

```
In [1]: ▶ import pandas as pd
import matplotlib.pyplot as plt

%matplotlib inline
```

```
In [2]: ▶ import plotly
plotly.__version__
```

Out[2]: '3.10.0'

```
In [3]: ▶ from __future__ import division
from plotly.offline import init_notebook_mode, iplot
init_notebook_mode()
import plotly.plotly as py
import plotly.graph_objs as go
import plotly.io as pio
```

```
In [4]: ▶ migration = pd.read_excel("migration.xls")
migration.head()
```

Out[4]:

| | cities | years | migration | net_migration | migration_rate | emigration |
|---|---------|-------|-----------|---------------|----------------|------------|
| 0 | Adana-1 | 2008 | 45493 | -12823 | -6.31 | 58316 |
| 1 | NaN | 2009 | 53685 | -424 | -0.21 | 54109 |
| 2 | NaN | 2010 | 53096 | -4306 | -2.06 | 57402 |
| 3 | NaN | 2011 | 50523 | -11879 | -5.62 | 62402 |
| 4 | NaN | 2012 | 45927 | -13367 | -6.27 | 59294 |

```
In [5]: ▶ # Filling Nan values with forward fill
migration["cities"].fillna(method="ffill", inplace=True)
migration.head()
```

Out[5]:

| | cities | years | migration | net_migration | migration_rate | emigration |
|---|---------|-------|-----------|---------------|----------------|------------|
| 0 | Adana-1 | 2008 | 45493 | -12823 | -6.31 | 58316 |
| 1 | Adana-1 | 2009 | 53685 | -424 | -0.21 | 54109 |
| 2 | Adana-1 | 2010 | 53096 | -4306 | -2.06 | 57402 |
| 3 | Adana-1 | 2011 | 50523 | -11879 | -5.62 | 62402 |
| 4 | Adana-1 | 2012 | 45927 | -13367 | -6.27 | 59294 |

```
In [6]: ▶ # Deleting last 2 characters of cities column.
migration["cities"] = migration["cities"].str[:-2]
```

```
In [7]: ▶ migration.tail()
```

Out[7]:

| | cities | years | migration | net_migration | migration_rate | emigration |
|-----|------------|-------|-----------|---------------|----------------|------------|
| 886 | Zonguldak- | 2014 | 18115 | -6668 | -11.07 | 24783 |
| 887 | Zonguldak- | 2015 | 18244 | -7096 | -11.84 | 25340 |
| 888 | Zonguldak- | 2016 | 19991 | -1942 | -3.24 | 21933 |
| 889 | Zonguldak- | 2017 | 19421 | -3120 | -5.21 | 22541 |
| 890 | Zonguldak- | 2018 | 24363 | 258 | 0.43 | 24105 |

```
In [8]: ▶ # We still have "-" in some rows.
migration["cities"] = migration["cities"].str.replace("-", "")
```

```
In [9]: ▶ migration.head()
```

Out[9]:

| | cities | years | migration | net_migration | migration_rate | emigration |
|---|--------|-------|-----------|---------------|----------------|------------|
| 0 | Adana | 2008 | 45493 | -12823 | -6.31 | 58316 |
| 1 | Adana | 2009 | 53685 | -424 | -0.21 | 54109 |
| 2 | Adana | 2010 | 53096 | -4306 | -2.06 | 57402 |
| 3 | Adana | 2011 | 50523 | -11879 | -5.62 | 62402 |
| 4 | Adana | 2012 | 45927 | -13367 | -6.27 | 59294 |

```
In [10]: migration.shape
```

```
Out[10]: (891, 6)
```

```

In [11]: # I want to plot grouped bar charts for all cities and save all the charts as an image for a youtube video
# Creating a year list for plot, for x axe
x = migration.years.unique()

# 2008 - 2018 11 years of data for each city. 891\11=81 cities I need to iterate 81 times.
# Set variable for slicing
a = 0
for i in range(81):

    # defining y axes
    y1 = migration.loc[a:a+10, "migration"].values
    y2 = migration.loc[a:a+10, "emigration"].values
    y3 = migration.loc[a:a+10, "net_migration"].values

    trace1 = go.Bar(
        x=x,
        y=y1,
        text=y1,
        textposition = 'auto',
        marker=dict(
            color='rgb(129, 207, 224)',
            line=dict(
                color='rgb(8,48,107)',
                width=1.5),
        ),
        opacity=0.6, name="verilen göç / migration"
    )

    trace2 = go.Bar(
        x=x,
        y=y2,
        text=y2,
        textposition = 'auto',
        marker=dict(
            color='rgb(77, 5, 232)',
            line=dict(
                color='rgb(8,48,107)',
                width=1.5),
        ),
        opacity=0.6, name="alınan göç / emigration"
    )

    trace3 = go.Bar(
        x=x,
        y=y3,
        text=y3,
        textposition = 'auto',
        marker=dict(
            color='rgb(25, 181, 254)',
            line=dict(
                color='rgb(8,48,107)',
                width=1.5),
        ),
        opacity=0.9, name="net göç / net migration"
    )

    data = [trace1,trace2, trace3]

    layout = go.Layout(
        title=go.layout.Title(
            text=migration.loc[a,"cities"],
            xref='paper',
            x=0,
            font=dict(
                family='Courier New, monospace',
                size=30,
                color='#7f7f7f')
        ),
        xaxis=go.layout.XAxis(
            title=go.layout.xaxis.Title(
                text='yıl / years',
                font=dict(
                    family='Courier New, monospace',
                    size=18,
                    color="rgb(0,0,0)"
                )
            )
        ),
        yaxis=go.layout.YAxis(
            title=go.layout.yaxis.Title(
                text='kişi sayısı / number of people',
                font=dict(
                    family='Courier New, monospace',
                    size=14,
                    color='#7f7f7f'
                )
            )
        )
    )

```

```

)

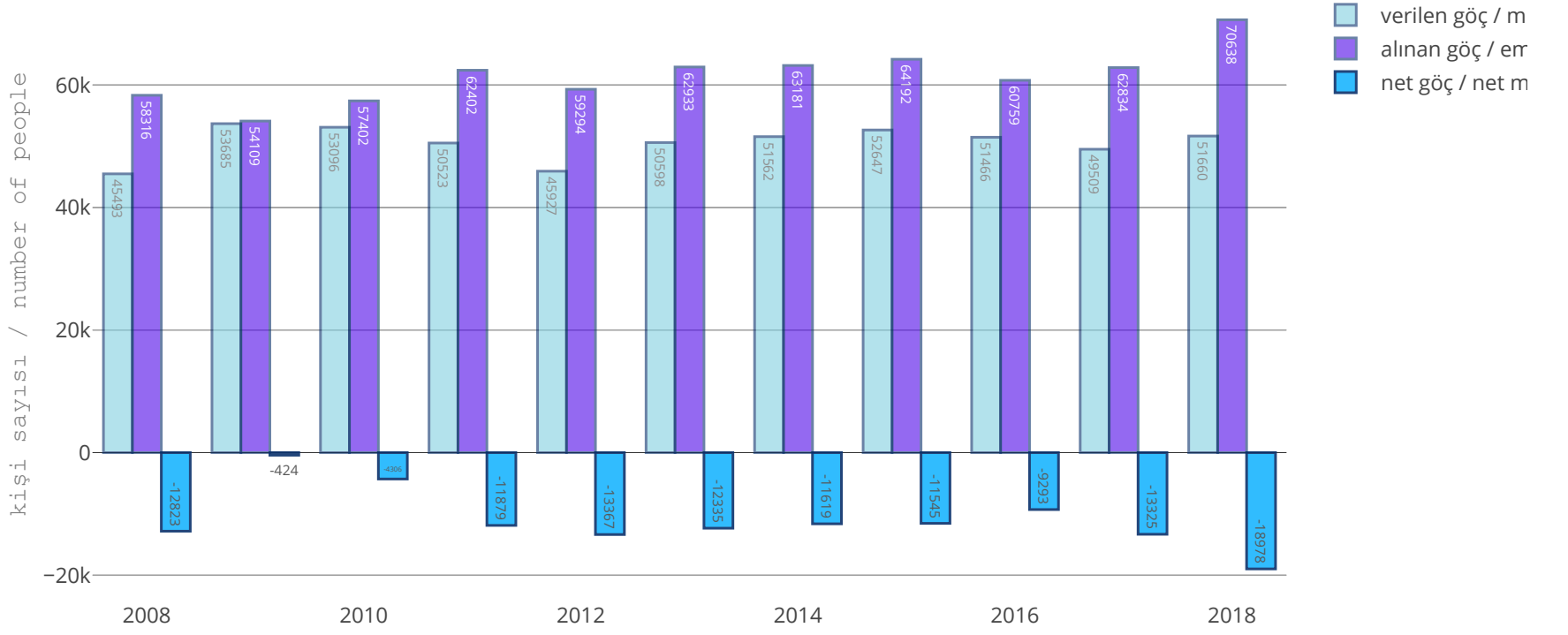
fig = go.Figure(data=data, layout=layout)
iplot(fig)

pio.write_image(fig, './images/{}.png'.format(migration.loc[a,"cities"]), scale=10)

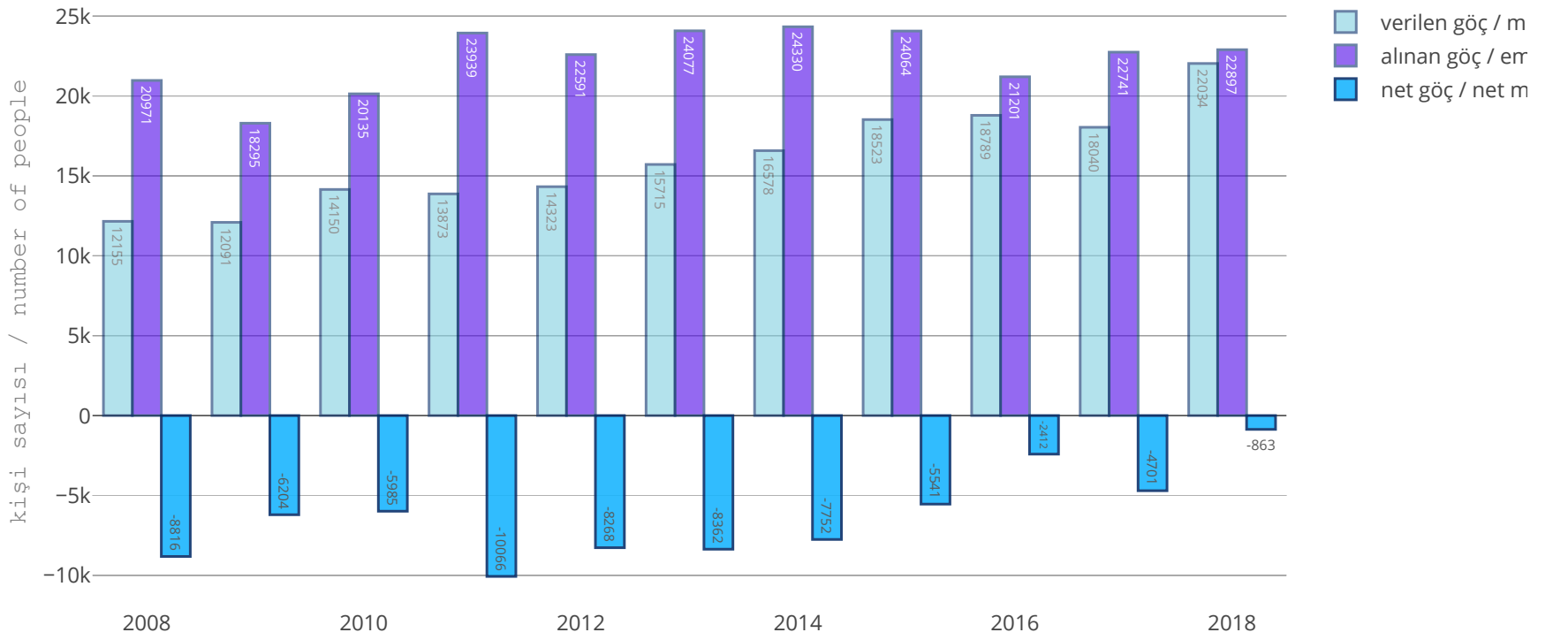
a = a+11

```

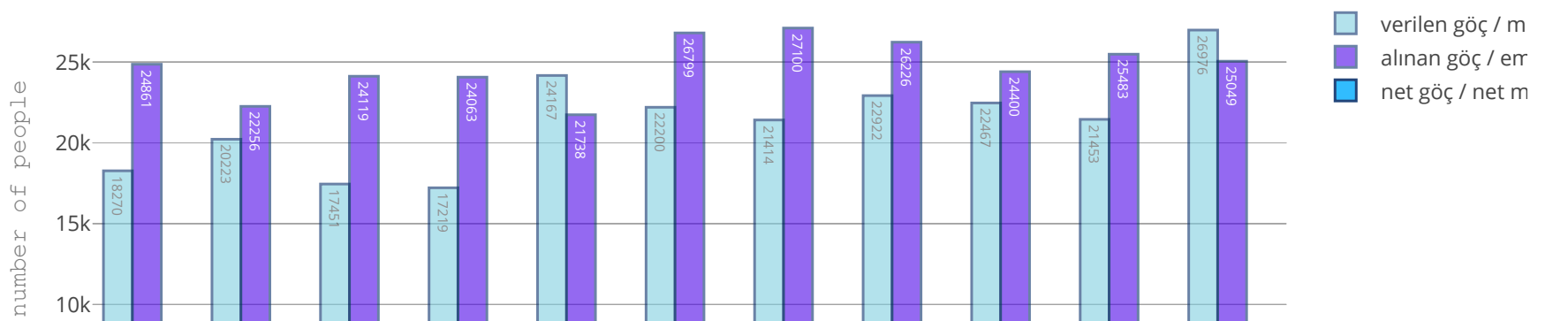
Adana

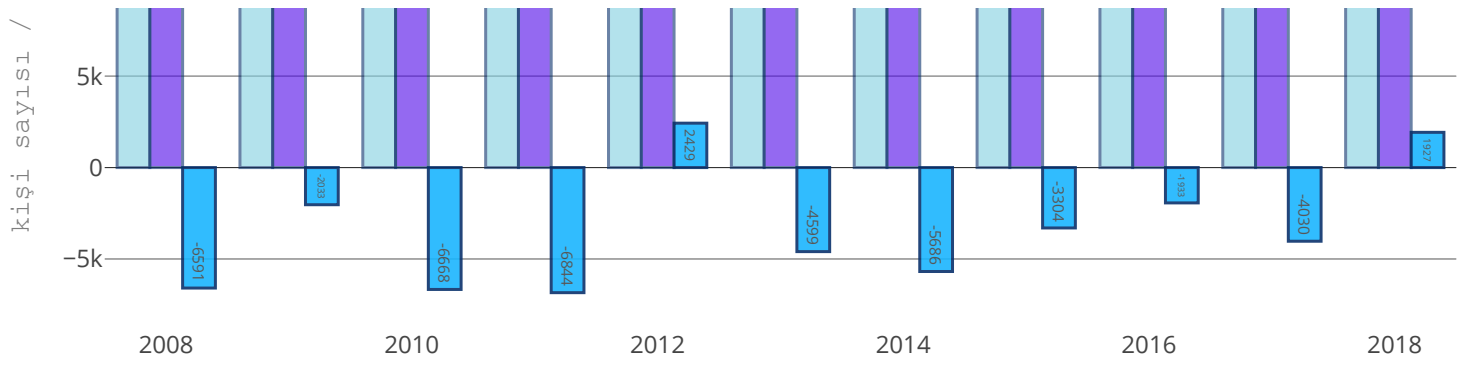


Adıyaman

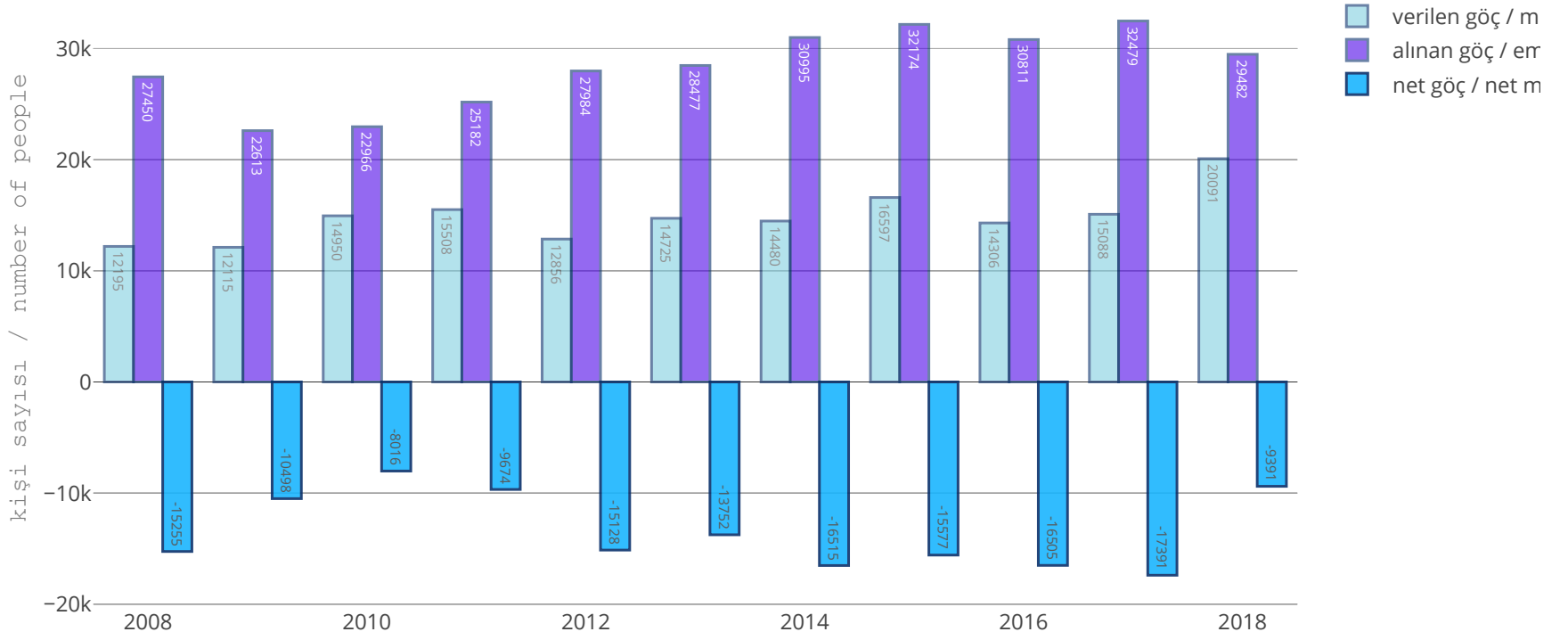


Afyonkarahisar

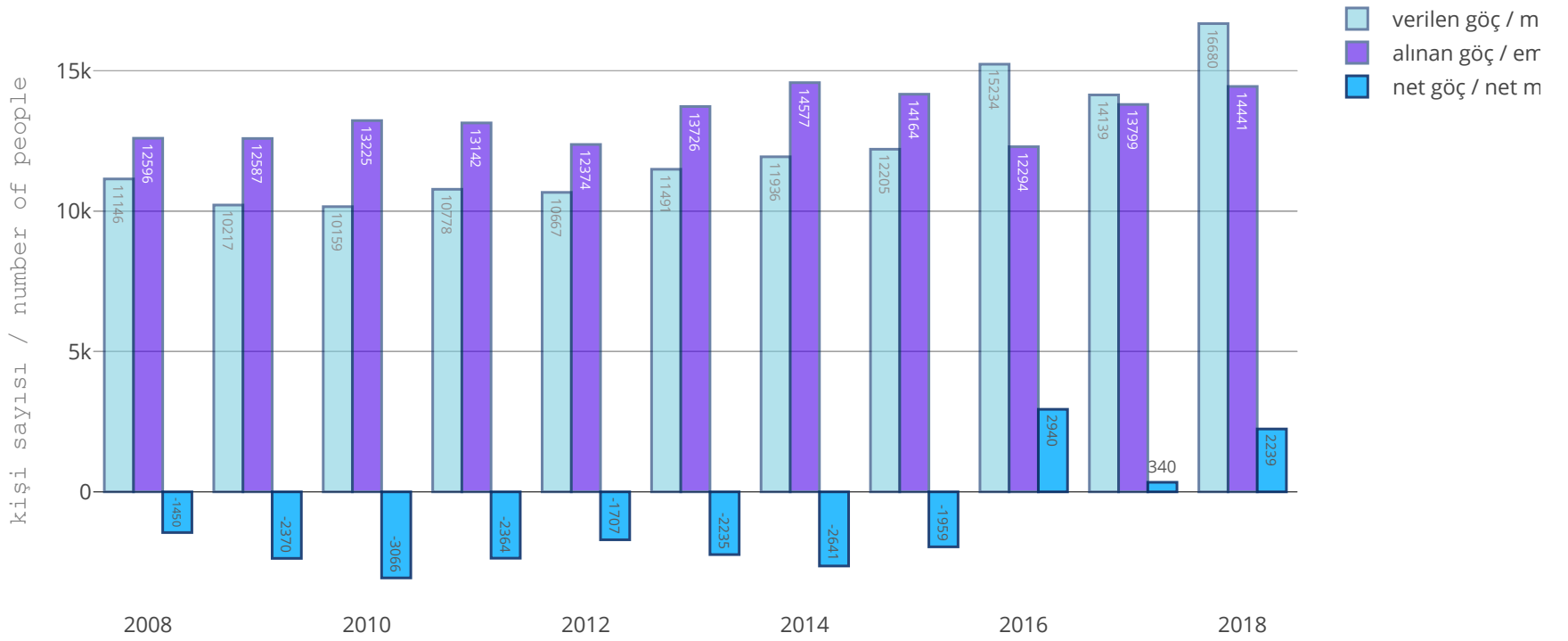




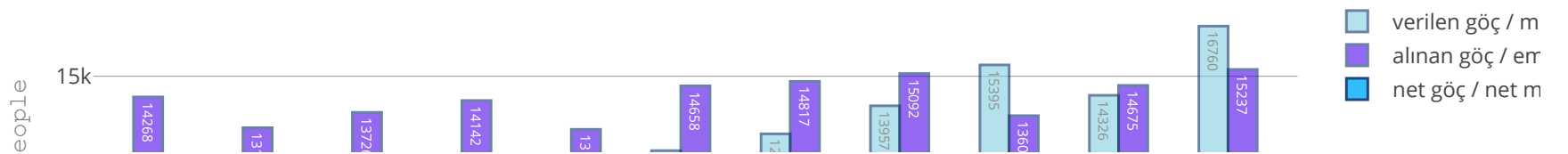
Ağrı

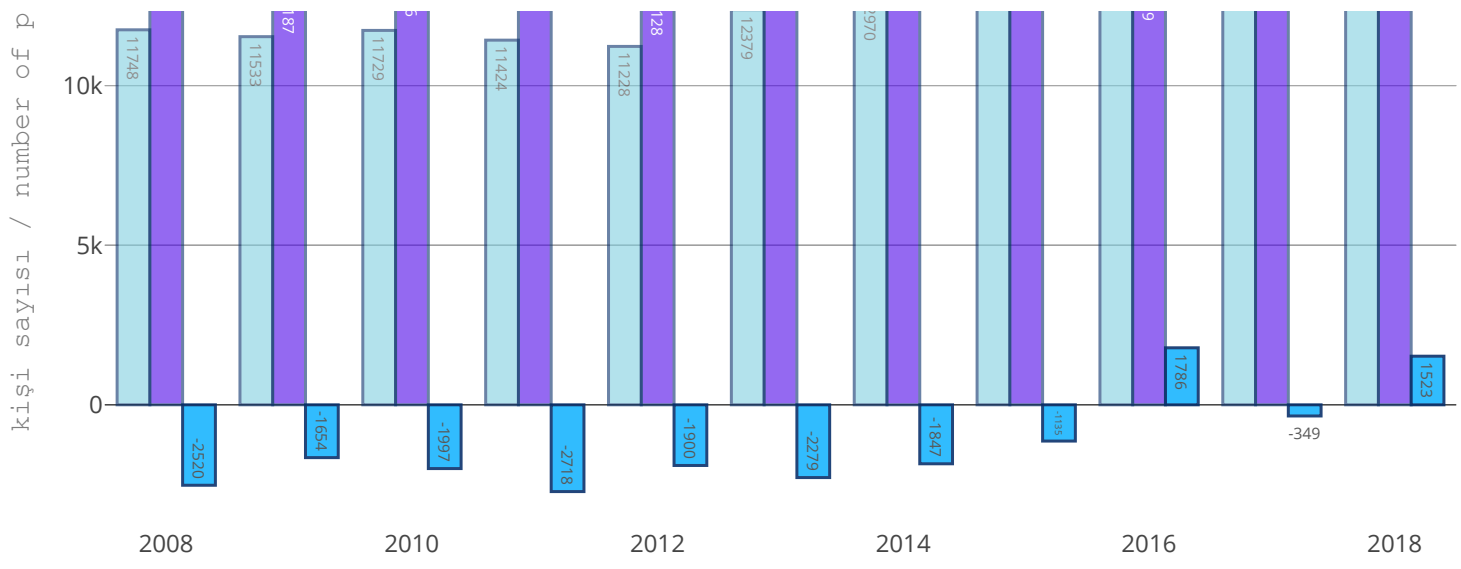


Aksaray



Amasya

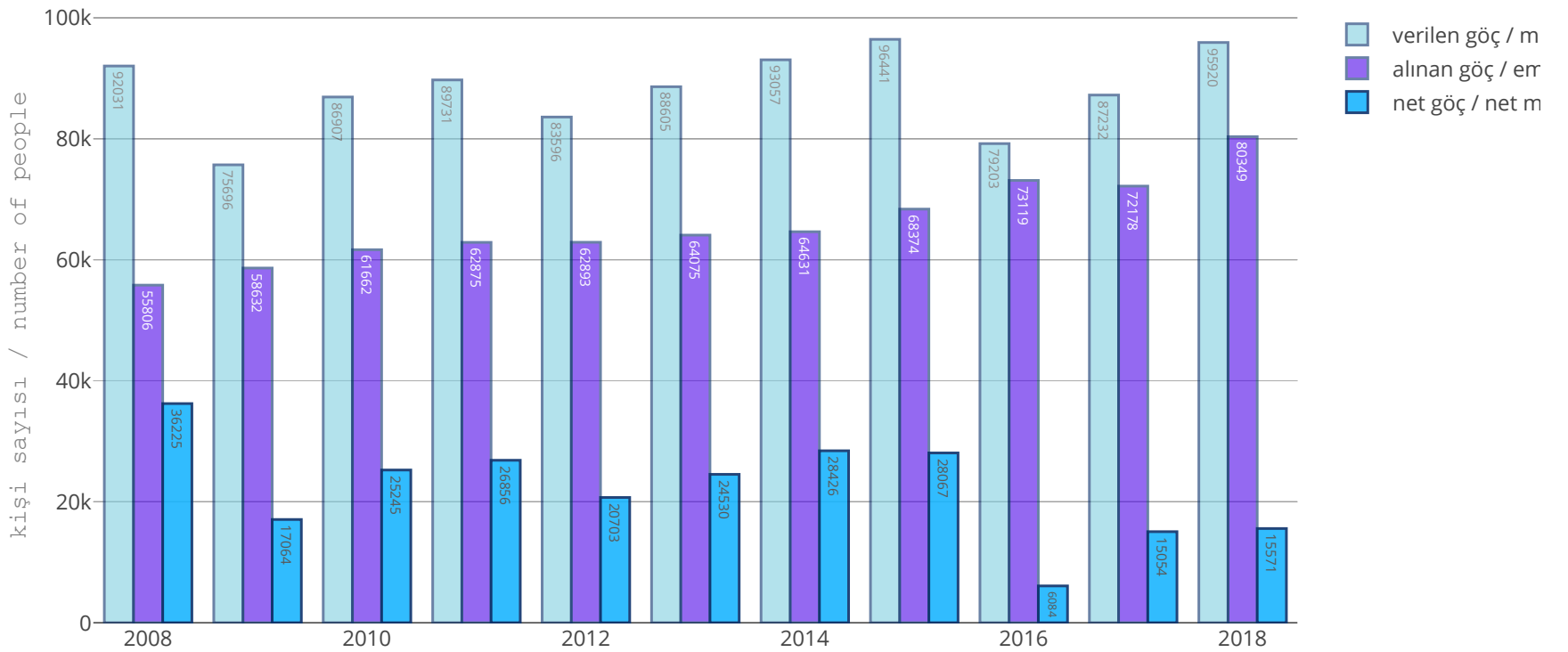




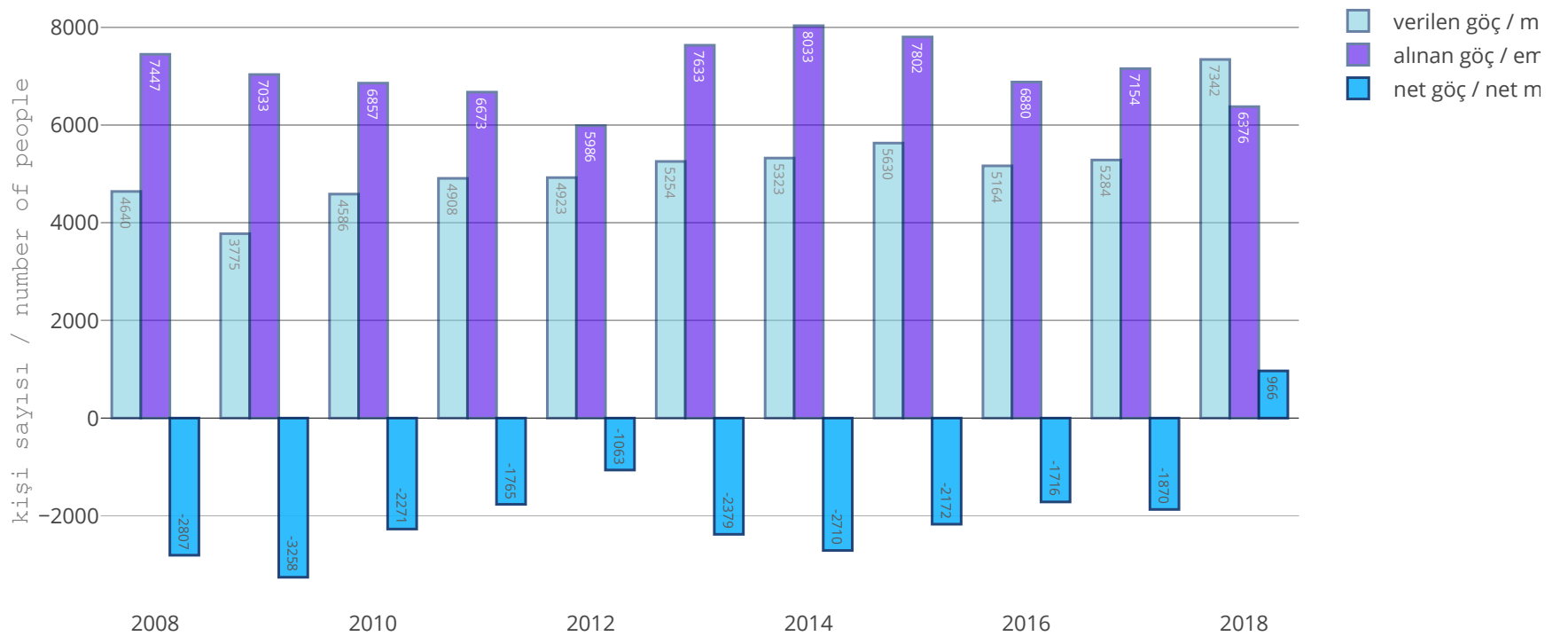
Ankara



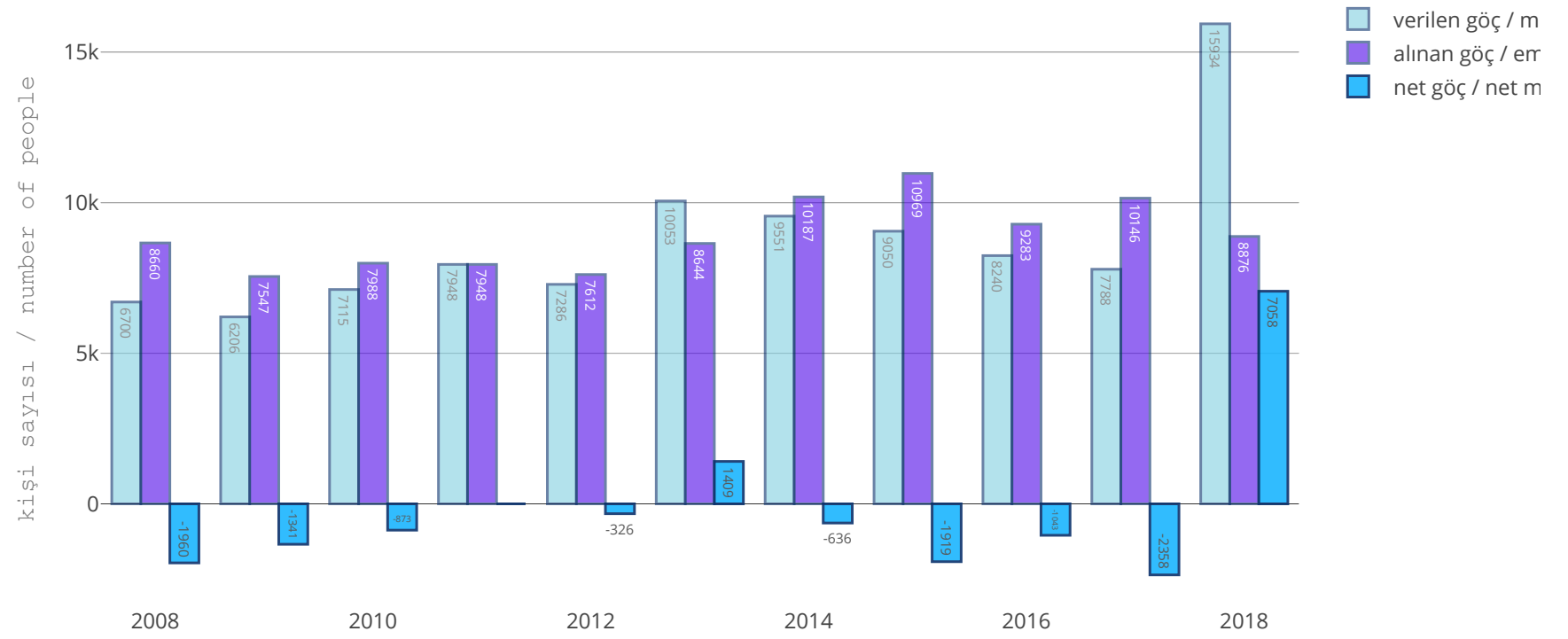
Antalya



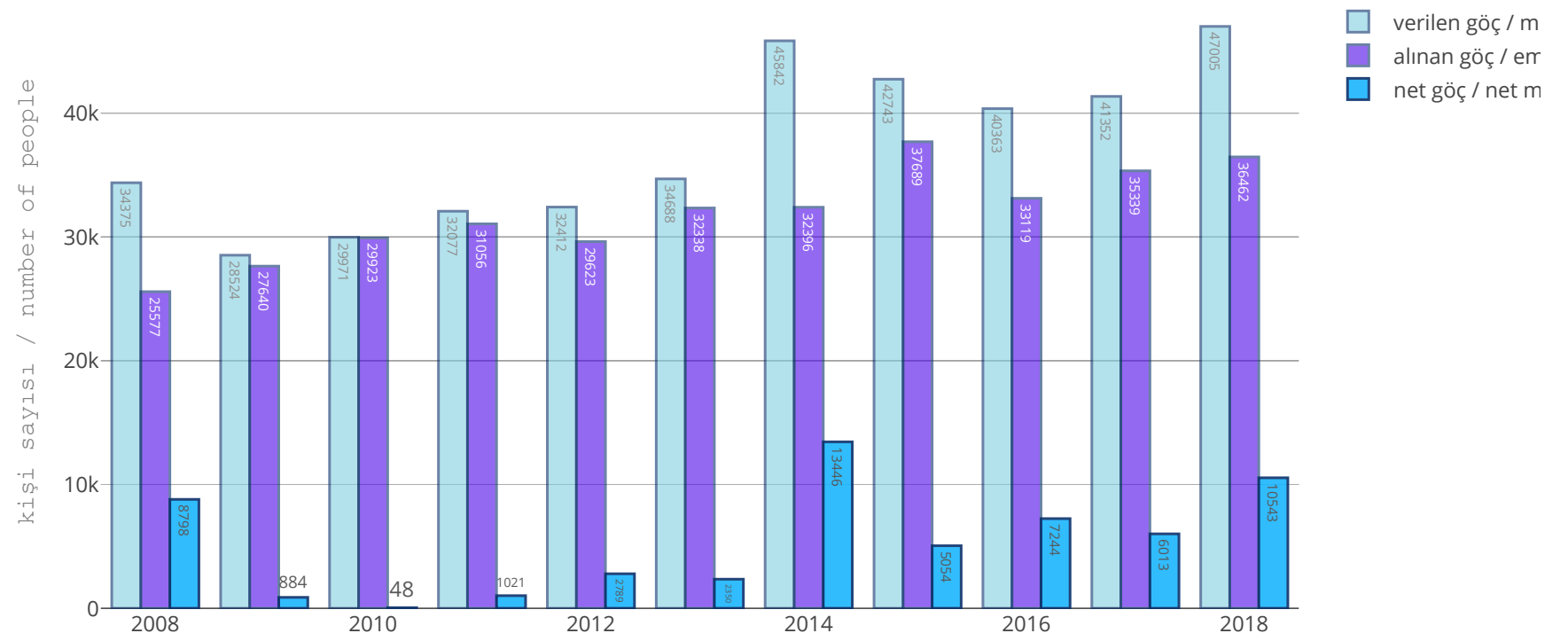
Ardahan



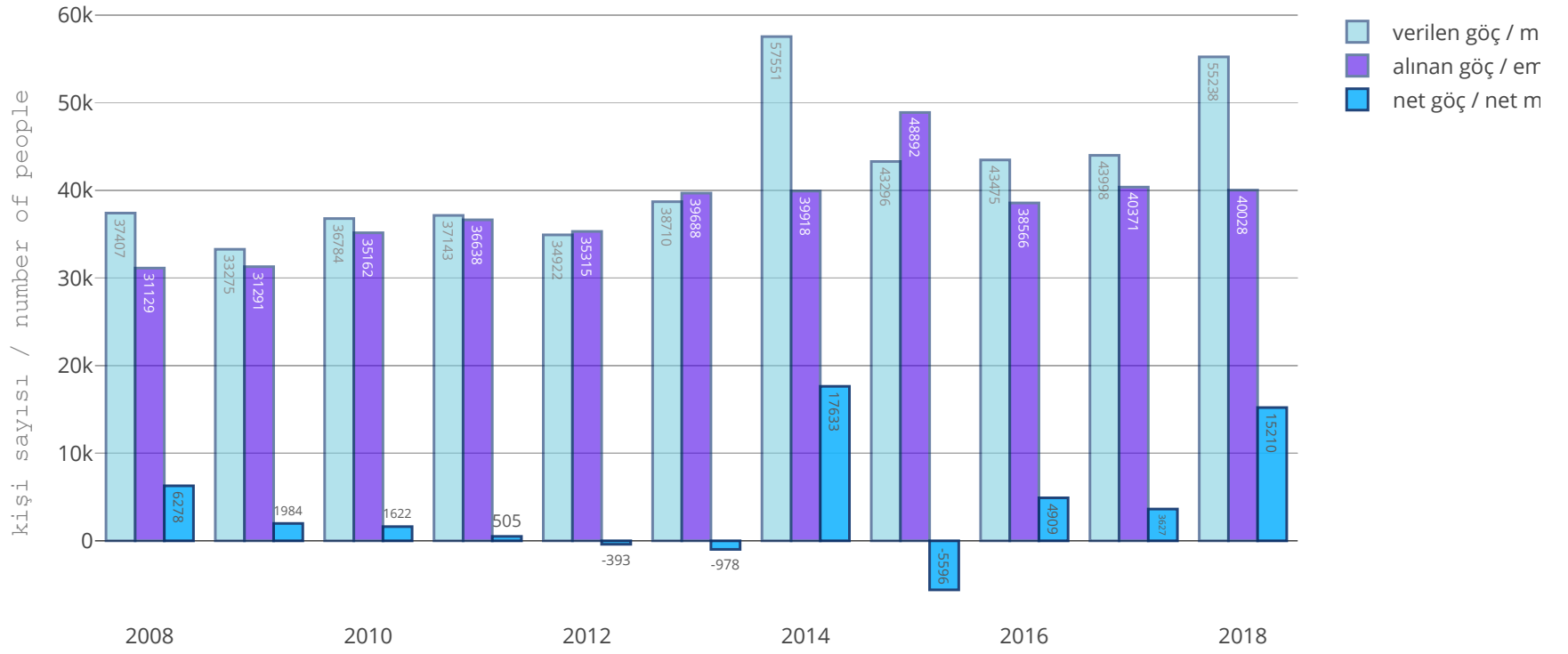
Artvin



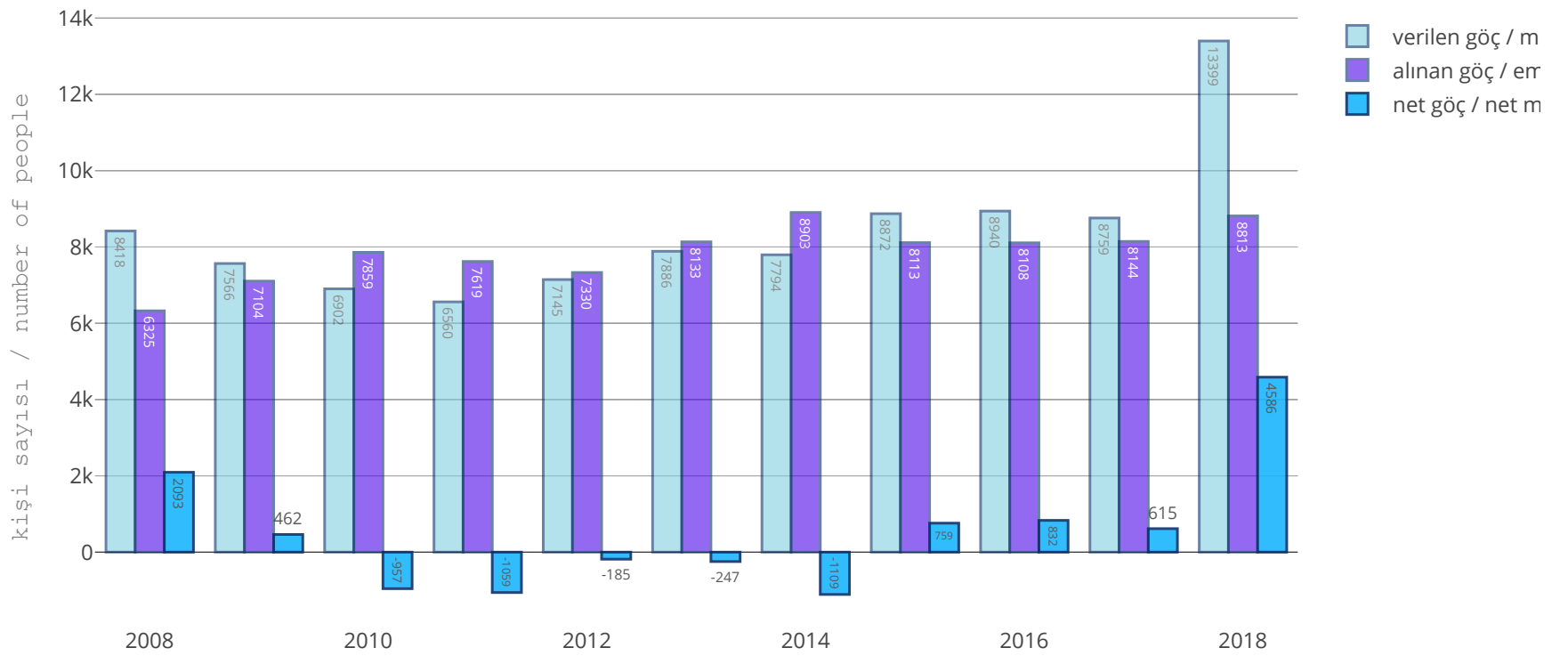
Aydın



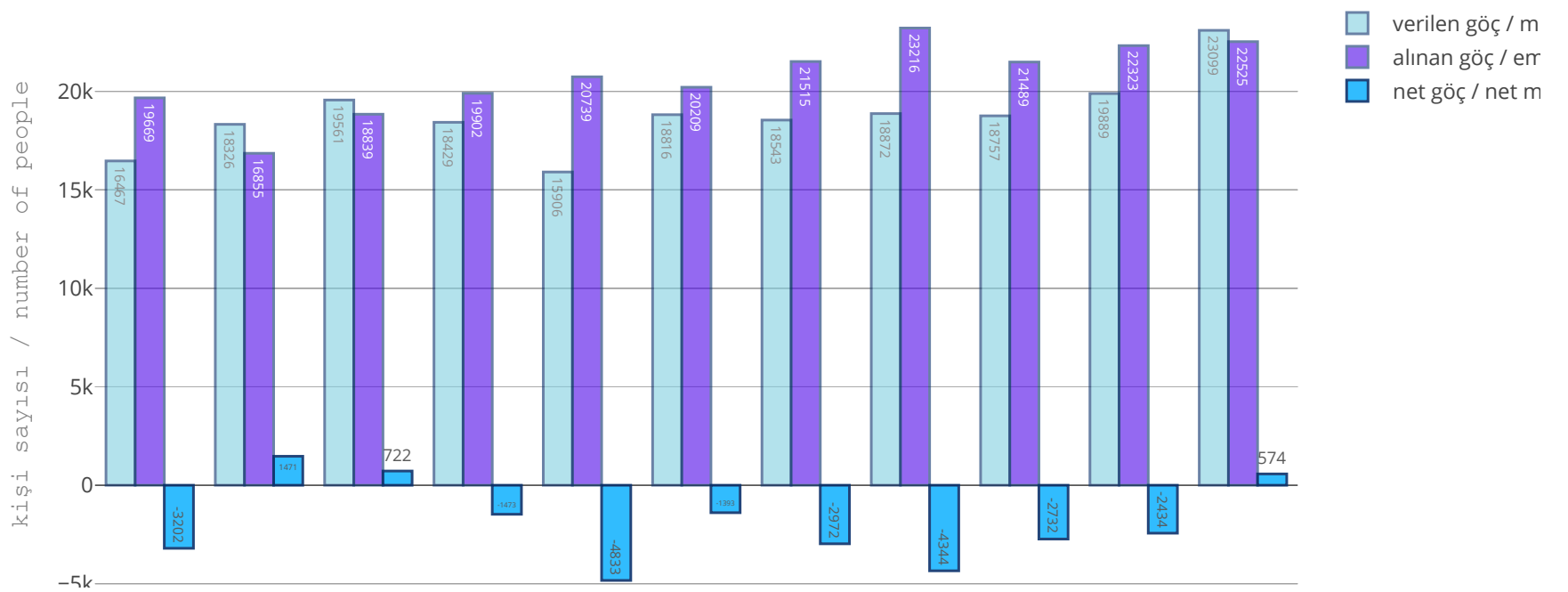
Balıkesir

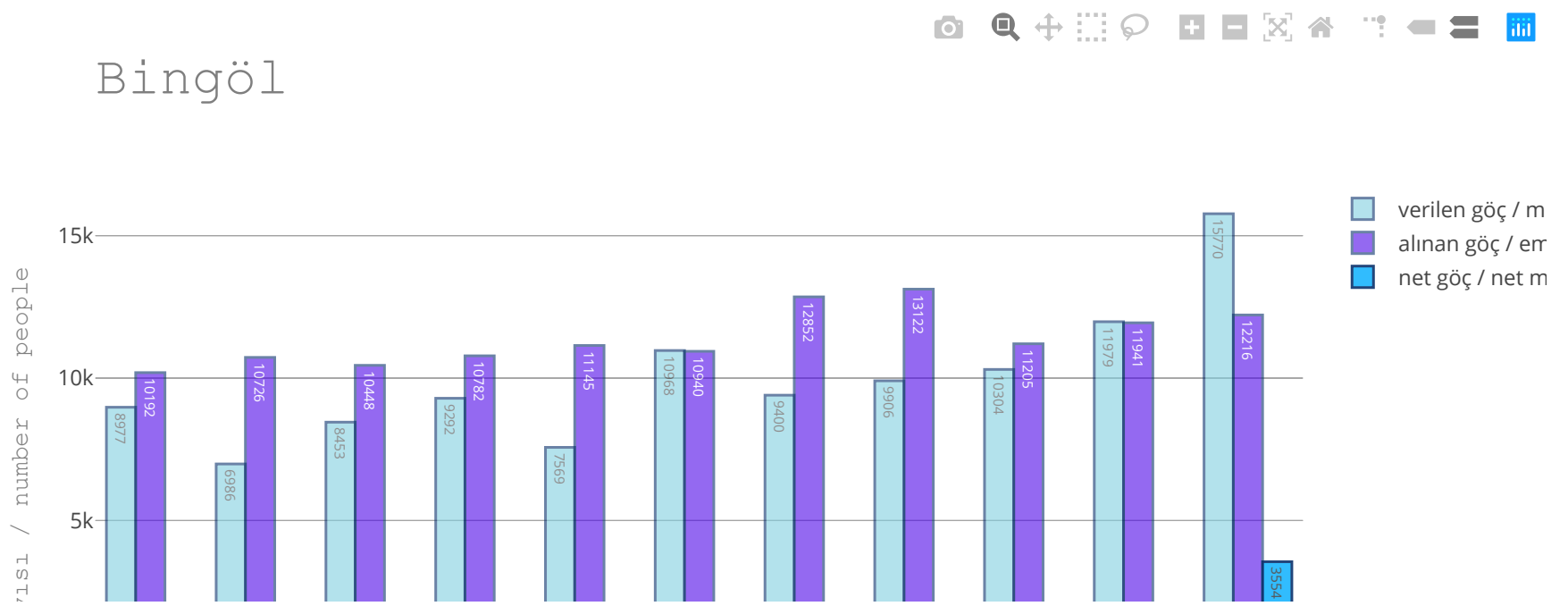
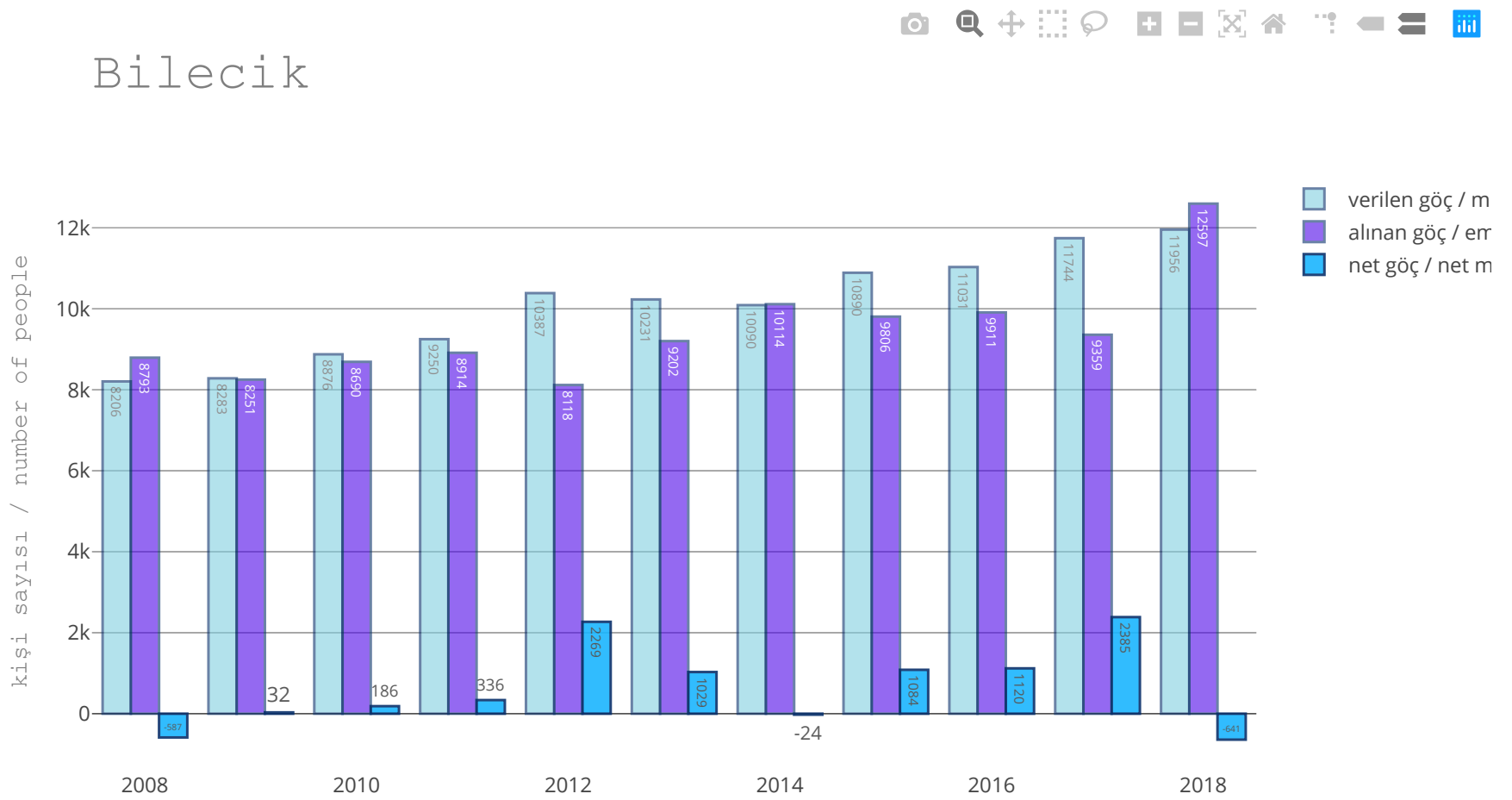
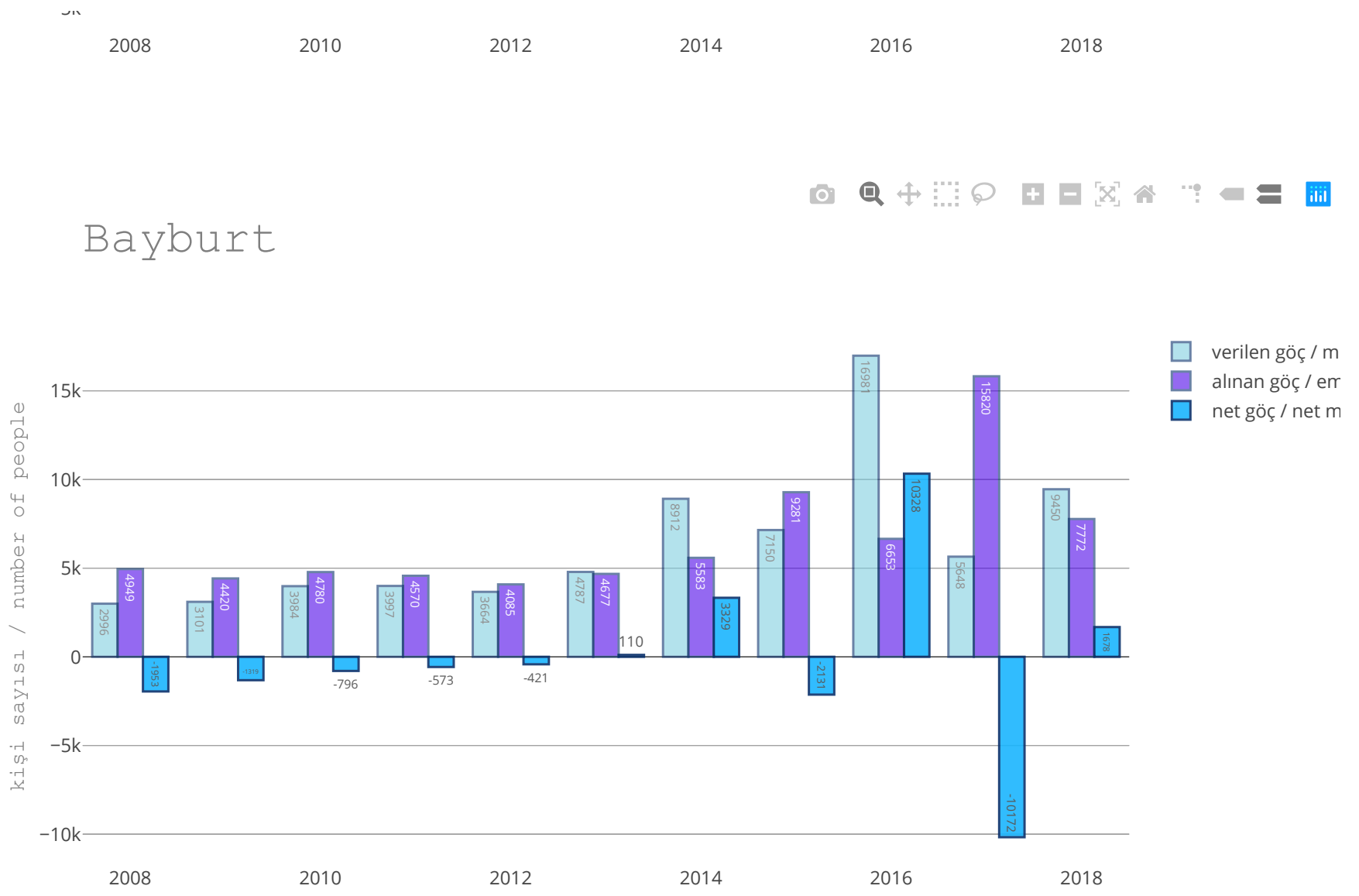


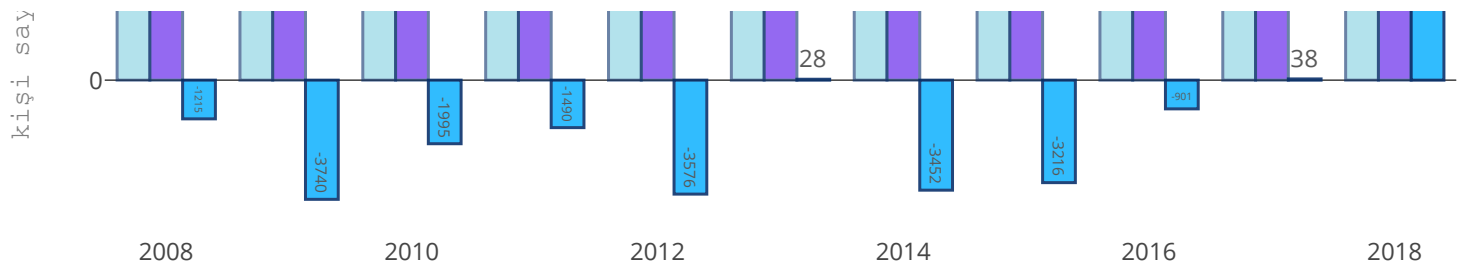
Bartın



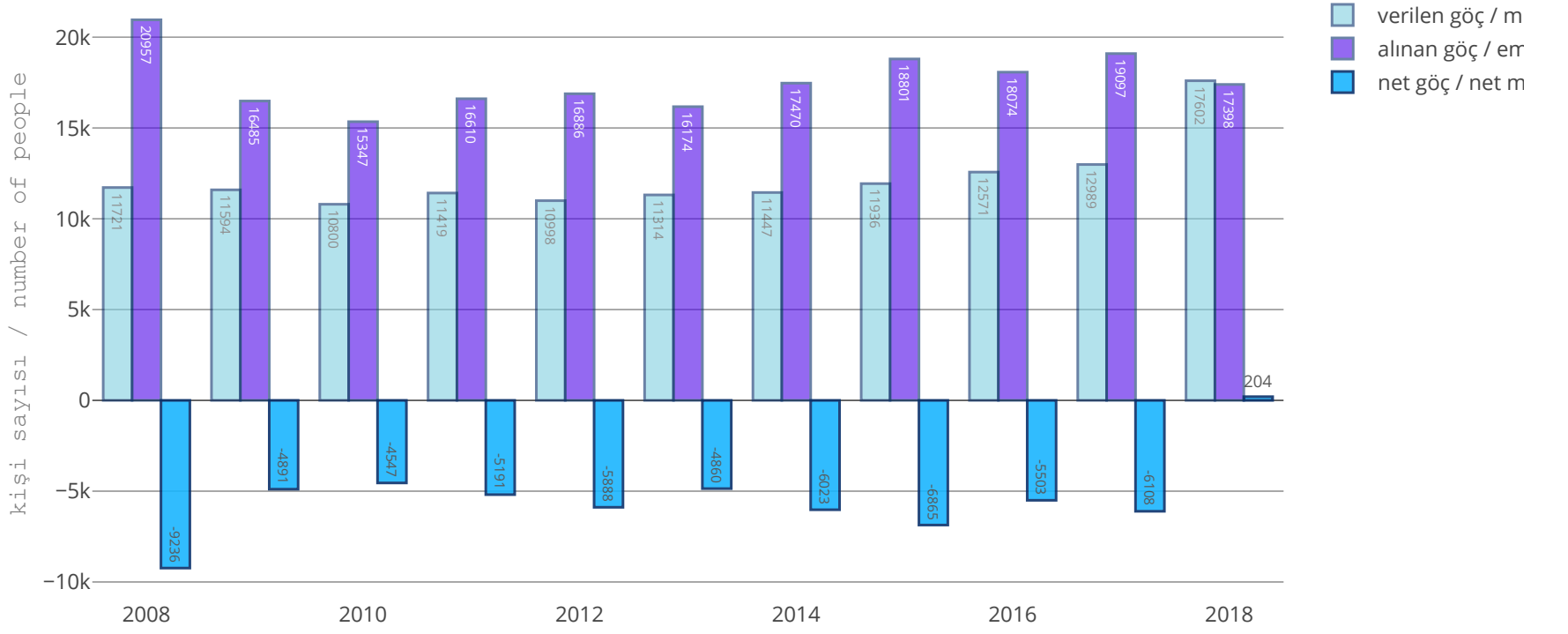
Batman



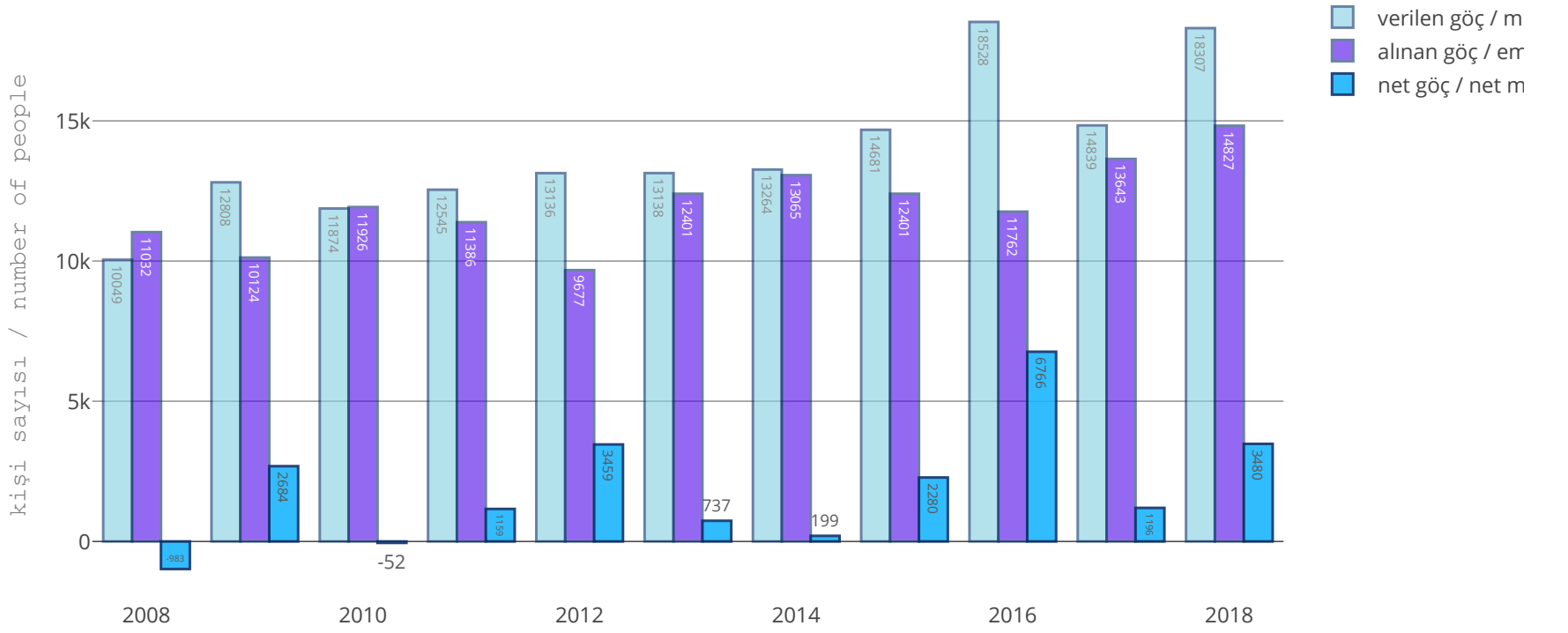




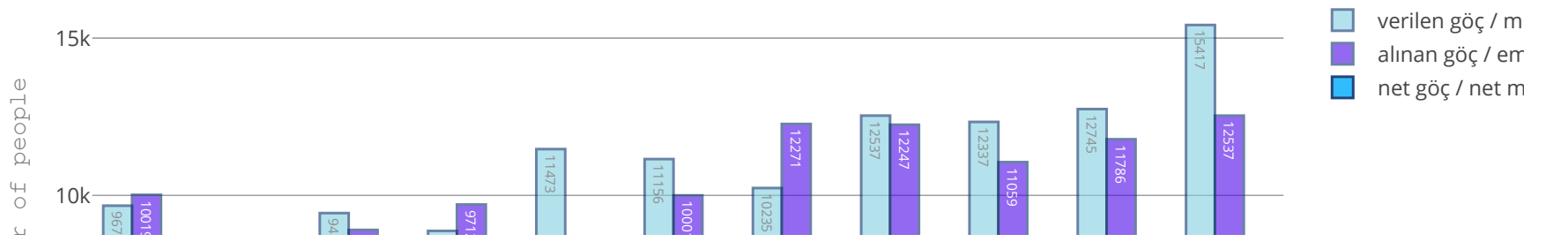
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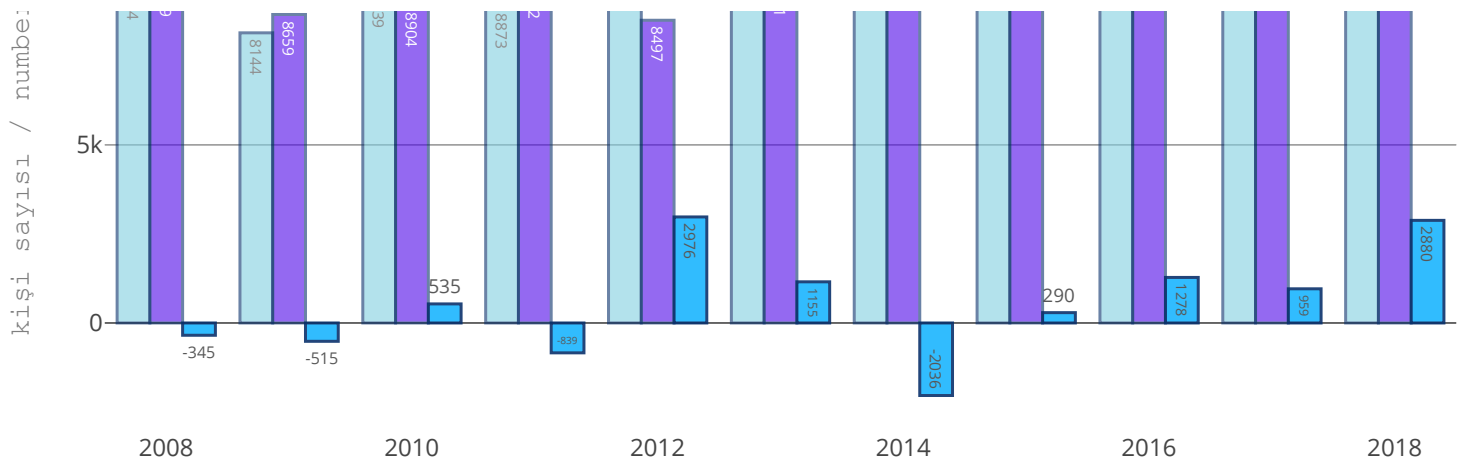


Bolu

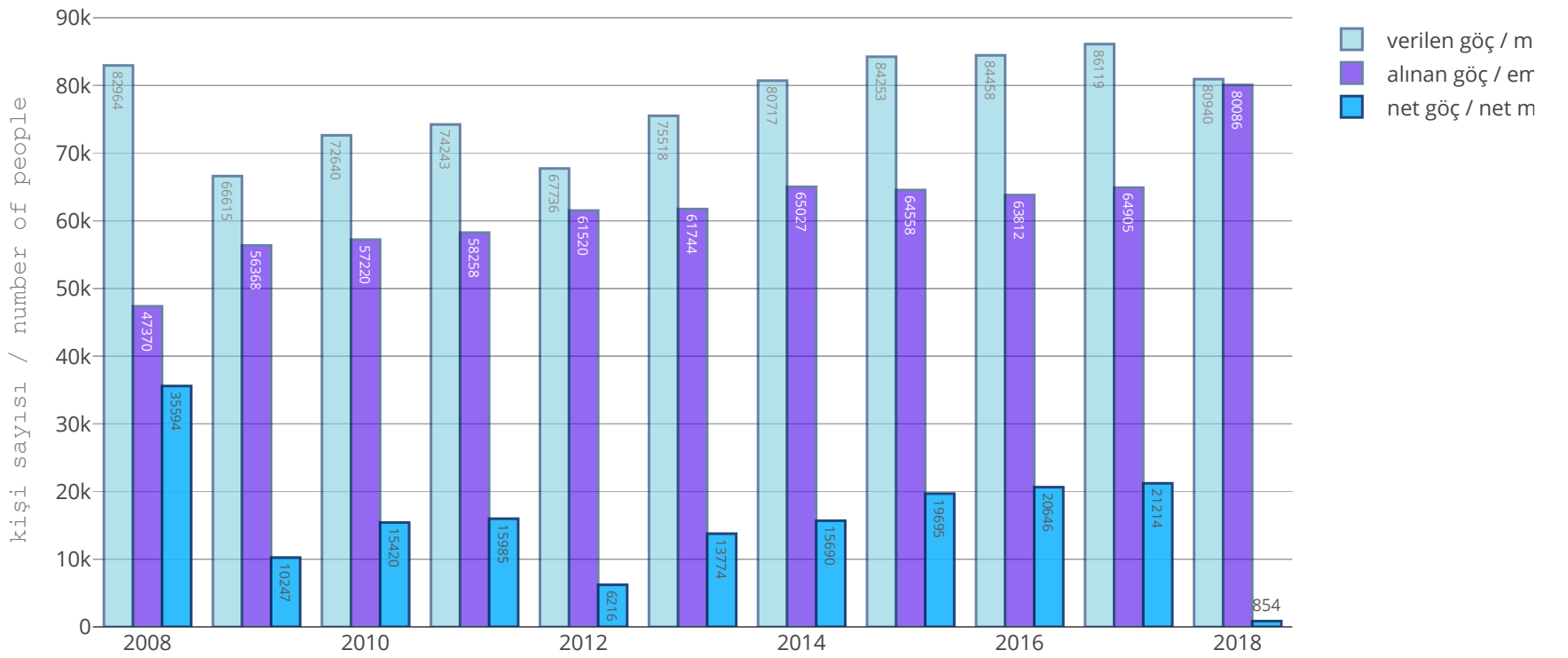


Burdur

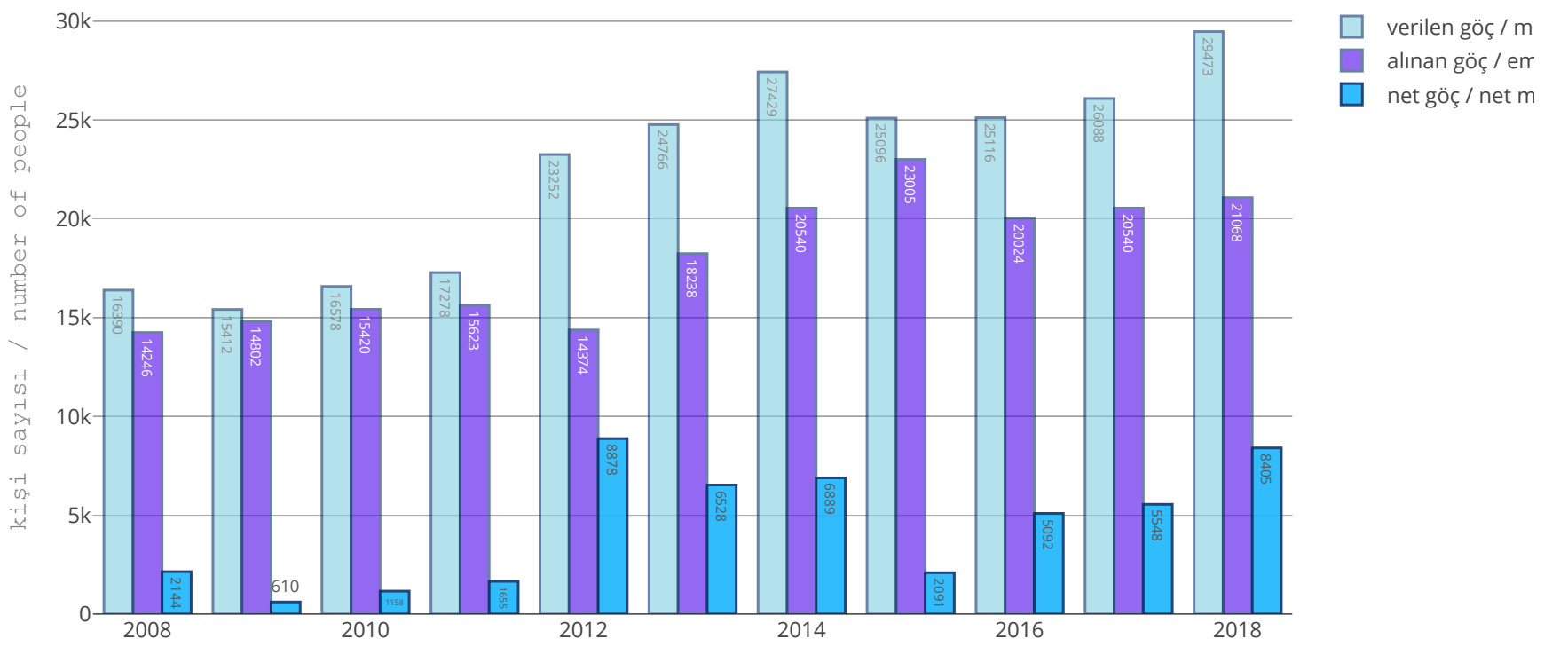




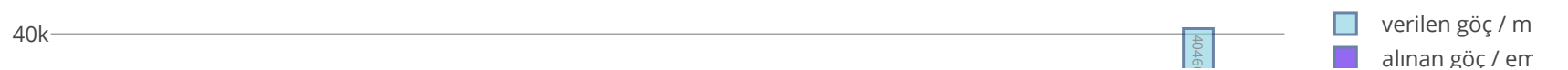
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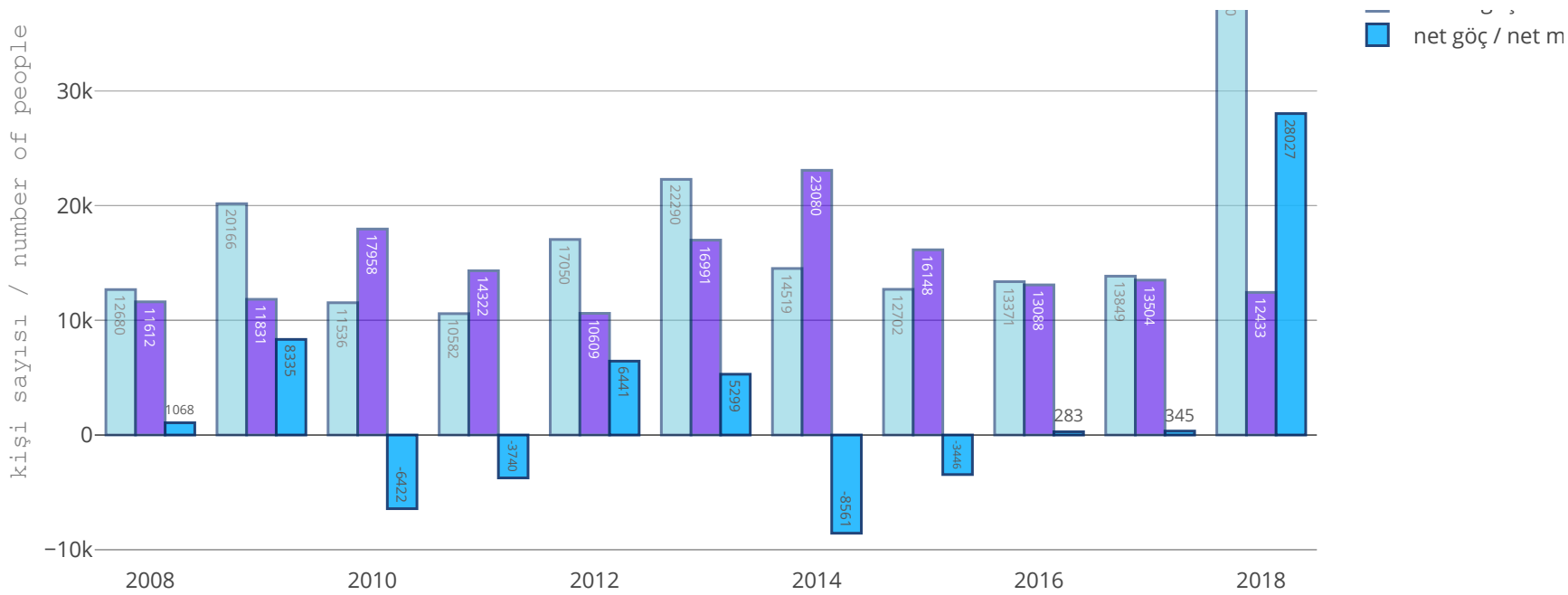


Çanakkale



Çankırı

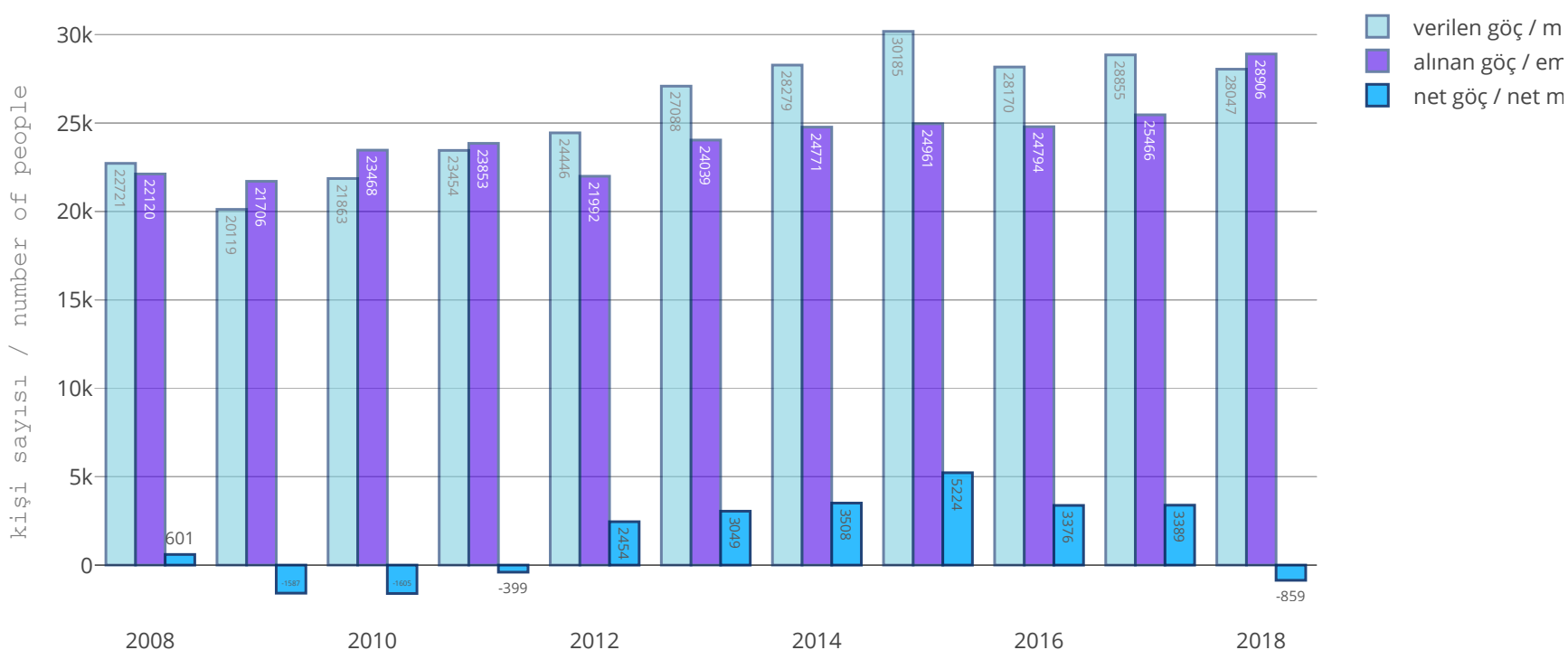




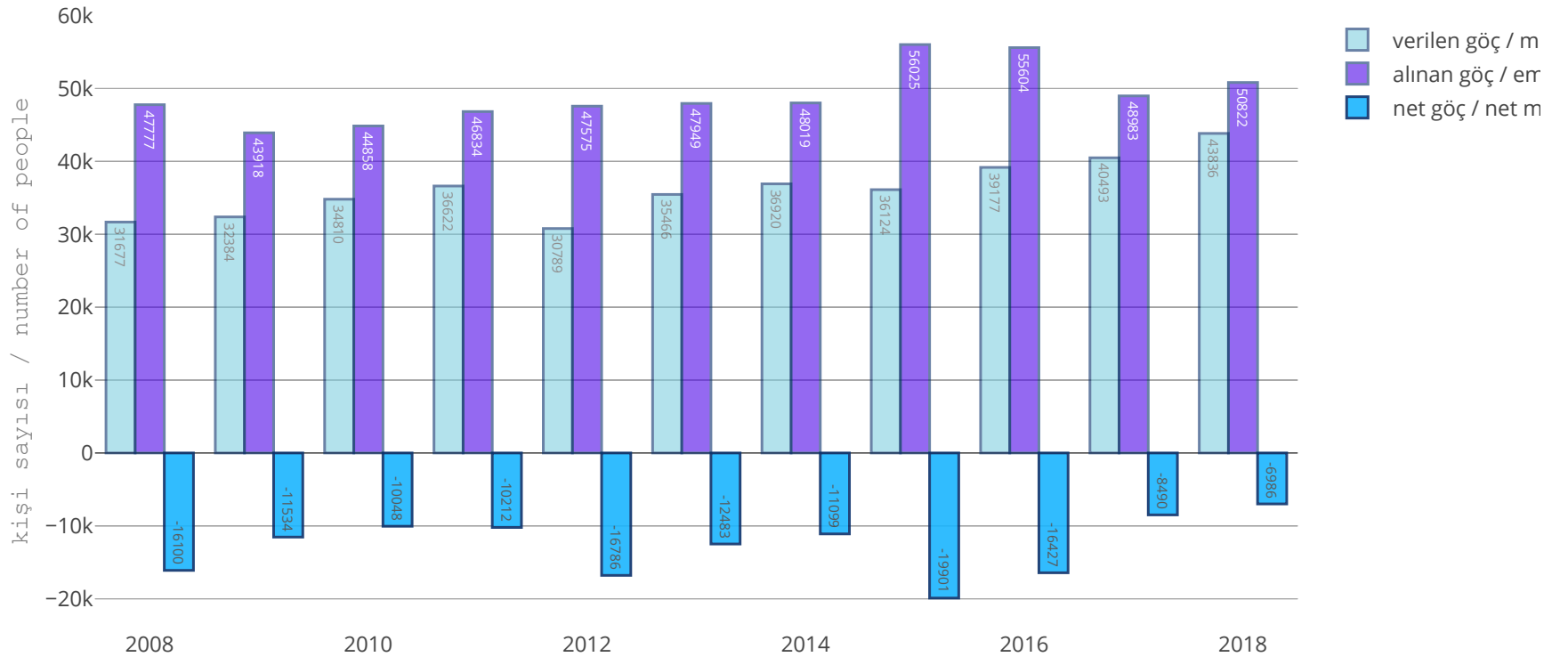
Çorum



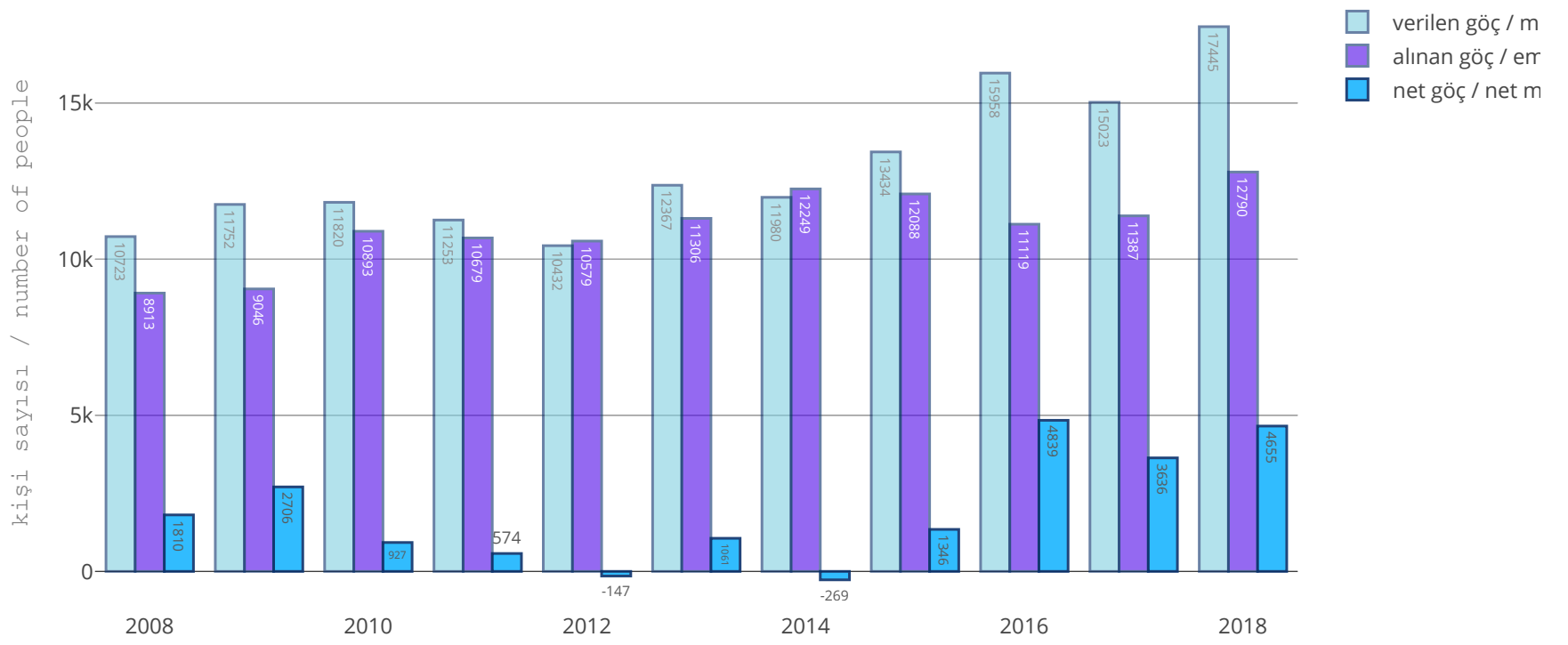
Denizli



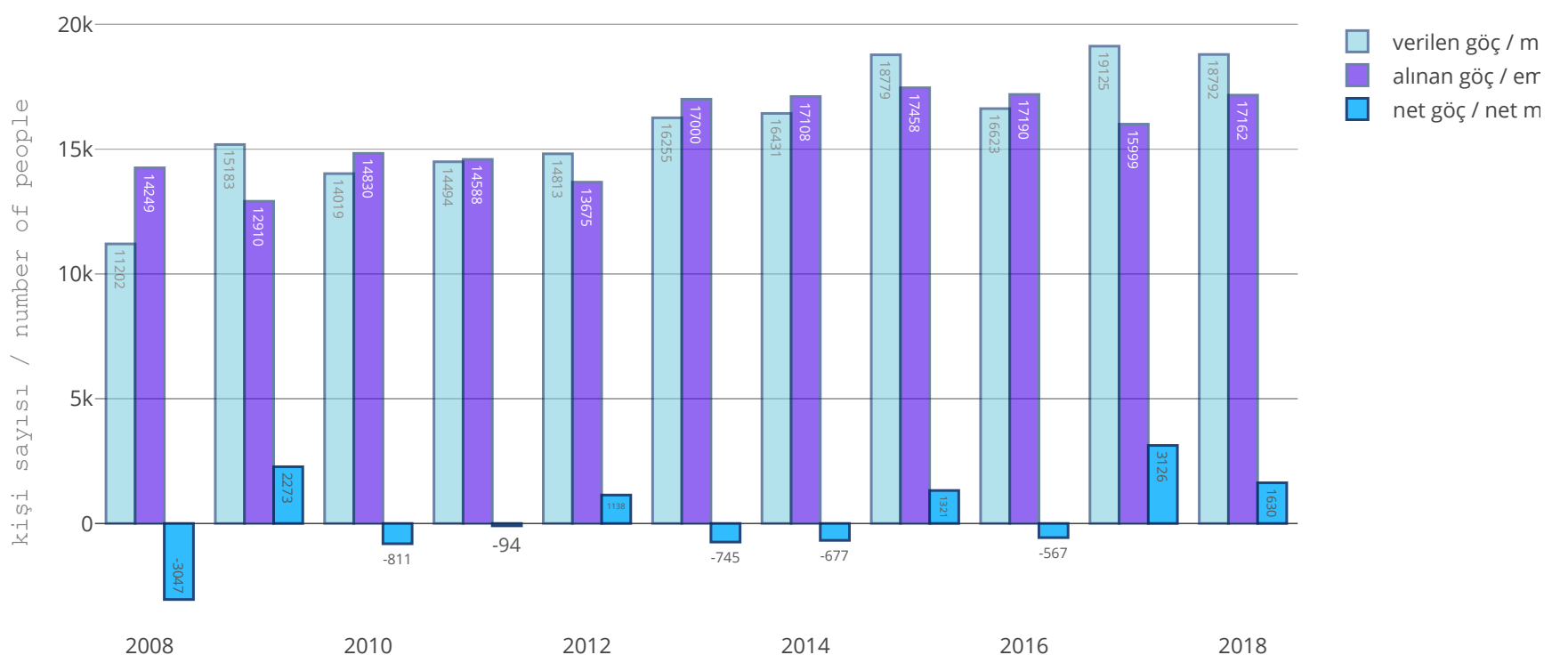
Diyarbakır



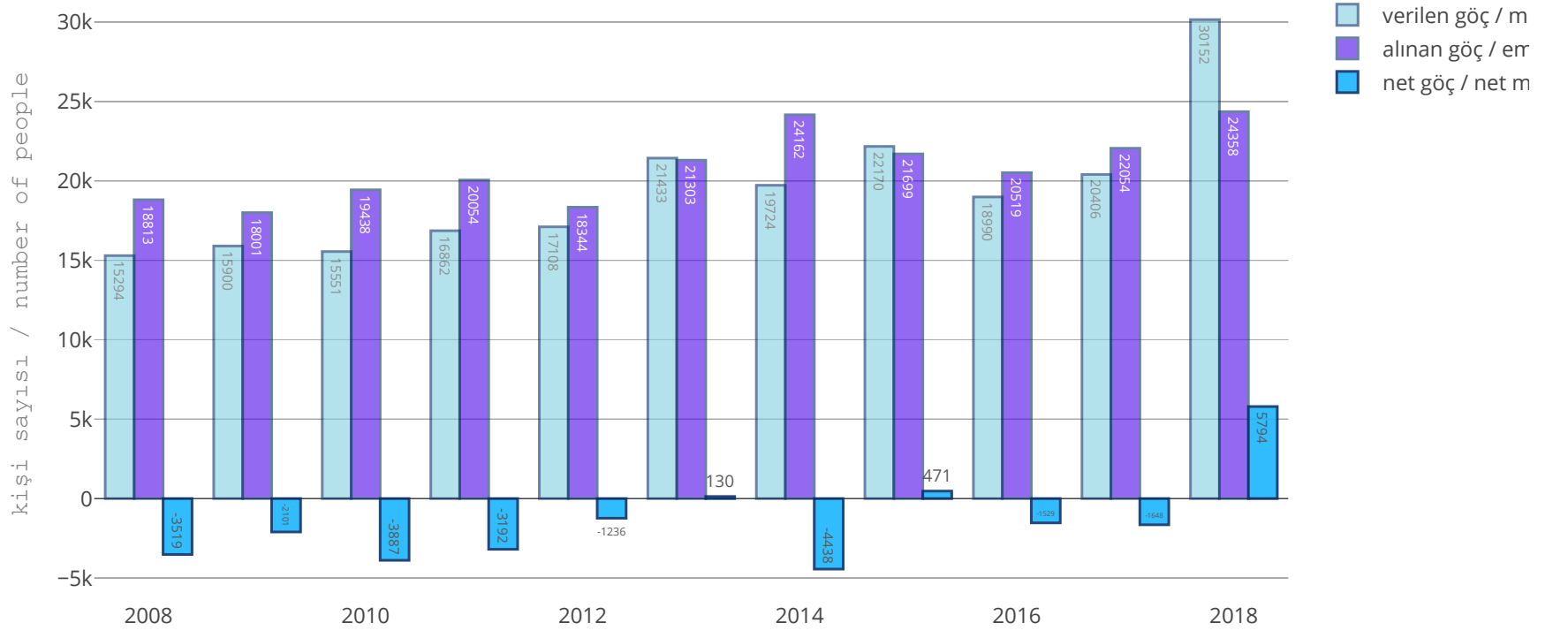
Düzce



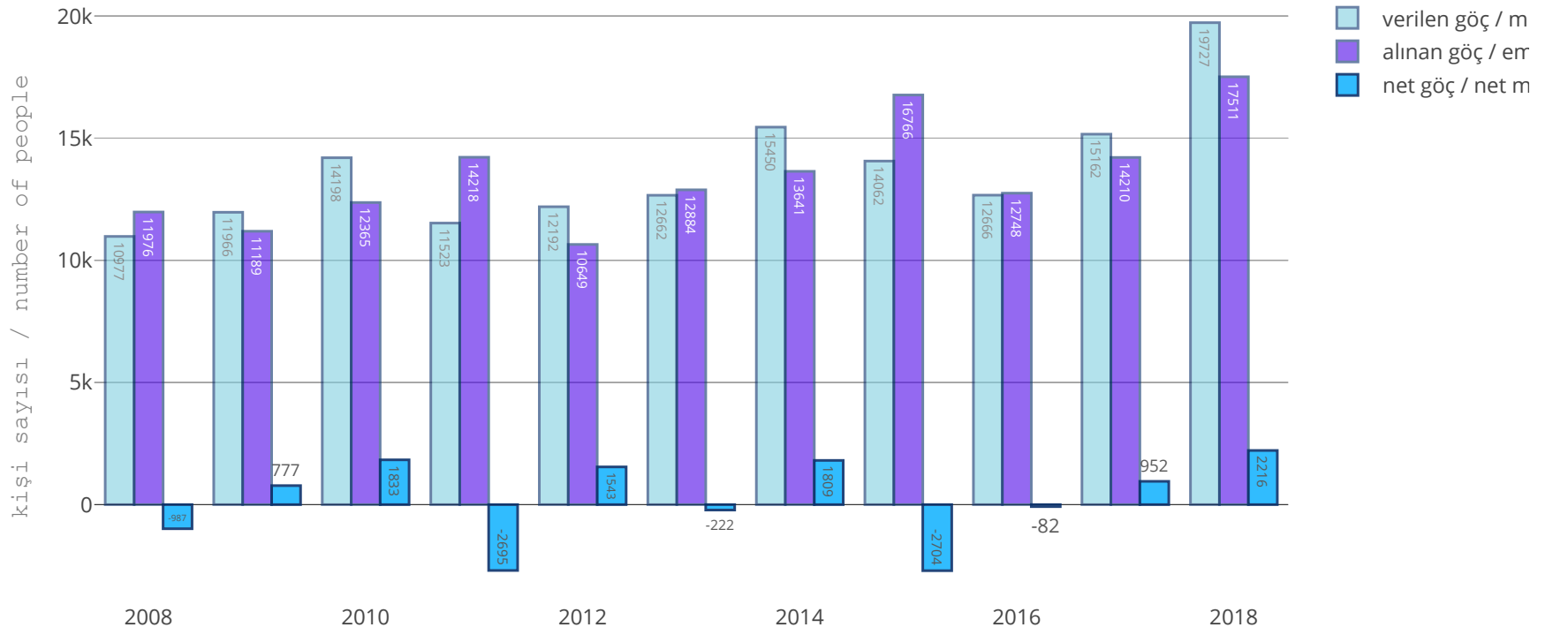
Edirne



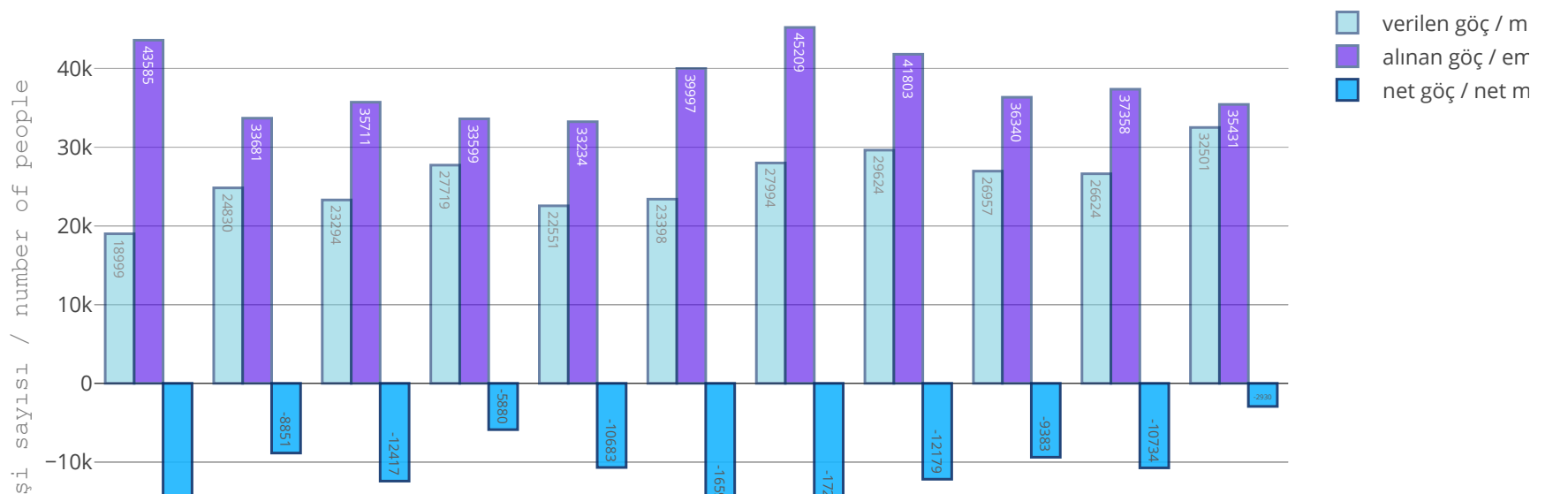
Elazığ

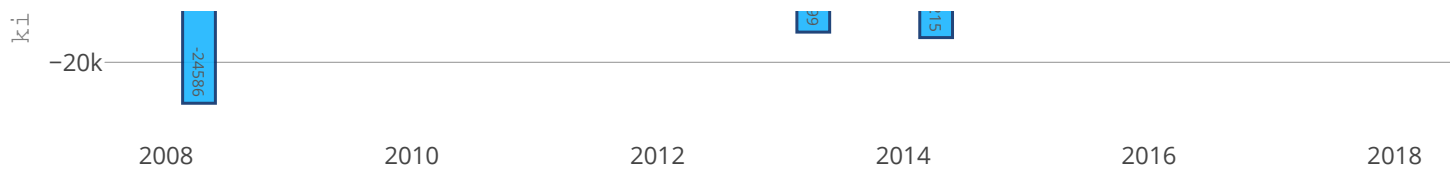


Erzincan

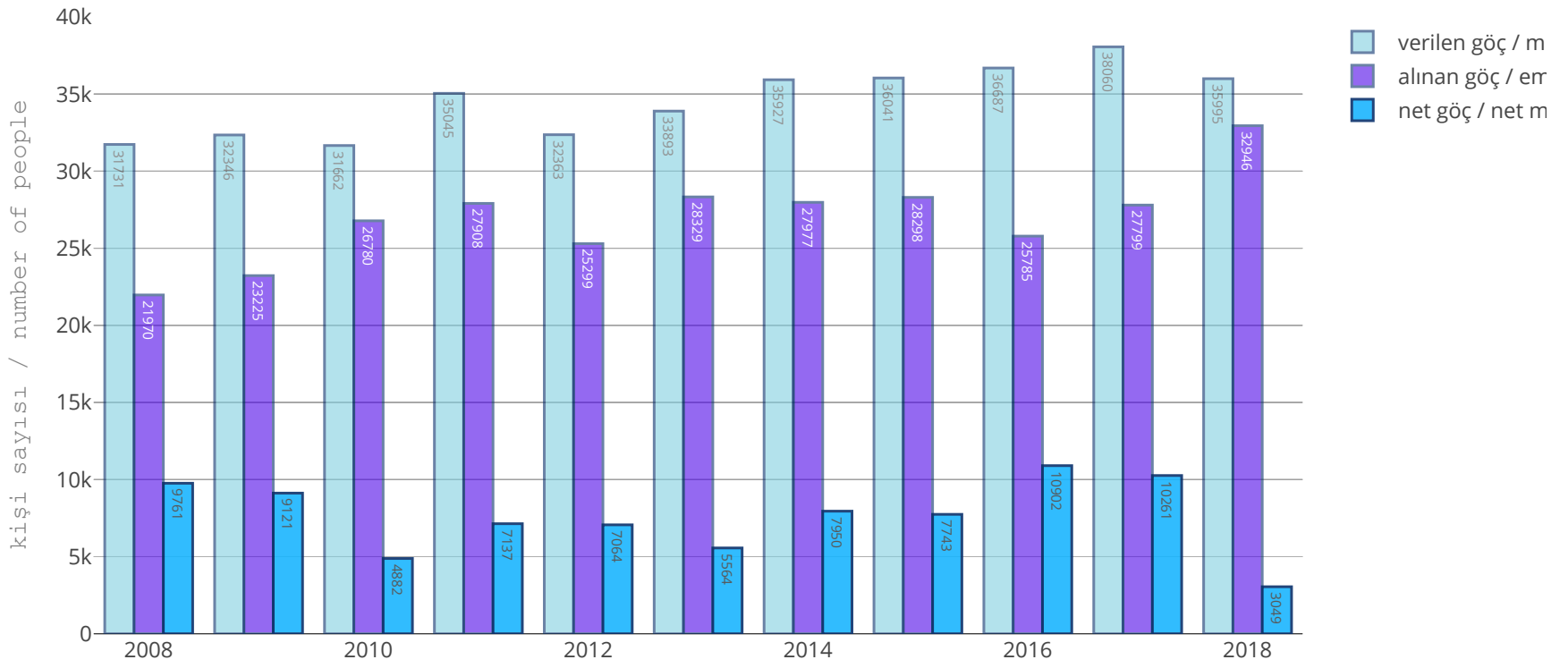


Erzurum

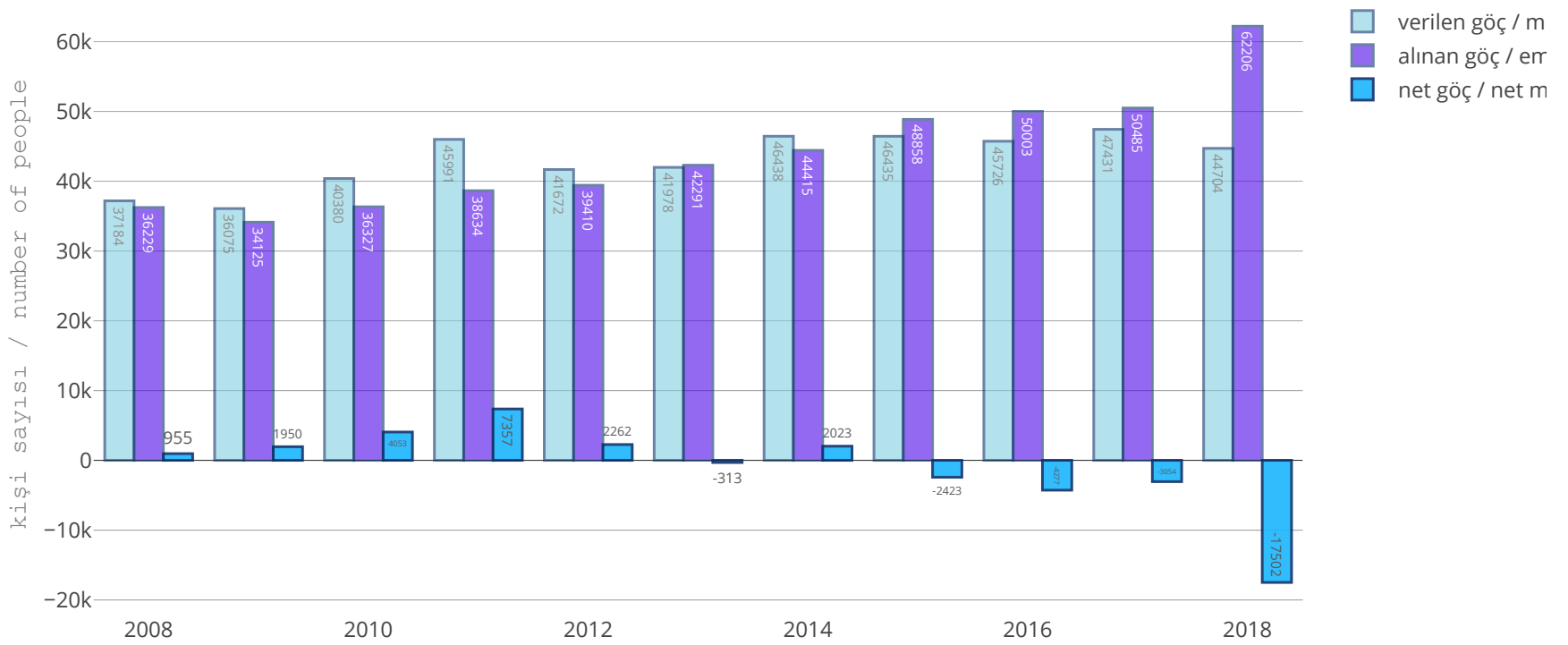




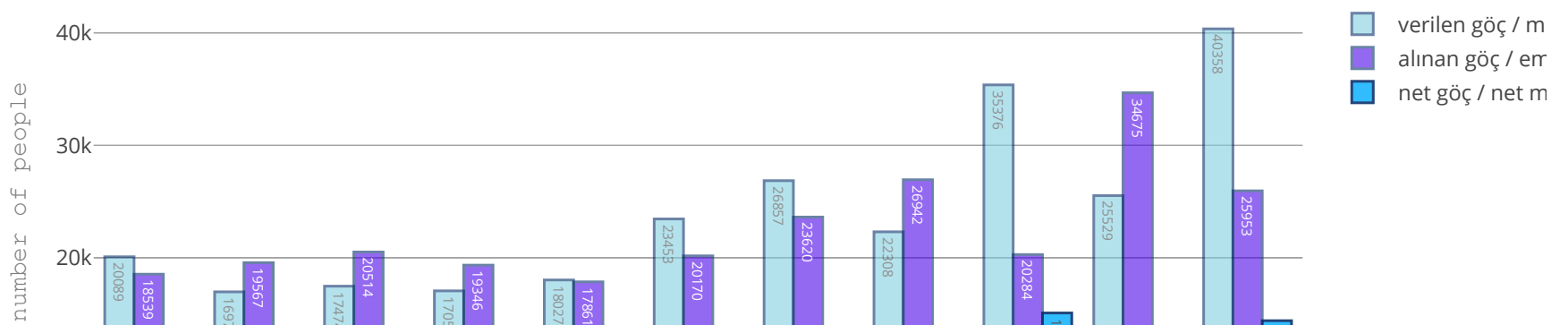
Eskişehir

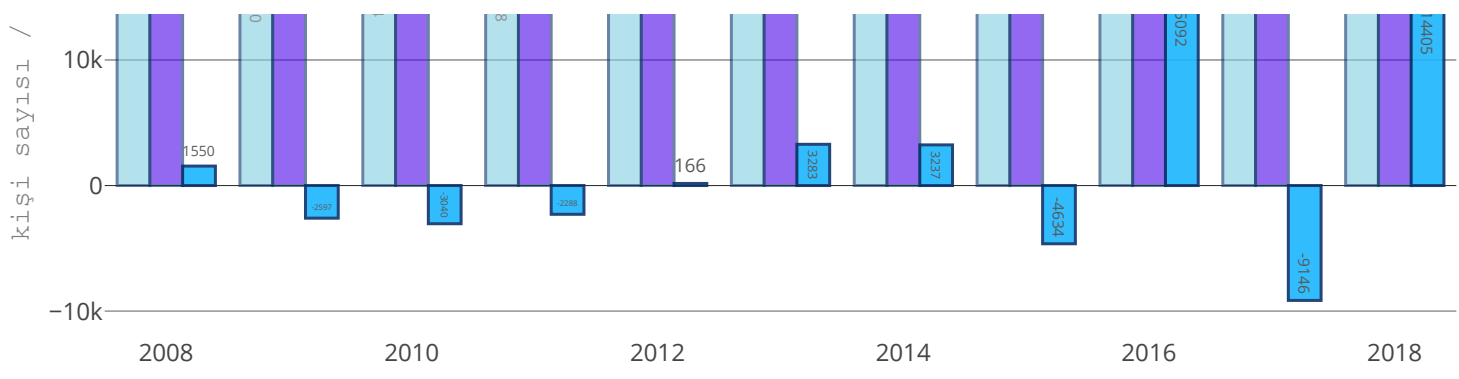


Gaziantep

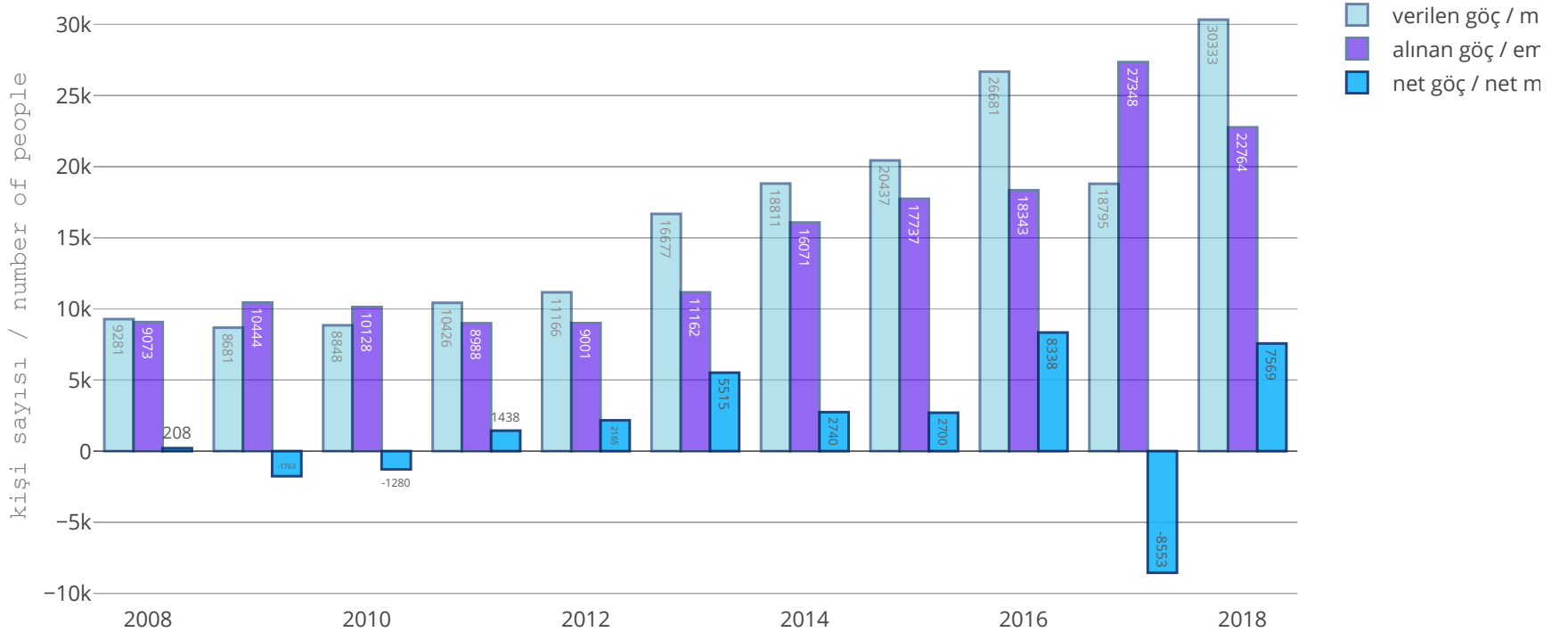


Giresun

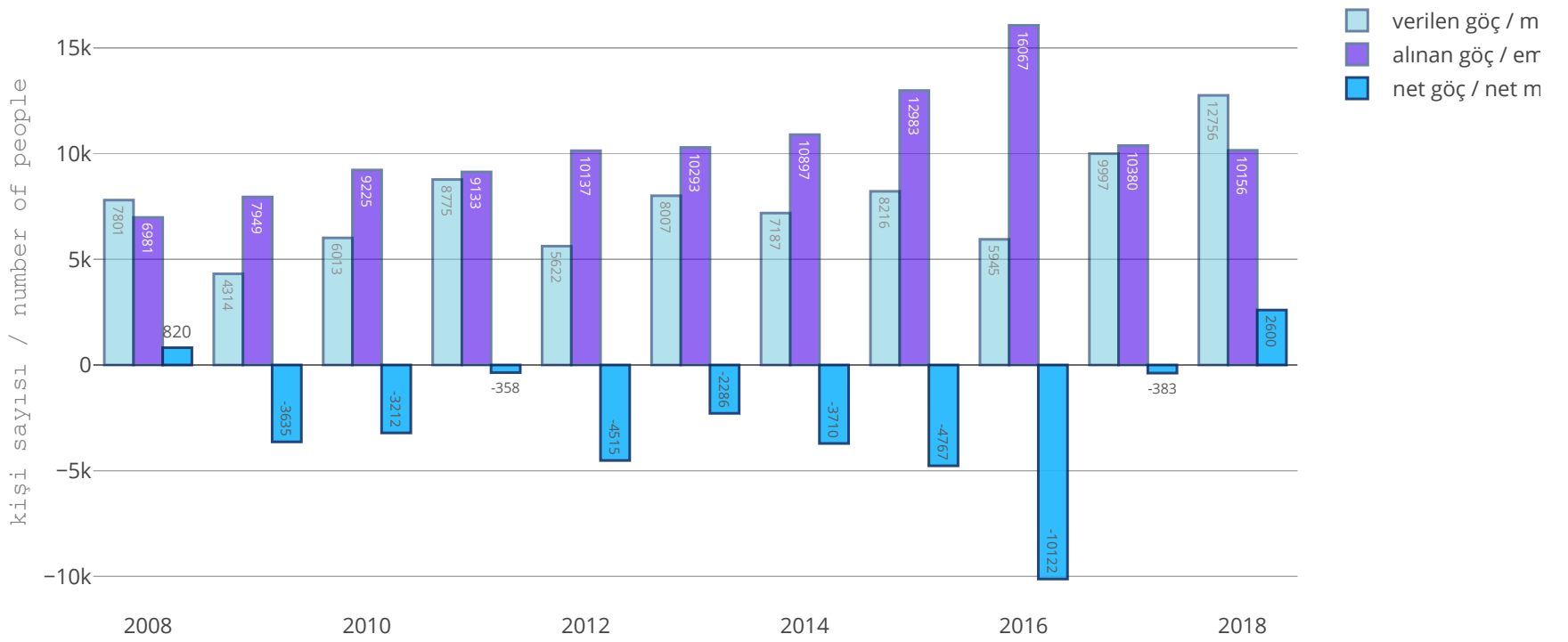




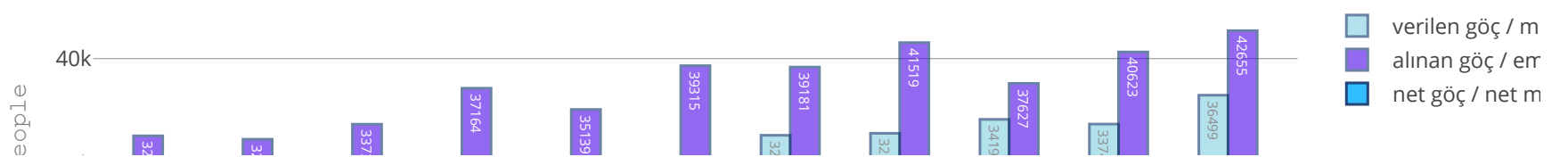
Gümüşhane

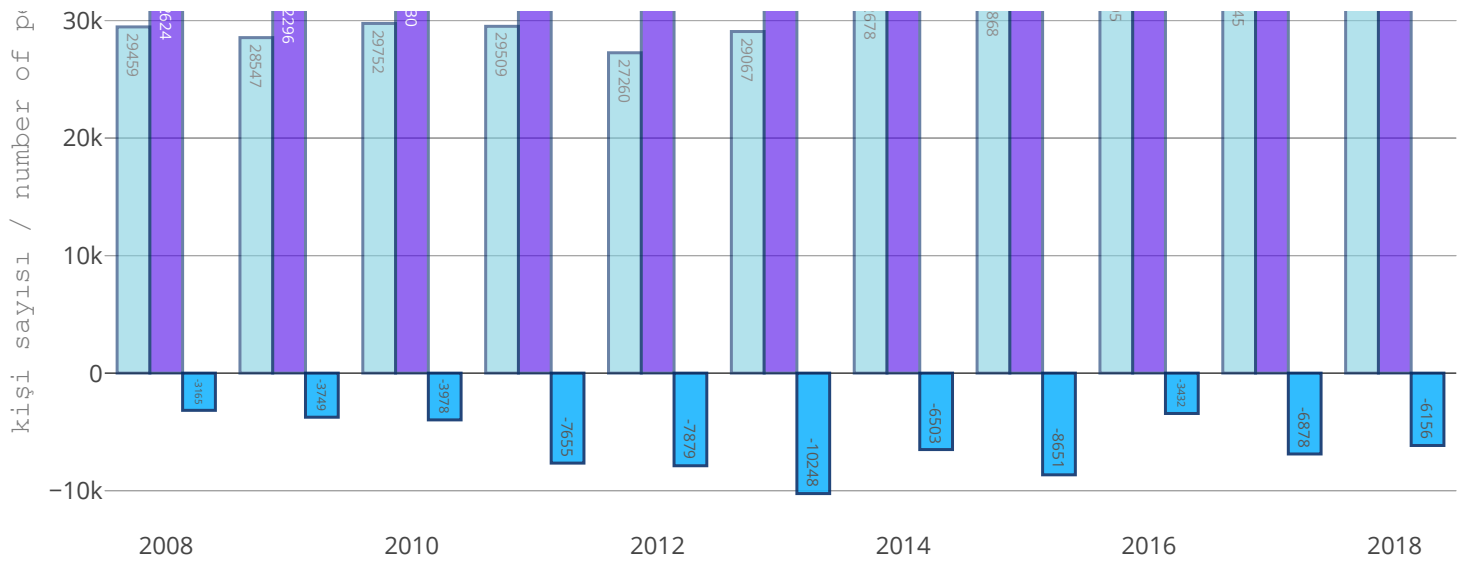


Hakkari

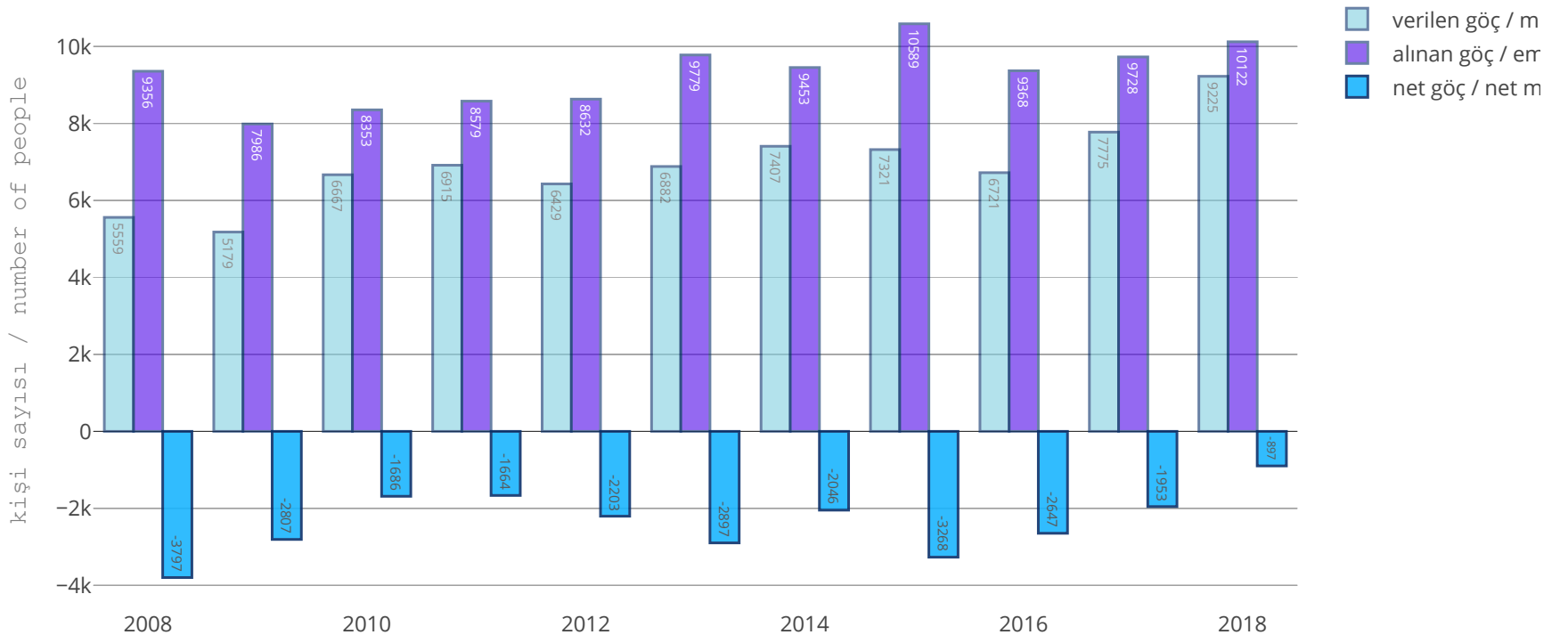


Hatay

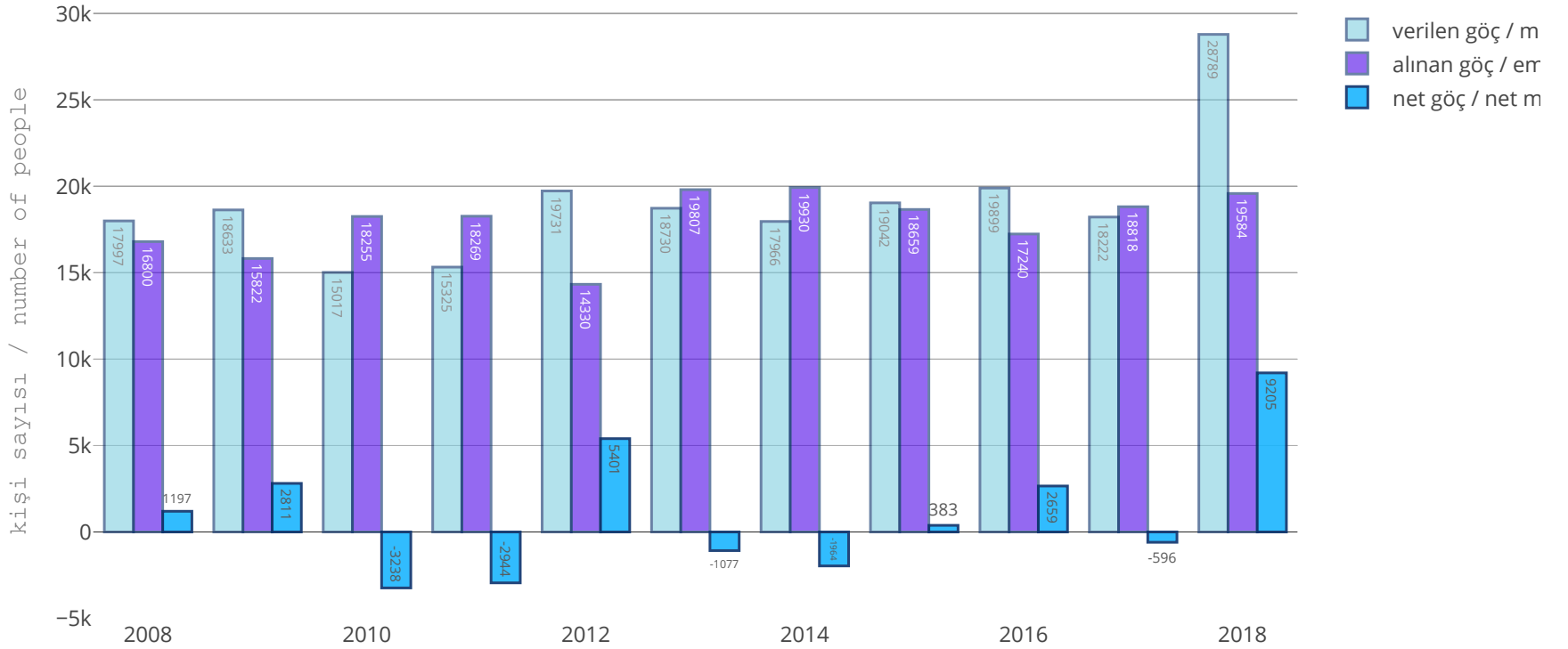




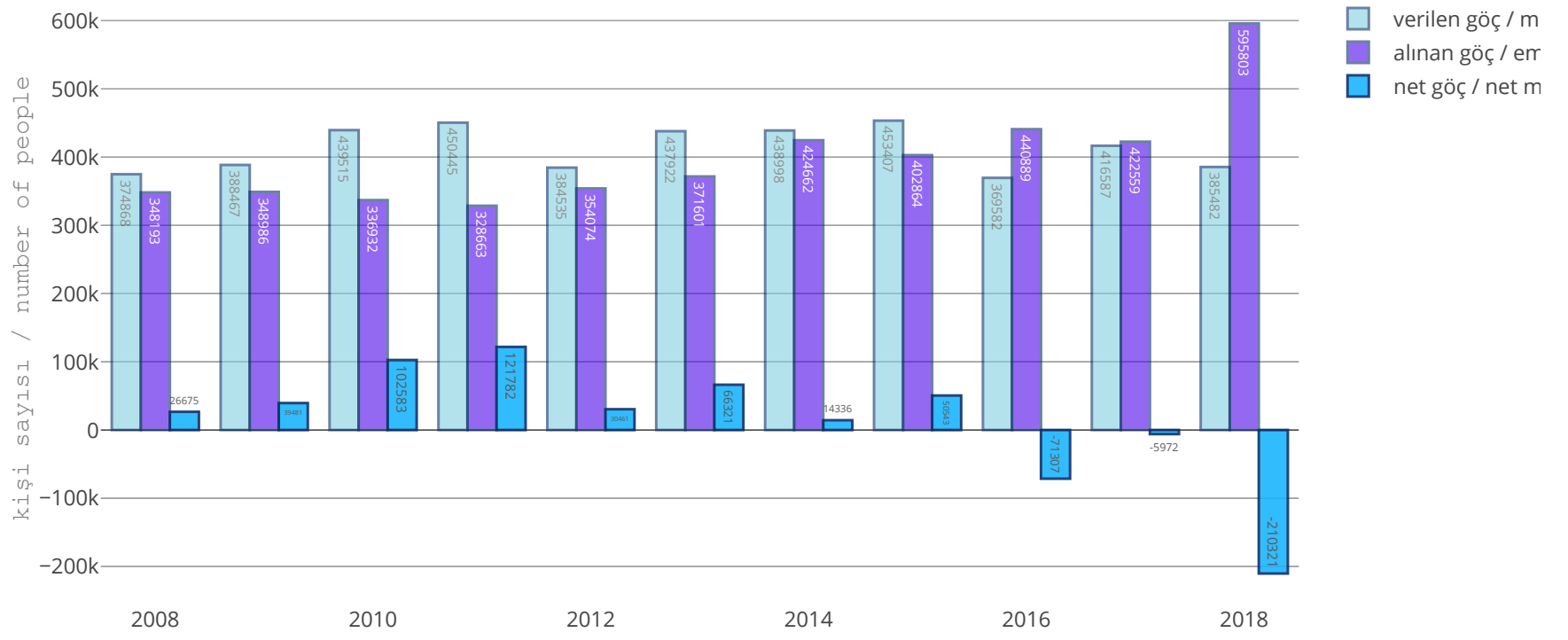
Iğdır



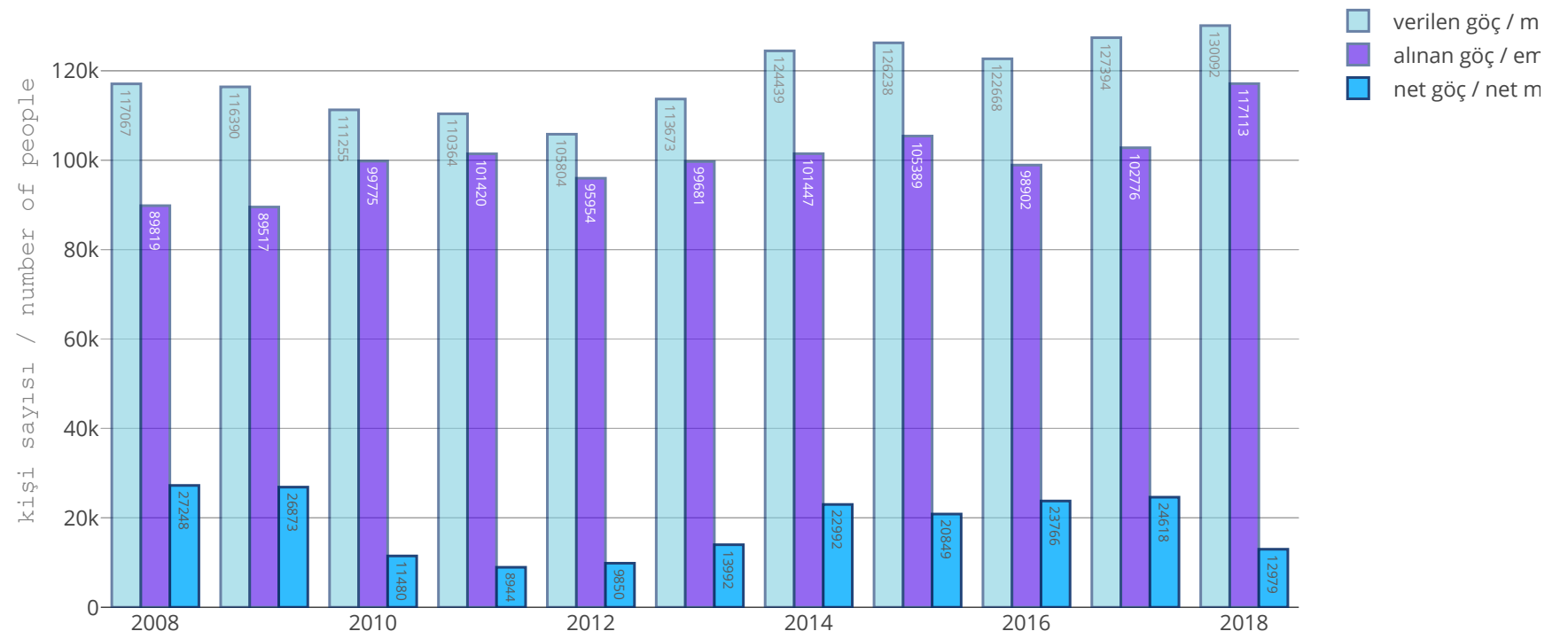
Isparta



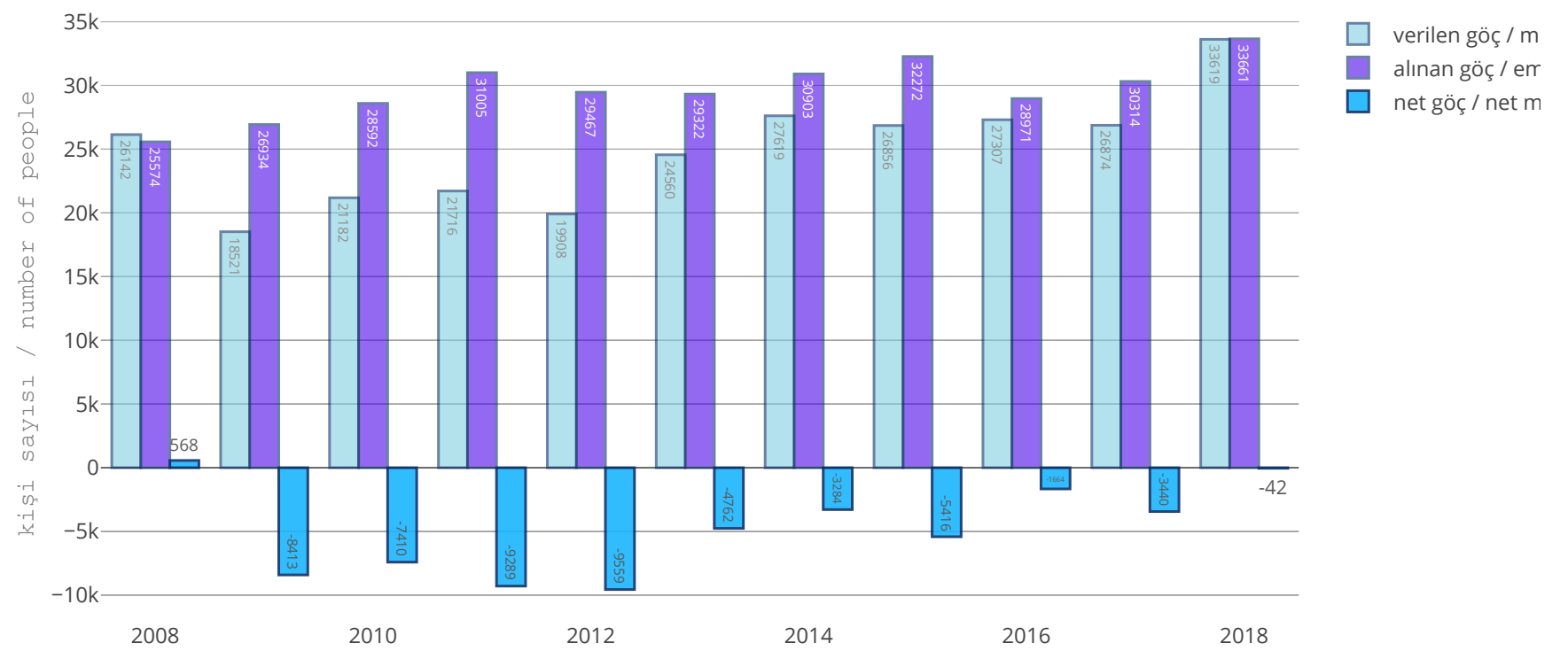
İstanbul



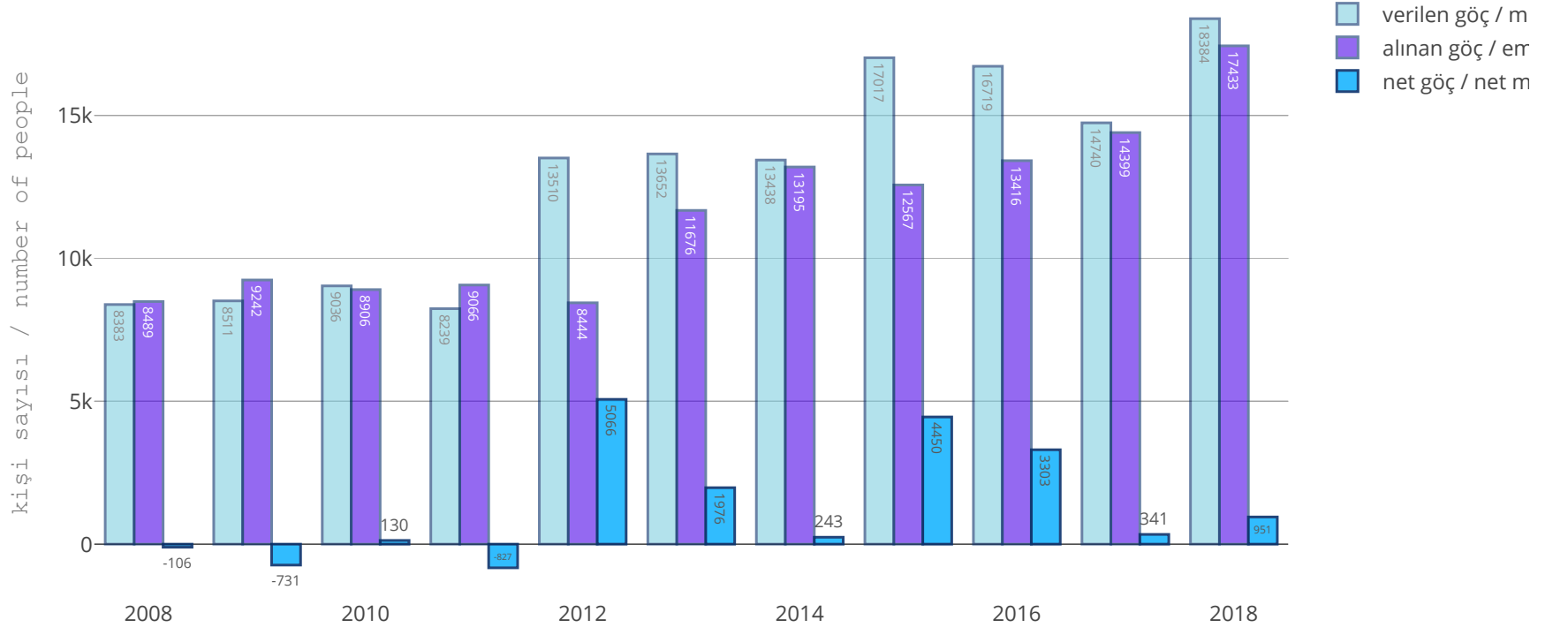
Izmir



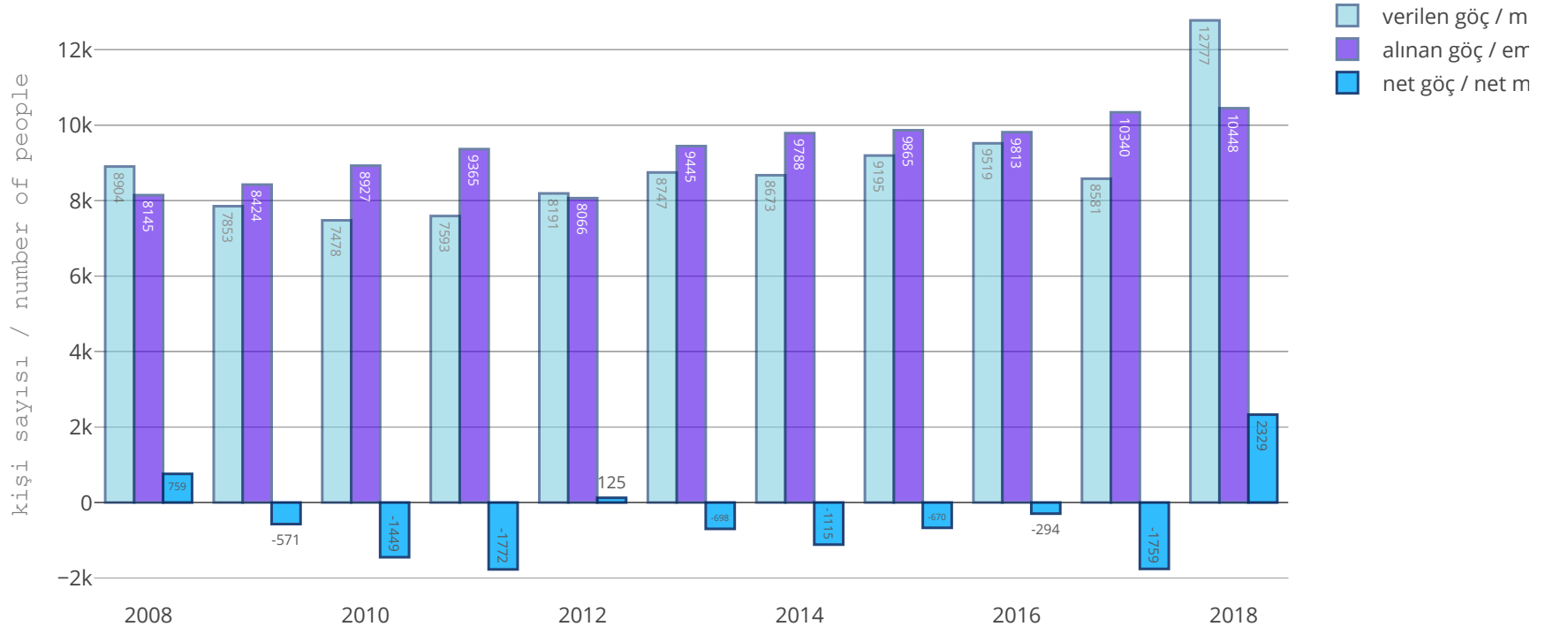
Kahramanmaraş



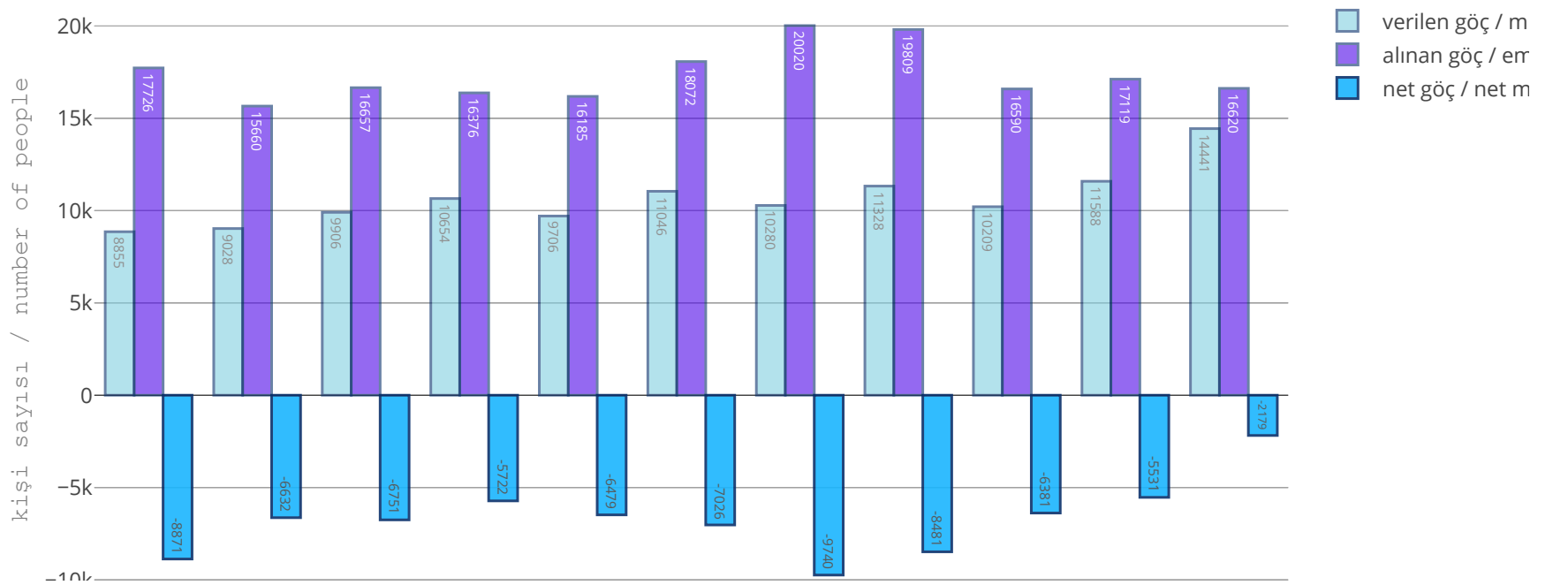
Karabük

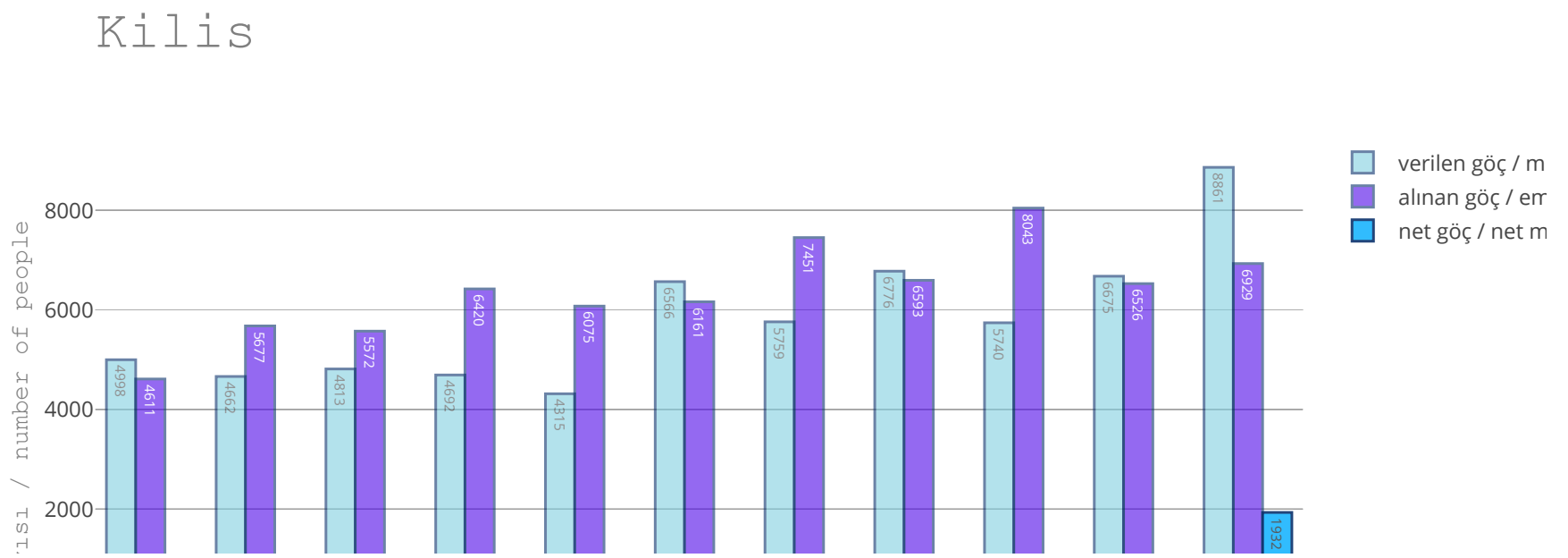
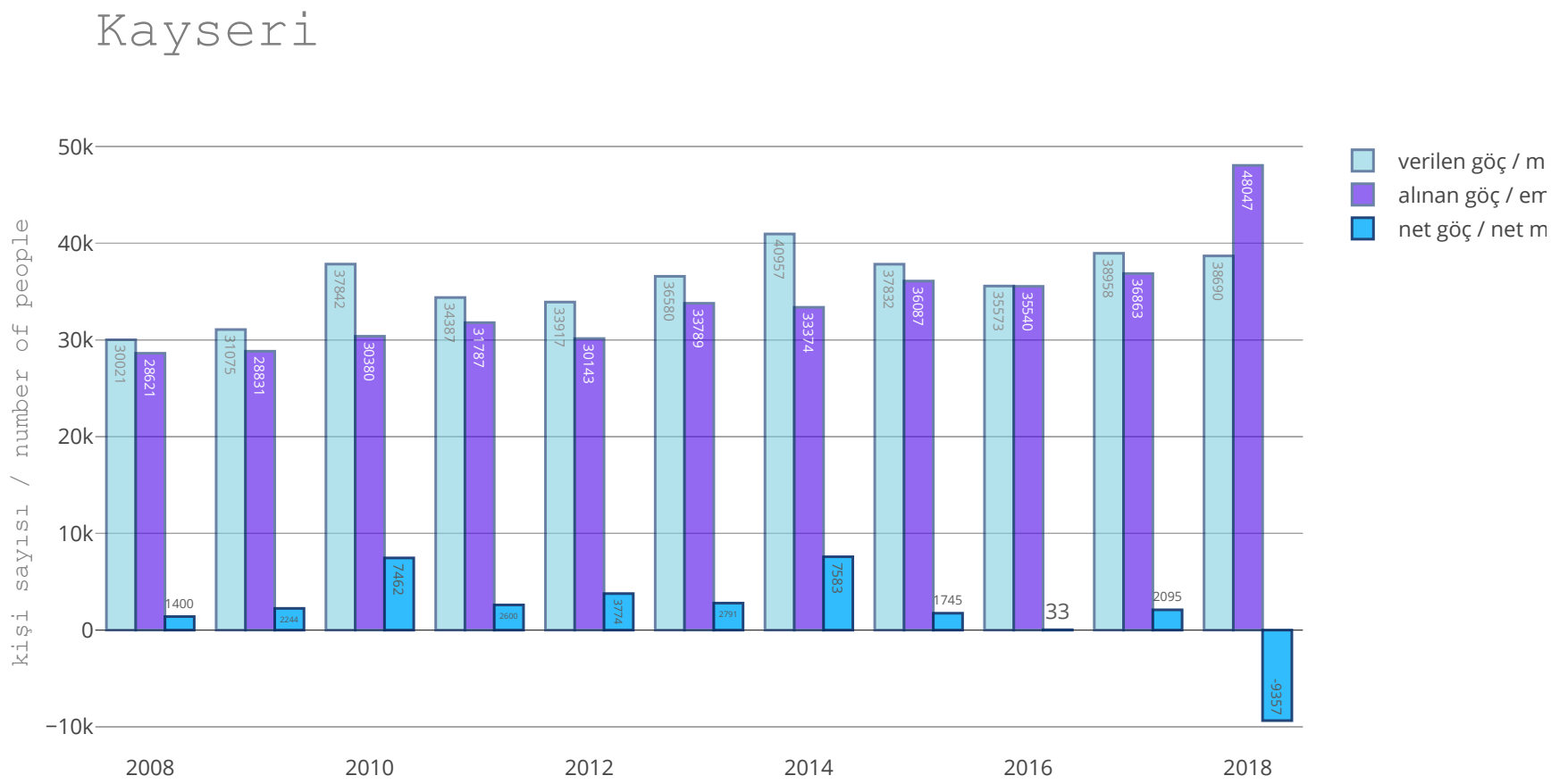
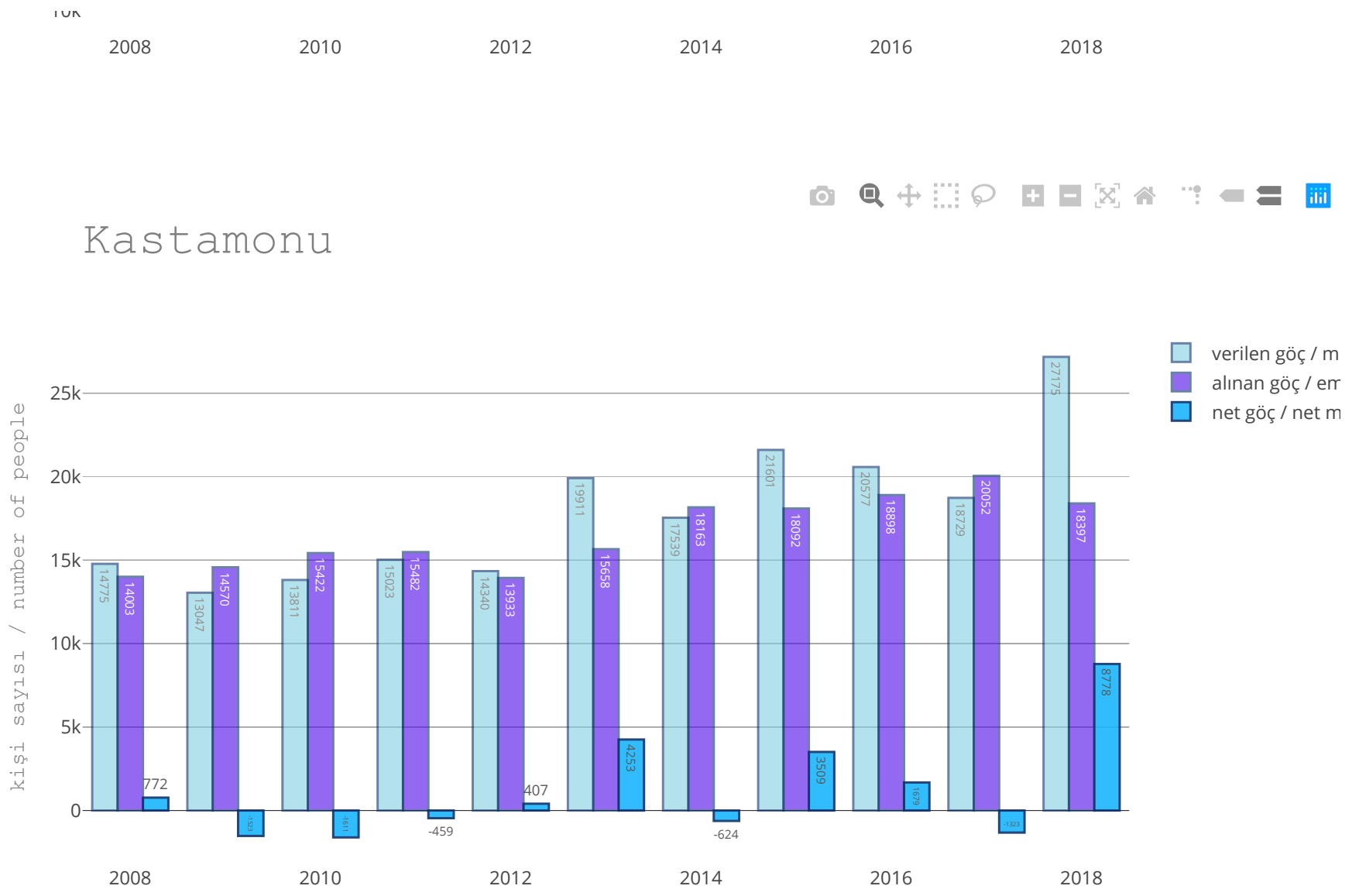


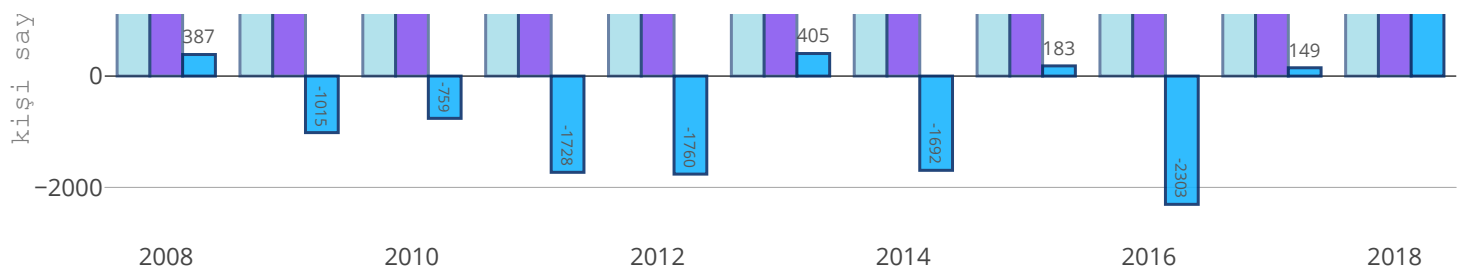
Karaman



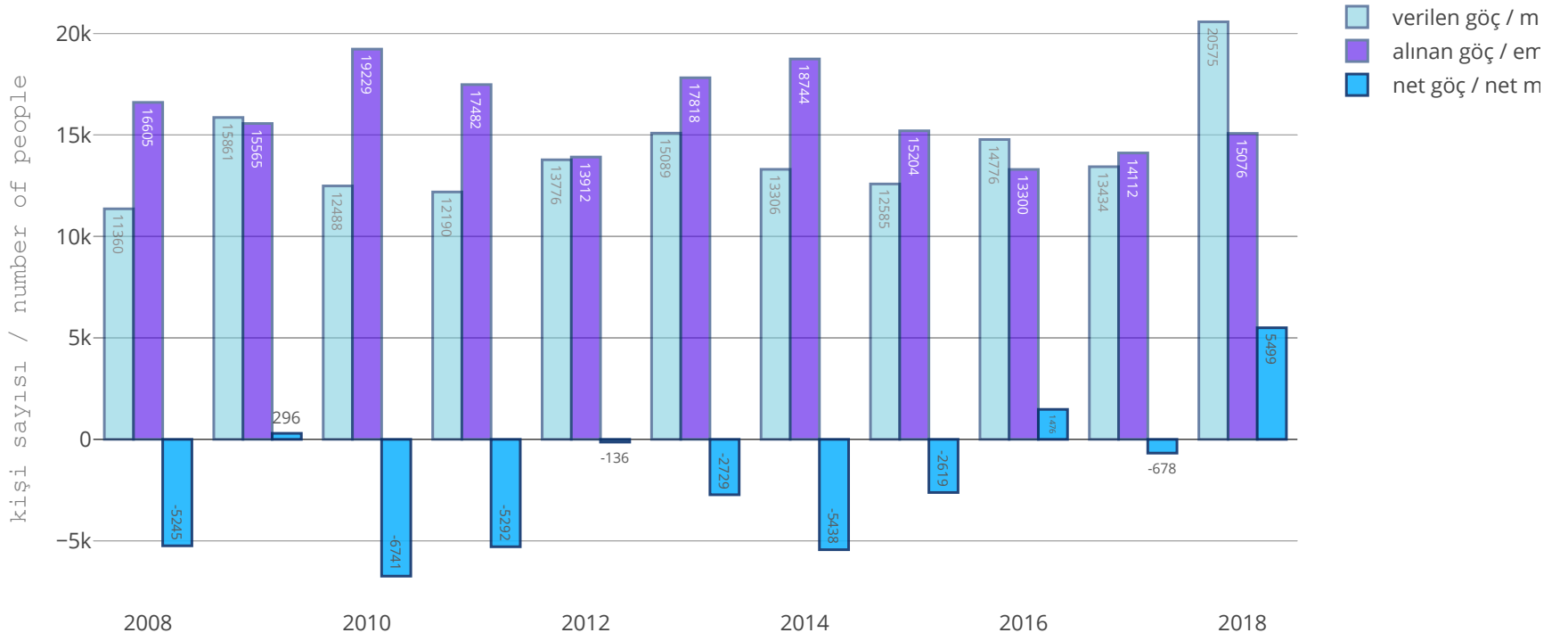
Kars



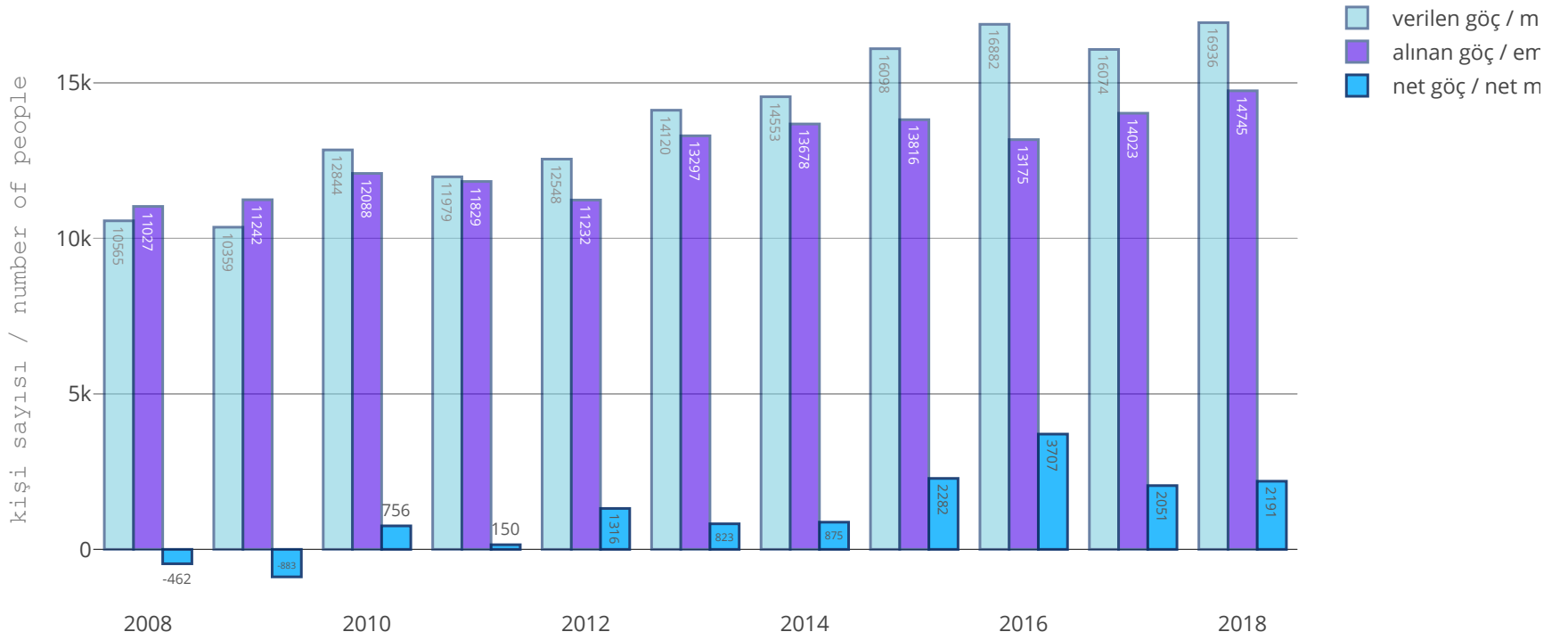




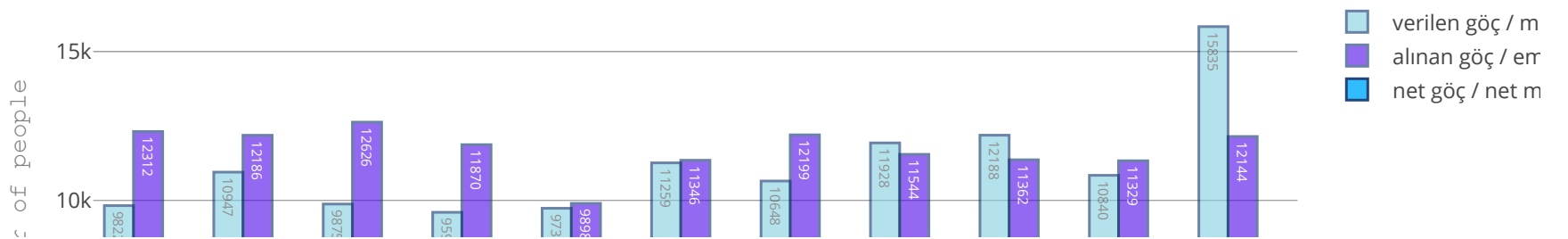
Kırıkkale

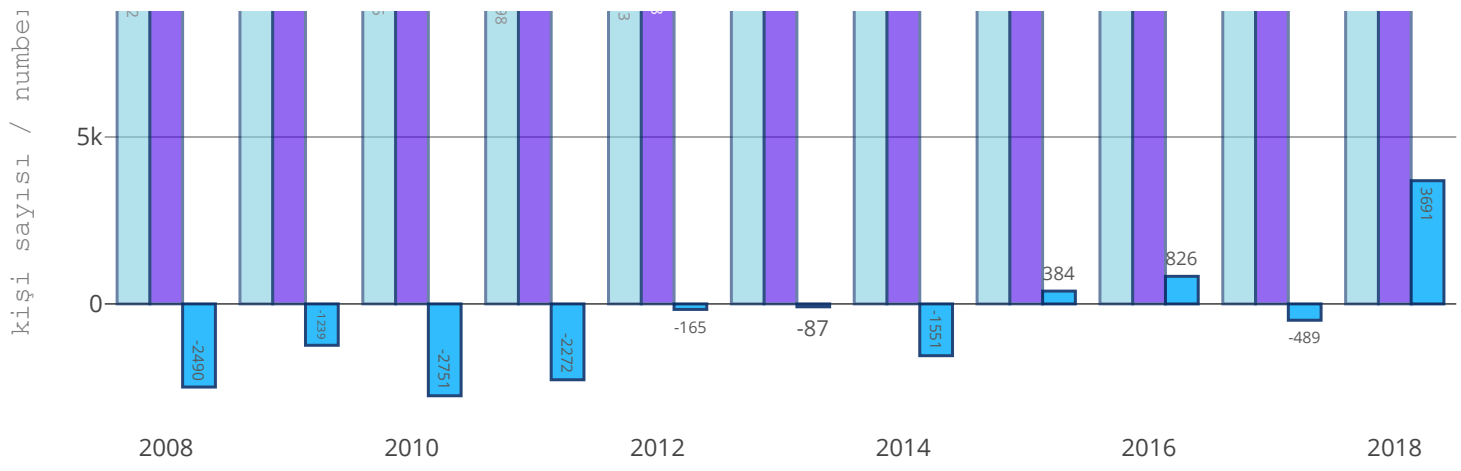


Kırklareli

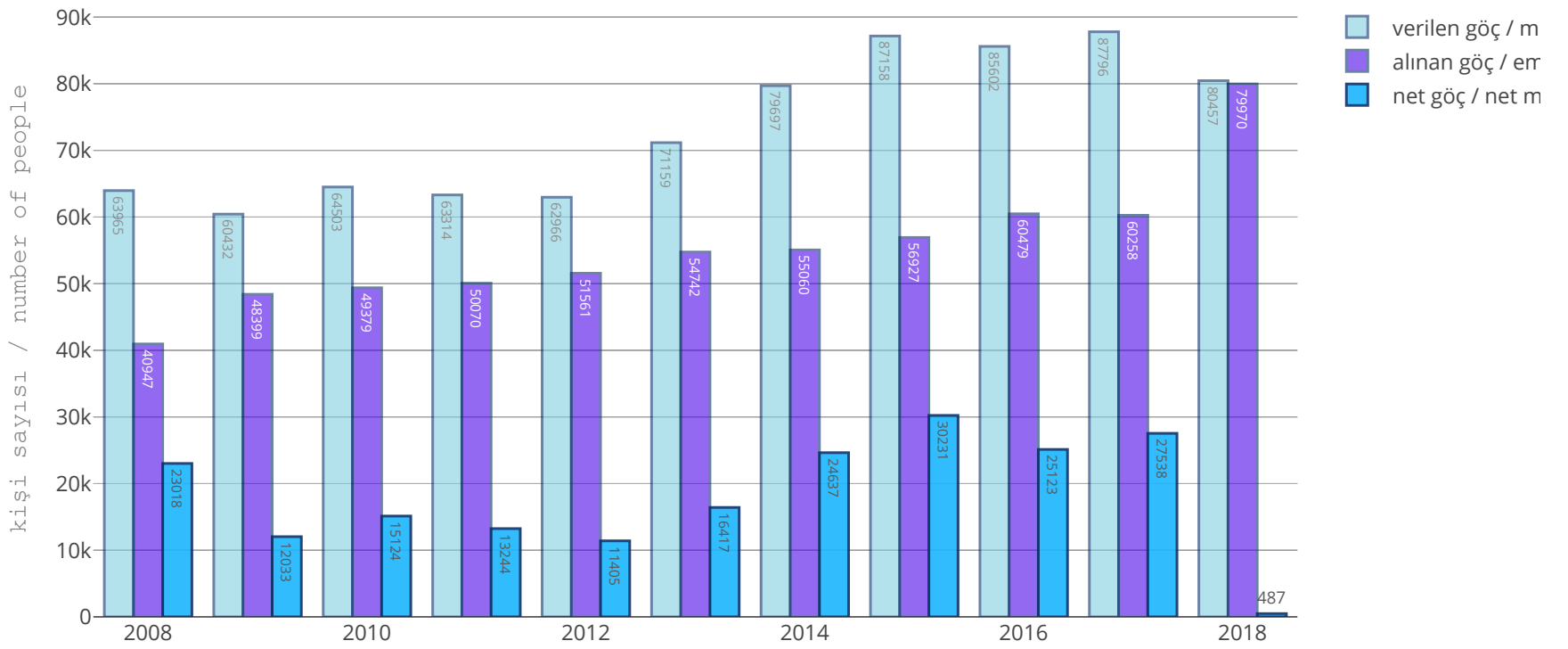


Kırşehir

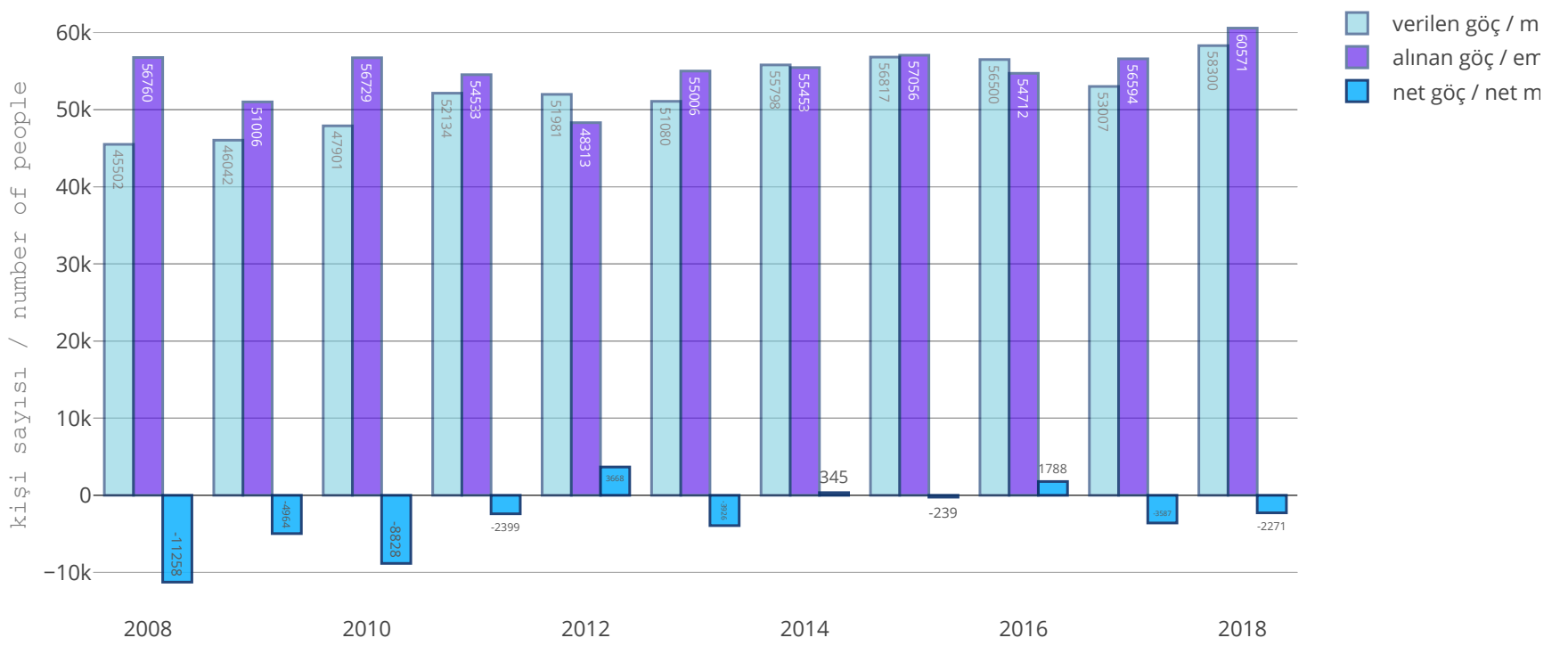




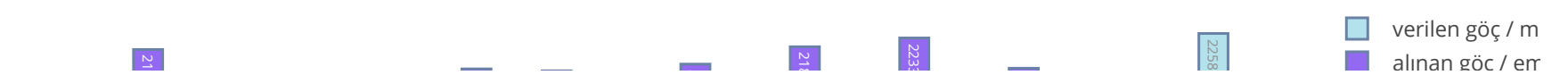
Kocaeli

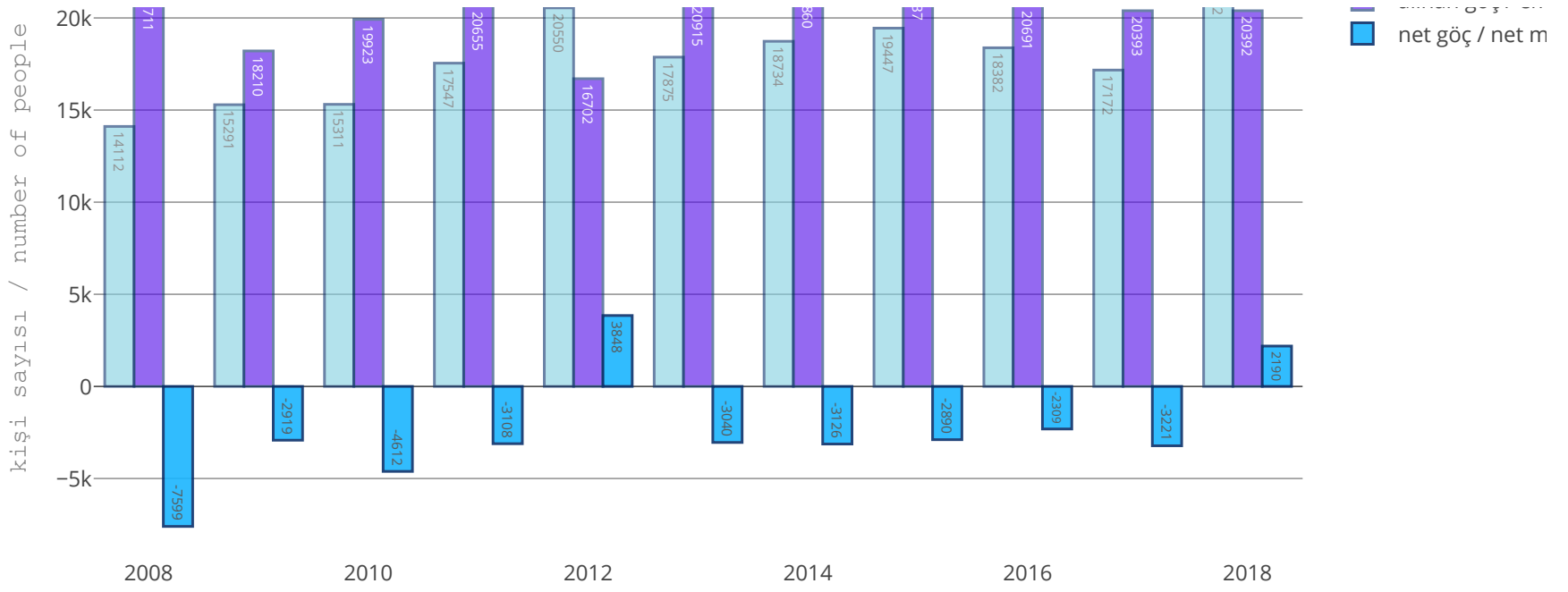


Konya

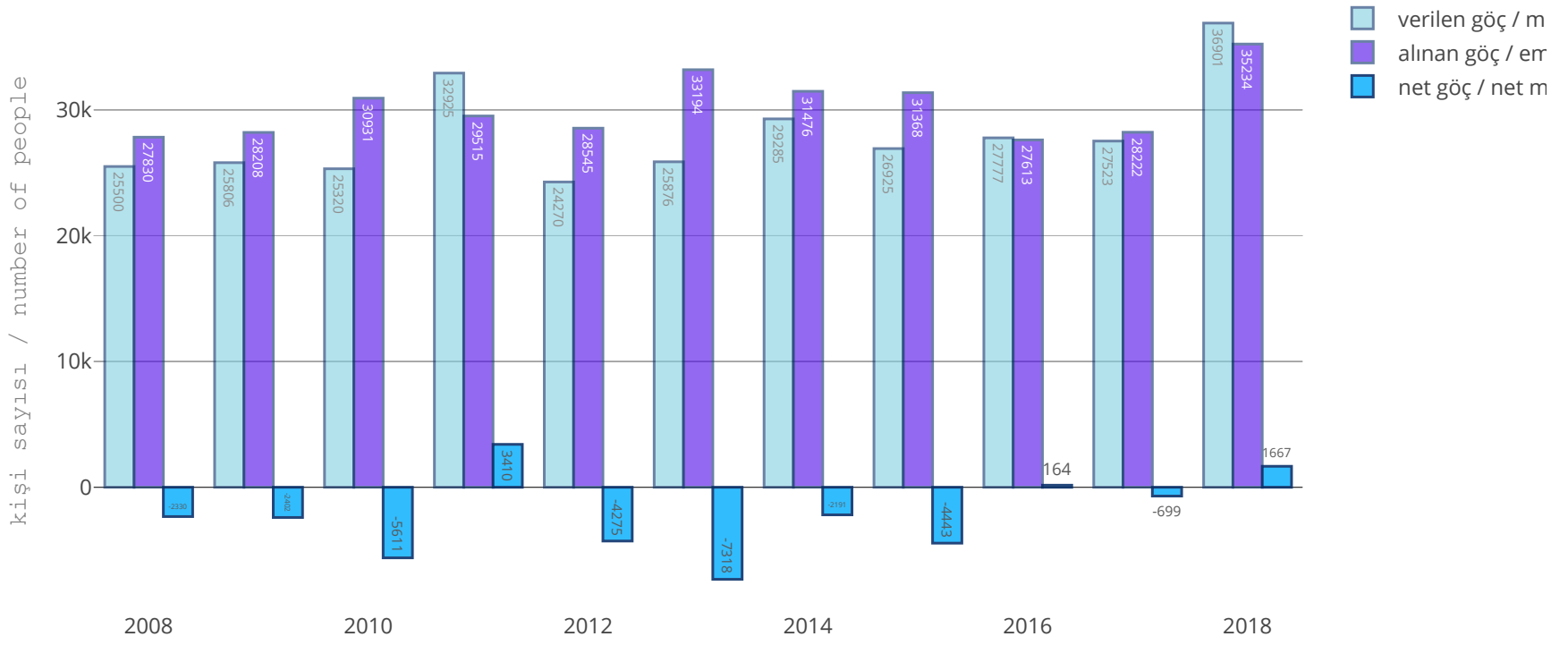


Kütahya

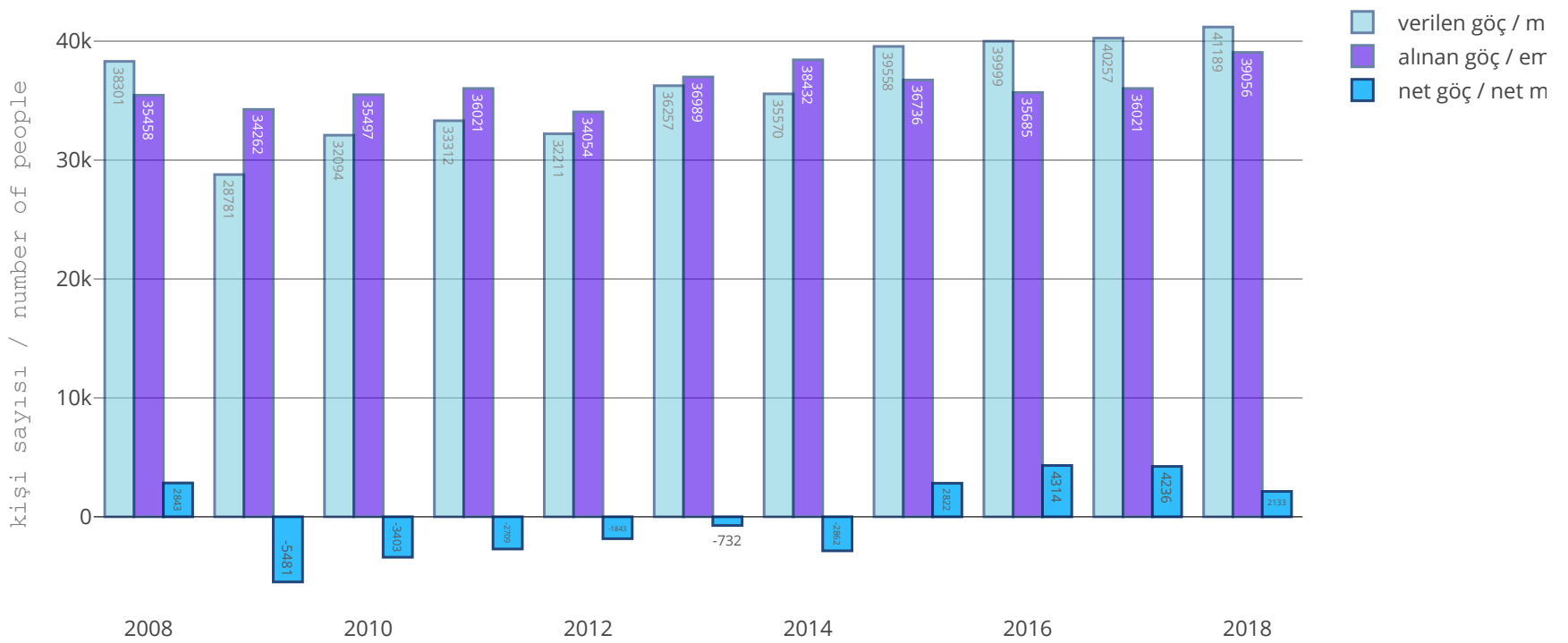




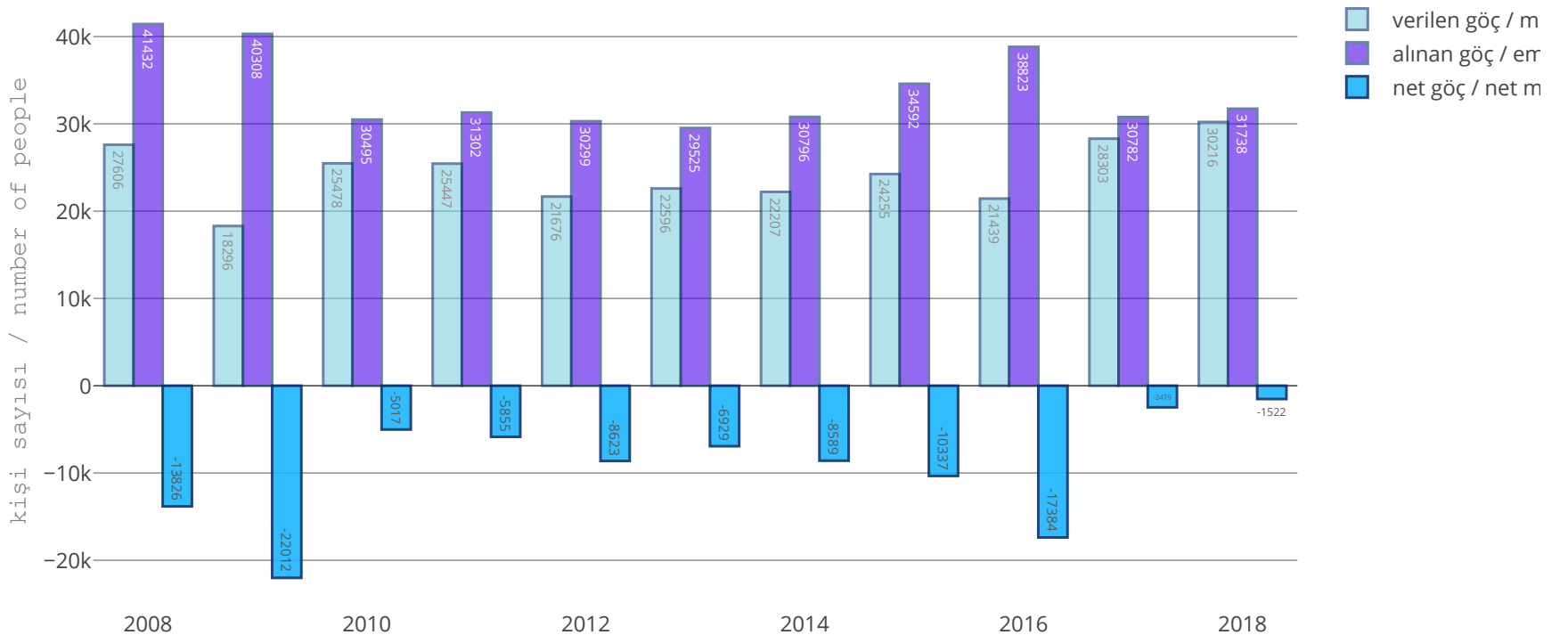
Malatya



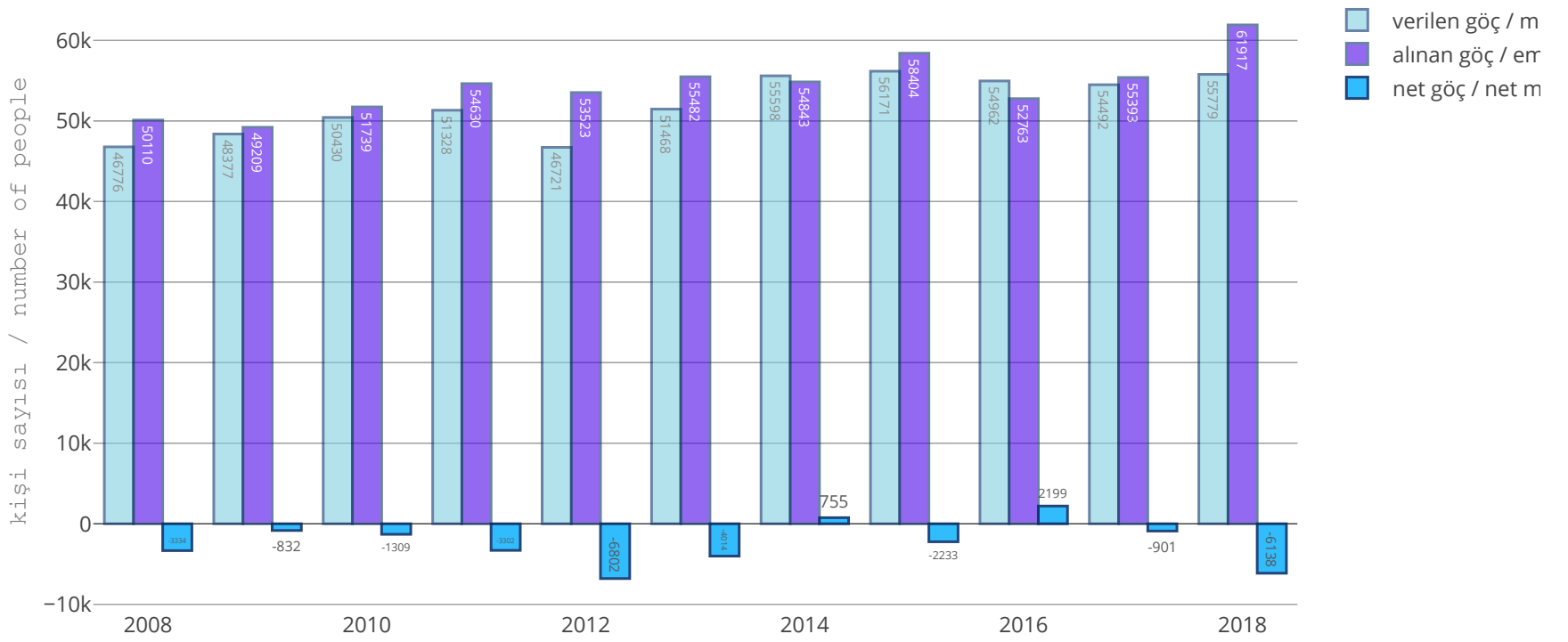
Manisa



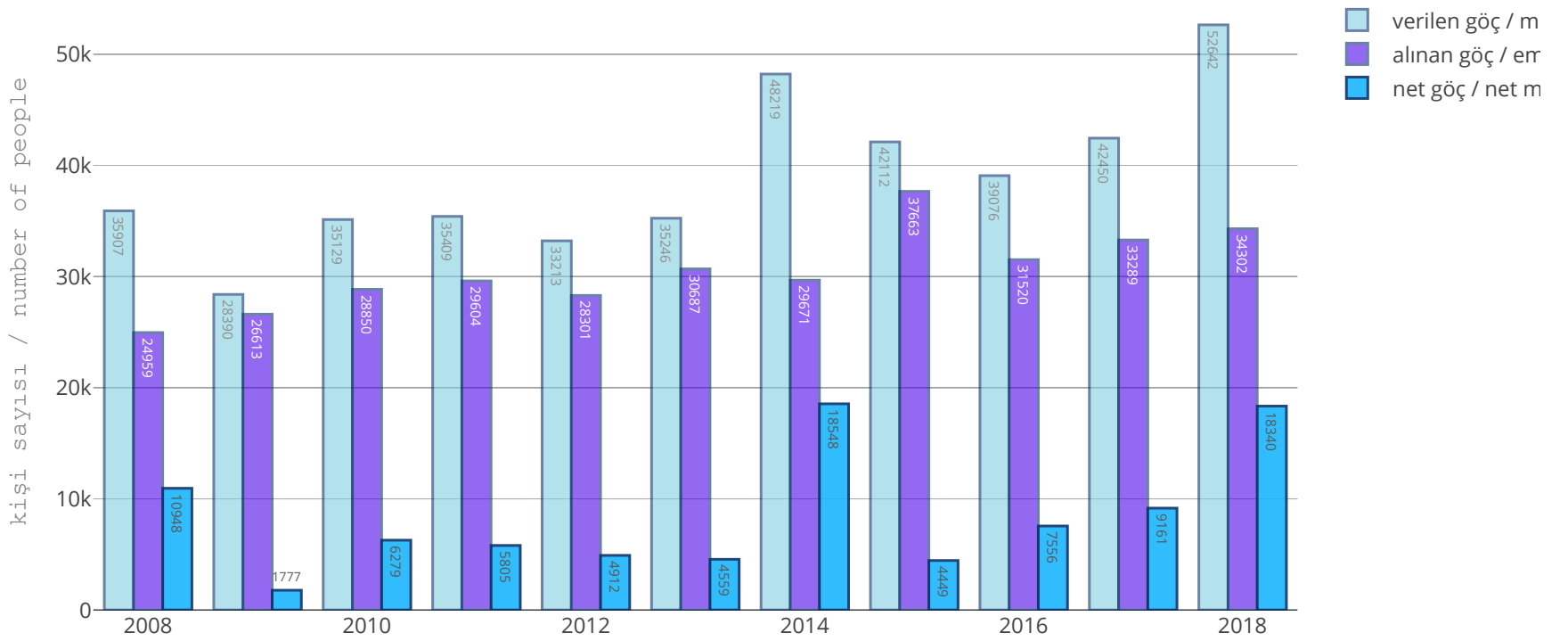
Malatya



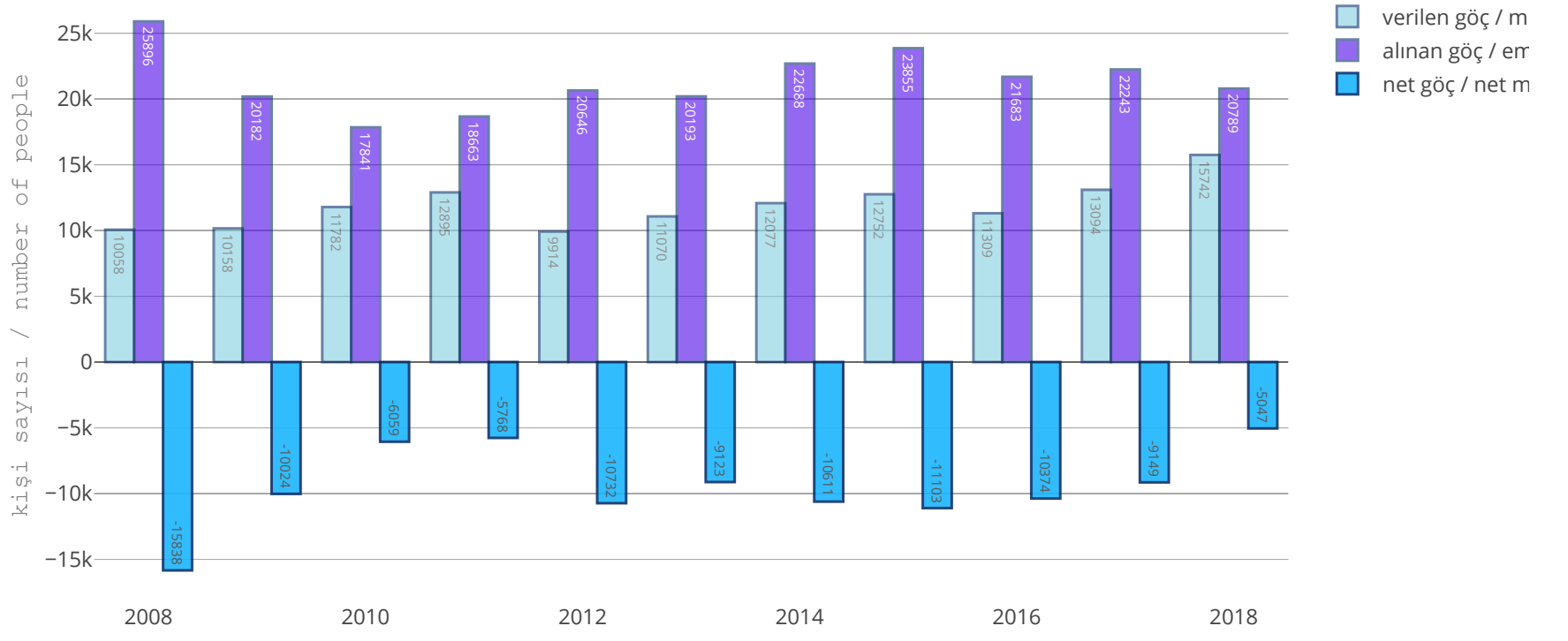
Mersin



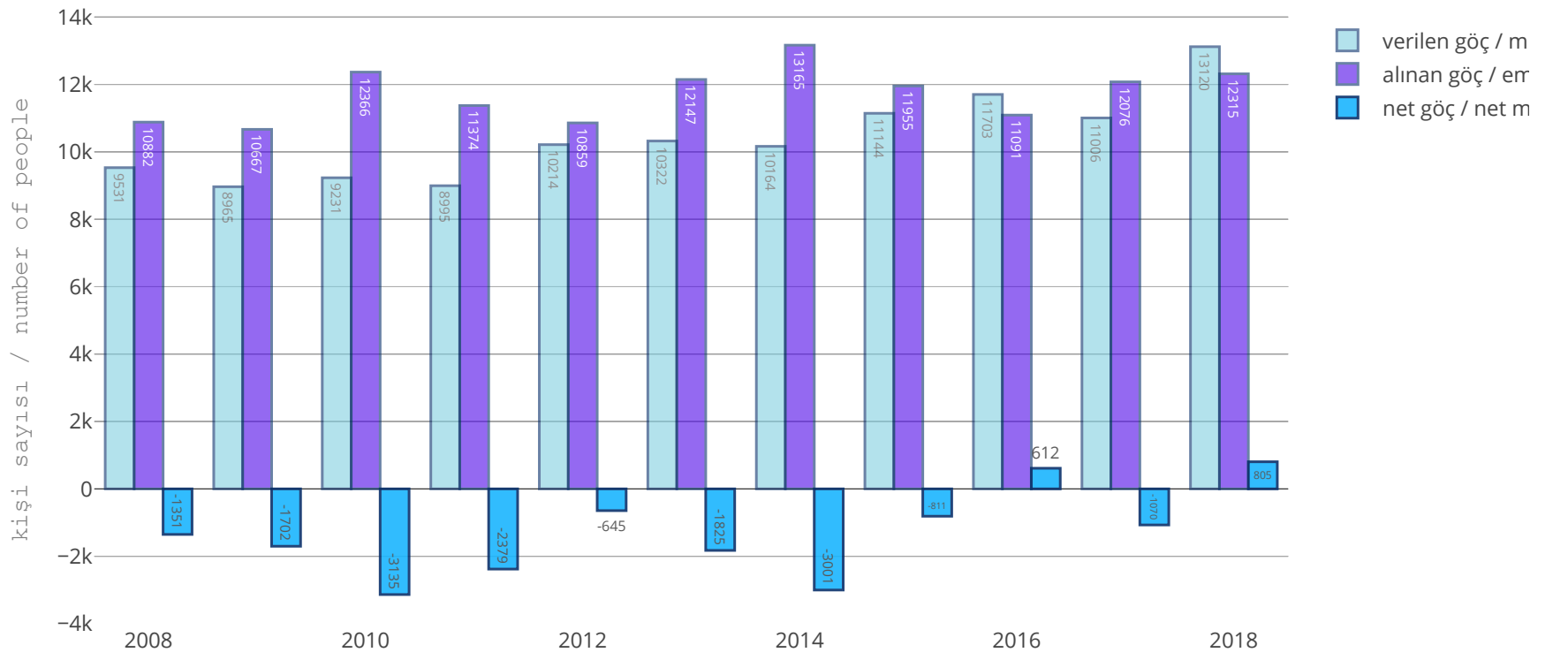
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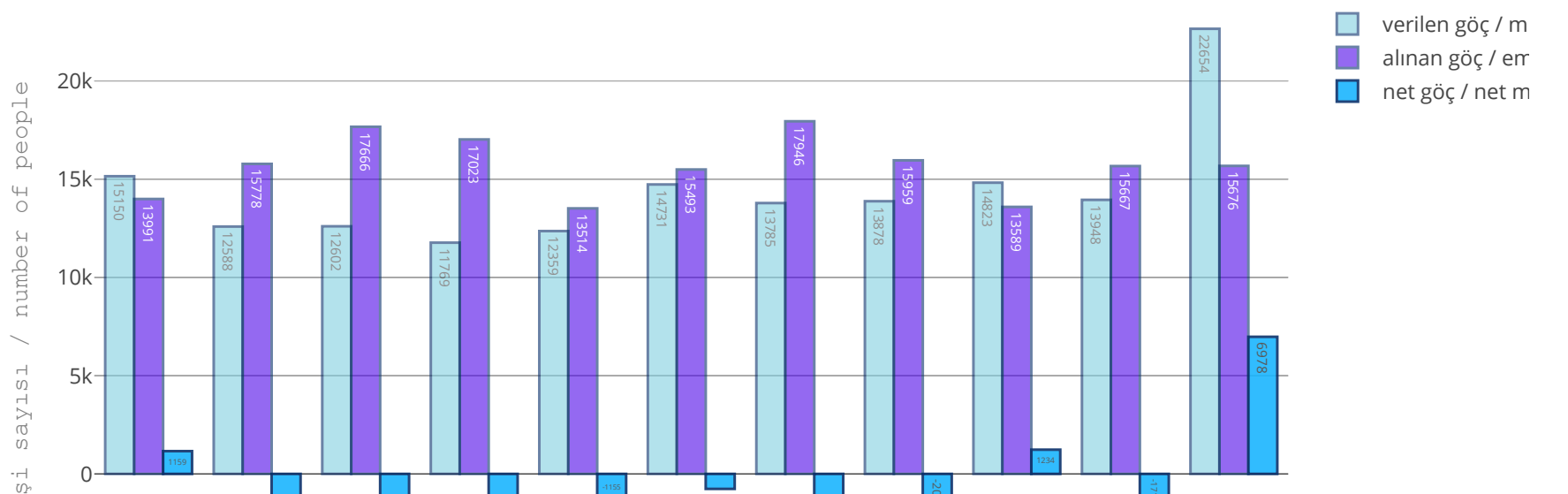
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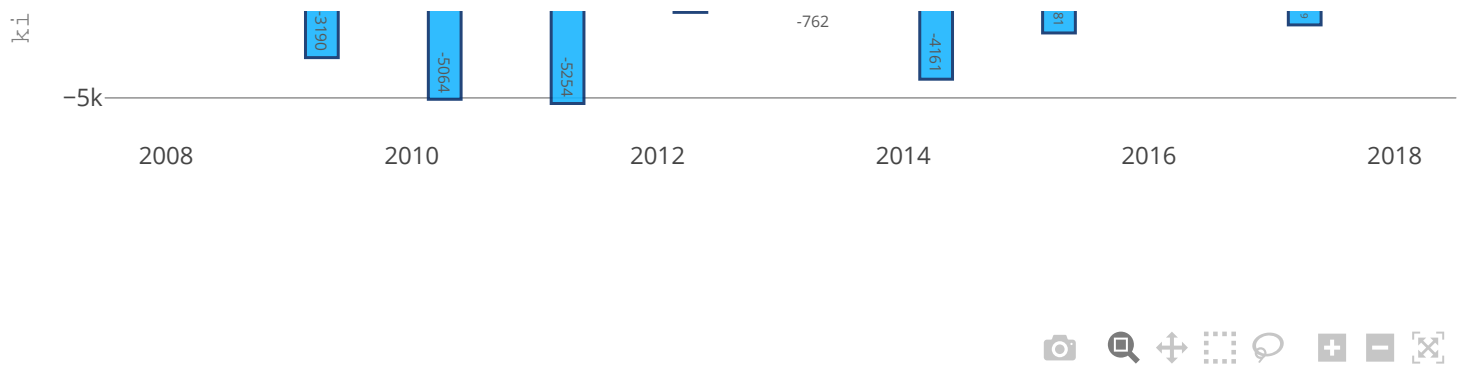


Nevşehir

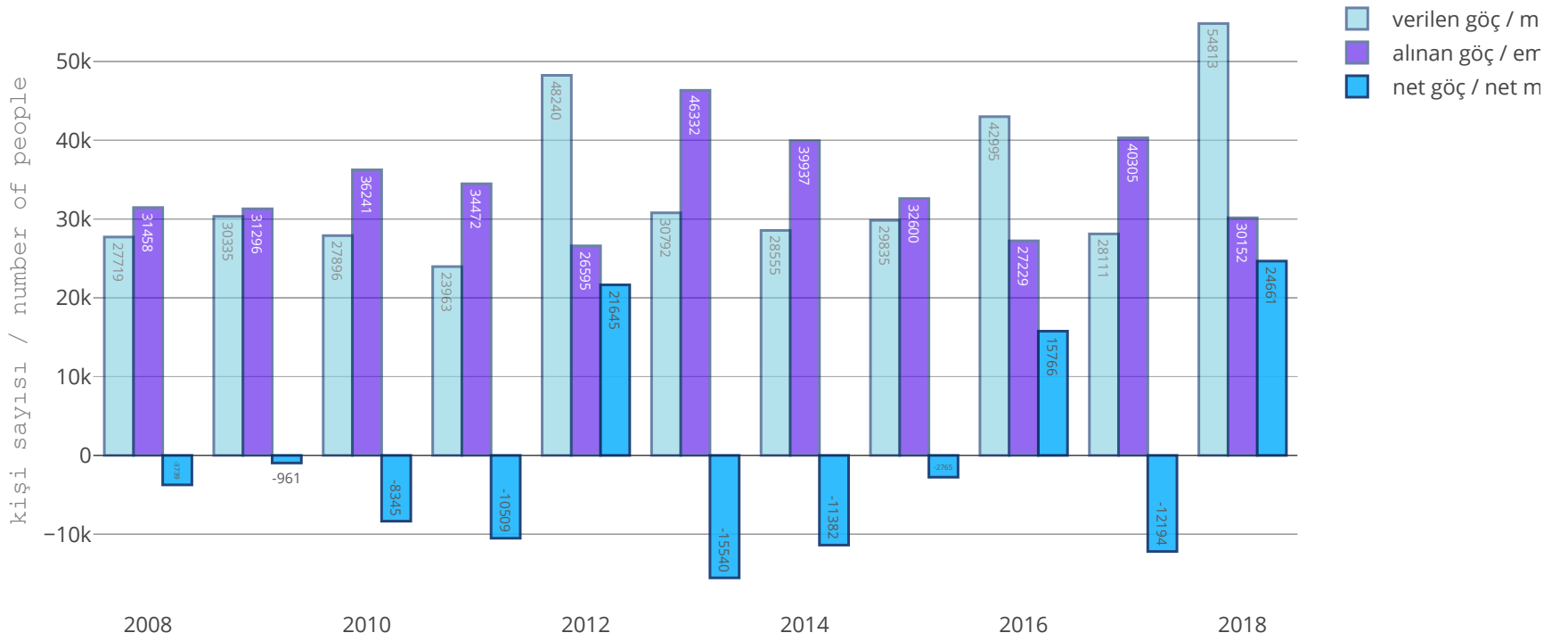


Niğde

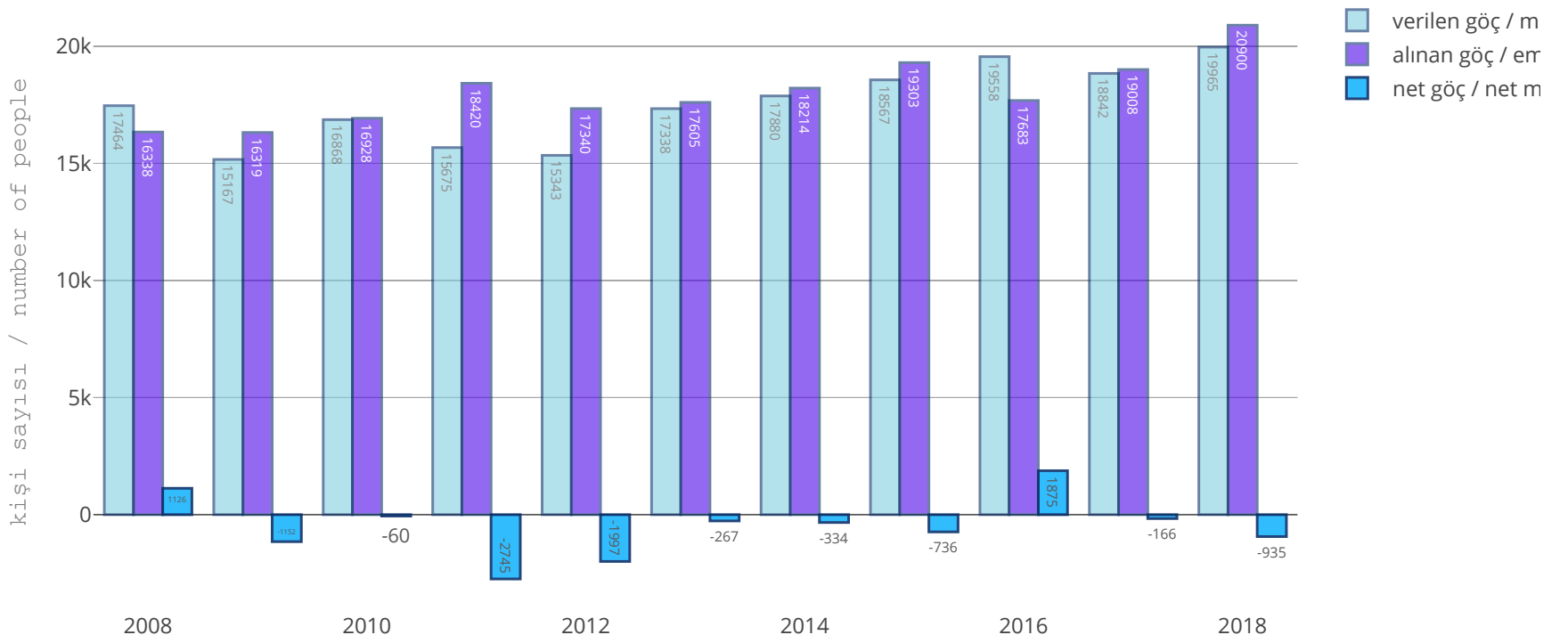




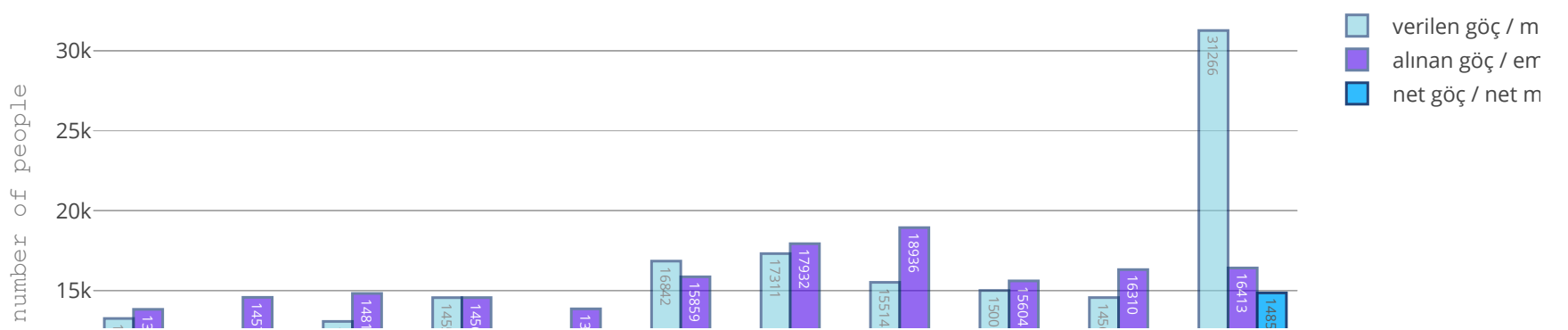
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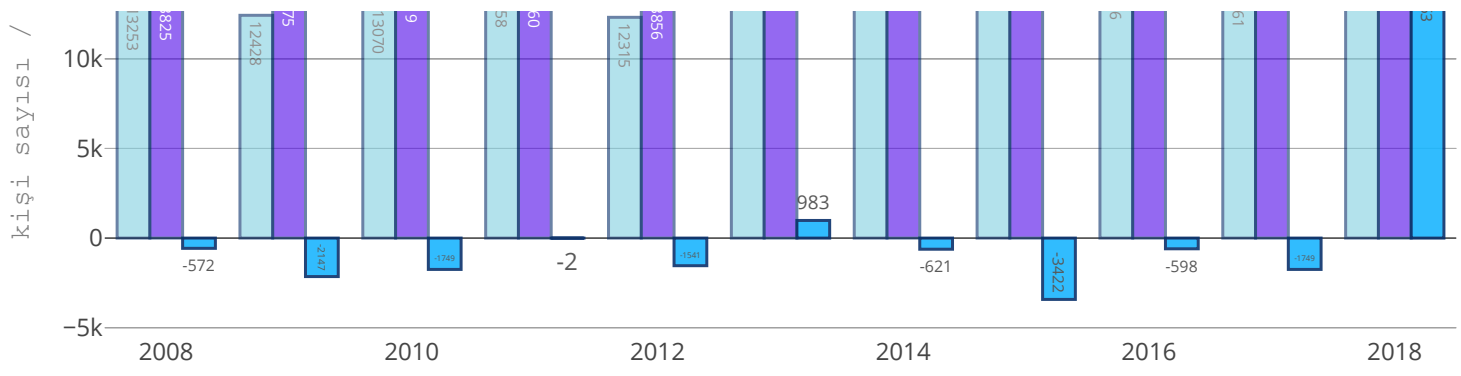


Osmaniye

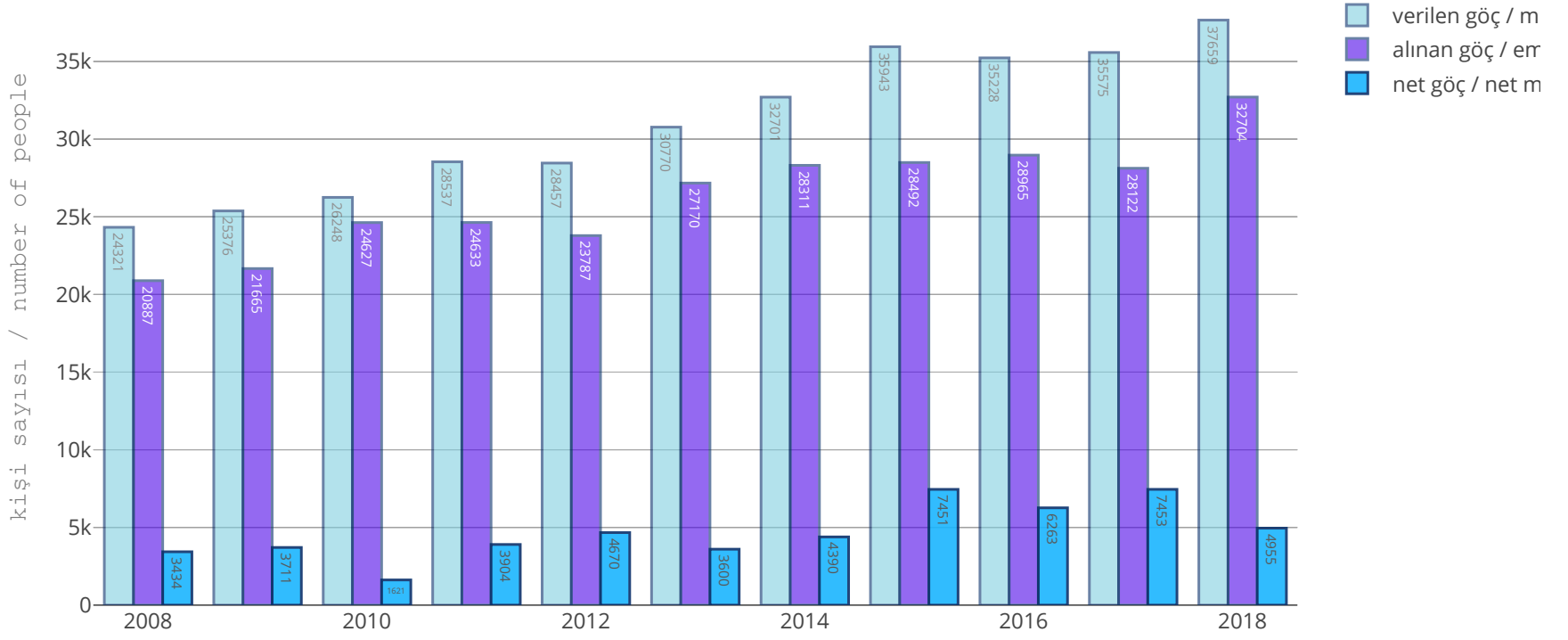


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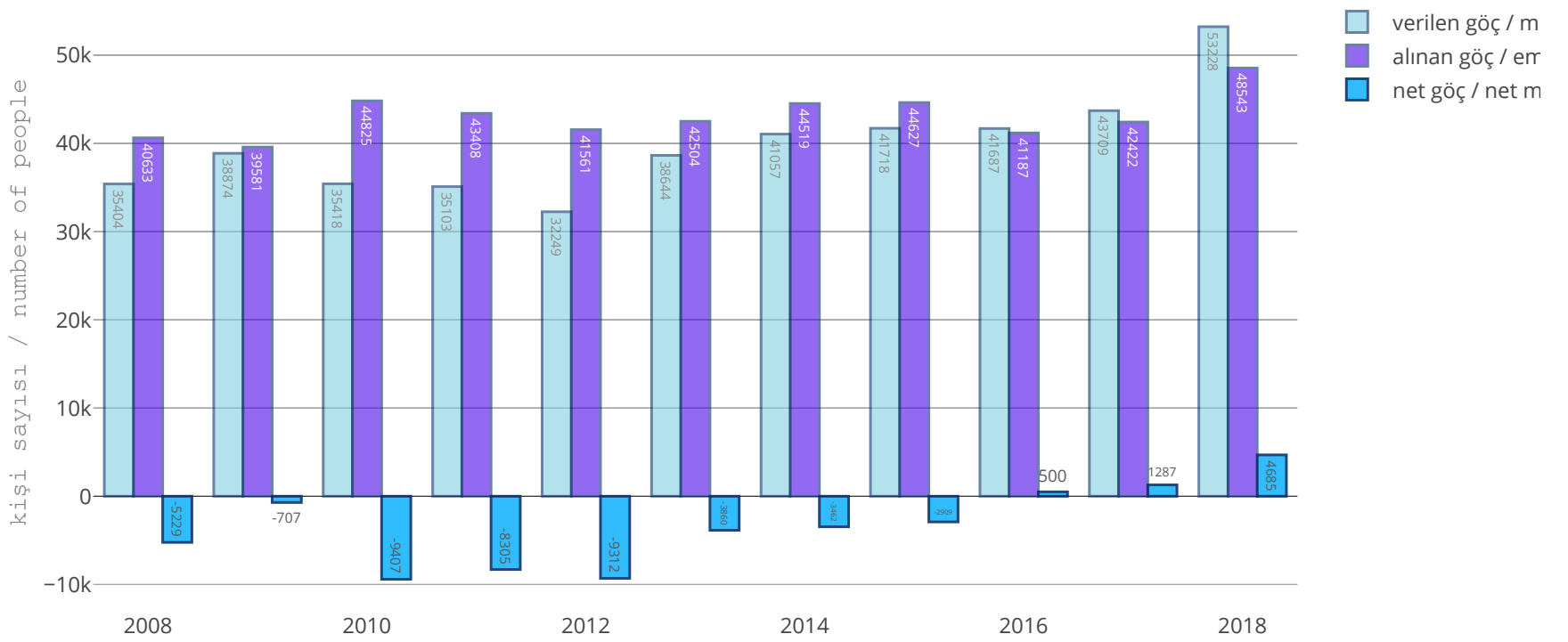




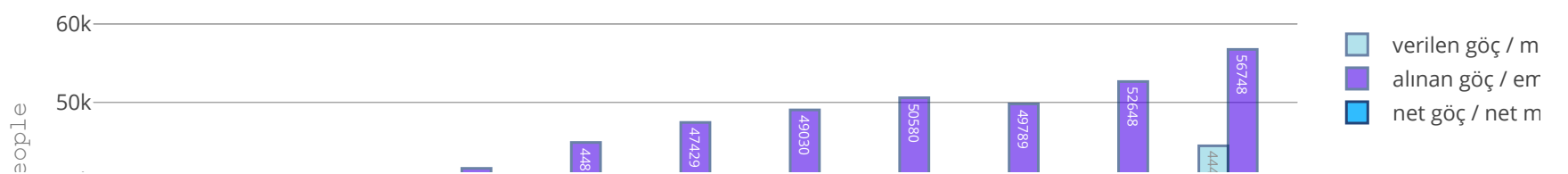
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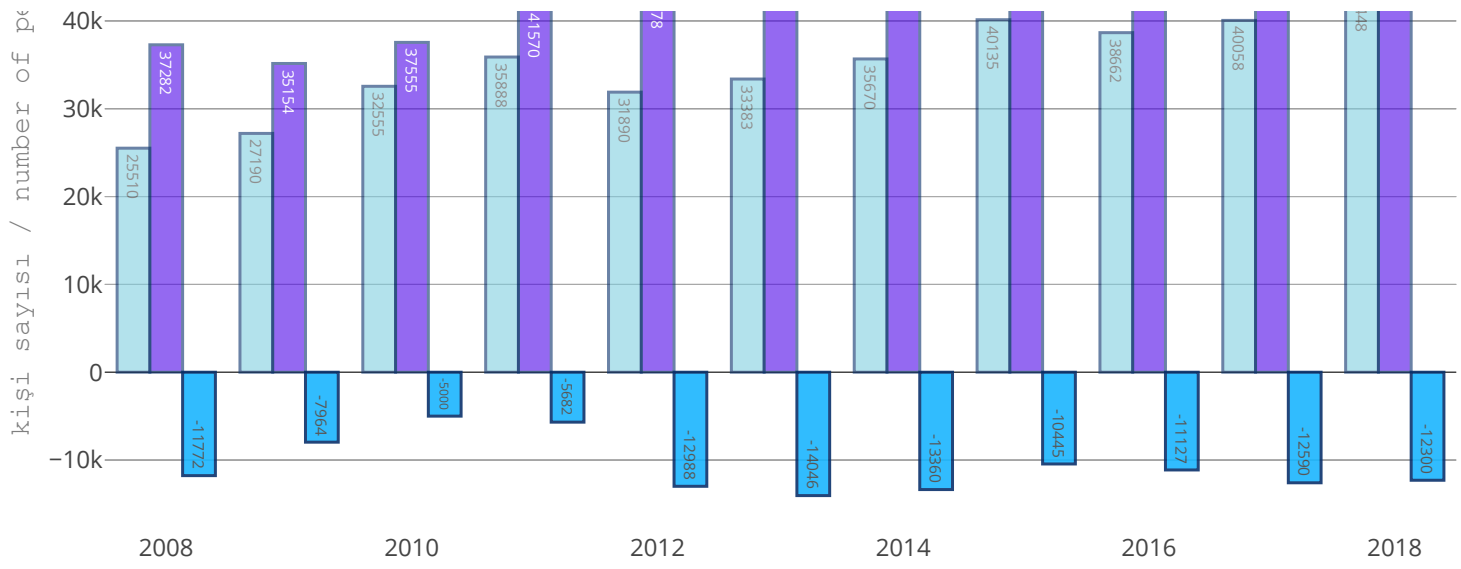


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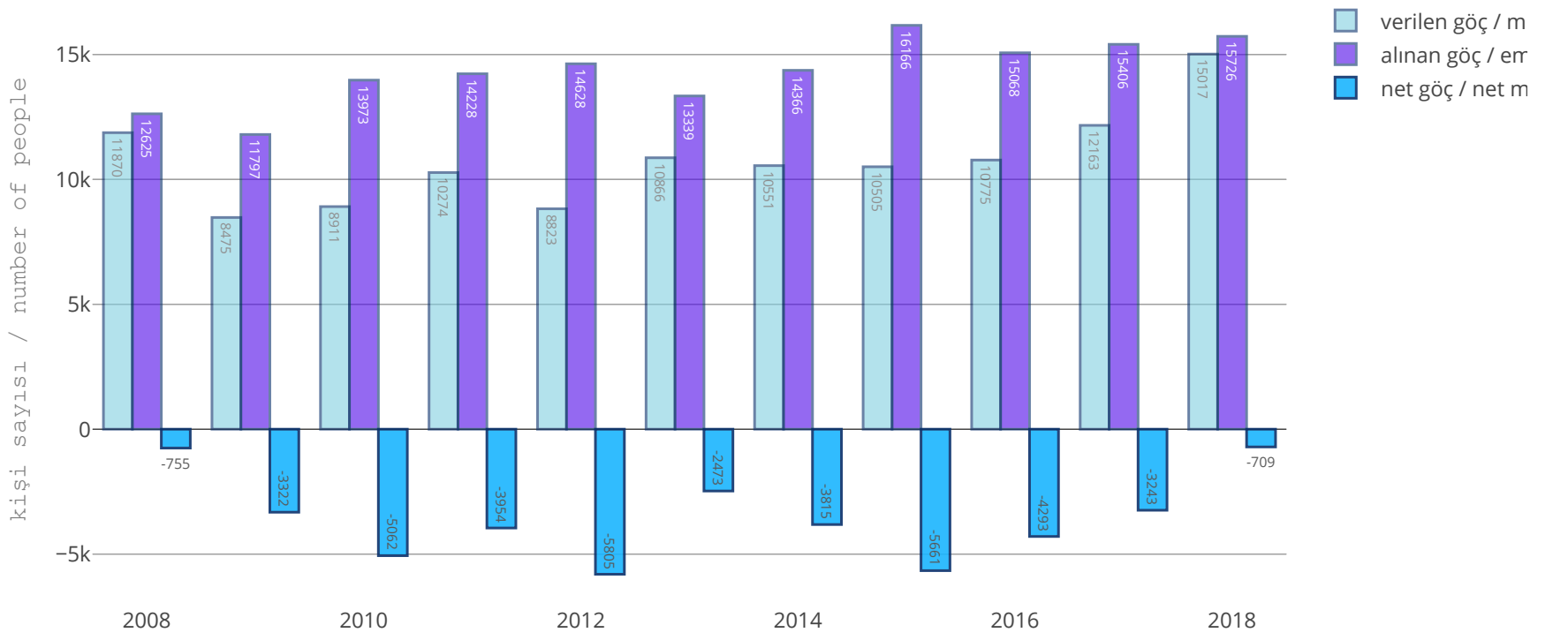


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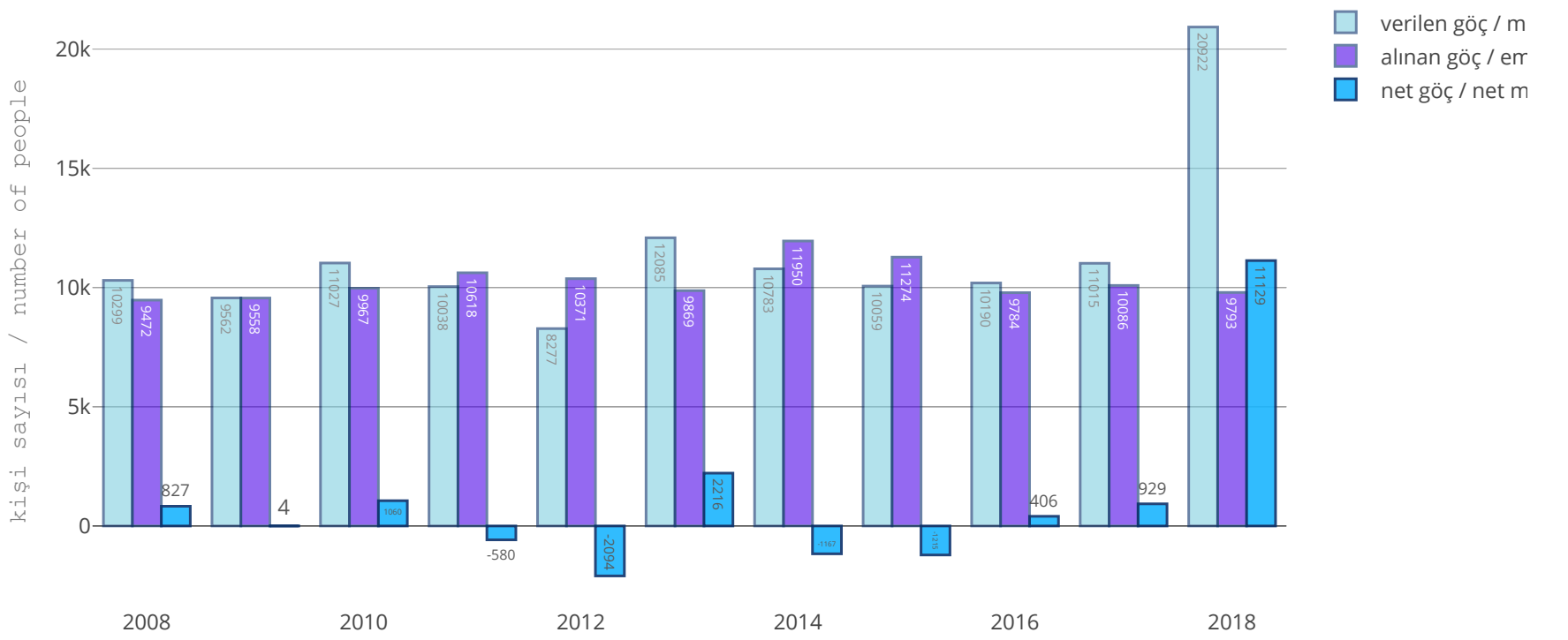




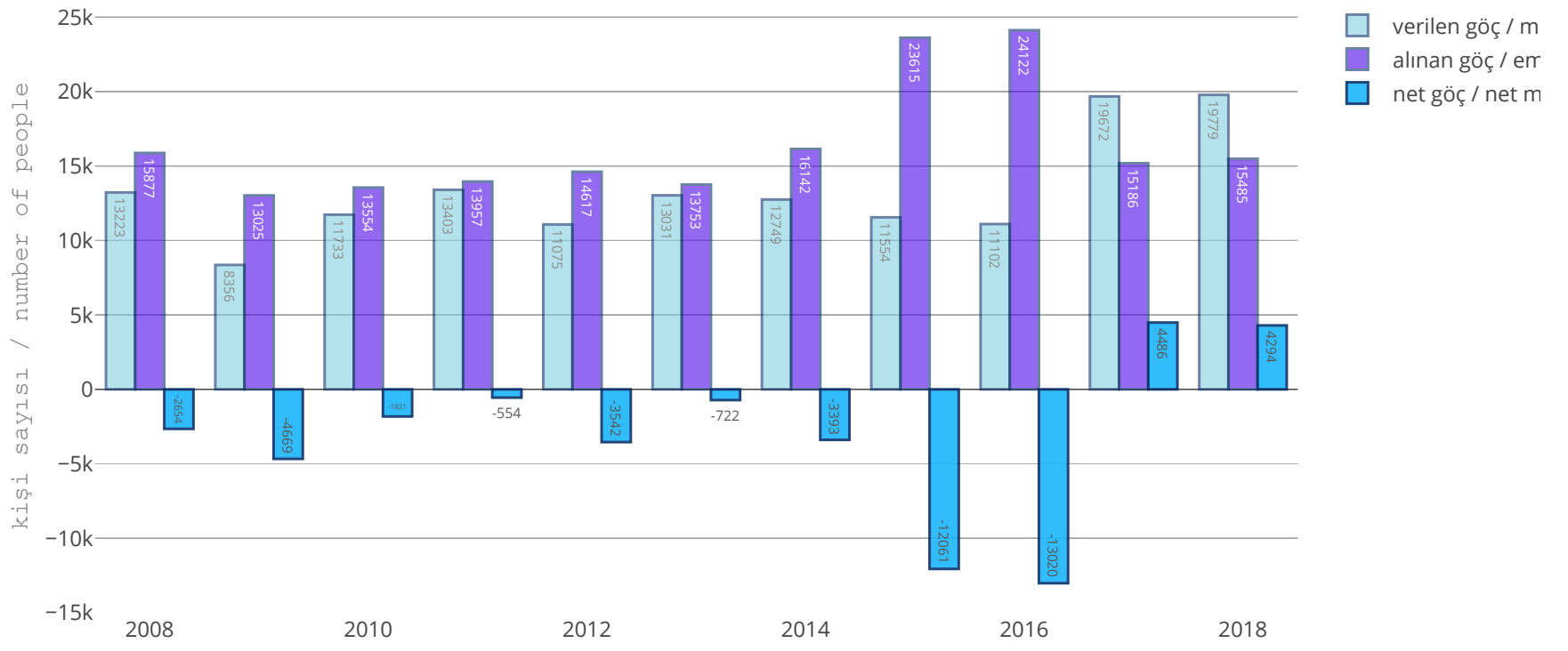
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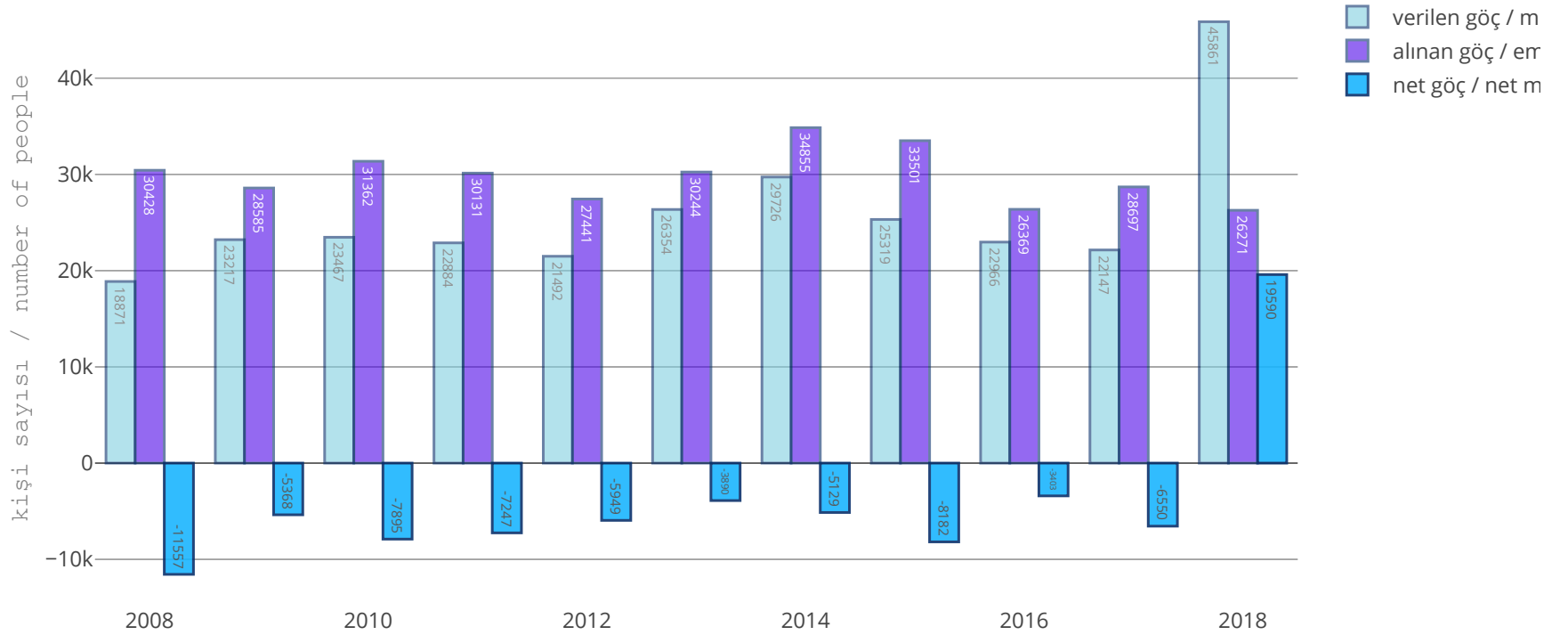
Sinop



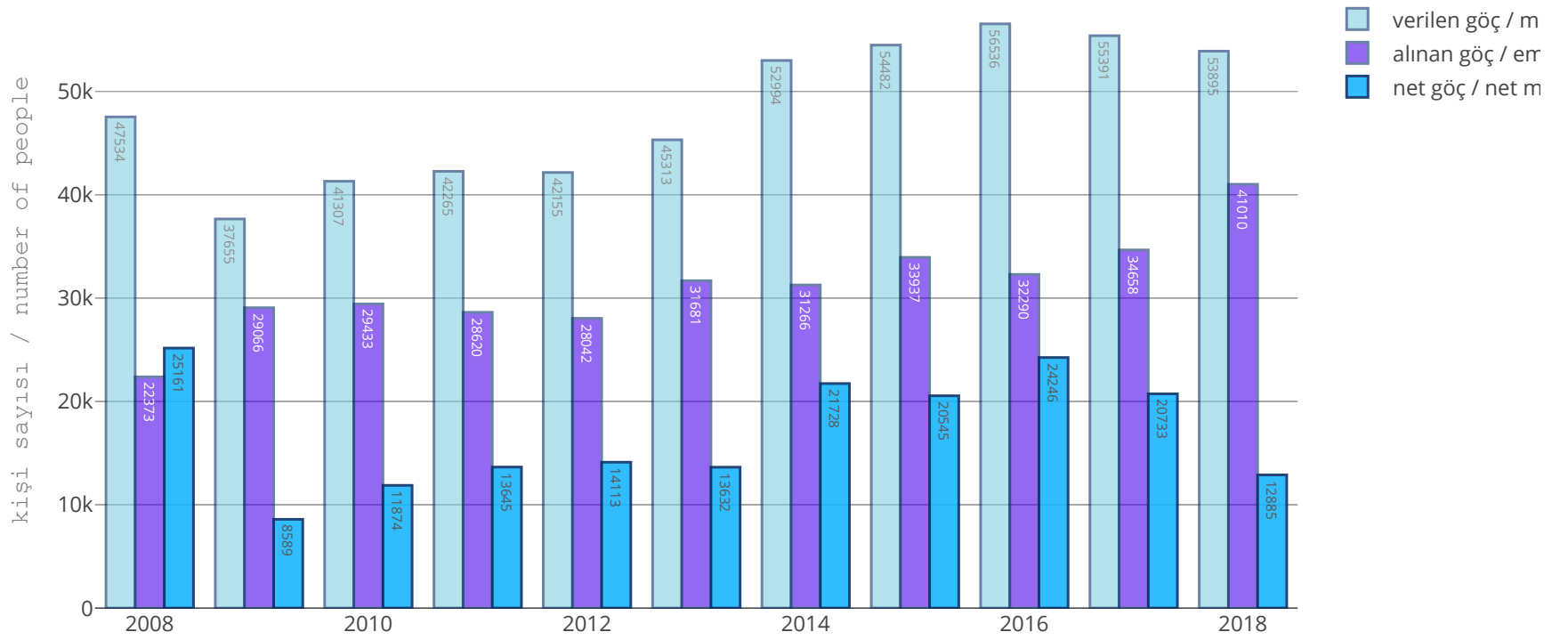
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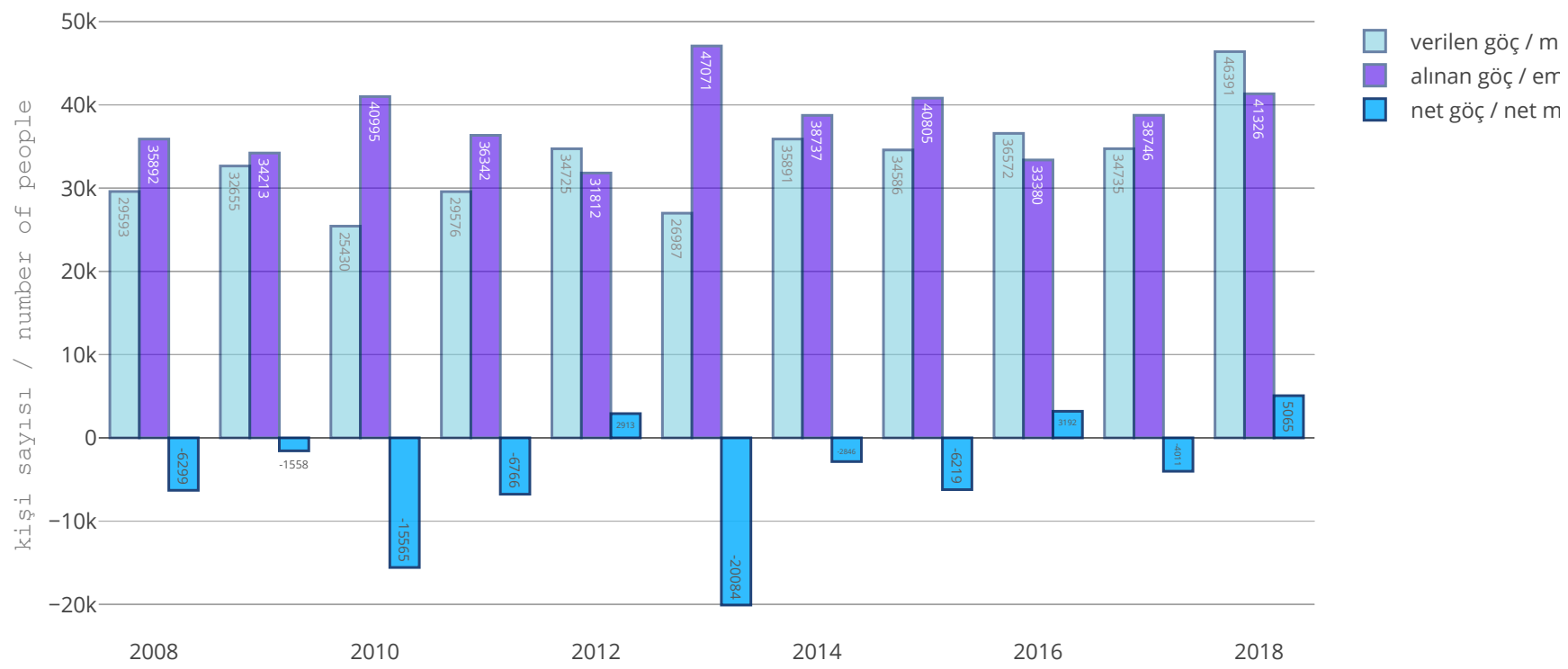
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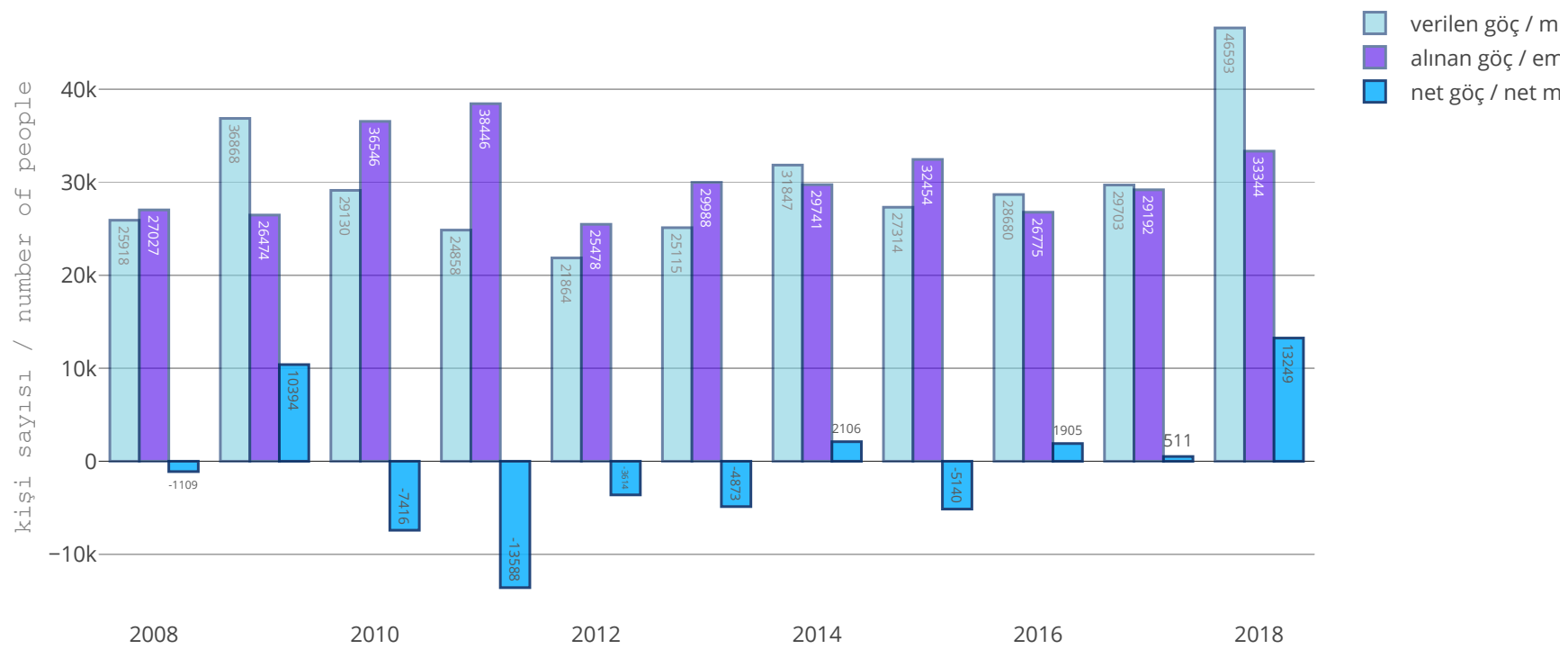
Tekirdağ



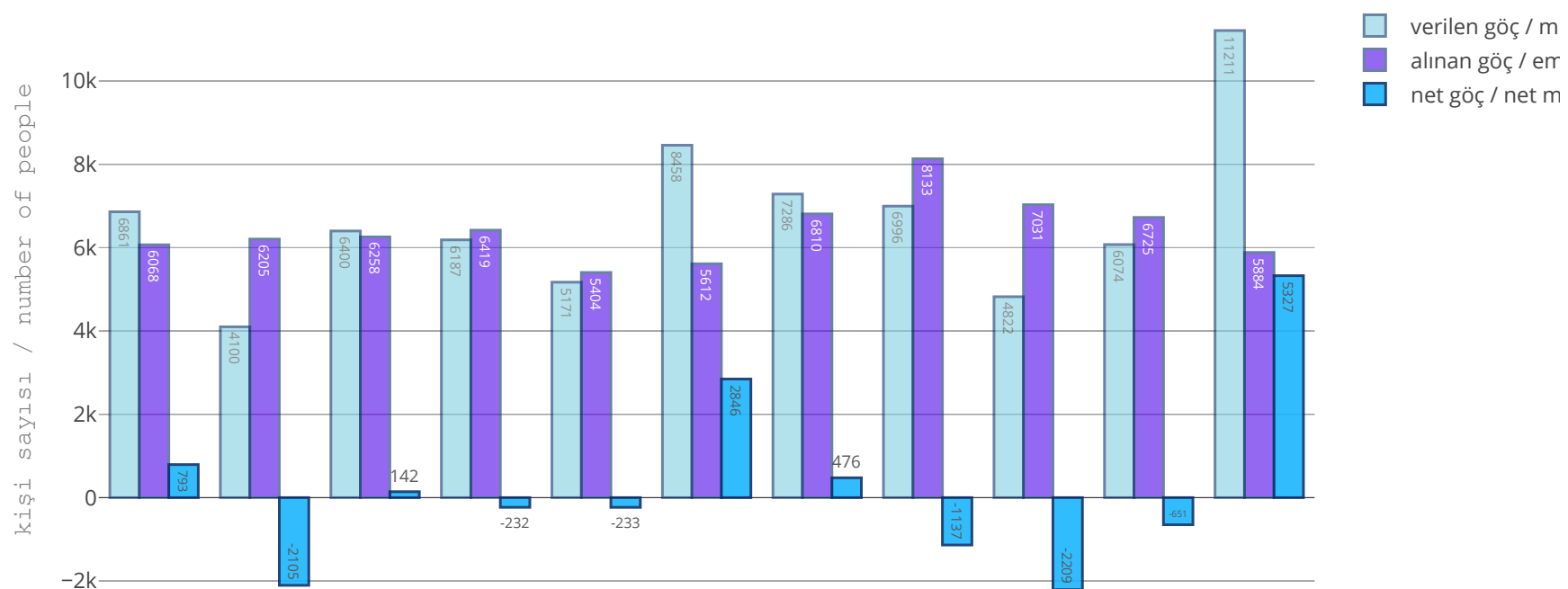
Tokat



Trabzon



Tunceli



2008

2010

2012

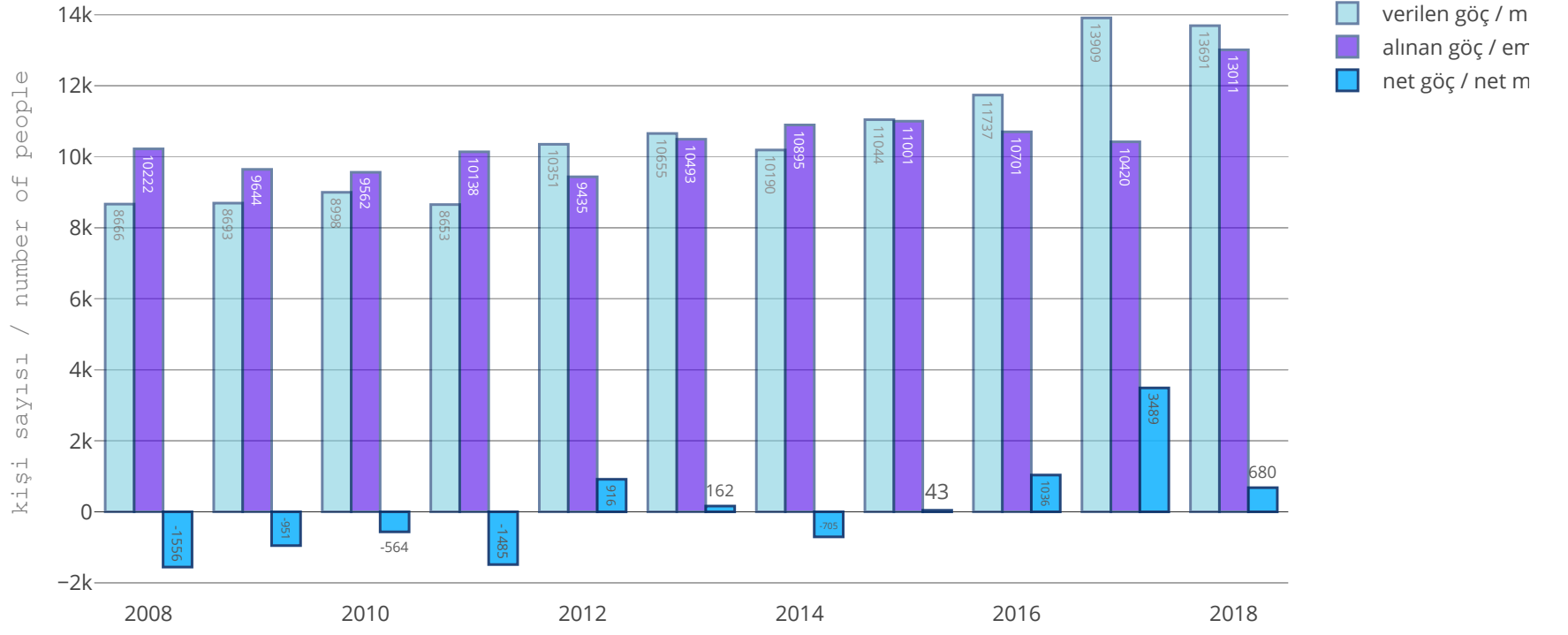
2014

2016

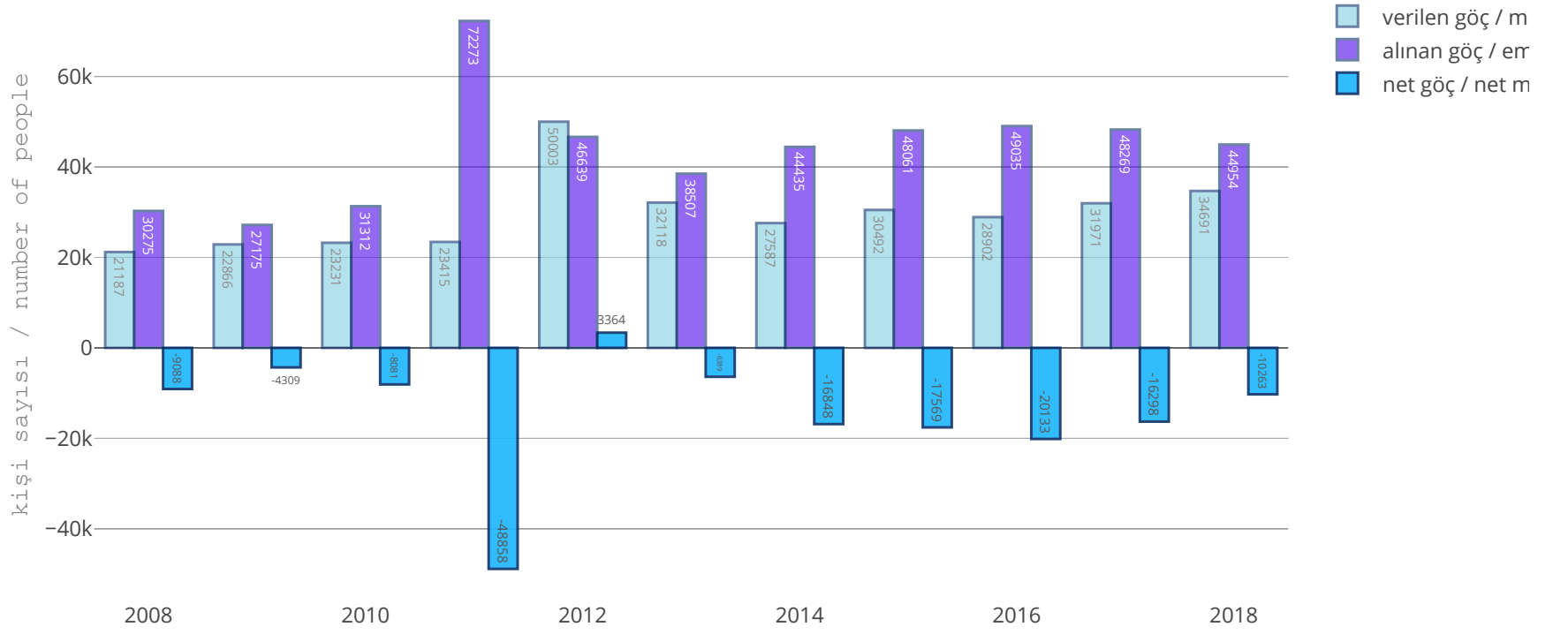
2018



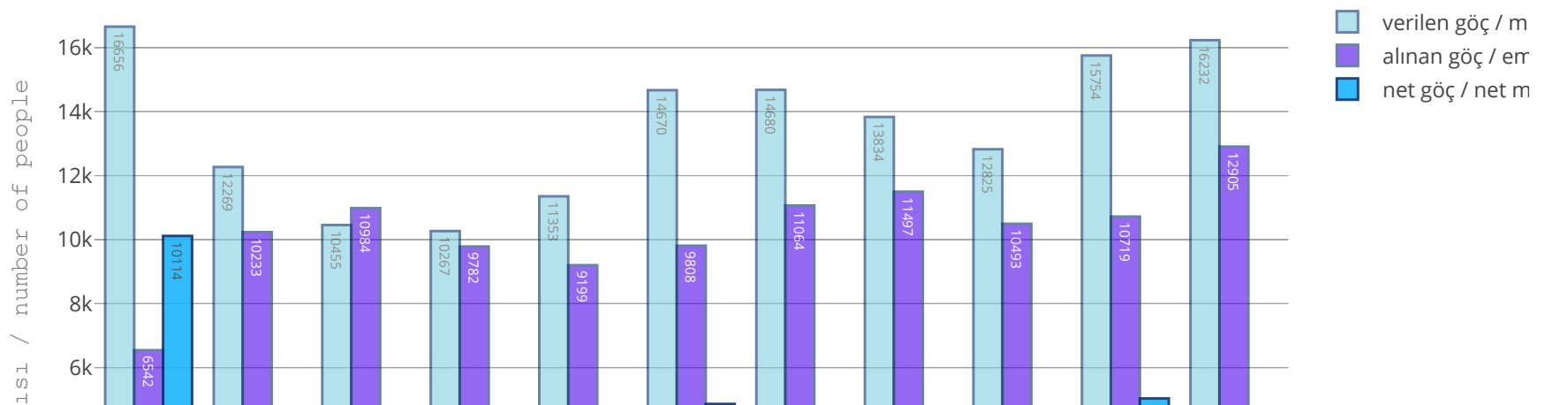
Uşak

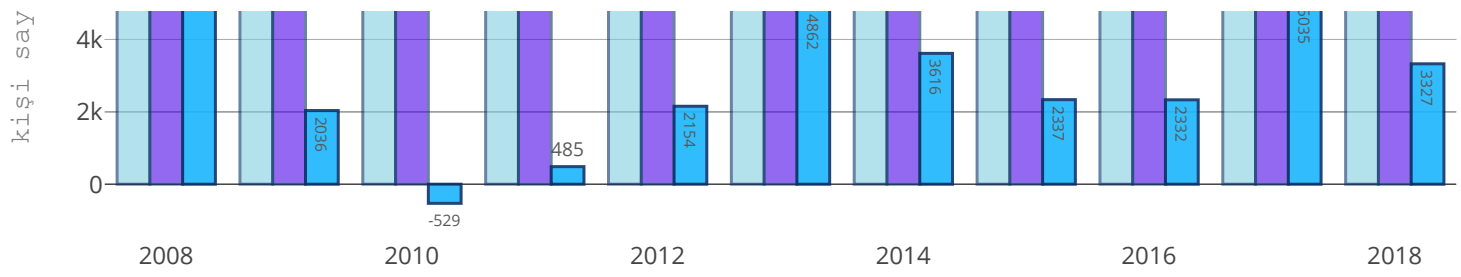


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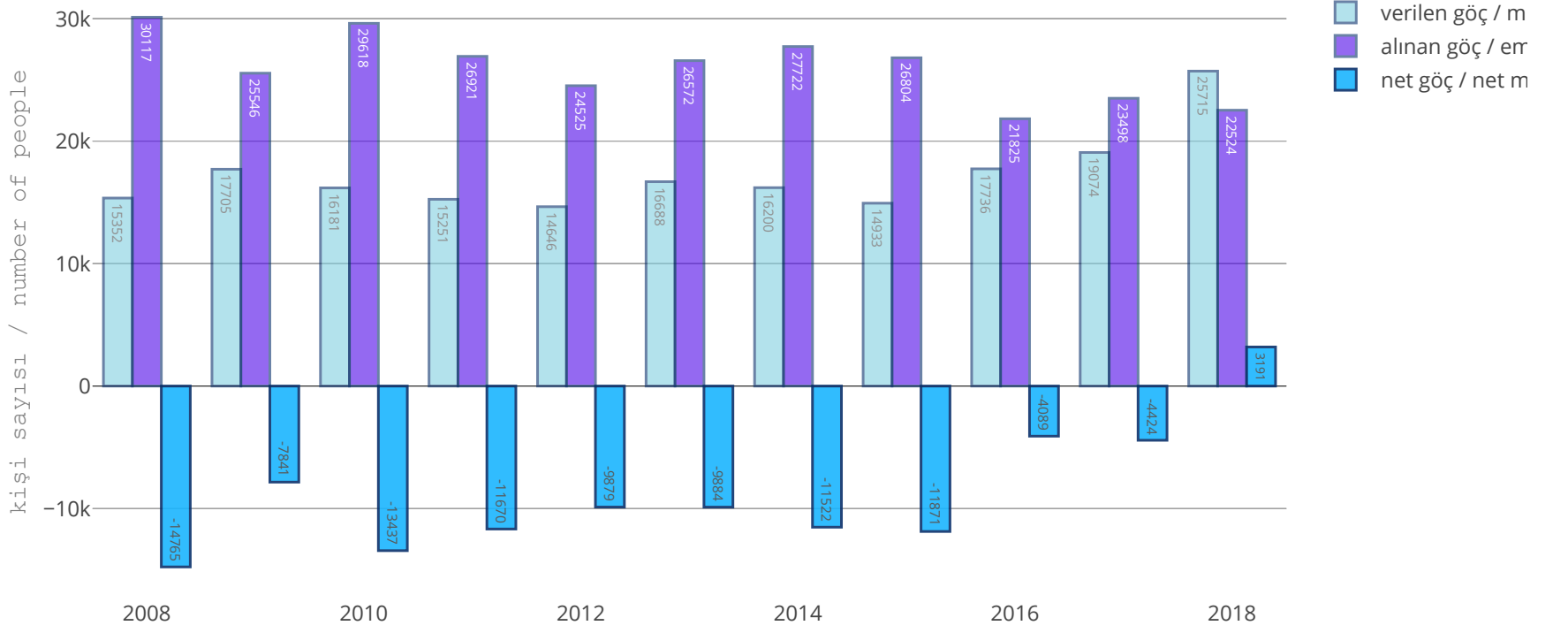


Yalova

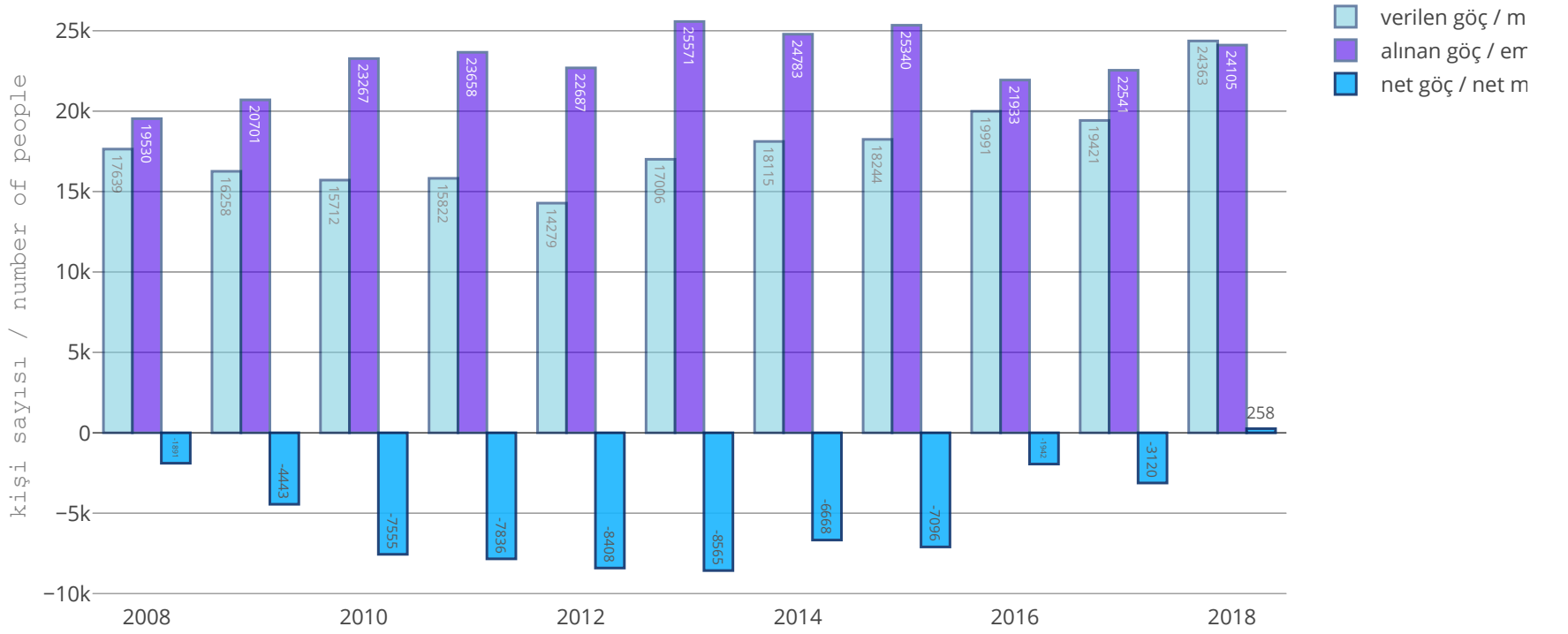




Yozgat



Zonguldak



In []:

