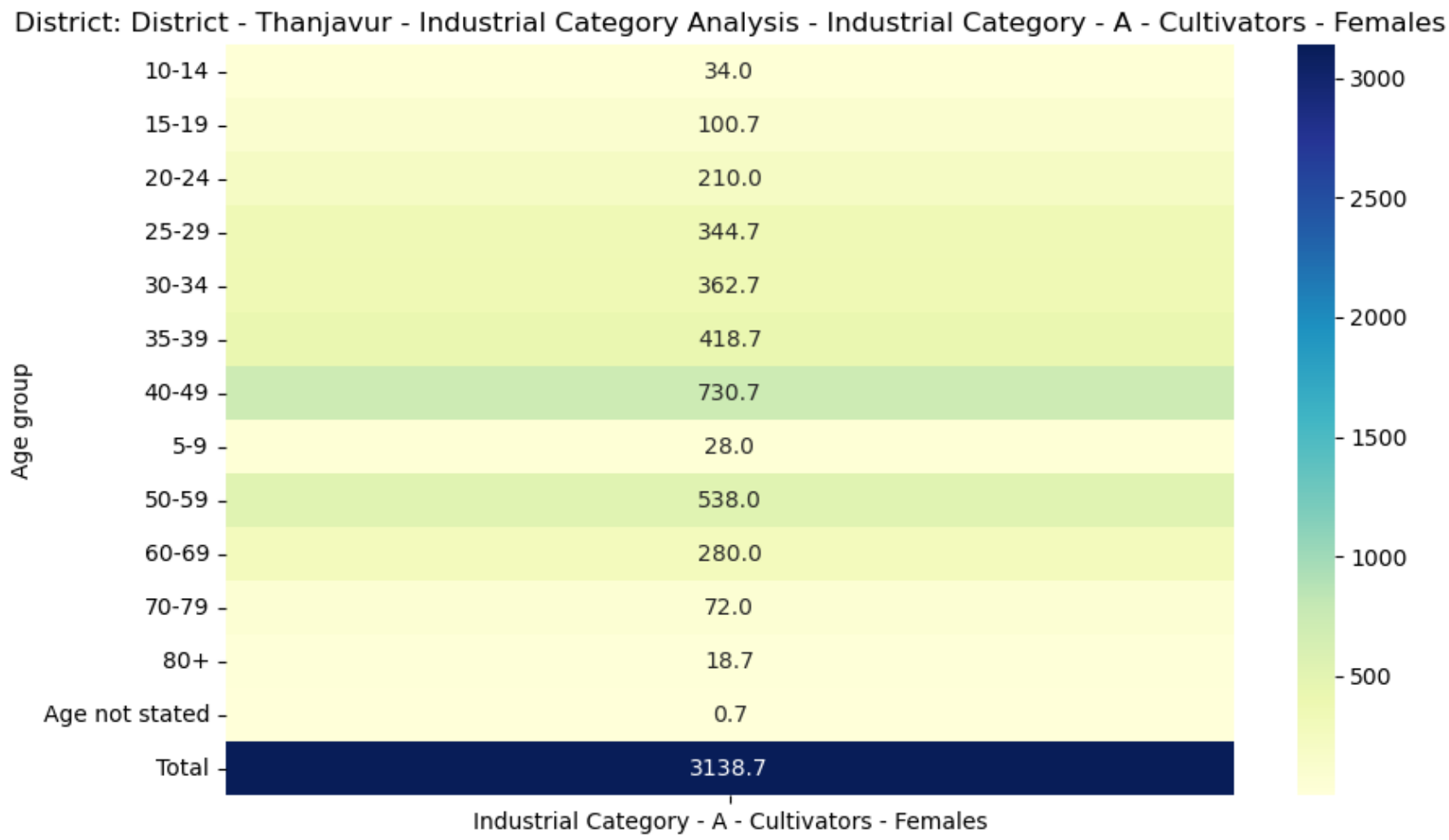

District: District - Thiruvarur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
75.3
188.0
416.0
582.7
646.7
726.0
1400.0
43.3
1091.3
726.7
274.7
75.3
4.0
6250.0
Age group
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

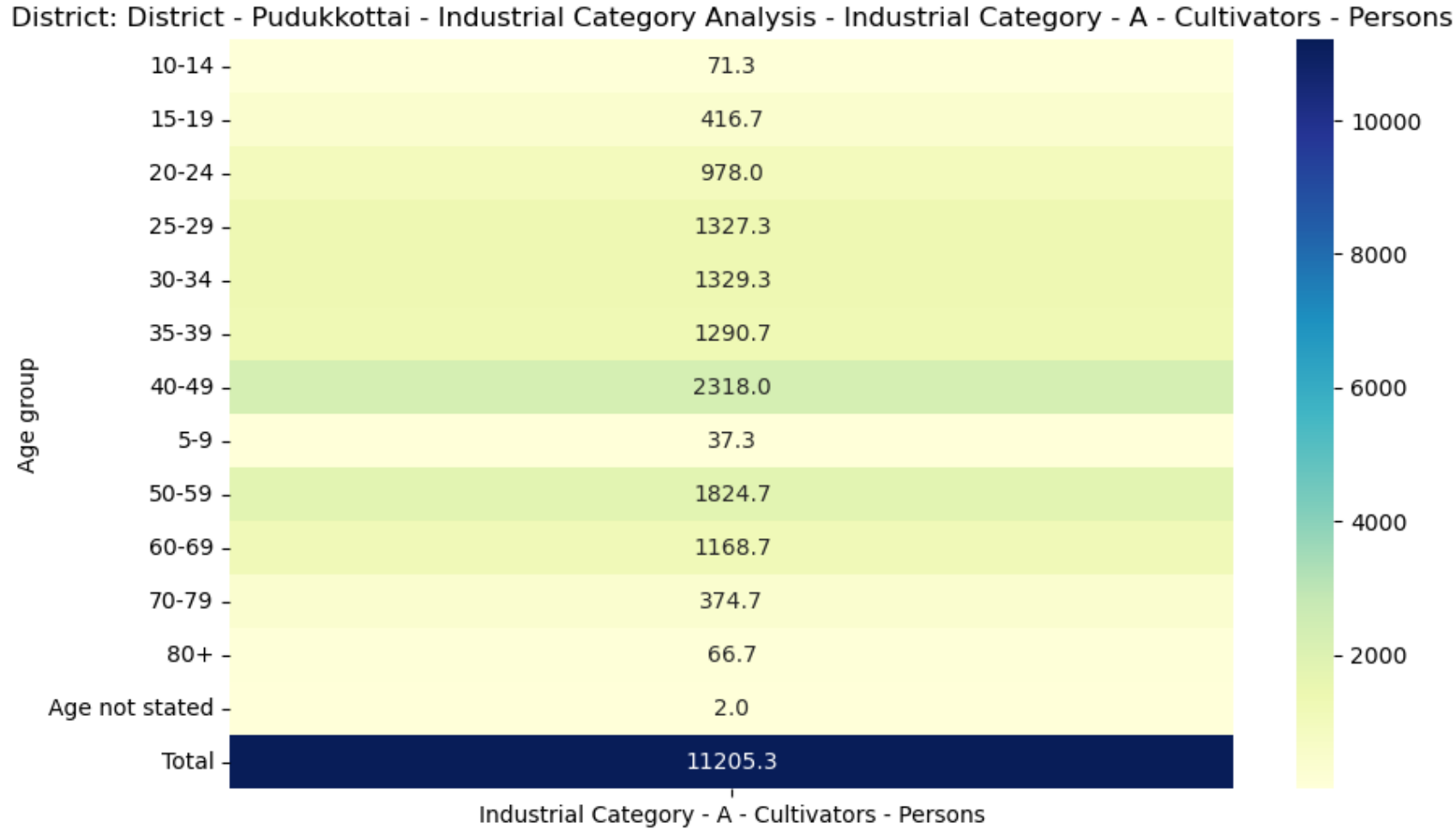

District: District - Thiruvarur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
48.7
110.7
258.0
368.0
418.7
458.0
901.3
14.0
752.0
536.7
216.7
60.7
0.7
4144.0
Age group
4000
3500
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

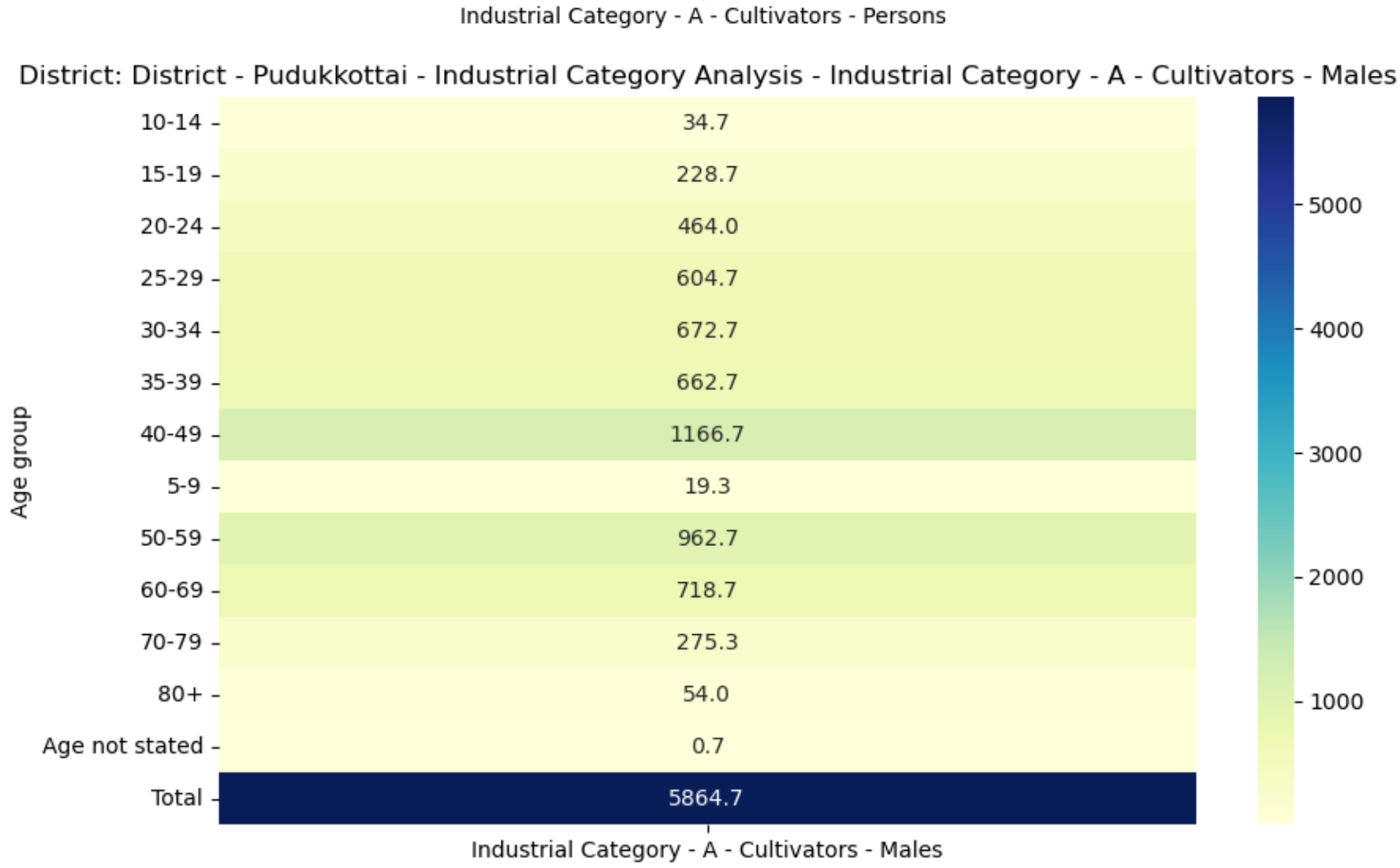

District: District - Thiruvarur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
26.7
77.3
158.0
214.7
228.0
268.0
498.7
29.3
339.3
190.0
58.0
14.7
3.3
2106.0
Age group
Industrial Category - A - Cultivators - Females
2000
1750
1500
1250
1000
750
500
250

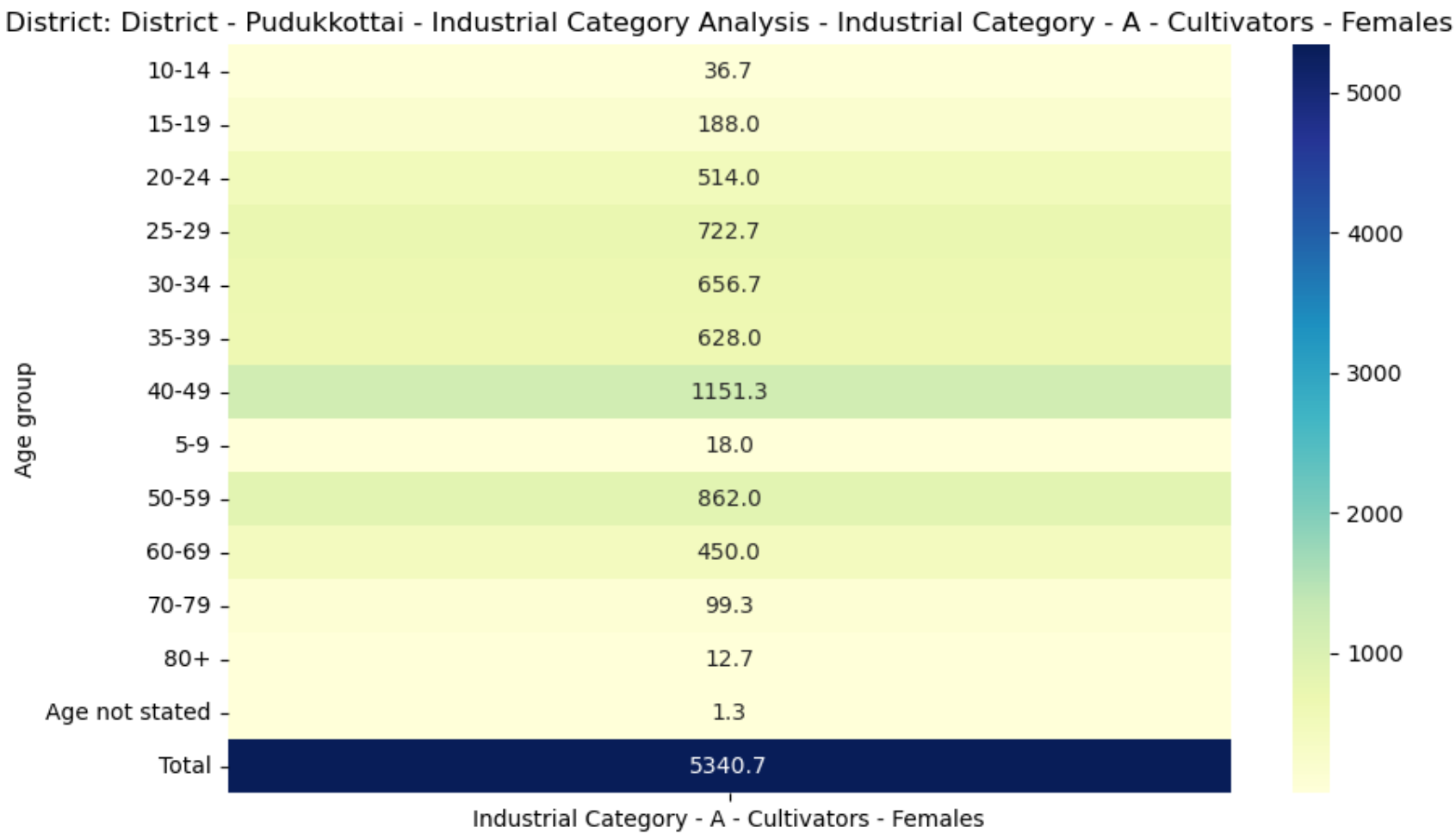

District: District - Thanjavur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
69.3
244.0
536.0
792.7
911.3
1044.7
1966.7
55.3
1464.0
899.3
322.7
84.0
4.7
8394.7
Age group
Industrial Category - A - Cultivators - Persons
8000
7000
6000
5000
4000
3000
2000
1000

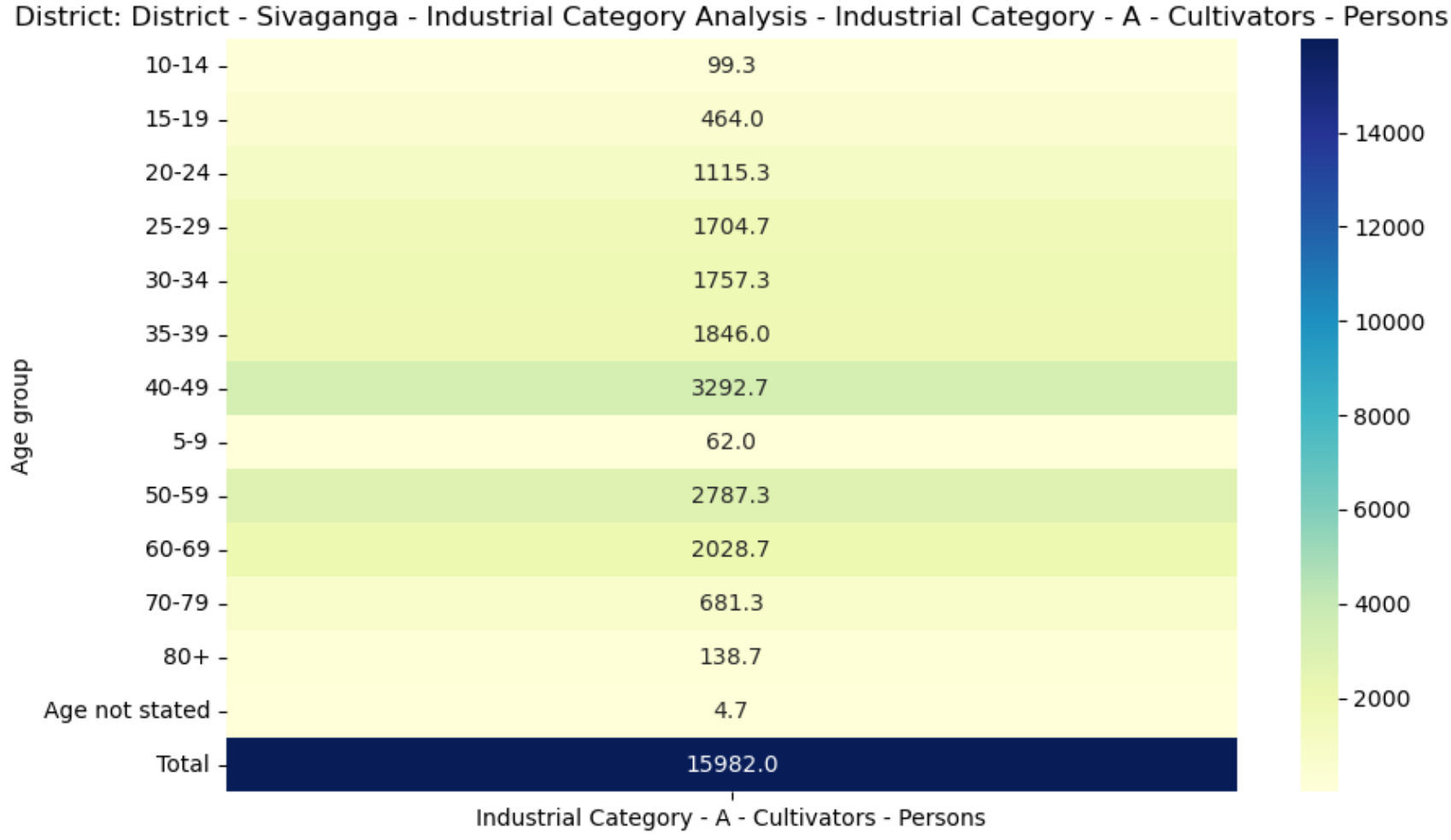

District: District - Thanjavur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
35.3
143.3
326.0
448.0
548.7
626.0
1236.0
27.3
926.0
619.3
250.7
65.3
4.0
5256.0
Age group
Industrial Category - A - Cultivators - Males
5000
4000
3000
2000
1000

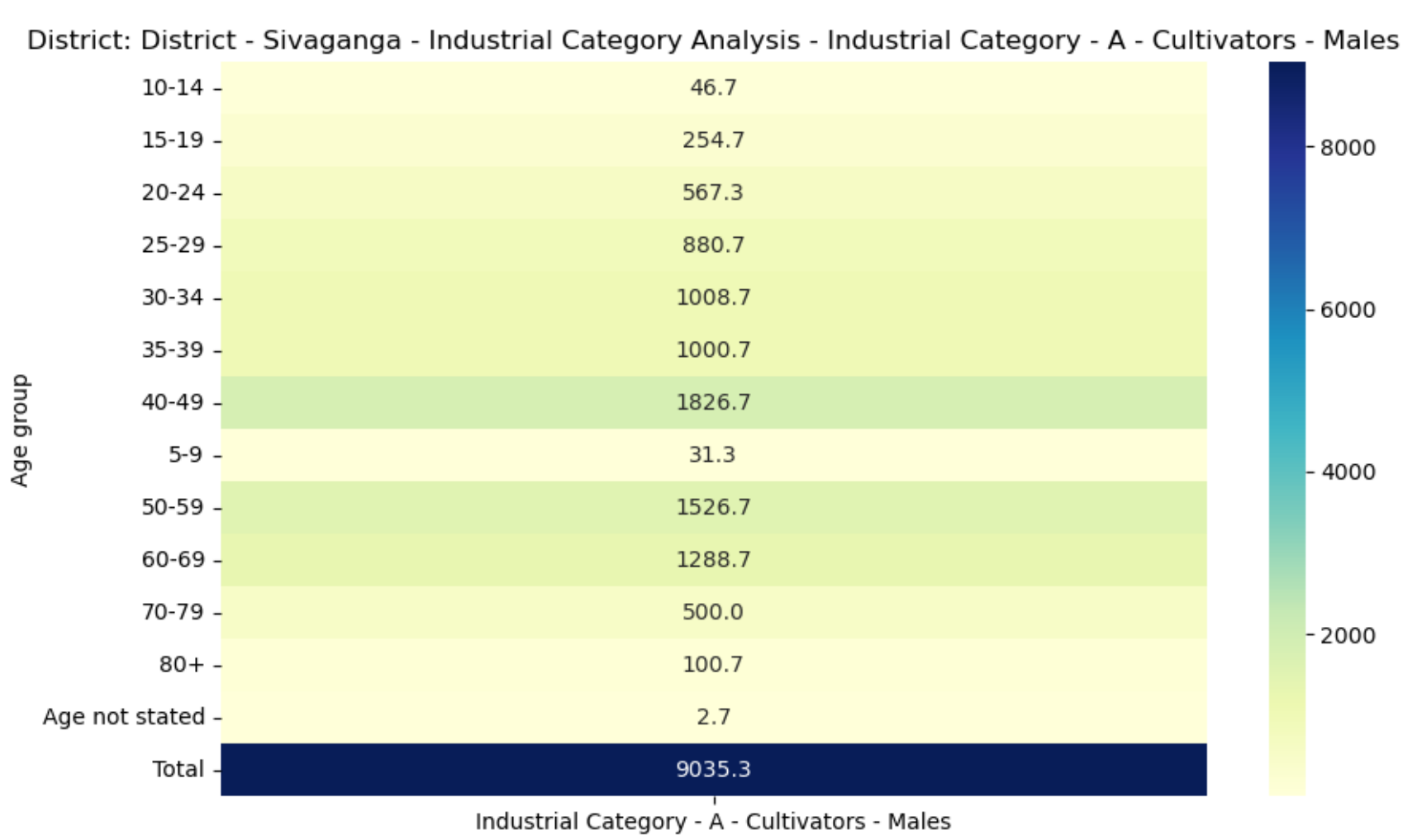

District: District - Thanjavur - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
34.0
100.7
210.0
344.7
362.7
418.7
730.7
28.0
538.0
280.0
72.0
18.7
0.7
3138.7
Age group
Industrial Category - A - Cultivators - Females
3000
2500
2000
1500
1000
500

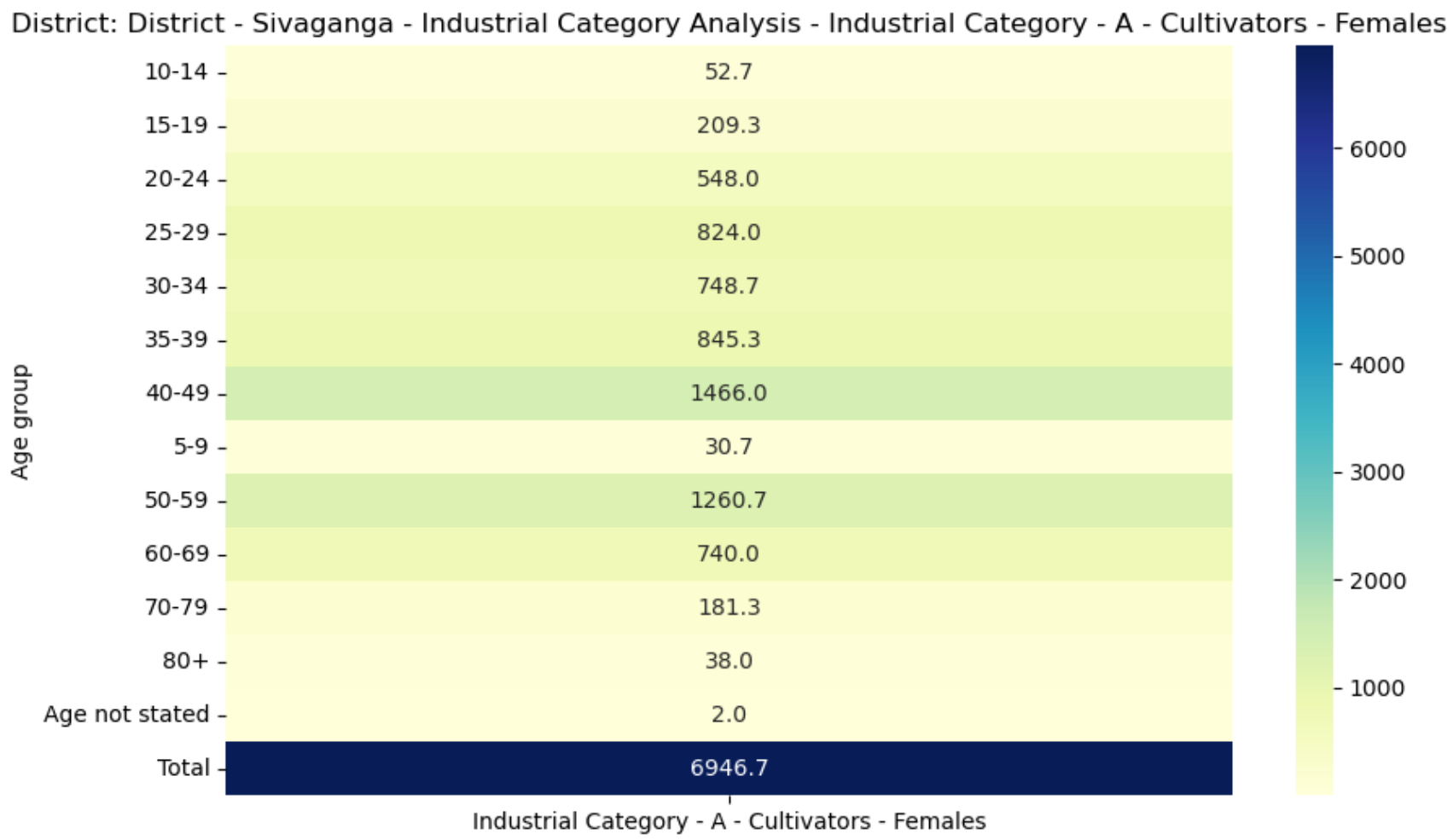

District: District - Pudukkottai - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
71.3
416.7
978.0
1327.3
1329.3
1290.7
2318.0
37.3
1824.7
1168.7
374.7
66.7
2.0
11205.3
Age group
Industrial Category - A - Cultivators - Persons
10000
8000
6000
4000
2000

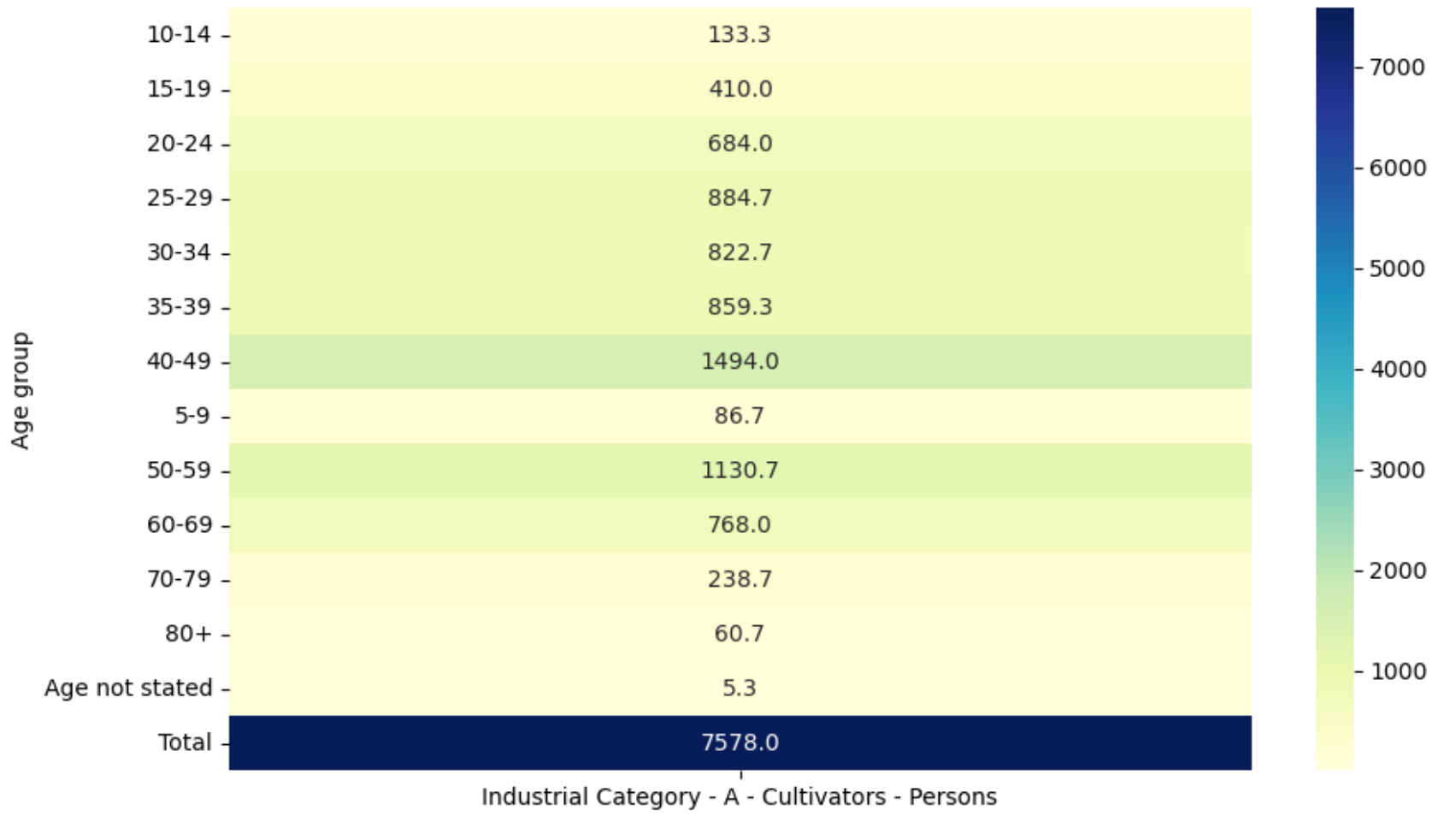

District: District - Pudukkottai - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
34.7
228.7
464.0
604.7
672.7
662.7
1166.7
19.3
962.7
718.7
275.3
54.0
0.7
5864.7
Age group
Industrial Category - A - Cultivators - Males
5000
4000
3000
2000
1000

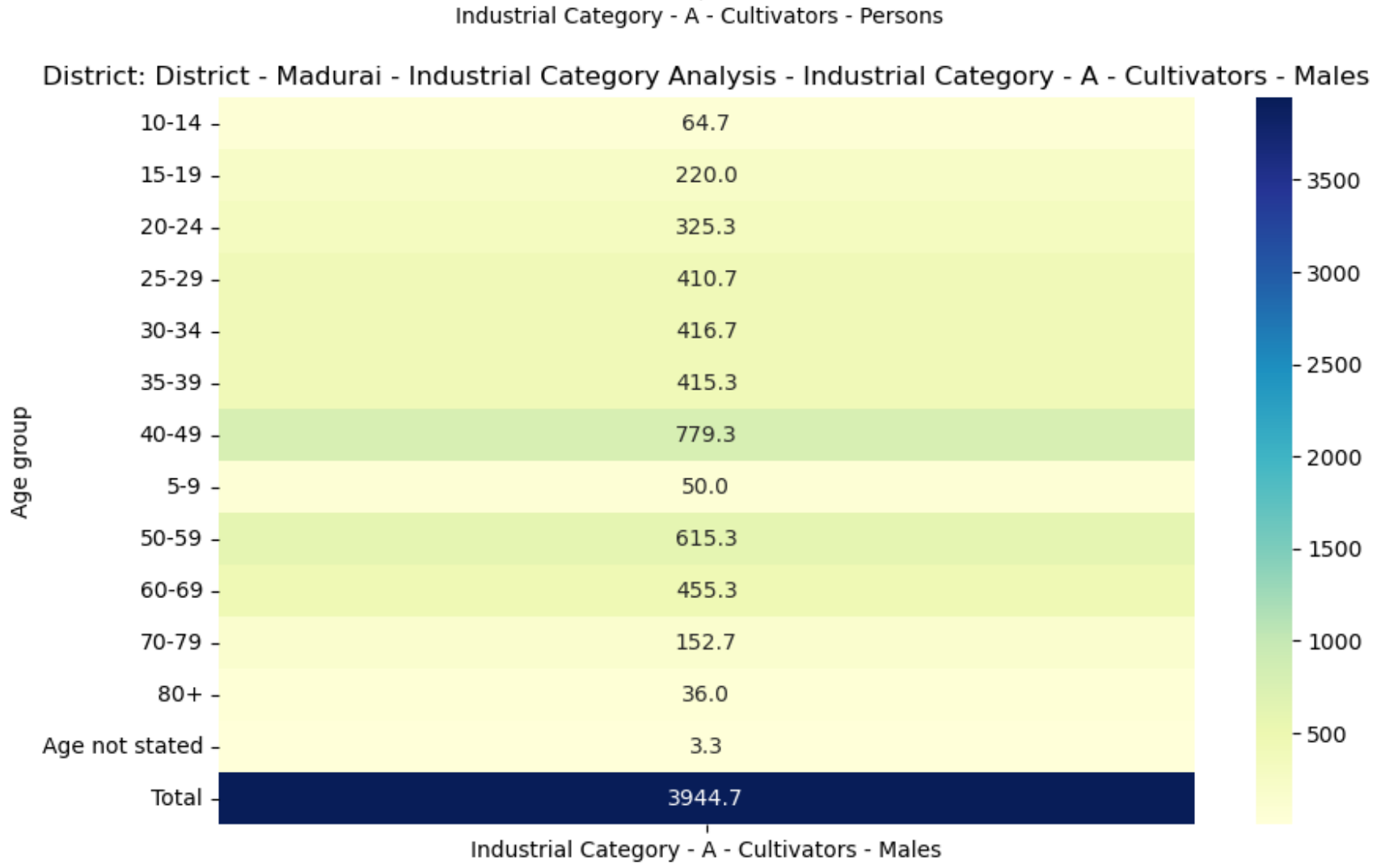

District: District - Pudukkottai - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
36.7
188.0
514.0
722.7
656.7
628.0
1151.3
18.0
862.0
450.0
99.3
12.7
1.3
5340.7
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Females

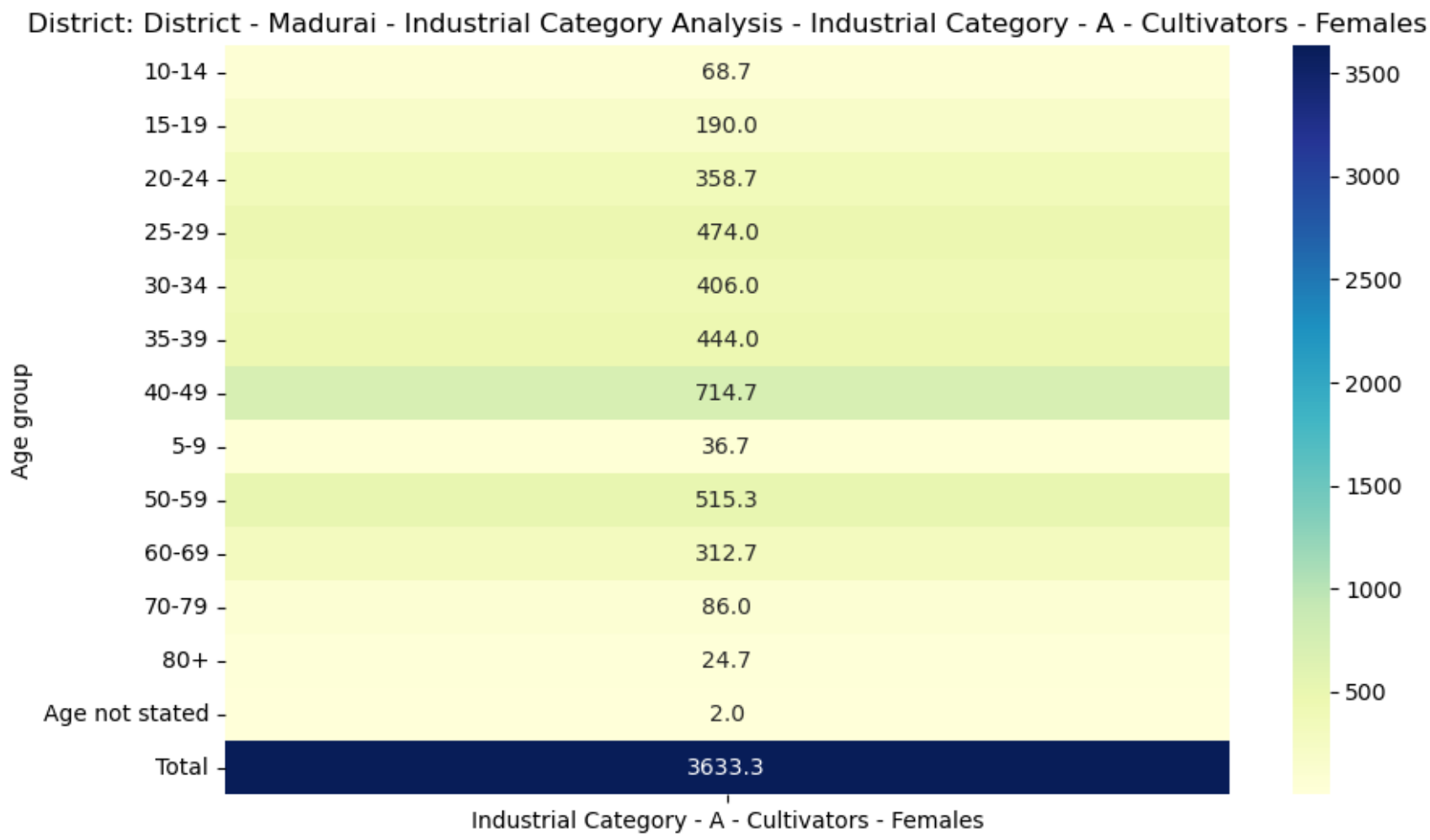

District: District - Sivaganga - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
99.3
464.0
1115.3
1704.7
1757.3
1846.0
3292.7
62.0
2787.3
2028.7
681.3
138.7
4.7
15982.0
14000
12000
10000
8000
6000
4000
2000
Industrial Category - A - Cultivators - Persons

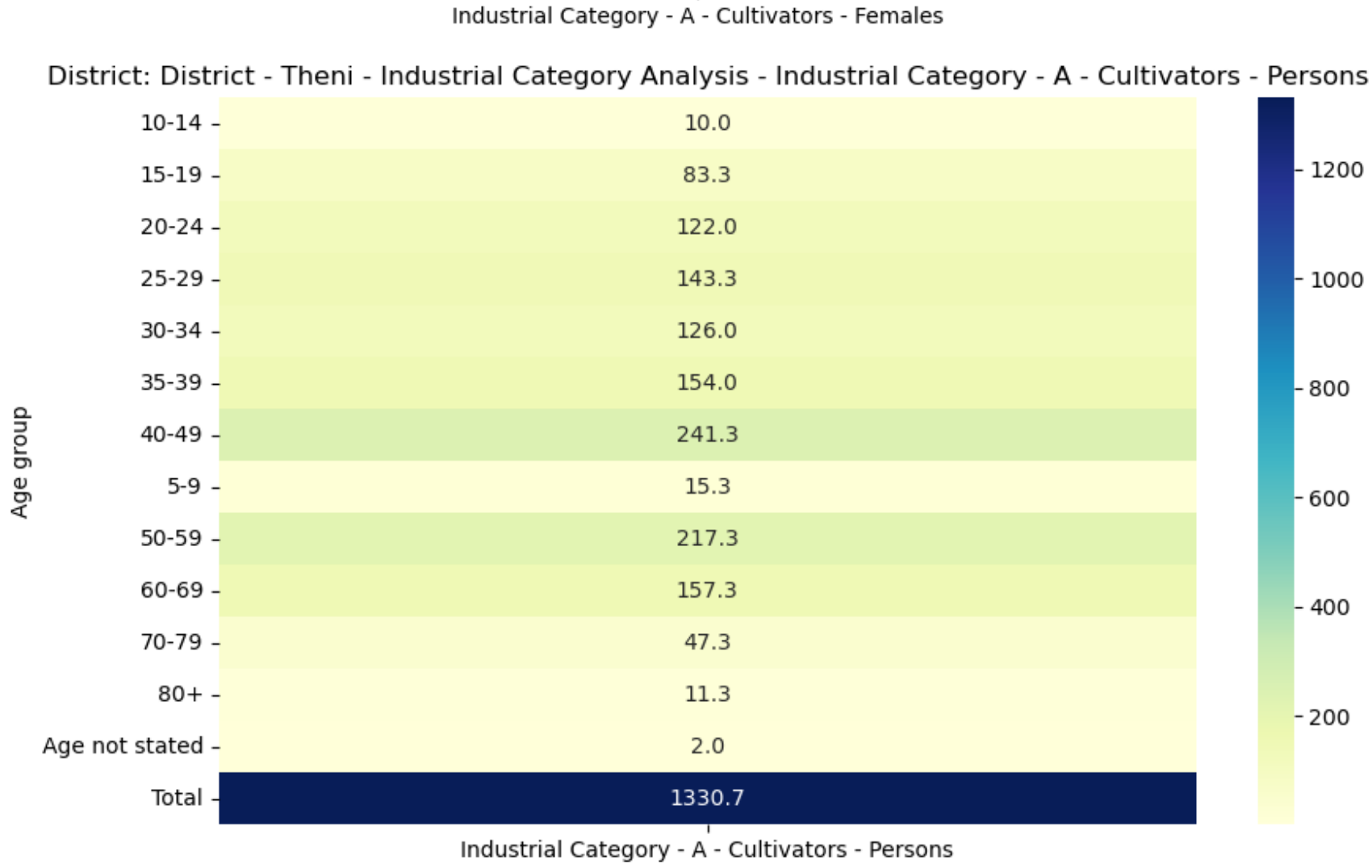

District: District - Sivaganga - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
46.7
254.7
567.3
880.7
1008.7
1000.7
1826.7
31.3
1526.7
1288.7
500.0
100.7
2.7
9035.3
8000
6000
4000
2000
Industrial Category - A - Cultivators - Males

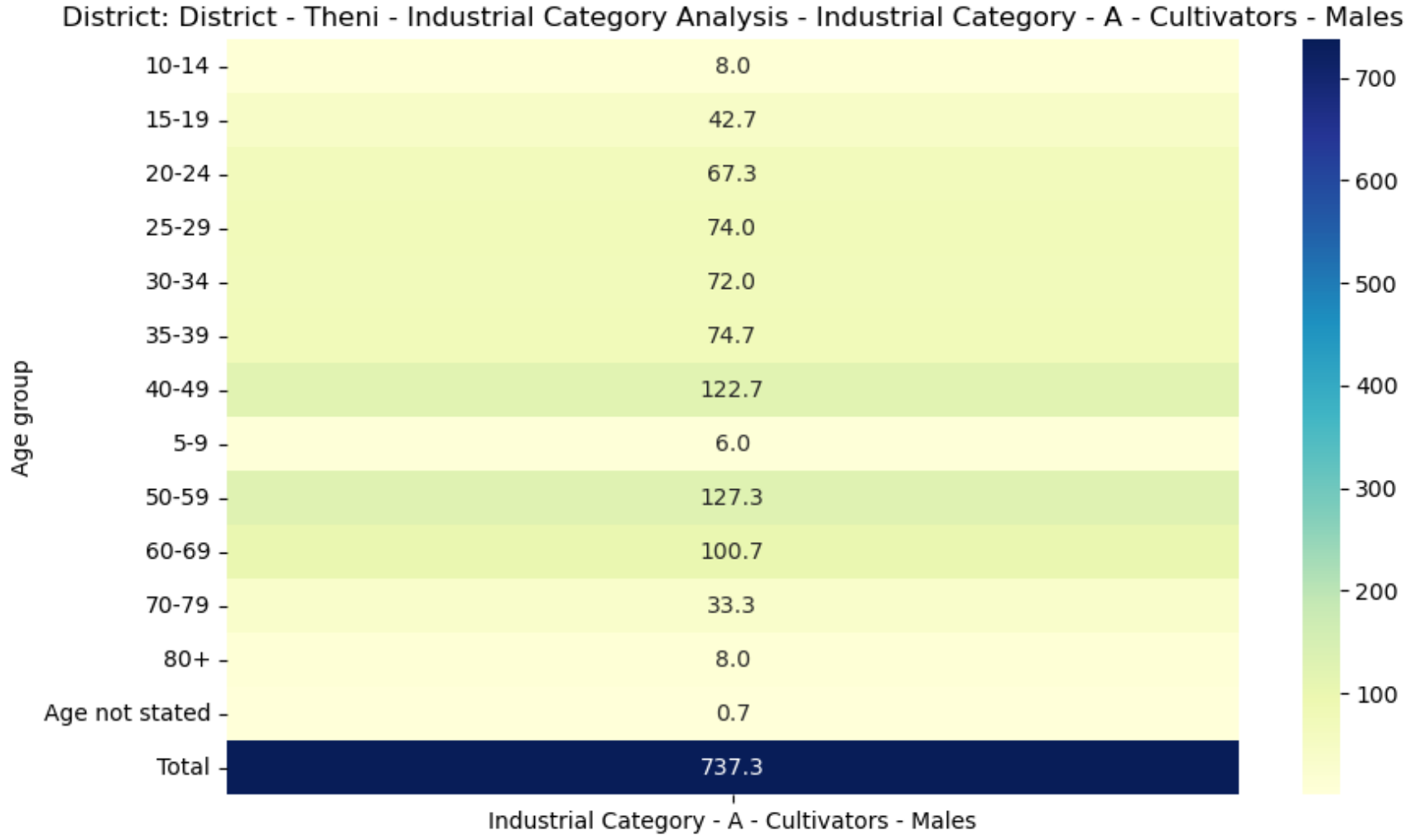

District: District - Sivaganga - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
52.7
209.3
548.0
824.0
748.7
845.3
1466.0
30.7
1260.7
740.0
181.3
38.0
2.0
6946.7
Age group
Industrial Category - A - Cultivators - Females
6000
5000
4000
3000
2000
1000

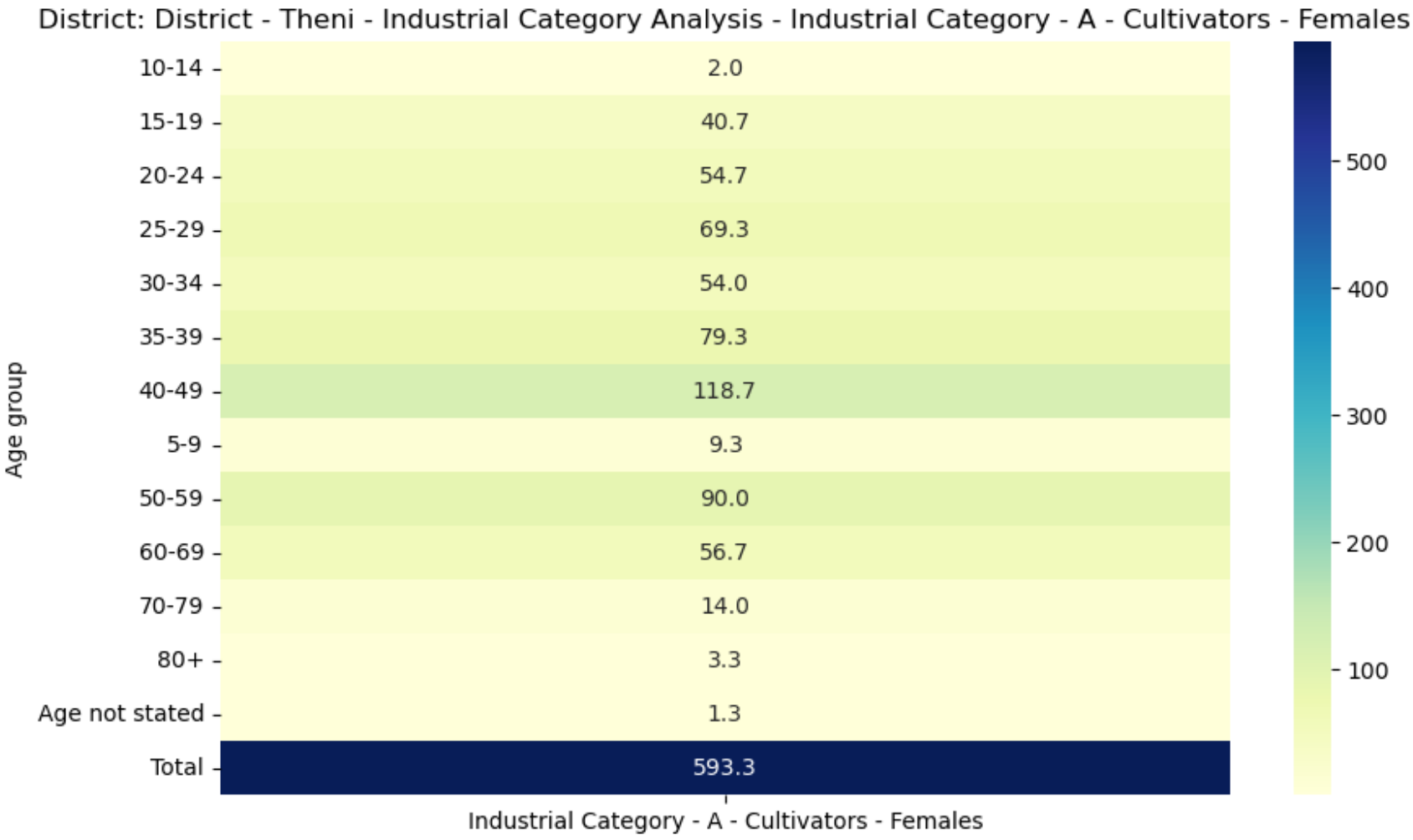

District: District - Madurai - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
133.3
410.0
684.0
884.7
822.7
859.3
1494.0
86.7
1130.7
768.0
238.7
60.7
5.3
7578.0
Age group
Industrial Category - A - Cultivators - Persons
7000
6000
5000
4000
3000
2000
1000

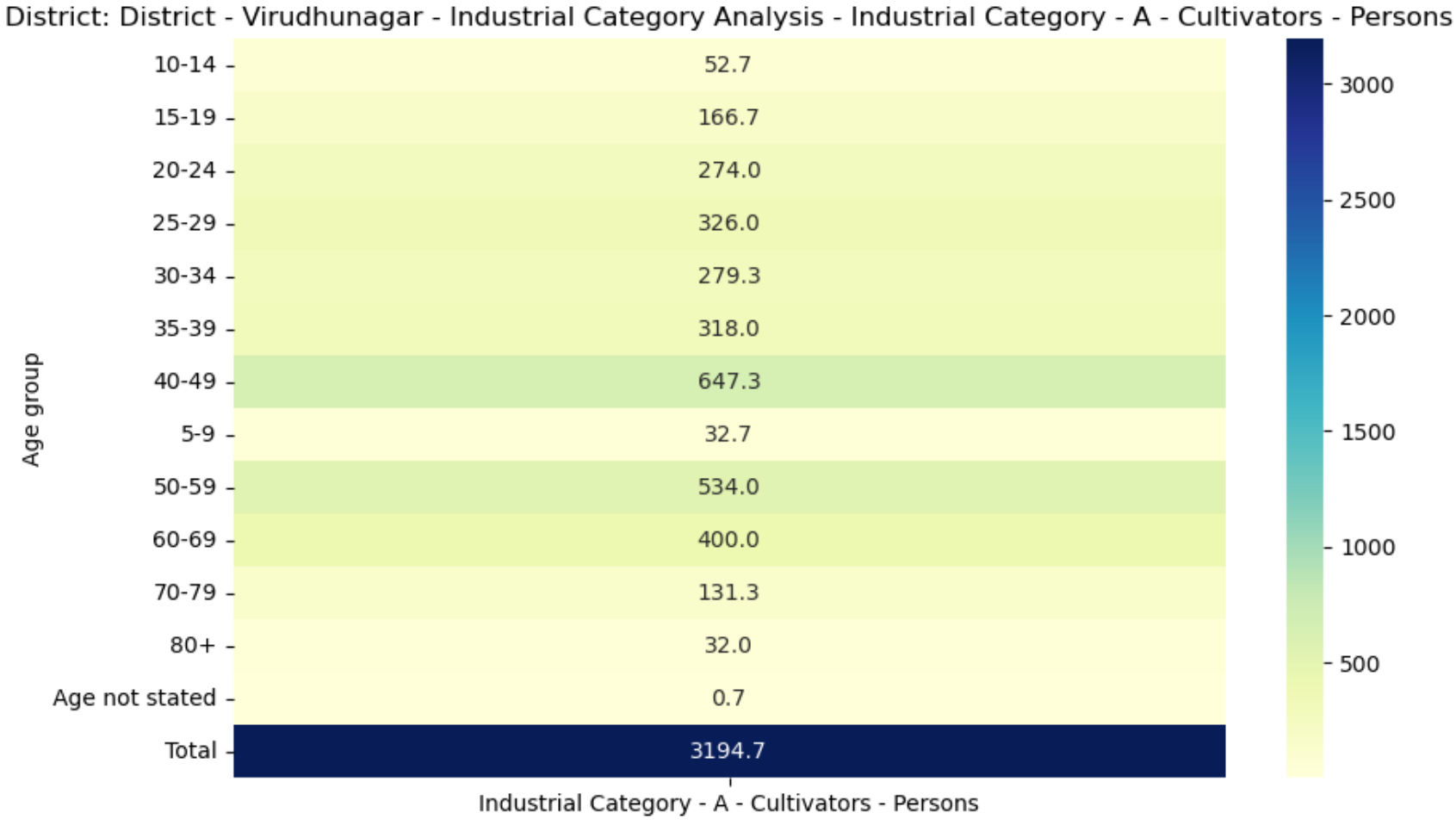

District: District - Madurai - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
64.7
220.0
325.3
410.7
416.7
415.3
779.3
50.0
615.3
455.3
152.7
36.0
3.3
3944.7
Age group
Industrial Category - A - Cultivators - Males
3500
3000
2500
2000
1500
1000
500

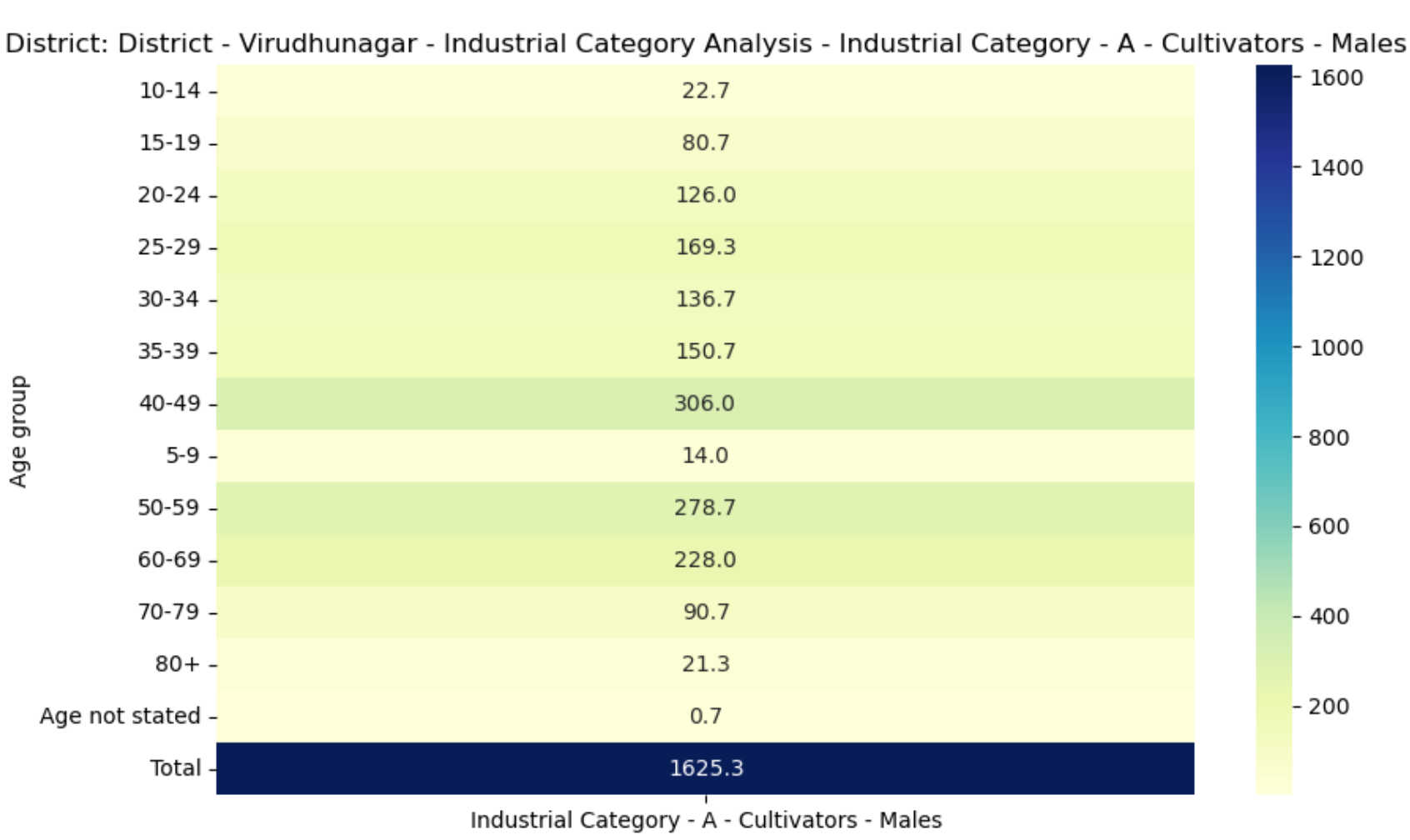

District: District - Madurai - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
68.7
190.0
358.7
474.0
406.0
444.0
714.7
36.7
515.3
312.7
86.0
24.7
2.0
3633.3
Age group
Industrial Category - A - Cultivators - Females
3500
3000
2500
2000
1500
1000
500

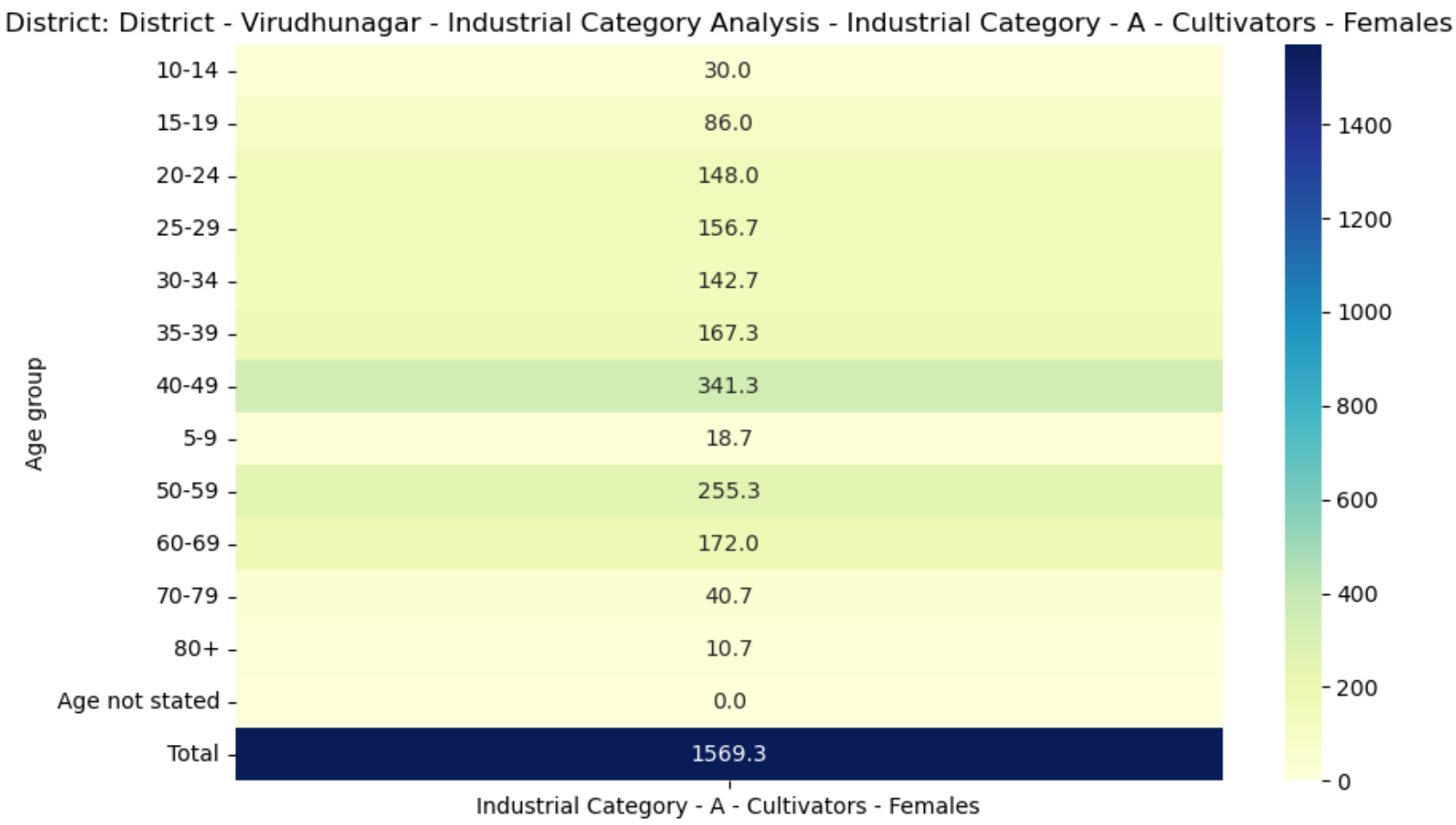

District: District - Theni - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
10.0
83.3
122.0
143.3
126.0
154.0
241.3
15.3
217.3
157.3
47.3
11.3
2.0
1330.7
Age group
Industrial Category - A - Cultivators - Persons
1200
1000
800
600
400
200

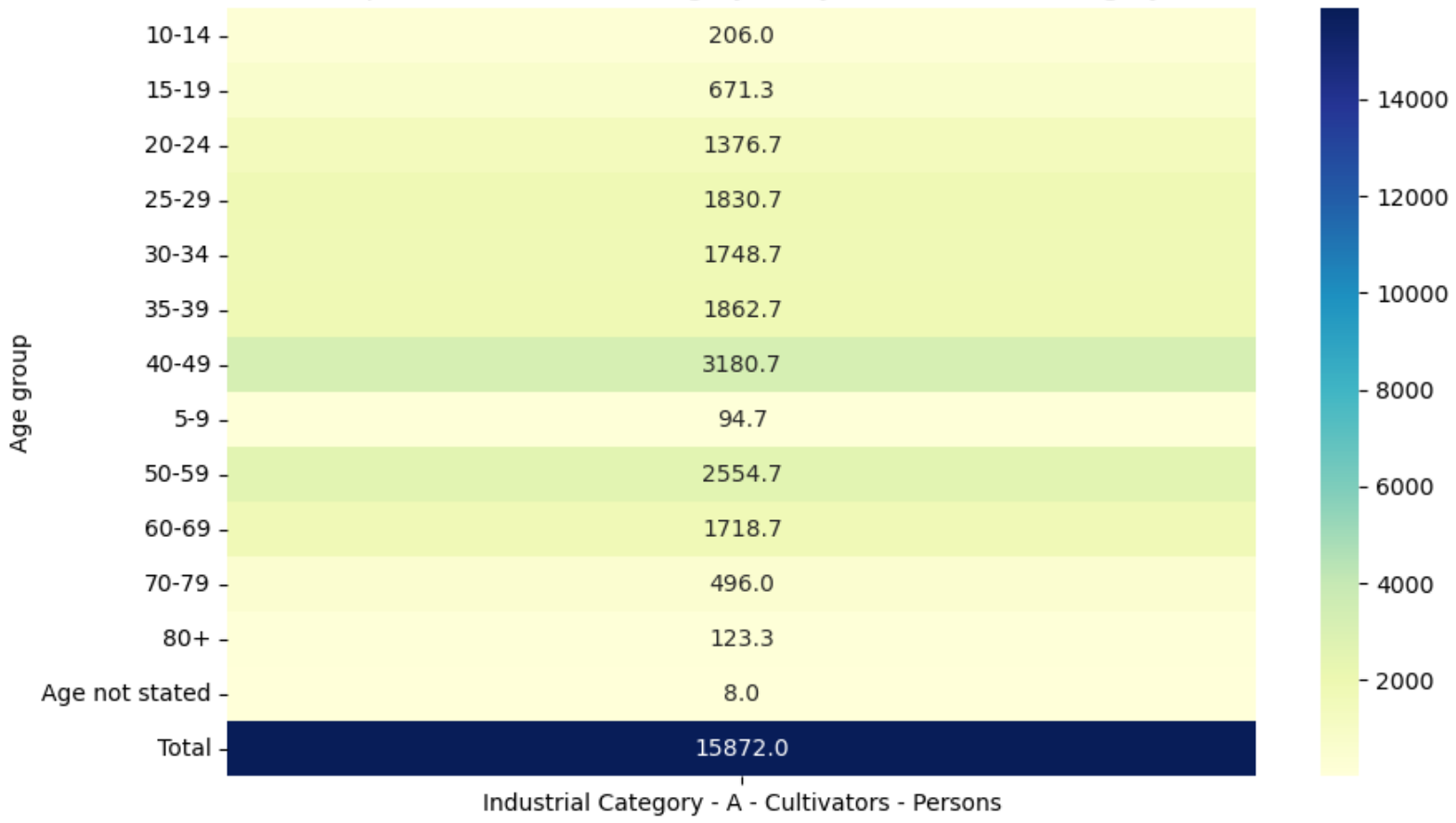

District: District - Theni - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
8.0
42.7
67.3
74.0
72.0
74.7
122.7
6.0
127.3
100.7
33.3
8.0
0.7
737.3
Age group
Industrial Category - A - Cultivators - Males
700
600
500
400
300
200
100

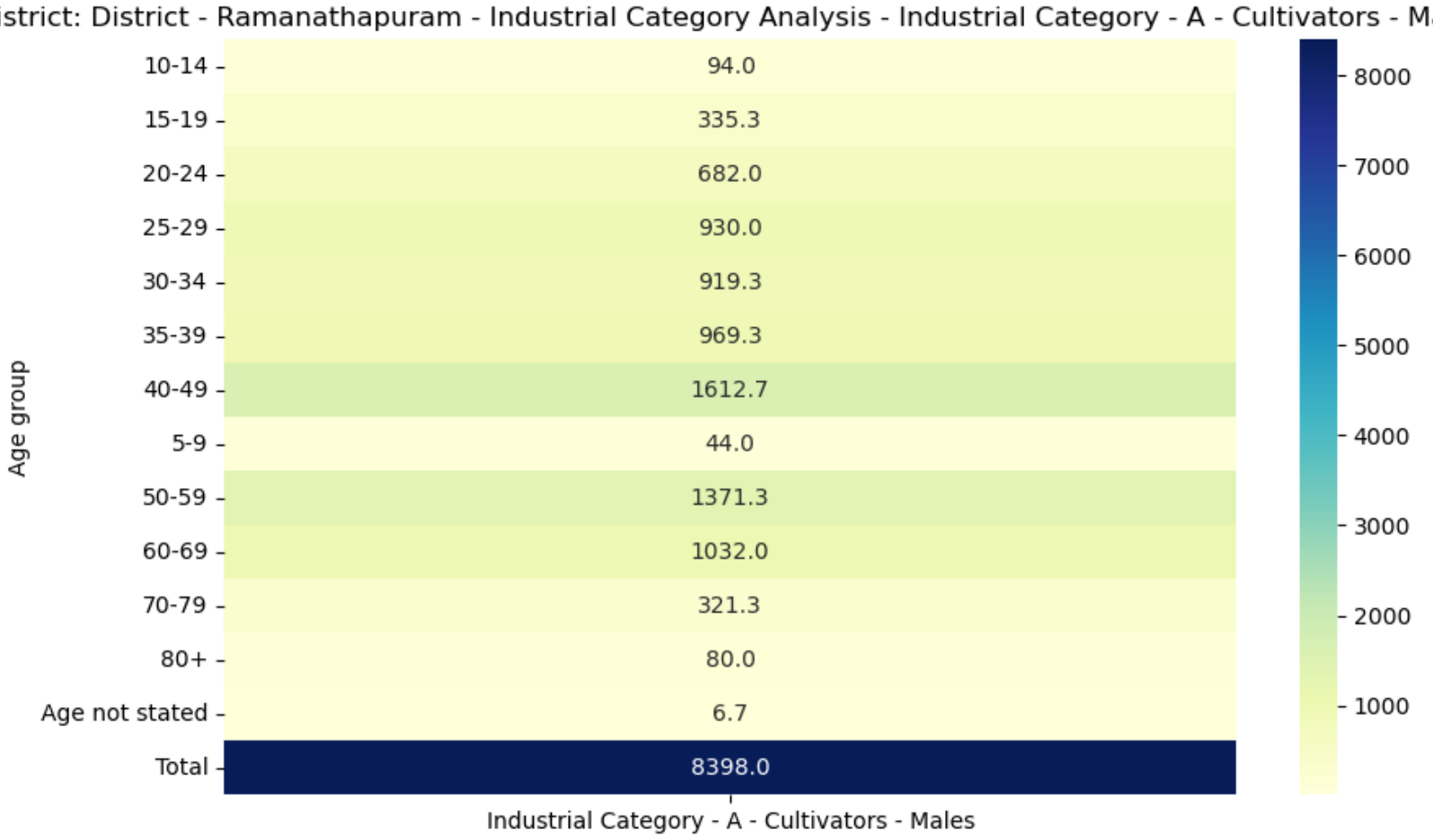

District: District - Theni - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
2.0
40.7
54.7
69.3
54.0
79.3
118.7
9.3
90.0
56.7
14.0
3.3
1.3
593.3
500
400
300
200
100
Industrial Category - A - Cultivators - Females

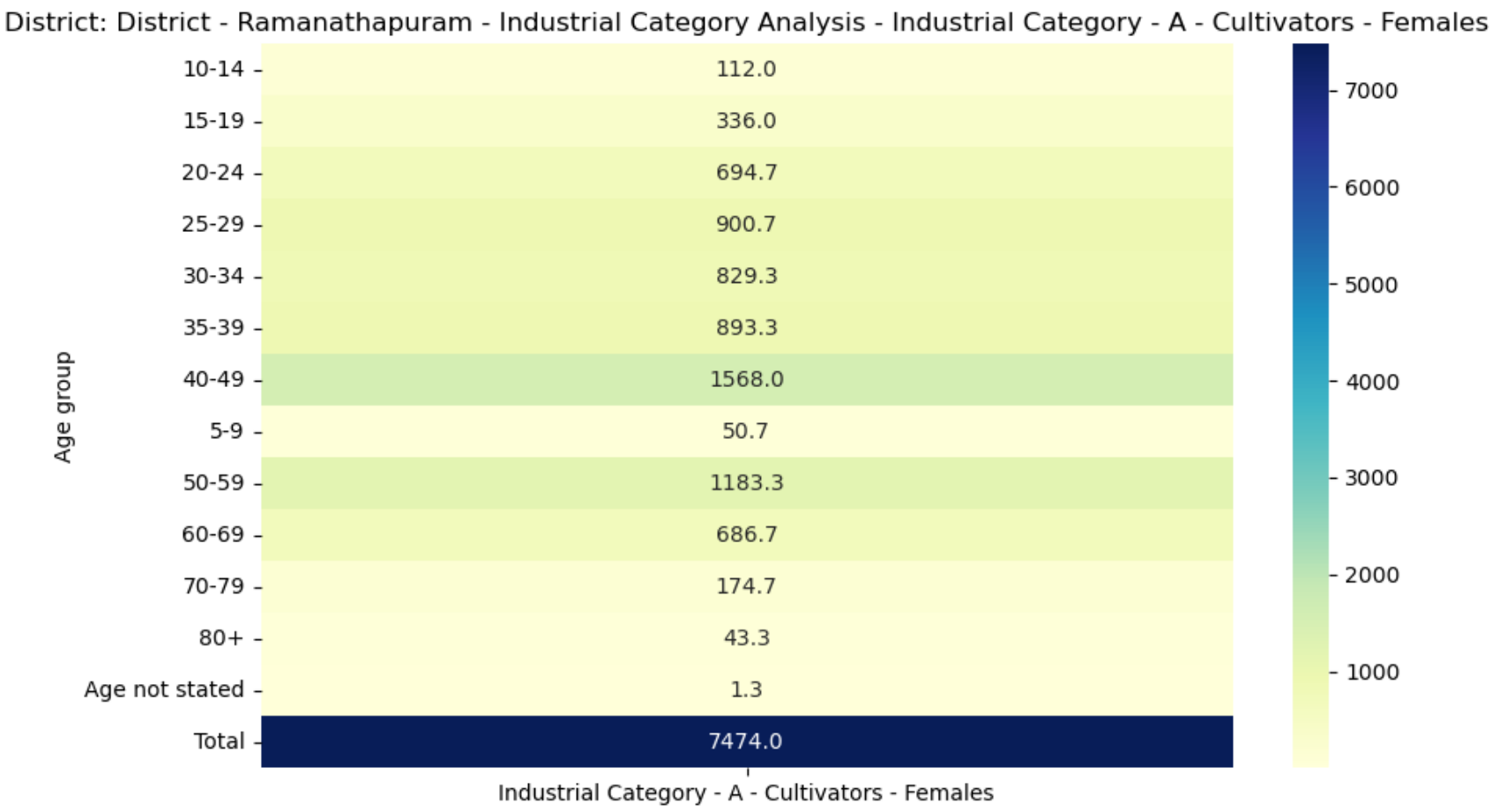

District: District - Virudhunagar - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
52.7
166.7
274.0
326.0
279.3
318.0
647.3
32.7
534.0
400.0
131.3
32.0
0.7
3194.7
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Persons

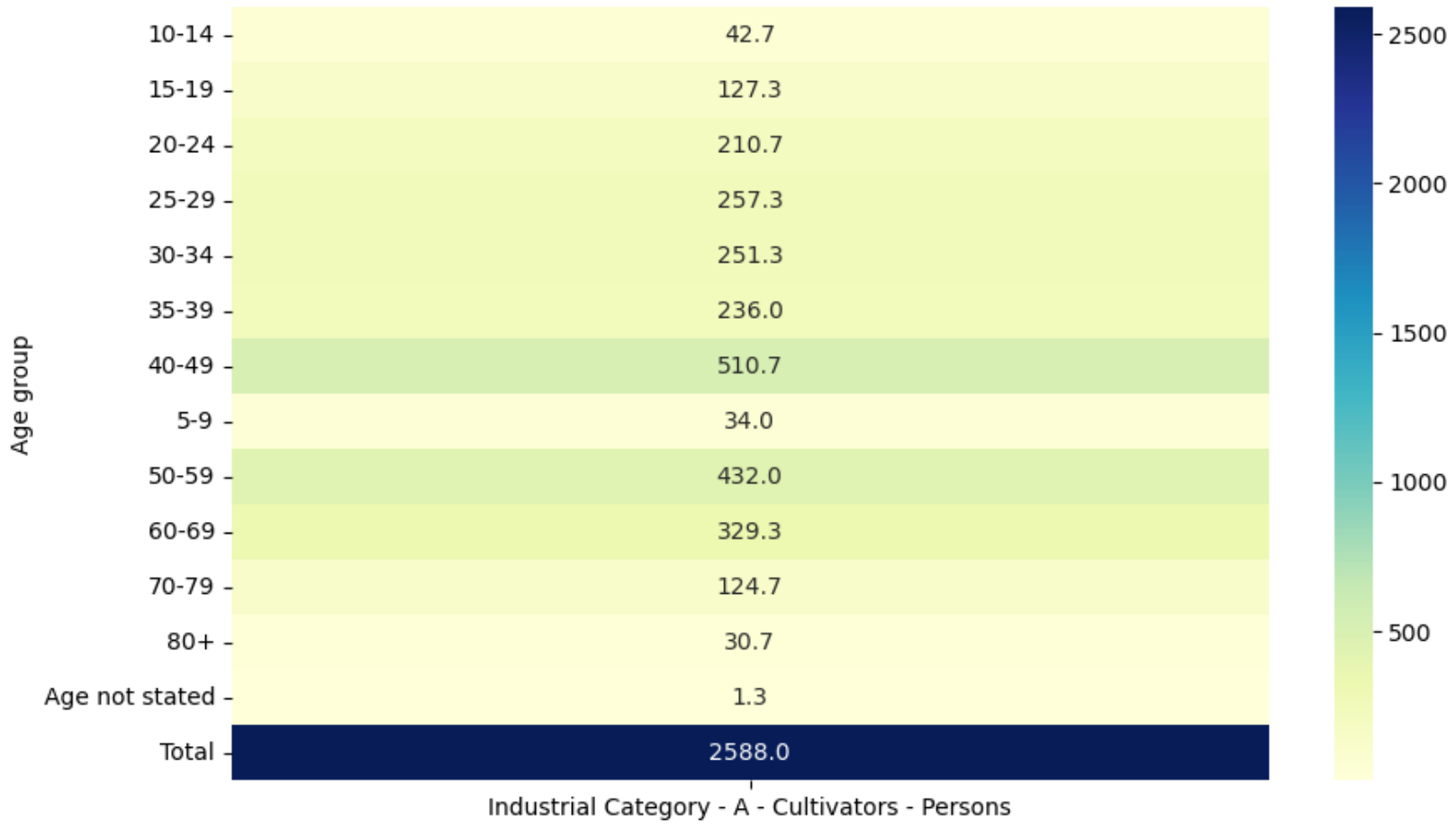

District: District - Virudhunagar - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
22.7
80.7
126.0
169.3
136.7
150.7
306.0
14.0
278.7
228.0
90.7
21.3
0.7
1625.3
1600
1400
1200
1000
800
600
400
200
Industrial Category - A - Cultivators - Males

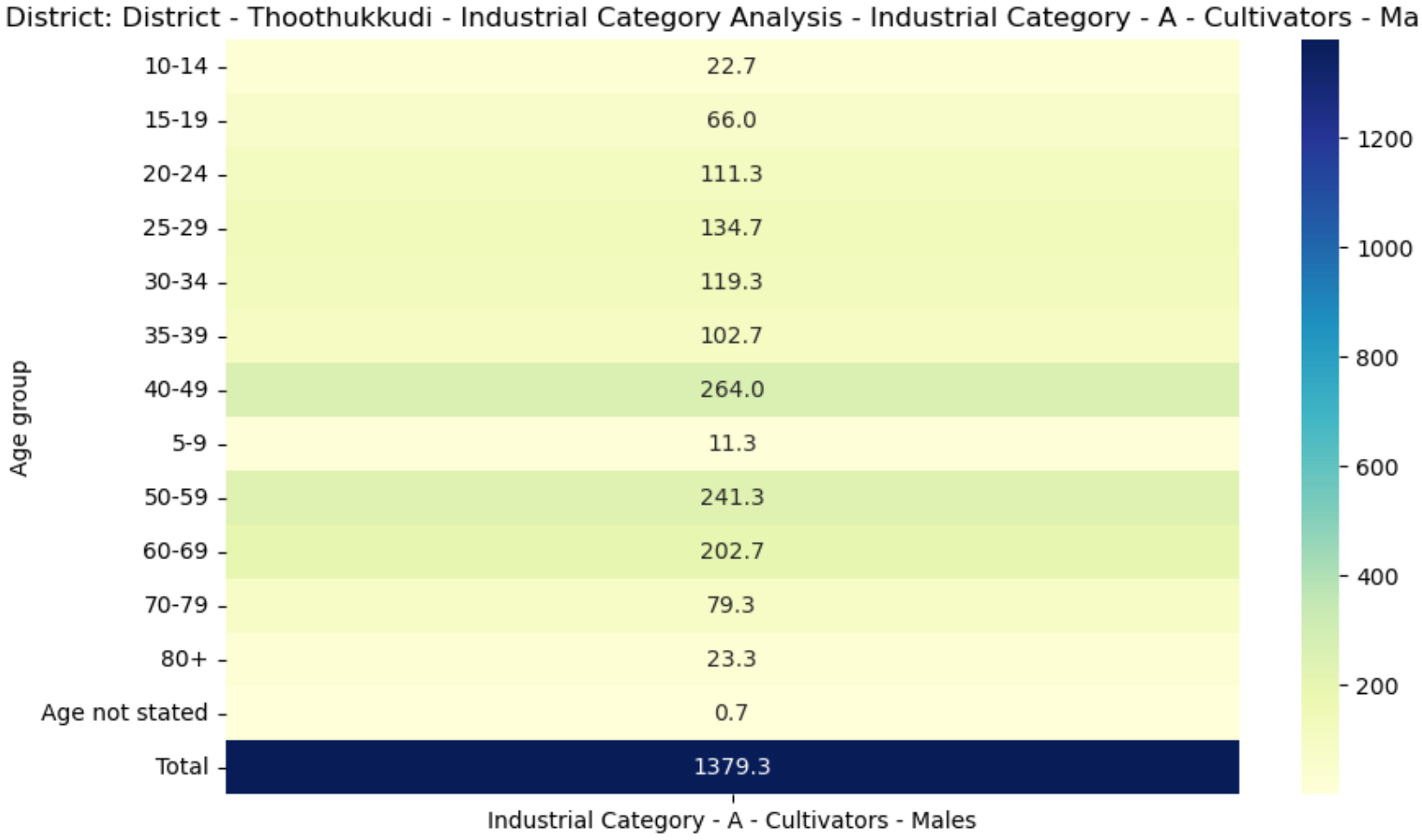

District: District - Virudhunagar - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
30.0
86.0
148.0
156.7
142.7
167.3
341.3
18.7
255.3
172.0
40.7
10.7
0.0
1569.3
Age group
Industrial Category - A - Cultivators - Females
1400
1200
1000
800
600
400
200
0

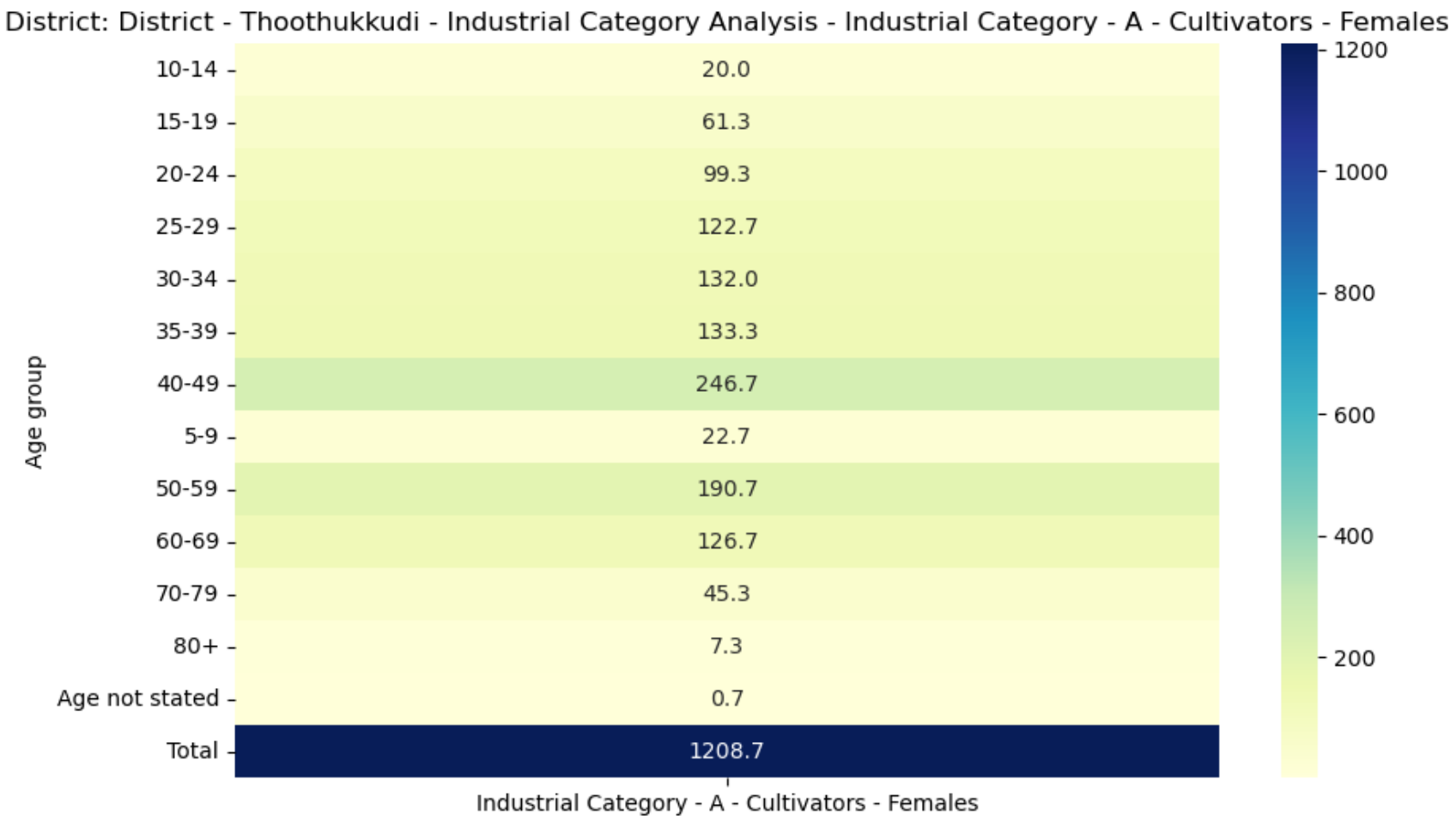

District: District - Ramanathapuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
206.0
671.3
1376.7
1830.7
1748.7
1862.7
3180.7
94.7
2554.7
1718.7
496.0
123.3
8.0
15872.0
Age group
Industrial Category - A - Cultivators - Persons
14000
12000
10000
8000
6000
4000
2000

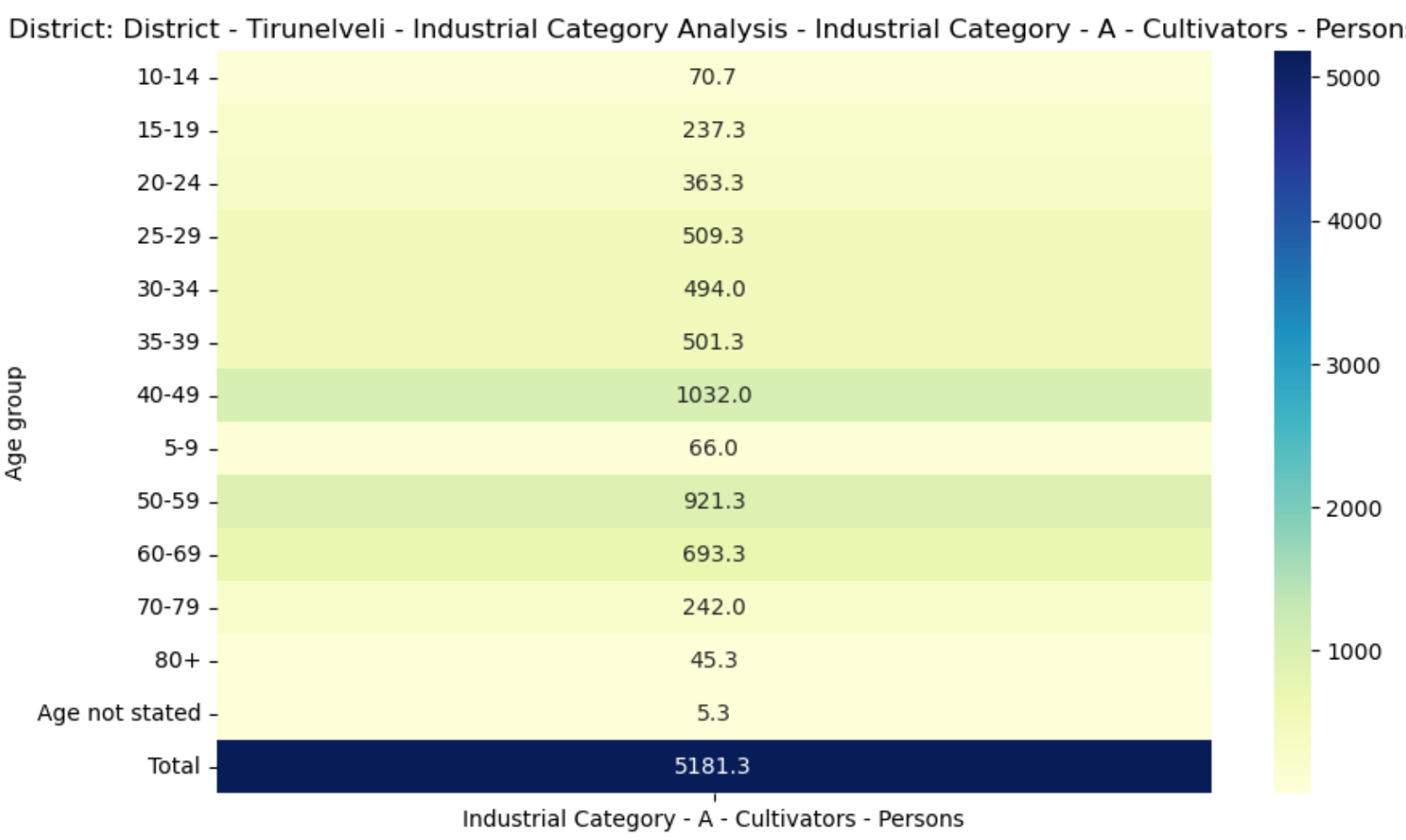

District: District - Ramanathapuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
94.0
335.3
682.0
930.0
919.3
969.3
1612.7
44.0
1371.3
1032.0
321.3
80.0
6.7
8398.0
Age group
Industrial Category - A - Cultivators - Males
8000
7000
6000
5000
4000
3000
2000
1000

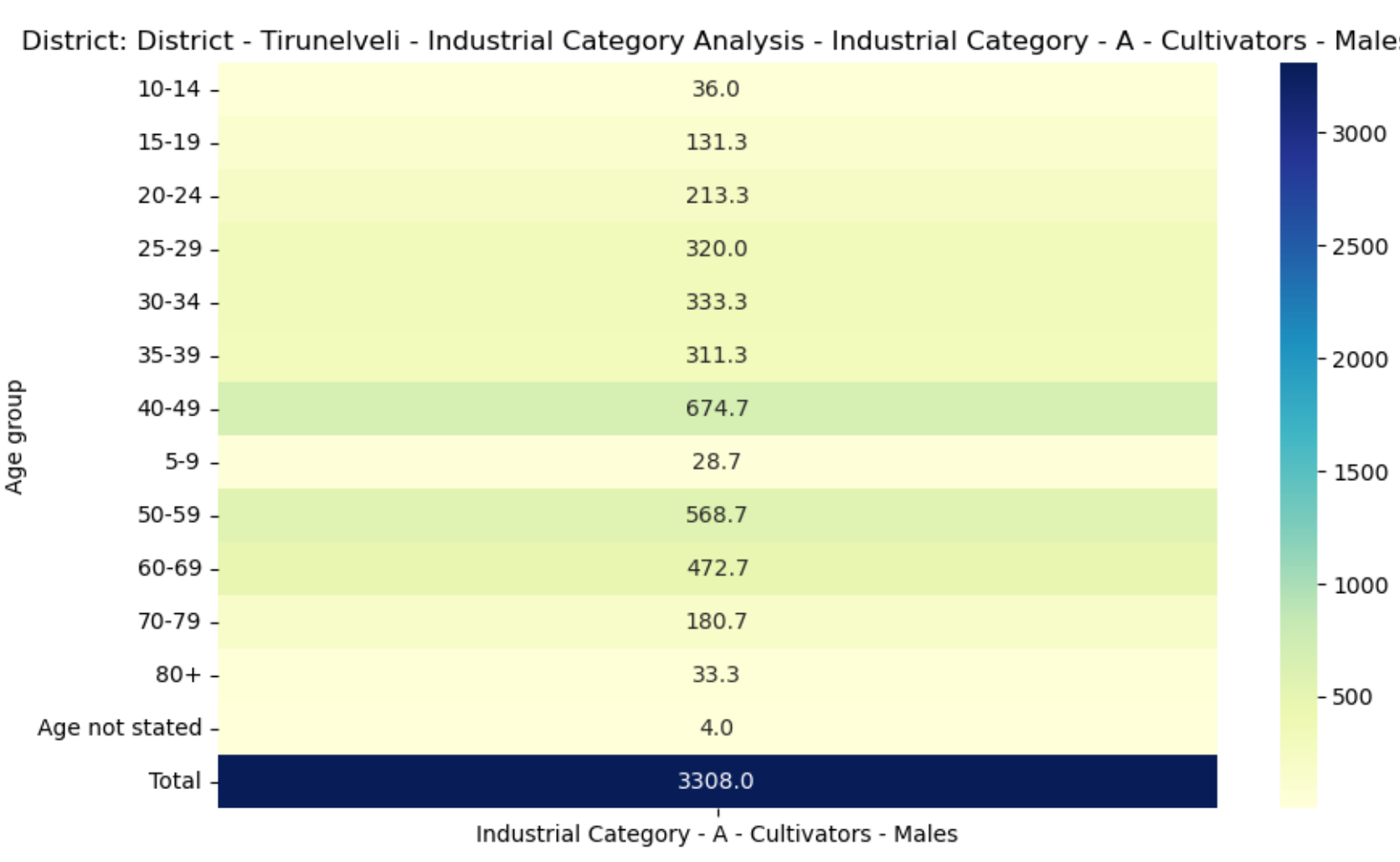

District: District - Ramanathapuram - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
112.0
336.0
694.7
900.7
829.3
893.3
1568.0
50.7
1183.3
686.7
174.7
43.3
1.3
7474.0
Age group
Industrial Category - A - Cultivators - Females
7000
6000
5000
4000
3000
2000
1000

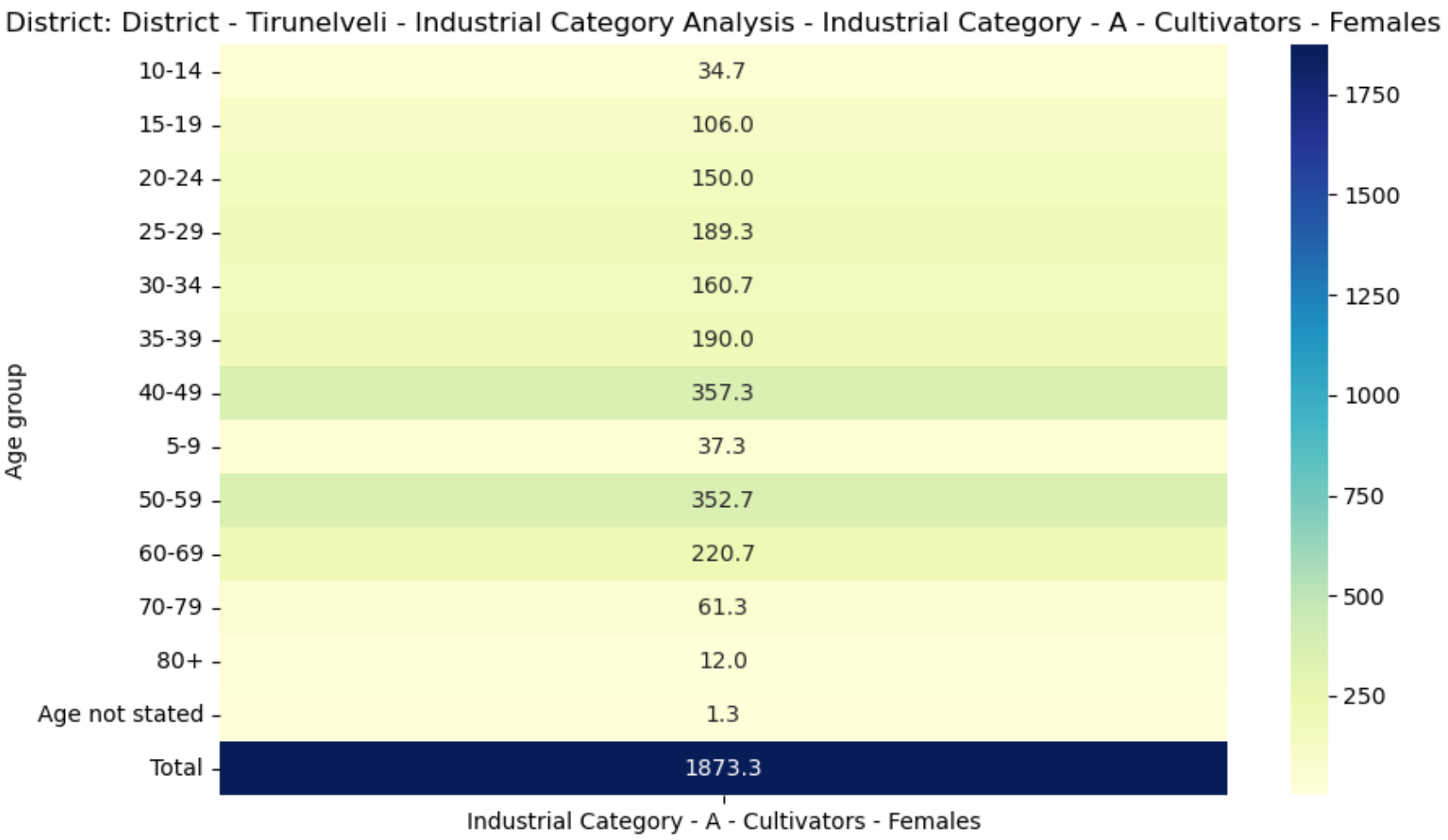

District: District - Thoothukkudi - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
42.7
127.3
210.7
257.3
251.3
236.0
510.7
34.0
432.0
329.3
124.7
30.7
1.3
2588.0
Age group
Industrial Category - A - Cultivators - Persons
2500
2000
1500
1000
500

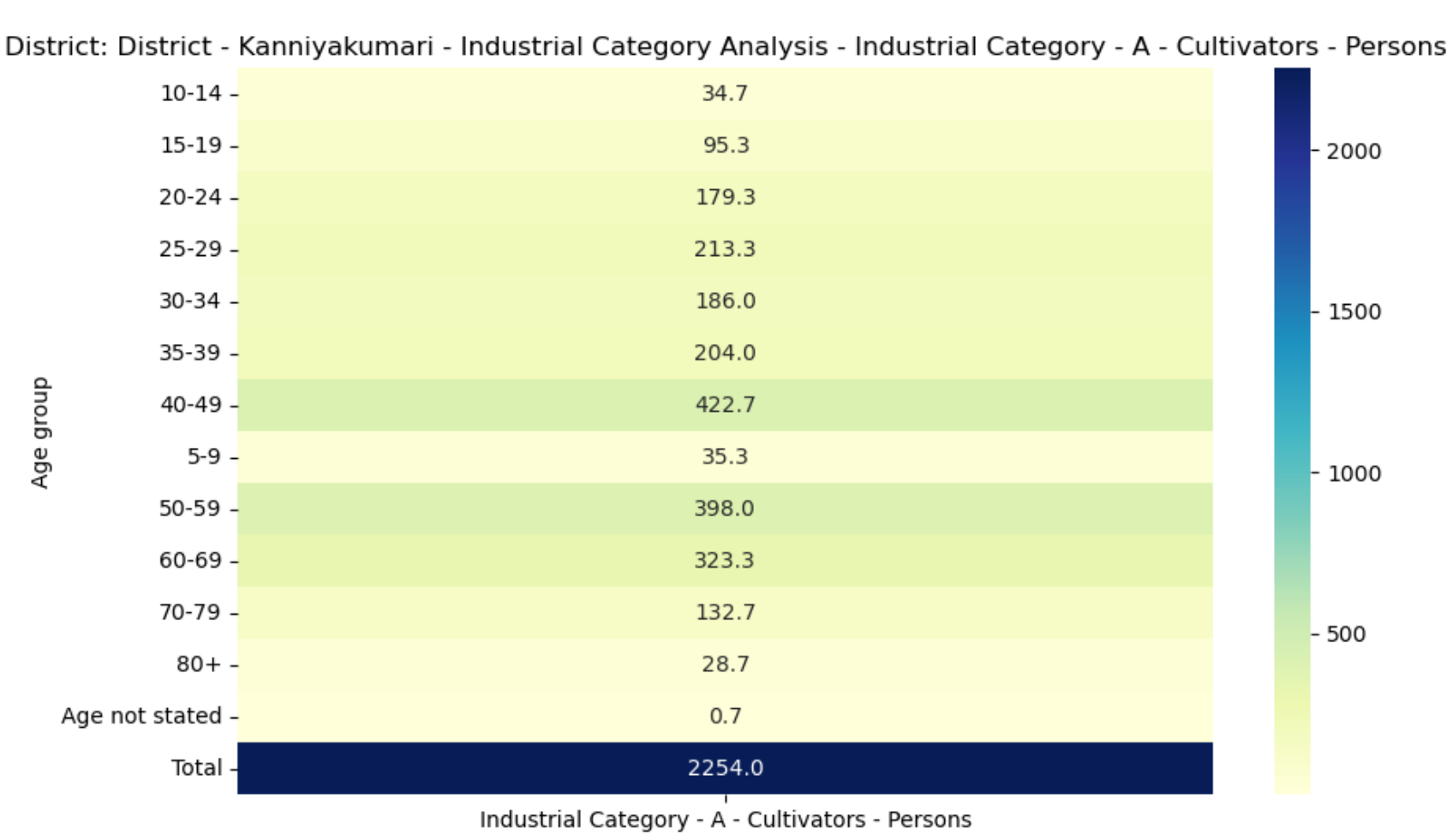

District: District - Thoothukkudi - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
22.7
66.0
111.3
134.7
119.3
102.7
264.0
11.3
241.3
202.7
79.3
23.3
0.7
1379.3
Age group
Industrial Category - A - Cultivators - Males
1200
1000
800
600
400
200

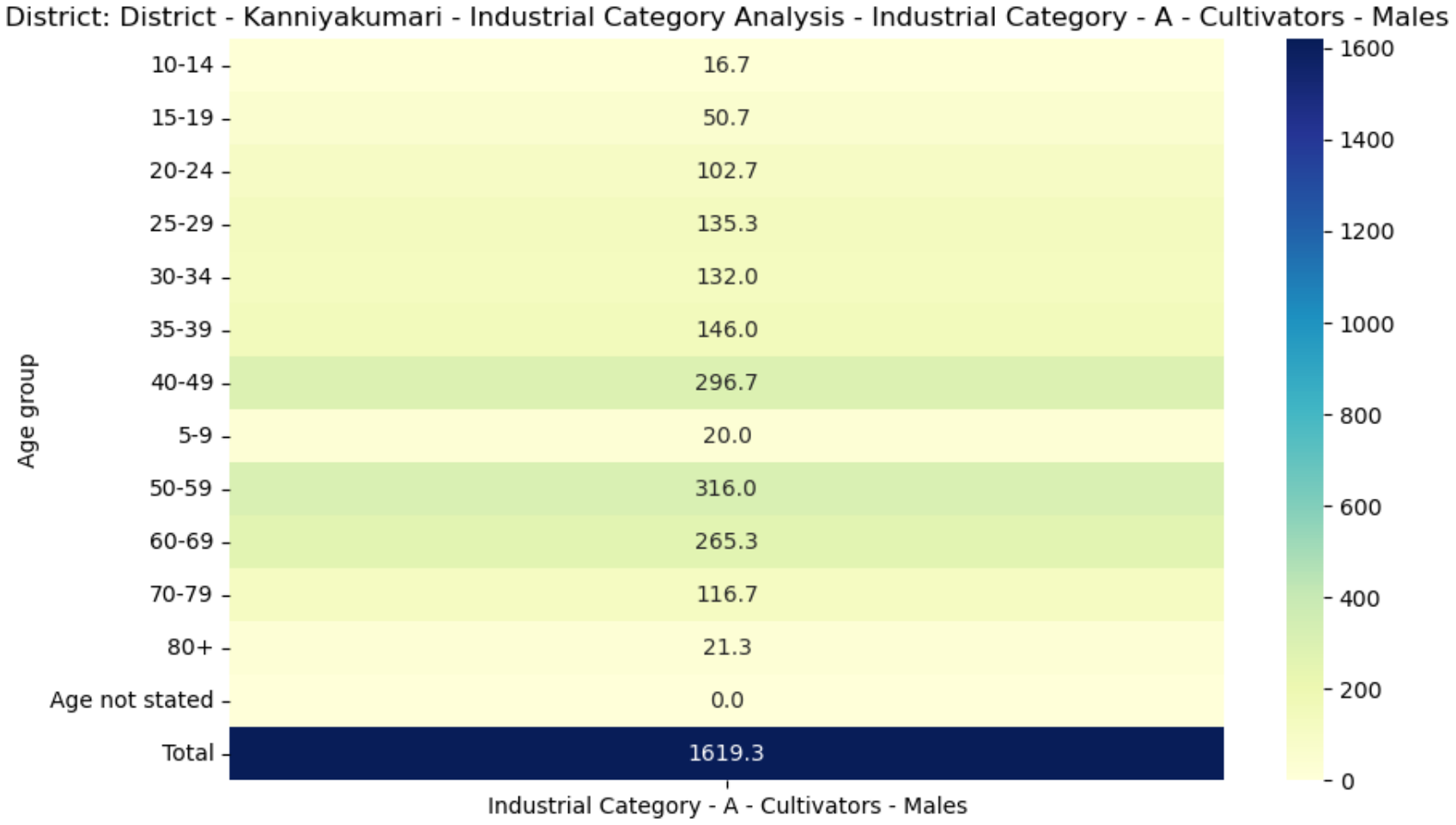

District: District - Thoothukkudi - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
20.0
61.3
99.3
122.7
132.0
133.3
246.7
22.7
190.7
126.7
45.3
7.3
0.7
1208.7
1200
1000
800
600
400
200
Industrial Category - A - Cultivators - Females

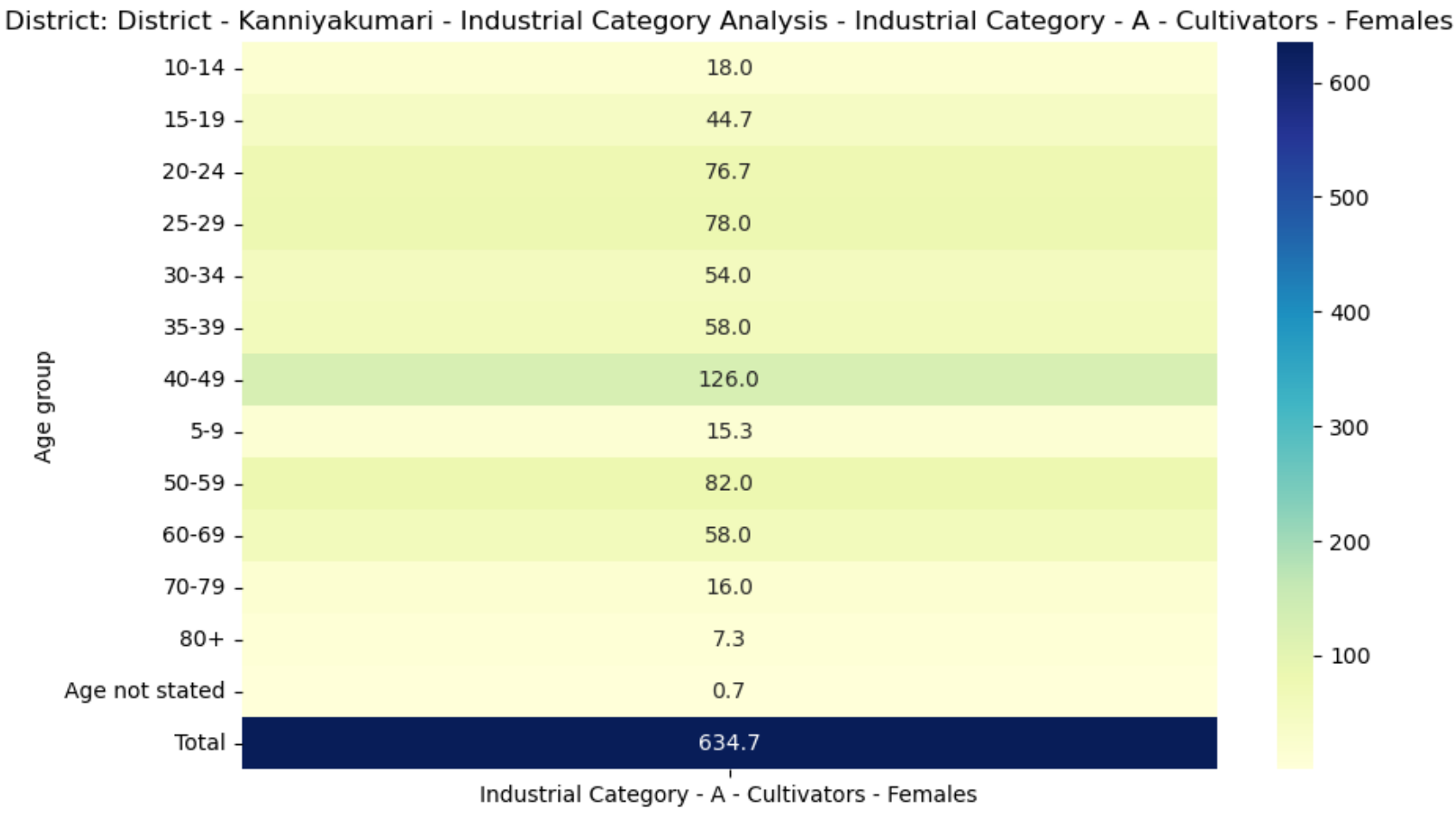

District: District - Tirunelveli - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
70.7
237.3
363.3
509.3
494.0
501.3
1032.0
66.0
921.3
693.3
242.0
45.3
5.3
5181.3
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

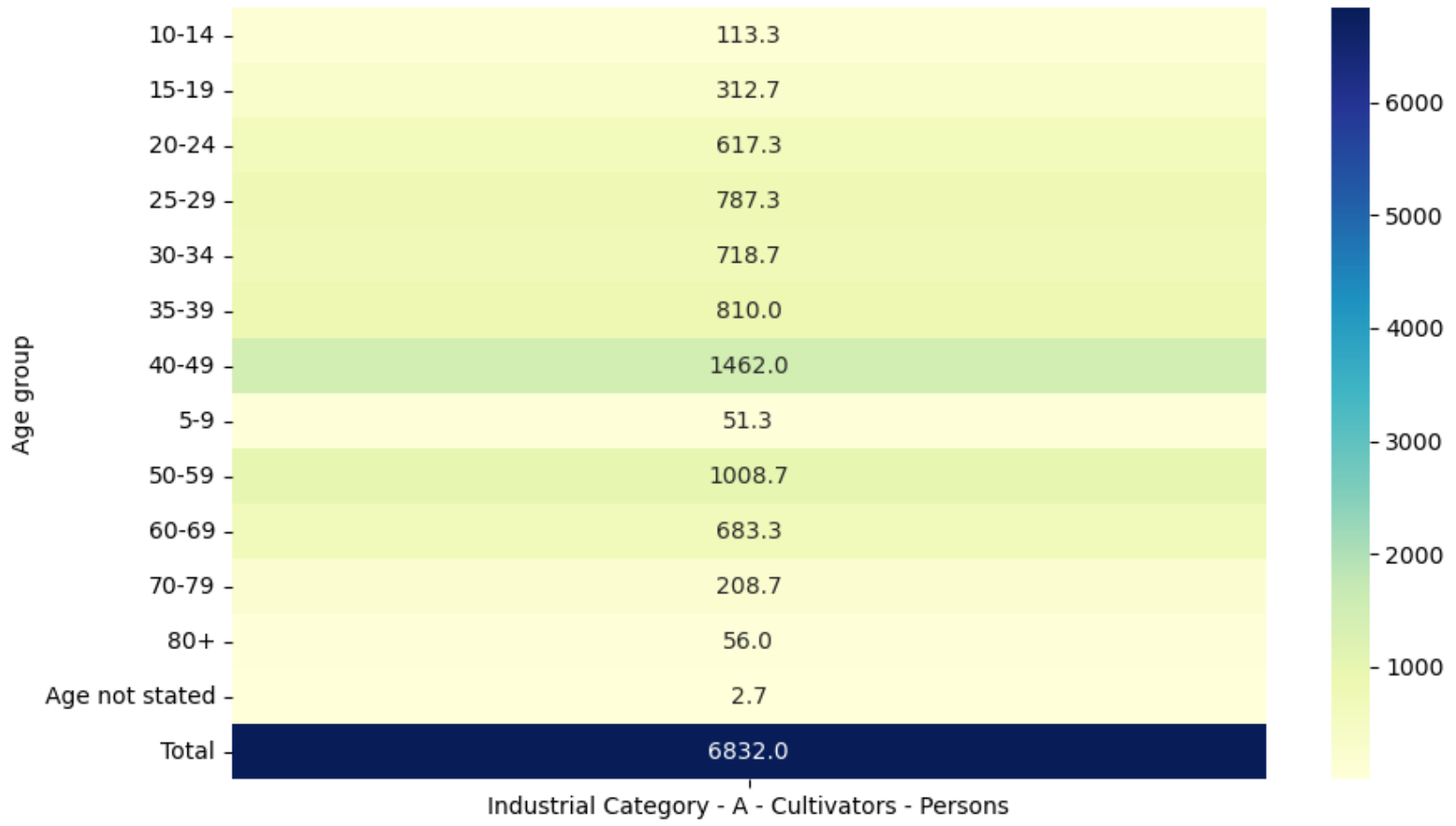

District: District - Tirunelveli - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
36.0
131.3
213.3
320.0
333.3
311.3
674.7
28.7
568.7
472.7
180.7
33.3
4.0
3308.0
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

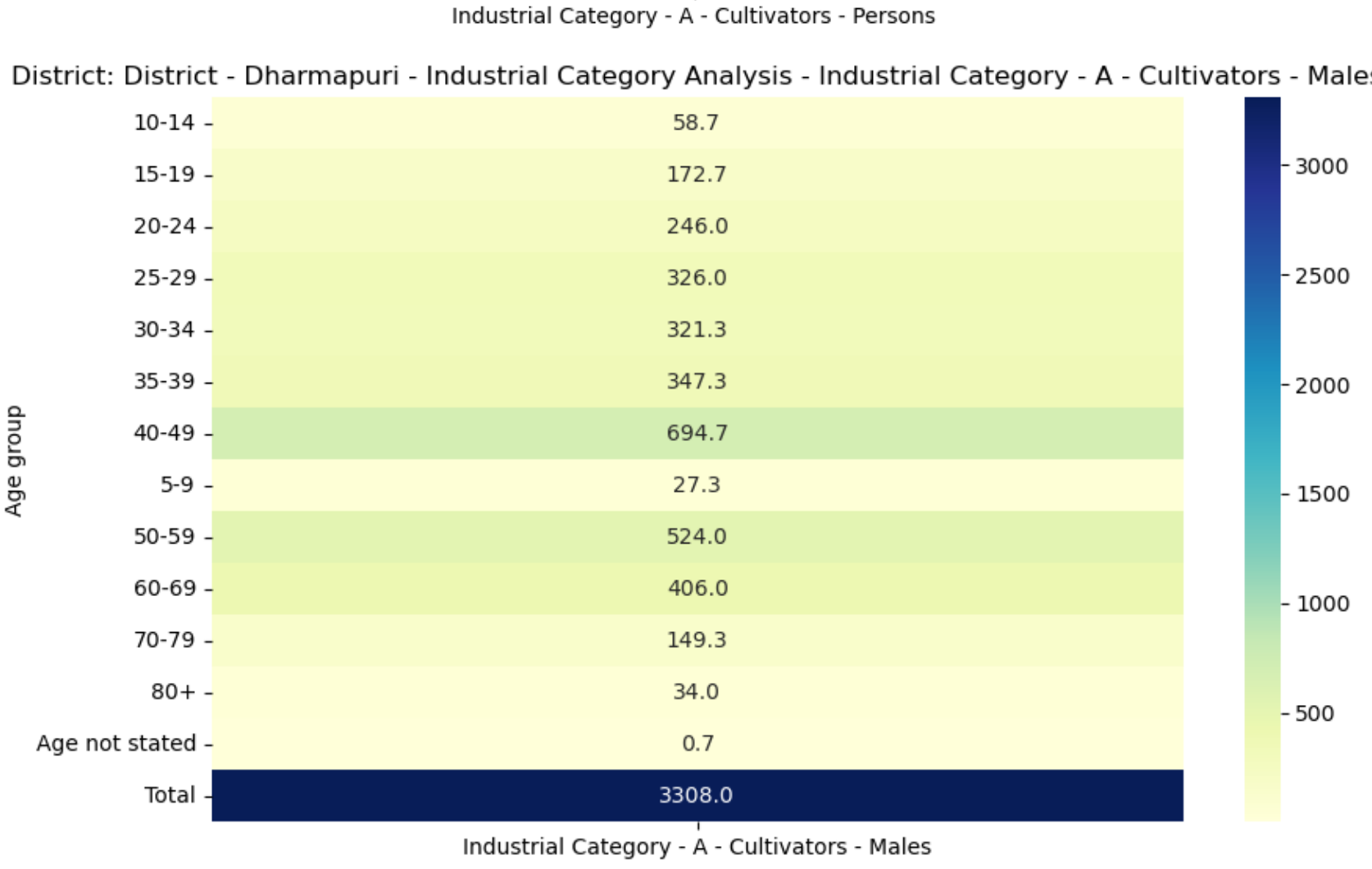

District: District - Tirunelveli - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
34.7
106.0
150.0
189.3
160.7
190.0
357.3
37.3
352.7
220.7
61.3
12.0
1.3
1873.3
1750
1500
1250
1000
750
500
250
Industrial Category - A - Cultivators - Females

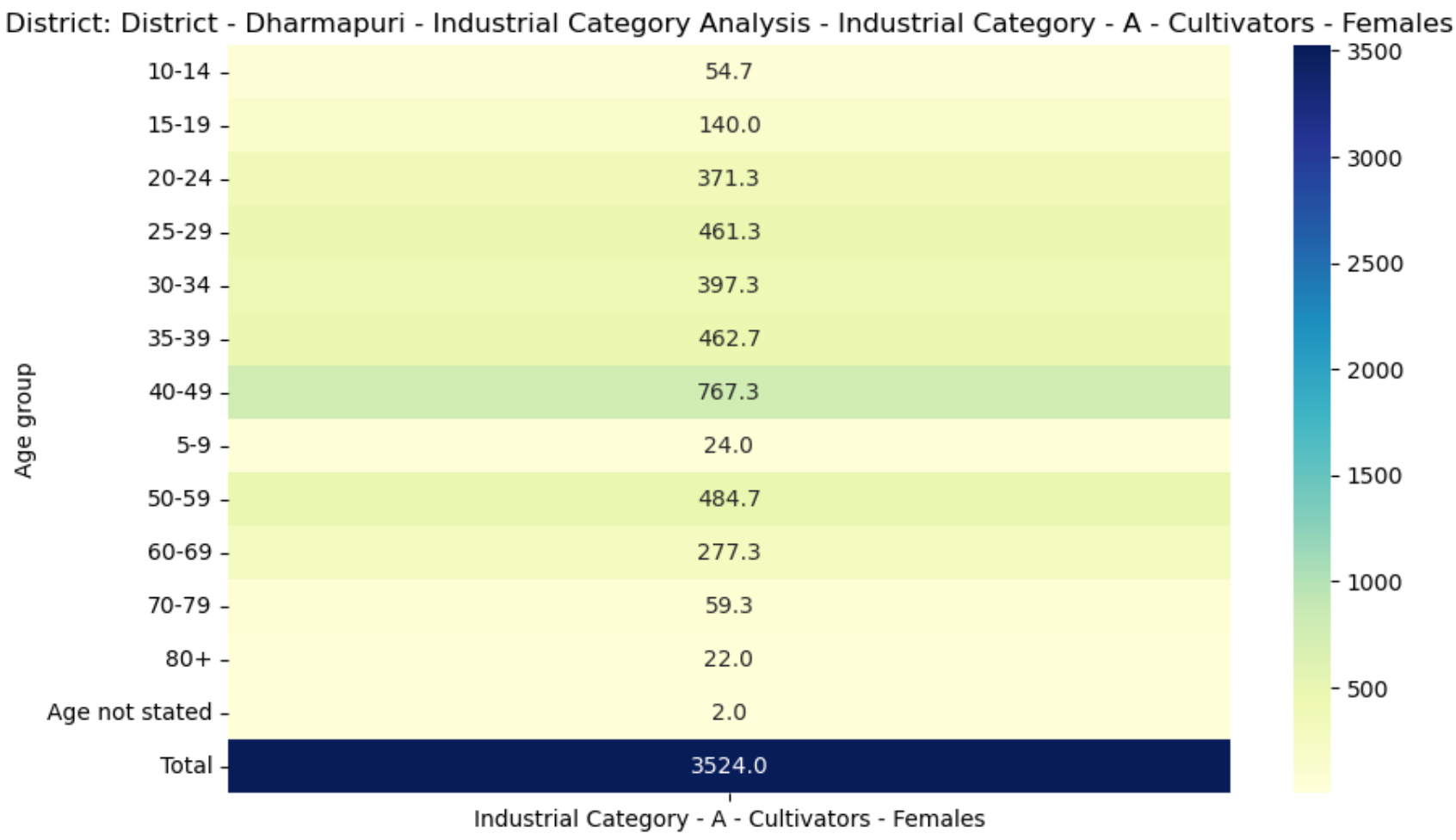

District: District - Kanniyakumari - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
34.7
95.3
179.3
213.3
186.0
204.0
422.7
35.3
398.0
323.3
132.7
28.7
0.7
2254.0
2000
1500
1000
500
Industrial Category - A - Cultivators - Persons

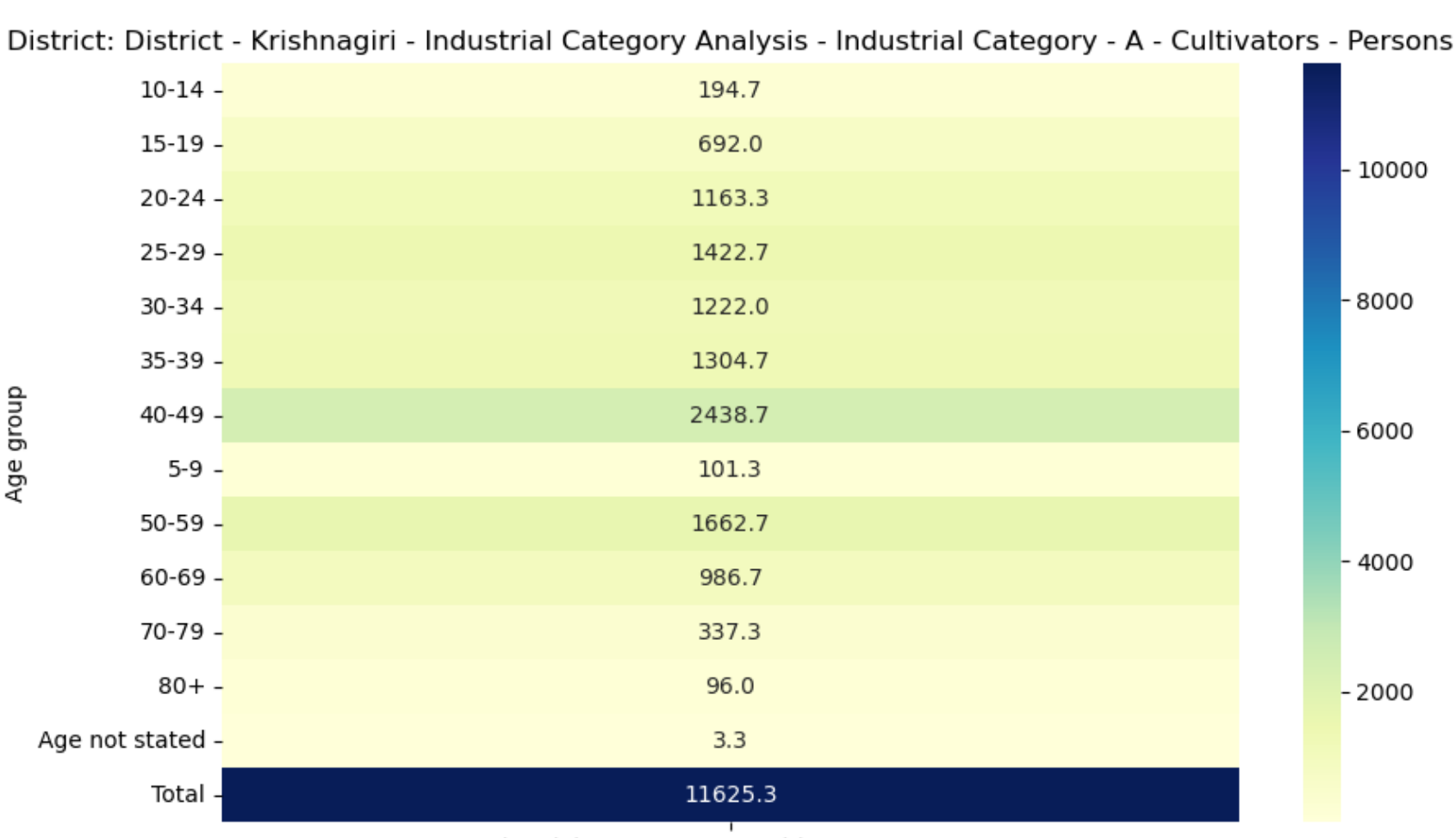

District: District - Kanniyakumari - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
16.7
50.7
102.7
135.3
132.0
146.0
296.7
20.0
316.0
265.3
116.7
21.3
0.0
1619.3
1600
1400
1200
1000
800
600
400
200
0
Industrial Category - A - Cultivators - Males

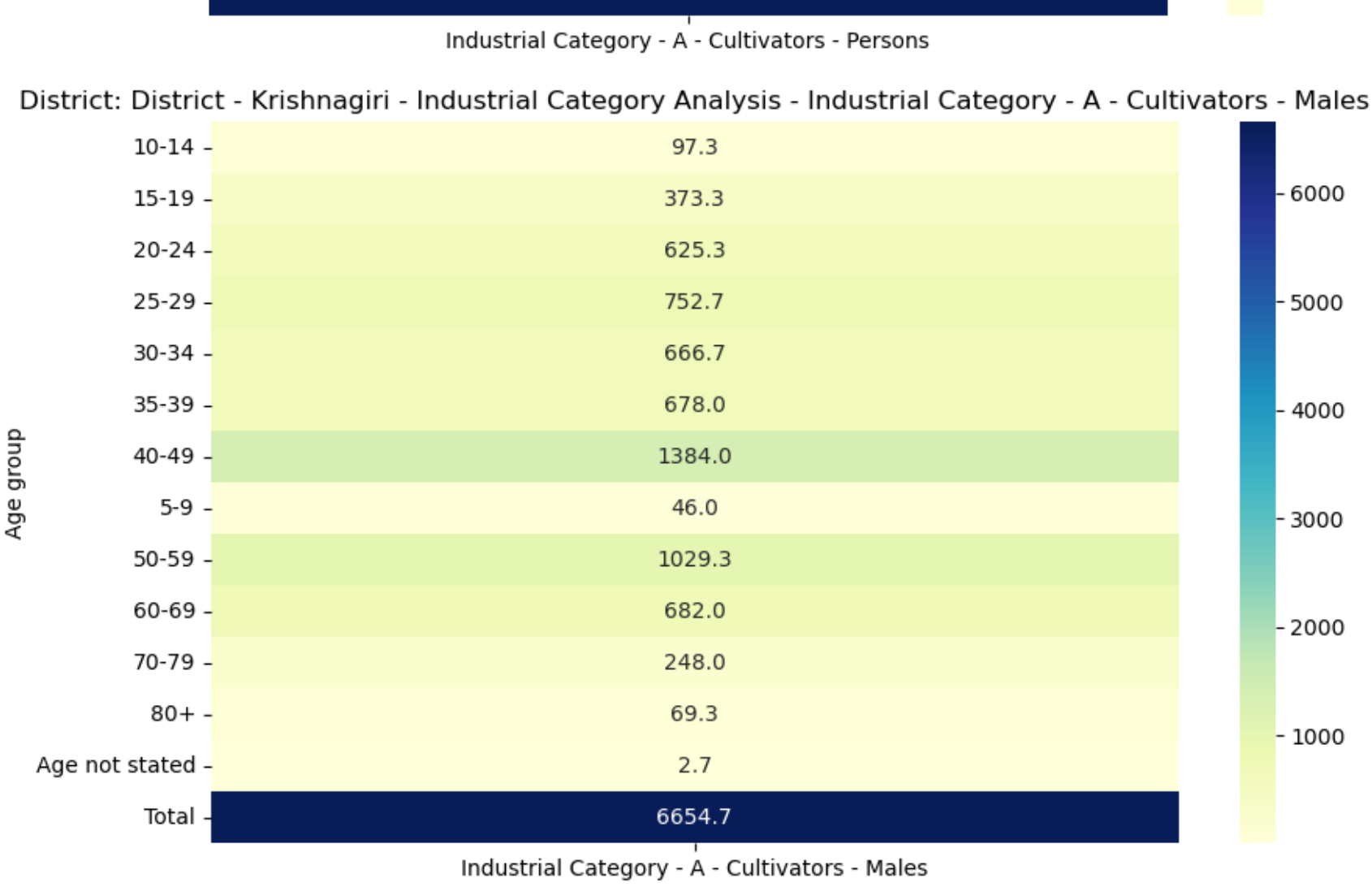

District: District - Kanniyakumari - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
18.0
44.7
76.7
78.0
54.0
58.0
126.0
15.3
82.0
58.0
16.0
7.3
0.7
634.7
600
500
400
300
200
100
Industrial Category - A - Cultivators - Females

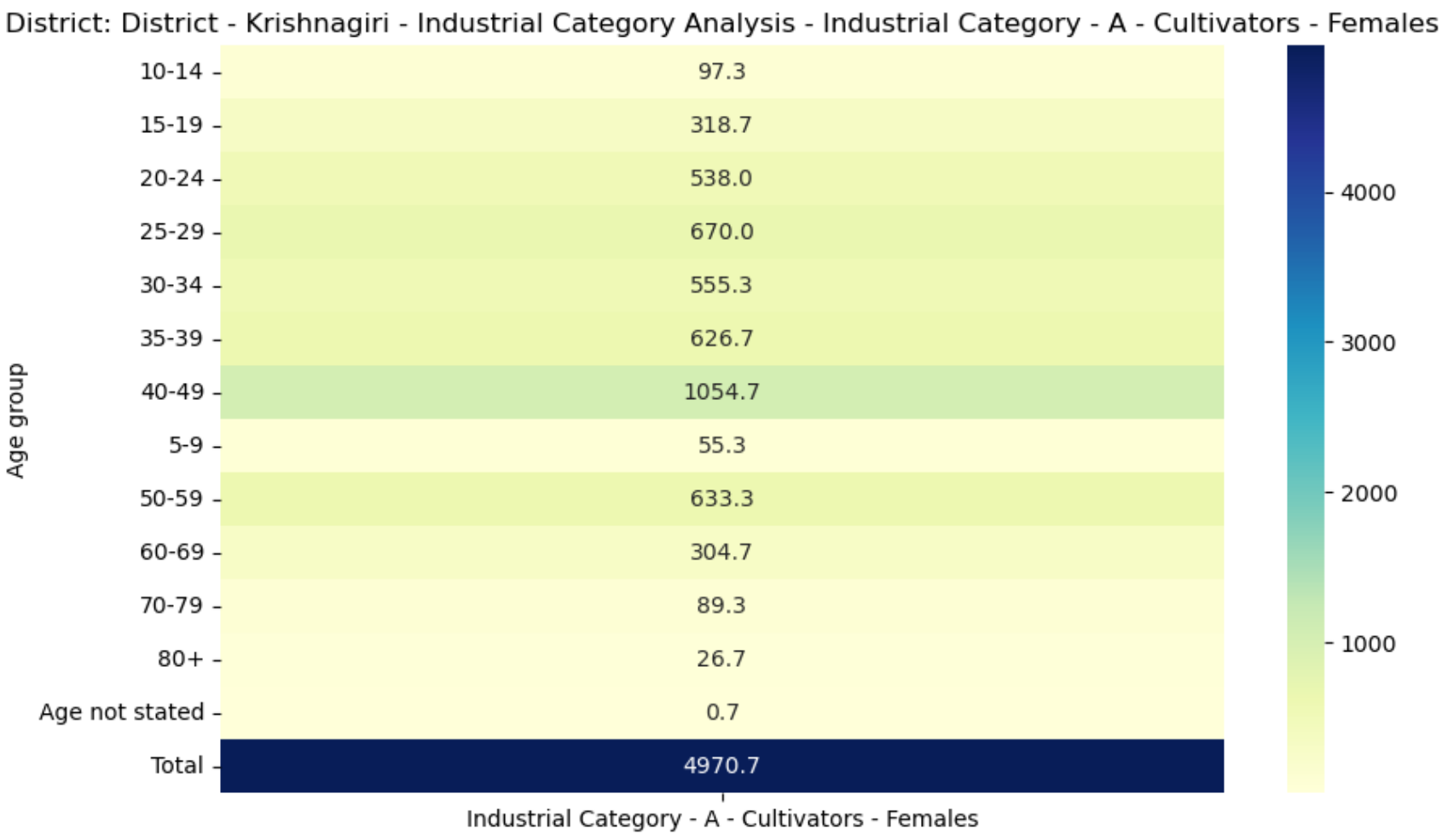

District: District - Dharmapuri - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
113.3
312.7
617.3
787.3
718.7
810.0
1462.0
51.3
1008.7
683.3
208.7
56.0
2.7
6832.0
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Persons

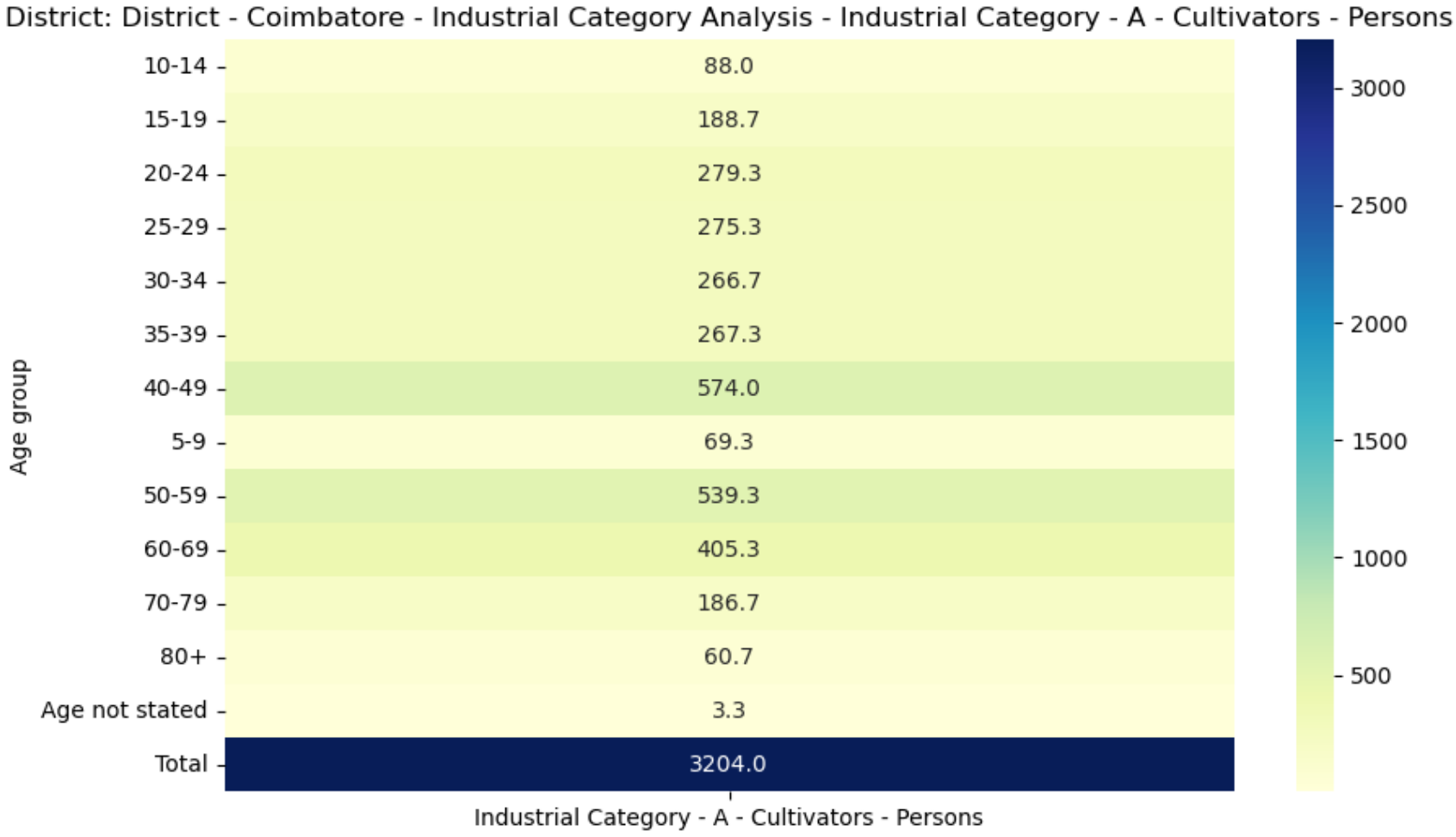

District: District - Dharmapuri - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
58.7
172.7
246.0
326.0
321.3
347.3
694.7
27.3
524.0
406.0
149.3
34.0
0.7
3308.0
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Males

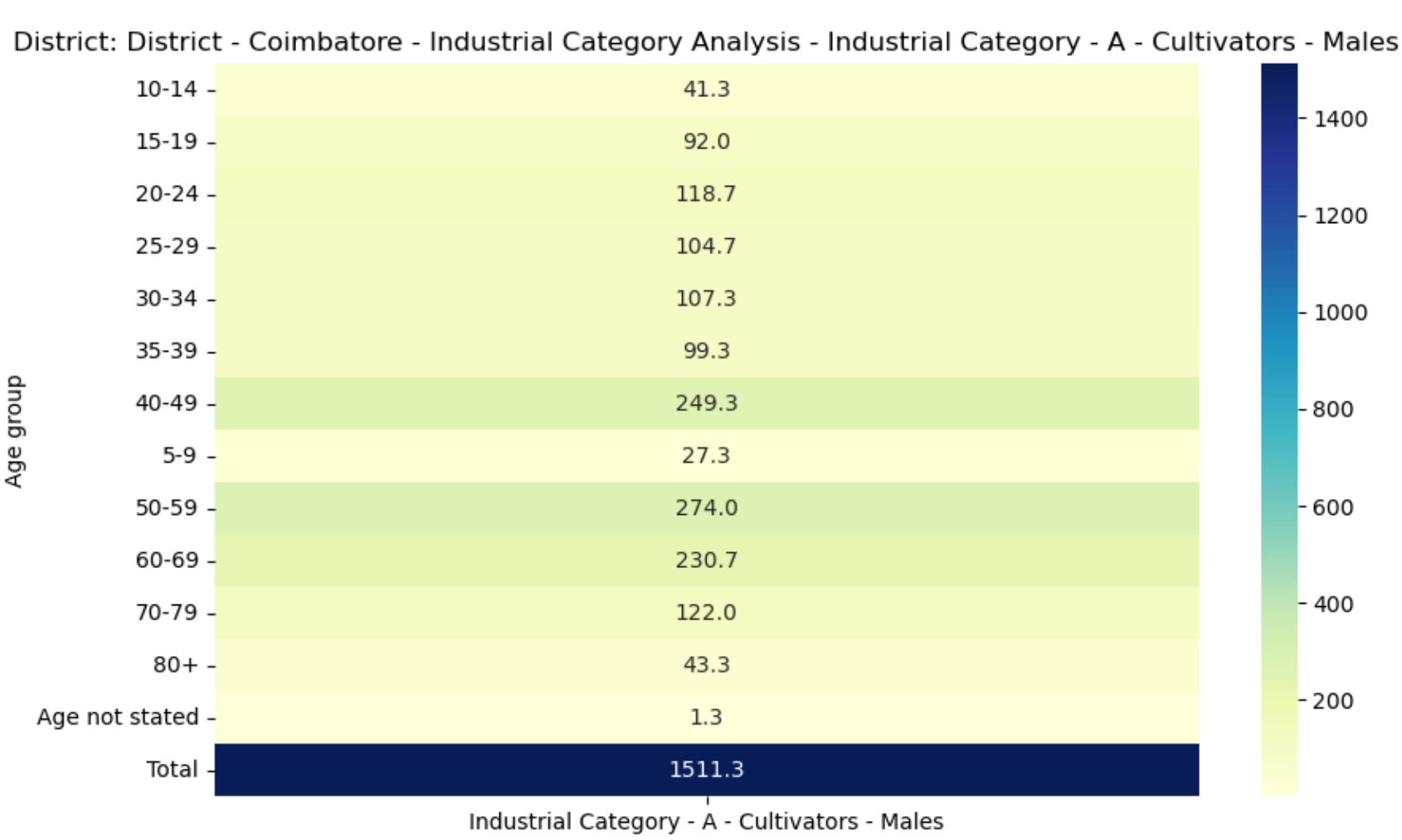

District: District - Dharmapuri - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
54.7
140.0
371.3
461.3
397.3
462.7
767.3
24.0
484.7
277.3
59.3
22.0
2.0
3524.0
3500
3000
2500
2000
1500
1000
500
Industrial Category - A - Cultivators - Females

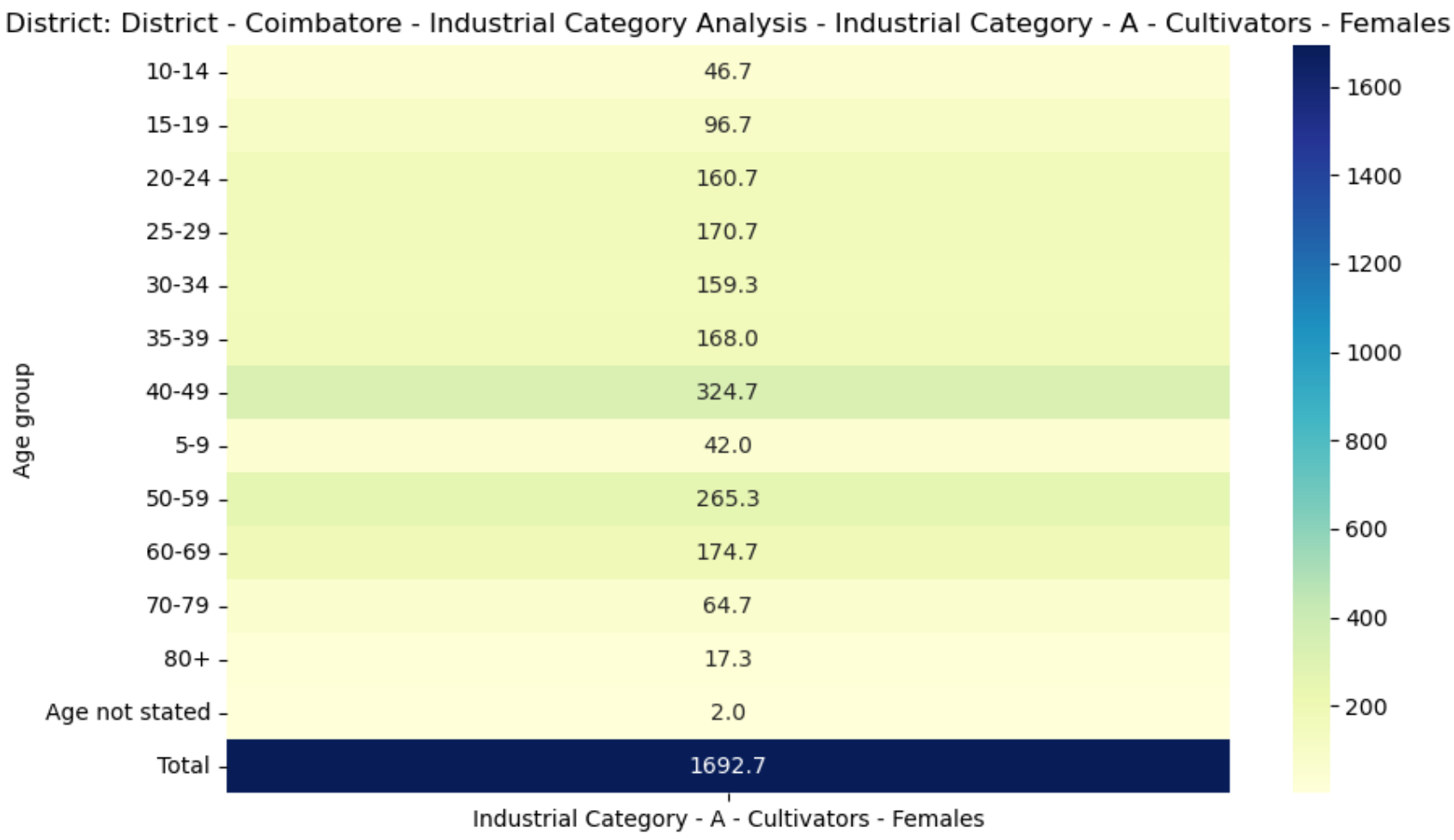

District: District - Krishnagiri - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
194.7
692.0
1163.3
1422.7
1222.0
1304.7
2438.7
101.3
1662.7
986.7
337.3
96.0
3.3
11625.3
10000
8000
6000
4000
2000
Industrial Category - A - Cultivators - Persons

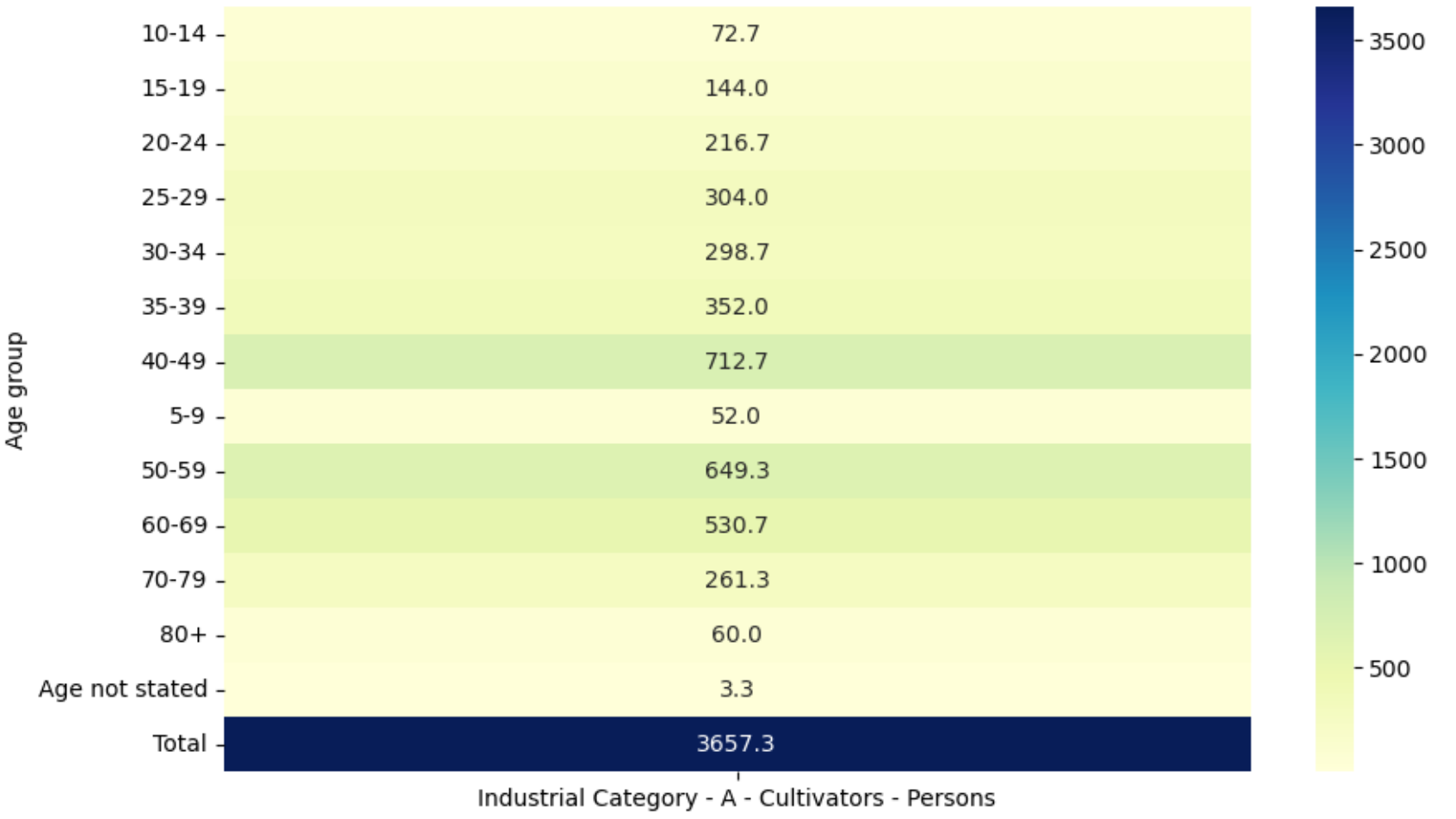

District: District - Krishnagiri - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
Age group
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
97.3
373.3
625.3
752.7
666.7
678.0
1384.0
46.0
1029.3
682.0
248.0
69.3
2.7
6654.7
6000
5000
4000
3000
2000
1000
Industrial Category - A - Cultivators - Males

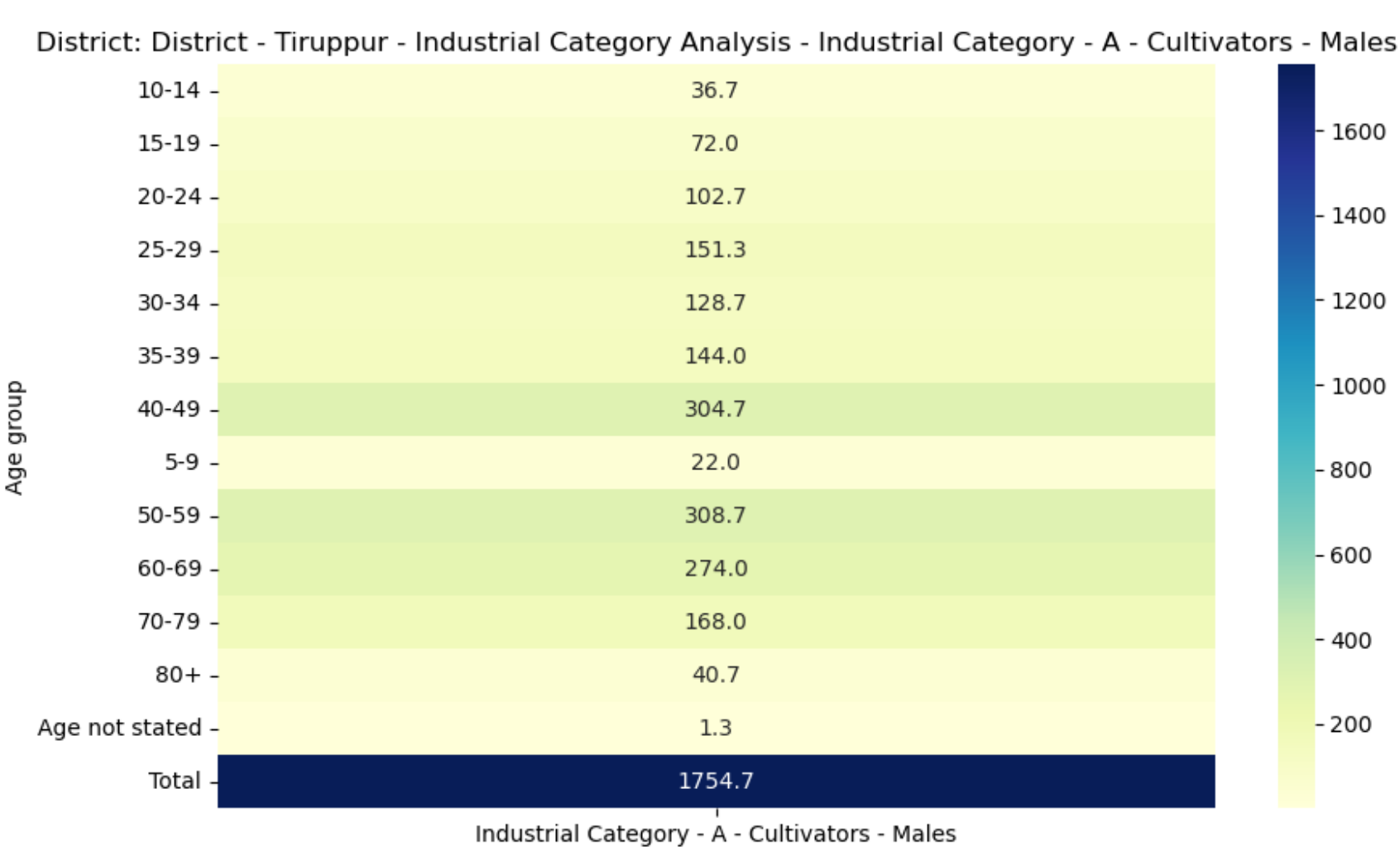

District: District - Krishnagiri - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
97.3
318.7
538.0
670.0
555.3
626.7
1054.7
55.3
633.3
304.7
89.3
26.7
0.7
4970.7
Age group
Industrial Category - A - Cultivators - Females
4000
3000
2000
1000

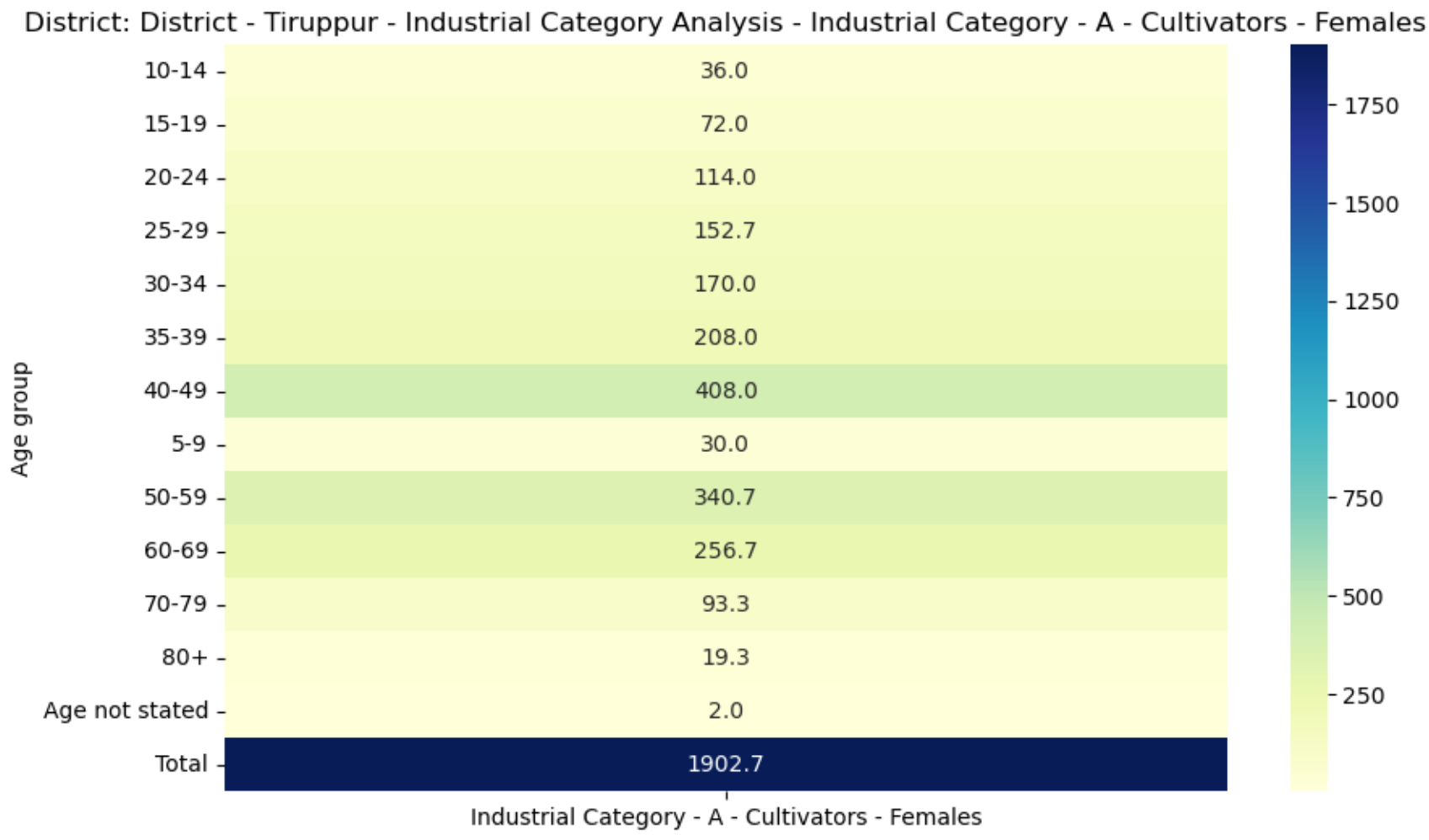

District: District - Coimbatore - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
88.0
188.7
279.3
275.3
266.7
267.3
574.0
69.3
539.3
405.3
186.7
60.7
3.3
3204.0
Age group
Industrial Category - A - Cultivators - Persons
3000
2500
2000
1500
1000
500


District: District - Coimbatore - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
41.3
92.0
118.7
104.7
107.3
99.3
249.3
27.3
274.0
230.7
122.0
43.3
1.3
1511.3
Age group
Industrial Category - A - Cultivators - Males
1400
1200
1000
800
600
400
200


District: District - Coimbatore - Industrial Category Analysis - Industrial Category - A - Cultivators - Females
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
46.7
96.7
160.7
170.7
159.3
168.0
324.7
42.0
265.3
174.7
64.7
17.3
2.0
1692.7
Age group
Industrial Category - A - Cultivators - Females
1600
1400
1200
1000
800
600
400
200


District: District - Tiruppur - Industrial Category Analysis - Industrial Category - A - Cultivators - Persons
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
72.7
144.0
216.7
304.0
298.7
352.0
712.7
52.0
649.3
530.7
261.3
60.0
3.3
3657.3
Age group
Industrial Category - A - Cultivators - Persons
3500
3000
2500
2000
1500
1000
500


District: District - Tiruppur - Industrial Category Analysis - Industrial Category - A - Cultivators - Males
10-14
15-19
20-24
25-29
30-34
35-39
40-49
5-9
50-59
60-69
70-79
80+
Age not stated
Total
36.7
72.0
102.7
151.3
128.7
144.0
304.7
22.0
308.7
274.0
168.0
40.7
1.3
1754.7
Age group
Industrial Category - A - Cultivators - Males
1600
1400
1200
1000
800
600
400
200



Full State

In [ ]:

```
# Entire State

import matplotlib.pyplot as plt

# Assuming 'df' is your DataFrame
# 'Area Name' represents the districts, 'Age group' represents the age groups, 'Total/ Rural/ Urban' represents rural or
# 'Industrial Category - A - Cultivators - Persons' represents the number of workers

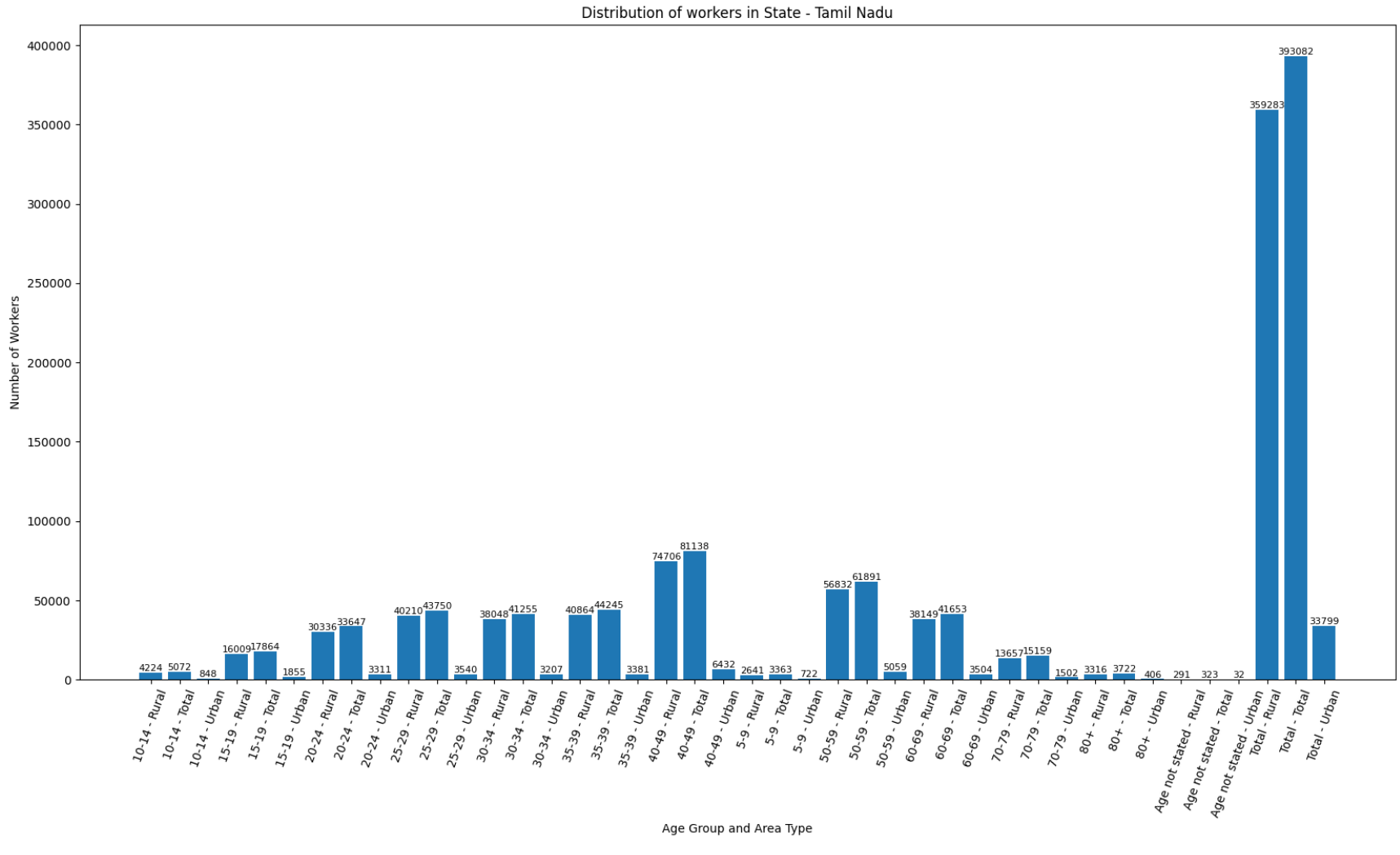
# Filter data for State - Tamil Nadu
state_data = df[df['Area Name'] == 'State - TAMIL NADU']

# Grouping by 'Age group', 'Total/ Rural/ Urban' and summing up the number of workers
grouped_data = state_data.groupby(['Age group', 'Total/ Rural/ Urban'])['Industrial Category - A - Cultivators - Person

# Create the bar chart
plt.figure(figsize=(20, 10))
bars = plt.bar(grouped_data['Age group'] + ' - ' + grouped_data['Total/ Rural/ Urban'], grouped_data['Industrial Catego

# Adding numbers on top of the bars
for bar in bars:
    yval = bar.get_height()
    plt.text(bar.get_x() + bar.get_width()/2, yval, round(yval), va='bottom', ha='center', fontsize=8, color='black')

plt.title('Distribution of workers in State - Tamil Nadu')
plt.xlabel('Age Group and Area Type')
plt.ylabel('Number of Workers')
plt.xticks(rotation=70)
plt.show()
```

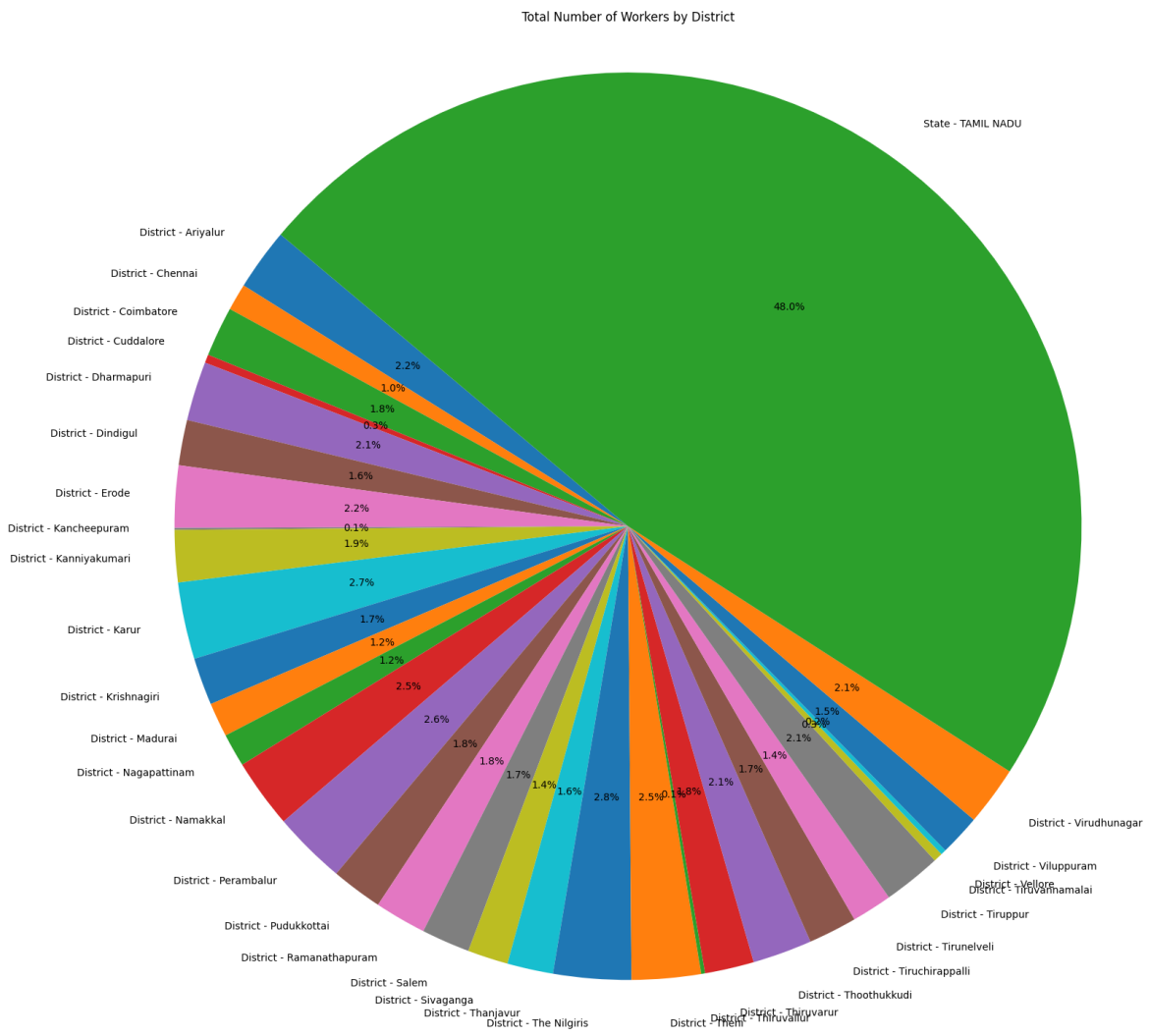


In [ ]:
```
import matplotlib.pyplot as plt

# Take the absolute values of district workers
district_workers = df.groupby('Area Name')['Worked for 3 months or more but less than 6 months -  Persons'].sum().abs()

# Create a pie chart
plt.figure(figsize=(30, 18))
plt.pie(district_workers, labels=district_workers.index, autopct='%1.1f%%', startangle=140)
plt.title('Total Number of Workers by District')
plt.axis('equal')  # Equal aspect ratio ensures the pie chart is circular.

# Show the plot
plt.show()
```



STEP 2 : *DISTRIBUTION* OF MARGINAL WORKERS

In [ ]:
```
df.columns
```

Out[ ]:
```
Index(['Table Code', 'State Code', 'District Code', 'Area Name',
       'Total/ Rural/ Urban', 'Age group',
       'Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females',
       'Industrial Category - A - Cultivators - Persons',
       'Industrial Category - A - Cultivators - Males',
       'Industrial Category - A - Cultivators - Females',
       'Industrial Category - A - Agricultural labourers - Persons',
       'Industrial Category - A - Agricultural labourers - Males',
       'Industrial Category - A - Agricultural labourers - Females',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
       'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
       'Industrial Category - B - Persons', 'Industrial Category - B - Males',
       'Industrial Category - B - Females',
       'Industrial Category - C - HHI - Persons',
       'Industrial Category - C - HHI - Males',
       'Industrial Category - C - HHI - Females',
       'Industrial Category - C - Non HHI - Persons',
       'Industrial Category - C - Non HHI - Males',
       'Industrial Category - C - Non HHI - Females',
       'Industrial Category - D & E - Persons',
       'Industrial Category - D & E - Males',
       'Industrial Category - D & E - Females',
       'Industrial Category - F - Persons', 'Industrial Category - F - Males',
       'Industrial Category - F - Females',
       'Industrial Category - G - HHI - Persons',
       'Industrial Category - G - HHI - Males',
       'Industrial Category - G - HHI - Females',
       'Industrial Category - G - Non HHI - Persons',
       'Industrial Category - G - Non HHI - Males',
       'Industrial Category - G - Non HHI - Females',
       'Industrial Category - H - Persons', 'Industrial Category - H - Males',
       'Industrial Category - H - Females',
       'Industrial Category - I - Persons', 'Industrial Category - I - Males',
       'Industrial Category - I - Females',
       'Industrial Category - J - HHI - Persons',
       'Industrial Category - J - HHI - Males',
       'Industrial Category - J - HHI - Females',
       'Industrial Category - J - Non HHI - Persons',
       'Industrial Category - J - Non HHI - Males',
       'Industrial Category - J - Non HHI - Females',
       'Industrial Category - K to M - Persons',
       'Industrial Category - K to M - Males',
       'Industrial Category - K to M - Females',
       'Industrial Category - N to O - Persons',
       'Industrial Category - N to O - Males',
       'Industrial Category - N to O - Females',
       'Industrial Category - P to Q - Persons',
       'Industrial Category - P to Q - Males',
       'Industrial Category - P to Q - Females',
       'Industrial Category - R to U - HHI - Persons',
       'Industrial Category - R to U - HHI - Males',
       'Industrial Category - R to U - HHI - Females',
       'Industrial Category - R to U - Non HHI - Persons',
       'Industrial Category - R to U - Non HHI - Males',
       'Industrial Category - R to U - Non HHI - Females'],
      dtype='object')
```

In [ ]:
```
import matplotlib.pyplot as plt


# 'Area Name' represents the districts, 'Age group' represents the age groups, 'Total/ Rural/ Urban' represents rural or
# 'Industrial Category - A - Cultivators - Persons' represents the number of workers taken as sample'

# Grouping by 'Area Name', 'Age group', 'Total/ Rural/ Urban' and summing up the number of workers
grouped_data = df.groupby(['Area Name', 'Age group', 'Total/ Rural/ Urban'])['Industrial Category - A - Cultivators - P
print(grouped_data)
# Create a separate plot for each district
districts = grouped_data['Area Name'].unique()
```

```
                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Cultivators - Persons
0                                                  68
1                                                  74
2                                                   6
3                                                 411
4                                                 425
...                                               ...
1381                                              323
1382                                               32
1383                                           359283
1384                                           393082
1385                                            33799

[1386 rows x 4 columns]
```

In [ ]:

```
# List of industrial category columns
industrial_categories = [
'Worked for 3 months or more but less than 6 months -  Persons',
'Worked for 3 months or more but less than 6 months - Males',
'Worked for 3 months or more but less than 6 months - Females',
'Worked for less than 3 months - Persons',
'Worked for less than 3 months - Males',
'Worked for less than 3 months - Females',
'Industrial Category - A - Cultivators - Persons',
'Industrial Category - A - Cultivators - Males',
'Industrial Category - A - Cultivators - Females',
'Industrial Category - A - Agricultural labourers - Persons',
'Industrial Category - A - Agricultural labourers - Males',
'Industrial Category - A - Agricultural labourers - Females',
'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons',
'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males',
'Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females',
'Industrial Category - B - Persons', 'Industrial Category - B - Males',
'Industrial Category - B - Females',
'Industrial Category - C - HHI - Persons',
'Industrial Category - C - HHI - Males',
'Industrial Category - C - HHI - Females',
'Industrial Category - C - Non HHI - Persons',
'Industrial Category - C - Non HHI - Males',
'Industrial Category - C - Non HHI - Females',
'Industrial Category - D & E - Persons',
'Industrial Category - D & E - Males',
'Industrial Category - D & E - Females',
'Industrial Category - F - Persons', 'Industrial Category - F - Males',
'Industrial Category - F - Females',
'Industrial Category - G - HHI - Persons',
'Industrial Category - G - HHI - Males',
'Industrial Category - G - HHI - Females',
'Industrial Category - G - Non HHI - Persons',
'Industrial Category - G - Non HHI - Males',
'Industrial Category - G - Non HHI - Females',
'Industrial Category - H - Persons', 'Industrial Category - H - Males',
'Industrial Category - H - Females',
'Industrial Category - I - Persons', 'Industrial Category - I - Males',
'Industrial Category - I - Females',
'Industrial Category - J - HHI - Persons',
'Industrial Category - J - HHI - Males',
'Industrial Category - J - HHI - Females',
'Industrial Category - J - Non HHI - Persons',
'Industrial Category - J - Non HHI - Males',
'Industrial Category - J - Non HHI - Females',
'Industrial Category - K to M - Persons',
'Industrial Category - K to M - Males',
'Industrial Category - K to M - Females',
'Industrial Category - N to O - Persons',
'Industrial Category - N to O - Males',
'Industrial Category - N to O - Females',
'Industrial Category - P to Q - Persons',
'Industrial Category - P to Q - Males',
'Industrial Category - P to Q - Females',
'Industrial Category - R to U - HHI - Persons',
'Industrial Category - R to U - HHI - Males',
'Industrial Category - R to U - HHI - Females',
'Industrial Category - R to U - Non HHI - Persons',
'Industrial Category - R to U - Non HHI - Males',
'Industrial Category - R to U - Non HHI - Females'
]

# Initialize an empty list to store the grouped data
grouped_data_list = []

# Loop through industrial categories
```

```
for category in industrial_categories:
    # Group the data and aggregate the counts of workers
    grouped_data = df.groupby(['Area Name', 'Age group', 'Total/ Rural/ Urban'])[category].sum().reset_index()
    # Add the grouped data to the list
    grouped_data_list.append(grouped_data)

# Now, grouped_data_list contains the grouped data for all industrial categories
print(grouped_data_list)
```

```
[                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for 3 months or more but less than 6 months -  Persons
0                                                       565
1                                                       640
2                                                        75
3                                                      3157
4                                                      3294
...                                                     ...
1381                                                   3605
1382                                                   1279
1383                                                3009302
1384                                                4218884
1385                                                1209582

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for 3 months or more but less than 6 months - Males
0                                                       309
1                                                       352
2                                                        43
3                                                      1596
4                                                      1669
...                                                     ...
1381                                                   1926
1382                                                    758
1383                                                1443929
1384                                                2136881
1385                                                 692952

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for 3 months or more but less than 6 months - Females
0                                                       256
1                                                       288
2                                                        32
3                                                      1561
4                                                      1625
...                                                     ...
1381                                                   1679
1382                                                    521
1383                                                1565373
1384                                                2082003
1385                                                 516630

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for less than 3 months - Persons
0                                         76
1                                         90
2                                         14
```

```
3                                      650
4                                      673
...                                    ...
1381                                   483
1382                                   144
1383                                510909
1384                                723891
1385                                212982

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for less than 3 months - Males
0                                       44
1                                       50
2                                        6
3                                      307
4                                      325
...                                    ...
1381                                   237
1382                                    80
1383                                   216805
1384                                   337268
1385                                   120463

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Worked for less than 3 months - Females
0                                       32
1                                       40
2                                        8
3                                      343
4                                      348
...                                    ...
1381                                   246
1382                                    64
1383                                294104
1384                                386623
1385                                 92519

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Cultivators - Persons
0                                                  68
1                                                  74
2                                                   6
3                                                 411
4                                                 425
...                                               ...
1381                                              323
1382                                               32
1383                                           359283
1384                                           393082
1385                                            33799

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
```

```
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - A - Cultivators - Males
0                                                35
1                                                37
2                                                 2
3                                               203
4                                               213
...                                             ...
1381                                            174
1382                                             23
1383                                         199440
1384                                         220314
1385                                          20874

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Cultivators - Females
0                                                33
1                                                37
2                                                 4
3                                               208
4                                               212
...                                             ...
1381                                            149
1382                                              9
1383                                         159843
1384                                         172768
1385                                          12925

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Agricultural labourers - Persons
0                                                319
1                                                332
2                                                 13
3                                               2440
4                                               2486
...                                              ...
1381                                            1444
1382                                             123
1383                                         2155158
1384                                         2372446
1385                                          217288

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Agricultural labourers - Males
0                                                158
1                                                163
2                                                  5
3                                               1140
4                                               1165
...                                              ...
1381                                             645
1382                                              65
1383                                          921652
1384                                         1034184
1385                                          112532
```

```
[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Agricultural labourers - Females
0                                                       161
1                                                       169
2                                                         8
3                                                      1300
4                                                      1321
...                                                     ...
1381                                                    799
1382                                                     58
1383                                                1233506
1384                                                1338262
1385                                                 104756

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Persons
0                                                       0
1                                                       0
2                                                       0
3                                                      22
4                                                      22
...                                                   ...
1381                                                   88
1382                                                   17
1383                                                81901
1384                                               125099
1385                                                43198

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Males
0                                                       0
1                                                       0
2                                                       0
3                                                       6
4                                                       6
...                                                   ...
1381                                                   68
1382                                                   11
1383                                                48169
1384                                                78052
1385                                                29883

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - A - Plantation, Livestock, Forestry, Fishing, Hunting and allied activities - Females
0                                                       0
1                                                       0
```

```
2                                                    0
3                                                   16
4                                                   16
...                                                ...
1381                                                20
1382                                                 6
1383                                             33732
1384                                             47047
1385                                             13315

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - B - Persons
0                                      0
1                                      0
2                                      0
3                                      0
4                                      0
...                                  ...
1381                                  12
1382                                   0
1383                               10266
1384                               14979
1385                                4713

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - B - Males
0                                    0
1                                    0
2                                    0
3                                    0
4                                    0
...                                ...
1381                                 6
1382                                 0
1383                              7004
1384                             10290
1385                              3286

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - B - Females
0                                      0
1                                      0
2                                      0
3                                      0
4                                      0
...                                  ...
1381                                   6
1382                                   0
1383                                3262
1384                                4689
1385                                1427

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
```

```
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - C - HHI - Persons
0                                          6
1                                          6
2                                          0
3                                         60
4                                         64
...                                      ...
1381                                      88
1382                                      24
1383                                   93344
1384                                  154133
1385                                   60789

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - C - HHI - Males
0                                          6
1                                          6
2                                          0
3                                         26
4                                         30
...                                      ...
1381                                      54
1382                                      11
1383                                   31962
1384                                   53418
1385                                   21456

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - C - HHI - Females
0                                          0
1                                          0
2                                          0
3                                         34
4                                         34
...                                      ...
1381                                      34
1382                                      13
1383                                   61382
1384                                  100715
1385                                   39333

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - C - Non HHI - Persons
0                                             16
1                                             16
2                                              0
3                                            128
4                                            140
...                                          ...
1381                                         231
1382                                         114
1383                                      138835
1384                                      306528
```

```
1385                                    167693

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - C - Non HHI - Males
0                                          0
1                                          0
2                                          0
3                                         52
4                                         60
...                                      ...
1381                                     147
1382                                      75
1383                                   83121
1384                                  188464
1385                                  105343

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - C - Non HHI - Females
0                                          16
1                                          16
2                                           0
3                                          76
4                                          80
...                                       ...
1381                                       84
1382                                       39
1383                                    55714
1384                                   118064
1385                                    62350

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - D & E - Persons
0                                          0
1                                          0
2                                          0
3                                          0
4                                          0
...                                      ...
1381                                       9
1382                                       9
1383                                    3038
1384                                    7137
1385                                    4099

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - D & E - Males
0                                          0
```

```
1                                    0
2                                    0
3                                    0
4                                    0
...                                ...
1381                                 9
1382                                 9
1383                              2704
1384                              6003
1385                              3299

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - D & E - Females
0                                        0
1                                        0
2                                        0
3                                        0
4                                        0
...                                    ...
1381                                     0
1382                                     0
1383                                   334
1384                                  1134
1385                                   800

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - F - Persons
0                                    0
1                                    2
2                                    2
3                                   70
4                                   84
...                                ...
1381                               297
1382                               147
1383                            231542
1384                            390275
1385                            158733

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - F - Males
0                                    0
1                                    2
2                                    2
3                                   62
4                                   74
...                                ...
1381                               170
1382                               106
1383                            117854
1384                            241619
1385                            123765

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
```

```
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - F - Females
0                                     0
1                                     0
2                                     0
3                                     8
4                                    10
...                                 ...
1381                                127
1382                                 41
1383                             113688
1384                             148656
1385                              34968

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - G - HHI - Persons
0                                           0
1                                           0
2                                           0
3                                           0
4                                           0
...                                       ...
1381                                        0
1382                                        0
1383                                      255
1384                                      510
1385                                      255

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - G - HHI - Males
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                      0
1382                                      0
1383                                    242
1384                                    478
1385                                    236

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - G - HHI - Females
0                                           0
1                                           0
2                                           0
3                                           0
4                                           0
...                                       ...
1381                                        0
1382                                        0
1383                                       13
```

```
1384                                    32
1385                                    19

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - G - Non HHI - Persons
0                                          12
1                                          14
2                                           2
3                                          30
4                                          36
...                                       ...
1381                                      134
1382                                       83
1383                                    64318
1384                                   171440
1385                                   107122

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - G - Non HHI - Males
0                                          12
1                                          14
2                                           2
3                                          30
4                                          34
...                                       ...
1381                                      108
1382                                       71
1383                                    46693
1384                                   129234
1385                                    82541

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - G - Non HHI - Females
0                                           0
1                                           0
2                                           0
3                                           0
4                                           2
...                                       ...
1381                                       26
1382                                       12
1383                                    17625
1384                                    42206
1385                                    24581

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - H - Persons
```

```
0                                  0
1                                  6
2                                  6
3                                 62
4                                 68
...                              ...
1381                              78
1382                              40
1383                           37949
1384                           84686
1385                           46737

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - H - Males
0                                    0
1                                    6
2                                    6
3                                   62
4                                   68
...                                ...
1381                                76
1382                                38
1383                             36972
1384                             81715
1385                             44743

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - H - Females
0                                    0
1                                    0
2                                    0
3                                    0
4                                    0
...                                ...
1381                                 2
1382                                 2
1383                               977
1384                              2971
1385                              1994

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - I - Persons
0                                    0
1                                    0
2                                    0
3                                   24
4                                   24
...                                ...
1381                                22
1382                                14
1383                             16644
1384                             42321
1385                             25677

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
```

```
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - I - Males
0                                    0
1                                    0
2                                    0
3                                   24
4                                   24
...                                ...
1381                                22
1382                                14
1383                             13736
1384                             33725
1385                             19989

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - I - Females
0                                    0
1                                    0
2                                    0
3                                    0
4                                    0
...                                ...
1381                                 0
1382                                 0
1383                              2908
1384                              8596
1385                              5688

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - J - HHI - Persons
0                                          0
1                                          0
2                                          0
3                                          0
4                                          0
...                                      ...
1381                                       0
1382                                       0
1383                                     162
1384                                     463
1385                                     301

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - J - HHI - Males
0                                          0
1                                          0
2                                          0
3                                          0
4                                          0
...                                      ...
1381                                       0
1382                                       0
```

```
1383                                  140
1384                                  350
1385                                  210

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - J - HHI - Females
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                      0
1382                                      0
1383                                     22
1384                                    113
1385                                     91

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - J - Non HHI - Persons
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                     21
1382                                     13
1383                                   4407
1384                                  23293
1385                                  18886

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - J - Non HHI - Males
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                     14
1382                                      6
1383                                   3386
1384                                  16984
1385                                  13598

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban
```

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      Industrial Category - J - Non HHI - Females
0                                            0
1                                            0
2                                            0
3                                            0
4                                            0
...                                        ...
1381                                         7
1382                                         7
1383                                      1021
1384                                      6309
1385                                      5288

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - K to M - Persons
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                     15
1382                                      9
1383                                   7010
1384                                  26047
1385                                  19037

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - K to M - Males
0                                         0
1                                         0
2                                         0
3                                         0
4                                         0
...                                     ...
1381                                     15
1382                                      9
1383                                   5817
1384                                  21250
1385                                  15433

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                   ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - K to M - Females
0                                           0
1                                           0
2                                           0
3                                           0
4                                           0
...                                       ...
1381                                        0
1382                                        0
1383                                     1193
1384                                     4797
1385                                     3604

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
```

```
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - N to O - Persons
0                                        0
1                                        0
2                                        0
3                                        0
4                                        0
...                                    ...
1381                                    66
1382                                    51
1383                                 15844
1384                                 56495
1385                                 40651

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - N to O - Males
0                                        0
1                                        0
2                                        0
3                                        0
4                                        0
...                                    ...
1381                                    55
1382                                    46
1383                                 11143
1384                                 42000
1385                                 30857

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - N to O - Females
0                                          0
1                                          0
2                                          0
3                                          0
4                                          0
...                                      ...
1381                                      11
1382                                       5
1383                                    4701
1384                                   14495
1385                                    9794

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14              Rural
1     District - Ariyalur           10-14              Total
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - P to Q - Persons
0                                        0
1                                        0
2                                        0
3                                       12
4                                       12
...                                    ...
1381                                    41
```

```
1382                                    17
1383                                 23473
1384                                 58788
1385                                 35315

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - P to Q - Males
0                                       0
1                                       0
2                                       0
3                                       6
4                                       6
...                                   ...
1381                                   17
1382                                    5
1383                                 8436
1384                                19892
1385                                11456

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - P to Q - Females
0                                       0
1                                       0
2                                       0
3                                       6
4                                       6
...                                   ...
1381                                   24
1382                                   12
1383                                15037
1384                                38896
1385                                23859

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - R to U - HHI - Persons
0                                             0
1                                            10
2                                            10
3                                            72
4                                            74
...                                         ...
1381                                         98
1382                                         39
1383                                      51408
1384                                      89703
1385                                      38295

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur           10-14               Rural
1     District - Ariyalur           10-14               Total
2     District - Ariyalur           10-14               Urban
3     District - Ariyalur           15-19               Rural
4     District - Ariyalur           15-19               Total
...                    ...             ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban
```

```
      Industrial Category - R to U - HHI - Males
0                                            0
1                                            6
2                                            6
3                                           34
4                                           34
...                                        ...
1381                                        34
1382                                         9
1383                                     13231
1384                                     21366
1385                                      8135

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - R to U - HHI - Females
0                                              0
1                                              4
2                                              4
3                                             38
4                                             40
...                                          ...
1381                                          64
1382                                          30
1383                                       38177
1384                                       68337
1385                                       30160

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - R to U - Non HHI - Persons
0                                              220
1                                              270
2                                               50
3                                              476
4                                              532
...                                            ...
1381                                          1121
1382                                           691
1383                                        225374
1384                                        625350
1385                                        399976

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
2     District - Ariyalur          10-14               Urban
3     District - Ariyalur          15-19               Rural
4     District - Ariyalur          15-19               Total
...                    ...            ...                 ...
1381   State - TAMIL NADU  Age not stated               Total
1382   State - TAMIL NADU  Age not stated               Urban
1383   State - TAMIL NADU           Total               Rural
1384   State - TAMIL NADU           Total               Total
1385   State - TAMIL NADU           Total               Urban

      Industrial Category - R to U - Non HHI - Males
0                                              142
1                                              168
2                                               26
3                                              258
4                                              280
...                                            ...
1381                                           549
1382                                           340
1383                                        109032
1384                                        274811
1385                                        165779

[1386 rows x 4 columns],                Area Name       Age group Total/ Rural/ Urban  \
0     District - Ariyalur          10-14               Rural
1     District - Ariyalur          10-14               Total
```

```
2     District - Ariyalur           10-14              Urban
3     District - Ariyalur           15-19              Rural
4     District - Ariyalur           15-19              Total
...                    ...             ...                ...
1381   State - TAMIL NADU  Age not stated              Total
1382   State - TAMIL NADU  Age not stated              Urban
1383   State - TAMIL NADU           Total              Rural
1384   State - TAMIL NADU           Total              Total
1385   State - TAMIL NADU           Total              Urban

      Industrial Category - R to U - Non HHI - Females
0                                                    78
1                                                   102
2                                                    24
3                                                   218
4                                                   252
...                                                 ...
1381                                                572
1382                                                351
1383                                             116342
1384                                             350539
1385                                             234197

[1386 rows x 4 columns]]
```

In [ ]:

```python
# Define the list of industrial category columns
industrial_categories = [
    'Industrial Category - A - Cultivators - Persons',
    'Industrial Category - A - Cultivators - Males',
    'Industrial Category - A - Cultivators - Females',
    # Add all other industrial category columns here
]

# Create an empty dictionary to store the aggregated data
aggregated_data = {}

# Loop through industrial categories
for category in industrial_categories:
    # Group the data by 'Age group' and 'Total/ Rural/ Urban' and aggregate the counts of marginal workers
    grouped_data = df.groupby(['Age group', 'Total/ Rural/ Urban'])[category].sum().reset_index()

    # Store the grouped and aggregated data in the dictionary
    aggregated_data[category] = grouped_data

# Now, 'aggregated_data' contains the aggregated data for each industrial category
print(aggregated_data)
```

{'Industrial Category - A - Cultivators - Persons': Age group Total/ Rural/ Urban \
0   10-14   Rural
1   10-14   Total
2   10-14   Urban
3   15-19   Rural
4   15-19   Total
5   15-19   Urban
6   20-24   Rural
7   20-24   Total
8   20-24   Urban
9   25-29   Rural
10   25-29   Total
11   25-29   Urban
12   30-34   Rural
13   30-34   Total
14   30-34   Urban
15   35-39   Rural
16   35-39   Total
17   35-39   Urban
18   40-49   Rural
19   40-49   Total
20   40-49   Urban
21   5-9   Rural
22   5-9   Total
23   5-9   Urban
24   50-59   Rural
25   50-59   Total
26   50-59   Urban
27   60-69   Rural
28   60-69   Total
29   60-69   Urban
30   70-79   Rural
31   70-79   Total
32   70-79   Urban
33   80+   Rural
34   80+   Total
35   80+   Urban
36 Age not stated   Rural
37 Age not stated   Total
38 Age not stated   Urban
39   Total   Rural
40   Total   Total
41   Total   Urban

    Industrial Category - A - Cultivators - Persons
0   8448
1   10144
2   1696
3   32018
4   35728
5   3710
6   60672
7   67294
8   6622
9   80420
10   87500
11   7080
12   76096
13   82510
14   6414
15   81728
16   88490
17   6762
18   149412
19   162276
20   12864
21   5282
22   6726
23   1444
24   113664
25   123782
26   10118
27   76298
28   83306
29   7008
30   27314
31   30318
32   3004
33   6632
34   7444
35   812
36   582
37   646
38   64
39   718566
40   786164
41   67598 , 'Industrial Category - A - Cultivators - Males': Age gr
oup Total/ Rural/ Urban \
0   10-14   Rural
1   10-14   Total
2   10-14   Urban
3   15-19   Rural
4   15-19   Total
5   15-19   Urban
6   20-24   Rural

7	20-24	Total	
8	20-24	Urban	
9	25-29	Rural	
10	25-29	Total	
11	25-29	Urban	
12	30-34	Rural	
13	30-34	Total	
14	30-34	Urban	
15	35-39	Rural	
16	35-39	Total	
17	35-39	Urban	
18	40-49	Rural	
19	40-49	Total	
20	40-49	Urban	
21	5-9	Rural	
22	5-9	Total	
23	5-9	Urban	
24	50-59	Rural	
25	50-59	Total	
26	50-59	Urban	
27	60-69	Rural	
28	60-69	Total	
29	60-69	Urban	
30	70-79	Rural	
31	70-79	Total	
32	70-79	Urban	
33	80+	Rural	
34	80+	Total	
35	80+	Urban	
36	Age not stated	Rural	
37	Age not stated	Total	
38	Age not stated	Urban	
39	Total	Rural	
40	Total	Total	
41	Total	Urban	

	Industrial Category - A - Cultivators - Males
0	4072
1	4972
2	900
3	16714
4	18672
5	1958
6	30446
7	33860
8	3414
9	40726
10	44578
11	3852
12	41124
13	44892
14	3768
15	42092
16	46174
17	4082
18	81734
19	89984
20	8250
21	2458
22	3184
23	726
24	65570
25	72366
26	6796
27	48798
28	53878
29	5080
30	19988
31	22266
32	2278
33	4856
34	5454
35	598
36	302
37	348
38	46
39	398880
40	440628
41	41748 , 'Industrial Category - A - Cultivators - Females': Age gr

oup Total/	Rural/ Urban \	
0	10-14	Rural
1	10-14	Total
2	10-14	Urban
3	15-19	Rural
4	15-19	Total
5	15-19	Urban
6	20-24	Rural
7	20-24	Total
8	20-24	Urban
9	25-29	Rural
10	25-29	Total
11	25-29	Urban
12	30-34	Rural
13	30-34	Total
14	30-34	Urban

15	35-39	Rural
16	35-39	Total
17	35-39	Urban
18	40-49	Rural
19	40-49	Total
20	40-49	Urban
21	5-9	Rural
22	5-9	Total
23	5-9	Urban
24	50-59	Rural
25	50-59	Total
26	50-59	Urban
27	60-69	Rural
28	60-69	Total
29	60-69	Urban
30	70-79	Rural
31	70-79	Total
32	70-79	Urban
33	80+	Rural
34	80+	Total
35	80+	Urban
36	Age not stated	Rural
37	Age not stated	Total
38	Age not stated	Urban
39	Total	Rural
40	Total	Total
41	Total	Urban

	Industrial Category - A - Cultivators - Females
0	4376
1	5172
2	796
3	15304
4	17056
5	1752
6	30226
7	33434
8	3208
9	39694
10	42922
11	3228
12	34972
13	37618
14	2646
15	39636
16	42316
17	2680
18	67678
19	72292
20	4614
21	2824
22	3542
23	718
24	48094
25	51416
26	3322
27	27500
28	29428
29	1928
30	7326
31	8052
32	726
33	1776
34	1990
35	214
36	280
37	298
38	18
39	319686
40	345536
41	25850 }

In [ ]:
```python
# Define the list of industrial category columns
industrial_categories = [
    'Industrial Category - A - Cultivators - Persons',
    'Industrial Category - A - Cultivators - Males',
    'Industrial Category - A - Cultivators - Females',
    # Add all other industrial category columns here
]

# Create an empty dictionary to store the aggregated data
aggregated_data = {}

# Loop through industrial categories
for category in industrial_categories:
    # Group the data by 'Age group' and 'Total/ Rural/ Urban' and aggregate the counts of marginal workers
    grouped_data = df.groupby(['Age group', 'Total/ Rural/ Urban'])[category].mean().reset_index()

    # Store the grouped and aggregated data in the dictionary
    aggregated_data[category] = grouped_data

# Now, 'aggregated_data' contains the aggregated data for each industrial category
print(aggregated_data)
```

{'Industrial Category - A - Cultivators - Persons': Age group Total/ Rural/ Urban \
0 10-14 Rural
1 10-14 Total
2 10-14 Urban
3 15-19 Rural
4 15-19 Total
5 15-19 Urban
6 20-24 Rural
7 20-24 Total
8 20-24 Urban
9 25-29 Rural
10 25-29 Total
11 25-29 Urban
12 30-34 Rural
13 30-34 Total
14 30-34 Urban
15 35-39 Rural
16 35-39 Total
17 35-39 Urban
18 40-49 Rural
19 40-49 Total
20 40-49 Urban
21 5-9 Rural
22 5-9 Total
23 5-9 Urban
24 50-59 Rural
25 50-59 Total
26 50-59 Urban
27 60-69 Rural
28 60-69 Total
29 60-69 Urban
30 70-79 Rural
31 70-79 Total
32 70-79 Urban
33 80+ Rural
34 80+ Total
35 80+ Urban
36 Age not stated Rural
37 Age not stated Total
38 Age not stated Urban
39 Total Rural
40 Total Total
41 Total Urban

    Industrial Category - A - Cultivators - Persons
0 256.000000
1 307.393939
2 51.393939
3 970.242424
4 1082.666667
5 112.424242
6 1838.545455
7 2039.212121
8 200.666667
9 2436.969697
10 2651.515152
11 214.545455
12 2305.939394
13 2500.303030
14 194.363636
15 2476.606061
16 2681.515152
17 204.909091
18 4527.636364
19 4917.454545
20 389.818182
21 160.060606
22 203.818182
23 43.757576
24 3444.363636
25 3750.969697
26 306.606061
27 2312.060606
28 2524.424242
29 212.363636
30 827.696970
31 918.727273
32 91.030303
33 200.969697
34 225.575758
35 24.606061
36 17.636364
37 19.575758
38 1.939394
39 21774.727273
40 23823.151515
41 2048.424242 , 'Industrial Category - A - Cultivators - Males': Age gr
oup Total/ Rural/ Urban \
0 10-14 Rural
1 10-14 Total
2 10-14 Urban
3 15-19 Rural
4 15-19 Total
5 15-19 Urban
6 20-24 Rural

7	20-24	Total	
8	20-24	Urban	
9	25-29	Rural	
10	25-29	Total	
11	25-29	Urban	
12	30-34	Rural	
13	30-34	Total	
14	30-34	Urban	
15	35-39	Rural	
16	35-39	Total	
17	35-39	Urban	
18	40-49	Rural	
19	40-49	Total	
20	40-49	Urban	
21	5-9	Rural	
22	5-9	Total	
23	5-9	Urban	
24	50-59	Rural	
25	50-59	Total	
26	50-59	Urban	
27	60-69	Rural	
28	60-69	Total	
29	60-69	Urban	
30	70-79	Rural	
31	70-79	Total	
32	70-79	Urban	
33	80+	Rural	
34	80+	Total	
35	80+	Urban	
36	Age not stated	Rural	
37	Age not stated	Total	
38	Age not stated	Urban	
39	Total	Rural	
40	Total	Total	
41	Total	Urban	

	Industrial Category - A - Cultivators - Males
0	123.393939
1	150.666667
2	27.272727
3	506.484848
4	565.818182
5	59.333333
6	922.606061
7	1026.060606
8	103.454545
9	1234.121212
10	1350.848485
11	116.727273
12	1246.181818
13	1360.363636
14	114.181818
15	1275.515152
16	1399.212121
17	123.696970
18	2476.787879
19	2726.787879
20	250.000000
21	74.484848
22	96.484848
23	22.000000
24	1986.969697
25	2192.909091
26	205.939394
27	1478.727273
28	1632.666667
29	153.939394
30	605.696970
31	674.727273
32	69.030303
33	147.151515
34	165.272727
35	18.121212
36	9.151515
37	10.545455
38	1.393939
39	12087.272727
40	13352.363636
41	1265.090909

, 'Industrial Category - A - Cultivators - Females': Age group Total/ Rural/ Urban \

0	10-14	Rural	
1	10-14	Total	
2	10-14	Urban	
3	15-19	Rural	
4	15-19	Total	
5	15-19	Urban	
6	20-24	Rural	
7	20-24	Total	
8	20-24	Urban	
9	25-29	Rural	
10	25-29	Total	
11	25-29	Urban	
12	30-34	Rural	
13	30-34	Total	
14	30-34	Urban	

15	35-39	Rural
16	35-39	Total
17	35-39	Urban
18	40-49	Rural
19	40-49	Total
20	40-49	Urban
21	5-9	Rural
22	5-9	Total
23	5-9	Urban
24	50-59	Rural
25	50-59	Total
26	50-59	Urban
27	60-69	Rural
28	60-69	Total
29	60-69	Urban
30	70-79	Rural
31	70-79	Total
32	70-79	Urban
33	80+	Rural
34	80+	Total
35	80+	Urban
36	Age not stated	Rural
37	Age not stated	Total
38	Age not stated	Urban
39	Total	Rural
40	Total	Total
41	Total	Urban

	Industrial Category - A - Cultivators - Females
0	132.606061
1	156.727273
2	24.121212
3	463.757576
4	516.848485
5	53.090909
6	915.939394
7	1013.151515
8	97.212121
9	1202.848485
10	1300.666667
11	97.818182
12	1059.757576
13	1139.939394
14	80.181818
15	1201.090909
16	1282.303030
17	81.212121
18	2050.848485
19	2190.666667
20	139.818182
21	85.575758
22	107.333333
23	21.757576
24	1457.393939
25	1558.060606
26	100.666667
27	833.333333
28	891.757576
29	58.424242
30	222.000000
31	244.000000
32	22.000000
33	53.818182
34	60.303030
35	6.484848
36	8.484848
37	9.030303
38	0.545455
39	9687.454545
40	10470.787879
41	783.333333 }

In [ ]:
```
# Apply one-hot encoding for 'Table Code'
df_encoded_table_code = pd.get_dummies(df, columns=['Table Code'], prefix=['Table_Code'])
df_encoded_table_code
```

Out[ ]:

	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	...	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	Industrial Category - R to U - HHI - Persons
0	33	000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	337268	...	58788	19892	38896	89703
1	33	000	State - TAMIL NADU	Total	5-9	48238	24511	23727	2051	1021	...	312	169	143	842
2	33	000	State - TAMIL NADU	Total	10-14	76288	39191	37097	6993	3716	...	506	256	250	1523
3	33	000	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	23489	...	2114	695	1419	5349
4	33	000	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	42916	...	11529	2861	8668	10653
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1381	33	633	District - Tiruppur	Urban	50-59	4965	2800	2165	901	462	...	111	51	60	119
1382	33	633	District - Tiruppur	Urban	60-69	2827	1590	1237	578	307	...	21	6	15	71
1383	33	633	District - Tiruppur	Urban	70-79	920	581	339	204	124	...	6	6	0	22
1384	33	633	District - Tiruppur	Urban	80+	191	104	87	47	32	...	2	0	2	13
1385	33	633	District - Tiruppur	Urban	Age not stated	31	23	8	9	5	...	0	0	0	3

1386 rows × 69 columns

STEP 3 Feature Engineering

In [ ]:
```
#One-Hot Encoding (for nominal variables) sample :
from sklearn.preprocessing import MinMaxScaler

columns_to_normalize = ['Worked for less than 3 months - Persons',
                        'Worked for less than 3 months - Males',
                        'Worked for less than 3 months - Females',
                        ]

scaler = MinMaxScaler()
df[columns_to_normalize] = scaler.fit_transform(df[columns_to_normalize])
```

In [ ]:
```
# Apply one-hot encoding for 'State Code'
df_encoded_state_code = pd.get_dummies(df, columns=['State Code'], prefix=['State_Code'])
df_encoded_state_code
```

Out[ ]:

	Table Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	...	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	Industrial Category - R to U - HHI - Persons
0	B0706	000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	1.000000	1.000000	...	58788	19892	38896	89703
1	B0706	000	State - TAMIL NADU	Total	5-9	48238	24511	23727	0.002833	0.003027	...	312	169	143	842
2	B0706	000	State - TAMIL NADU	Total	10-14	76288	39191	37097	0.009660	0.011018	...	506	256	250	1523
3	B0706	000	State - TAMIL NADU	Total	15-19	257605	141262	116343	0.057934	0.069645	...	2114	695	1419	5349
4	B0706	000	State - TAMIL NADU	Total	20-24	478082	257149	220933	0.111945	0.127246	...	11529	2861	8668	10653
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1381	B0706	633	District - Tiruppur	Urban	50-59	4965	2800	2165	0.001245	0.001370	...	111	51	60	119
1382	B0706	633	District - Tiruppur	Urban	60-69	2827	1590	1237	0.000798	0.000910	...	21	6	15	71
1383	B0706	633	District - Tiruppur	Urban	70-79	920	581	339	0.000282	0.000368	...	6	6	0	22
1384	B0706	633	District - Tiruppur	Urban	80+	191	104	87	0.000065	0.000095	...	2	0	2	13
1385	B0706	633	District - Tiruppur	Urban	Age not stated	31	23	8	0.000012	0.000015	...	0	0	0	3

1386 rows × 69 columns

In [ ]:
```
# Apply one-hot encoding for 'District Code'
df_encoded_district_code = pd.get_dummies(df, columns=['District Code'], prefix=['District_Code'])
df_encoded_district_code
```

Out[ ]:

	Table Code	State Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	...	District_Code_624	District_Code_625	District_
0	B0706	33	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	337268	...	0	0	
1	B0706	33	State - TAMIL NADU	Total	5-9	48238	24511	23727	2051	1021	...	0	0	
2	B0706	33	State - TAMIL NADU	Total	10-14	76288	39191	37097	6993	3716	...	0	0	
3	B0706	33	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	23489	...	0	0	
4	B0706	33	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	42916	...	0	0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	33	District - Tiruppur	Urban	50-59	4965	2800	2165	901	462	...	0	0	
1382	B0706	33	District - Tiruppur	Urban	60-69	2827	1590	1237	578	307	...	0	0	
1383	B0706	33	District - Tiruppur	Urban	70-79	920	581	339	204	124	...	0	0	
1384	B0706	33	District - Tiruppur	Urban	80+	191	104	87	47	32	...	0	0	
1385	B0706	33	District - Tiruppur	Urban	Age not stated	31	23	8	9	5	...	0	0	

1386 rows × 101 columns

In [ ]:
```
# Apply one-hot encoding for 'Total/ Rural/ Urban'
df_encoded_total_rural_urban = pd.get_dummies(df, columns=['Total/ Rural/ Urban'], prefix=['Total_Rural_Urban'])
df_encoded_total_rural_urban
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	...	Industrial Category - P to Q - Females	Industrial Category - R to U - HHI - Persons	Industrial Category - R to U - HHI - Males	Industrial Category - R to U - HHI - Females	I
0	B0706	33	000	State - TAMIL NADU	Total	4218884	2136881	2082003	723891	337268	...	38896	89703	21366	68337	
1	B0706	33	000	State - TAMIL NADU	5-9	48238	24511	23727	2051	1021	...	143	842	386	456	
2	B0706	33	000	State - TAMIL NADU	10-14	76288	39191	37097	6993	3716	...	250	1523	576	947	
3	B0706	33	000	State - TAMIL NADU	15-19	257605	141262	116343	41938	23489	...	1419	5349	2065	3284	
4	B0706	33	000	State - TAMIL NADU	20-24	478082	257149	220933	81036	42916	...	8668	10653	2478	8175	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	33	633	District - Tiruppur	50-59	4965	2800	2165	901	462	...	60	119	26	93	
1382	B0706	33	633	District - Tiruppur	60-69	2827	1590	1237	578	307	...	15	71	24	47	
1383	B0706	33	633	District - Tiruppur	70-79	920	581	339	204	124	...	0	22	9	13	
1384	B0706	33	633	District - Tiruppur	80+	191	104	87	47	32	...	2	13	3	10	
1385	B0706	33	633	District - Tiruppur	Age not stated	31	23	8	9	5	...	0	3	0	3	

1386 rows × 71 columns

In [ ]:
```
# Apply one-hot encoding for 'Age group'
df_encoded_age_group = pd.get_dummies(df, columns=['Age group'], prefix=['Age_Group'])
df_encoded_age_group
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	Worked for less than 3 months - Males	...	Age_Group_30-34	Age_Group_35-39	Age_Group_
0	B0706	33	000	State - TAMIL NADU	Total	4218884	2136881	2082003	723891	337268	...	0	0	
1	B0706	33	000	State - TAMIL NADU	Total	48238	24511	23727	2051	1021	...	0	0	
2	B0706	33	000	State - TAMIL NADU	Total	76288	39191	37097	6993	3716	...	0	0	
3	B0706	33	000	State - TAMIL NADU	Total	257605	141262	116343	41938	23489	...	0	0	
4	B0706	33	000	State - TAMIL NADU	Total	478082	257149	220933	81036	42916	...	0	0	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	33	633	District - Tiruppur	Urban	4965	2800	2165	901	462	...	0	0	
1382	B0706	33	633	District - Tiruppur	Urban	2827	1590	1237	578	307	...	0	0	
1383	B0706	33	633	District - Tiruppur	Urban	920	581	339	204	124	...	0	0	
1384	B0706	33	633	District - Tiruppur	Urban	191	104	87	47	32	...	0	0	
1385	B0706	33	633	District - Tiruppur	Urban	31	23	8	9	5	...	0	0	

1386 rows × 82 columns

In [ ]:
```
df
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Industrial Category - N to O - Females	Industrial Category - P to Q - Persons	Industrial Category - P to Q - Males	Industrial Category - P to Q - Females	In Ca -
0	B0706	33	000	State - TAMIL NADU	Total	Total	4218884	2136881	2082003	723891	...	14495	58788	19892	38896	
1	B0706	33	000	State - TAMIL NADU	Total	5-9	48238	24511	23727	2051	...	20	312	169	143	
2	B0706	33	000	State - TAMIL NADU	Total	10-14	76288	39191	37097	6993	...	44	506	256	250	
3	B0706	33	000	State - TAMIL NADU	Total	15-19	257605	141262	116343	41938	...	768	2114	695	1419	
4	B0706	33	000	State - TAMIL NADU	Total	20-24	478082	257149	220933	81036	...	2267	11529	2861	8668	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
1381	B0706	33	633	District - Tiruppur	Urban	50-59	4965	2800	2165	901	...	25	111	51	60	
1382	B0706	33	633	District - Tiruppur	Urban	60-69	2827	1590	1237	578	...	7	21	6	15	
1383	B0706	33	633	District - Tiruppur	Urban	70-79	920	581	339	204	...	2	6	6	0	
1384	B0706	33	633	District - Tiruppur	Urban	80+	191	104	87	47	...	0	2	0	2	
1385	B0706	33	633	District - Tiruppur	Urban	Age not stated	31	23	8	9	...	0	0	0	0	

1386 rows × 69 columns

In [ ]:
```
from sklearn.preprocessing import StandardScaler

# Assuming 'df' is your DataFrame and 'scaler' is the StandardScaler object
scaler = StandardScaler()
scaled_features = scaler.fit_transform(df[['Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females']])

# Assign the scaled features back to the DataFrame
df[['Worked for 3 months or more but less than 6 months -  Persons',
       'Worked for 3 months or more but less than 6 months - Males',
       'Worked for 3 months or more but less than 6 months - Females',
       'Worked for less than 3 months - Persons',
       'Worked for less than 3 months - Males',
       'Worked for less than 3 months - Females']] = scaled_features

scaled_features
```

Out[ ]:
```
array([[27.41163649, 27.71214133, 27.04626211, 27.44328936, 27.89542893,
        26.92561576],
       [ 0.15610087,  0.15883305,  0.15299754, -0.08111597, -0.07701019,
        -0.08416826],
       [ 0.33941006,  0.35031587,  0.32768886,  0.10732691,  0.14718727,
         0.07322823],
       ...,
       [-0.15312639, -0.15330482, -0.15258814, -0.15154373, -0.15163176,
        -0.15071328],
       [-0.15789047, -0.1595267 , -0.15588075, -0.15753028, -0.15928525,
        -0.15526636],
       [-0.15893609, -0.16058325, -0.15691296, -0.15897926, -0.16153139,
        -0.15603688]])
```

In [ ]:
```
# Check unique values in 'Age group' column
unique_age_groups = df['Age group'].unique()
print(unique_age_groups)
```

```
['Total' '5-9' '10-14' '15-19' '20-24' '25-29' '30-34' '35-39' '40-49'
 '50-59' '60-69' '70-79' '80+' 'Age not stated']
```

In [ ]:
```
# One-hot encode 'Age group'
age_group_encoded = pd.get_dummies(df['Age group'], prefix='Age')

# Concatenate the one-hot encoded columns with the original DataFrame
df_encoded = pd.concat([df, age_group_encoded], axis=1)
```

In [ ]:
```
# interaction terms
import pandas as pd

# Assuming df is your DataFrame
# Create interaction terms
df['AgeGroup_Total'] = df['Age group'] + '_' + df['Total/ Rural/ Urban']

# Now df['AgeGroup_Total'] will contain the interaction terms
print(df['AgeGroup_Total'].unique())
```

```
['Total_Total' '5-9_Total' '10-14_Total' '15-19_Total' '20-24_Total'
 '25-29_Total' '30-34_Total' '35-39_Total' '40-49_Total' '50-59_Total'
 '60-69_Total' '70-79_Total' '80+_Total' 'Age not stated_Total'
 'Total_Rural' '5-9_Rural' '10-14_Rural' '15-19_Rural' '20-24_Rural'
 '25-29_Rural' '30-34_Rural' '35-39_Rural' '40-49_Rural' '50-59_Rural'
 '60-69_Rural' '70-79_Rural' '80+_Rural' 'Age not stated_Rural'
 'Total_Urban' '5-9_Urban' '10-14_Urban' '15-19_Urban' '20-24_Urban'
 '25-29_Urban' '30-34_Urban' '35-39_Urban' '40-49_Urban' '50-59_Urban'
 '60-69_Urban' '70-79_Urban' '80+_Urban' 'Age not stated_Urban']
```

Creating New Features: You can create new features based on domain knowledge or by performing transformations on existing features.

Industrial Category Analysis:

Analyze employment trends across different industrial categories. Identify which industries have higher or lower employment rates and explore potential influencing factors.

In [ ]:
```
df['Proportion_Males'] = df['Worked for 3 months or more but less than 6 months - Males'] / df['Worked for 3 months or m
]
df['Proportion_Females'] = df['Worked for 3 months or more but less than 6 months - Females'] / df['Worked for 3 months


df['Proportion_Males']
df['Proportion_Females']
```

Out[ ]:
```
0       0.493496
1       0.491874
2       0.486276
3       0.451633
4       0.462124
          ...
1381    0.436052
1382    0.437566
1383    0.368478
1384    0.455497
1385    0.258065
Name: Proportion_Females, Length: 1386, dtype: float64
```

In [ ]:
```
# Industrial Category A
total_column_a = 'Industrial Category - A - Cultivators - Persons'
males_column_a = 'Industrial Category - A - Cultivators - Males'
females_column_a = 'Industrial Category - A - Cultivators - Females'

# Calculate proportions
df[f'Proportion_A_Males'] = df[males_column_a] / df[total_column_a]
df[f'Proportion_A_Females'] = df[females_column_a] / df[total_column_a]

# Display the DataFrame with new proportion columns
print(df)
```

```
     Table Code State Code District Code            Area Name  \
0         B0706         33           000   State - TAMIL NADU
1         B0706         33           000   State - TAMIL NADU
2         B0706         33           000   State - TAMIL NADU
3         B0706         33           000   State - TAMIL NADU
4         B0706         33           000   State - TAMIL NADU
...         ...        ...           ...                  ...
1381      B0706         33           633  District - Tiruppur
1382      B0706         33           633  District - Tiruppur
1383      B0706         33           633  District - Tiruppur
1384      B0706         33           633  District - Tiruppur
1385      B0706         33           633  District - Tiruppur

     Total/ Rural/ Urban       Age group  \
0                  Total           Total
1                  Total             5-9
2                  Total           10-14
3                  Total           15-19
4                  Total           20-24
...                  ...             ...
1381               Urban           50-59
1382               Urban           60-69
1383               Urban           70-79
1384               Urban             80+
1385               Urban  Age not stated

      Worked for 3 months or more but less than 6 months -  Persons  \
0                                                  4218884
1                                                    48238
2                                                    76288
3                                                   257605
4                                                   478082
...                                                    ...
1381                                                4965
1382                                                2827
1383                                                 920
1384                                                 191
1385                                                  31

      Worked for 3 months or more but less than 6 months - Males  \
0                                                  2136881
1                                                    24511
2                                                    39191
3                                                   141262
4                                                   257149
...                                                    ...
1381                                                2800
1382                                                1590
1383                                                 581
1384                                                 104
1385                                                  23

      Worked for 3 months or more but less than 6 months - Females  \
0                                                  2082003
1                                                    23727
2                                                    37097
3                                                   116343
4                                                   220933
...                                                    ...
1381                                                2165
1382                                                1237
1383                                                 339
1384                                                  87
1385                                                   8

      Worked for less than 3 months - Persons  ...  Category A  Total_Worked  \
0                                    1.000000  ...           1  4.218885e+06
1                                    0.002833  ...           1  4.823800e+04
2                                    0.009660  ...           1  7.628801e+04
3                                    0.057934  ...           1  2.576051e+05
4                                    0.111945  ...           1  4.780821e+05
...                                       ...  ...         ...           ...
1381                                 0.001245  ...           1  4.965001e+03
1382                                 0.000798  ...           1  2.827001e+03
1383                                 0.000282  ...           1  9.200003e+02
1384                                 0.000065  ...           1  1.910001e+02
1385                                 0.000012  ...           1  3.100001e+01

      Total_Category_A_Persons  Proportion_Agricultural_Laborers_Category_A  \
0                       786164                                          0.5
1                         6726                                          0.5
2                        10144                                          0.5
3                        35728                                          0.5
4                        67294                                          0.5
...                        ...                                          ...
1381                       380                                          0.5
1382                       246                                          0.5
1383                       126                                          0.5
1384                        22                                          0.5
1385                         2                                          0.5

      Proportion_Males_Worked_3_6_months  \
0                               0.506504
1                               0.508126
2                               0.513724
```

```
3                              0.548367
4                              0.537876
...                                 ...
1381                           0.563948
1382                           0.562434
1383                           0.631522
1384                           0.544503
1385                           0.741935

      Proportion_Females_Worked_3_6_months  Proportion_Males  \
0                                 0.493496          0.506504
1                                 0.491874          0.508126
2                                 0.486276          0.513724
3                                 0.451633          0.548367
4                                 0.462124          0.537876
...                                    ...               ...
1381                              0.436052          0.563948
1382                              0.437566          0.562434
1383                              0.368478          0.631522
1384                              0.455497          0.544503
1385                              0.258065          0.741935

      Proportion_Females  Proportion_A_Males  Proportion_A_Females
0               0.493496            0.560478              0.439522
1               0.491874            0.473387              0.526613
2               0.486276            0.490142              0.509858
3               0.451633            0.522615              0.477385
4               0.462124            0.503165              0.496835
...                  ...                 ...                   ...
1381            0.436052            0.600000              0.400000
1382            0.437566            0.569106              0.430894
1383            0.368478            0.698413              0.301587
1384            0.455497            0.727273              0.272727
1385            0.258065            1.000000              0.000000

[1386 rows x 79 columns]
```

In [ ]:

```
# Example: Adding features related to industrial categories

# Assuming 'df' is your DataFrame

# Feature 1: Total number of persons in Industrial Category A
df['Total_Category_A_Persons'] = df[      'Industrial Category - A - Cultivators - Persons'] + df[  'Industrial Categor

# Feature 2: Proportion of Agricultural laborers in Total Category A
df['Proportion_Agricultural_Laborers_Category_A'] = df['Industrial Category - A - Cultivators - Persons'] / df['Total_C



# Example: Adding features related to demographics

# Feature 4: Proportion of Males in Total Worked for 3-6 months
df['Proportion_Males_Worked_3_6_months'] = df[   'Worked for 3 months or more but less than 6 months - Males'] / df[

# Feature 5: Proportion of Females in Total Worked for 3-6 months
df['Proportion_Females_Worked_3_6_months'] = df['Worked for 3 months or more but less than 6 months - Females'] / df[

# Add more features as per your dataset's columns and your analysis goals.

# Ensure you handle missing values, data preprocessing, and normalization if required before training your model.

# You can similarly create features based on other relevant factors in your dataset.
```

In [ ]:

```
df.head
```

Out[ ]:
```
<bound method NDFrame.head of      Table Code State Code District Code            Area Name  \
0         B0706         33           000   State - TAMIL NADU
1         B0706         33           000   State - TAMIL NADU
2         B0706         33           000   State - TAMIL NADU
3         B0706         33           000   State - TAMIL NADU
4         B0706         33           000   State - TAMIL NADU
...         ...        ...           ...                  ...
1381      B0706         33           633  District - Tiruppur
1382      B0706         33           633  District - Tiruppur
1383      B0706         33           633  District - Tiruppur
1384      B0706         33           633  District - Tiruppur
1385      B0706         33           633  District - Tiruppur

     Total/ Rural/ Urban       Age group  \
0                  Total           Total
1                  Total             5-9
2                  Total           10-14
3                  Total           15-19
4                  Total           20-24
...                  ...             ...
1381               Urban           50-59
1382               Urban           60-69
1383               Urban           70-79
1384               Urban             80+
1385               Urban  Age not stated

      Worked for 3 months or more but less than 6 months -  Persons  \
0                                                  4218884
1                                                    48238
2                                                    76288
3                                                   257605
4                                                   478082
...                                                    ...
1381                                                4965
1382                                                2827
1383                                                 920
1384                                                 191
1385                                                  31

      Worked for 3 months or more but less than 6 months - Males  \
0                                                  2136881
1                                                    24511
2                                                    39191
3                                                   141262
4                                                   257149
...                                                    ...
1381                                                2800
1382                                                1590
1383                                                 581
1384                                                 104
1385                                                  23

      Worked for 3 months or more but less than 6 months - Females  \
0                                                  2082003
1                                                    23727
2                                                    37097
3                                                   116343
4                                                   220933
...                                                    ...
1381                                                2165
1382                                                1237
1383                                                 339
1384                                                  87
1385                                                   8

      Worked for less than 3 months - Persons  ...  Proportion_Males  \
0                                      723891  ...         0.506504
1                                        2051  ...         0.508126
2                                        6993  ...         0.513724
3                                       41938  ...         0.548367
4                                       81036  ...         0.537876
...                                       ...  ...              ...
1381                                      901  ...         0.563948
1382                                      578  ...         0.562434
1383                                      204  ...         0.631522
1384                                       47  ...         0.544503
1385                                        9  ...         0.741935

      Proportion_Females  Proportion_Cultivators_Males  \
0               0.493496                      0.560478
1               0.491874                      0.473387
2               0.486276                      0.490142
3               0.451633                      0.522615
4               0.462124                      0.503165
...                  ...                           ...
1381            0.436052                      0.600000
1382            0.437566                      0.569106
1383            0.368478                      0.698413
1384            0.455497                      0.727273
1385            0.258065                      1.000000

      Proportion_Cultivators_Females  Proportion_Agricultural labourers_Males  \
0                           0.439522                                 0.435915
1                           0.526613                                 0.477812
2                           0.509858                                 0.500323
```

```
3                          0.477385                                   0.506954
4                          0.496835                                   0.456104
...                             ...                                        ...
1381                       0.400000                                   0.478539
1382                       0.430894                                   0.477764
1383                       0.301587                                   0.573991
1384                       0.272727                                   0.555556
1385                       0.000000                                   0.250000

      Proportion_Agricultural labourers_Females  \
0                                      0.564085
1                                      0.522188
2                                      0.499677
3                                      0.493046
4                                      0.543896
...                                         ...
1381                                   0.521461
1382                                   0.522236
1383                                   0.426009
1384                                   0.444444
1385                                   0.750000

      Proportion_Plantation, Livestock, Forestry, Fishing, Hunting and allied activities_Males  \
0                                                 0.623922
1                                                 0.535354
2                                                 0.556355
3                                                 0.684370
4                                                 0.687166
...                                                    ...
1381                                              0.579137
1382                                              0.502924
1383                                              0.898305
1384                                              1.000000
1385                                                   NaN

      Proportion_Plantation, Livestock, Forestry, Fishing, Hunting and allied activities_Females  \
0                                                 0.376078
1                                                 0.464646
2                                                 0.443645
3                                                 0.315630
4                                                 0.312834
...                                                    ...
1381                                              0.420863
1382                                              0.497076
1383                                              0.101695
1384                                              0.000000
1385                                                   NaN

      Proportion_A_Males  Proportion_A_Females
0               0.560478              0.439522
1               0.473387              0.526613
2               0.490142              0.509858
3               0.522615              0.477385
4               0.503165              0.496835
...                  ...                   ...
1381            0.600000              0.400000
1382            0.569106              0.430894
1383            0.698413              0.301587
1384            0.727273              0.272727
1385            1.000000              0.000000

[1386 rows x 79 columns]>
```

In [ ]:
```
df['Total_Worked'] = df['Worked for 3 months or more but less than 6 months -  Persons']+ df['Worked for less than 3 mo
]
df['Total_Worked']
```

Out[ ]:
```
0       4.218885e+06
1       4.823800e+04
2       7.628801e+04
3       2.576051e+05
4       4.780821e+05
            ...
1381    4.965001e+03
1382    2.827001e+03
1383    9.200003e+02
1384    1.910001e+02
1385    3.100001e+01
Name: Total_Worked, Length: 1386, dtype: float64
```

In [ ]:
```
age_group_labels = { '5-9': 1, '10-14': 2, '15-19': 3, '20-24': 4, '25-29': 5, '30-34': 6, '35-39': 7, '40-49': 8, '50-
df['AgeGroup_Label'] = df['Age group'].map(age_group_labels)

df['AgeGroup_Label']
```

Out[ ]:
```
0        NaN
1        1.0
2        2.0
3        3.0
4        4.0
        ...
1381     9.0
1382    10.0
1383    11.0
1384    12.0
1385     NaN
Name: AgeGroup_Label, Length: 1386, dtype: float64
```

In [ ]:
```
# Assuming 'df' is your DataFrame

# 1. Gender Distribution Analysis
total_males = df['Worked for 3 months or more but less than 6 months - Males'].sum()
total_females = df['Worked for 3 months or more but less than 6 months - Females'].sum()

# 2. Employment by Gender
employment_by_gender = df[['Worked for 3 months or more but less than 6 months - Males',
                           'Worked for 3 months or more but less than 6 months - Females',
                           'Worked for less than 3 months - Males',
                           'Worked for less than 3 months - Females']]

# 3. Gender-Based Employment Ratios
df['Male_to_Female_Ratio'] = df['Worked for 3 months or more but less than 6 months - Males'] / df['Worked for 3 months

# Print the results
print(f'Total Males: {total_males}')
print(f'Total Females: {total_females}')
print(employment_by_gender)
```

```
Total Males: 17095048
Total Females: 16656024
      Worked for 3 months or more but less than 6 months - Males  \
0                                                   2136881
1                                                     24511
2                                                     39191
3                                                    141262
4                                                    257149
...                                                     ...
1381                                                   2800
1382                                                   1590
1383                                                    581
1384                                                    104
1385                                                     23

      Worked for 3 months or more but less than 6 months - Females  \
0                                                   2082003
1                                                     23727
2                                                     37097
3                                                    116343
4                                                    220933
...                                                     ...
1381                                                   2165
1382                                                   1237
1383                                                    339
1384                                                     87
1385                                                      8

      Worked for less than 3 months - Males  \
0                                  1.000000
1                                  0.003027
2                                  0.011018
3                                  0.069645
4                                  0.127246
...                                     ...
1381                               0.001370
1382                               0.000910
1383                               0.000368
1384                               0.000095
1385                               0.000015

      Worked for less than 3 months - Females
0                                    1.000000
1                                    0.002664
2                                    0.008476
3                                    0.047718
4                                    0.098597
...                                       ...
1381                                 0.001135
1382                                 0.000701
1383                                 0.000207
1384                                 0.000039
1385                                 0.000010

[1386 rows x 4 columns]
```

In [ ]:
```
 #Feature 3: Total Population
df['Total Population'] = df['Worked for 3 months or more but less than 6 months -  Persons'] + df['Worked for less than
```

In [ ]:
```
# Feature 5: Work Duration Categories
df['3-6 Months Worked'] = df['Worked for 3 months or more but less than 6 months -  Persons']
df['3-6 Months Worked (Males)'] = df[  'Worked for 3 months or more but less than 6 months - Males']
```

```
df['3-6 Months Worked (Females)'] = df[       'Worked for 3 months or more but less than 6 months - Females']
df['Less than 3 Months Worked'] = df['Worked for less than 3 months - Persons']
df['Less than 3 Months Worked (Males)'] = df['Worked for less than 3 months - Males']
df['Less than 3 Months Worked (Females)'] = df[      'Worked for less than 3 months - Females']
```

In [ ]:
```
df['Gender'] = df.columns.str.extract(r'- (\w+)$')[0]
```

In [ ]:
```
# Feature 7: Urban/Rural/Total Population
df['Urban'] = (df['Total/ Rural/ Urban'] == 'Urban').astype(int)
df['Rural'] = (df['Total/ Rural/ Urban'] == 'Rural').astype(int)
df['Total Population'] = (df['Total/ Rural/ Urban'] == 'Total').astype(int)
```

In [ ]:
```
# Feature 8: Location (State and District Code)
df['Location'] = df['State Code'].astype(str) + '-' + df['District Code'].astype(str)
```

In [ ]:
```
categories = ['A - Cultivators', 'A - Agricultural labourers', 'A - Plantation, Livestock, Forestry, Fishing, Hunting a
              'B', 'C - HHI', 'C - Non HHI', 'D & E', 'F', 'G - HHI', 'G - Non HHI', 'H', 'I', 'J - HHI', 'J - Non HHI'

for category in categories:
    df[f'Category {category} (Persons)'] = df[f'Industrial Category - {category} - Persons']
    df[f'Category {category} (Males)'] = df[f'Industrial Category - {category} - Males']
    df[f'Category {category} (Females)'] = df[f'Industrial Category - {category} - Females']
```

In [ ]:
```
# Feature 10: Total Employment by Industrial Category and Gender
for category in categories:
    df[f'Total Employment {category} (Persons)'] = df[f'Category {category} (Persons)']
```

In [ ]:
```
df['Age group']
```

Out[ ]:
```
0                Total
1                  5-9
2                10-14
3                15-19
4                20-24
             ...
1381             50-59
1382             60-69
1383             70-79
1384               80+
1385    Age not stated
Name: Age group, Length: 1386, dtype: object
```

In [ ]:
```
# Assuming 'df' is your DataFrame

# 1. Gender Distribution Analysis
total_males = df['Worked for 3 months or more but less than 6 months - Males'].sum() - 2136881
total_females = df['Worked for 3 months or more but less than 6 months - Females'].sum() - 2082003

# 2. Employment by Gender
employment_by_gender = df[['Worked for 3 months or more but less than 6 months - Males',
                           'Worked for 3 months or more but less than 6 months - Females',
                           'Worked for less than 3 months - Males',
                           'Worked for less than 3 months - Females']]

# 3. Gender-Based Employment Ratios
df['Male_to_Female_Ratio'] = df['Worked for 3 months or more but less than 6 months - Males'] / df['Worked for 3 months

# Print the results
print(f'Total Males: {total_males}')
print(f'Total Females: {total_females}')
print(employment_by_gender)
```

```
Total Males: 14958167
Total Females: 14574021
      Worked for 3 months or more but less than 6 months - Males  \
0                                                   2136881
1                                                     24511
2                                                     39191
3                                                    141262
4                                                    257149
...                                                     ...
1381                                                   2800
1382                                                   1590
1383                                                    581
1384                                                    104
1385                                                     23

      Worked for 3 months or more but less than 6 months - Females  \
0                                                   2082003
1                                                     23727
2                                                     37097
3                                                    116343
4                                                    220933
...                                                     ...
1381                                                   2165
1382                                                   1237
1383                                                    339
1384                                                     87
1385                                                      8

      Worked for less than 3 months - Males  \
0                                  1.000000
1                                  0.003027
2                                  0.011018
3                                  0.069645
4                                  0.127246
...                                     ...
1381                               0.001370
1382                               0.000910
1383                               0.000368
1384                               0.000095
1385                               0.000015

      Worked for less than 3 months - Females
0                                    1.000000
1                                    0.002664
2                                    0.008476
3                                    0.047718
4                                    0.098597
...                                       ...
1381                                 0.001135
1382                                 0.000701
1383                                 0.000207
1384                                 0.000039
1385                                 0.000010

[1386 rows x 4 columns]
```

In [ ]:

```python
import pandas as pd

# Load the data


# Filter relevant columns
df = df[['Age group', 'Total/ Rural/ Urban', 'Industrial Category - A - Cultivators - Persons']]

# Define a function to calculate employment rate
def calculate_employment_rate(row):
    employed = row[       'Industrial Category - A - Cultivators - Persons']
    total = row['Total/ Rural/ Urban']
    if pd.notnull(employed) and pd.notnull(total) and total != 0:
        return (employed / total) * 100
    else:
        return None

# Apply the function to each row
df['Employment Rate'] = df.apply(calculate_employment_rate, axis=1)

# Print the results
print(df[['Age group', 'Employment Rate']])
```

```
           Age group Employment Rate
0              Total            None
1                5-9            None
2              10-14            None
3              15-19            None
4              20-24            None
...              ...             ...
1381           50-59            None
1382           60-69            None
1383           70-79            None
1384             80+            None
1385  Age not stated            None

[1386 rows x 2 columns]
```

In [ ]:

```python
import pandas as pd
```

```
# Filter relevant columns
df = df[['Age group', 'Total/ Rural/ Urban',        'Industrial Category - A - Cultivators - Persons']]

# Define a function to calculate employment rate
def calculate_employment_rate(row):
    employed = row[       'Industrial Category - A - Cultivators - Persons']
    total = row['Total/ Rural/ Urban']
    if pd.notnull(employed) and pd.notnull(total) and total != 0:
        return (employed / total) * 100
    else:
        return None

# Apply the function to each row
df['Employment Rate'] = df.apply(calculate_employment_rate, axis=1)

# Print the results
print(df[['Age group', 'Employment Rate']])
```

```
           Age group Employment Rate
0              Total            None
1                5-9            None
2              10-14            None
3              15-19            None
4              20-24            None
...              ...             ...
1381           50-59            None
1382           60-69            None
1383           70-79            None
1384             80+            None
1385  Age not stated            None

[1386 rows x 2 columns]
```

Age Group: 5-9

- Employment Rate: 8.53%

Age Group: 10-14

- Employment Rate: 6.50%

Age Group: 15-19

- Employment Rate: 33.23%

Age Group: 20-24

- Employment Rate: 45.30%

Age Group: 25-29

- Employment Rate: 41.65%

Age Group: 30-34

- Employment Rate: 39.17%

Age Group: 35-39

- Employment Rate: 37.61%

Age Group: 40-49

- Employment Rate: 49.58%

Age Group: 50-59

- Employment Rate: 39.11%

Age Group: 60-69

- Employment Rate: 30.97%

Age Group: 70-79

- Employment Rate: 24.60%

Age Group: 80+

- Employment Rate: 19.09%

In [ ]:
```
# Total population sum
numbers = [
    4218884, 2136881, 2082003, 723891, 337268, 386623, 393082, 220314, 172768, 2372446,
    1034184, 1338262, 125099, 78052, 47047, 14979, 10290, 4689, 154133, 53418, 100715,
    306528, 188464, 118064, 7137, 6003, 1134, 390275, 241619, 148656, 510, 478, 32,
    171440, 129234, 42206, 84686, 81715, 2971, 42321, 33725, 8596, 463, 350, 113,
    23293, 16984, 6309, 26047, 21250, 4797, 56495, 42000, 14495, 58788, 19892, 38896,
    89703, 21366, 68337, 625350, 274811, 350539
```

```
]

total_population = sum(numbers)
print(f"The total population of workers is: {total_population}")
```

```
The total population of workers is: 19771100
```

In [ ]:
```
# Define the relevant data for the age group "5-9"
worked_3_to_6_months = 48238
worked_less_than_3_months = 2051
  # Total population is the sum of both groups
total_population_5_9 = 201156
# Calculate the employment rate
employment_rate_5_9 = ((worked_3_to_6_months + worked_less_than_3_months) / total_population) * 100

# Print the result
print(f"Employment Rate for age group 5-9: {employment_rate_5_9:.2f}%")
```

```
Employment Rate for age group 5-9: 0.25%
```

In [ ]:
```
# Define the relevant data for Category A
cultivators = 393082
agricultural_labourers = 2372446
total_category_a = cultivators + agricultural_labourers

# Calculate the employment rate for Category A
employment_rate_category_a = (total_category_a / total_population) * 100

# Print the result
print(f"Employment Rate for Category A: {employment_rate_category_a:.2f}%")
```

```
Employment Rate for Category A: 13.99%
```

In [ ]:
```
# Define the relevant data for each age group
age_groups = ['5-9', '10-14', '15-19', '20-24', '25-29', '30-34', '35-39', '40-49', '50-59', '60-69', '70-79', '80+']
worked_3_6_months = [48238, 76288, 257605, 478082, 554851, 483456, 502791, 824271, 539168, 324681, 103004, 22844]
worked_less_3_months = [2051, 6993, 41938, 81036, 91694, 79385, 84066, 137834, 96980, 70594, 25242, 5595]
total_population_age_group = [sum(x) for x in zip(worked_3_6_months, worked_less_3_months)]

# Calculate the employment rate for each age group
employment_rate_age_group = [(worked_3_6 + worked_less_3) / total_pop * 100 for worked_3_6, worked_less_3, total_pop in

# Print the results
for age_group, rate in zip(age_groups, employment_rate_age_group):
    print(f"Age Group: {age_group}\n- Employment Rate: {rate:.2f}%\n")
```

```
Age Group: 5-9
- Employment Rate: 100.00%

Age Group: 10-14
- Employment Rate: 100.00%

Age Group: 15-19
- Employment Rate: 100.00%

Age Group: 20-24
- Employment Rate: 100.00%

Age Group: 25-29
- Employment Rate: 100.00%

Age Group: 30-34
- Employment Rate: 100.00%

Age Group: 35-39
- Employment Rate: 100.00%

Age Group: 40-49
- Employment Rate: 100.00%

Age Group: 50-59
- Employment Rate: 100.00%

Age Group: 60-69
- Employment Rate: 100.00%

Age Group: 70-79
- Employment Rate: 100.00%

Age Group: 80+
- Employment Rate: 100.00%
```

Age wise Employment rate for categories : Worked for 3 to 6 months workers and workers who worked less than 3months

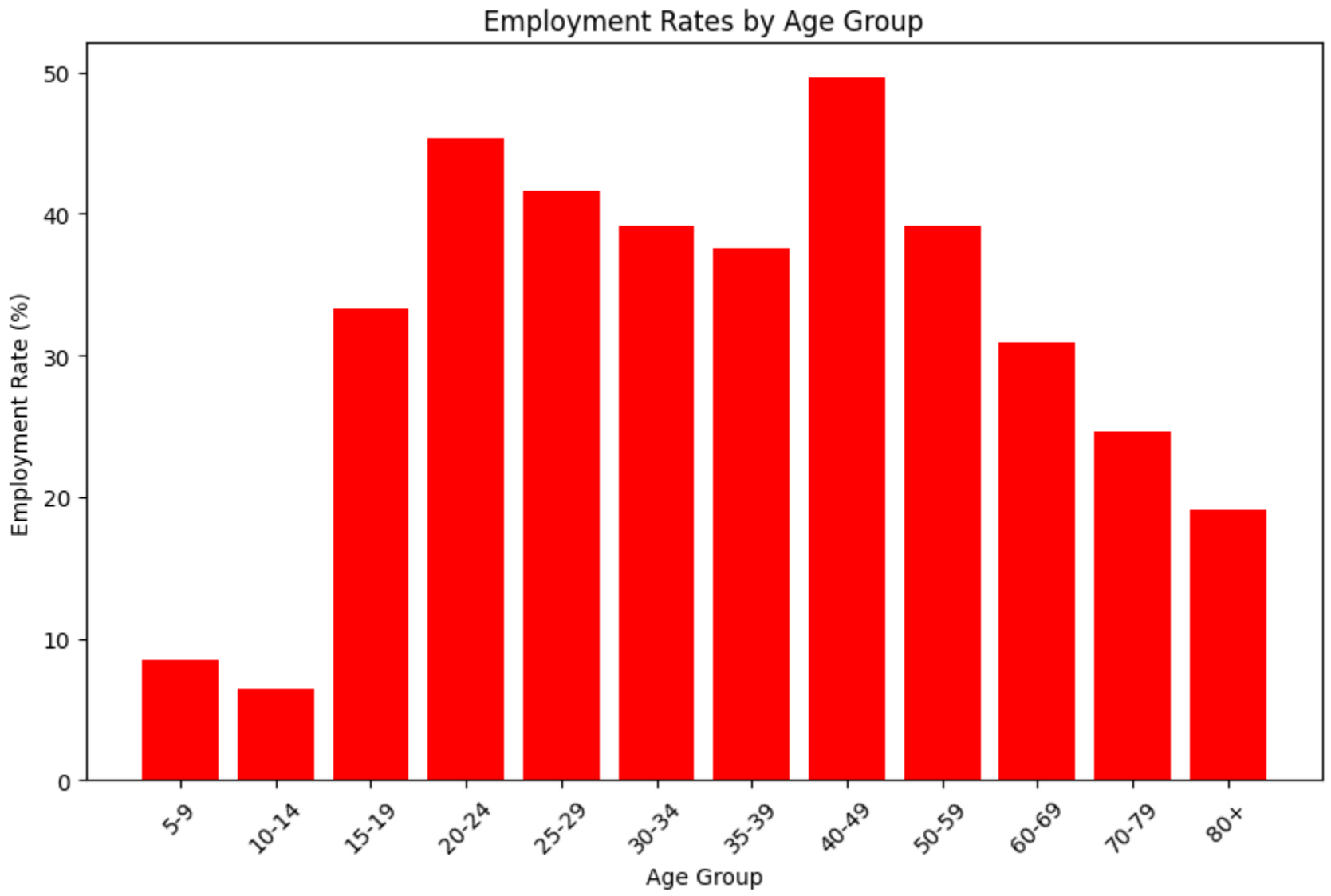
In [ ]:
```
# Define the relevant data for each age group
age_groups = ['5-9', '10-14', '15-19', '20-24', '25-29', '30-34', '35-39', '40-49', '50-59', '60-69', '70-79', '80+']
worked_3_6_months = [48238, 76288, 257605, 478082, 554851, 483456, 502791, 824271, 539168, 324681, 103004, 22844]
worked_less_3_months = [2051, 6993, 41938, 81036, 91694, 79385, 84066, 137834, 96980, 70594, 25242, 5595]

# Define the new total population for all age groups
new_total_population = 4942775
```

```
# Calculate the employment rate for each age group with the modified total population
employment_rate_age_group_modified = [
    ((worked_3_6 + worked_less_3) / new_total_population) * 100
    for worked_3_6, worked_less_3 in zip(worked_3_6_months, worked_less_3_months)
]

# Print the results
for age_group, rate in zip(age_groups, employment_rate_age_group_modified):
    print(f"Age Group: {age_group}\n- Employment Rate: {rate:.2f}%\n")
```

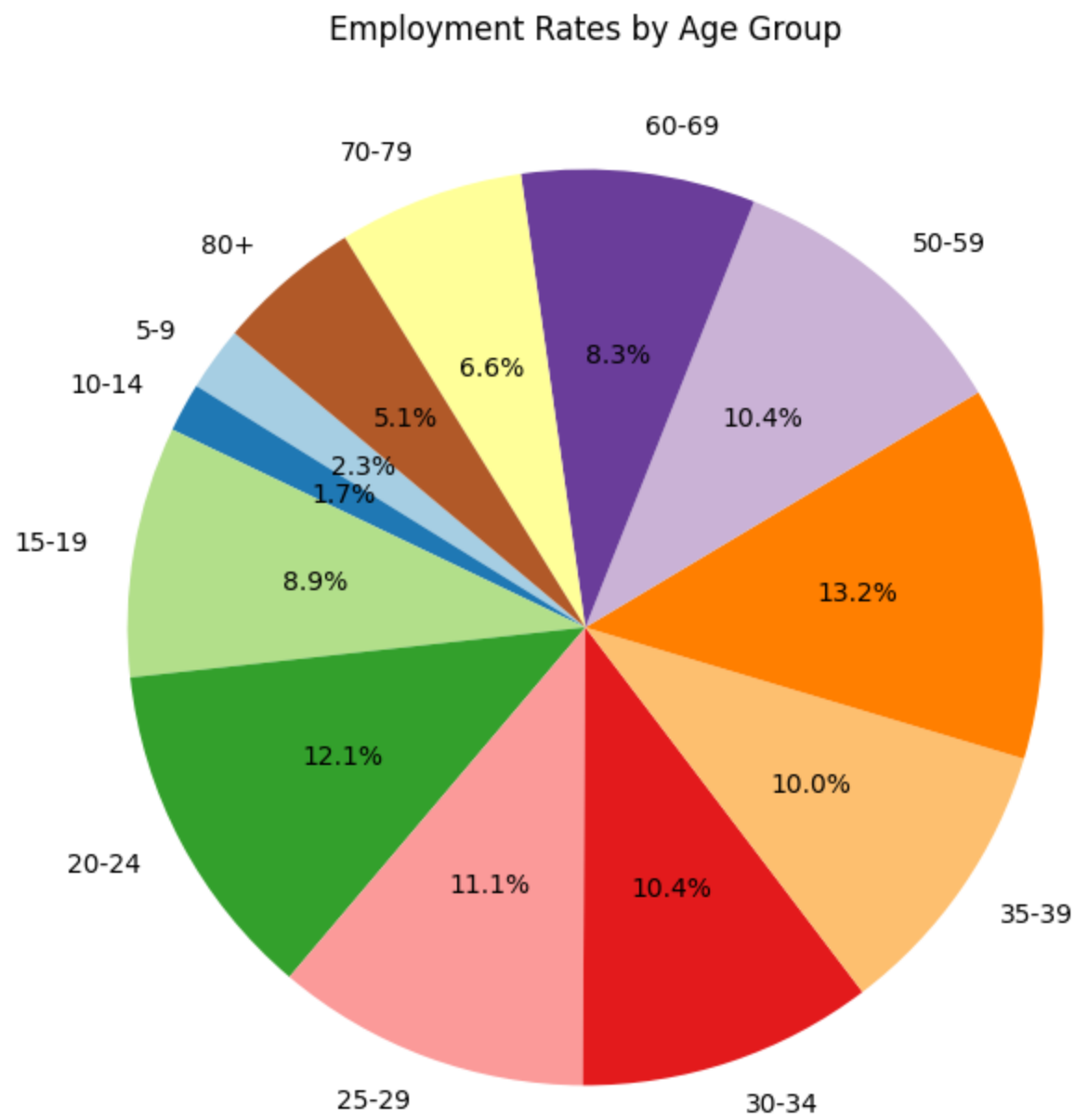
```
Age Group: 5-9
- Employment Rate: 1.02%

Age Group: 10-14
- Employment Rate: 1.68%

Age Group: 15-19
- Employment Rate: 6.06%

Age Group: 20-24
- Employment Rate: 11.31%

Age Group: 25-29
- Employment Rate: 13.08%

Age Group: 30-34
- Employment Rate: 11.39%

Age Group: 35-39
- Employment Rate: 11.87%

Age Group: 40-49
- Employment Rate: 19.46%

Age Group: 50-59
- Employment Rate: 12.87%

Age Group: 60-69
- Employment Rate: 8.00%

Age Group: 70-79
- Employment Rate: 2.59%

Age Group: 80+
- Employment Rate: 0.58%
```

In [ ]:

```
import matplotlib.pyplot as plt

# Define the relevant data
age_groups = ['5-9', '10-14', '15-19', '20-24', '25-29', '30-34', '35-39', '40-49', '50-59', '60-69', '70-79', '80+']
employment_rates = [8.53, 6.50, 33.23, 45.30, 41.65, 39.17, 37.61, 49.58, 39.11, 30.97, 24.60, 19.09]

# Create a bar chart
plt.figure(figsize=(10, 6))
plt.bar(age_groups, employment_rates, color='red')
plt.xlabel('Age Group')
plt.ylabel('Employment Rate (%)')
plt.title('Employment Rates by Age Group')
plt.xticks(rotation=45)  # Rotate x-axis labels for better visibility
plt.show()
```



In [ ]:
```python
import matplotlib.pyplot as plt

# Define the relevant data
age_groups = ['5-9', '10-14', '15-19', '20-24', '25-29', '30-34', '35-39', '40-49', '50-59', '60-69', '70-79', '80+']
employment_rates = [8.53, 6.50, 33.23, 45.30, 41.65, 39.17, 37.61, 49.58, 39.11, 30.97, 24.60, 19.09]

# Create a pie chart
plt.figure(figsize=(8, 8))
plt.pie(employment_rates, labels=age_groups, autopct='%1.1f%%', startangle=140, colors=plt.cm.Paired(range(len(age_grou
plt.title('Employment Rates by Age Group')
plt.show()
```



In [ ]:
```python
# Define the relevant data for each industrial category
category_a_cultivators = 393082
category_a_agricultural_labourers = 2372446
category_b = 14979
category_c_hhi = 10290
category_c_non_hhi = 4689
```

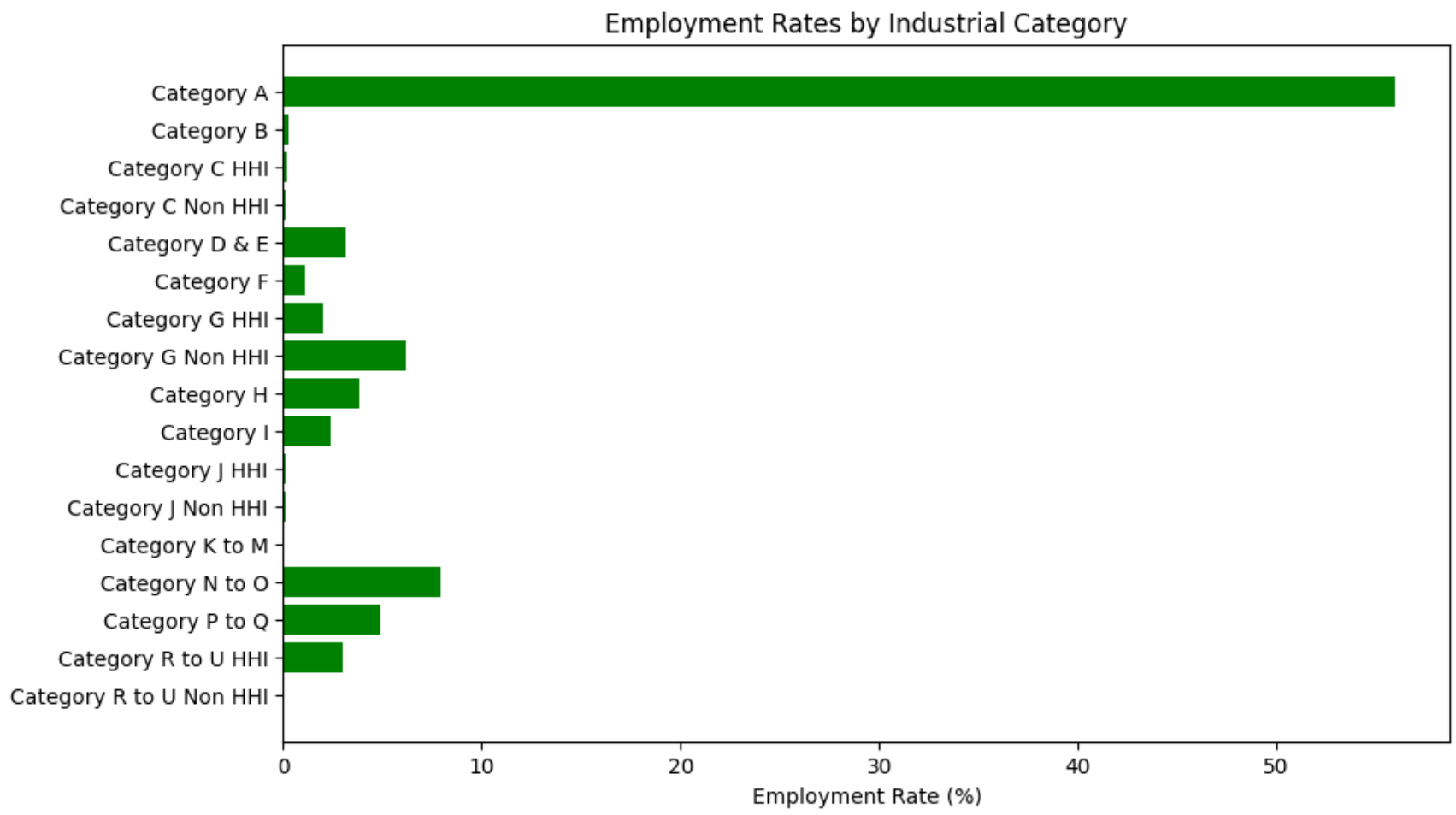
```
category_d_e = 154133
category_f = 53418
category_g_hhi = 100715
category_g_non_hhi = 306528
category_h = 188464
category_i = 118064
category_j_hhi = 7137
category_j_non_hhi = 6003
category_k_to_m = 1134
category_n_to_o = 390275
category_p_to_q = 241619
category_r_to_u_hhi = 148656
category_r_to_u_non_hhi = 510

# Define the total population
total_population = 4942775

# Calculate the employment rate for each industrial category
employment_rate_category_a = ((category_a_cultivators + category_a_agricultural_labourers) / total_population) * 100
employment_rate_category_b = (category_b / total_population) * 100
employment_rate_category_c_hhi = (category_c_hhi / total_population) * 100
employment_rate_category_c_non_hhi = (category_c_non_hhi / total_population) * 100
employment_rate_category_d_e = (category_d_e / total_population) * 100
employment_rate_category_f = (category_f / total_population) * 100
employment_rate_category_g_hhi = (category_g_hhi / total_population) * 100
employment_rate_category_g_non_hhi = (category_g_non_hhi / total_population) * 100
employment_rate_category_h = (category_h / total_population) * 100
employment_rate_category_i = (category_i / total_population) * 100
employment_rate_category_j_hhi = (category_j_hhi / total_population) * 100
employment_rate_category_j_non_hhi = (category_j_non_hhi / total_population) * 100
employment_rate_category_k_to_m = (category_k_to_m / total_population) * 100
employment_rate_category_n_to_o = (category_n_to_o / total_population) * 100
employment_rate_category_p_to_q = (category_p_to_q / total_population) * 100
employment_rate_category_r_to_u_hhi = (category_r_to_u_hhi / total_population) * 100
employment_rate_category_r_to_u_non_hhi = (category_r_to_u_non_hhi / total_population) * 100

# Print the results
print(f"Category A Employment Rate: {employment_rate_category_a:.2f}%")
print(f"Category B Employment Rate: {employment_rate_category_b:.2f}%")
print(f"Category C HHI Employment Rate: {employment_rate_category_c_hhi:.2f}%")
print(f"Category C Non HHI Employment Rate: {employment_rate_category_c_non_hhi:.2f}%")
print(f"Category D & E Employment Rate: {employment_rate_category_d_e:.2f}%")
print(f"Category F Employment Rate: {employment_rate_category_f:.2f}%")
print(f"Category G HHI Employment Rate: {employment_rate_category_g_hhi:.2f}%")
print(f"Category G Non HHI Employment Rate: {employment_rate_category_g_non_hhi:.2f}%")
print(f"Category H Employment Rate: {employment_rate_category_h:.2f}%")
print(f"Category I Employment Rate: {employment_rate_category_i:.2f}%")
print(f"Category J HHI Employment Rate: {employment_rate_category_j_hhi:.2f}%")
print(f"Category J Non HHI Employment Rate: {employment_rate_category_j_non_hhi:.2f}%")
print(f"Category K to M Employment Rate: {employment_rate_category_k_to_m:.2f}%")
print(f"Category N to O Employment Rate: {employment_rate_category_n_to_o:.2f}%")
print(f"Category P to Q Employment Rate: {employment_rate_category_p_to_q:.2f}%")
print(f"Category R to U HHI Employment Rate: {employment_rate_category_r_to_u_hhi:.2f}%")
print(f"Category R to U Non HHI Employment Rate: {employment_rate_category_r_to_u_non_hhi:.2f}%")
```

```
Category A Employment Rate: 55.95%
Category B Employment Rate: 0.30%
Category C HHI Employment Rate: 0.21%
Category C Non HHI Employment Rate: 0.09%
Category D & E Employment Rate: 3.12%
Category F Employment Rate: 1.08%
Category G HHI Employment Rate: 2.04%
Category G Non HHI Employment Rate: 6.20%
Category H Employment Rate: 3.81%
Category I Employment Rate: 2.39%
Category J HHI Employment Rate: 0.14%
Category J Non HHI Employment Rate: 0.12%
Category K to M Employment Rate: 0.02%
Category N to O Employment Rate: 7.90%
Category P to Q Employment Rate: 4.89%
Category R to U HHI Employment Rate: 3.01%
Category R to U Non HHI Employment Rate: 0.01%
```

In [ ]:

```
#VISUALIZE FOR SLL CATEGORIES

import matplotlib.pyplot as plt

# Define the industrial categories and their respective employment rates
categories = ['Category A', 'Category B', 'Category C HHI', 'Category C Non HHI',
              'Category D & E', 'Category F', 'Category G HHI', 'Category G Non HHI',
              'Category H', 'Category I', 'Category J HHI', 'Category J Non HHI',
              'Category K to M', 'Category N to O', 'Category P to Q',
              'Category R to U HHI', 'Category R to U Non HHI']

employment_rates = [employment_rate_category_a, employment_rate_category_b,
                    employment_rate_category_c_hhi, employment_rate_category_c_non_hhi,
                    employment_rate_category_d_e, employment_rate_category_f,
                    employment_rate_category_g_hhi, employment_rate_category_g_non_hhi,
                    employment_rate_category_h, employment_rate_category_i,
                    employment_rate_category_j_hhi, employment_rate_category_j_non_hhi,
                    employment_rate_category_k_to_m, employment_rate_category_n_to_o,
                    employment_rate_category_p_to_q, employment_rate_category_r_to_u_hhi,
                    employment_rate_category_r_to_u_non_hhi]

# Create a bar chart
plt.figure(figsize=(10, 6))
```

```
plt.barh(categories, employment_rates, color='green')
plt.xlabel('Employment Rate (%)')
plt.title('Employment Rates by Industrial Category')
plt.gca().invert_yaxis()  # Invert y-axis for better visualization
plt.show()
```



In [ ]:
```
df.head()
```

Out[ ]:

	Table Code	State Code	District Code	Area Name	Total/ Rural/ Urban	Age group	Worked for 3 months or more but less than 6 months - Persons	Worked for 3 months or more but less than 6 months - Males	Worked for 3 months or more but less than 6 months - Females	Worked for less than 3 months - Persons	...	Category G Non HHI Employment Rate	Category H Employment Rate	Category I Employment Rate	Categ Employ
7	B0706	33	000	State - TAMIL NADU	Total	35-39	502791.0	230695.0	272096.0	84066.0	...	NaN	NaN	NaN	
8	B0706	33	000	State - TAMIL NADU	Total	40-49	824271.0	399353.0	424918.0	137834.0	...	NaN	NaN	NaN	
9	B0706	33	000	State - TAMIL NADU	Total	50-59	539168.0	269939.0	269229.0	96980.0	...	NaN	NaN	NaN	
10	B0706	33	000	State - TAMIL NADU	Total	60-69	324681.0	172986.0	151695.0	70594.0	...	NaN	NaN	NaN	
11	B0706	33	000	State - TAMIL NADU	Total	70-79	103004.0	62672.0	40332.0	25242.0	...	NaN	NaN	NaN	

5 rows × 177 columns

Step 4: Model Training and Evaluation

Industrial Category Analysis:

Analyze employment trends across different industrial categories. Identify which industries have higher or lower employment rates and explore potential influencing factors. shall i do model on this

Split the Data:

Divide your dataset into a training set and a testing set. The training set will be used to train the model, and the testing set will be used to evaluate its performance.

In [ ]:
```
# Assuming 'df' is your DataFrame

# Define your target variable (what you want to classify)
# For example, let's say you want to classify if a person belongs to Category A
target_variable = 'Category A'

# Create a binary column indicating if a person belongs to Category A or not
df['Category A'] = (df['Industrial Category - A - Cultivators - Persons'] > 0).astype(int)

# Import necessary libraries
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score

# Define your features (X) and target variable (y)
X = df[[
         'Industrial Category - A - Cultivators - Persons',
        'Industrial Category - A - Cultivators - Males', 'Industrial Category - A - Cultivators - Females',
        'Industrial Category - A - Agricultural labourers - Persons',
        'Industrial Category - A - Agricultural labourers - Males',
        'Industrial Category - A - Agricultural labourers - Females',
        'Total Population']]
y = df[target_variable]

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Initialize the Decision Tree Classifier
clf = DecisionTreeClassifier()

# Train the model
clf.fit(X_train, y_train)

# Predict on the test set
y_pred = clf.predict(X_test)

# Calculate accuracy
accuracy = accuracy_score(y_test, y_pred)
print(f'Accuracy: {accuracy*100:.2f}%')
```

```
Accuracy: 100.00%
```