

Elder Abuse Cases in HK from 2005-2020

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Elder abuse has received increasing attention over the past decade as a common problem with serious consequences for the health and wellbeing of old people. But most of elder victims of abuse tend to be isolated and silent so that the chance we can help them and explore this issue is less. Although there is not that much cases and information we can refer to, we still want to detect the problem and the truth behind.

Definition of Elder Abuse:

Elder abuse is defined as: "

- a) intentional actions that cause harm or create a serious risk of harm (whether or not harm is intended), to a vulnerable elder by a caregiver or other person who stands in a trust relationship to the elder, or
- b) failure by a caregiver to satisfy the elder's basic needs or to protect the elder from harm."

Lachs, M. S., & Pillemer, K. (2004). Elder abuse. *The Lancet*, 364(9441), 1263-72. doi:[http://dx.doi.org/10.1016/S0140-6736\(04\)17144-4](http://dx.doi.org/10.1016/S0140-6736(04)17144-4)



Different kinds of elder abuse:

- a) physical abuse: acts carried out with the intention to cause physical pain or injury.
- b) psychological abuse: acts carried out with the aim of causing emotional pain or injury.
- c) sexual abuse: non-consensual sexual contact of any kind.
- d) financial exploitation: involving the misappropriation of an older person's money or property.
- e) neglect: the failure of a designated caregiver to meet the needs of a dependent older person.
- f) abandonment: failure to fulfil maintenance obligations and abandonment of the elderly.

[1]Lachs, M. S., & Pillemer, K. A. (2015). Elder abuse. *The New England Journal of Medicine*, 373(20), 1947-1956. doi:<http://dx.doi.org/10.1056/NEJMra1404688>

Questions & Data Source

We mentioned 5 questions based on these data and we want to discover the commonness of these cases and find out what leads people to treat elder people badly.

Year	Category	Item	No. of Cases
2005	Type of Elder Abuse	Physical abuse	390
2005	Type of Elder Abuse	Psychological abuse	26
2005	Type of Elder Abuse	Neglect	3
2005	Type of Elder Abuse	Financial abuse	87
2005	Type of Elder Abuse	Abandonment	1
2005	Type of Elder Abuse	Sexual abuse	1

area	name	Subsidised Service-Subvented and Self-financing Home Operated by NGO	Subsidised Service-Contract Home S
Hong Kong	Eastern	4	2
Hong Kong	Wan Chai	2	1
Hong Kong	Central and Western	2	3
Hong Kong	Islands	3	2
Hong Kong	Southern	10	0
West Kowloon	Sham Shui Po	7	6
West Kowloon	Kowloon City	4	1
West Kowloon	Yau Tsim Mong	1	4

What type of abuse are the elder most suffered in different years?

1

What type of abuse do male and female elderly suffer most in different years?

2

Who is most likely to abuse the elder?

3

Does the number of nursing homes affect the number of elder abuse cases which is based on different areas?

4

Is the elder abuse happening area related to that area's economy?

5

poorRate		
Year	name	poverty rate
2020	Central and Western	9.9
2020	Wan Chai	10.9
2020	Eastern	7.9
2020	Southern	6.1
2020	Yau Tsim Mong	10.7
2020	Sham Shui Po	6.7
2020	Kowloon City	8.8
2020	Wong Tai Sin	7.1
2020	Kwun Tong	5.5

The data is about the poor rate of different district of HK.

elderPopulation_districts2020

name	Population
Eastern	100400
Wan Chai	31600
Central and Western	42700
Islands	30200
Southern	46900
Sham Shui Po	74400
Kowloon City	73700

The data is about the number of elder people in different districts .

The data is main source we use, and it specifies the number of different types of elder abuse and the relationship between victims and abusers and so on.

The data is about the number of nursing house in different districts in HK.

visualization tools

Matplotlib

```
abuse_1_pivot.plot.barh(stacked=True,title = 'Which type of abuse are the elder most suffered in different years',
                        xlabel='Year',ylabel='Number of cases');
plt.legend(bbox_to_anchor=(1.0, 1.0))
plt.show()
```

Purpose of a plotting package is to assist the programmer visualizing data as easily as possible. Matplotlib is the whole package and matplotlib.pyplot is a module in Matplotlib.

In the coding we used plt.xlabel, plt.ylabel, plt.title and plt.legend set the axes labels and title and add a legend.

Pivot Table

```
#Select the data of type of abuse are the elder most suffered in different years
abuse_1 = abuse.loc[abuse['Item'].isin(['Physical abuse', 'Psychological abuse', 'Neglect',
                                         'Financial abuse', 'Abandonment', 'Sexual abuse',
                                         'Others', 'Multiple abuse'])]
abuse_1 = abuse_1[(abuse_1['Category'].isin(['Type of Elder Abuse']))]
abuse_1_pivot = abuse_1.pivot_table(values = 'No. of Cases', columns = 'Item', index = 'Year')
```

A pivot table is a table of statistics that summarize the data of a more extensive table (such as from a database, spreadsheet, or business intelligence program).

In the coding we used pivot table to select the required data for plotting chart.

Geopandas

```
plt.figure(figsize=(15,15))
plt.title('nursing houses availability and abuse cases numbers in different districts in 2020', fontsize = 20)
df.plot(ax = plt.subplot(1,1,1),
        alpha=1,
        edgecolor='k',
        linewidth = 0.5,
        legend=True,
        legend_kwds = dict(loc = 'lower right'),
        scheme = 'FisherJenks',
        column=df['results']*100000,
        cmap = 'Reds')
plt.scatter(geo1.lon,geo1.lat, sizes = (geo1['cases']/geo1['Population'])*3000000, color = 'gold',edgecolors='k', alpha=0.5)
lst = geo1[['name','lon','lat']].to_dict(orient = 'records')
for i in lst:
    plt.text(i['lon'], i['lat'], i['name'])
```

We use Geopandas for geospatial data processing, Pandas for data merging, and Matplotlib is used for drawing maps.

01. Question: What type of abuse are the elder most suffered in different years?

Method: Quantity and trend comparison.

Approach:

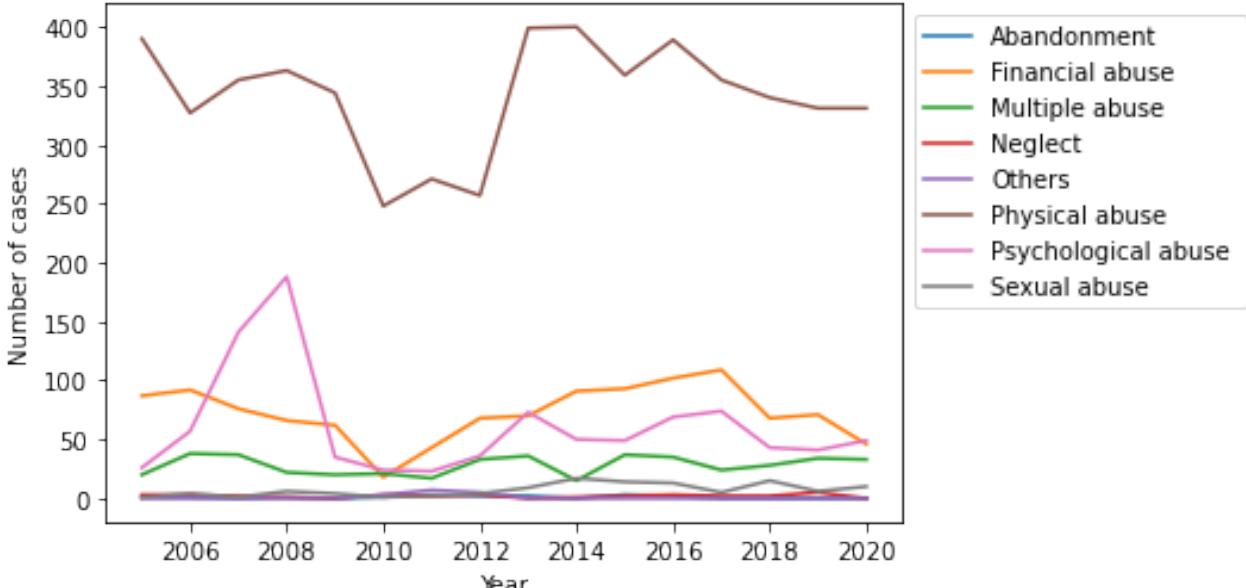
We draw two charts to describe the number of each type of elder abuse in different years and show the trend of the change.

Finding:

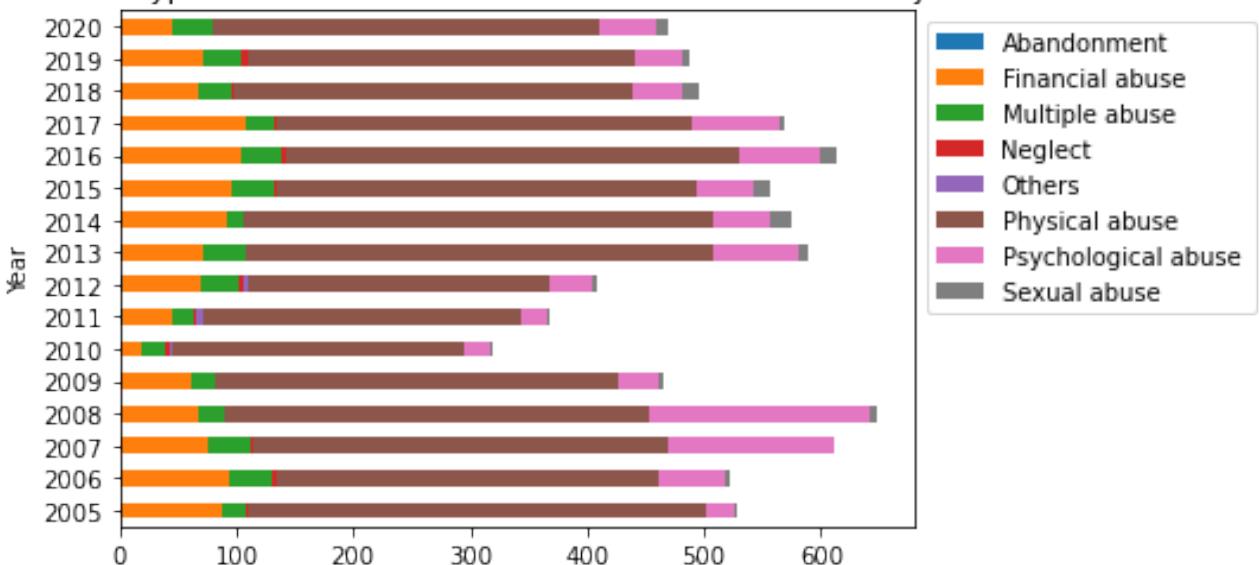
(1) Physical abuse is the most kind of abuse that the elder suffered and the following is the psychological abuse and financial abuse in 16 years.

(2) In addition, we can immediately see that here is a dramatic increase of the number of psychological abuse cases in the year 2008. And then it fluctuates between 50 and 100, so was the number of financial abuse, although it was always higher after the year 2013.

Which type of abuse are the elder most suffered in different years



Which type of abuse are the elder most suffered in different years



02. Question: What type of abuse do male and female elderly suffer most in different years?

Method: Quantity and trend comparison.

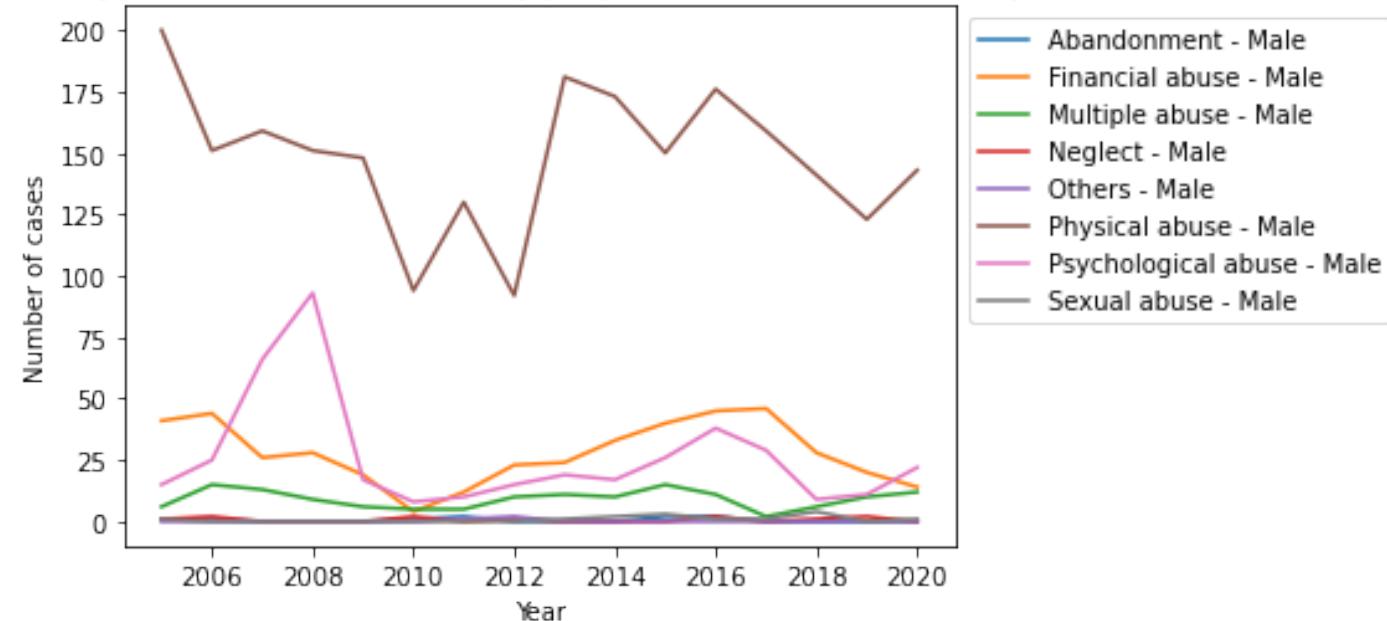
Approach:

We draw two line charts based on the number of different kinds of cases and genders.

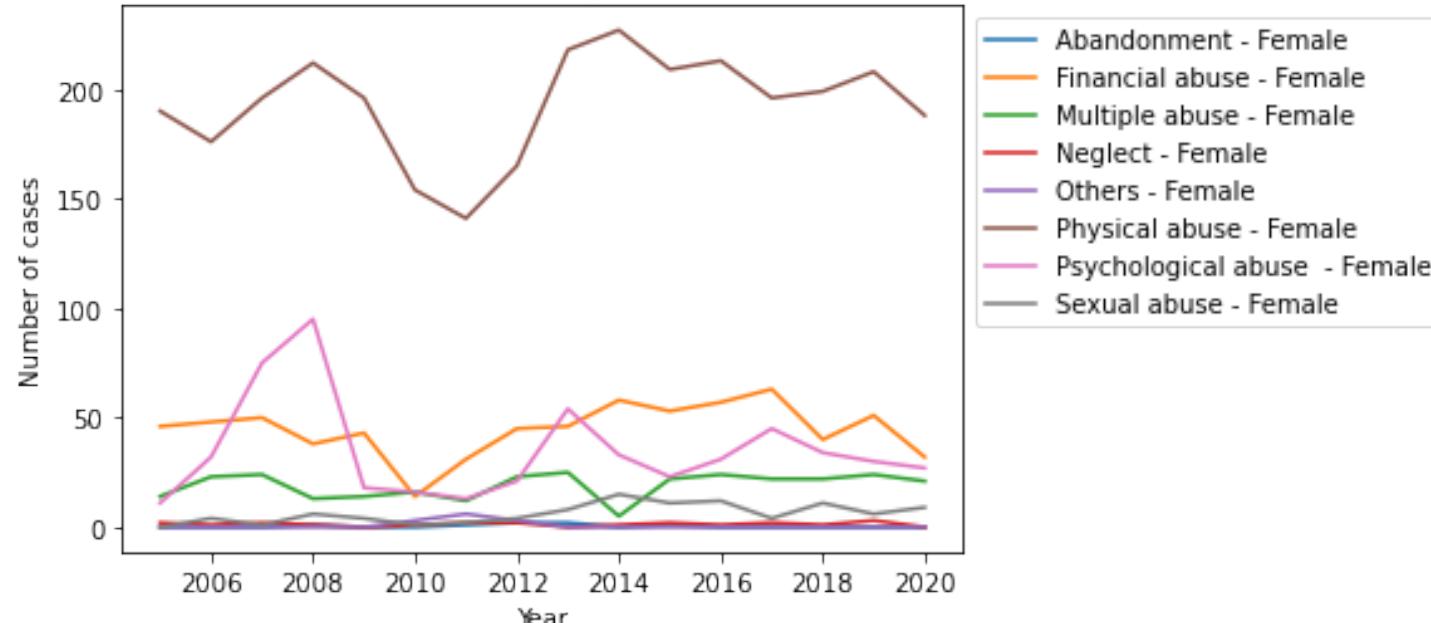
Finding:

- (1) Both the male and the female elderly are most likely to be physically abused.
- (2) Many male old people suffered psychological abuse in the year 2008.
- (3) Financial abuse and multiple abuse are also common scenario among female elder abuse cases.
- (4) Female elderly is more likely to suffer sexual abuse than male.

Which type of abuse do male elderly people suffer most in different years



Which kind of abuse do female elderly suffer most in different years



02. Question: What type of abuse do male and female elderly suffer most in different years?

~~Method~~: Quantity comparison.

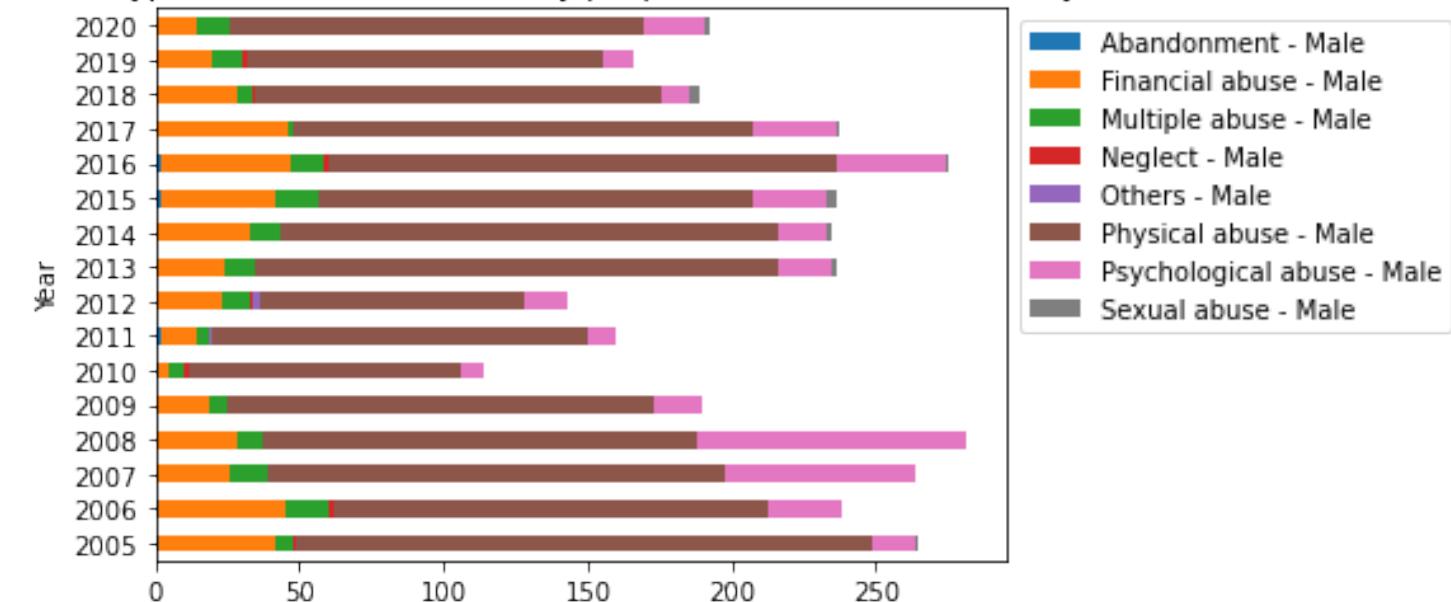
Approach:

We draw two graphs to specify the number of different kinds of cases between two genders using colours.

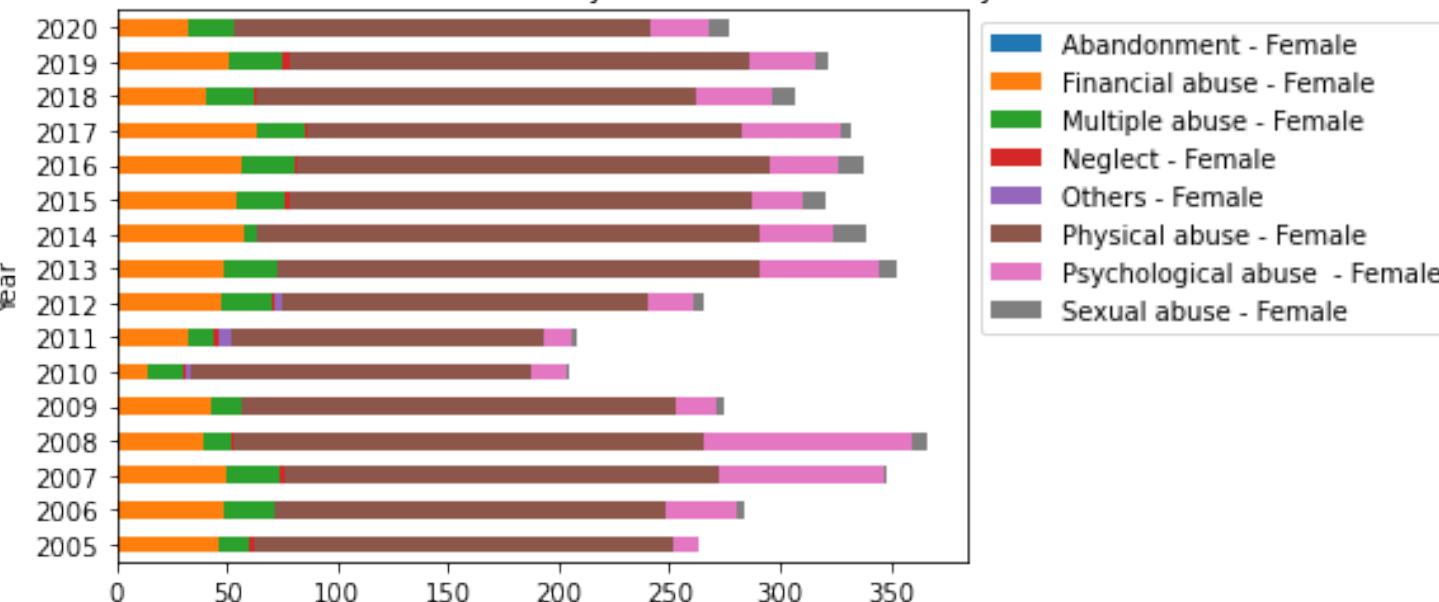
Finding:

- (1) The number of cases that female elder people suffered physical abuse is the largest among all kinds of cases.
- (2) More female elder people suffer physical abuse and sexual abuse than male.
- (3) Basically, the female elderly are more likely to be abused than male in all types of elder abuse.

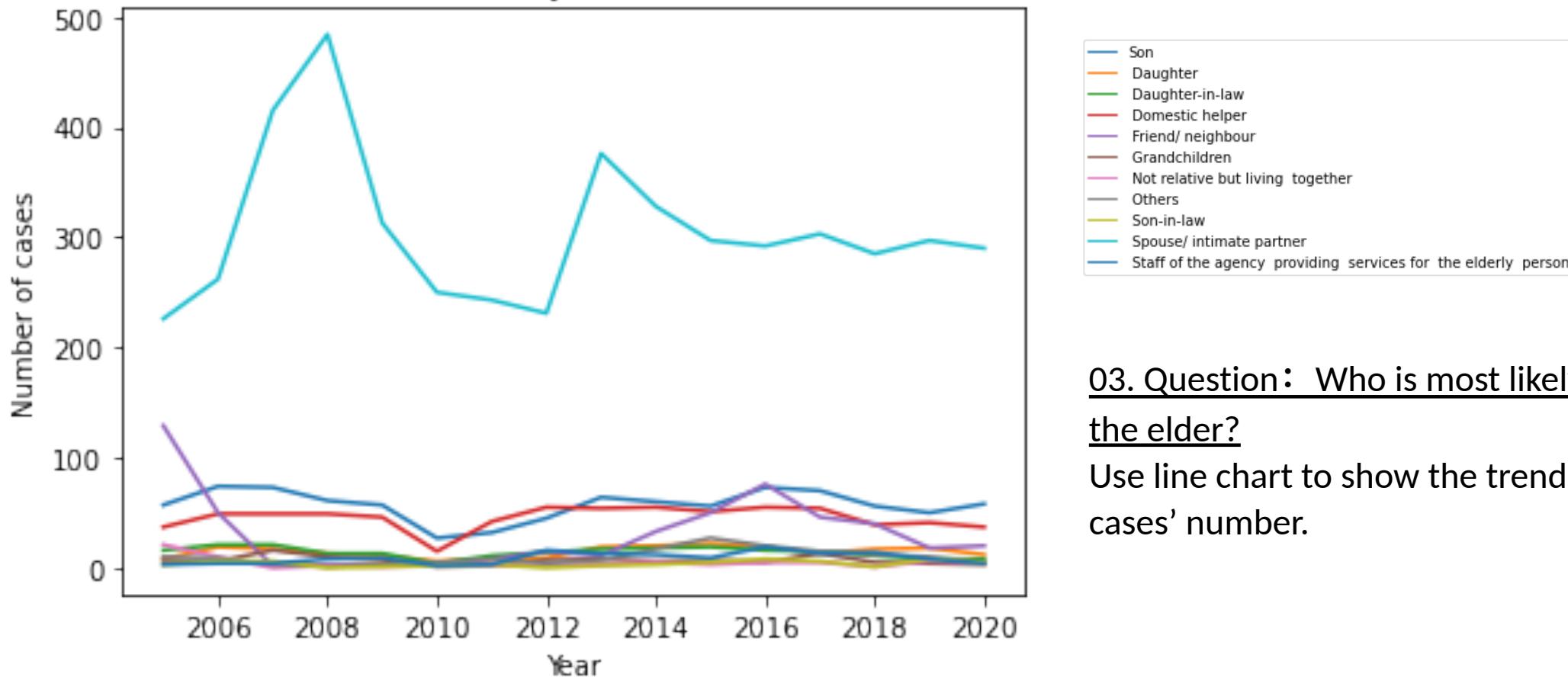
Which type of abuse do male elderly people suffer most in different years



Which kind of abuse do female elderly suffer most in different years



Who is most likely to abuse the elder



03. Question: Who is most likely to abuse the elder?

Use line chart to show the trends of different cases' number.

- (1) It is easy to find that spouses/intimate partners are most likely to abuse the old. To be specific, the most cases had been found that around 500 elder people were abused by their spouse in the year 2008.
- (2) Elder people's son is also likely to treat their parents badly and the following is the domestic helper.
- (3) Elder people are less likely to be neglected.

03. Question: Who is most likely to abuse the elder ?

Method: Quantity comparison.

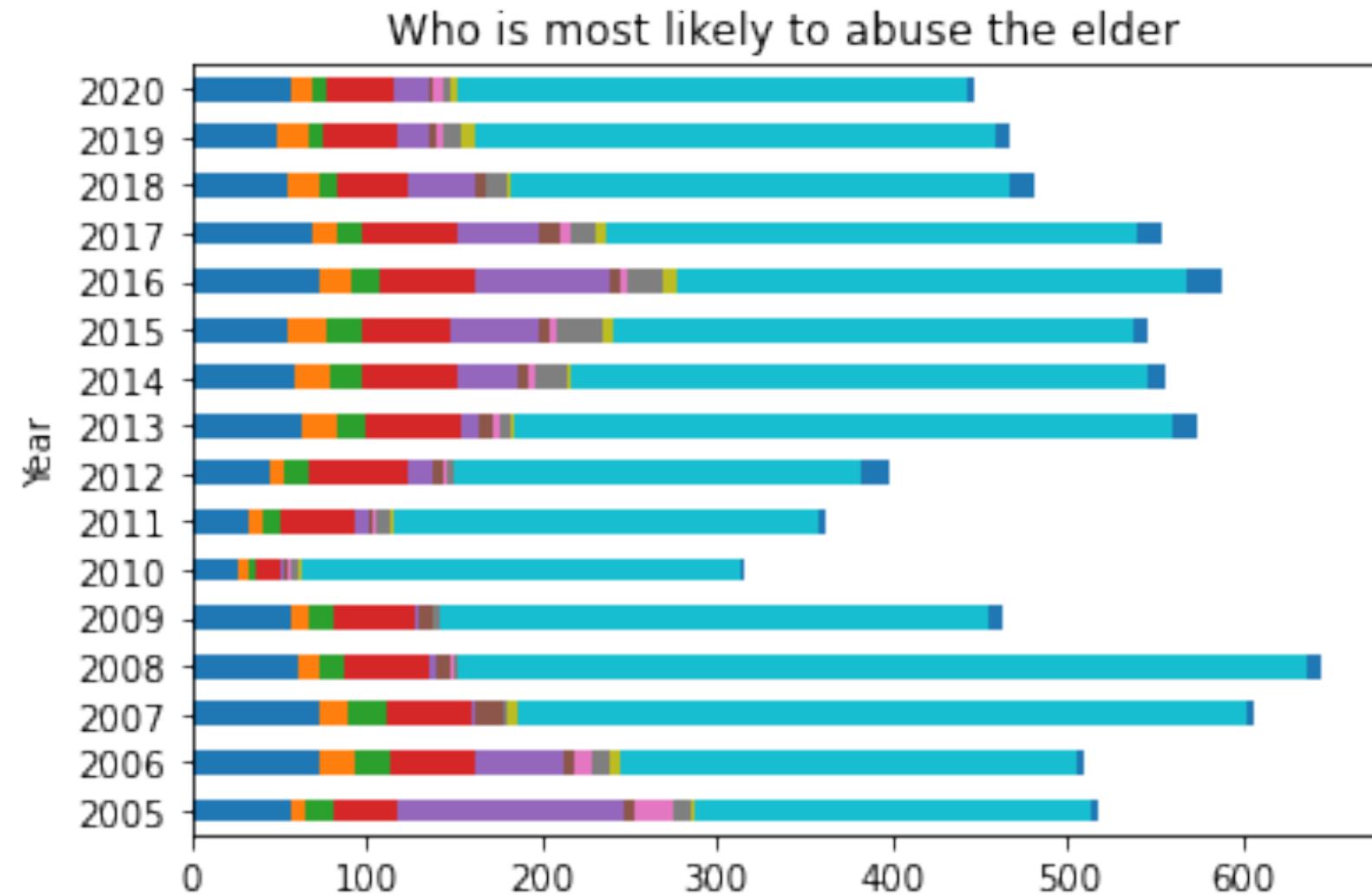
Approach:

We draw a graph to show the total number of elder abuse cases for each year based on different relationships between victims and abusers.

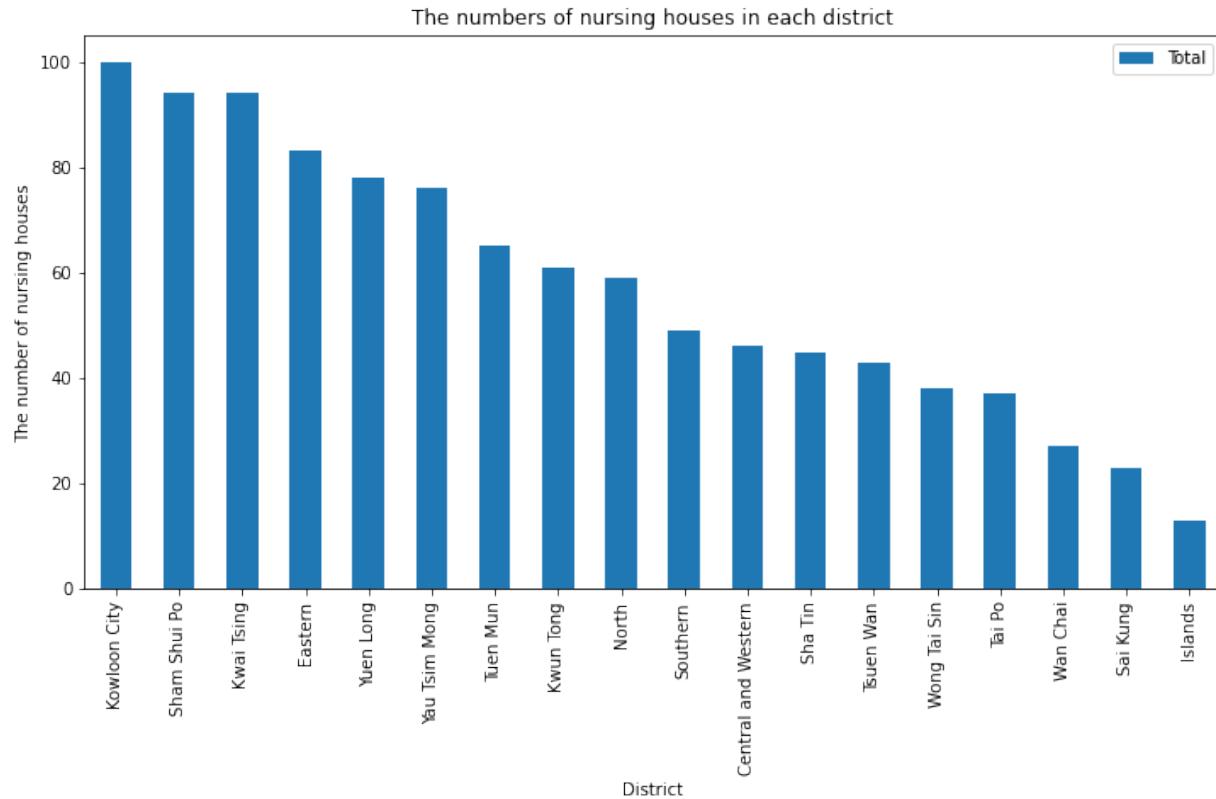
Finding:

- (1) The cases that the elderly suffered abuse from their spouse has the largest figure in the year 2010 and 2020.
- (2) Elder people are seldom abused by their son-in-law.

Son	Not relative but living together
Daughter	Others
Daughter-in-law	Son-in-law
Domestic helper	Spouse/ intimate partner
Friend/ neighbour	Staff of the agency providing services for the elderly person
Grandchildren	



Does the nursing homes numbers affect the number of elder abuse cases in different districts?



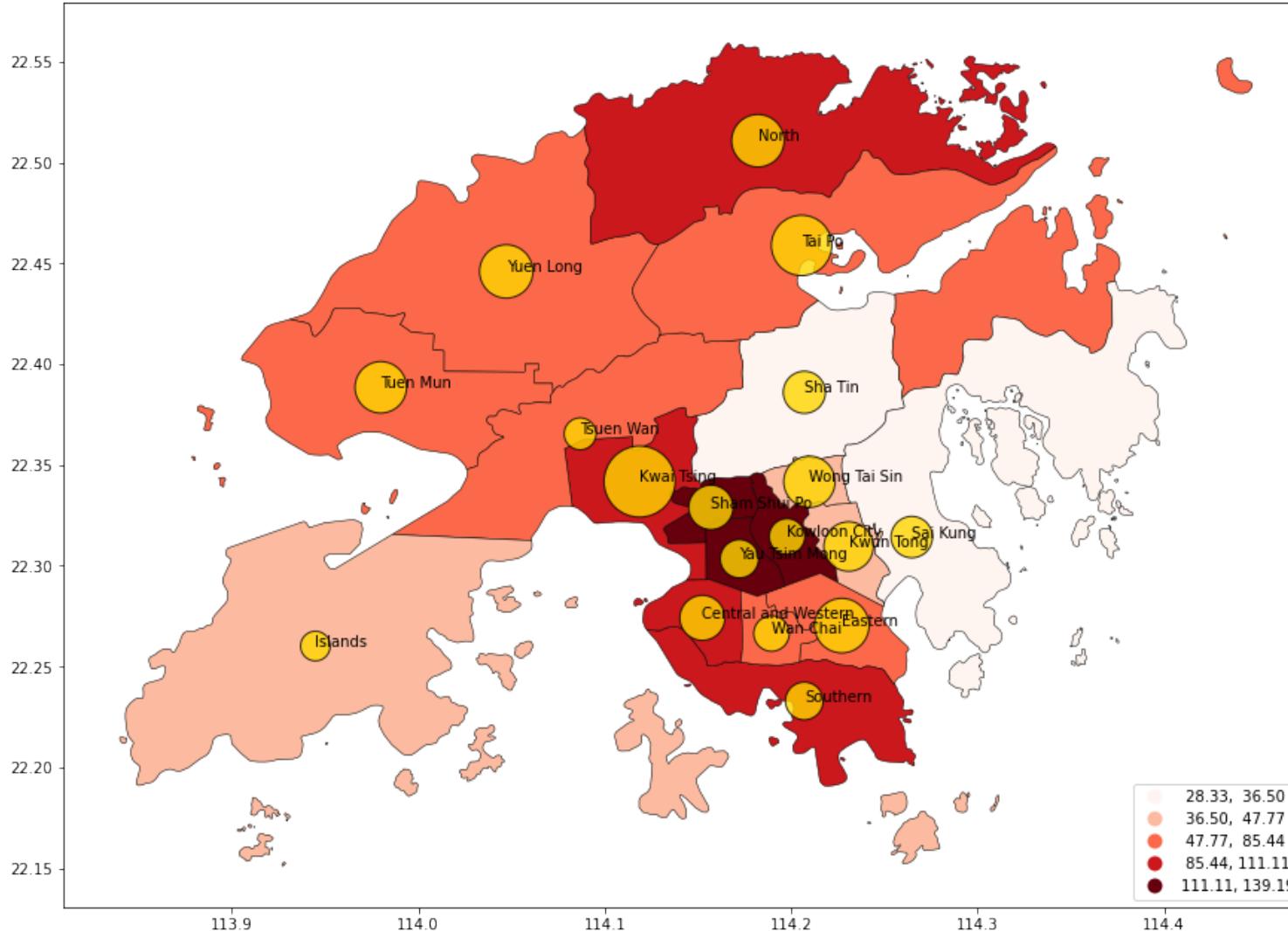
Methods: Compare the number of nursing house with the cases numbers in Hong Kong's different districts in 2020

Approach: First, we collected and imported the dataset of Hong Kong map, nursing house and abuse cases. Then, we use geopandas to merge the nursing house with the Hong Kong map. At last, we plot a bar chart and a geograph with this dataset. This bar chart gives us a distinct concept of the nursing houses numbers in different districts.

04

Does the nursing homes numbers affect the number of elder abuse cases in different districts?

nursing houses availability and abuse cases numbers in different districts in 2020

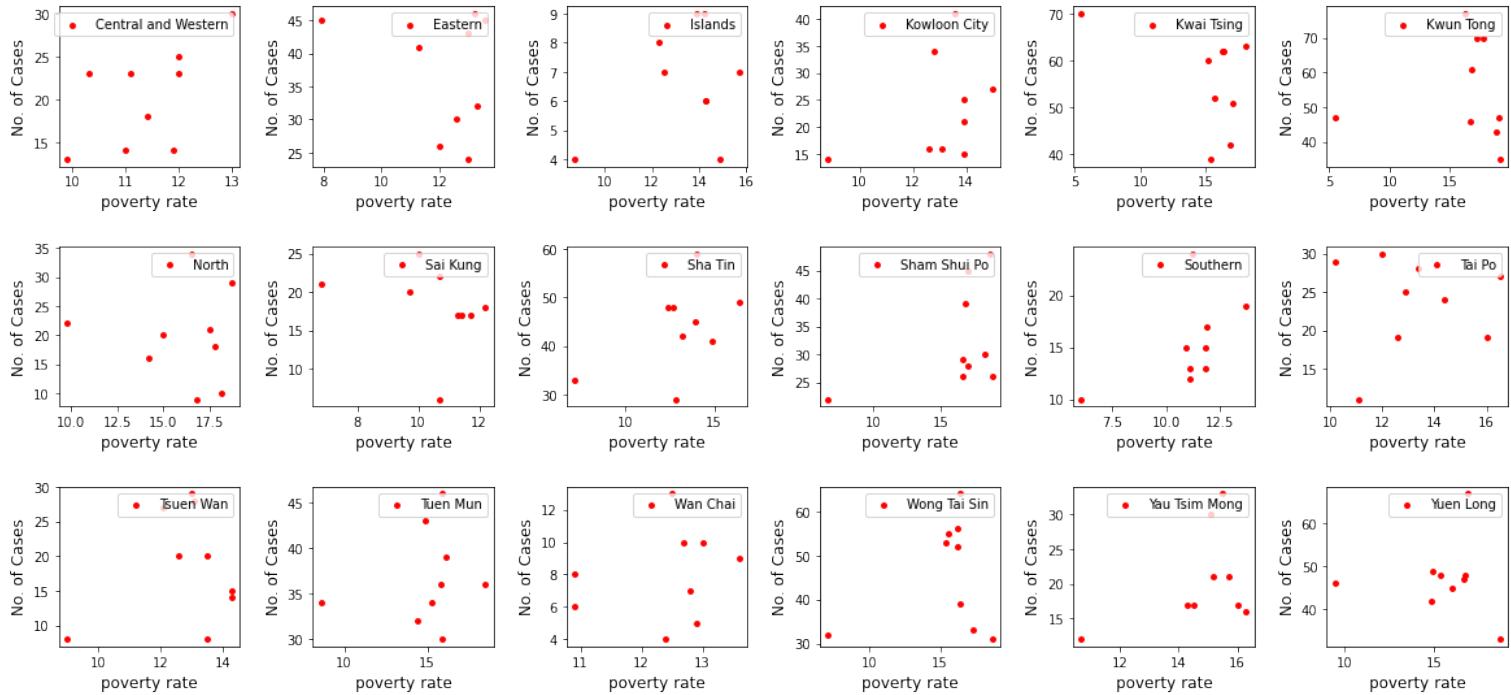


We use the shade of red to represent the nursing house availability from different districts by using the nursing room numbers divided by the total elderly population. Besides, we put the yellow circle with different sizes to represent the abuse rate by using the abuse cases numbers divided by the elder population different districts.

If there are more nursing houses available, the elderly abuse cases will be relatively low.

05

Is the elder abuse happening area related to that area's economy?



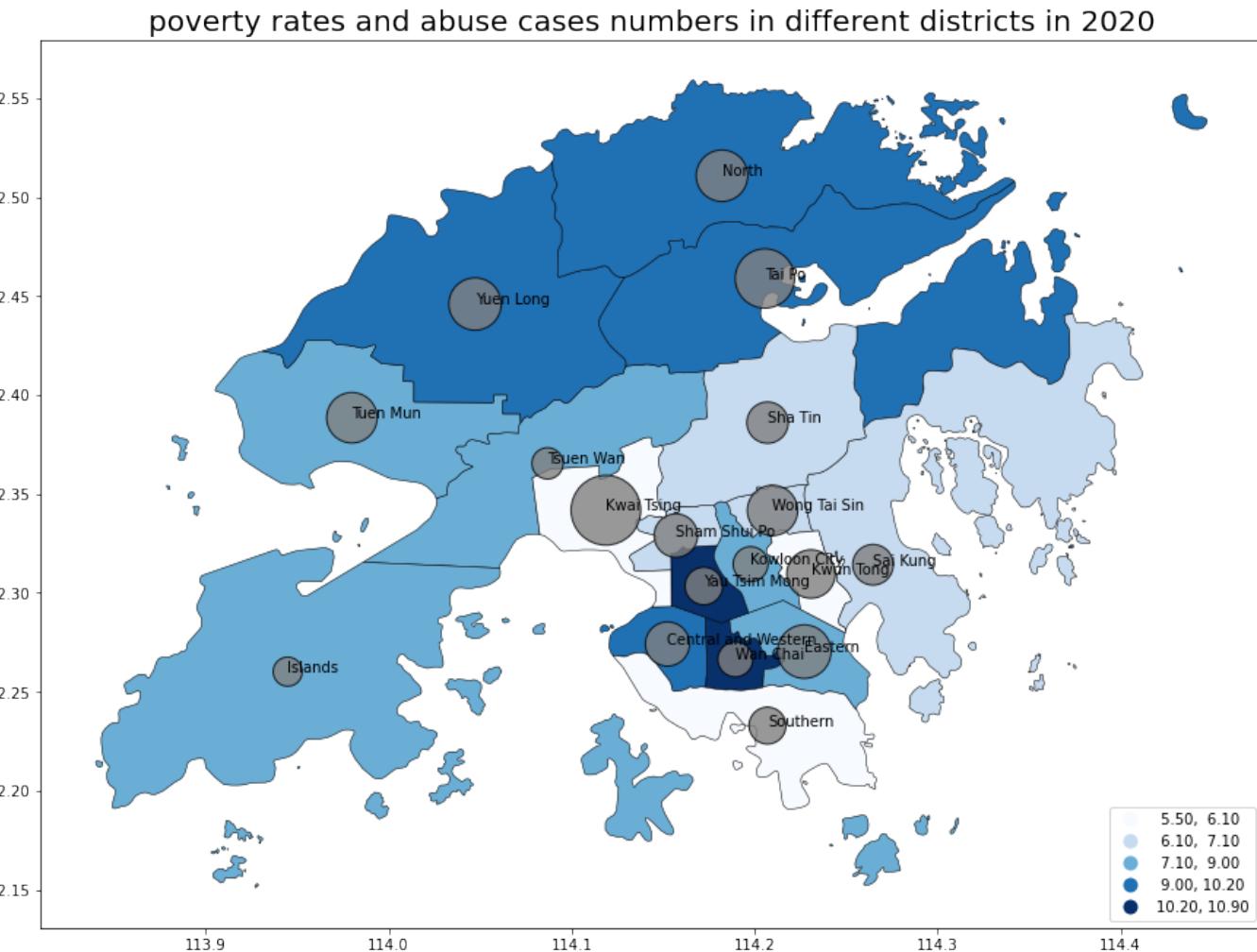
In this first scatter plot, each points represent one year, x axis represents poverty rate, and y axis represents cases numbers. If there is correlation between poverty rate and cases numbers, the red points should be shown like a positive slope.

Findings

In the scatter plot, there is no clear positive slope, so the correlation is not very strong. But it is notable that when poverty rate is above 10%, then the cases of most districts are both relatively low.

05

Is the elder abuse happening area related to that area's economy?



In the second geography, we choose the data from 2020 to plot a geography. We use the shade of blue to represent the poverty rate of each district. The darker the blue is, the poorer the district is. We also put grey points according to the abuse rate by using the abuse cases numbers divided by the elder population in different districts.

There is also no clear correlation between the poverty rate and the abuse rate. In Kwai Tong, the poverty rate is lowest while its elderly abuse cases ranked the first. As for Wan Chai, this plot shows that it is one of the poorest district. However, its abusing cases are one of the lowest among Hong Kong.

Limitation

Numbers of Nursing House

Nursing house numbers is not that accurate, since we do not know the capacity of each nursing house.

Not all the cases are reported

According to the statistics from Hong Kong government, only about 80% abusing are reported to the police in 2021.

Small Samples

The cases sample is not large compared to the whole elderly population.

More Social Support for the Elders!

We found that most nursing houses are Non-Subsidised Service-Private Home. Some elderly people may not afford private homes. Government should build more subsidised Service-Contract Home. The whole society should give more attention to the elders.

What We Can Do?

Some Suggestions from gov

- promote public's awareness of caring the elders
- strength the supervision the care works who abuse the elders
- care and listen to the elders and encourage them to seek helps and consultations from professionals