In [1]:

```
%matplotlib inline
import pandas
from sklearn import linear_model as lm
from plotnine import *
import numpy as np
import math
import traceback

root = '/Users/rix0rrr/Google Drive/Hackathon 28_4'
filename = root + '/Team 3/Instellingsdata merged (Elmar)-no-blanks.csv'

#df = pandas.read_csv(filename, index_col='BEVOEGD_GEZAGNAAM', encoding='utf-8')
df = pandas.read_csv(filename, index_col='key', encoding='utf-8', low_memory=Fals
    'aandeel_formatie_op_lb': np.float64
})

# joinert_cols = list(joinerts.columns.values)

# df = df.join(joinerts)

# for col in joinert_cols:
#     try:
#         df[col + ' per leerling'] = df[col] / df['AANTAL_LEERLINGEN']
#     except Exception as e:
#         print(e)
#         pass

# df = df.drop(joinert_cols, axis=1)

cols = list(df.columns.values)

# Ons jaar
df = df.loc[df['year'] == 2016]

# geen kleine scholen
df = df.loc[df['omvang_formatie_totaal'] >= 5]

# omvang besturen
#df = df.loc[df['Aantal instellingen'] >= 6]

print("Instellingen in analyse: %s" % len(df))

df = df.sort_values('aandeel_formatie_op_lb')
df.loc[:, 'cat'] = 'overig'
df.loc[:50, 'cat'] = 'slechtst'
df.loc[-50:, 'cat'] = 'best'

#print('De allerbeste is %s dus die doet niet meer mee' % df[-1:][['BEVOEGD_GEZAG
#df = df[:-1]
#cols = [c for c in cols if not c.startswith('AANDEEL_FORMATIE_')]

graphs = []

cols = [c for c in cols if c not in ['BRIN_NUMMER', 'instellingsnaam', 'bevoegd g
```

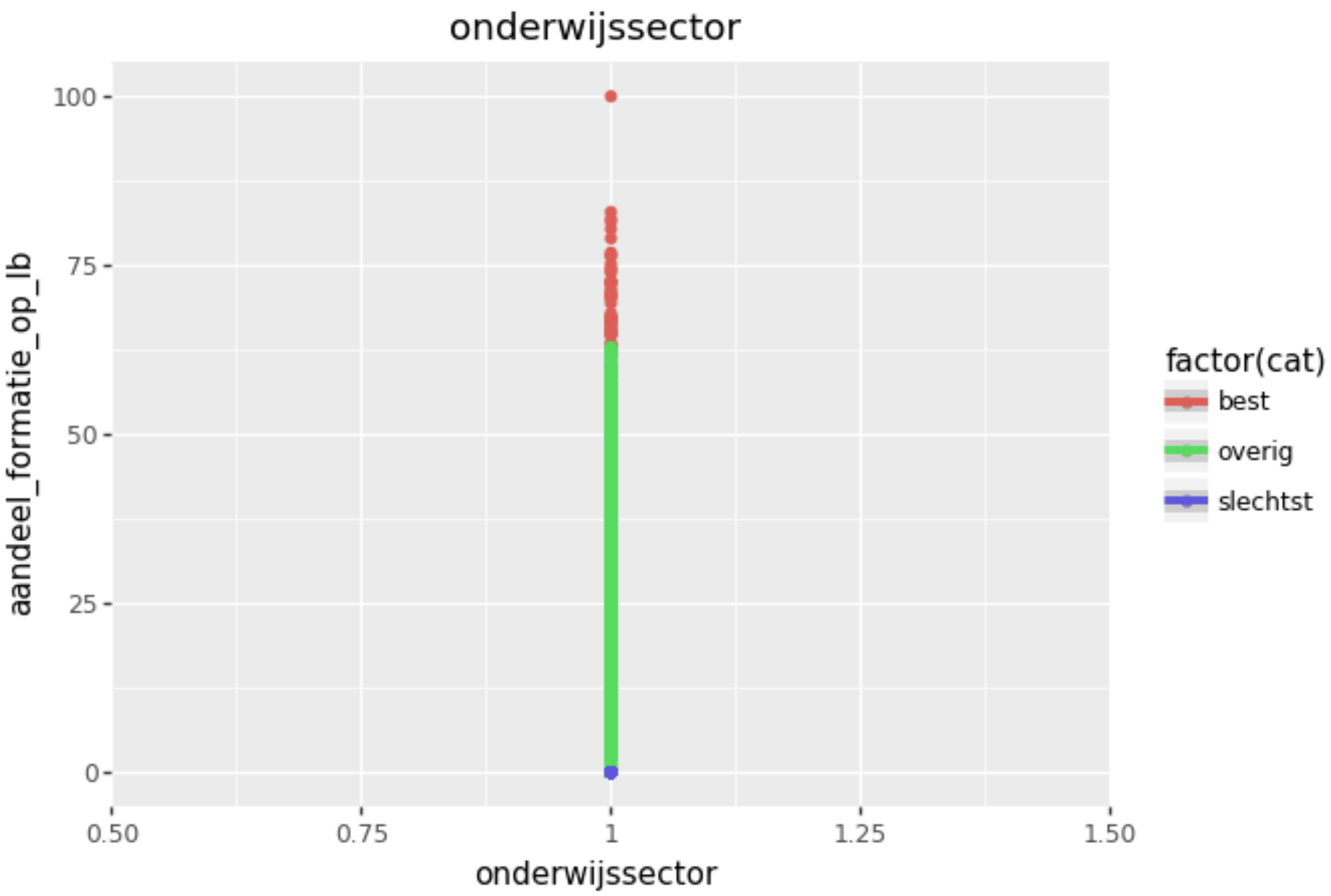
```
for x_as in cols:
    print(x_as)
    #x_as = 'SolvabiliteitI.2016'
    y_as = 'aandeel_formatie_op_lb'
    try:
        rows = df[[x_as, y_as, 'cat']].dropna()
        if not len(rows):
            print('NO NON-NA ROWS')
            continue

        print(ggplot(rows, aes(x_as, y_as, color='factor(cat)'))
         + ggtitle(x_as)
         + geom_point()
         + stat_smooth(method='lm'))
    except Exception as e:
        traceback.print_exc()
        print(e)
        pass

graphs
```

```
/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/site-pac
kages/statsmodels/compat/pandas.py:56: FutureWarning: The pandas.cor
e.datetools module is deprecated and will be removed in a future ver
sion. Please use the pandas.tseries module instead.
  from pandas.core import datetools

Instellingen in analyse: 5902
onderwijssector
```



```
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year
```
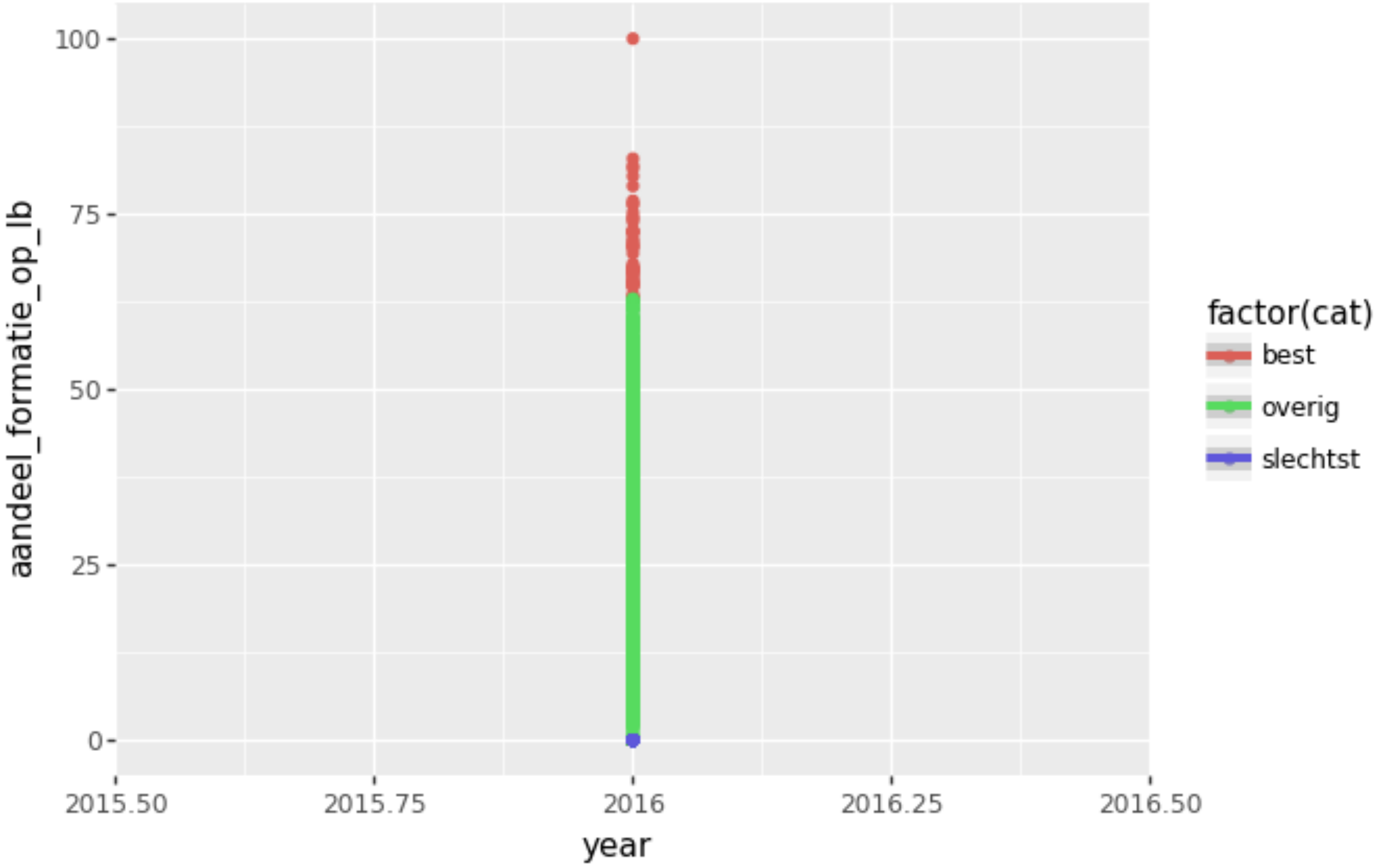

year



```
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postcode_school
```

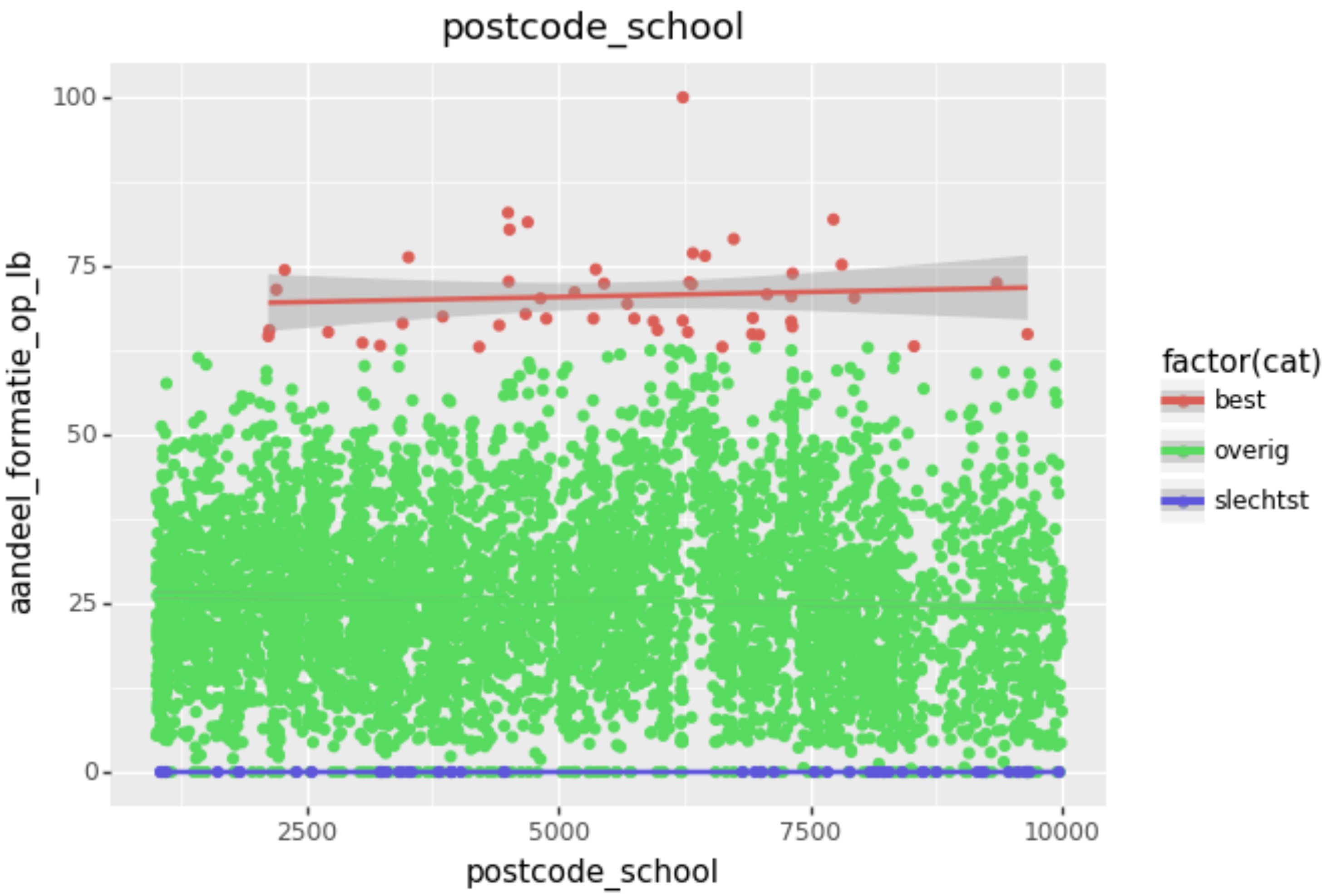

```
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rpa_gebiedcode
```

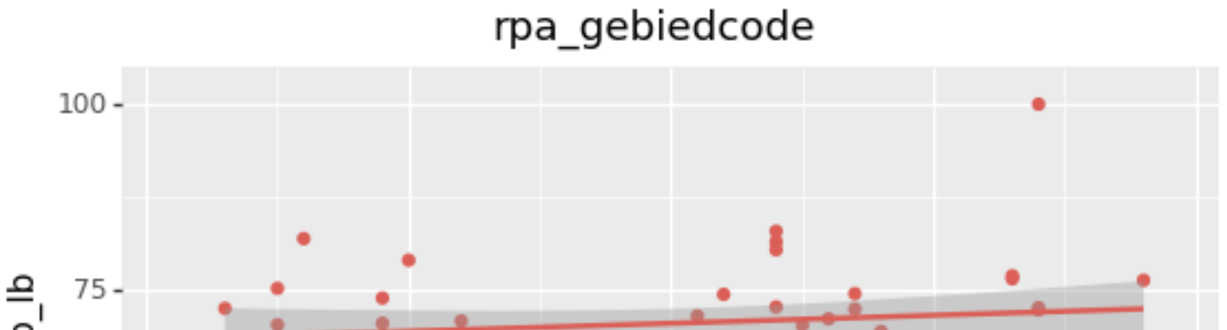

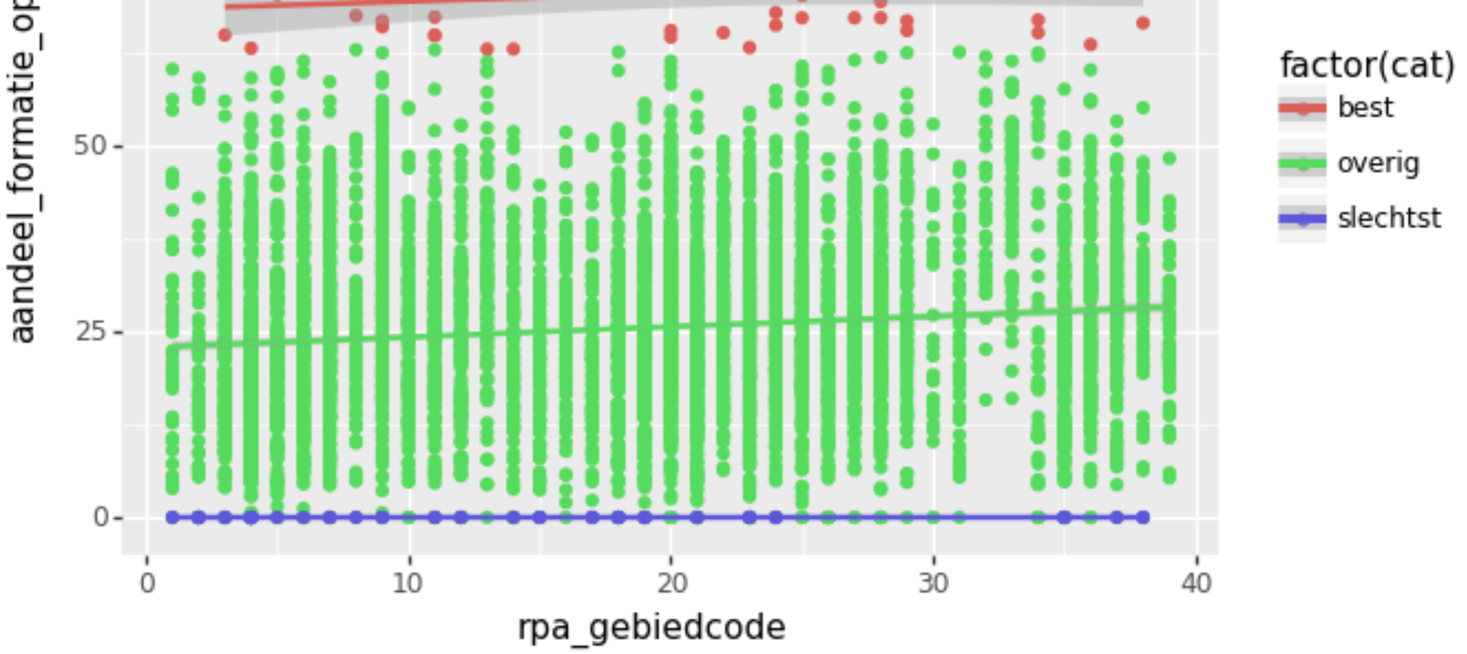

```
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randstad
```

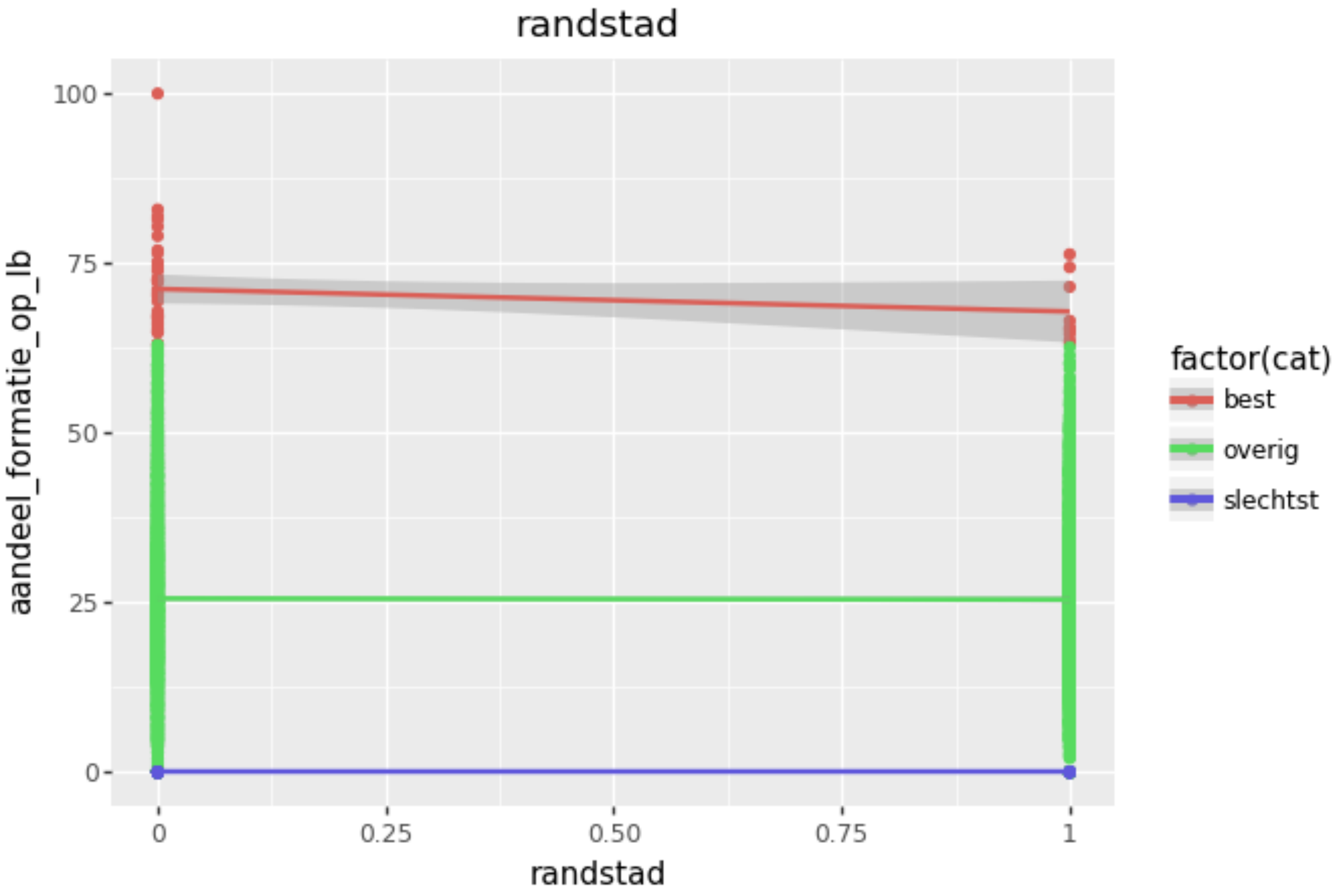

```
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gemeentenaam
```

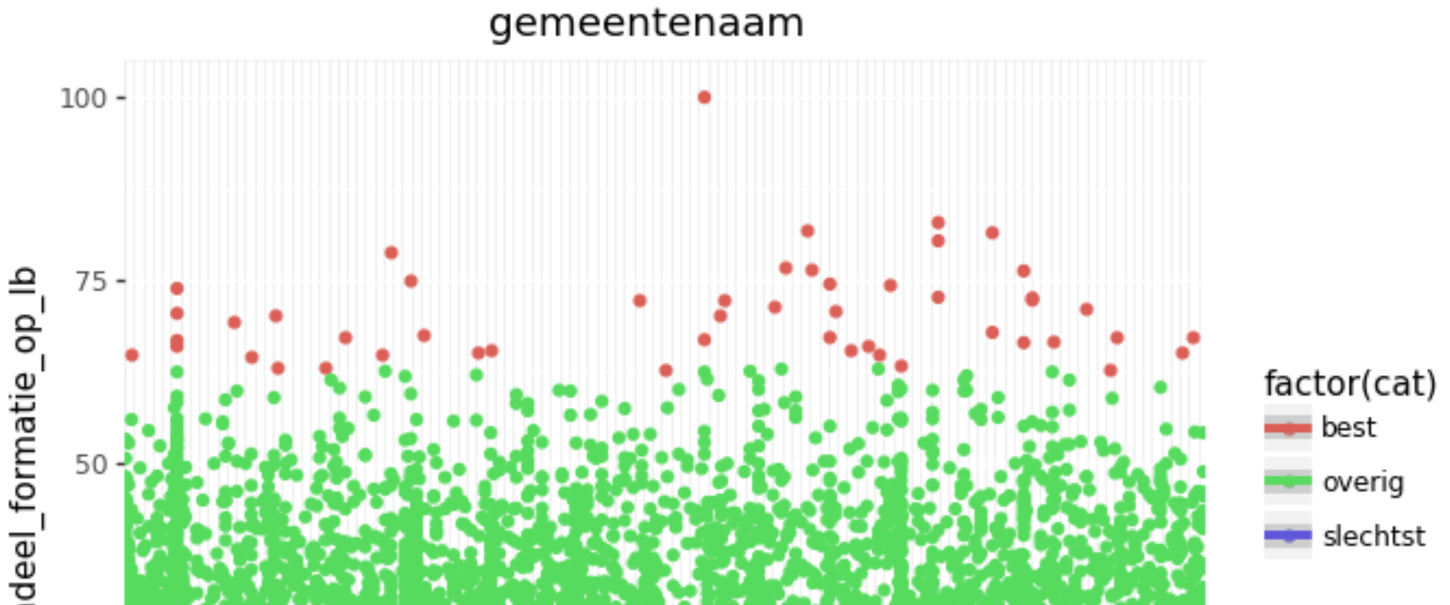

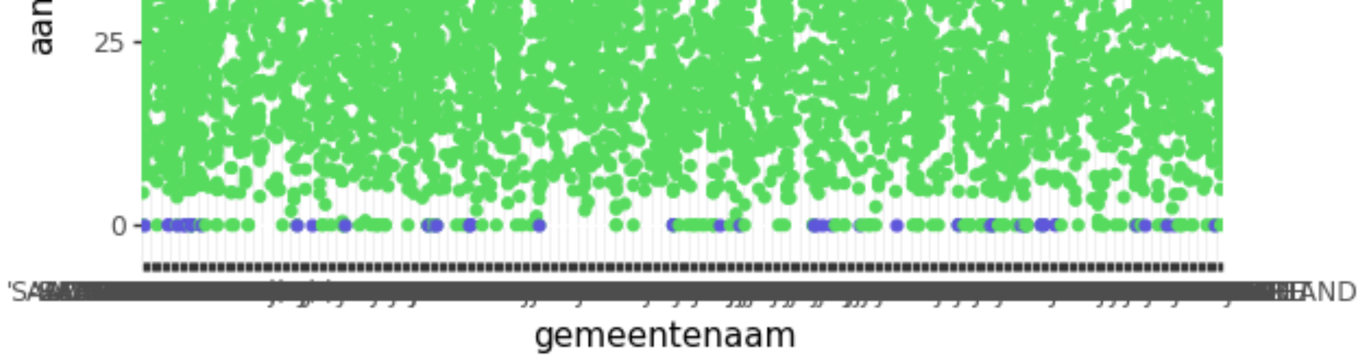

```
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schooltype
```

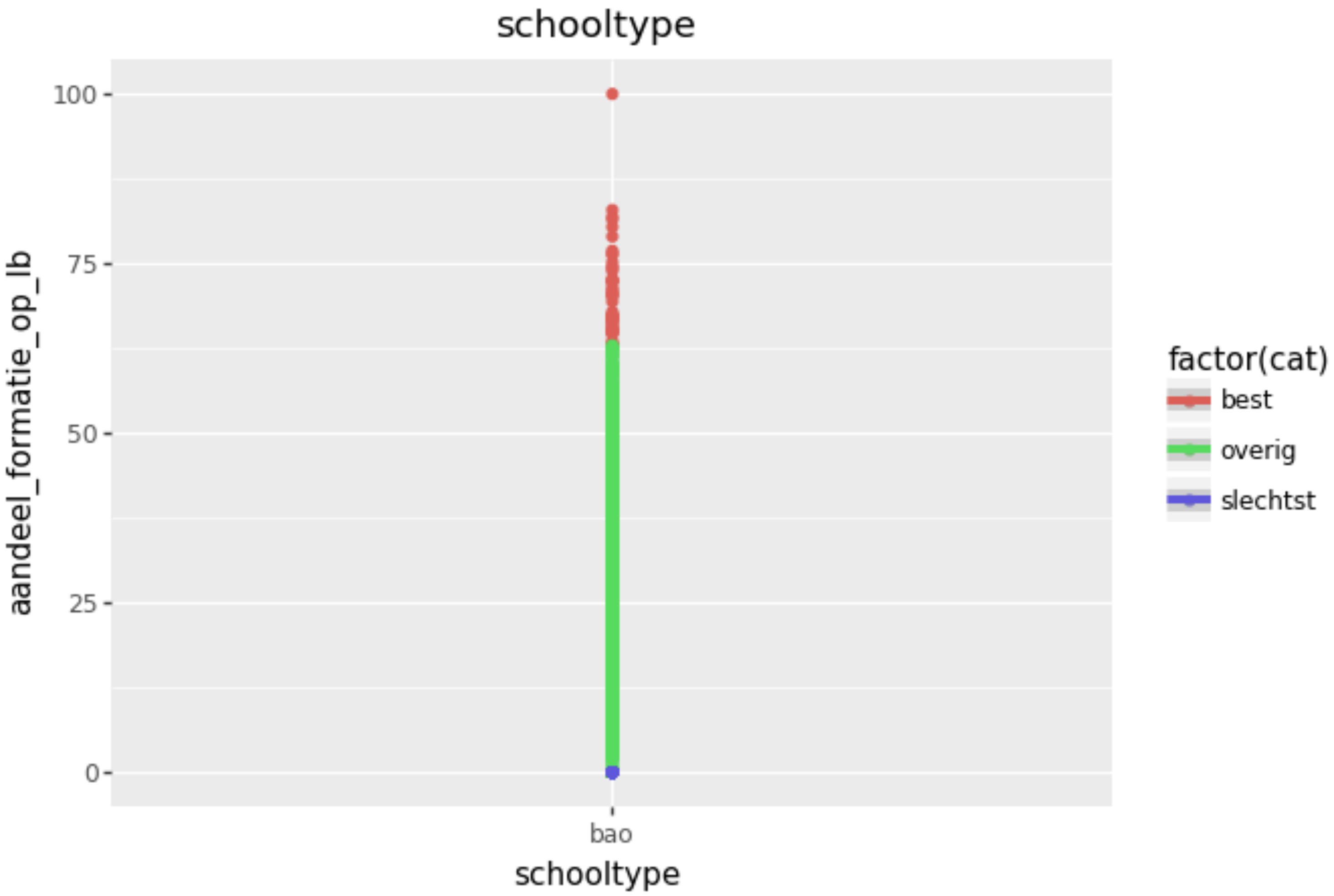

```
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schoolsoort
```

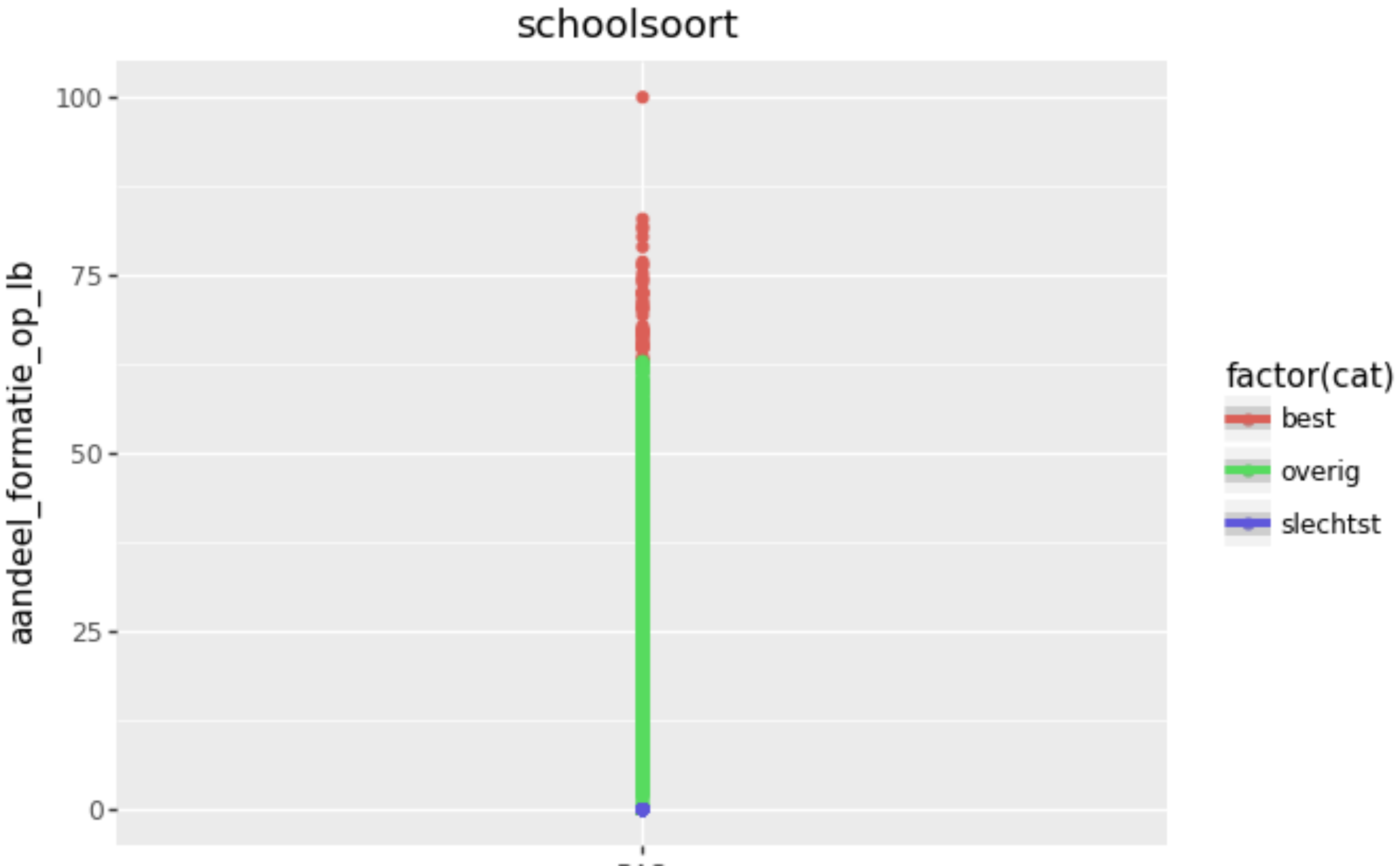

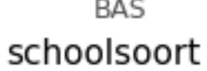

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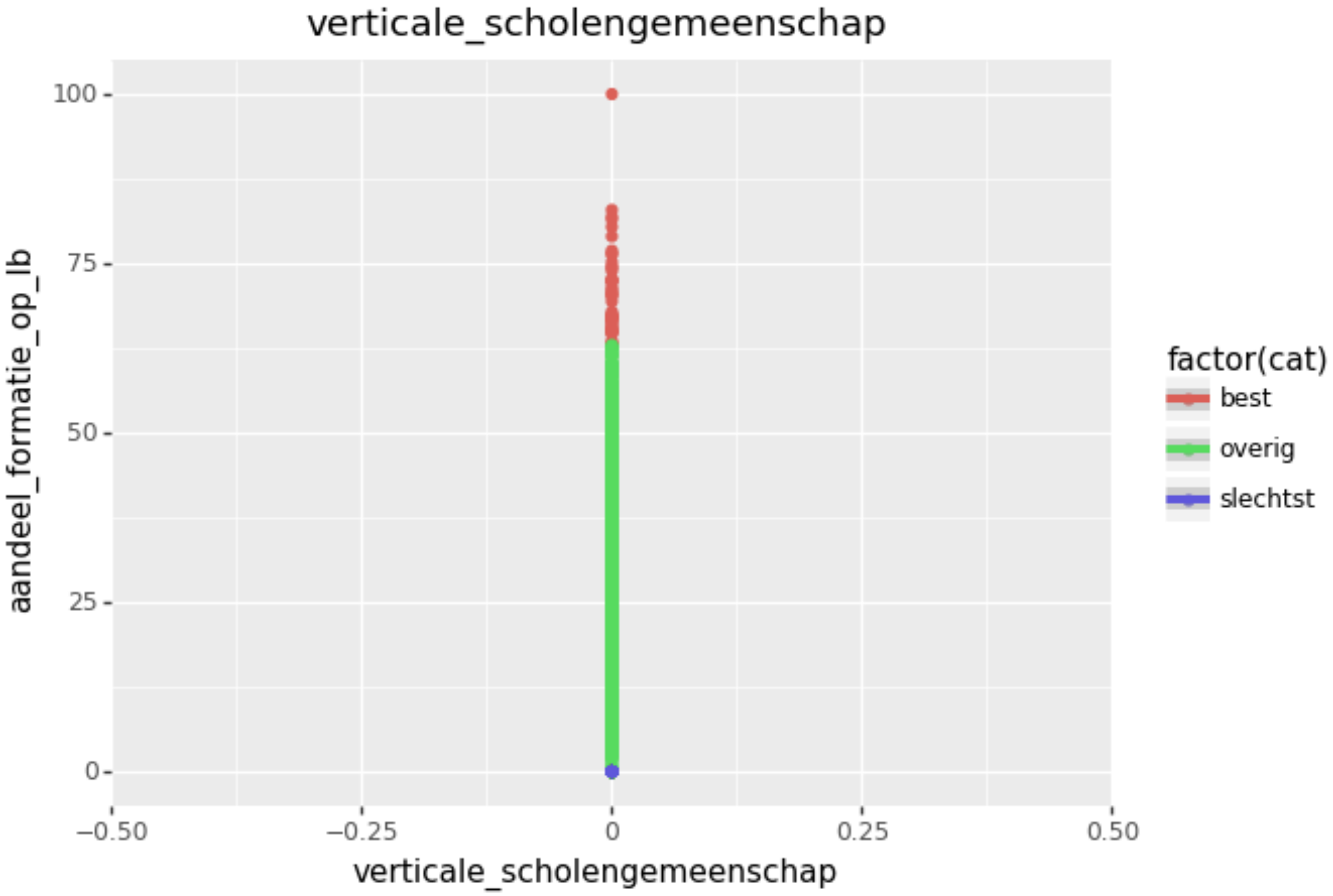
verticale_scholengemeenschap
```



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bevoegd_gezagnummer
```

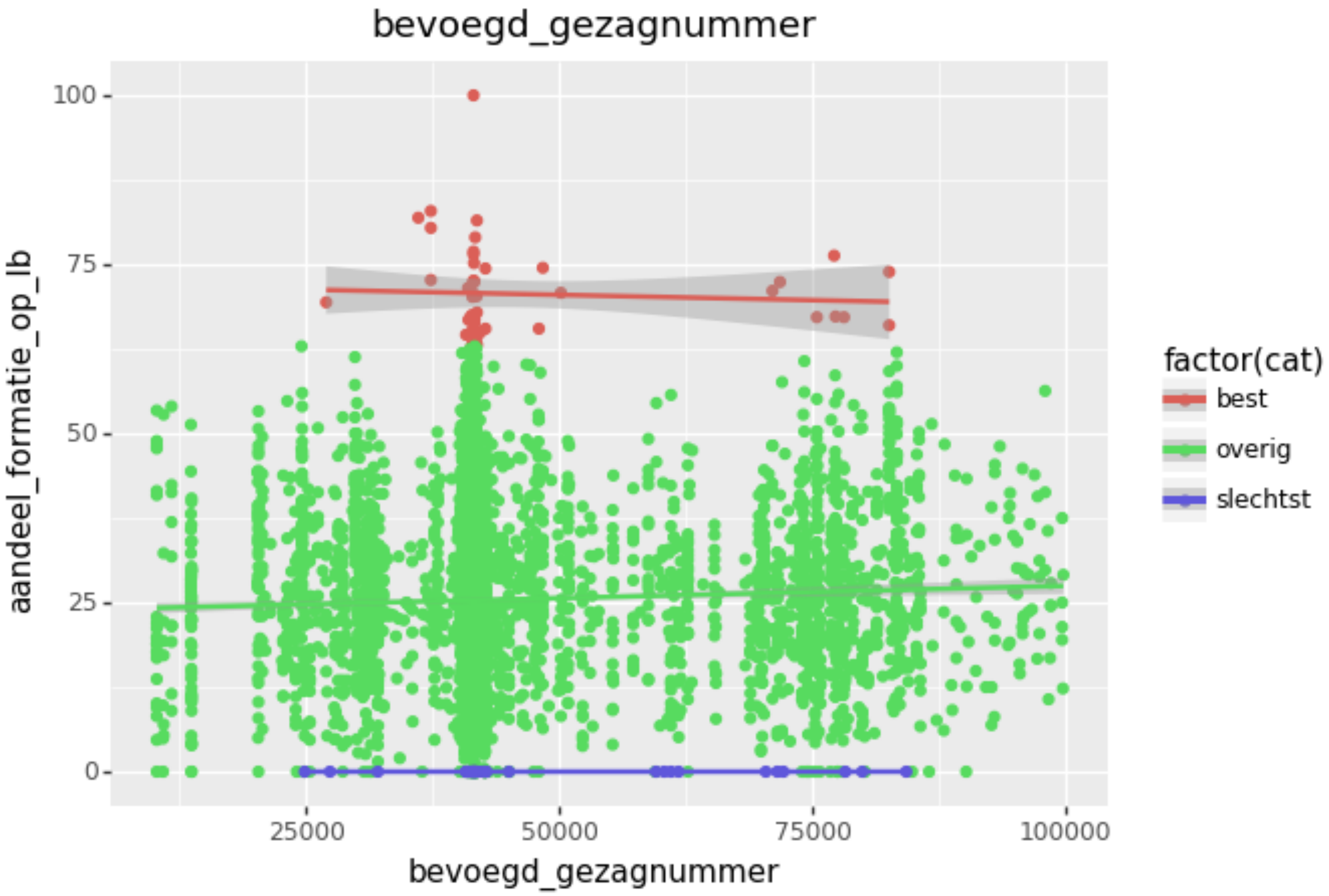

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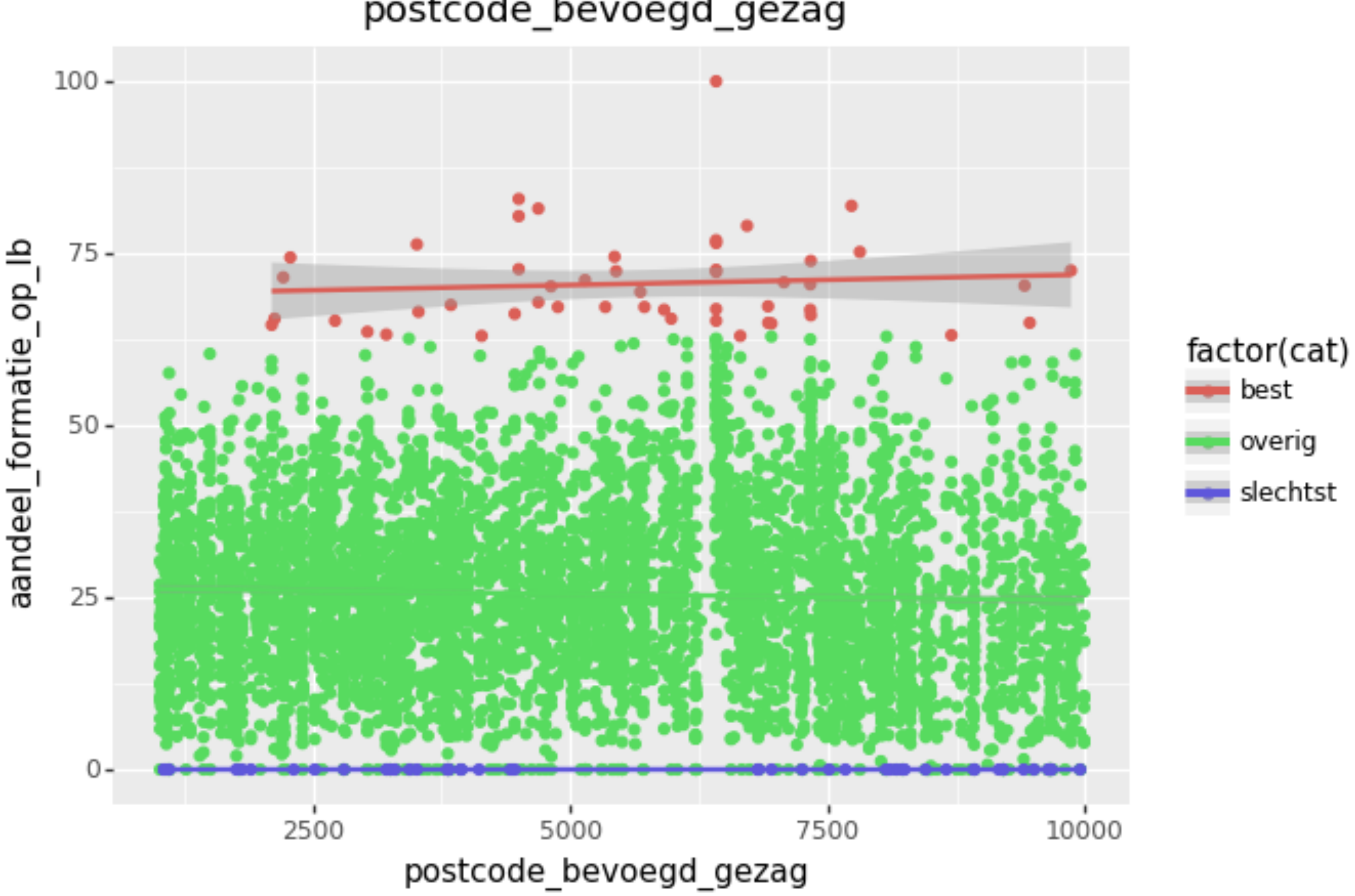
postcode_bevoegd_gezag
```



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eenpitter
```

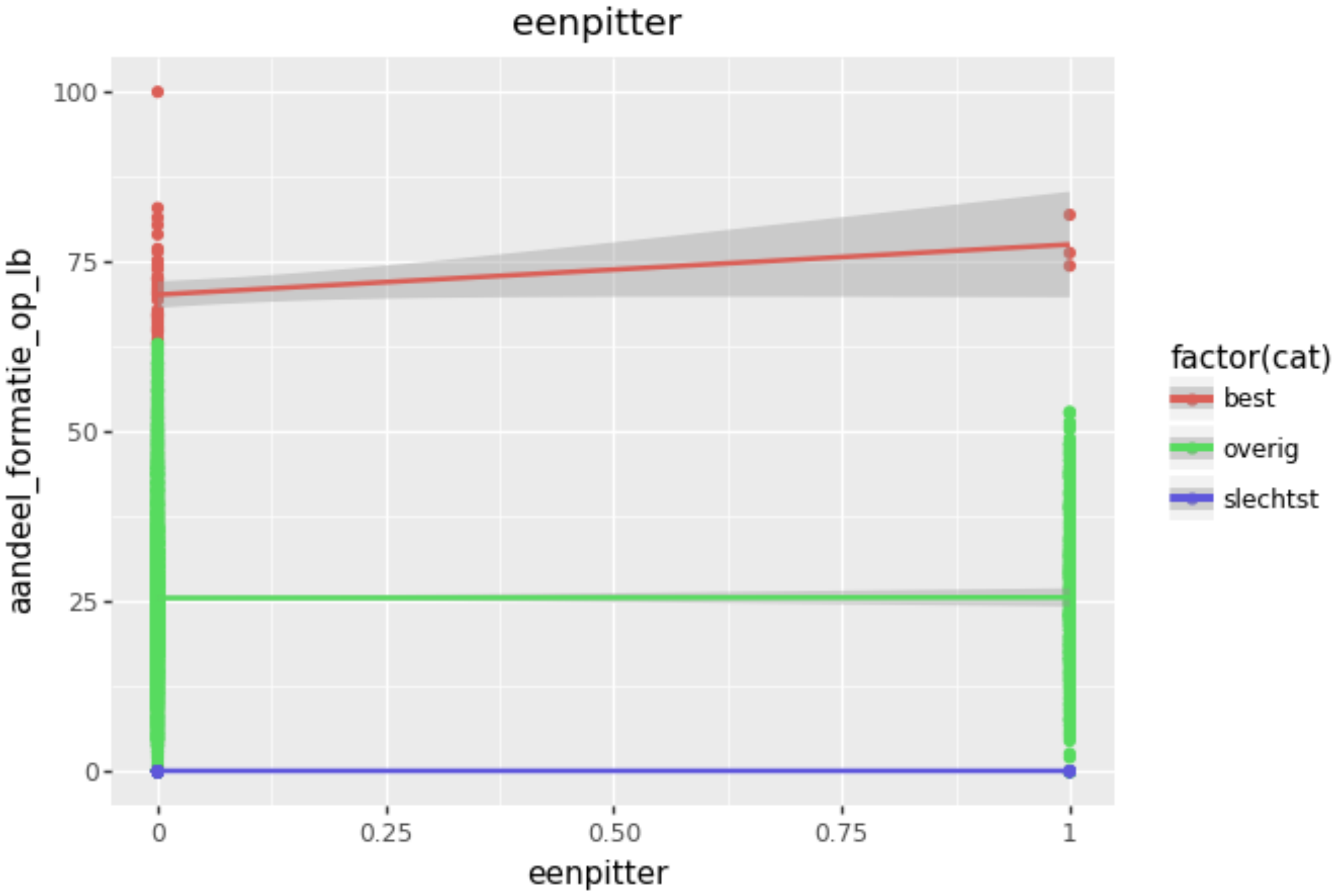

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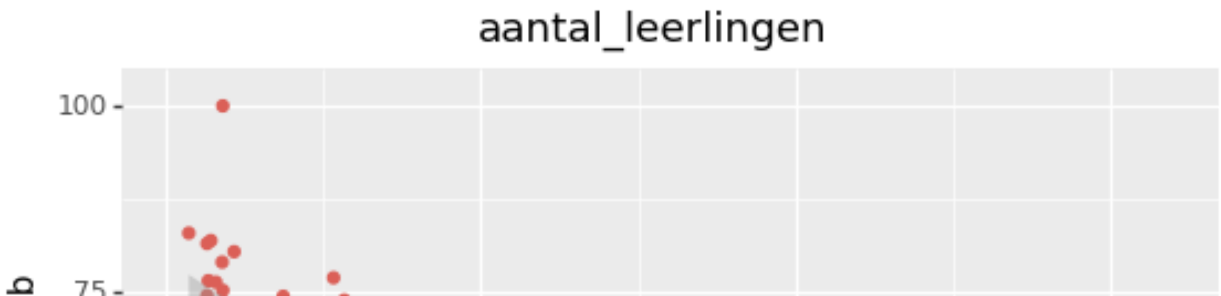
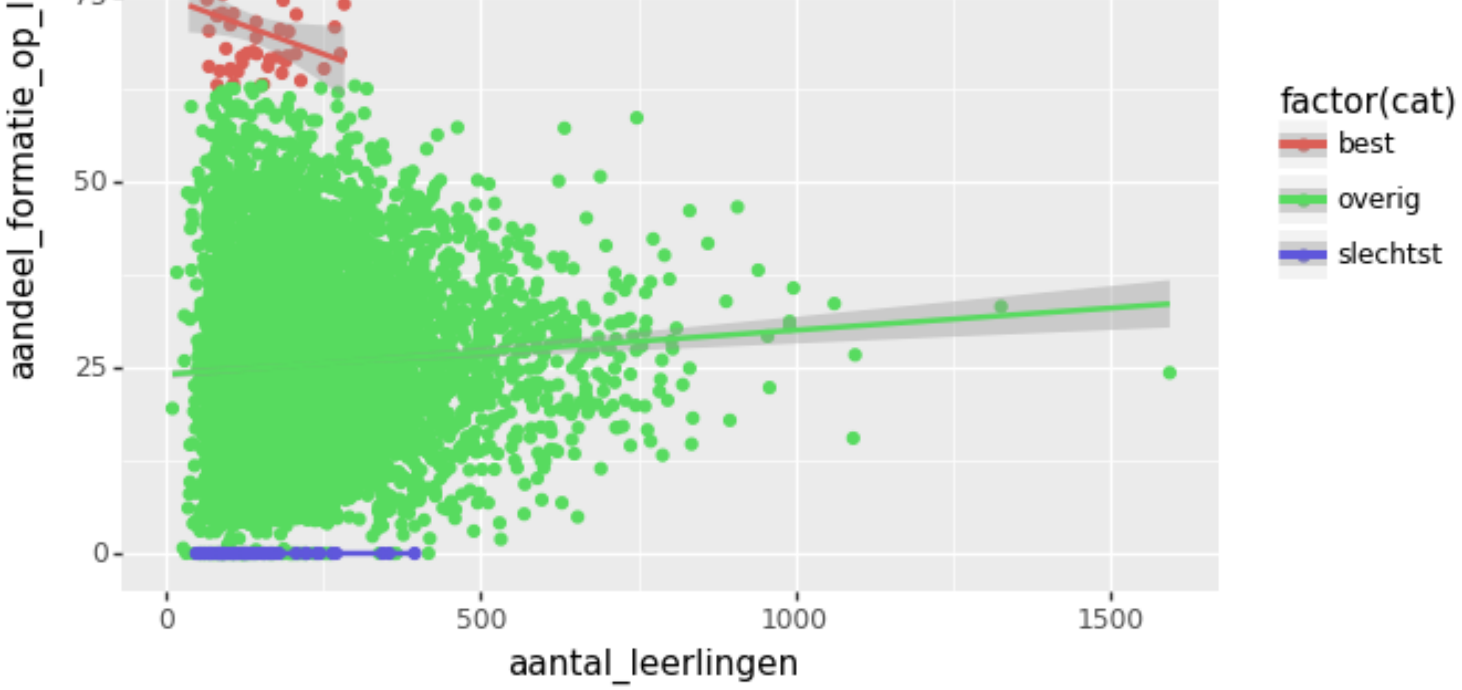
aantal_leerlingen
```





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categorie_schoolomvang
```

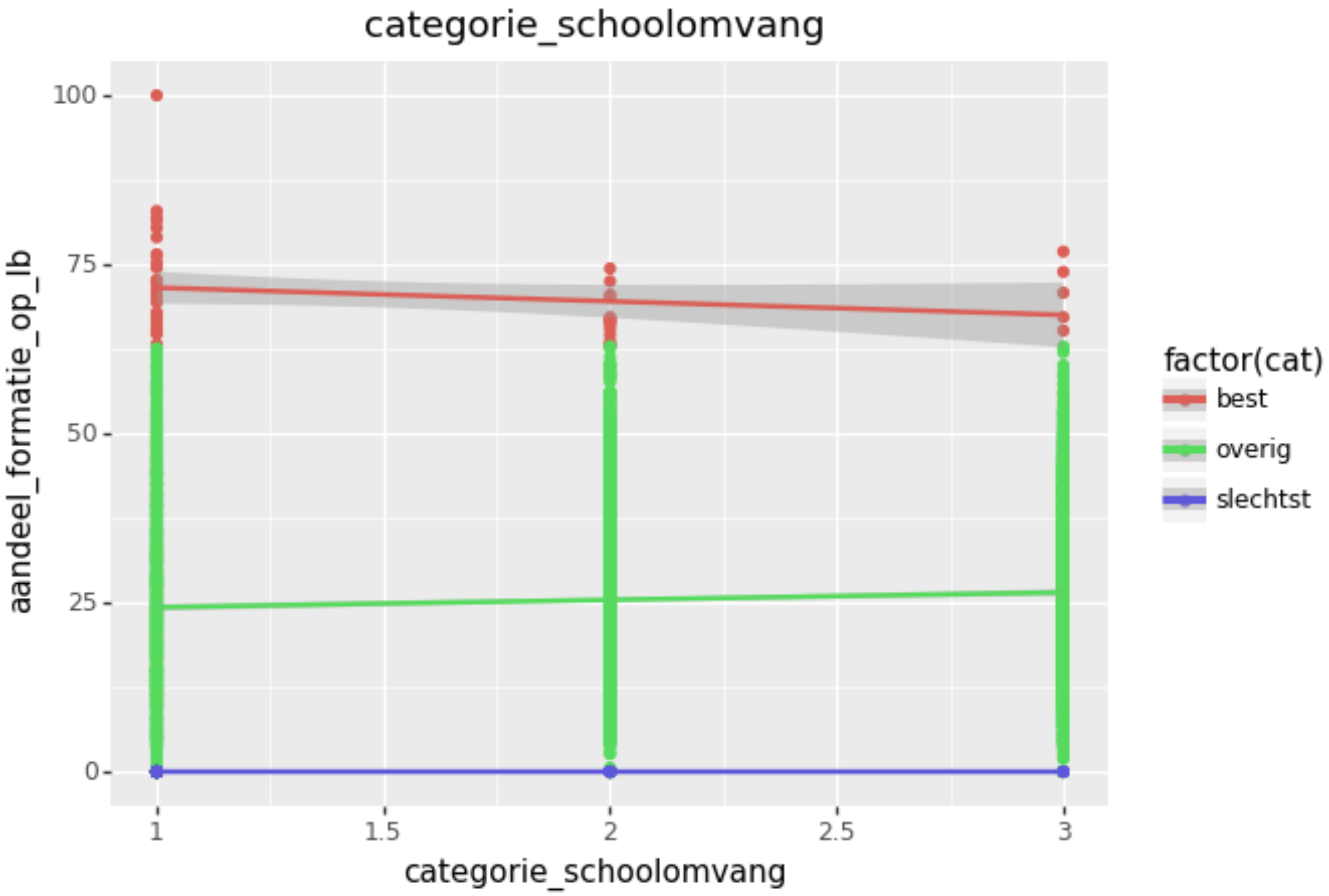

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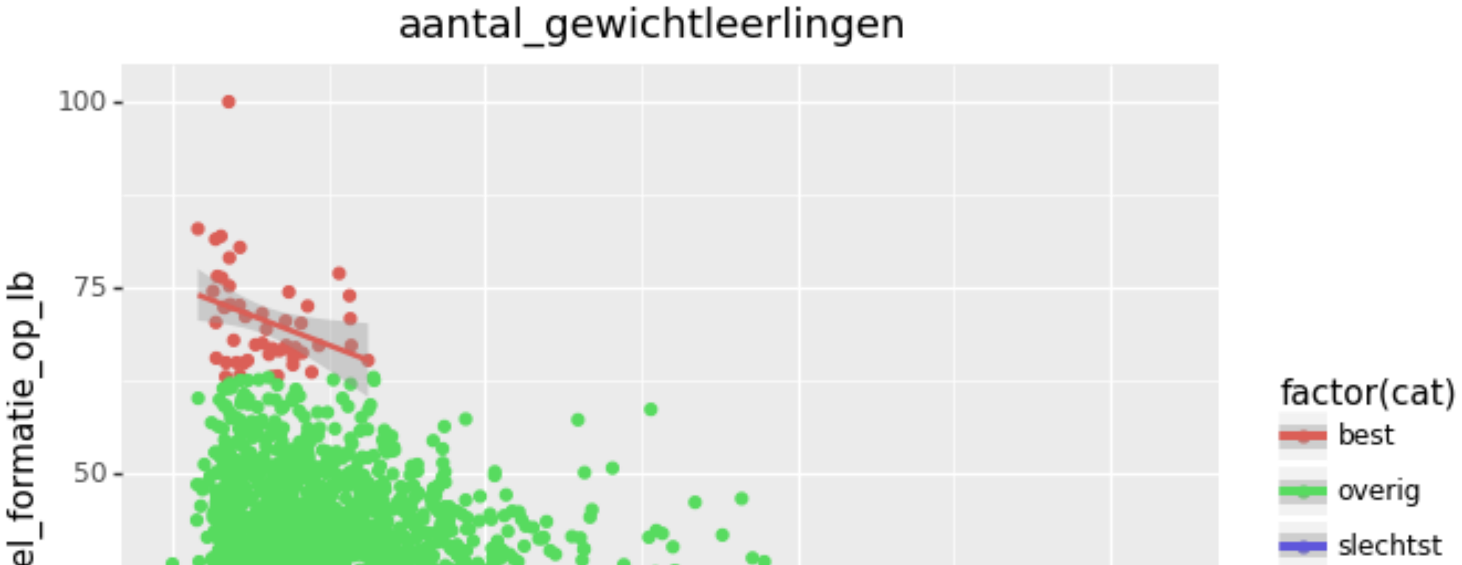

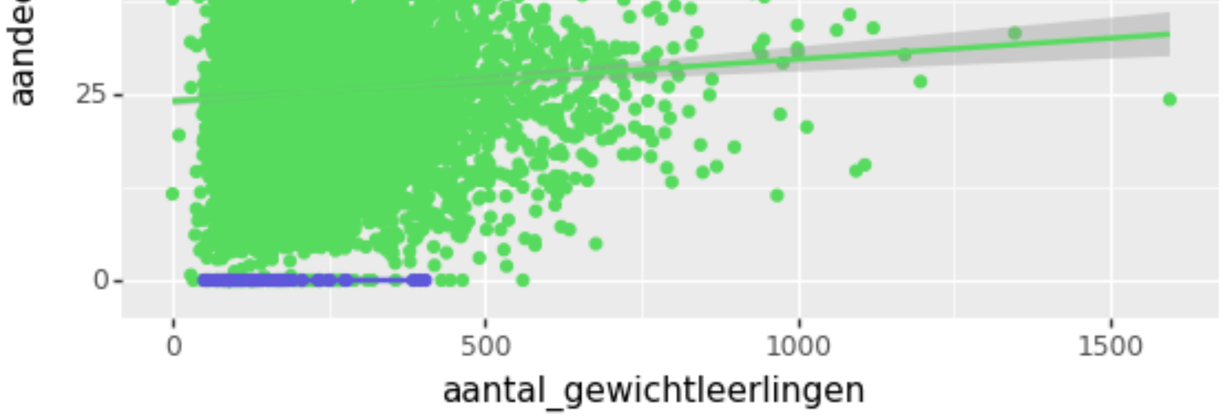

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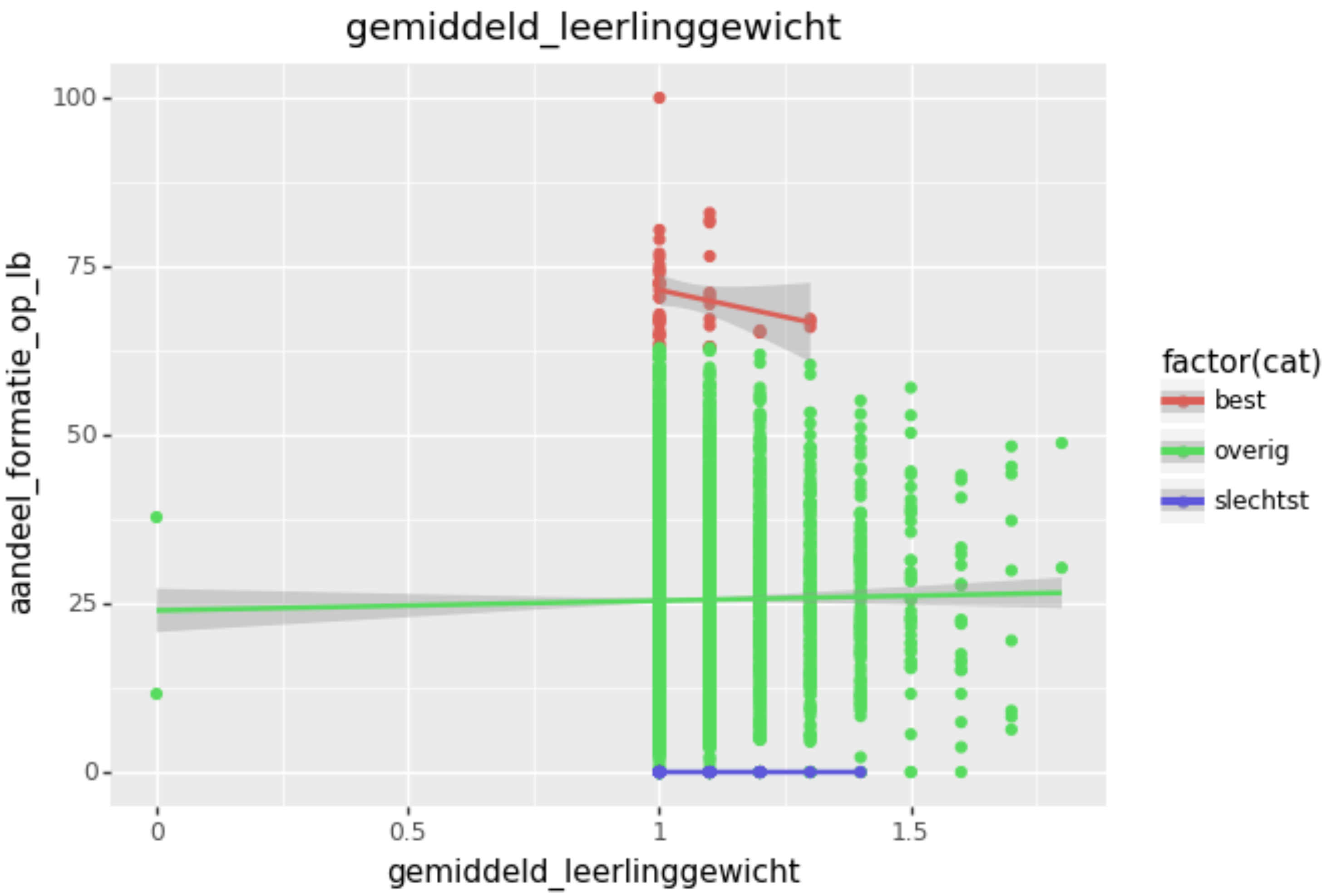
gemiddeld_leerlinggewicht
```



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aandeel_apcg_leerlingen
```

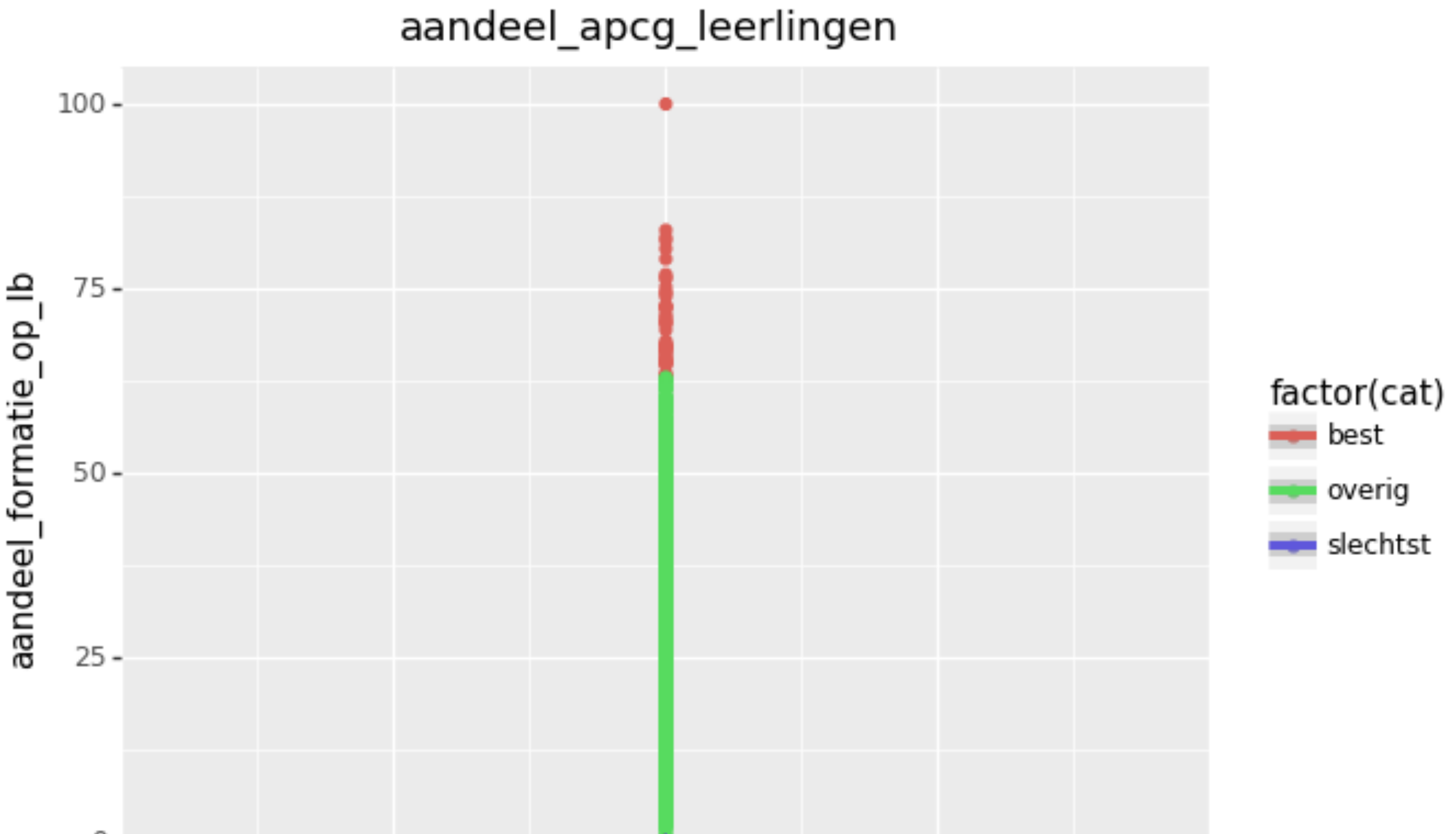

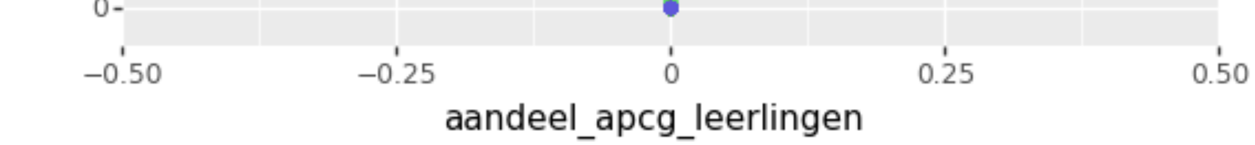

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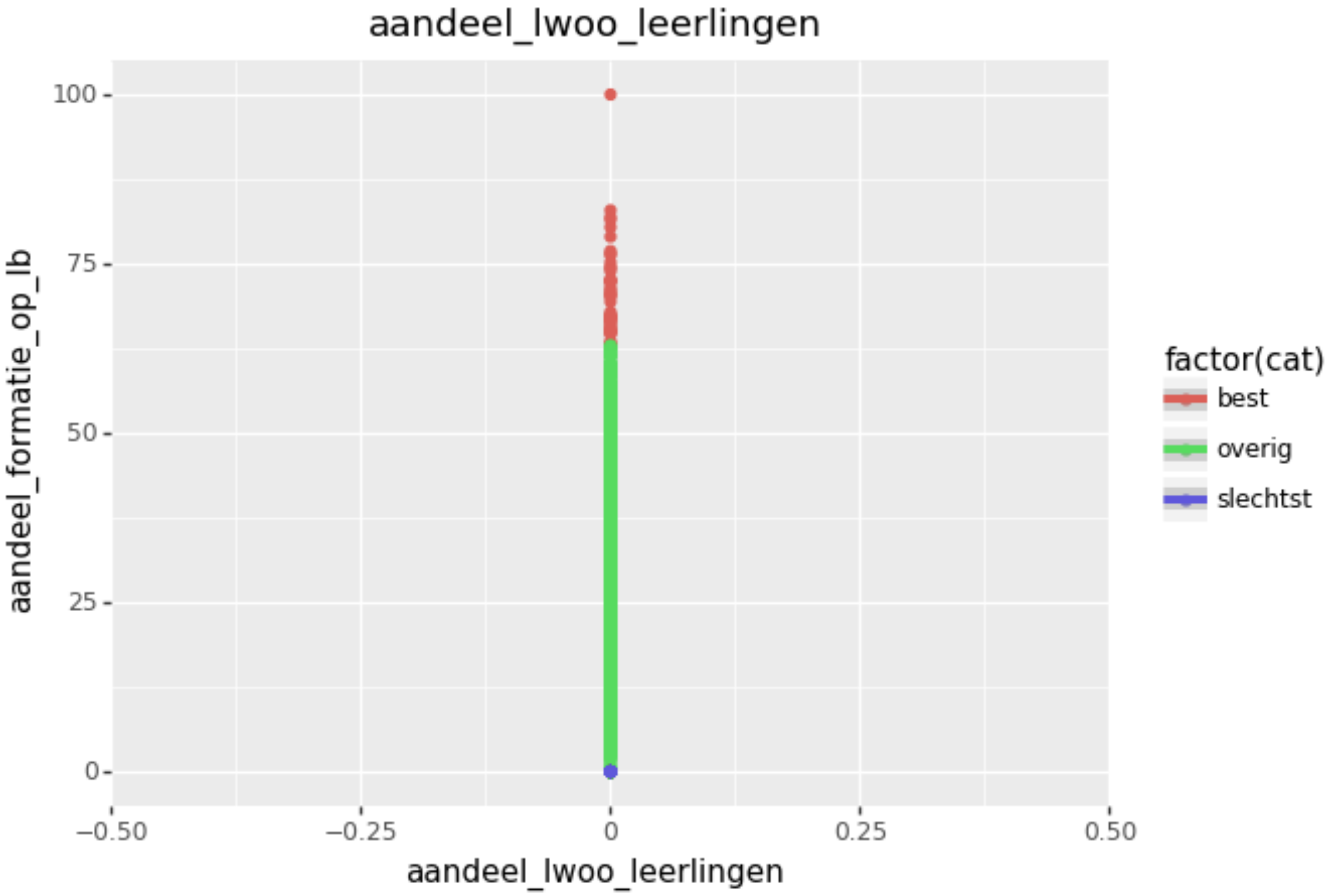

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aantal_voltijdleerlingen
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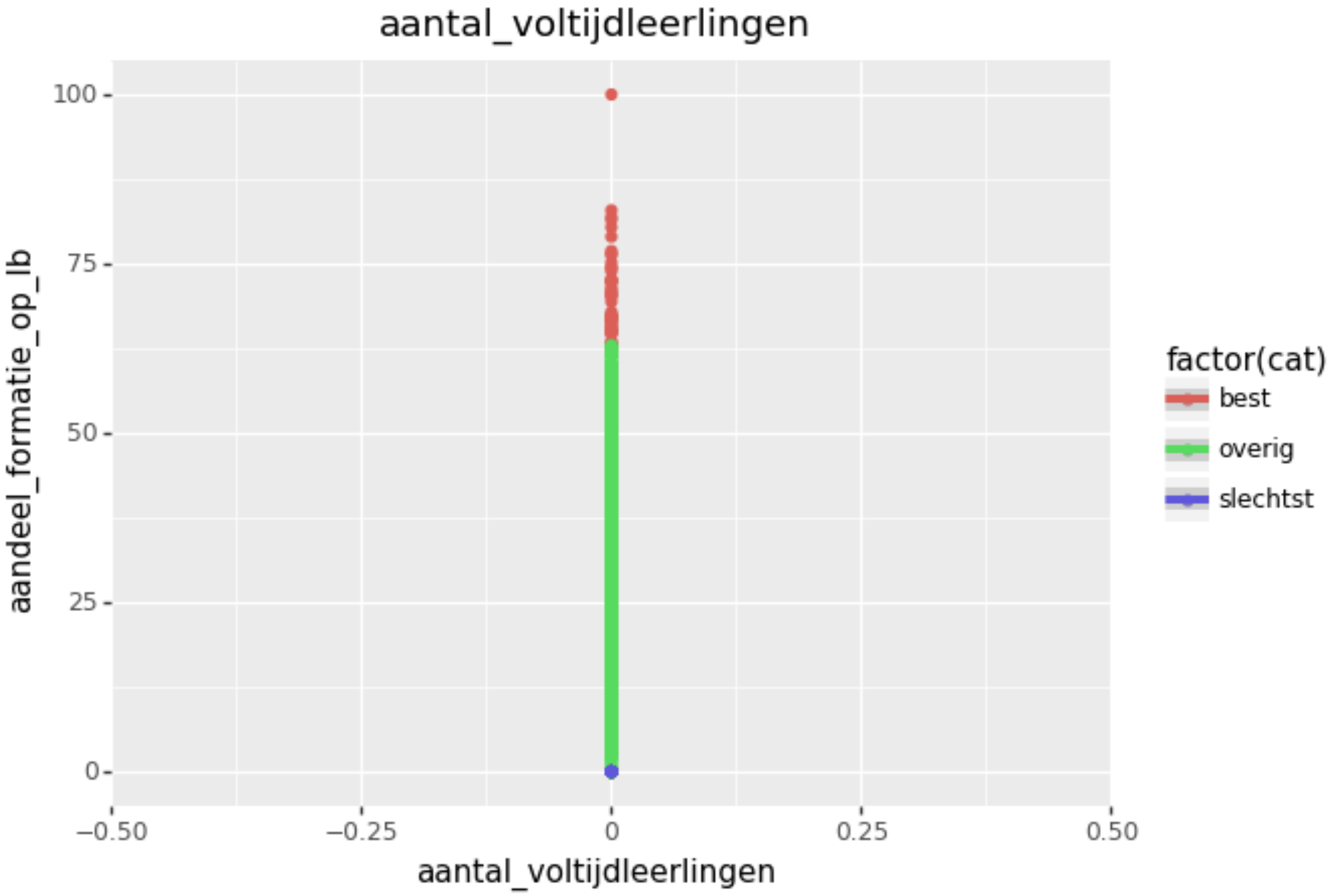

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aantal_deeltijdleerlingen
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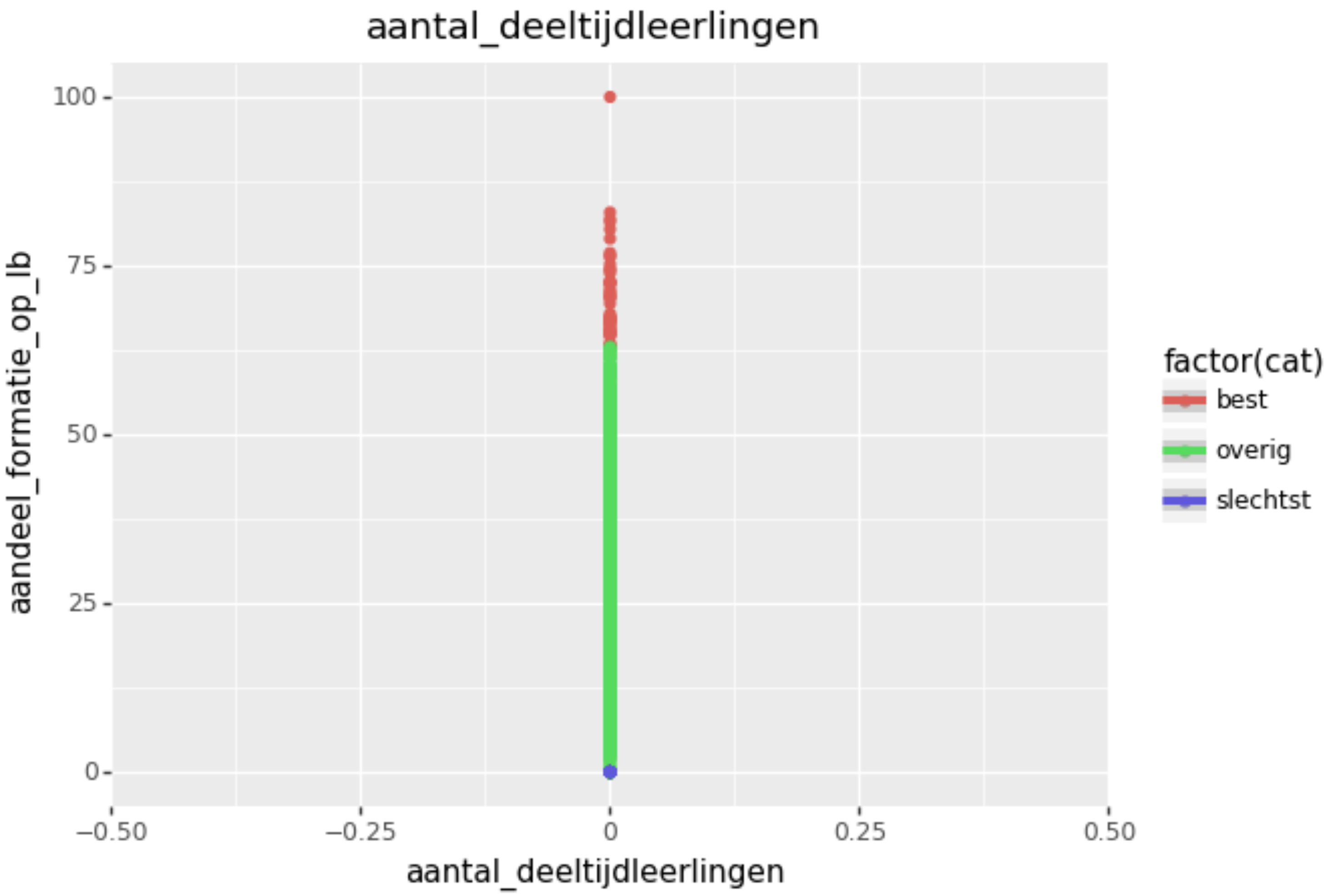

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aantal_leerlingen_vbo_groen
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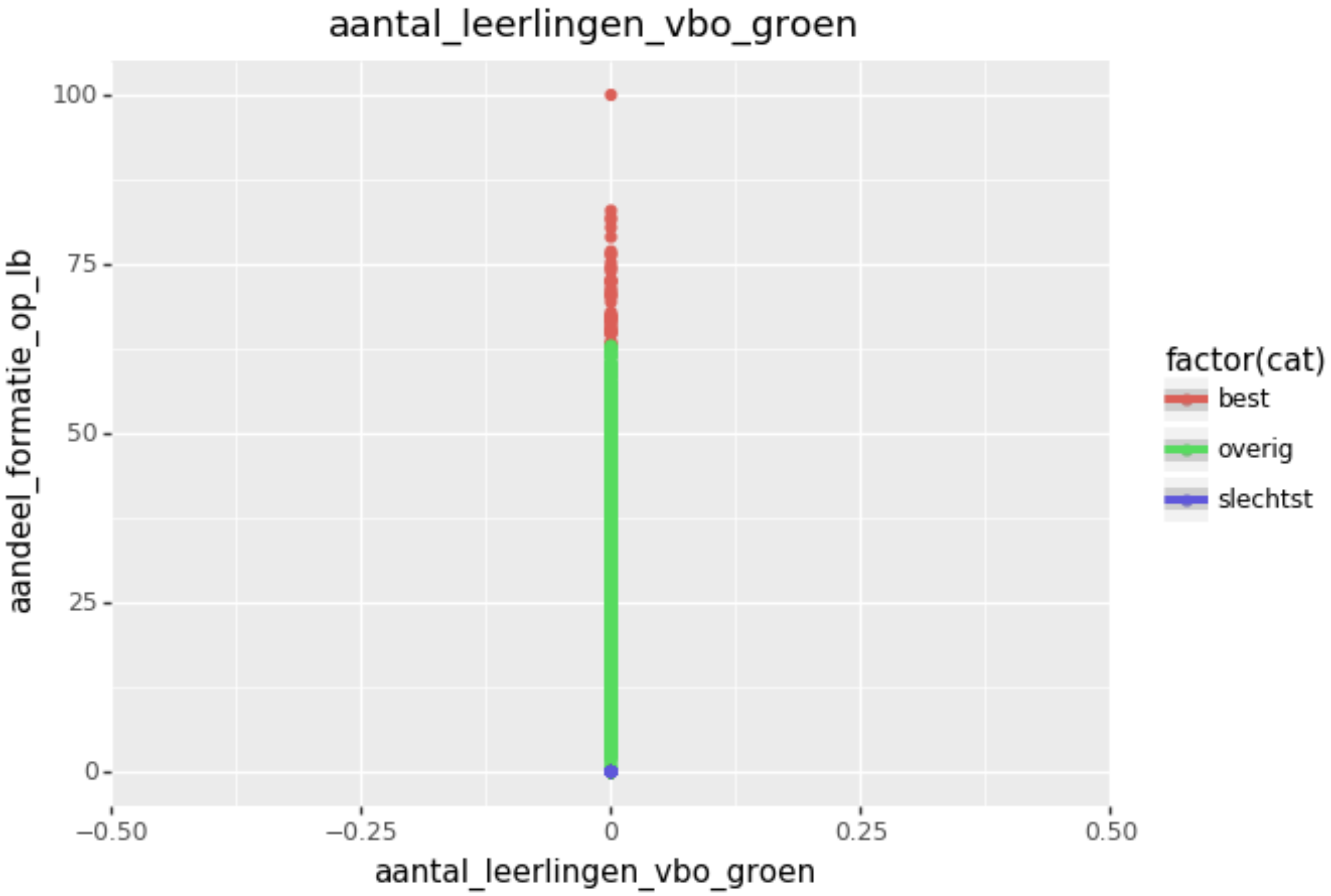

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aantal_bol_leerlingen
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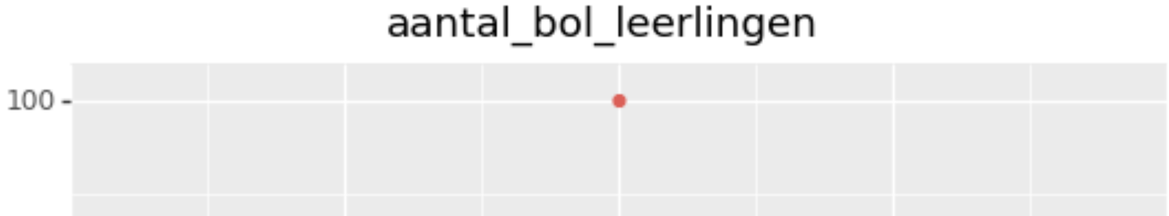

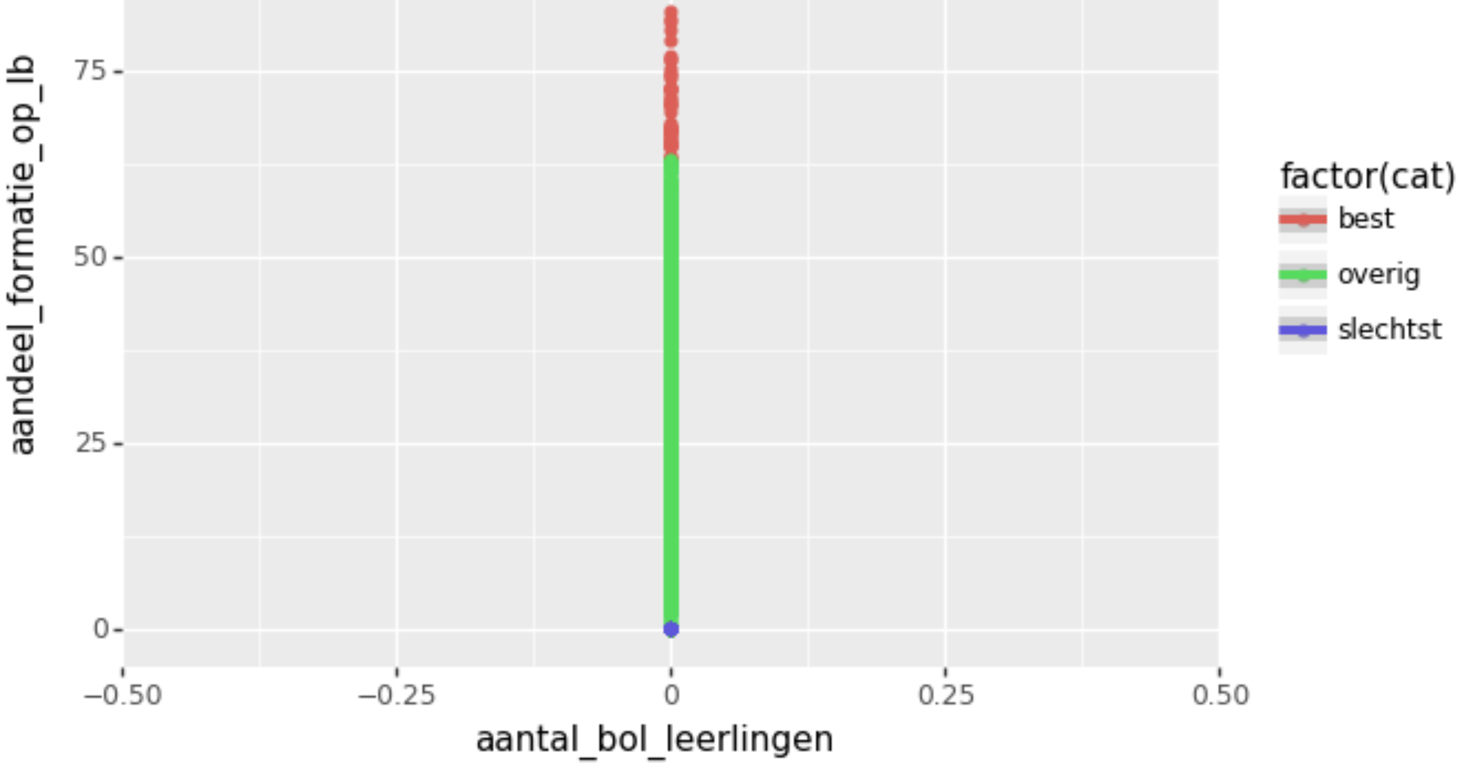

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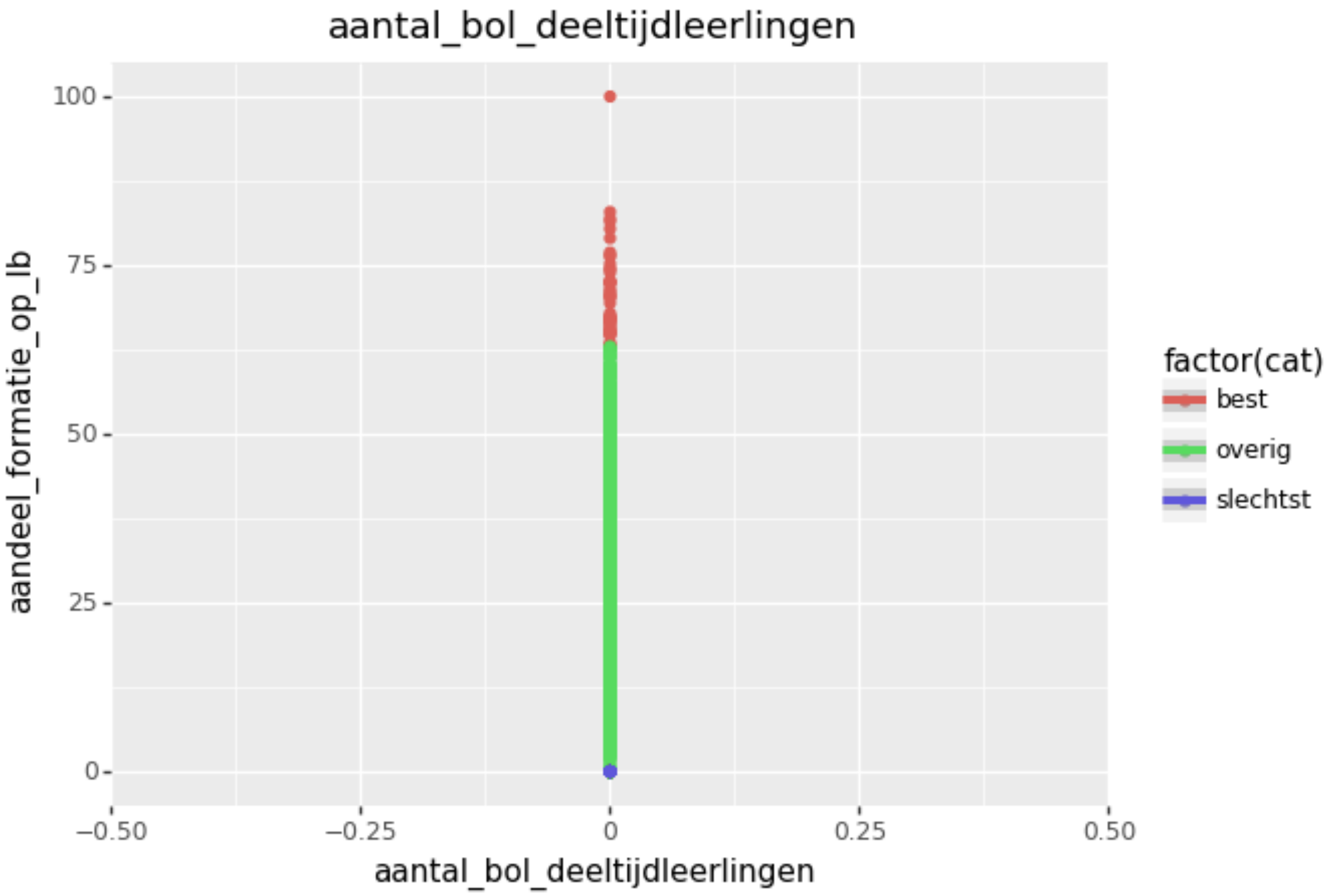
aantal_bol_deeltijdleerlingen
```



```
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aantal_bbl_leerlingen
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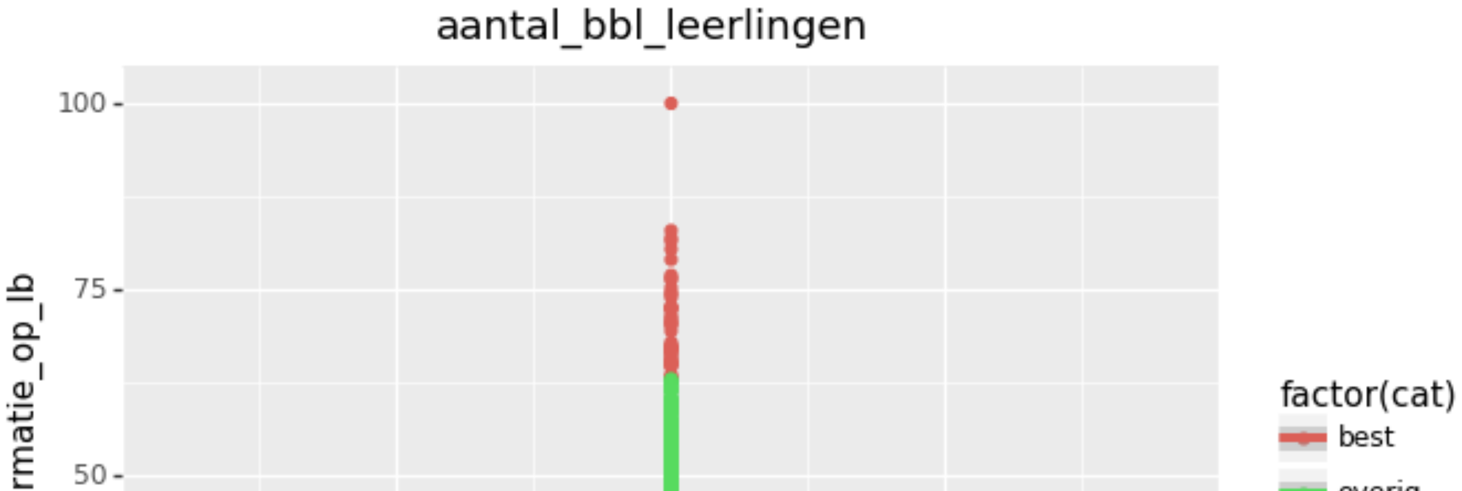

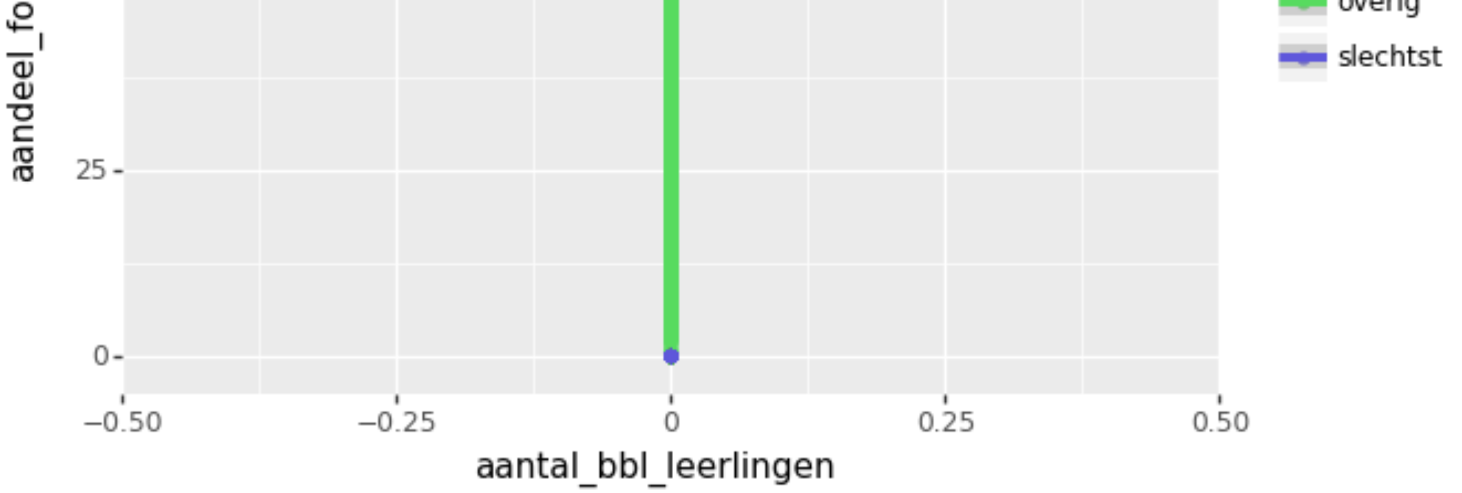

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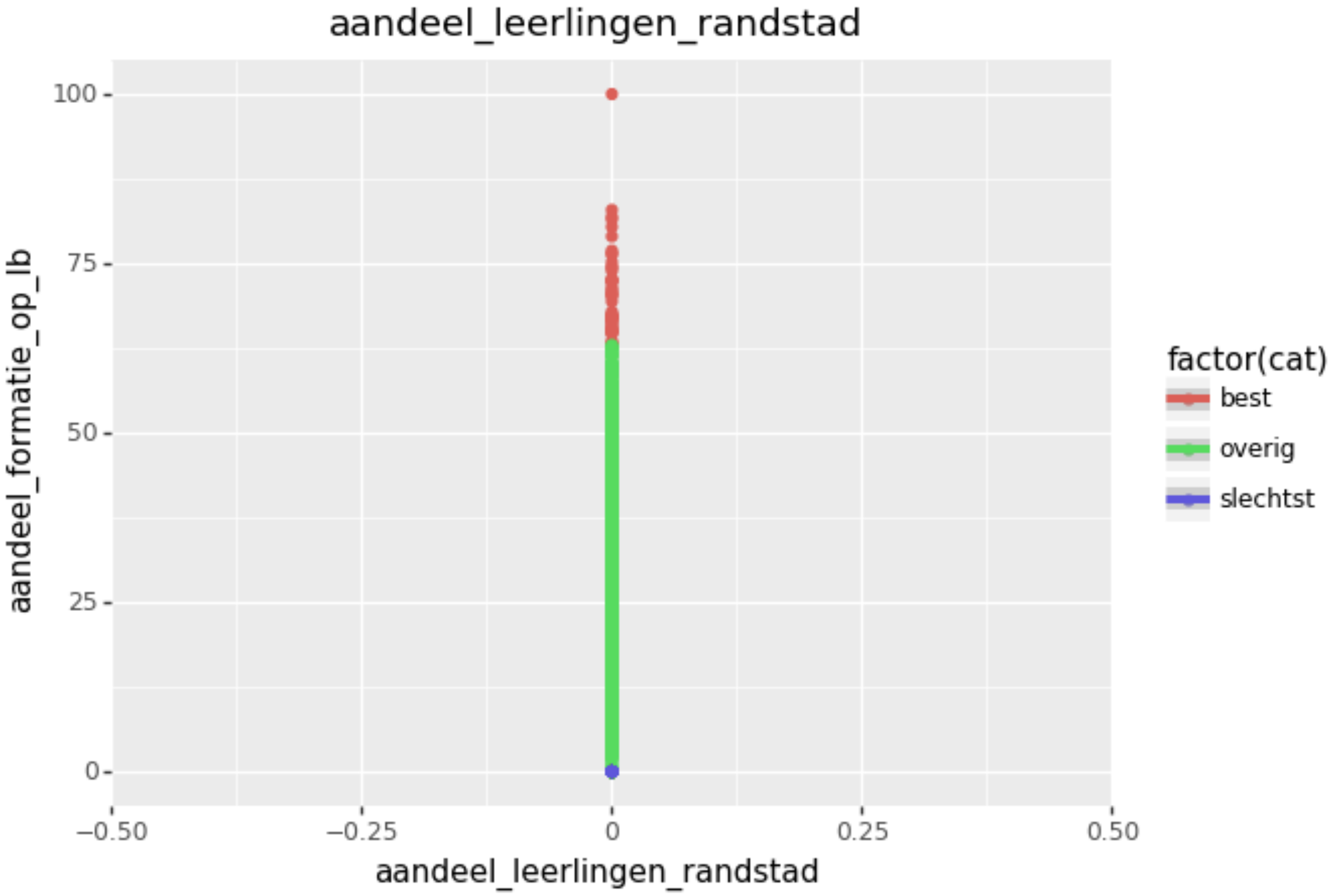
aandeel_leerlingen_randstad
```



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omvang_formatie_totaal
```

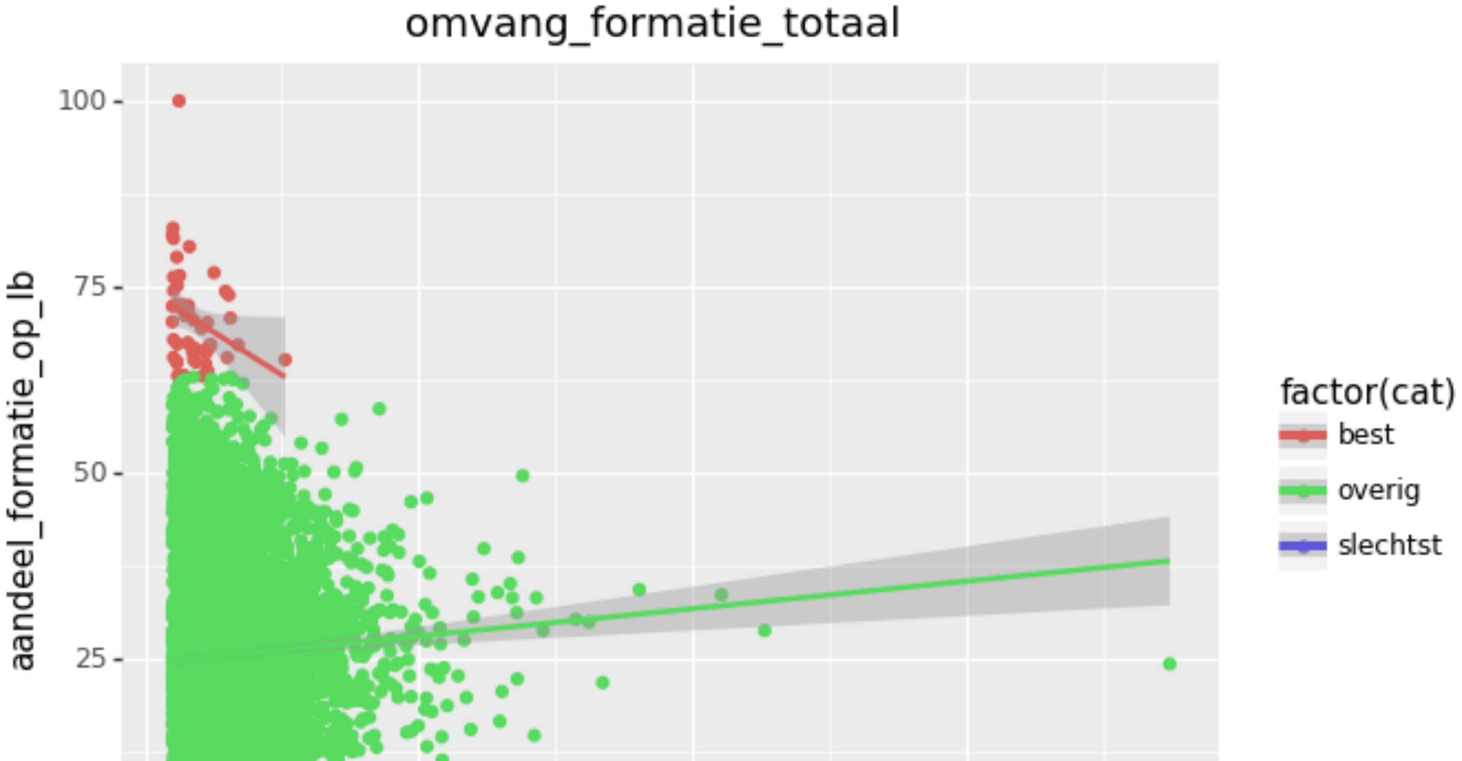

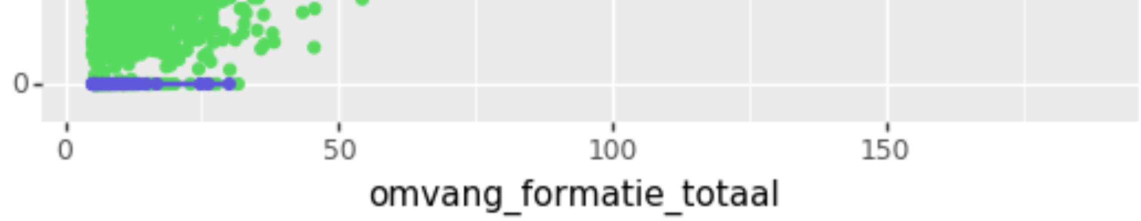

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omvang_formatie_manager
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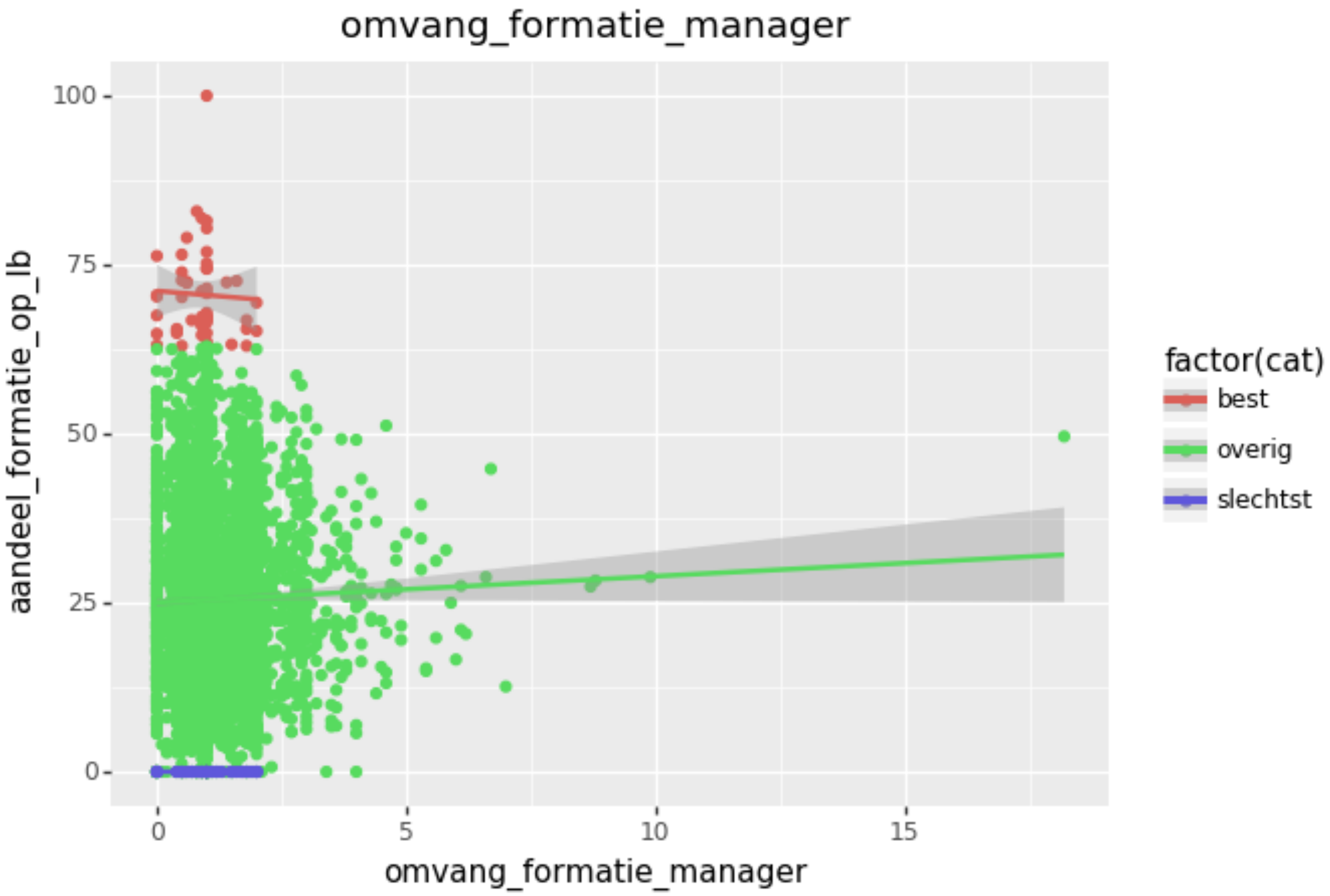

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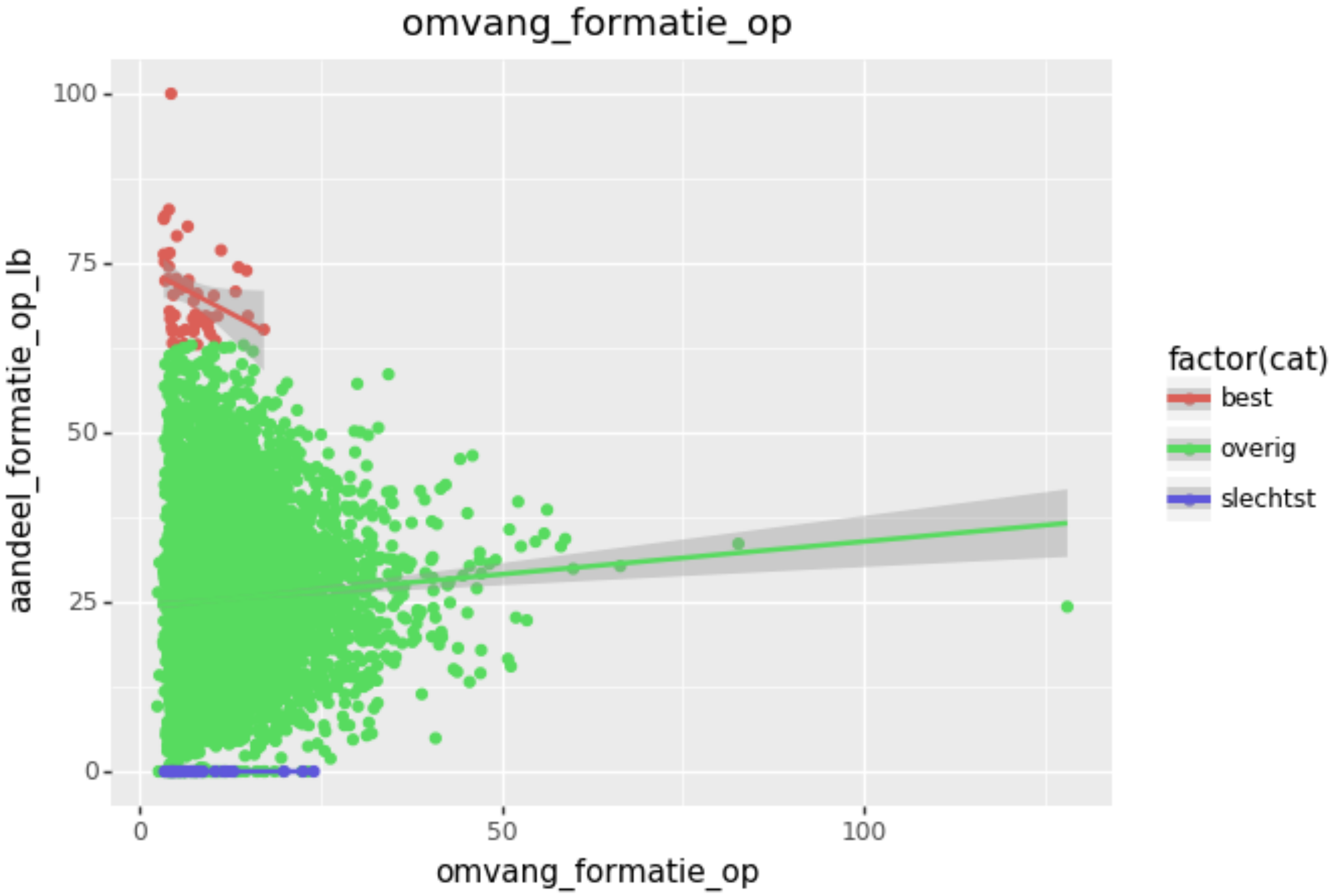
omvang_formatie_op
```



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omvang_formatie_lio
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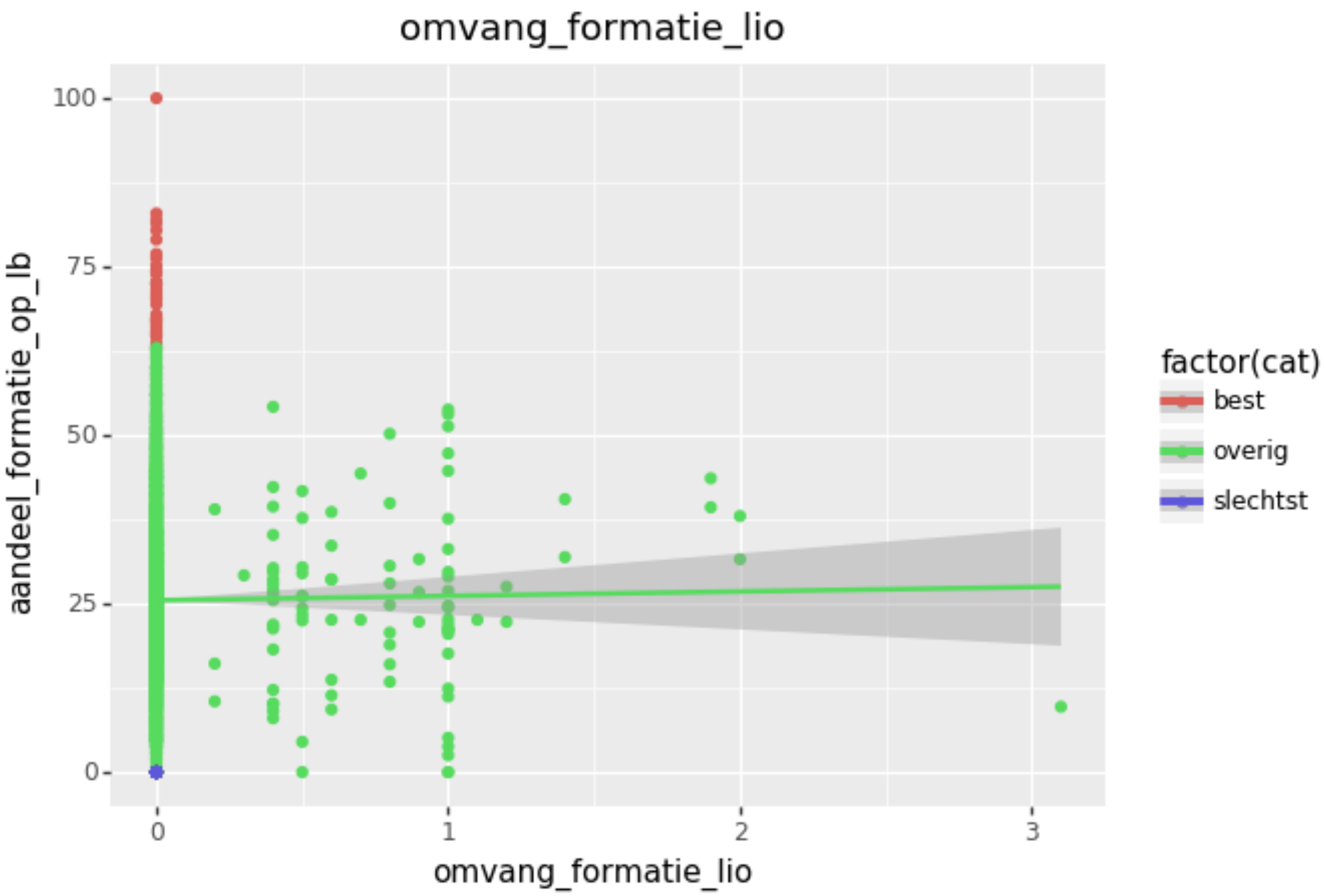

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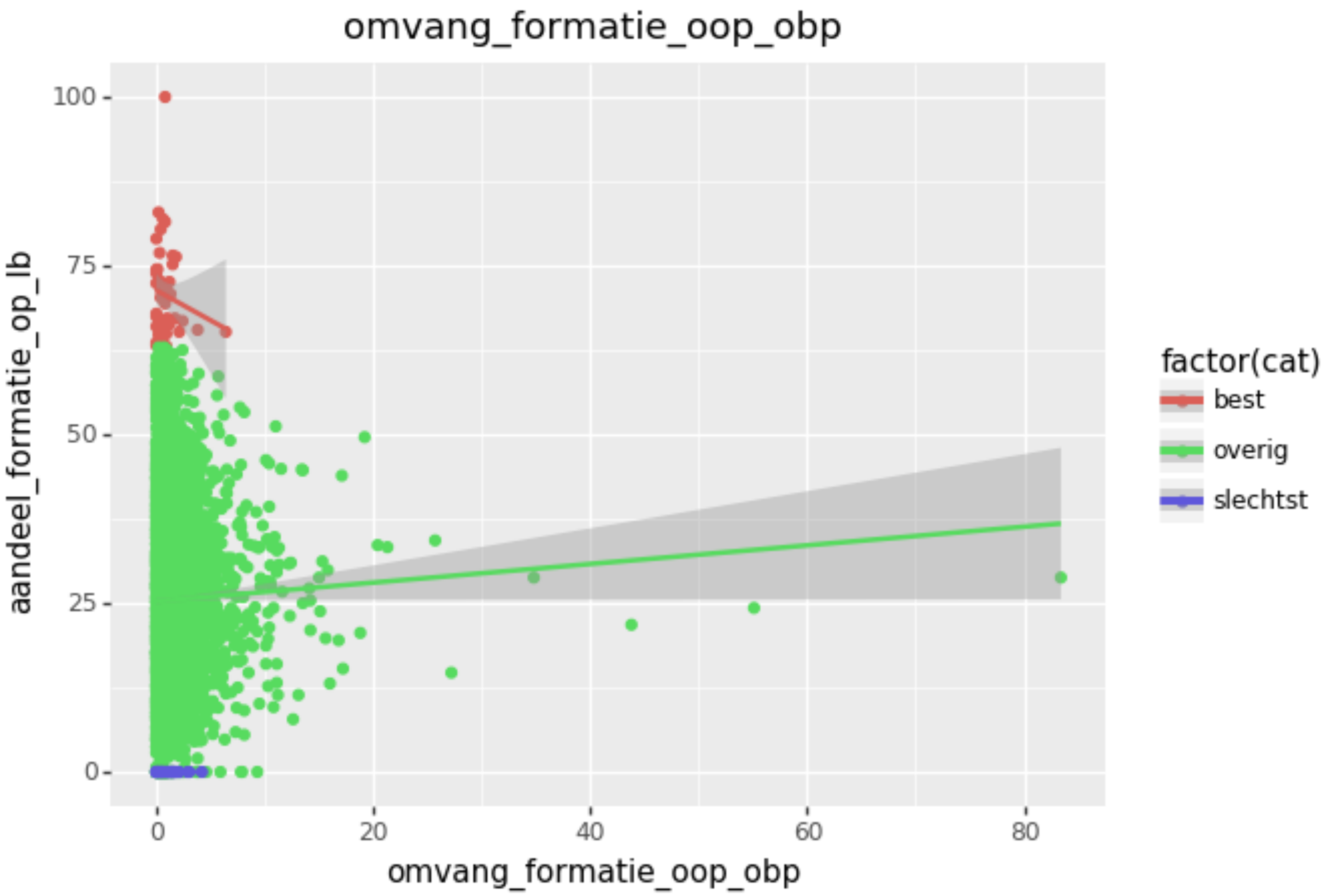

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omvang_formatie_onbekend
```

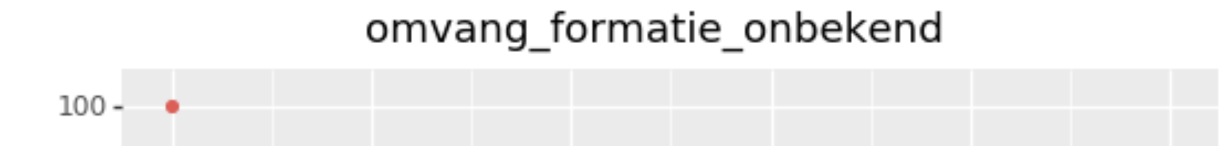

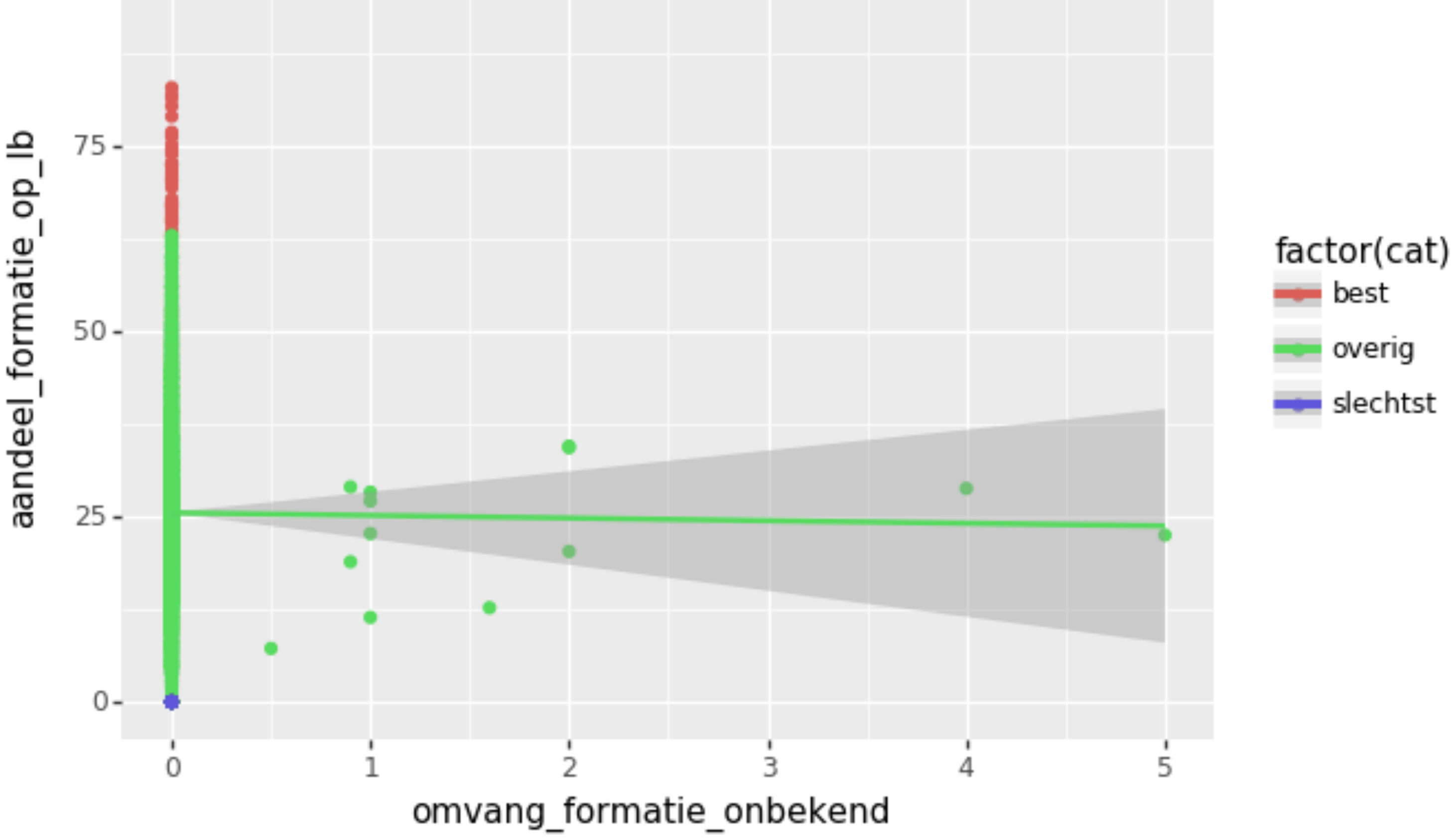

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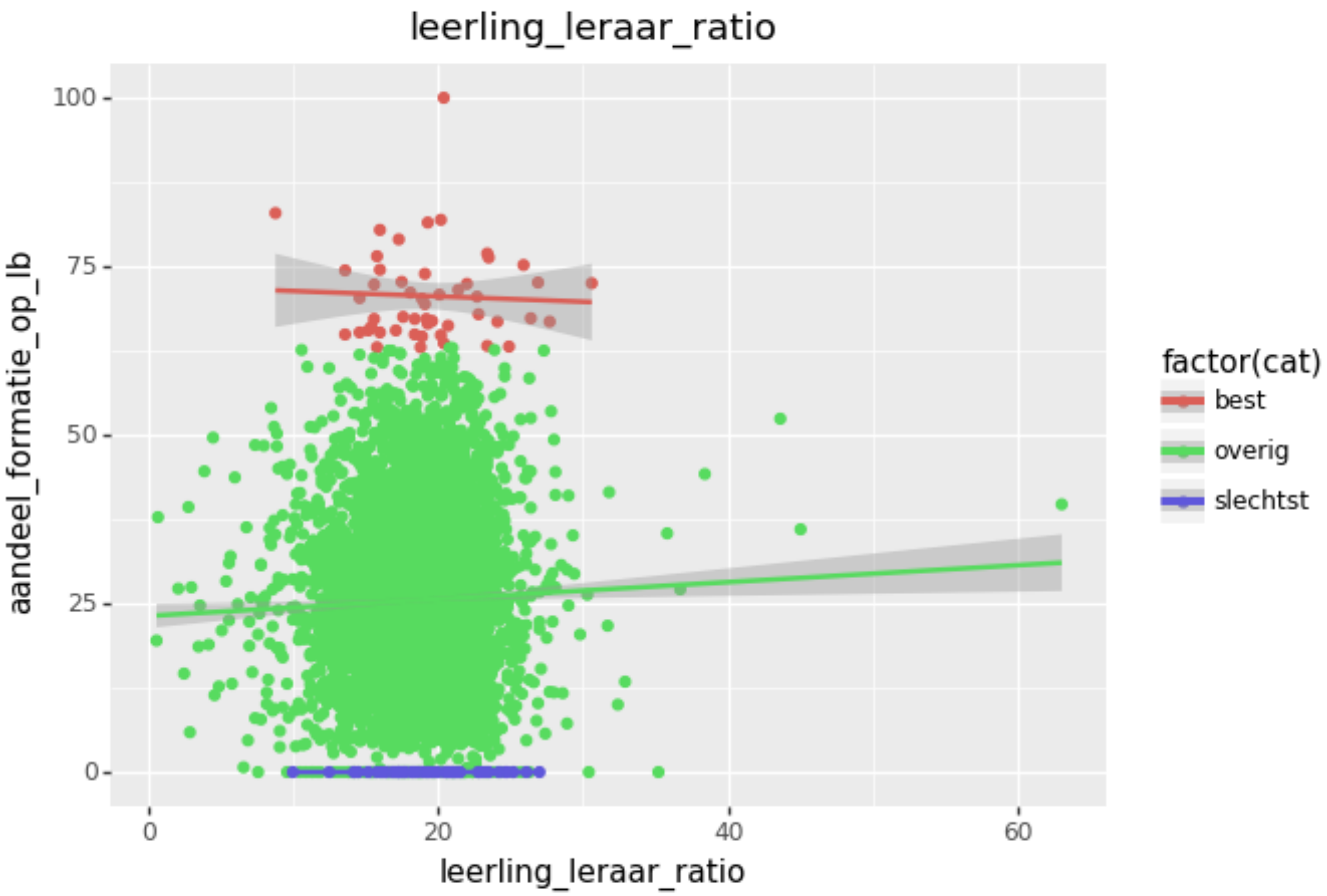
leerling_leraar_ratio
```



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gewogen_deelnemer_leraar_ratio
```

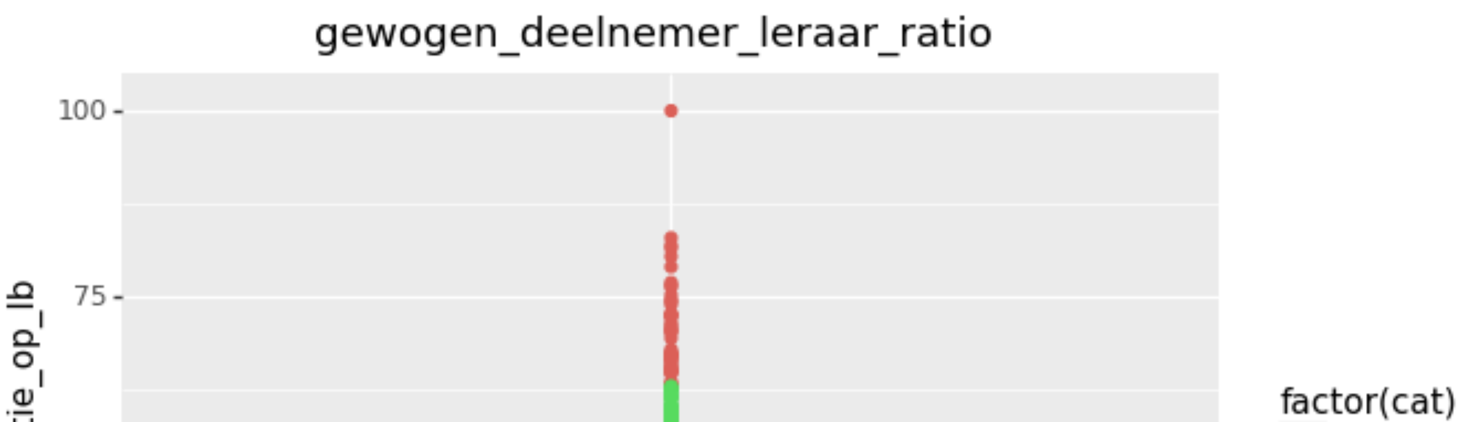

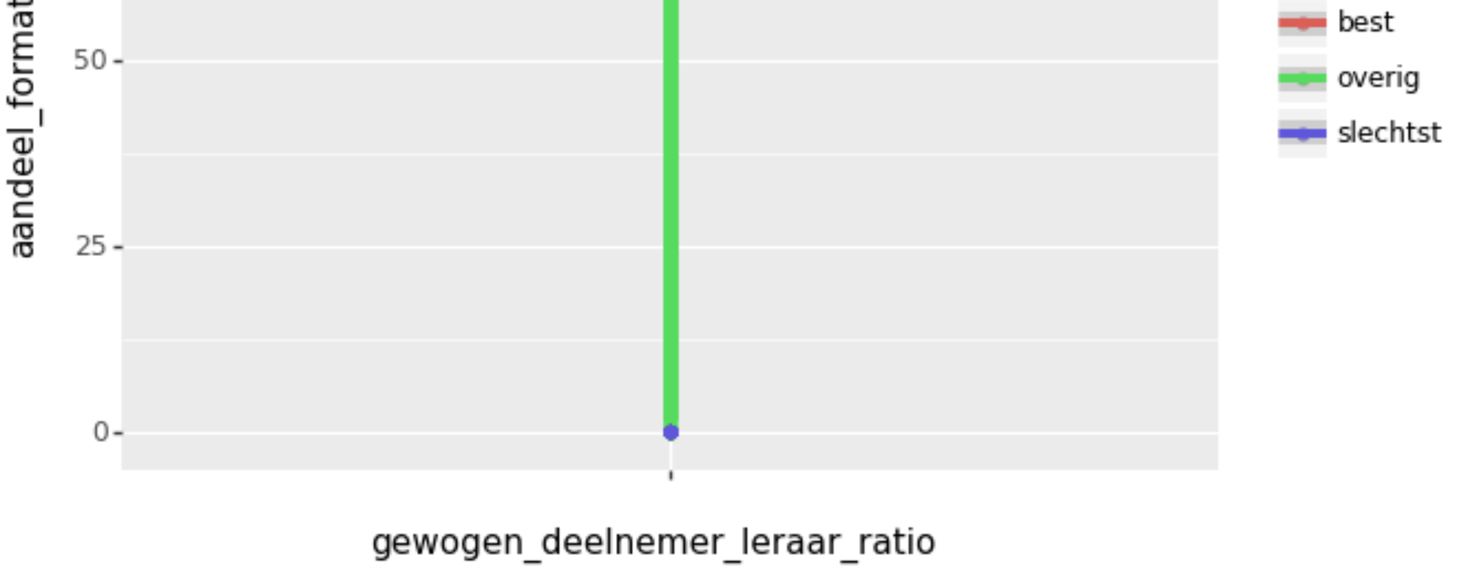

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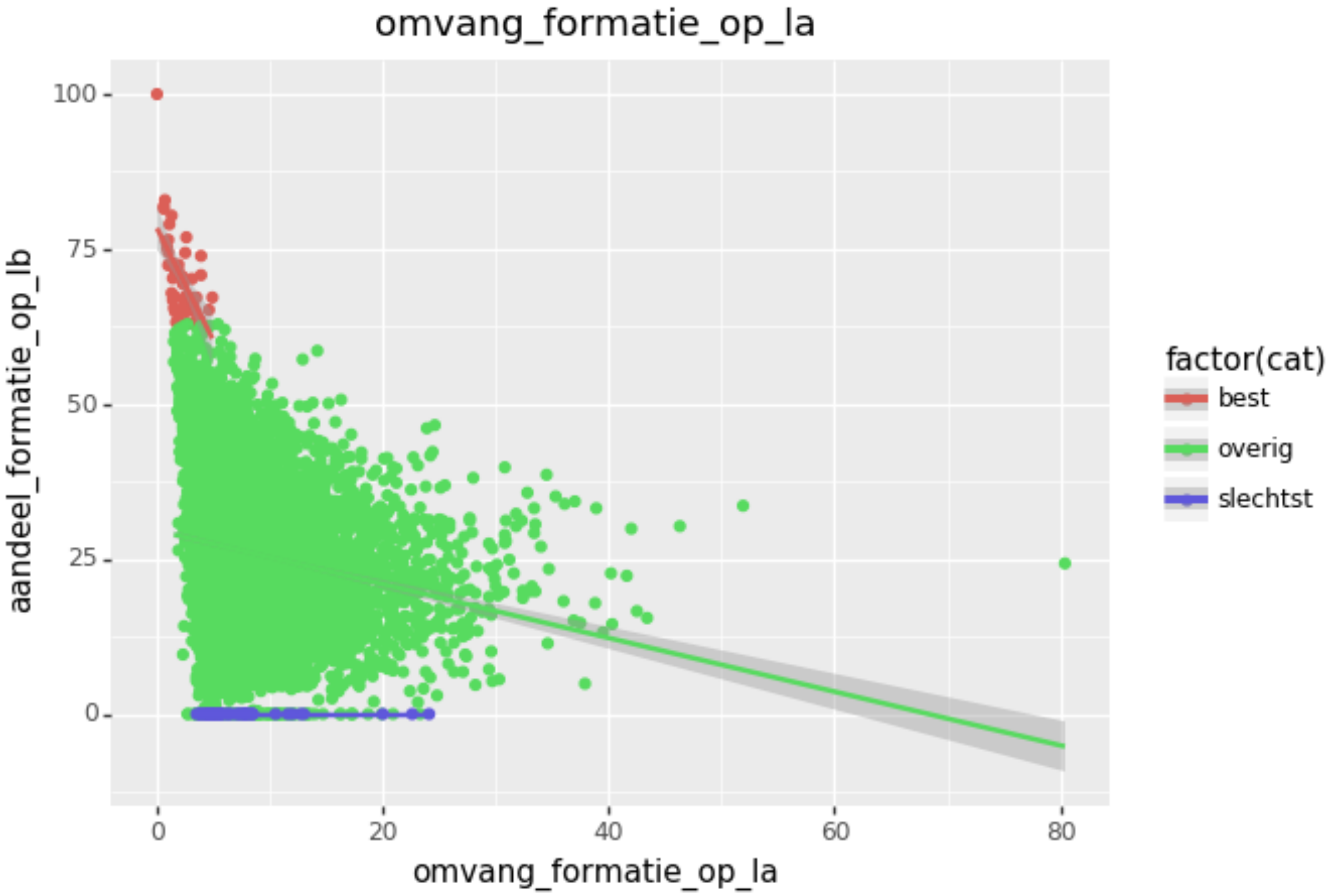
omvang_formatie_op_la
```



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omvang_formatie_op_lb
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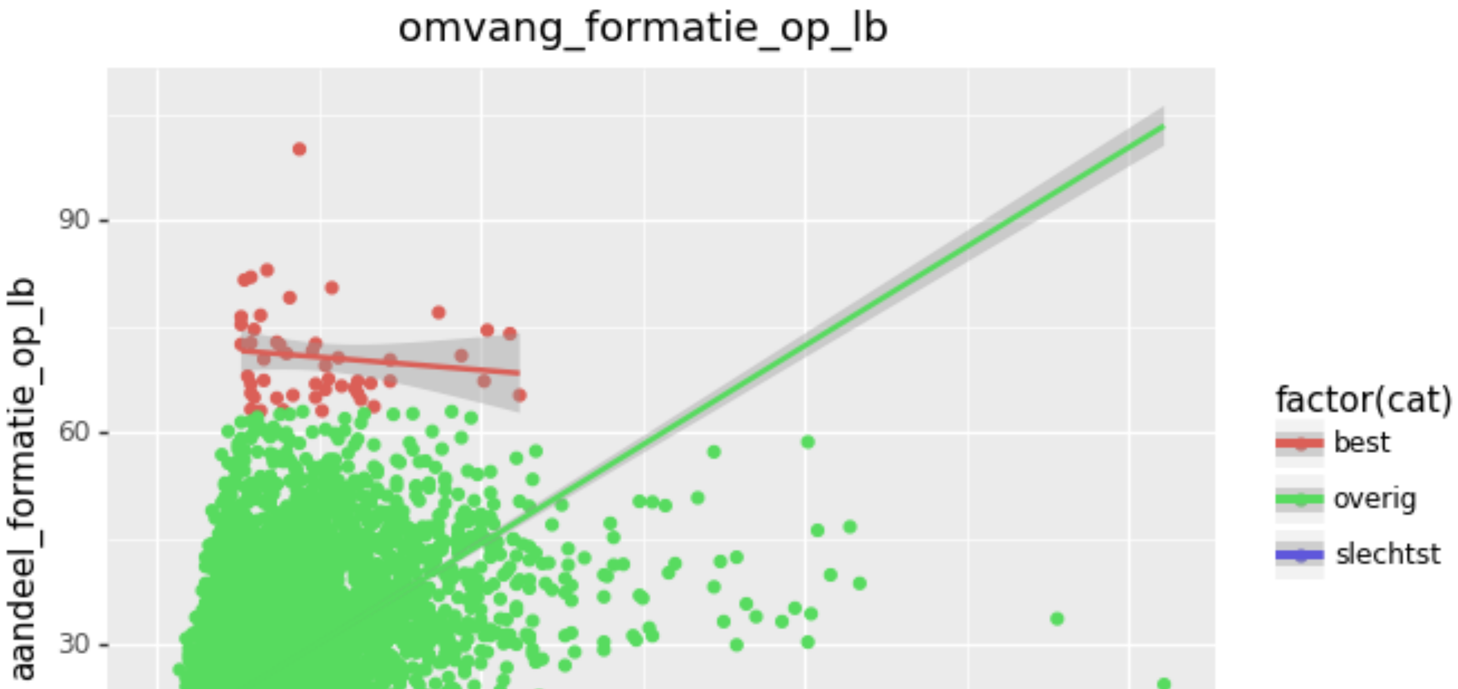

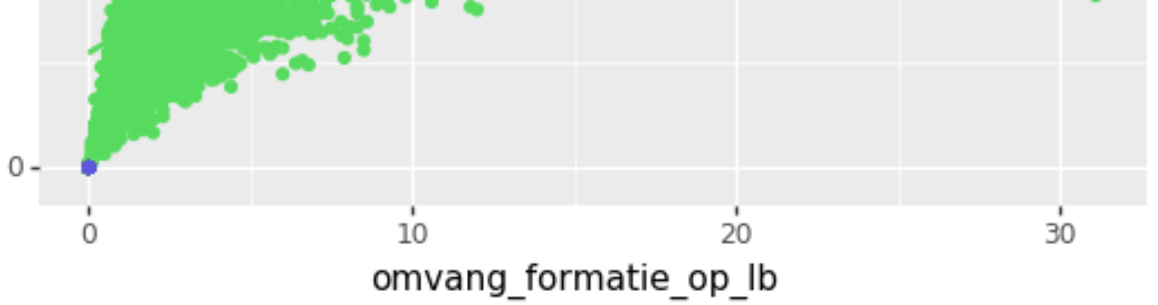

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omvang_formatie_op_lc
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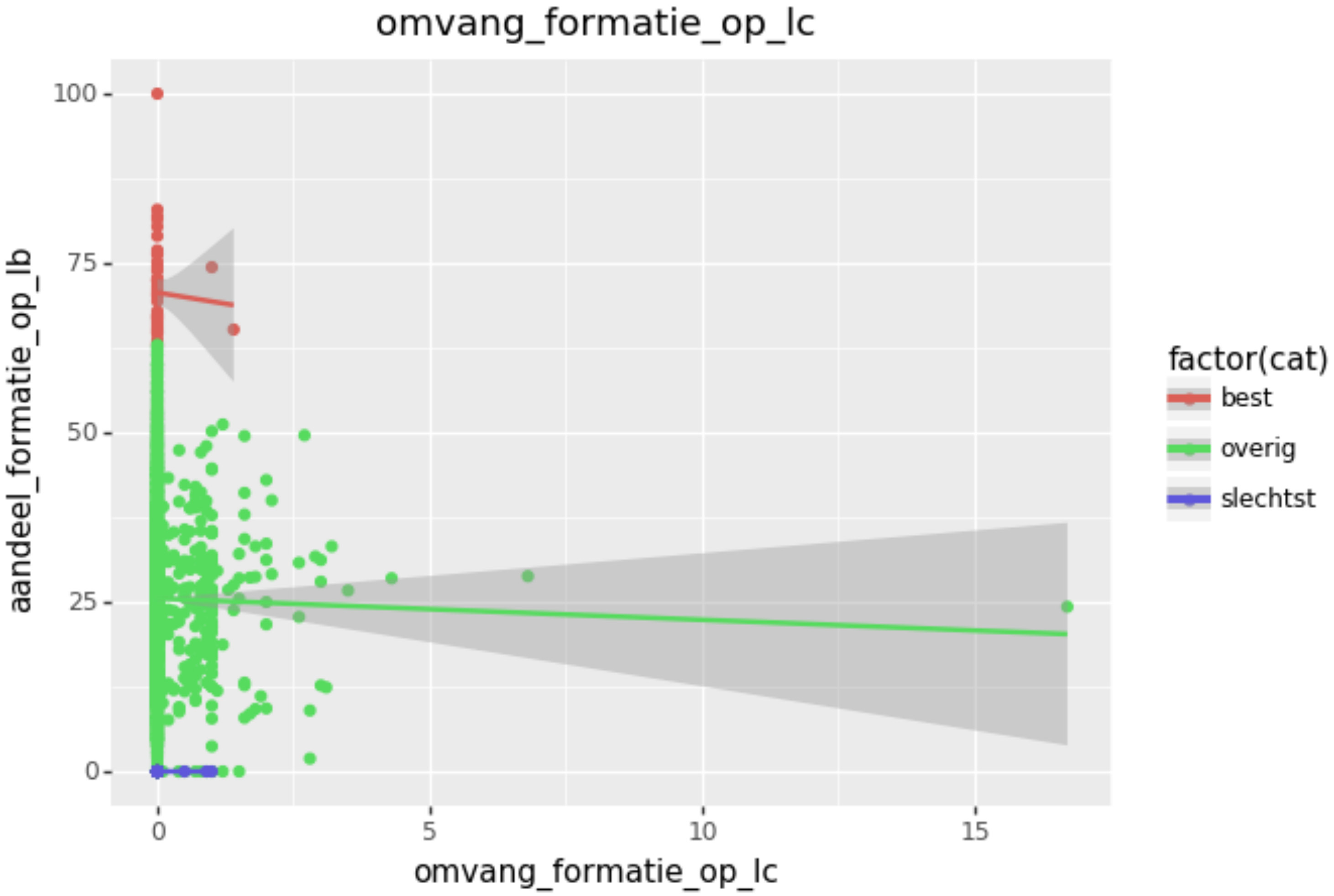

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omvang_formatie_op_ld
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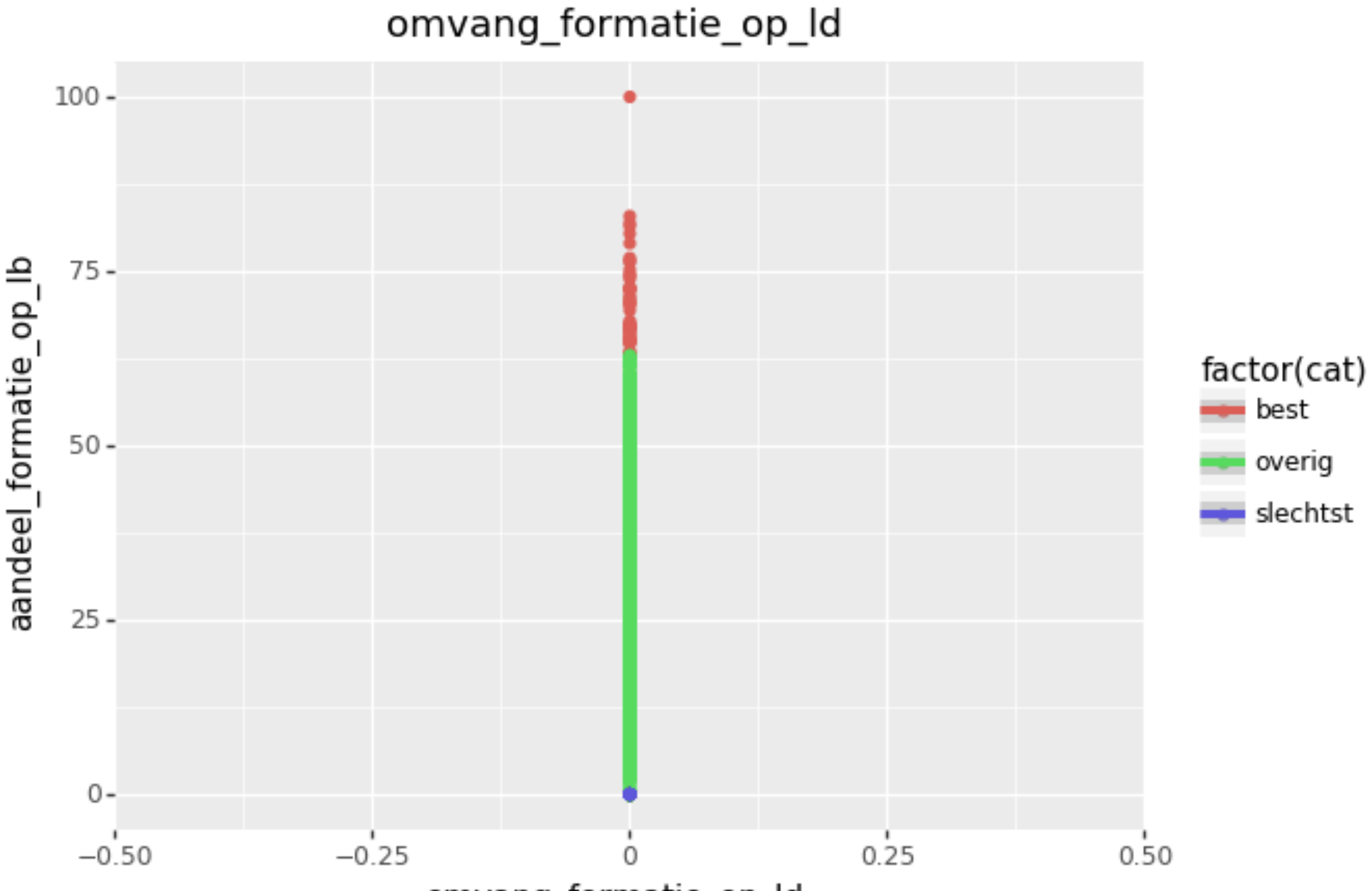

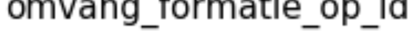

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omvang_formatie_op_le
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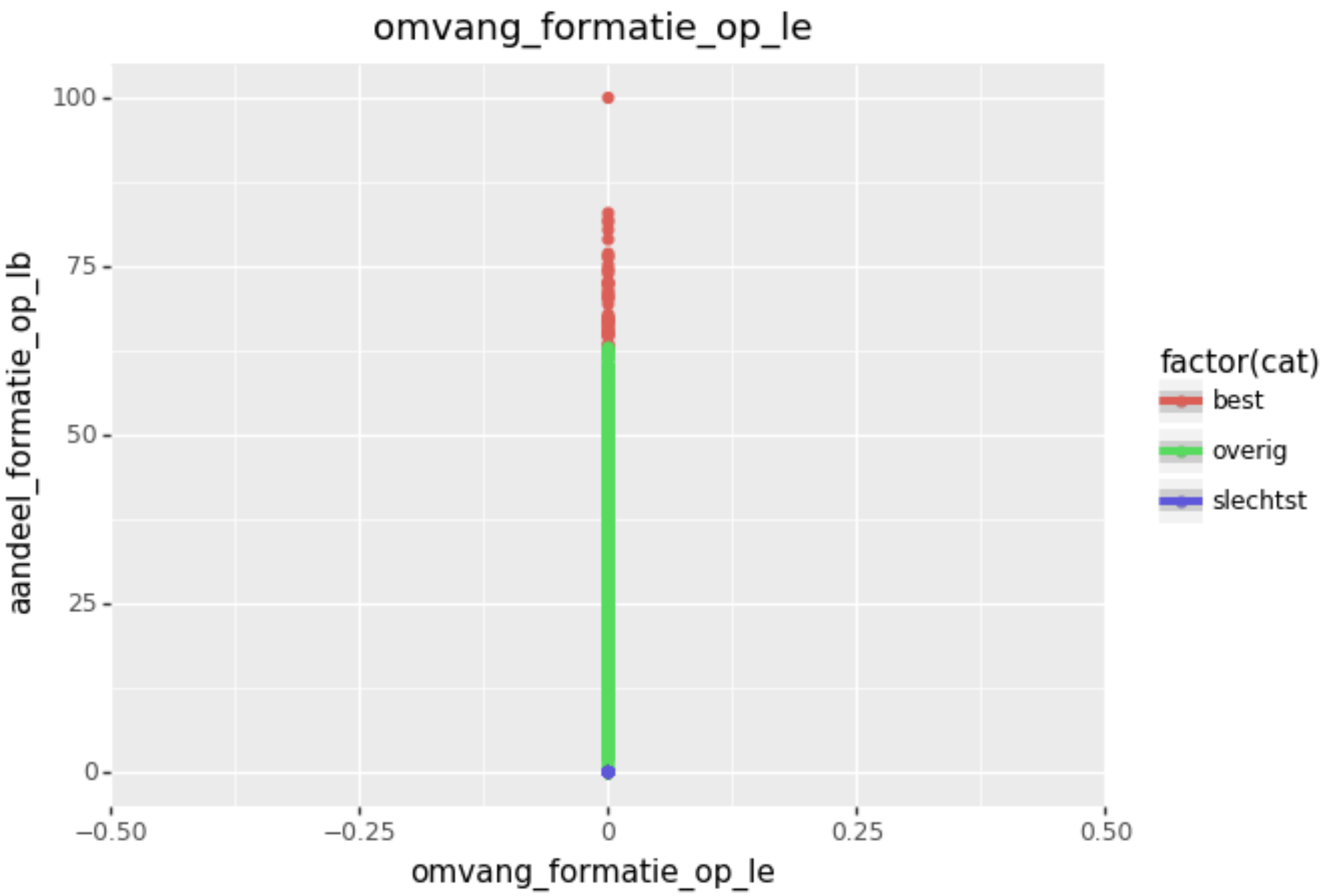

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omvang_formatie_op_overig
```

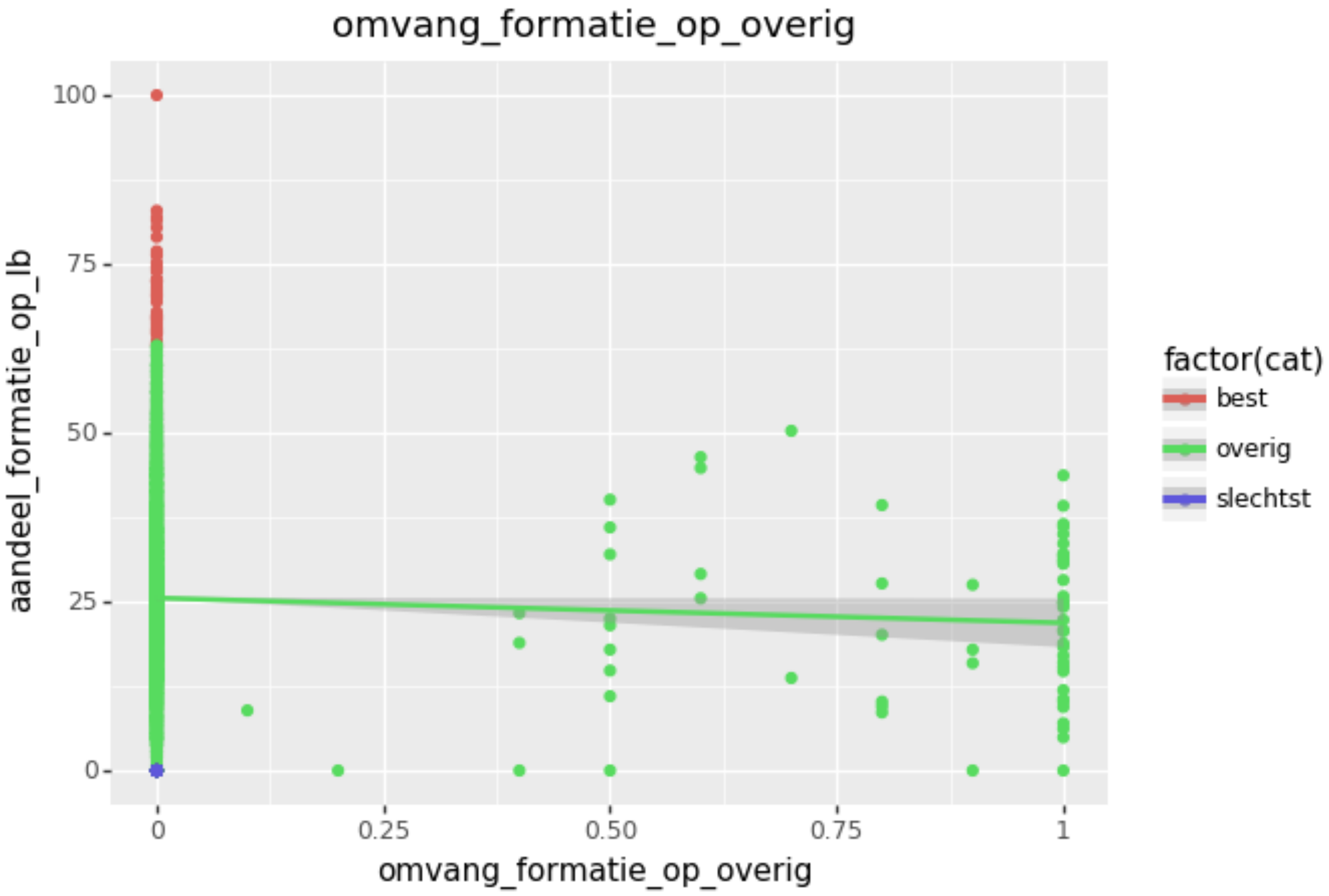

```
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aandeel_formatie_op_la
```
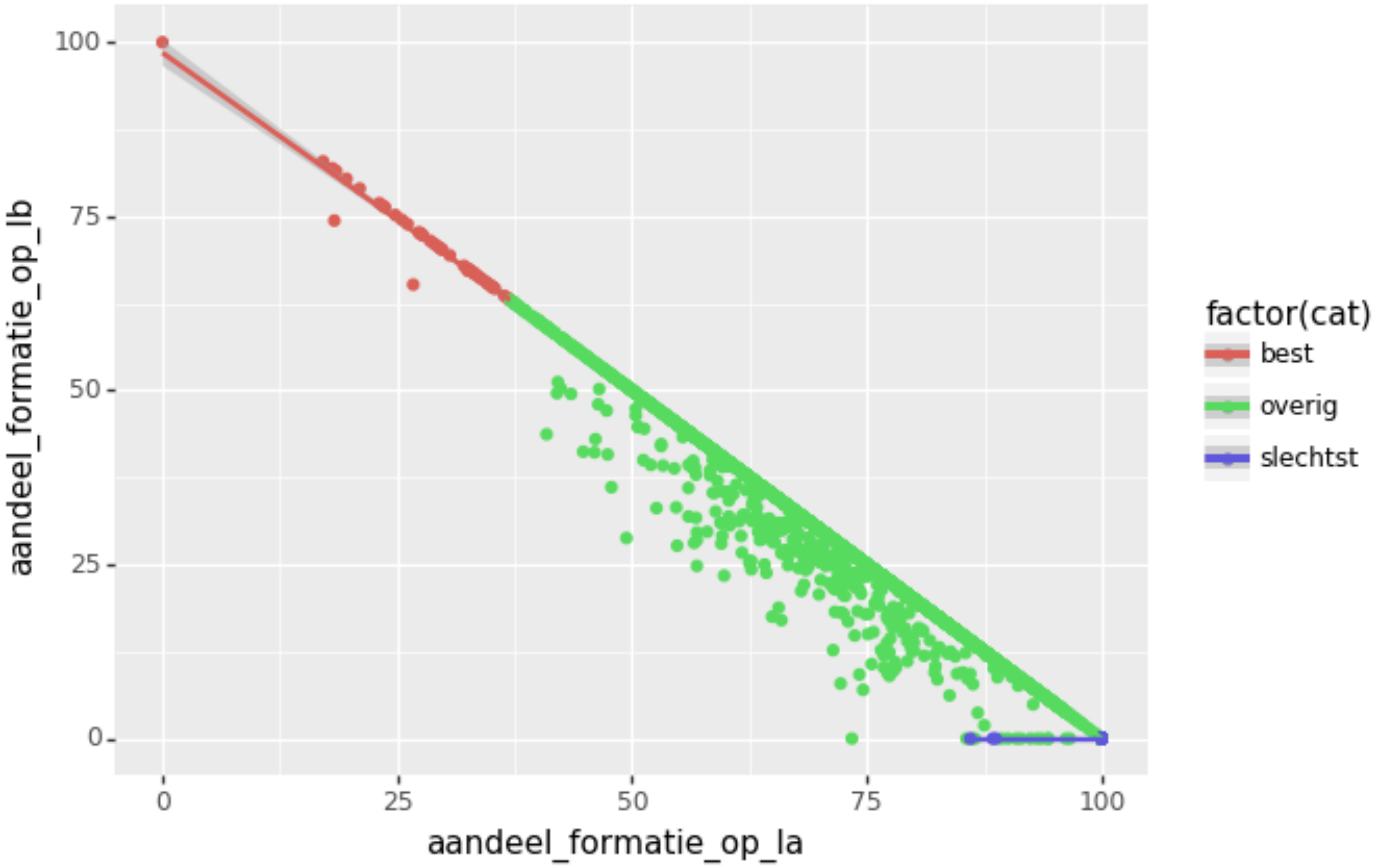
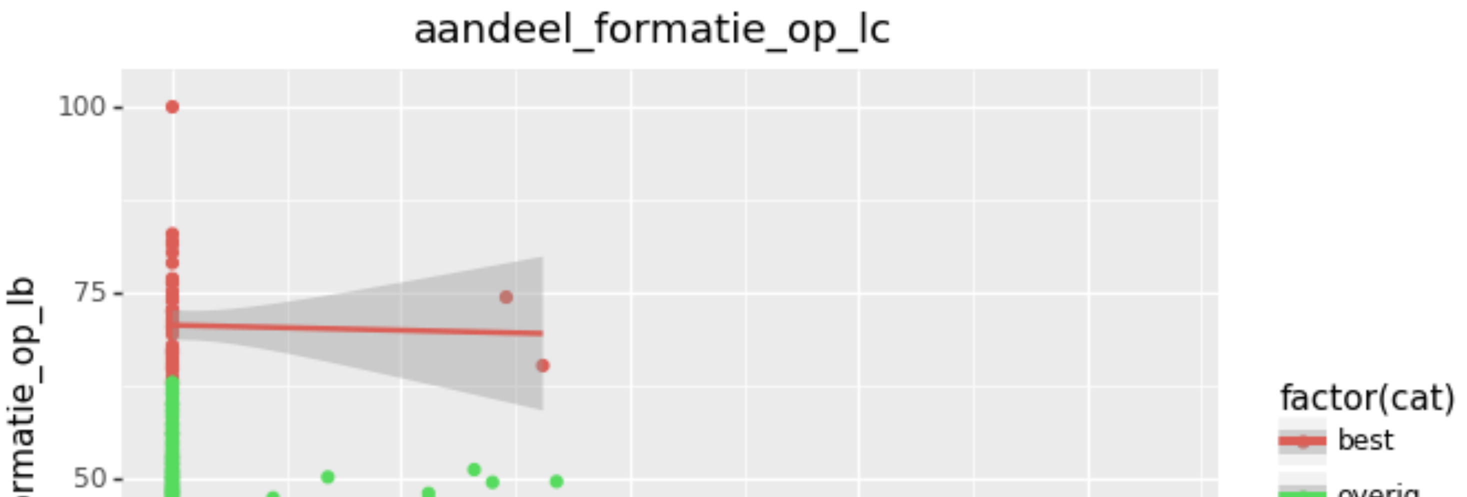
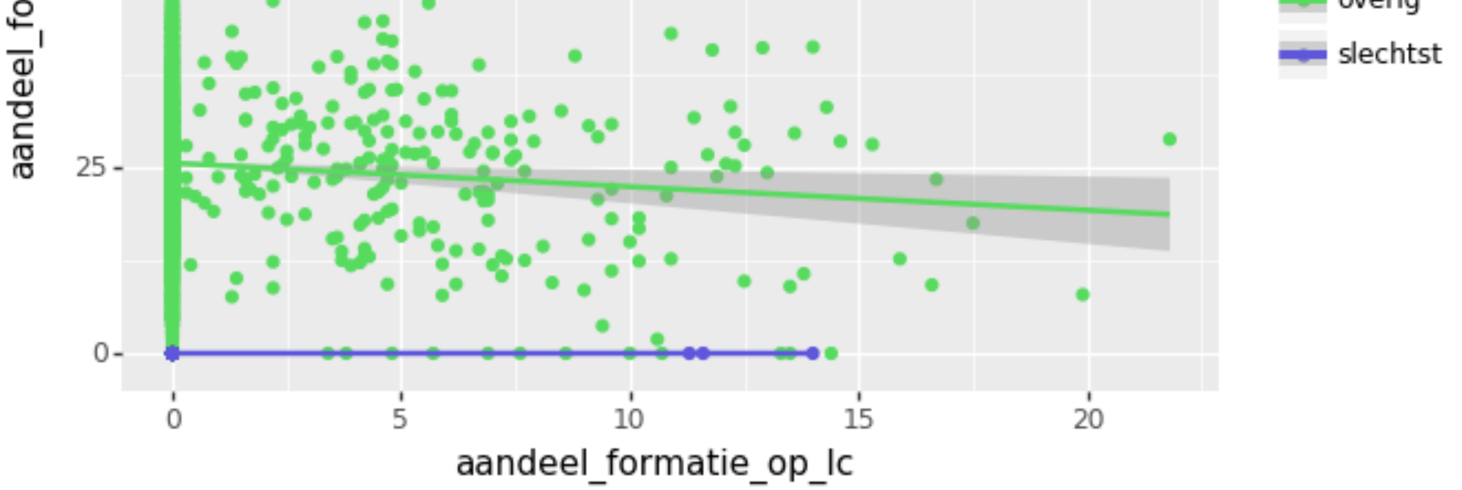



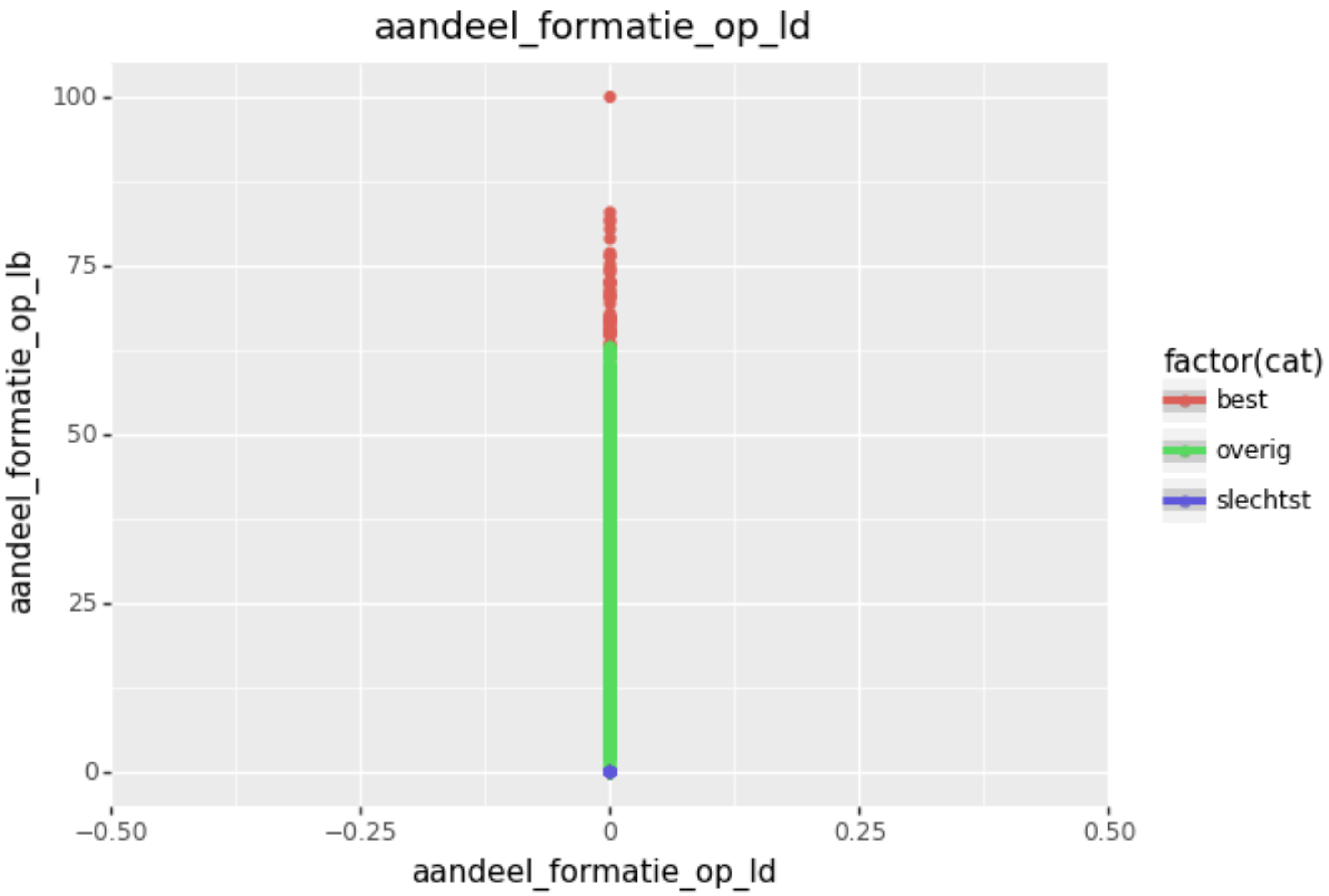
```
<ggplot: (-9223372036568014178)>
aandeel_formatie_op_lb
Wrong number of items passed 2, placement implies 1
aandeel_formatie_op_lc

Traceback (most recent call last):
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/indexes/base.py", line 2525, in get_loc
    return self._engine.get_loc(key)
  File "pandas/_libs/index.pyx", line 117, in pandas._libs.index.Ind
exEngine.get_loc
  File "pandas/_libs/index.pyx", line 139, in pandas._libs.index.Ind
exEngine.get_loc
  File "pandas/_libs/hashtable_class_helper.pxi", line 1265, in pand
as._libs.hashtable.PyObjectHashTable.get_item
  File "pandas/_libs/hashtable_class_helper.pxi", line 1273, in pand
as._libs.hashtable.PyObjectHashTable.get_item
KeyError: 'x'

During handling of the above exception, another exception occurred:

Traceback (most recent call last):
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/internals.py", line 3968, in set
    loc = self.items.get_loc(item)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/indexes/base.py", line 2527, in get_loc
    return self._engine.get_loc(self._maybe_cast_indexer(key))
  File "pandas/_libs/index.pyx", line 117, in pandas._libs.index.Ind
exEngine.get_loc
  File "pandas/_libs/index.pyx", line 139, in pandas._libs.index.Ind
exEngine.get_loc
  File "pandas/_libs/hashtable_class_helper.pxi", line 1265, in pand
as._libs.hashtable.PyObjectHashTable.get_item
  File "pandas/_libs/hashtable_class_helper.pxi", line 1273, in pand
as._libs.hashtable.PyObjectHashTable.get_item
```

```
KeyError: 'x'

During handling of the above exception, another exception occurred:

Traceback (most recent call last):
  File "<ipython-input-1-0789d905e37e>", line 69, in <module>
    + stat_smooth(method='lm'))
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/plotnine/ggplot.py", line 86, in __repr__
    self.draw()
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/plotnine/ggplot.py", line 179, in draw
    self._build()
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/plotnine/ggplot.py", line 276, in _build
    layers.compute_aesthetics(self)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/plotnine/layer.py", line 82, in compute_aesthetics
    l.compute_aesthetics(plot)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/plotnine/layer.py", line 308, in compute_aesthetics
    evaled[ae] = data[col]
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/frame.py", line 2519, in __setitem__
    self._set_item(key, value)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/frame.py", line 2586, in _set_item
    NDFrame._set_item(self, key, value)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/generic.py", line 1954, in _set_item
    self._data.set(key, value)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/internals.py", line 3971, in set
    self.insert(len(self.items), item, value)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/internals.py", line 4072, in insert
    placement=slice(loc, loc + 1))
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/internals.py", line 2957, in make_block
    return klass(values, ndim=ndim, fastpath=fastpath, placement=pla
cement)
  File "/Users/rix0rrr/Dev/CorrespondentPO/virtualenv/lib/python3.6/
site-packages/pandas/core/internals.py", line 120, in __init__
    len(self.mgr_locs)))
ValueError: Wrong number of items passed 2, placement implies 1
```





```
<ggplot: (291391990)>
aandeel_formatie_op_ld
```



```
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aandeel_formatie_op_le
```
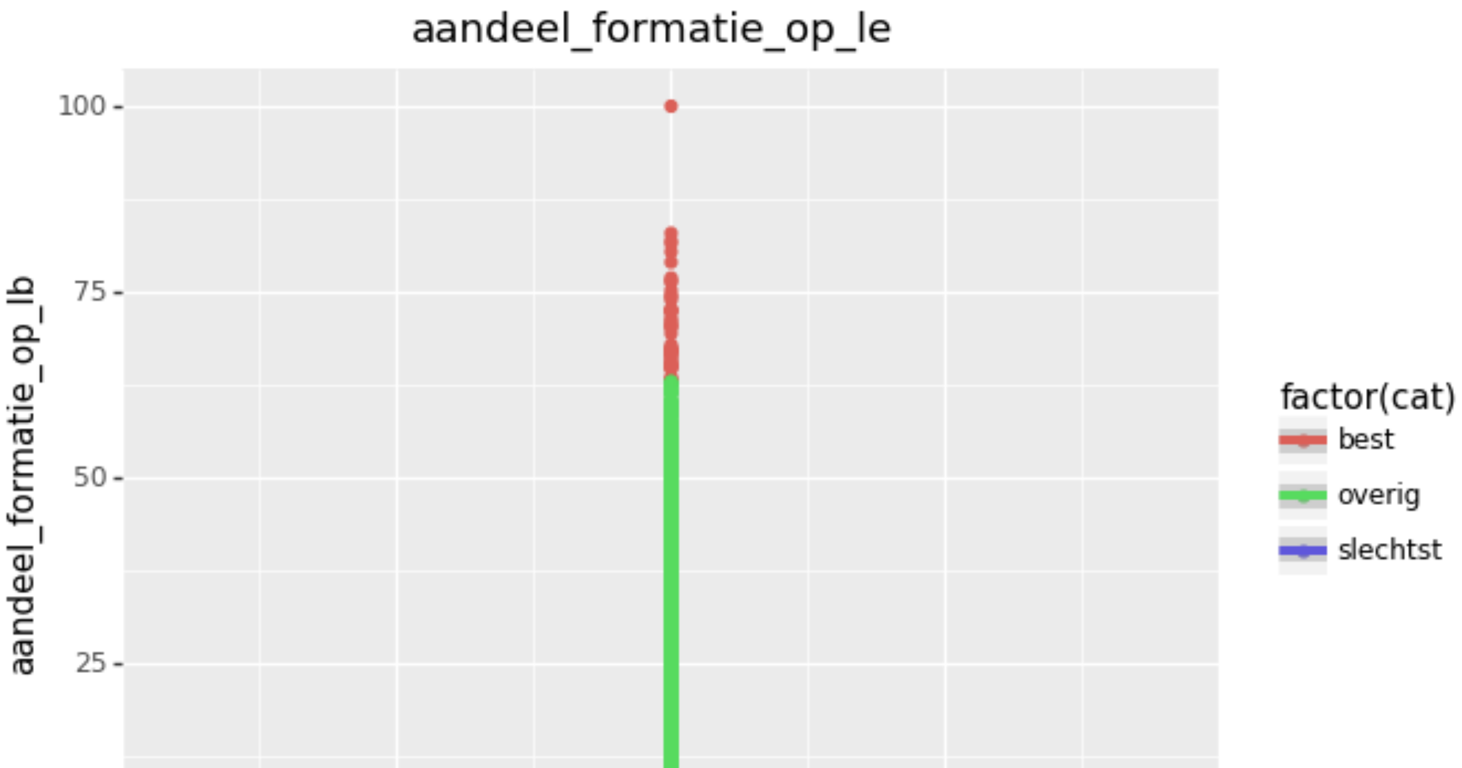
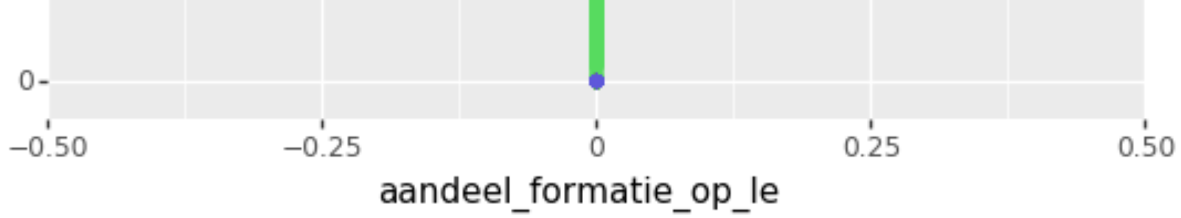
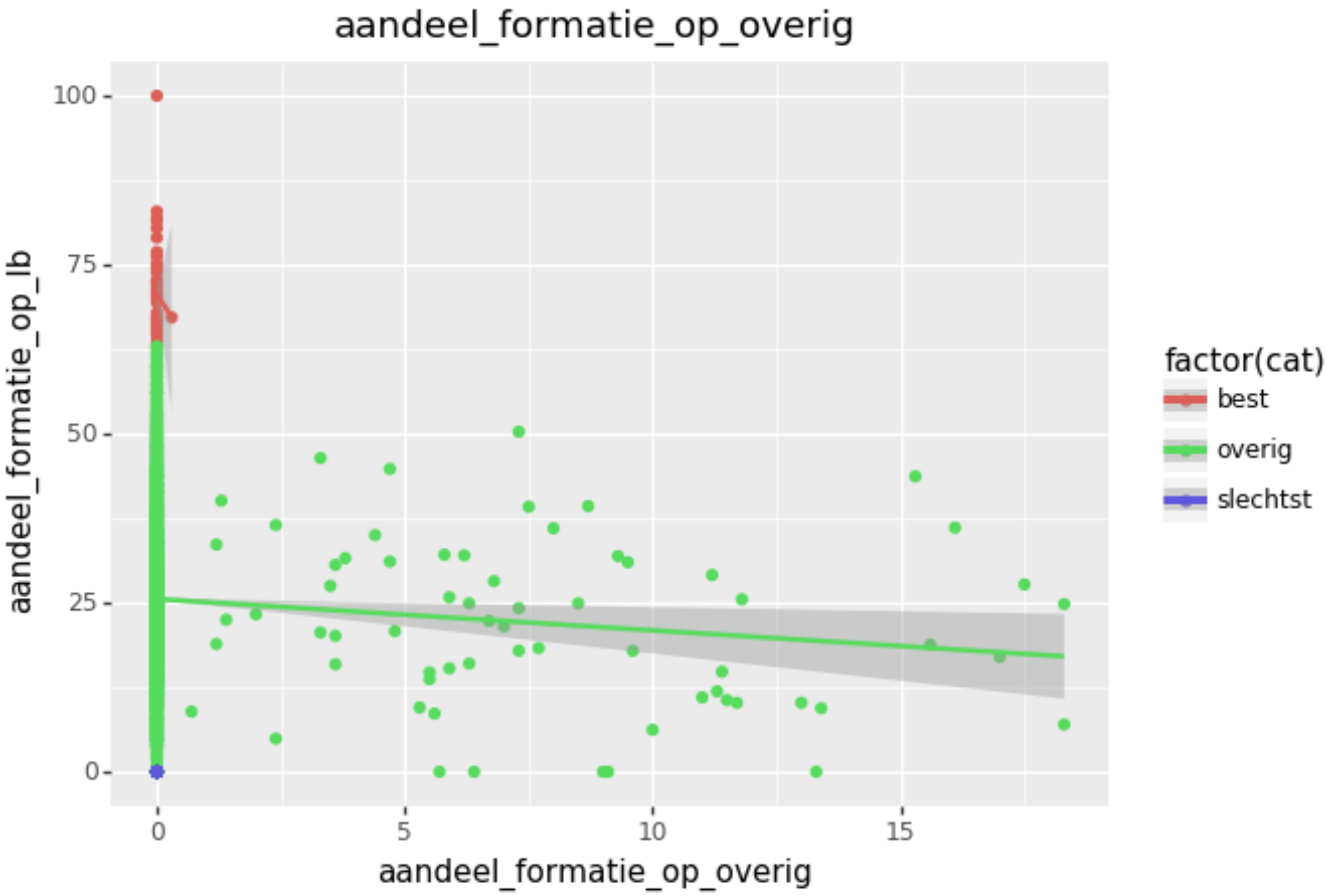
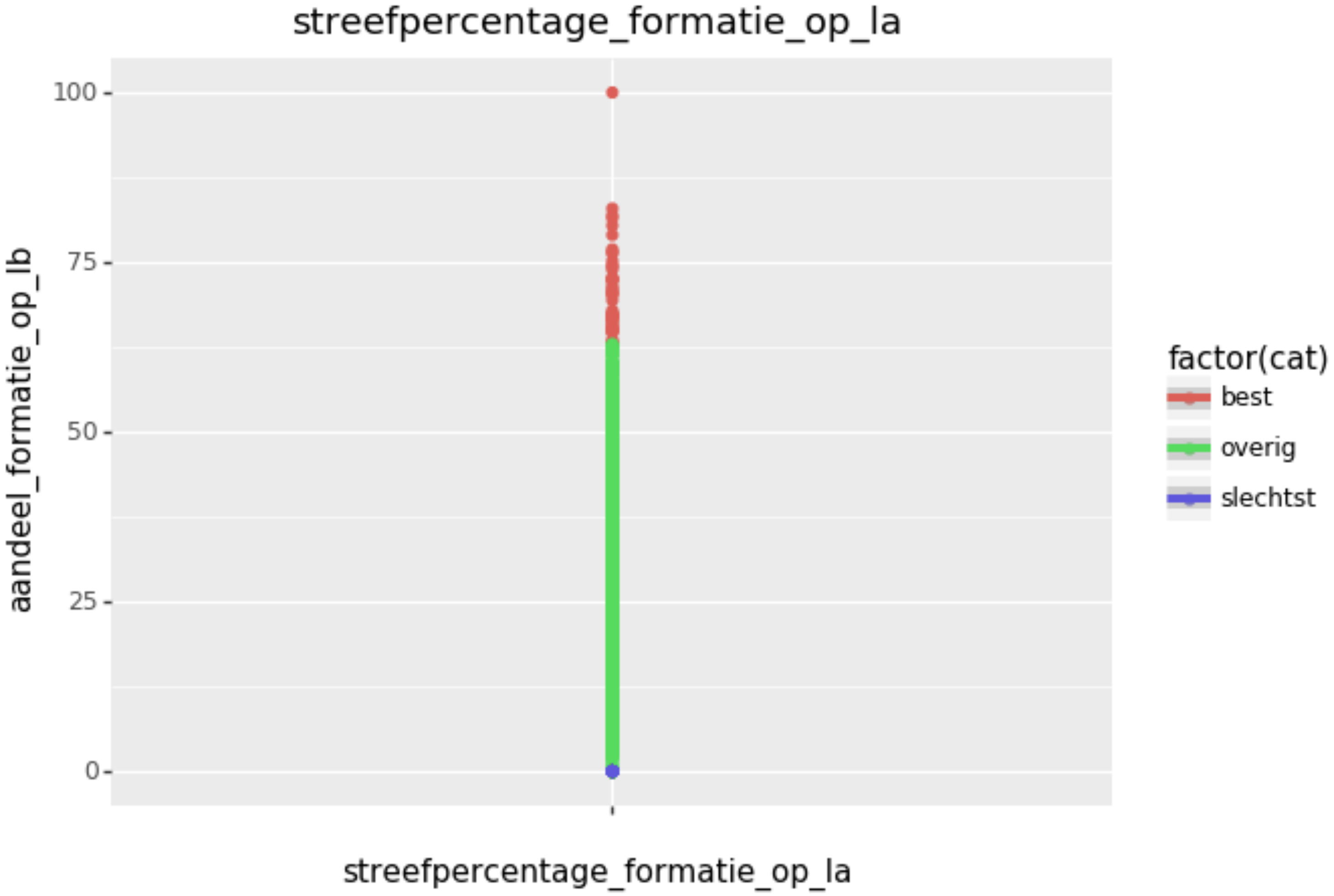





```
<ggplot: (-9223372036563571915)>
aandeel_formatie_op_overig
```



```
<ggplot: (-9223372036561481991)>
streefpercentage_formatie_op_la
```



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streefpercentage_formatie_op_lb
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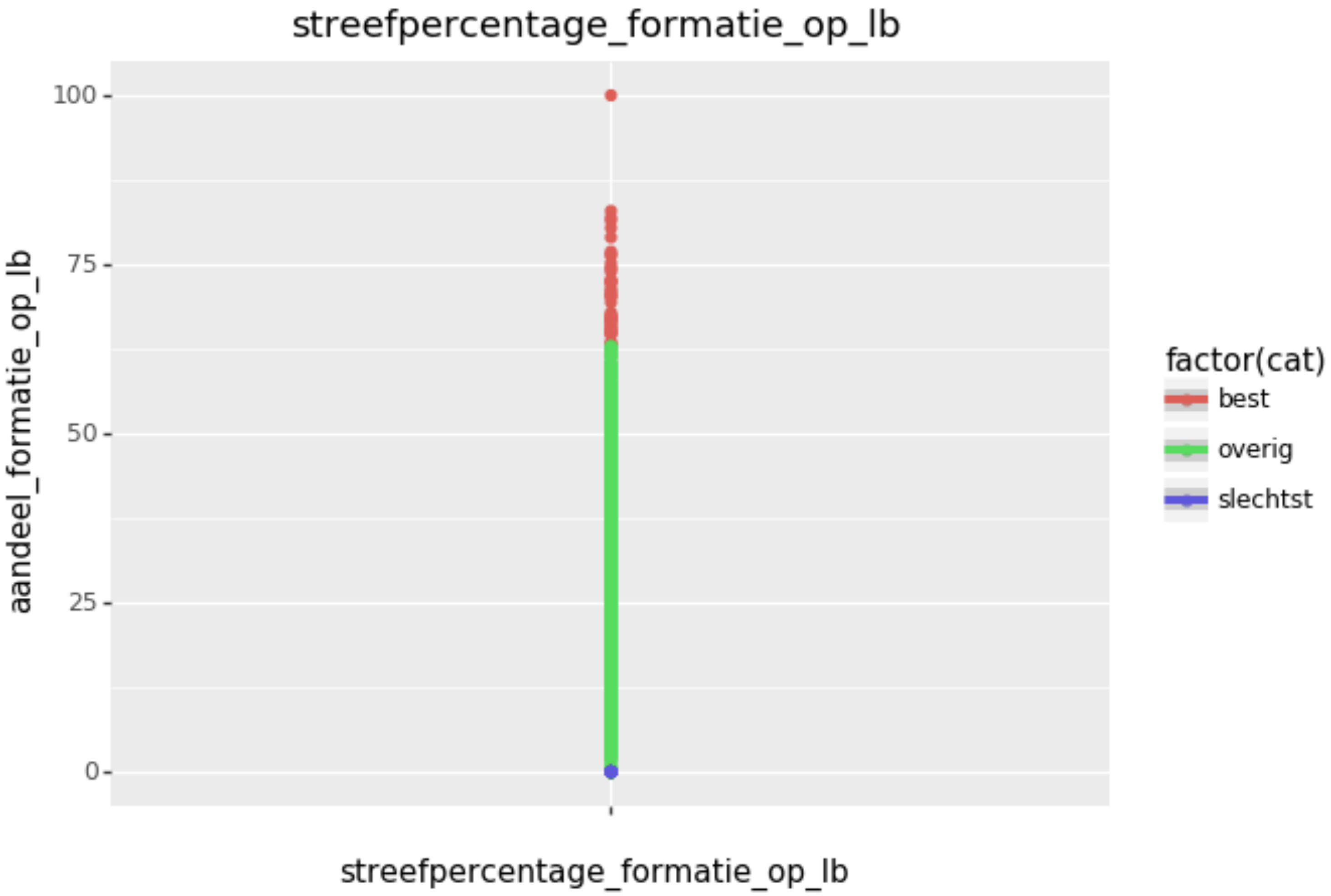

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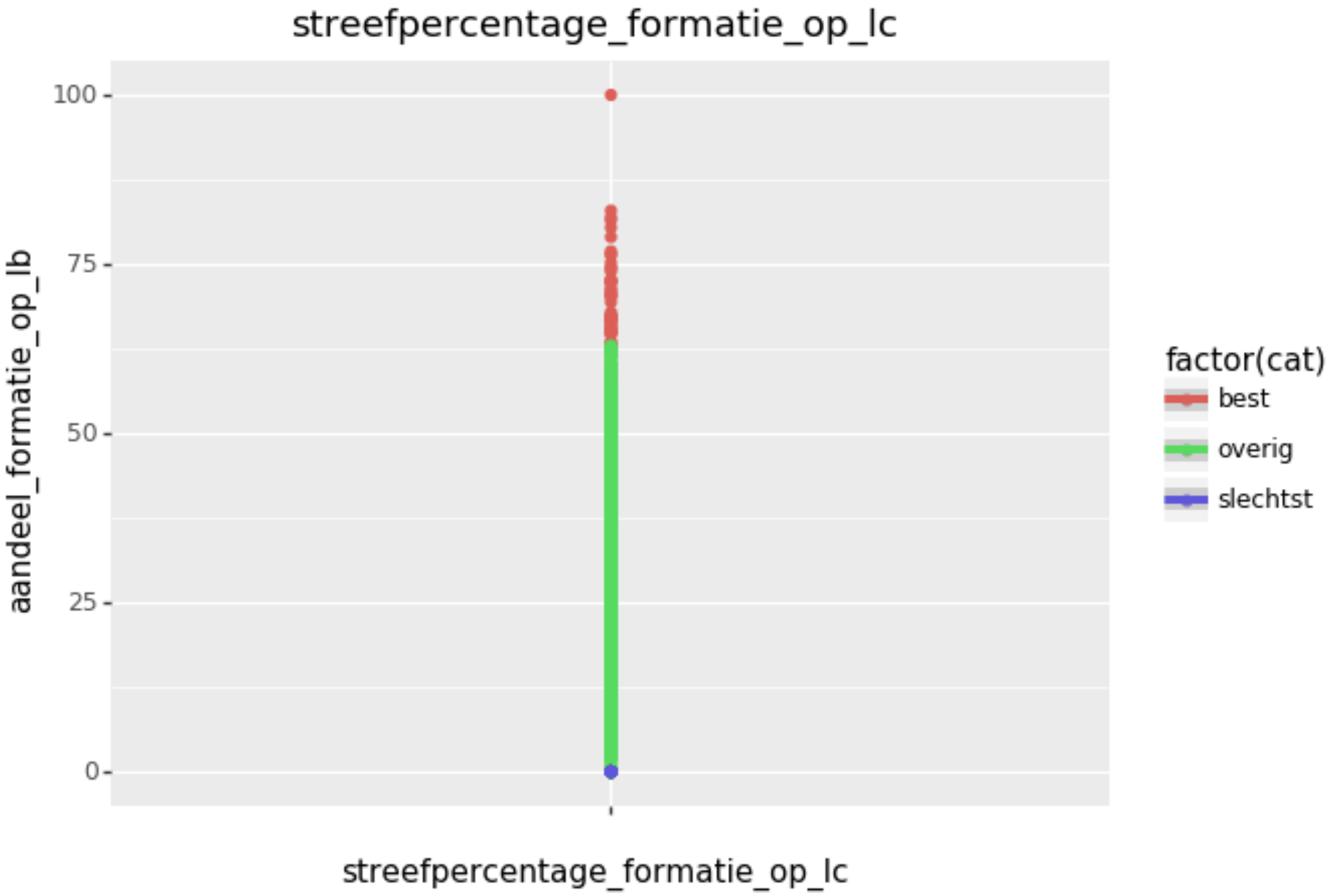

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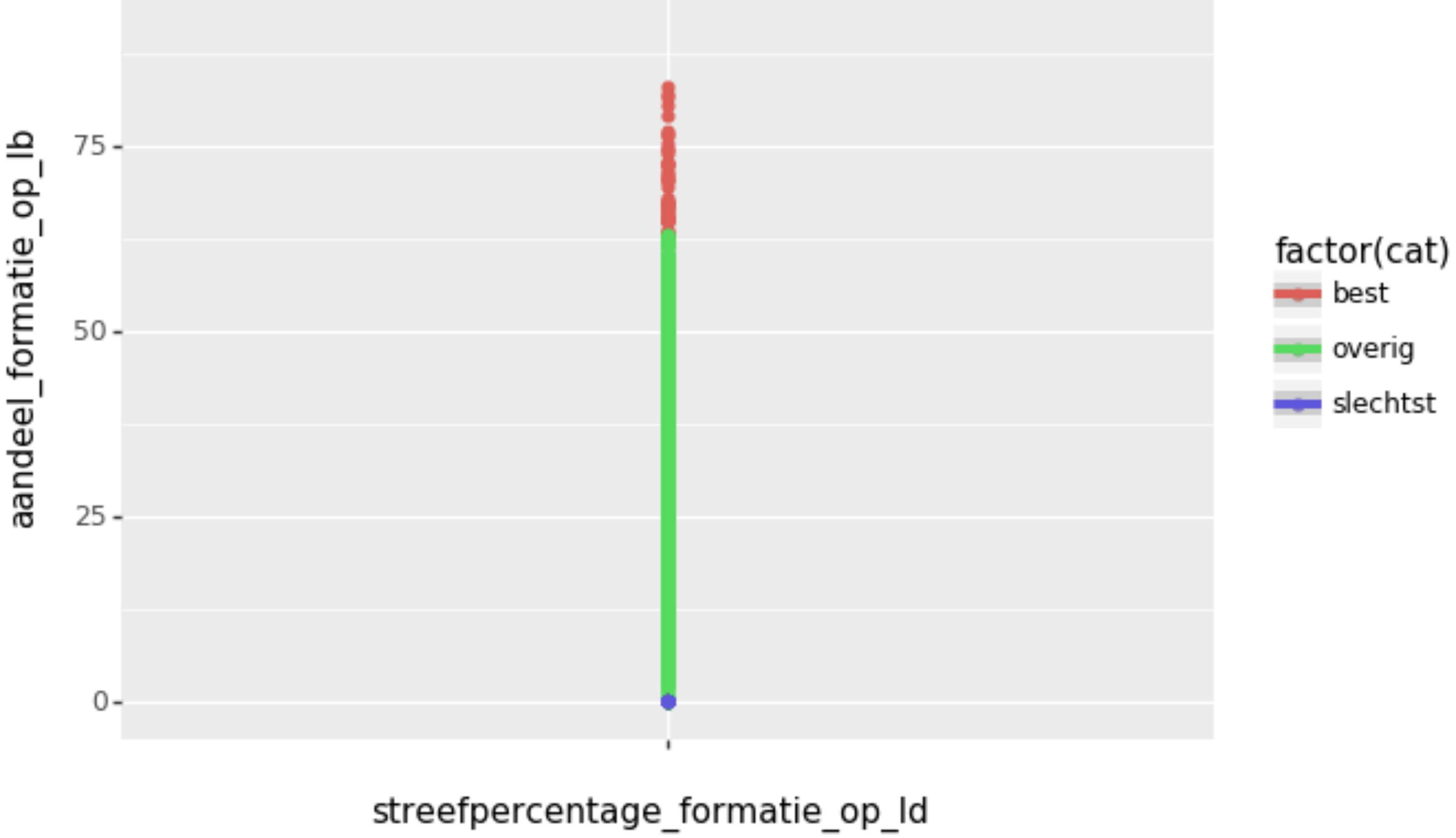
streefpercentage_formatie_op_ld
```



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<ggplot: (291833001)>
streefpercentage_formatie_op_le
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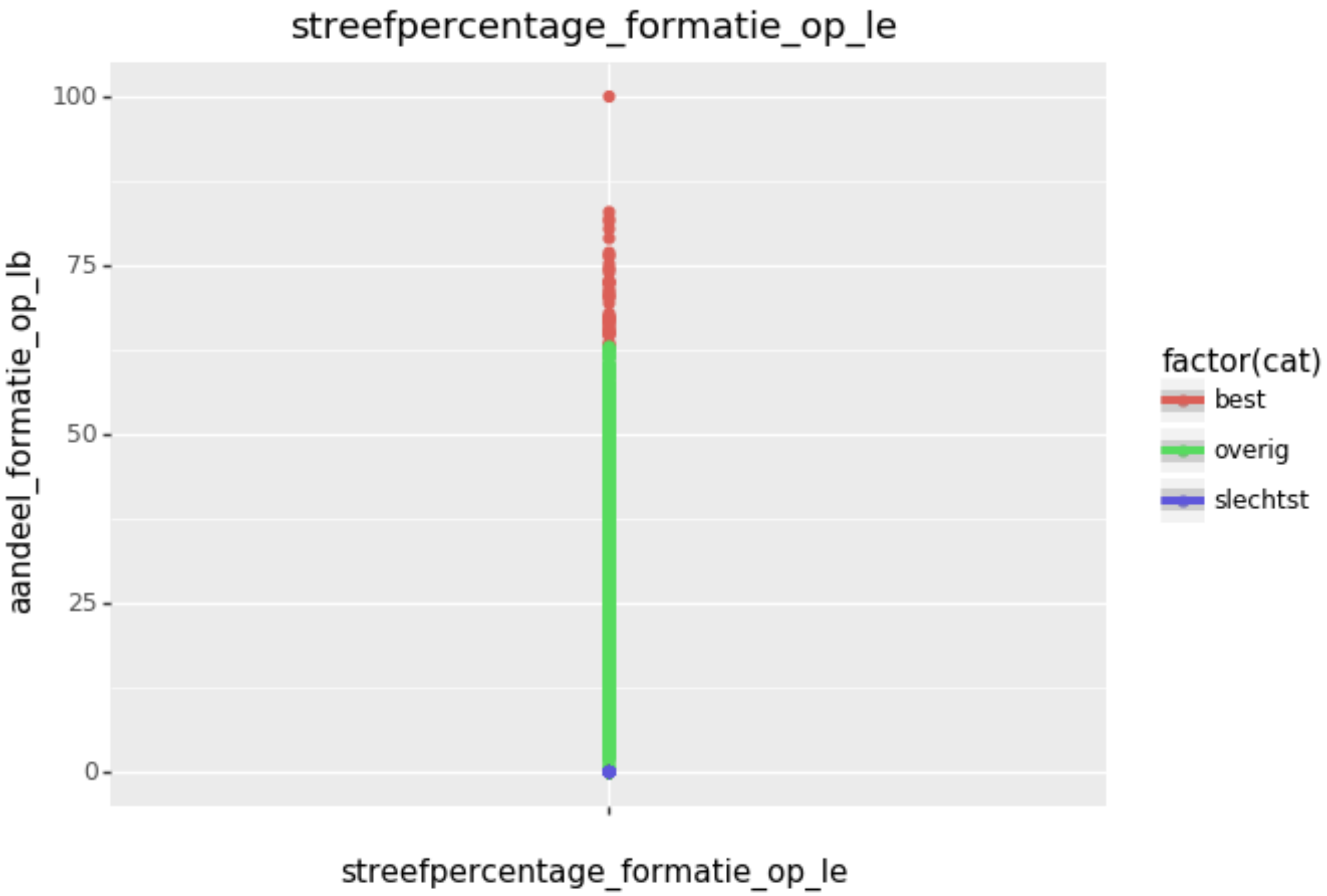

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streefpercentage_formatie_op_ove
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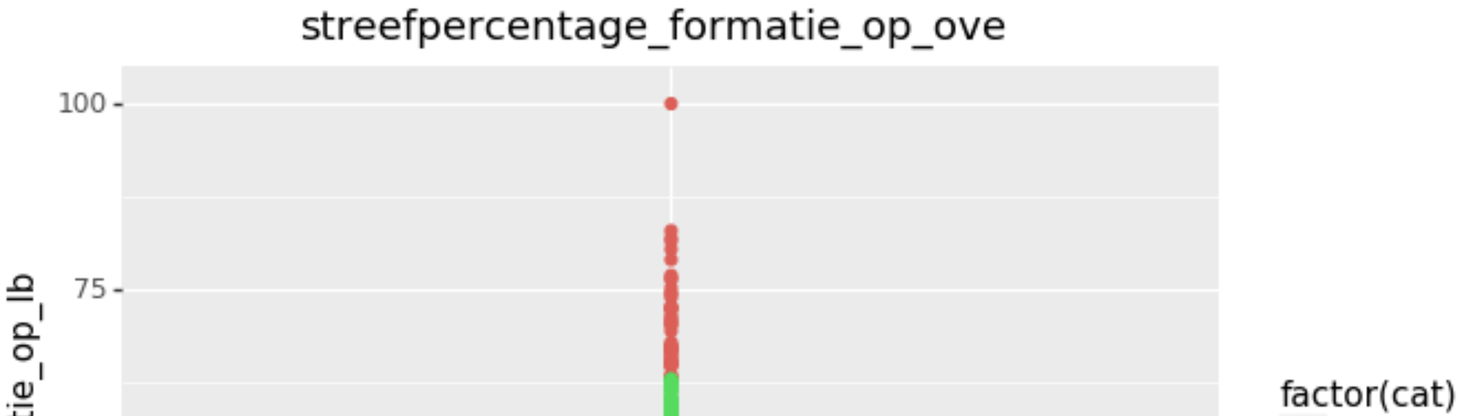

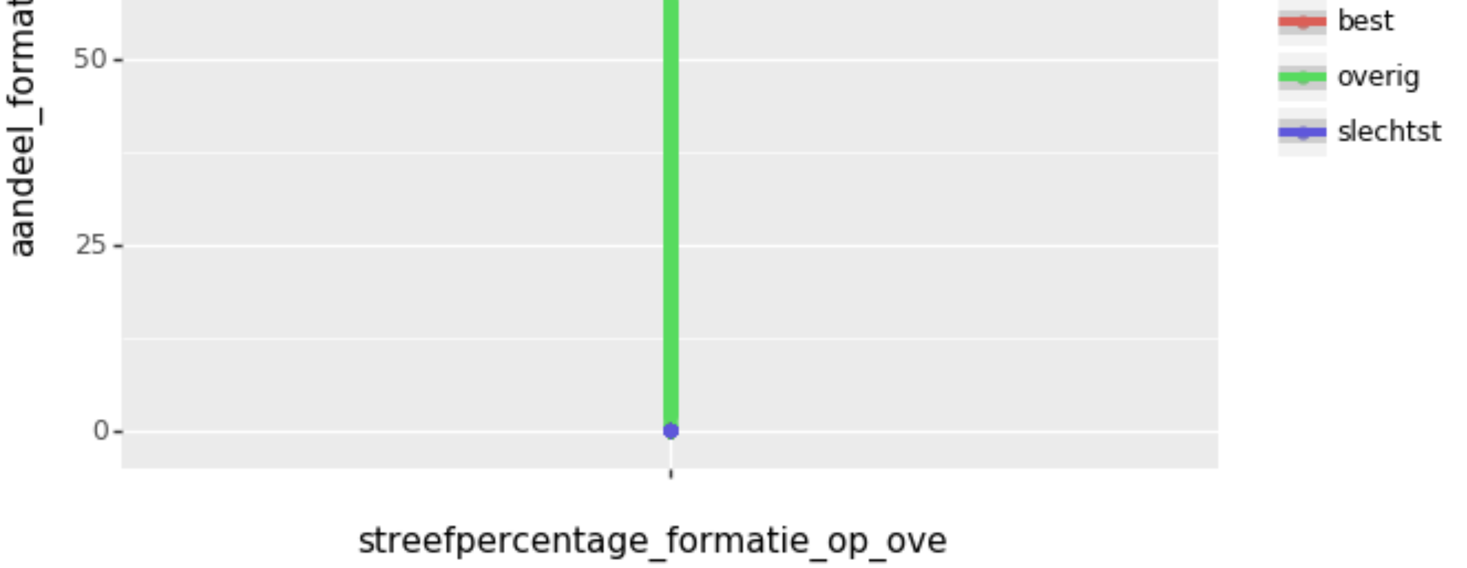

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<ggplot: (278535579)>
omvang_formatie_op_brutsal
```

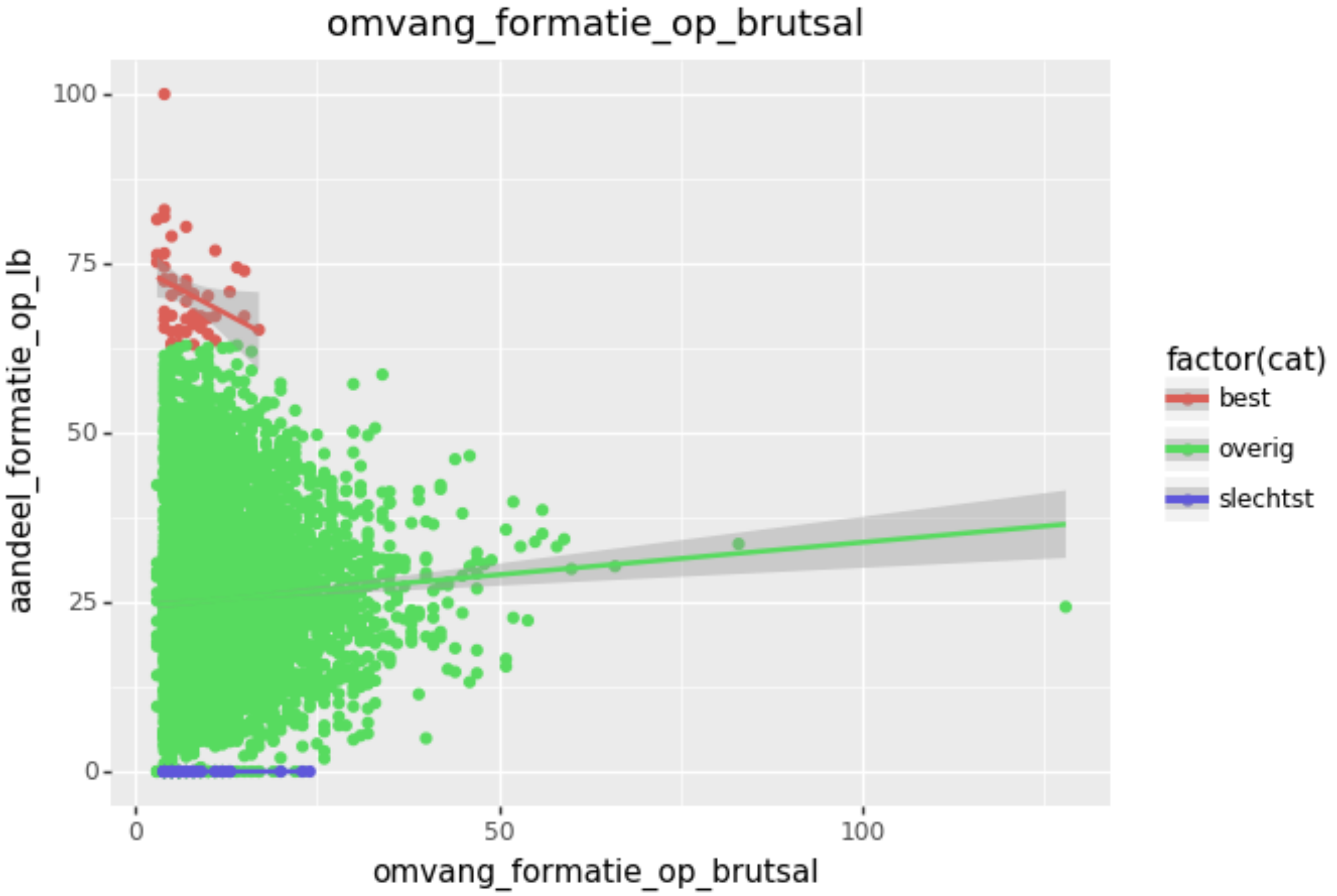

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loonsom_op_brutsal
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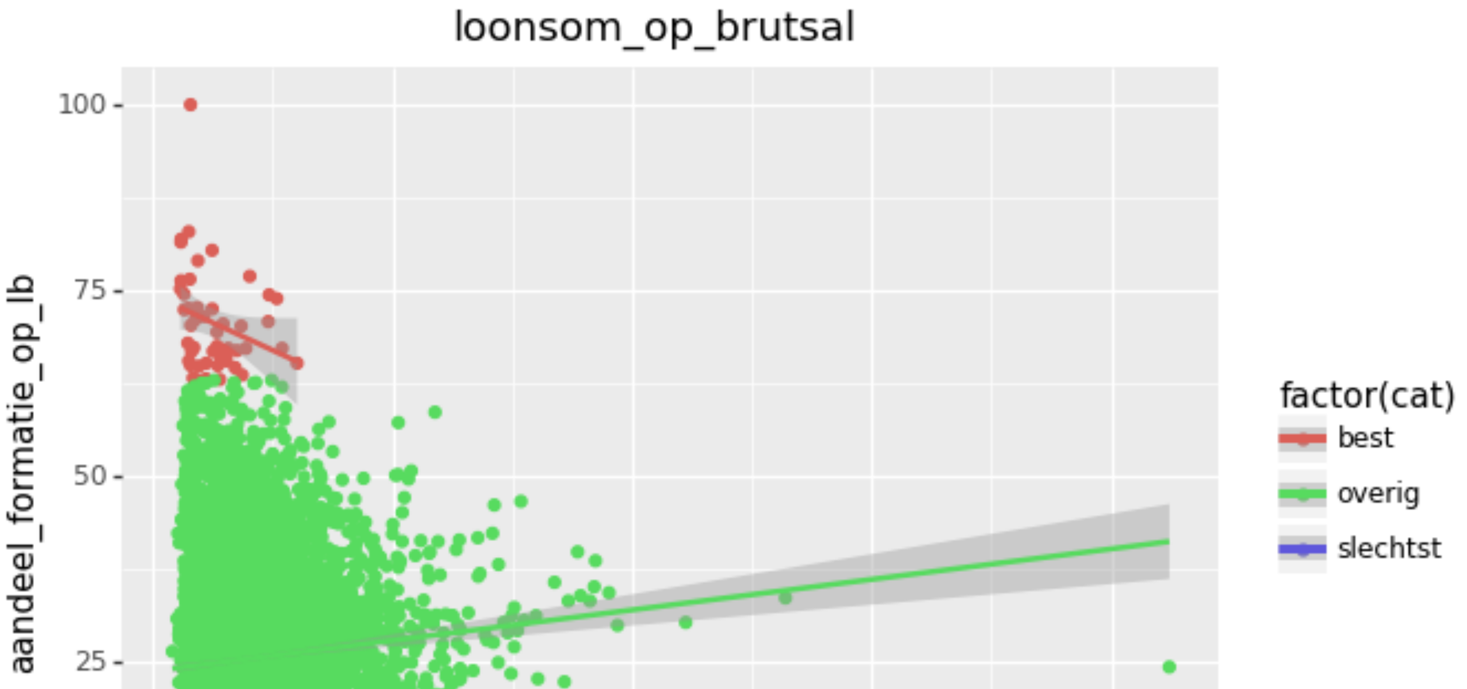

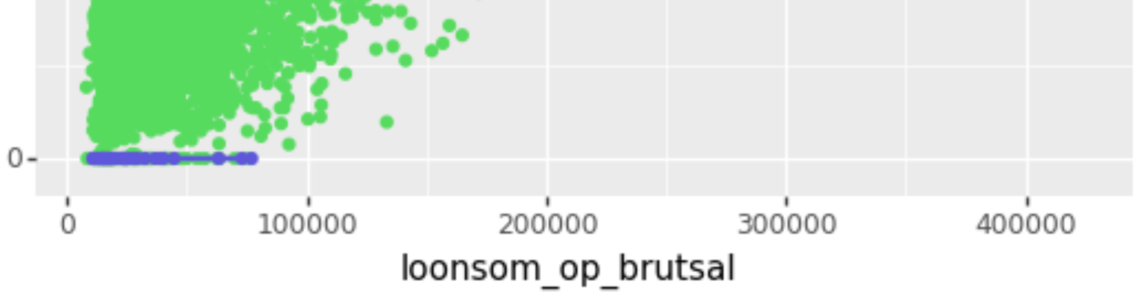

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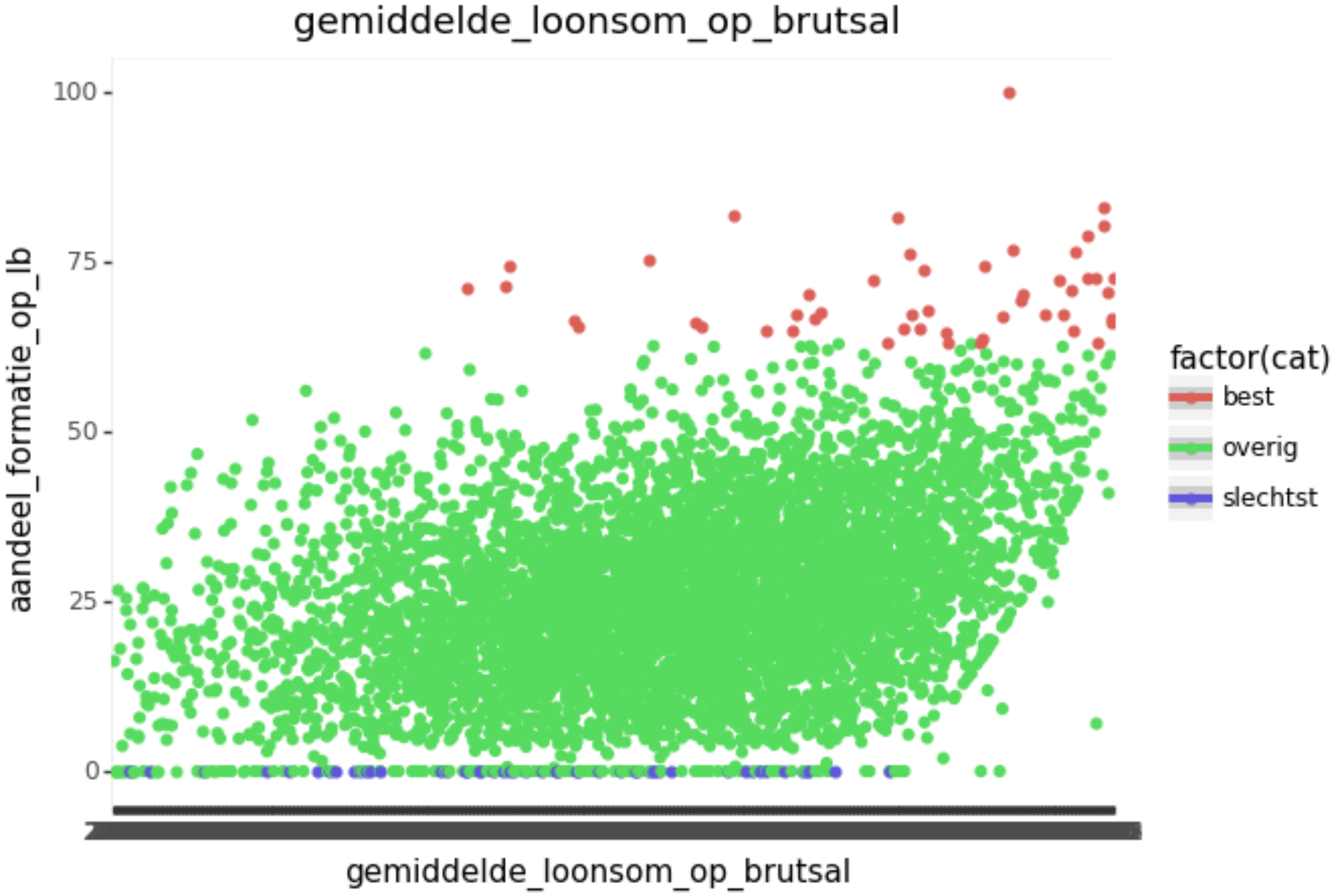
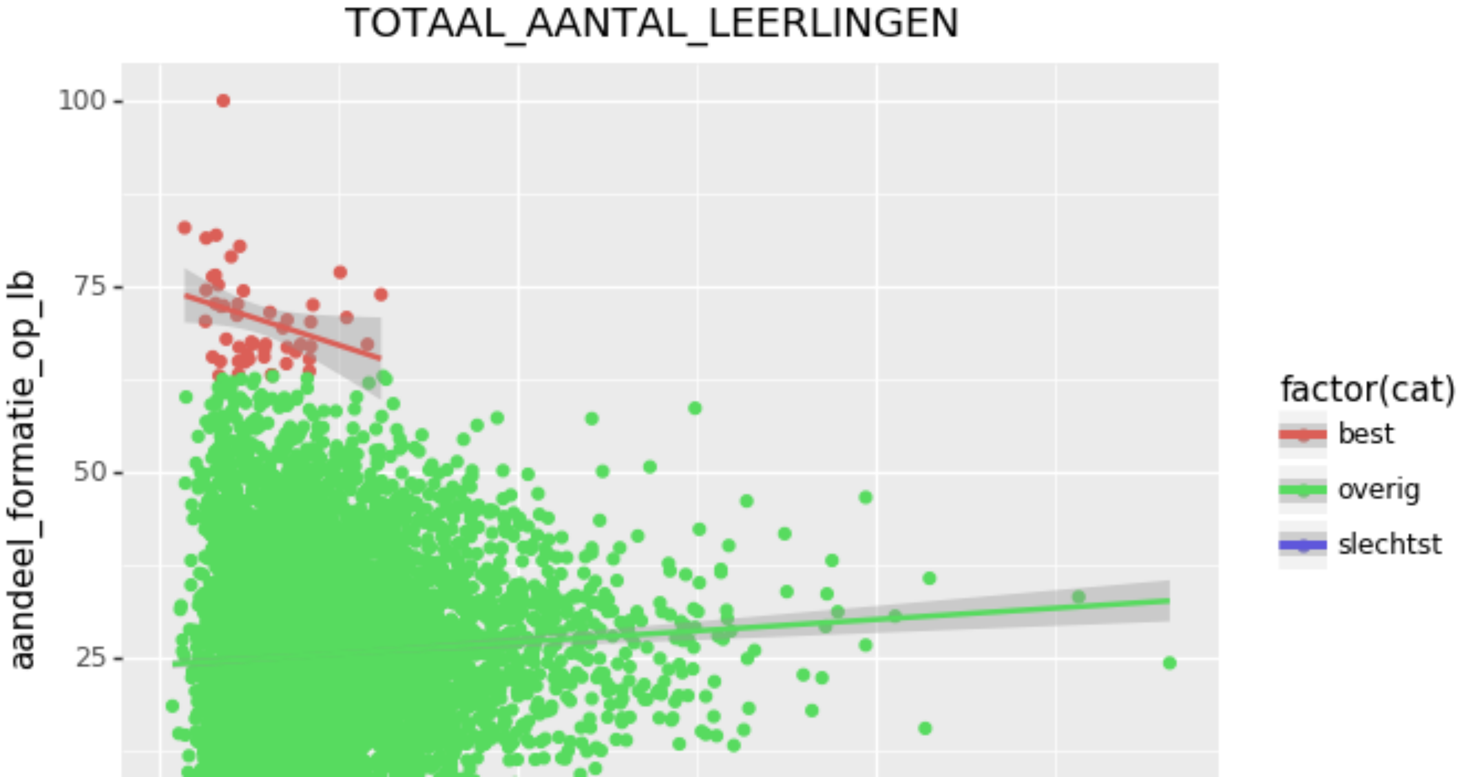
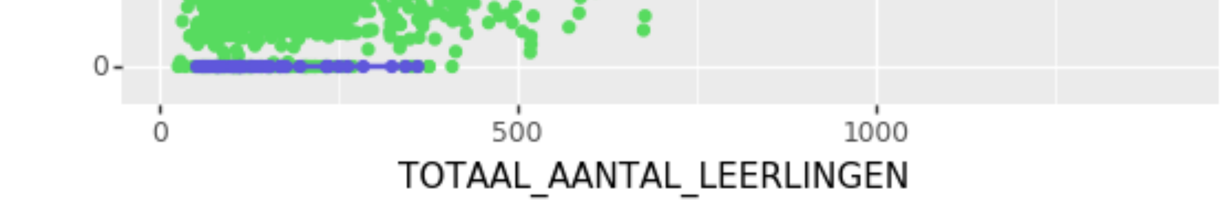
gemiddelde_loonsom_op_brutsal
```



```
<ggplot: (286560106)>
PEILDATUM
NO NON-NA ROWS
BEVOEGD_GEZAG_NUMMER
NO NON-NA ROWS
TOTAAL_AANTAL_LEERLINGEN
```





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AANTAL_LEERLINGEN_4_TOT_EN_MET_7
```

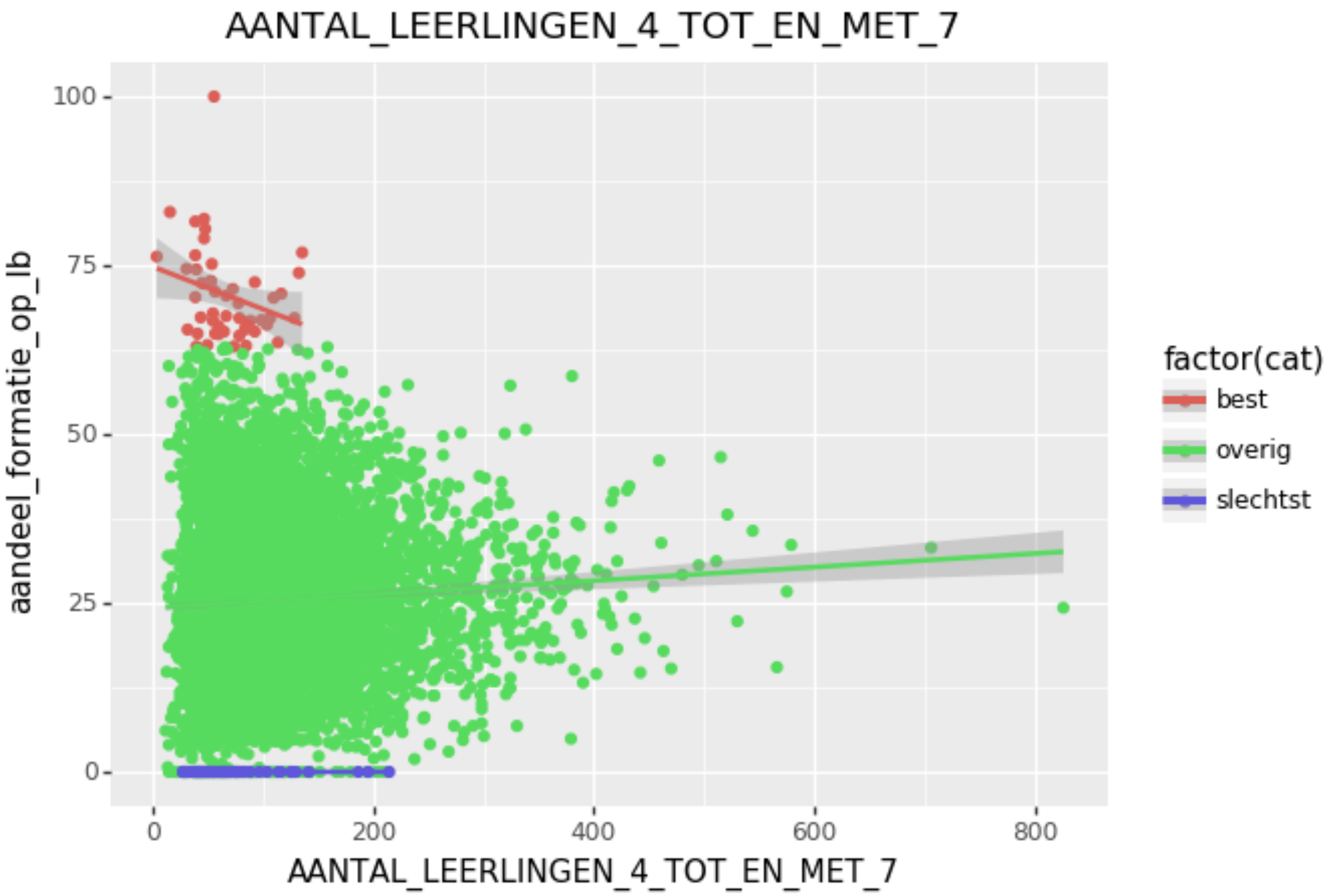

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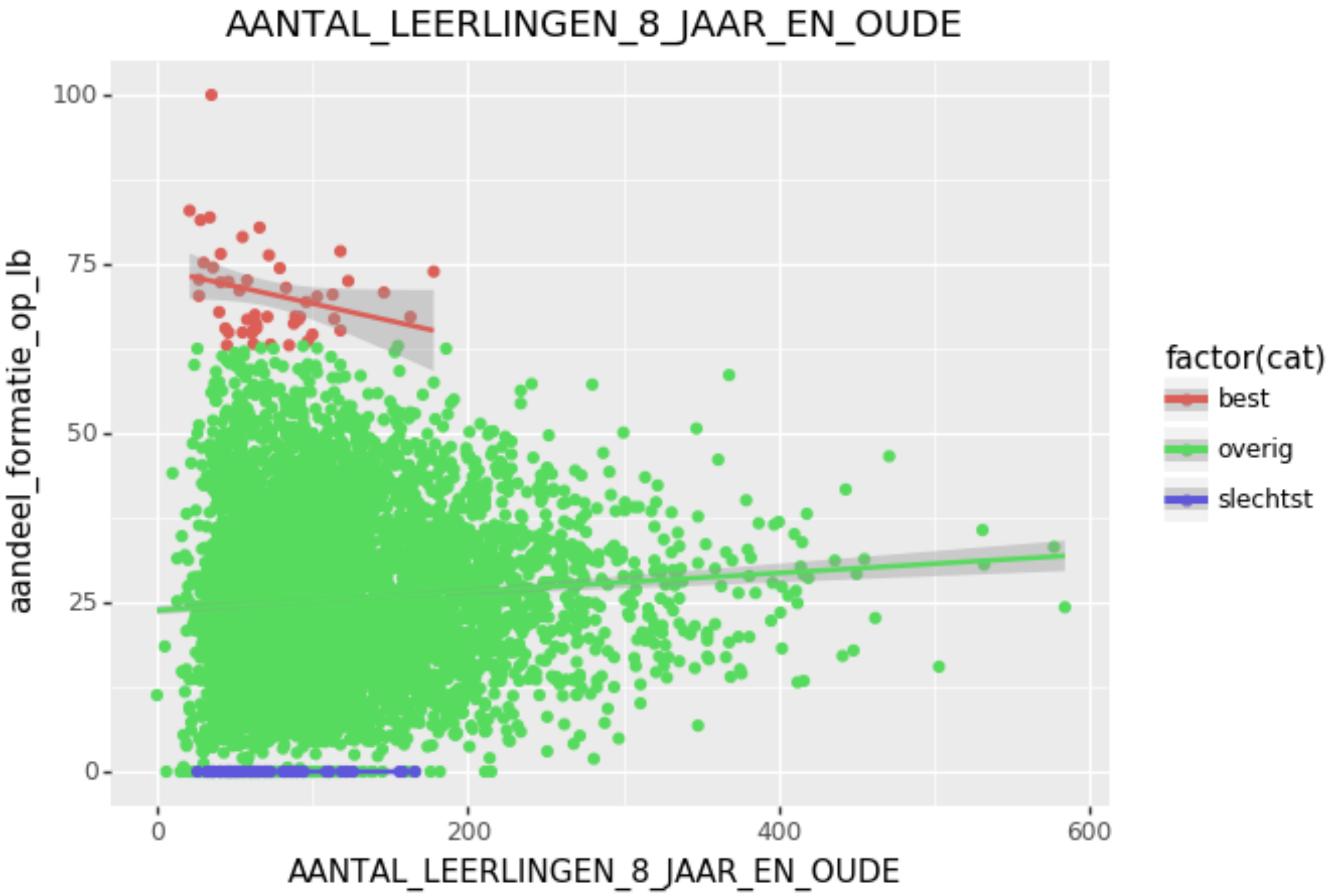

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```
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SCHOOLGEWICHT
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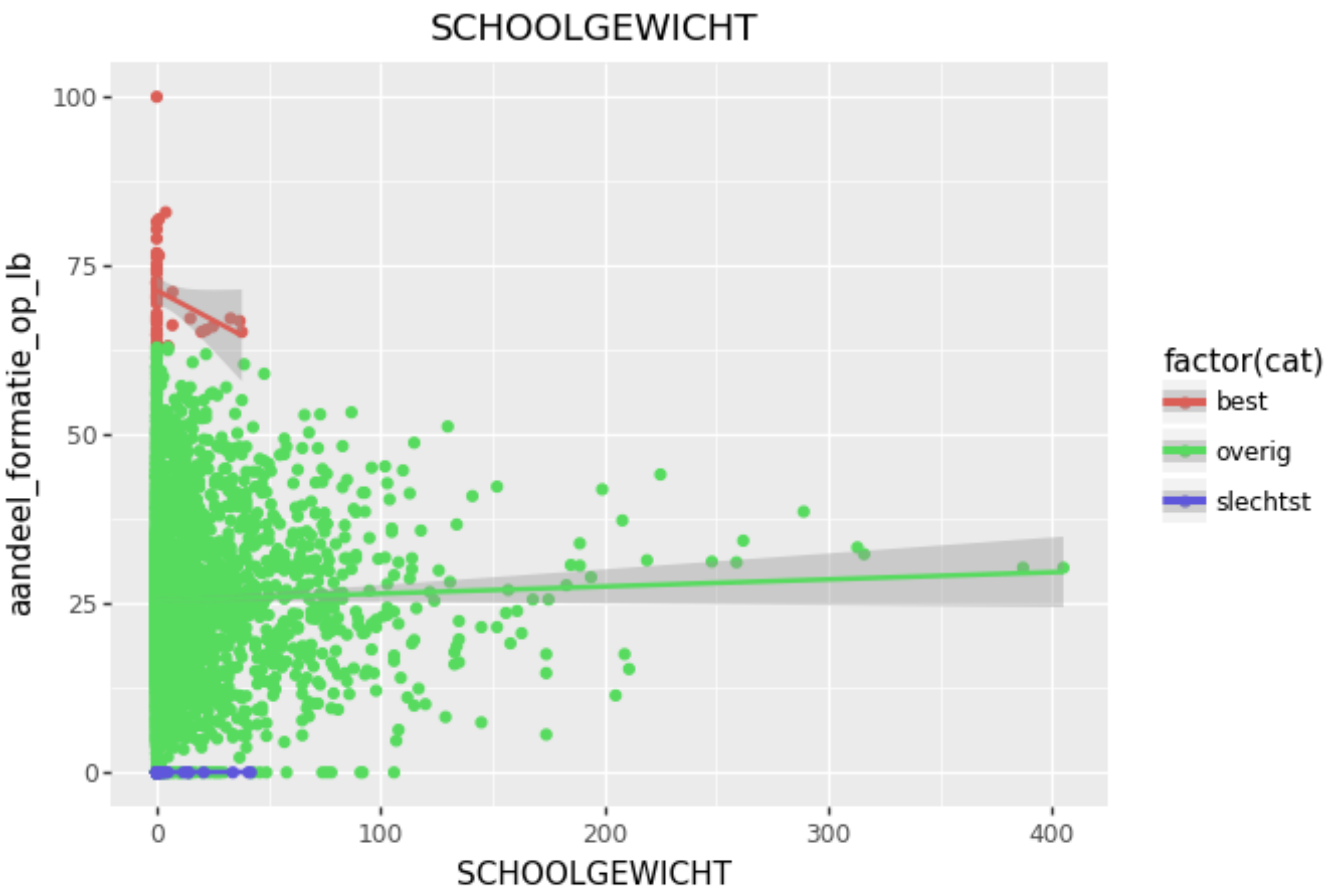

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GEMIDDELDE_GEWOGEN_LEEFTIJD
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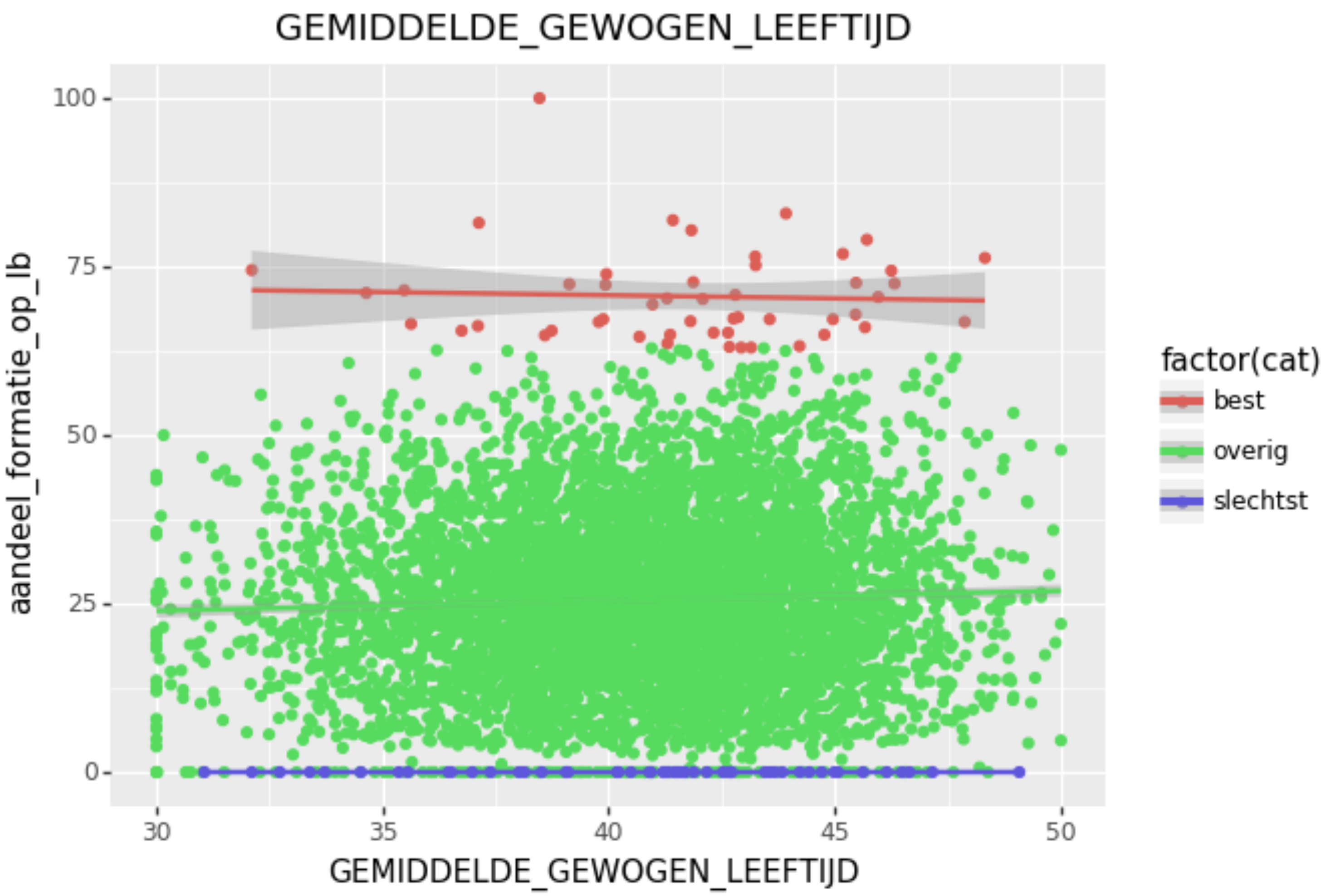

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AANTAL_GEWICHTENLEERLINGEN_IN_IM
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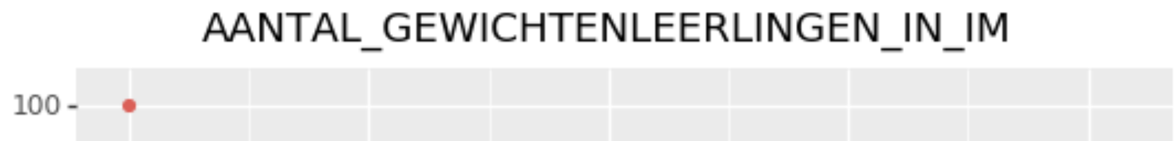

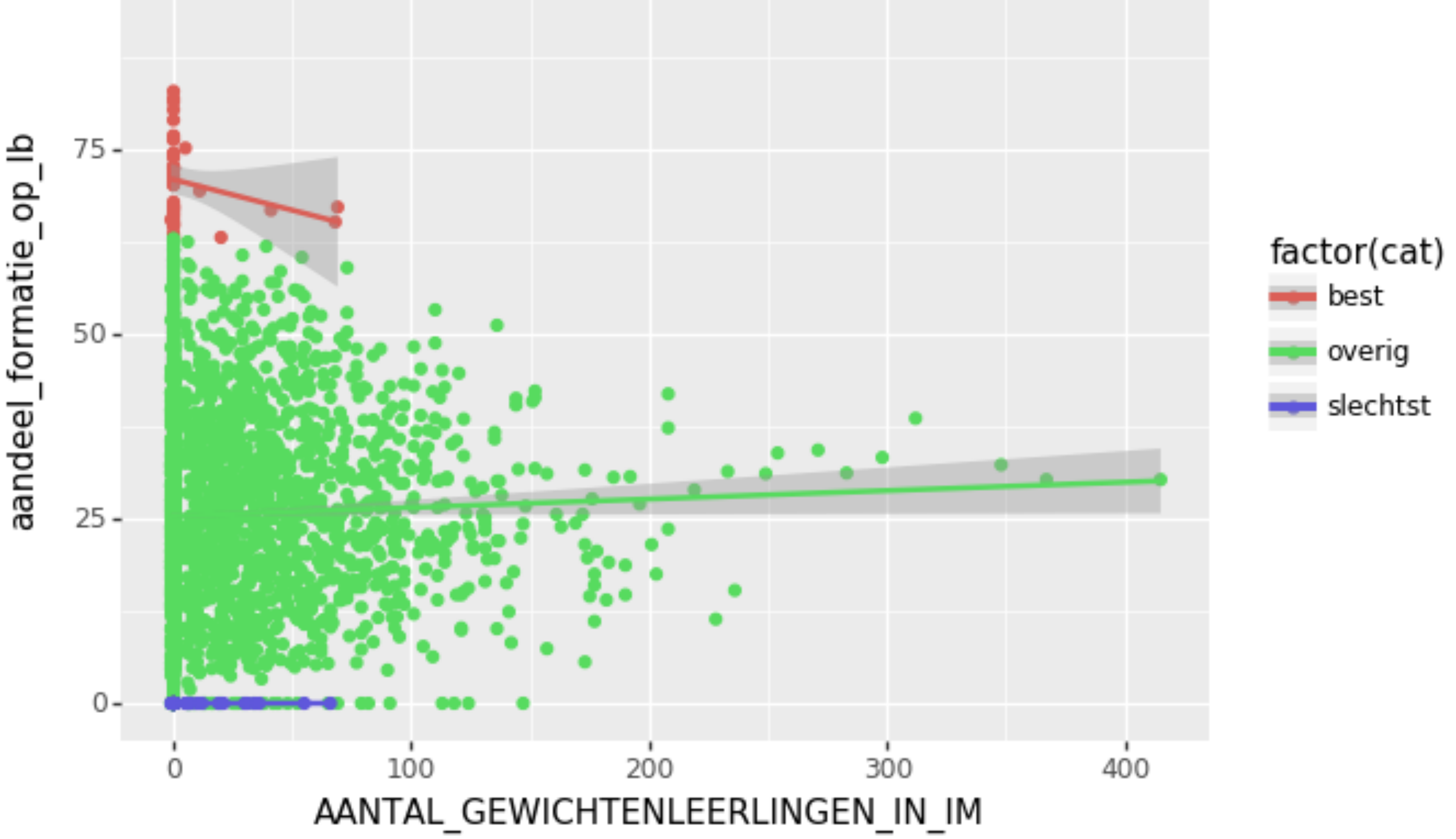

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ONDERBOUW
```

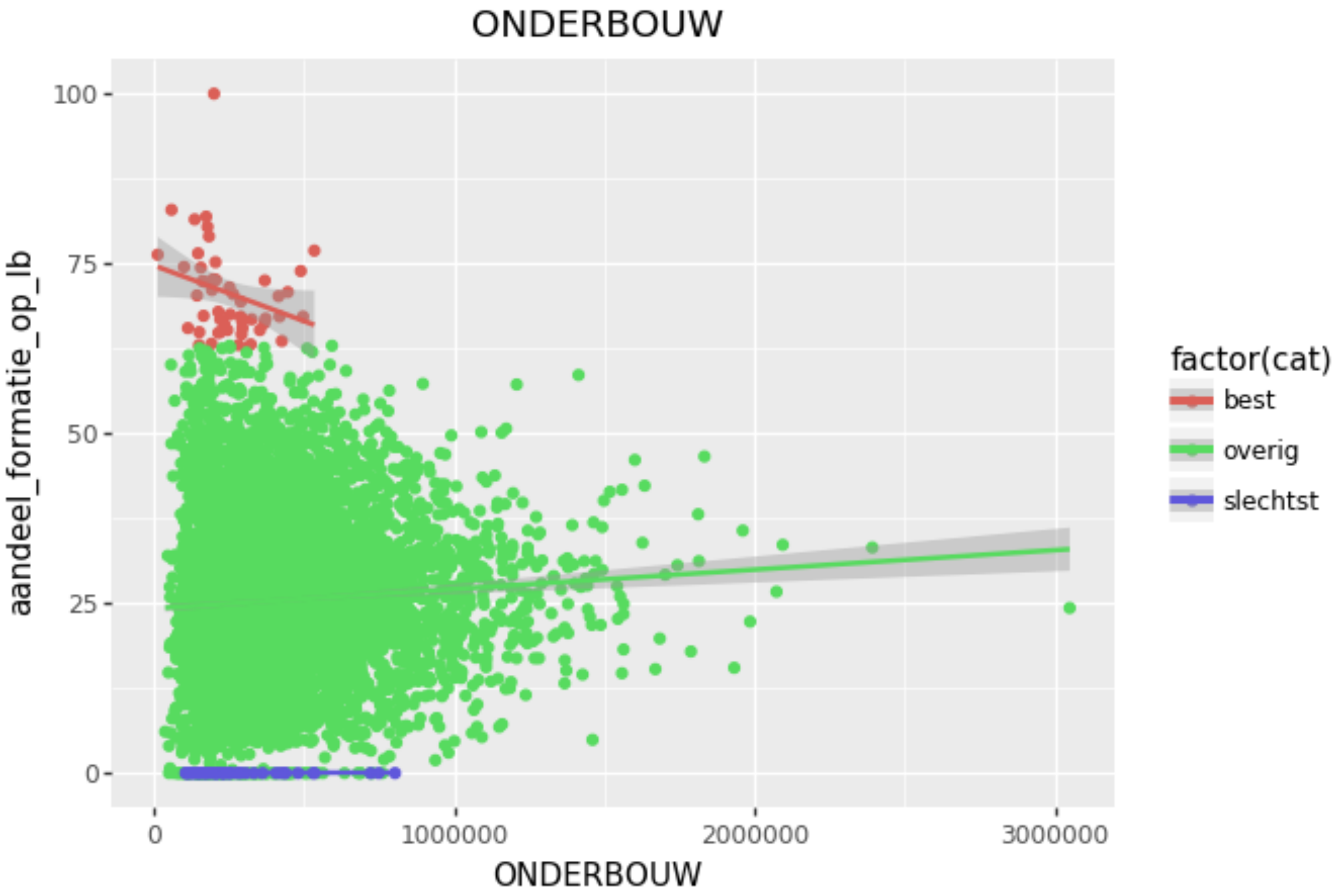

```
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BOVENBOUW
```

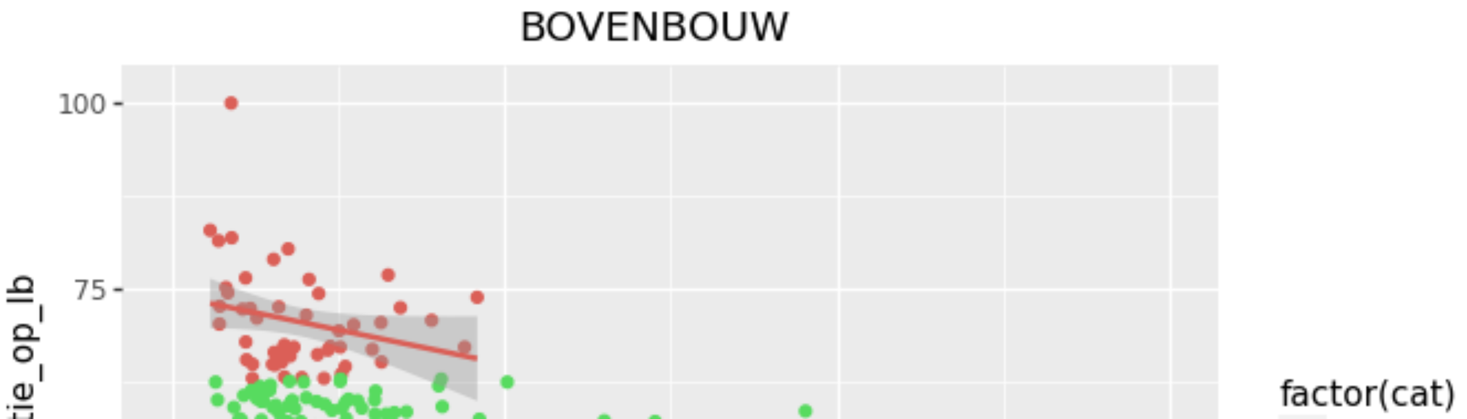

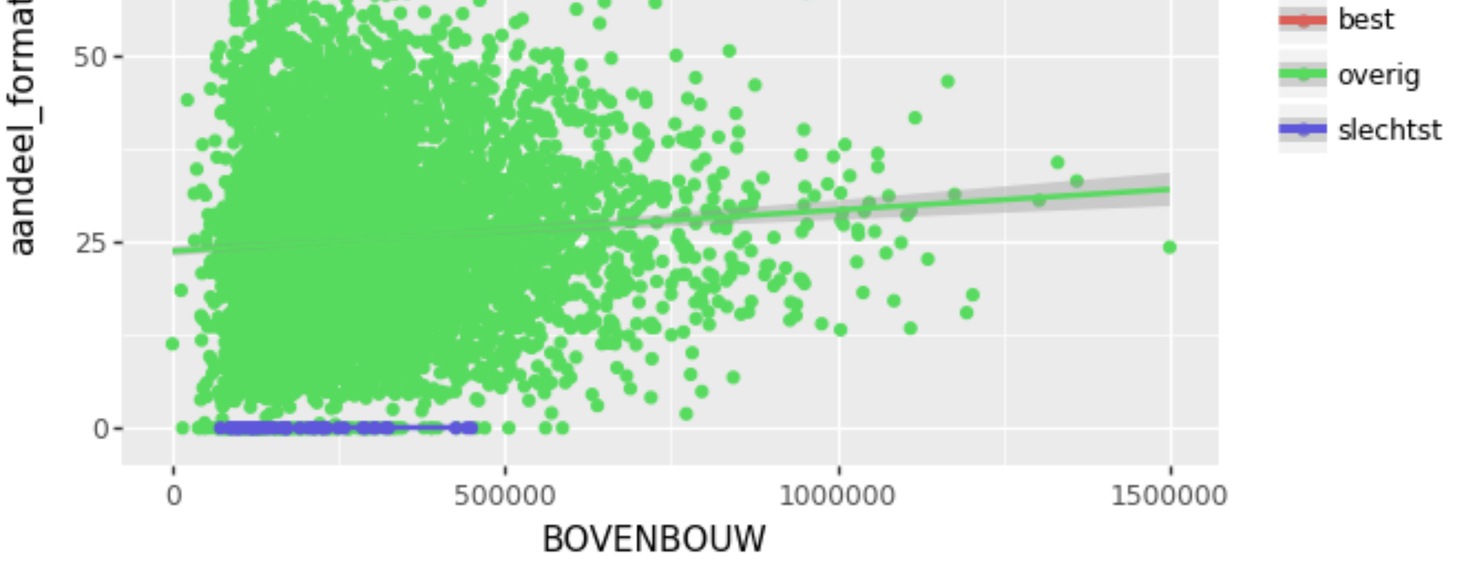

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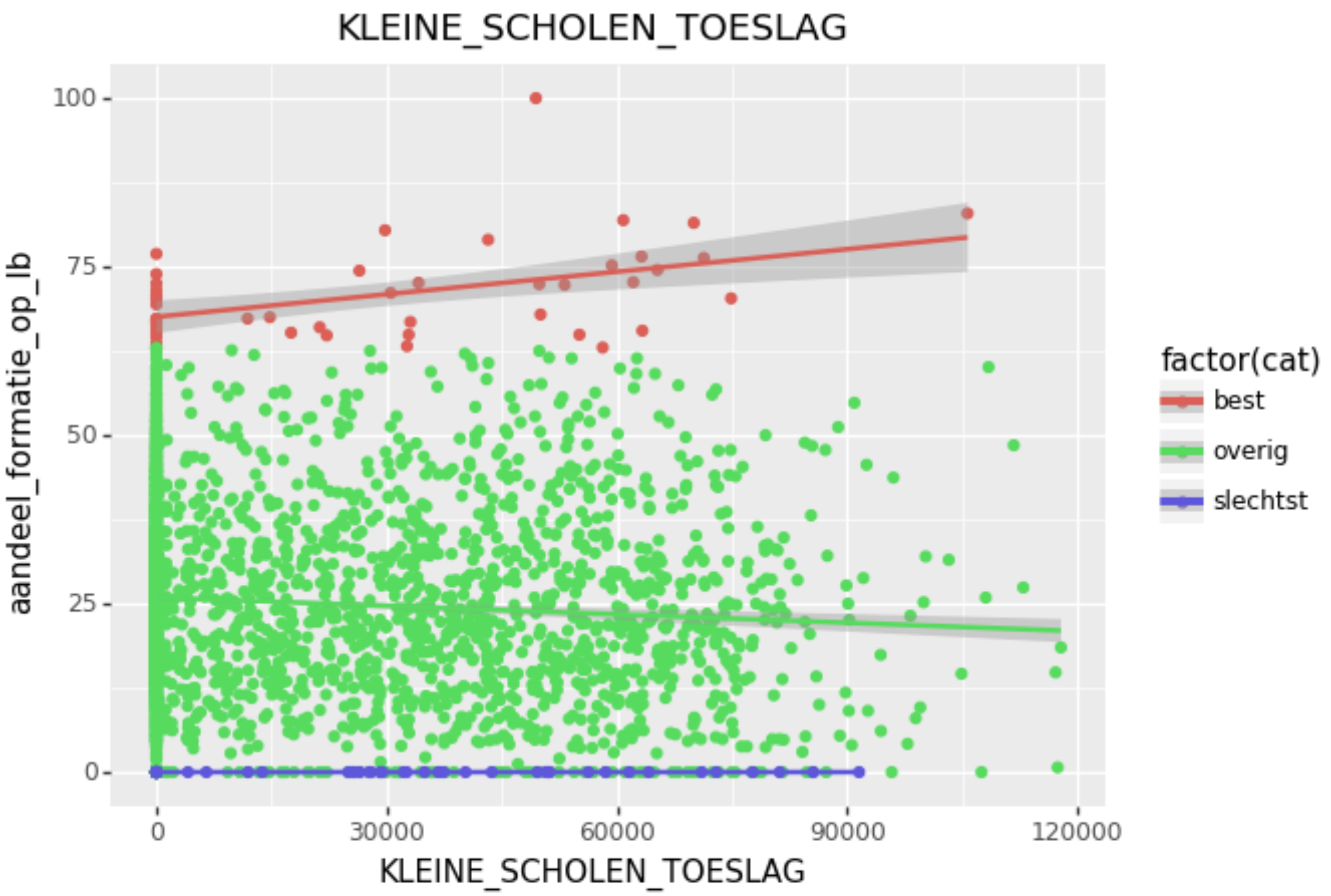
KLEINE_SCHOLEN_TOESLAG
```



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DRIEVIERDE_OPSLAG_NEVENVESTIGING
```

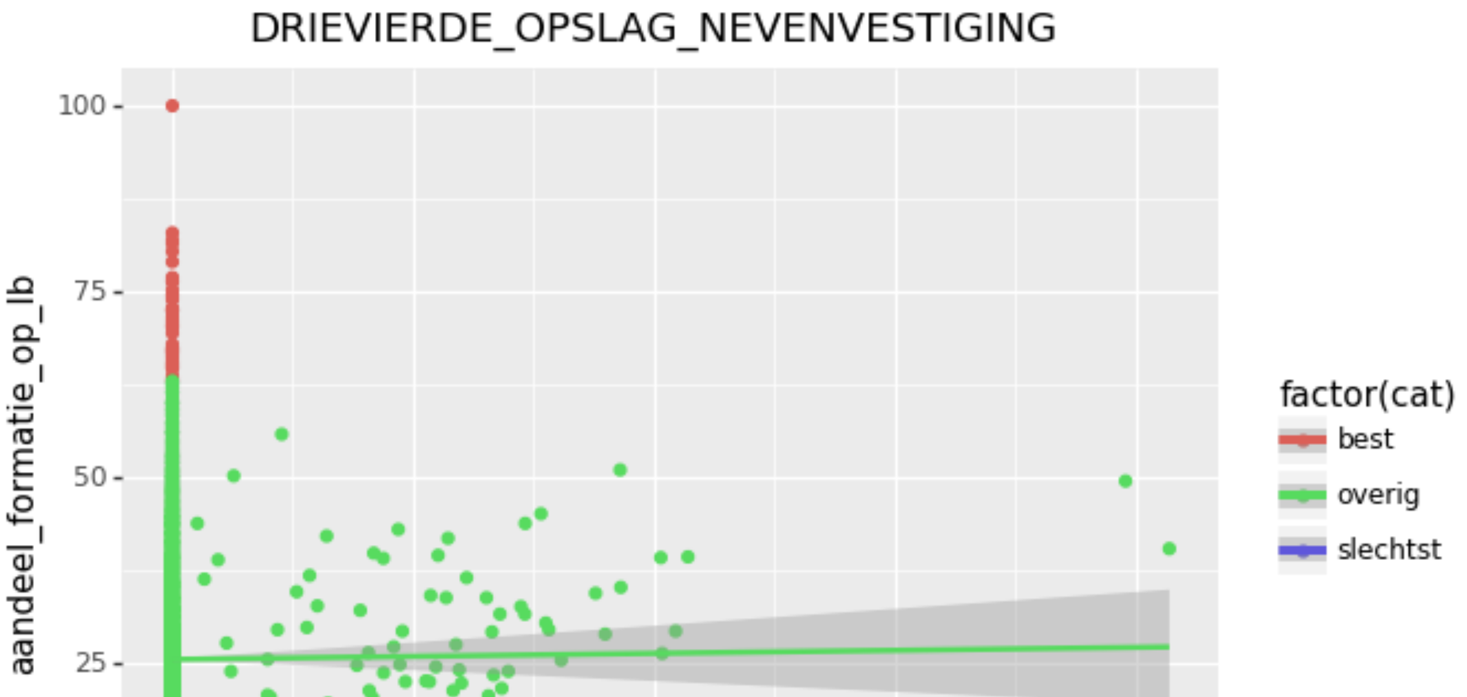

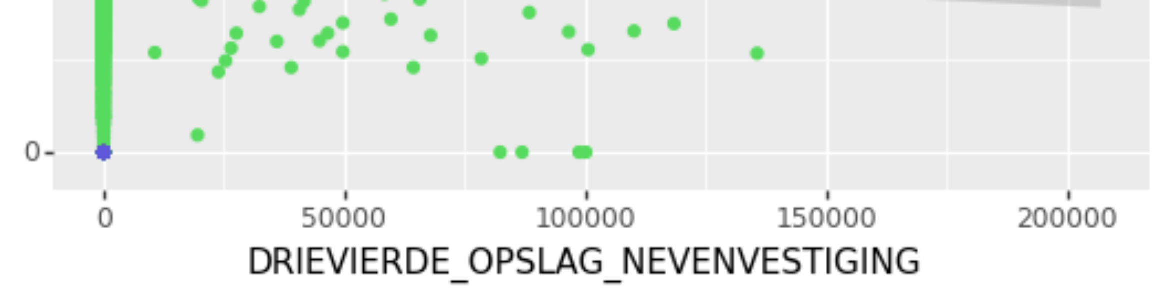

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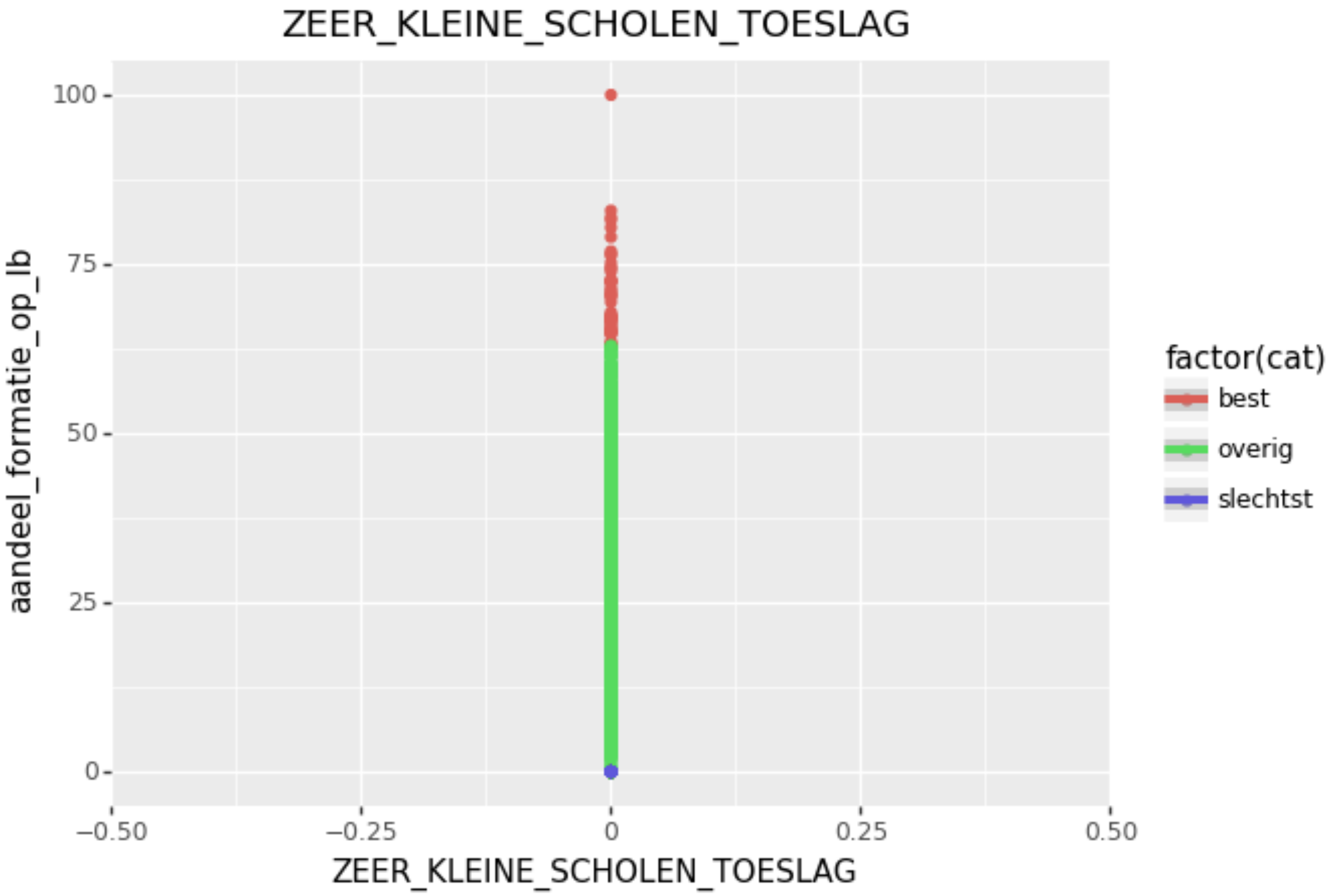
ZEER_KLEINE_SCHOLEN_TOESLAG
```



```
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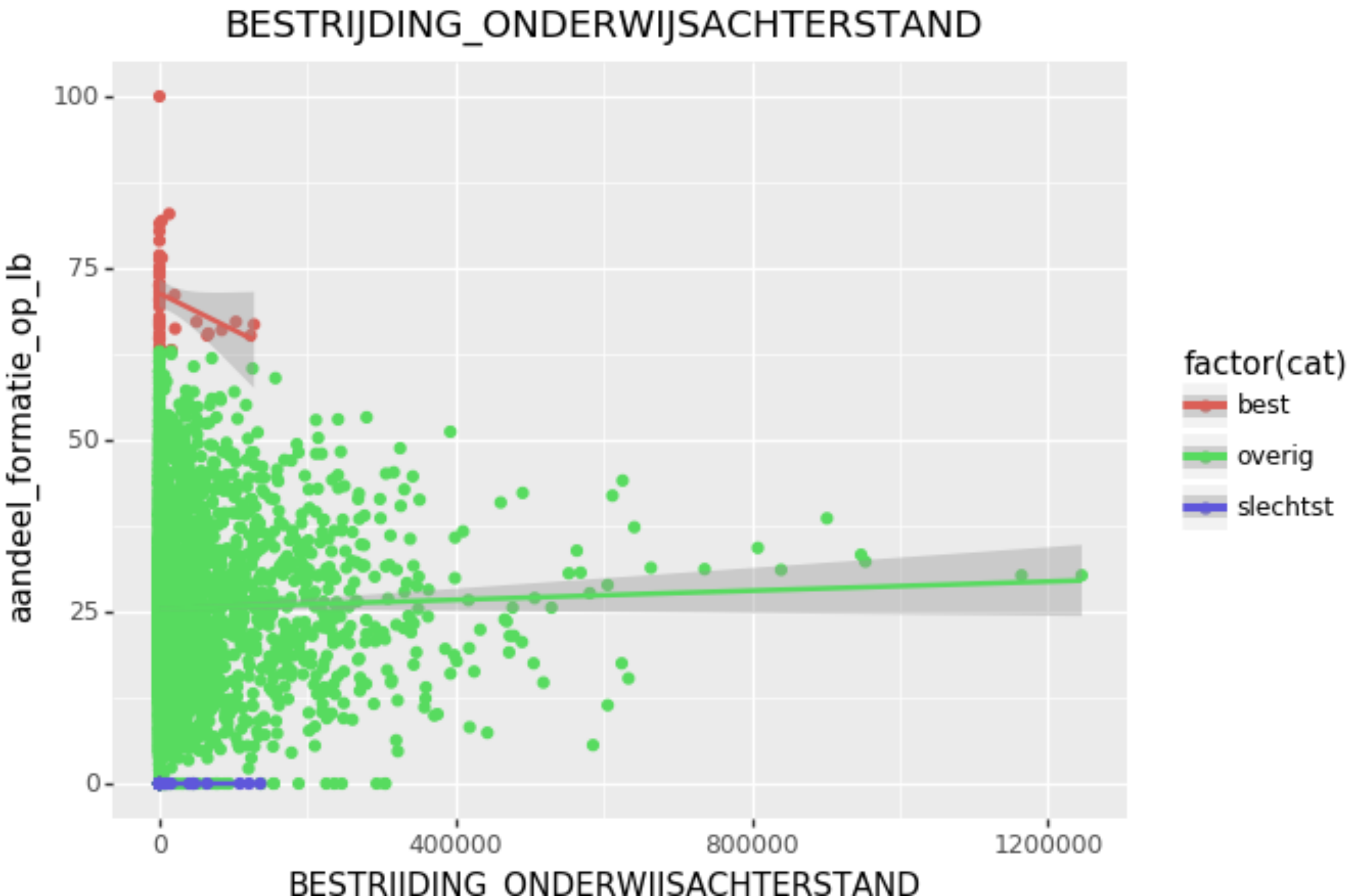
BESTRIJDING_ONDERWIJSACHTERSTAND
```



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DIRECTIETOESLAG
```

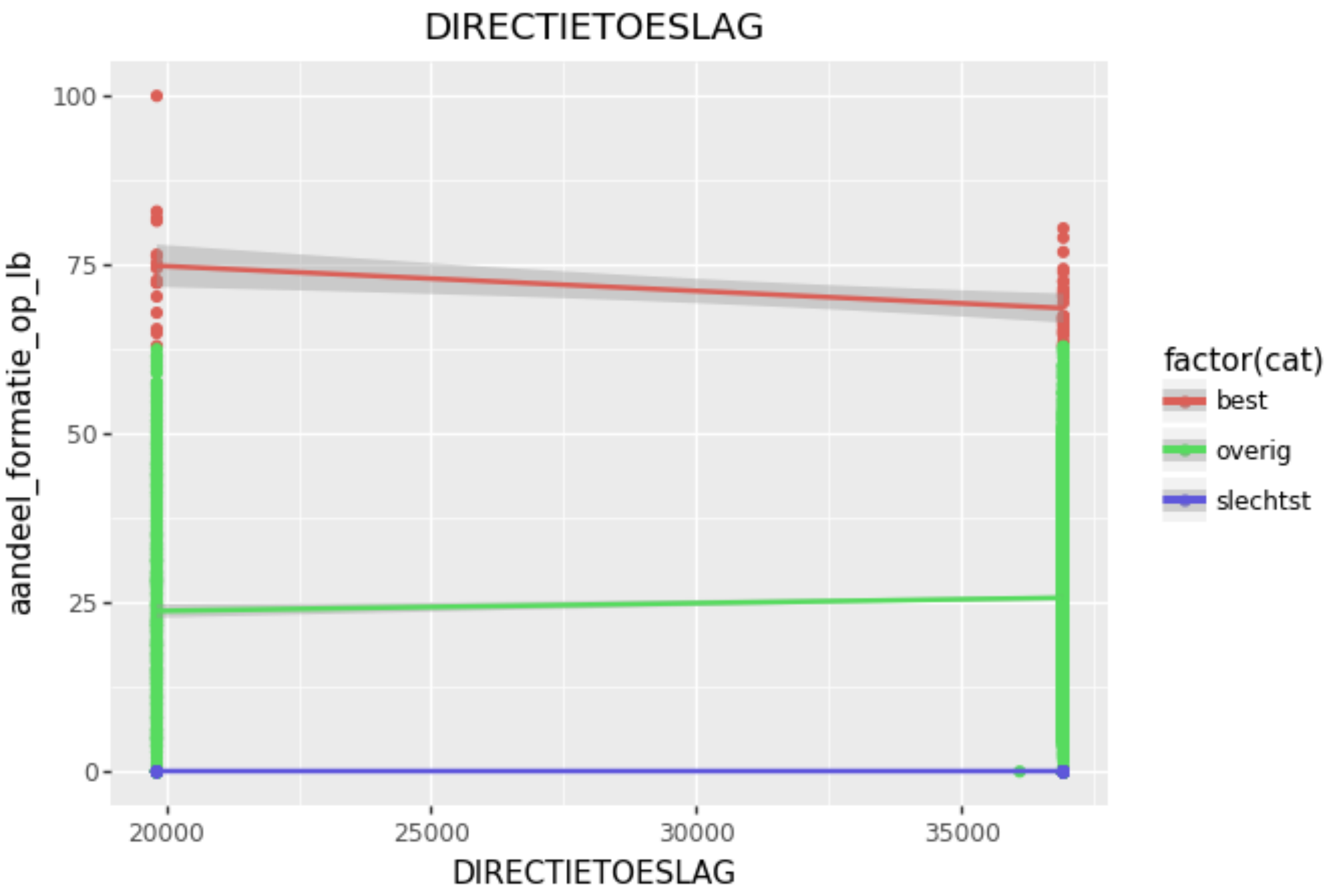

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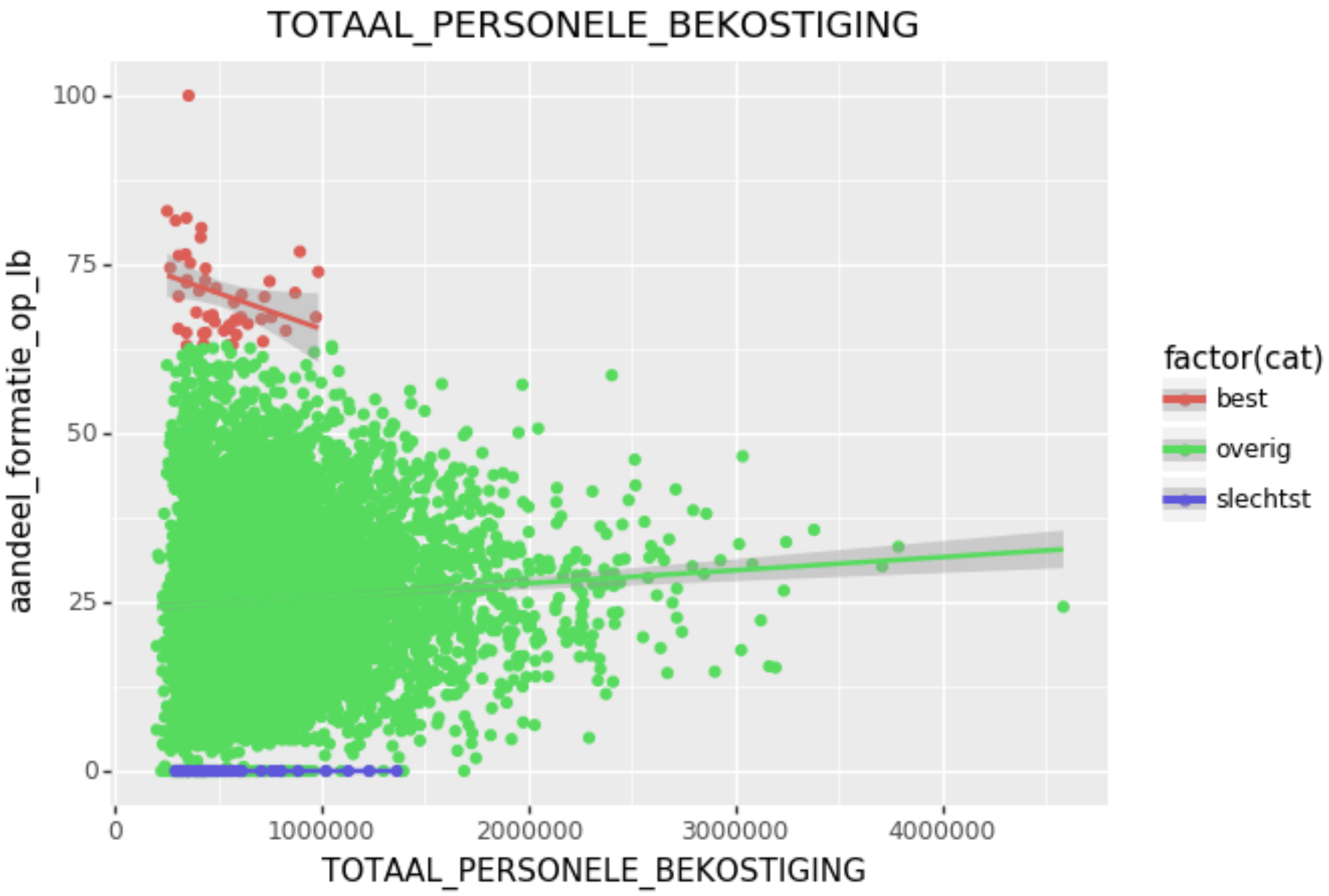
TOTAAL_PERSONELE_BEKOSTIGING
```



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IMPULSGEBIEDEN
```

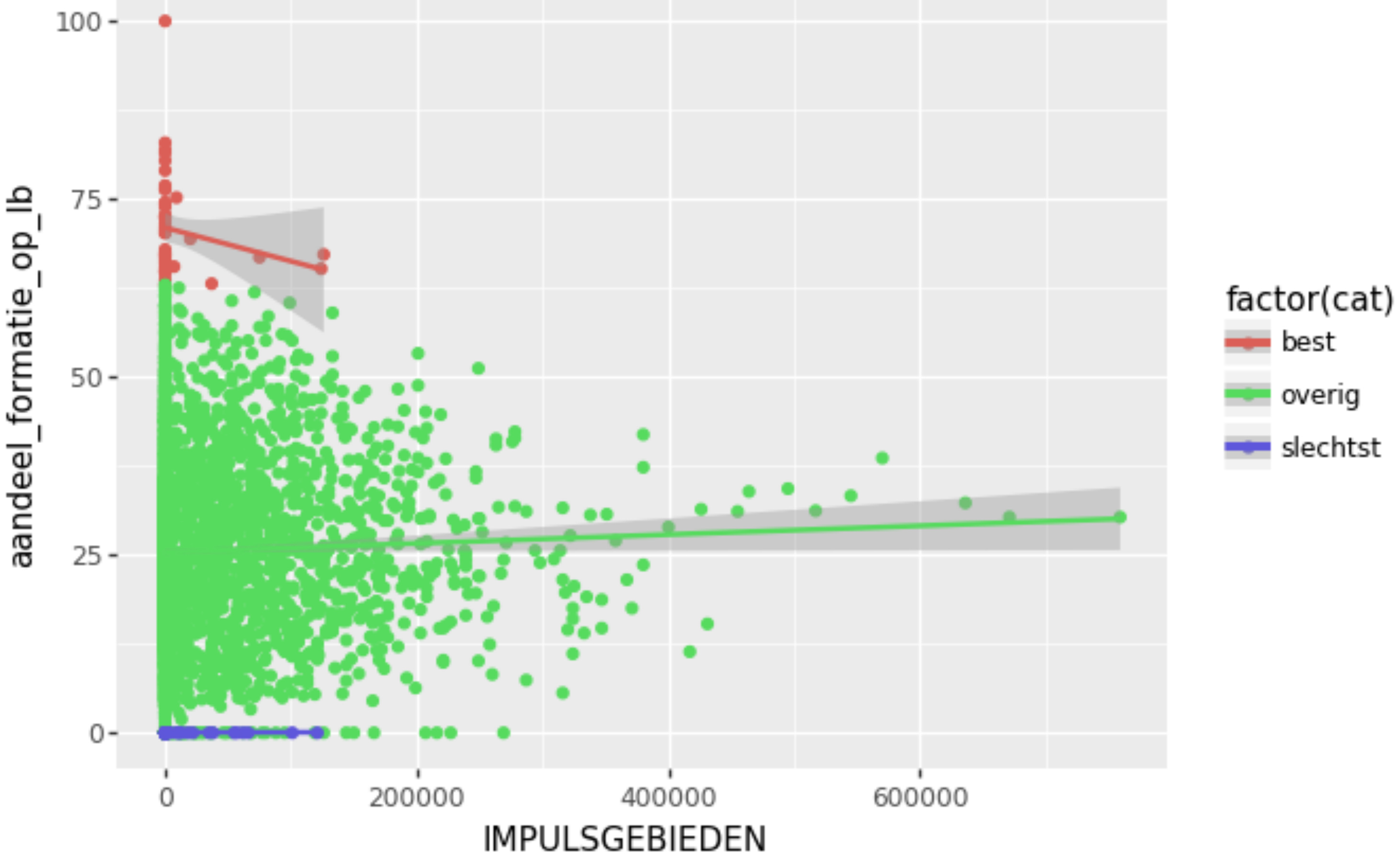

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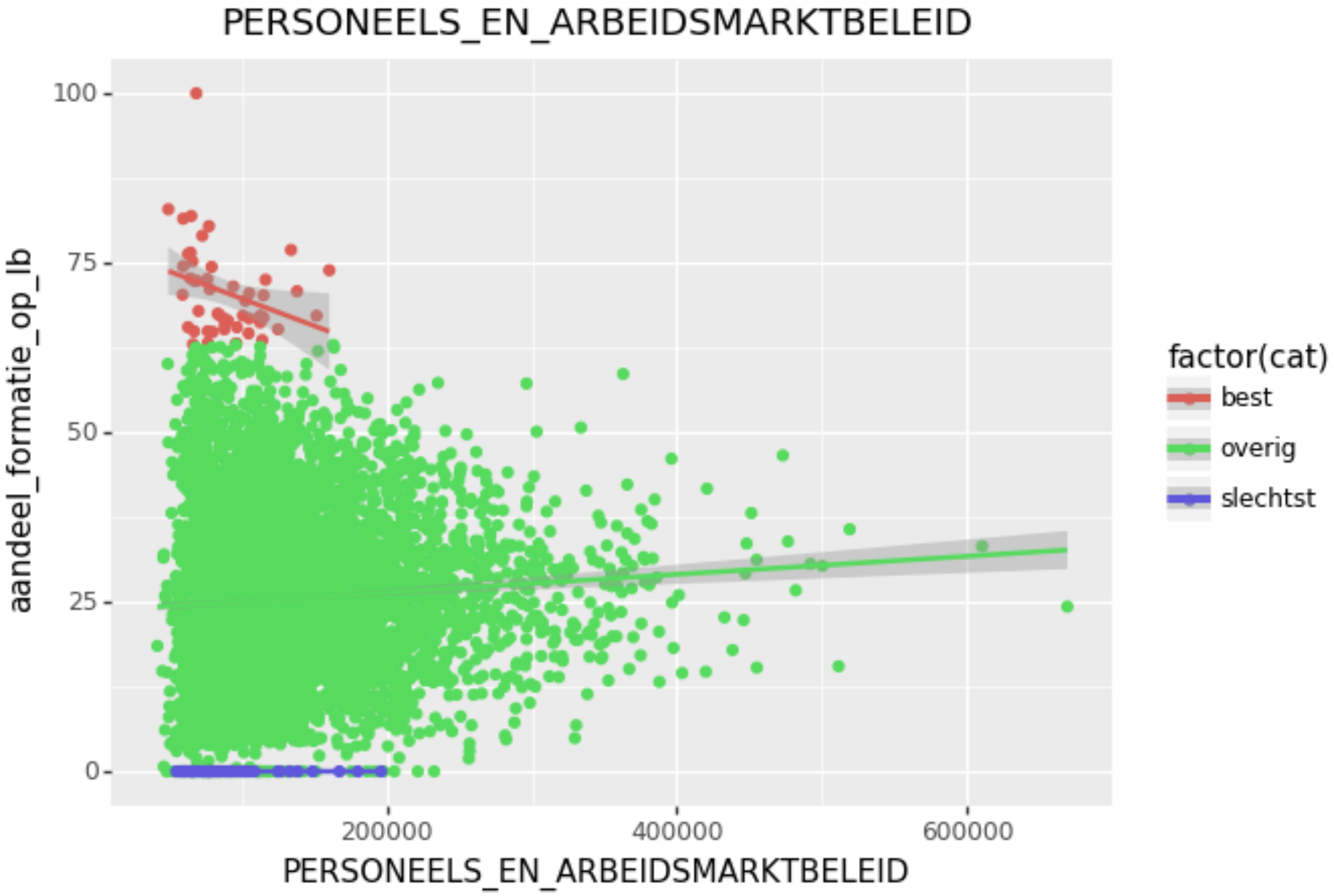
PERSONEELS_EN_ARBEIDSMARKTBELEID
```



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PRESTATIEBOX
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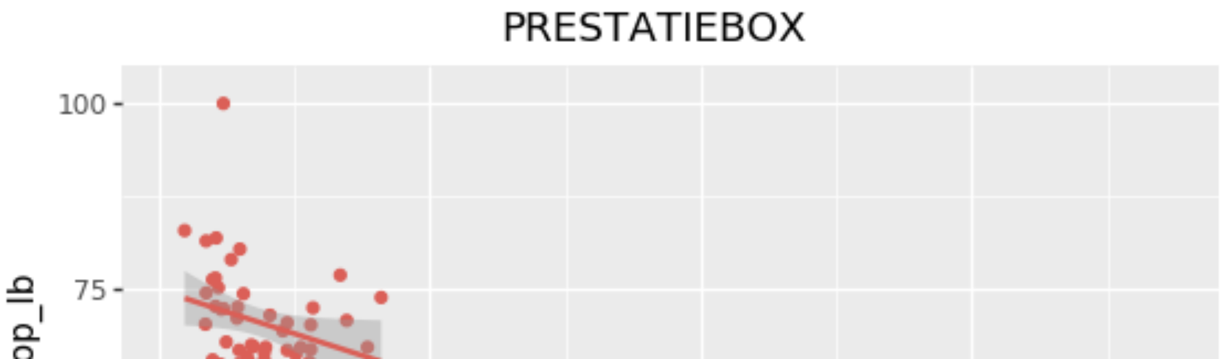

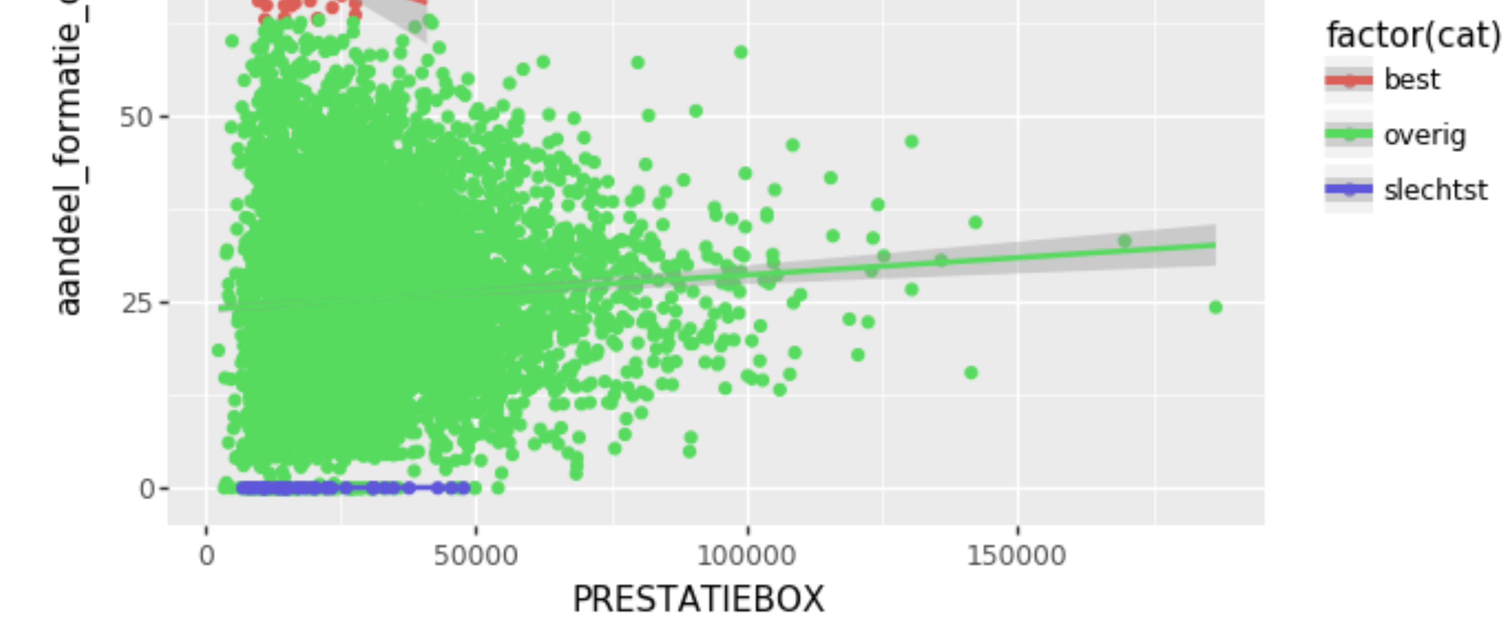

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TOTAAL
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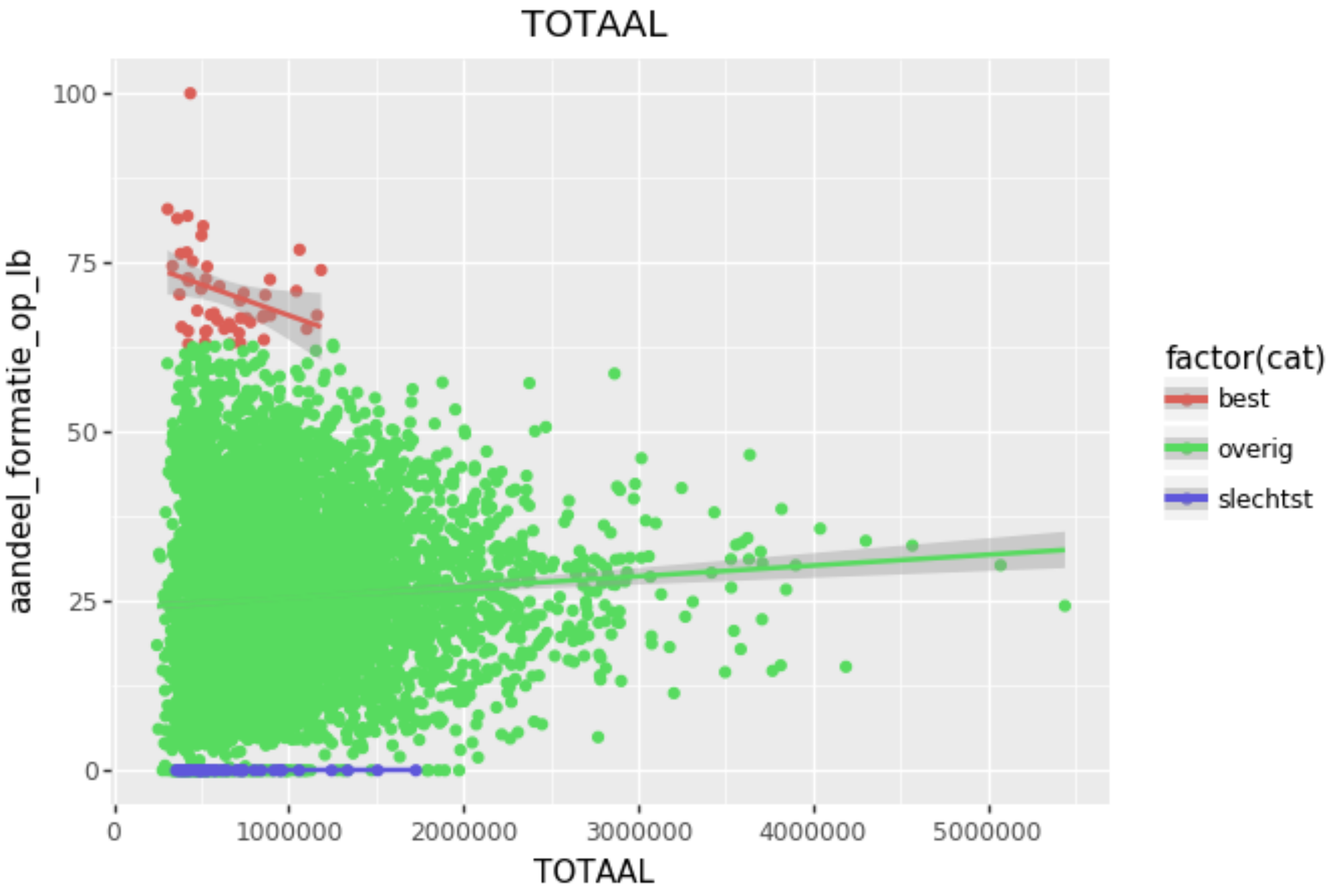

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merge_2012
NO NON-NA ROWS
merge_2013
NO NON-NA ROWS
merge_2014
NO NON-NA ROWS
merge_2015
NO NON-NA ROWS
OWBGNUMMER
```

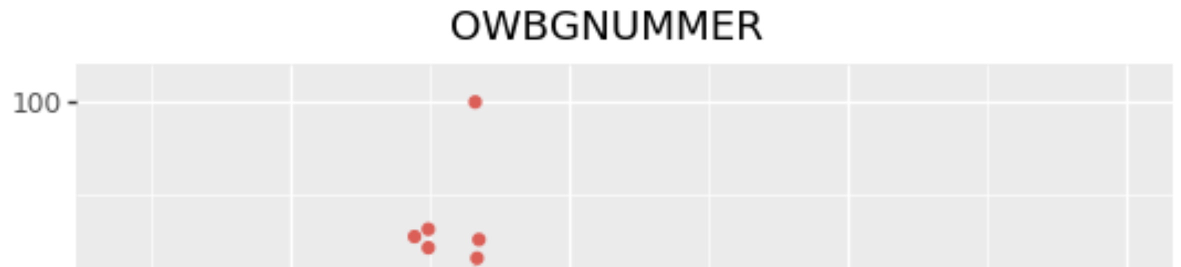

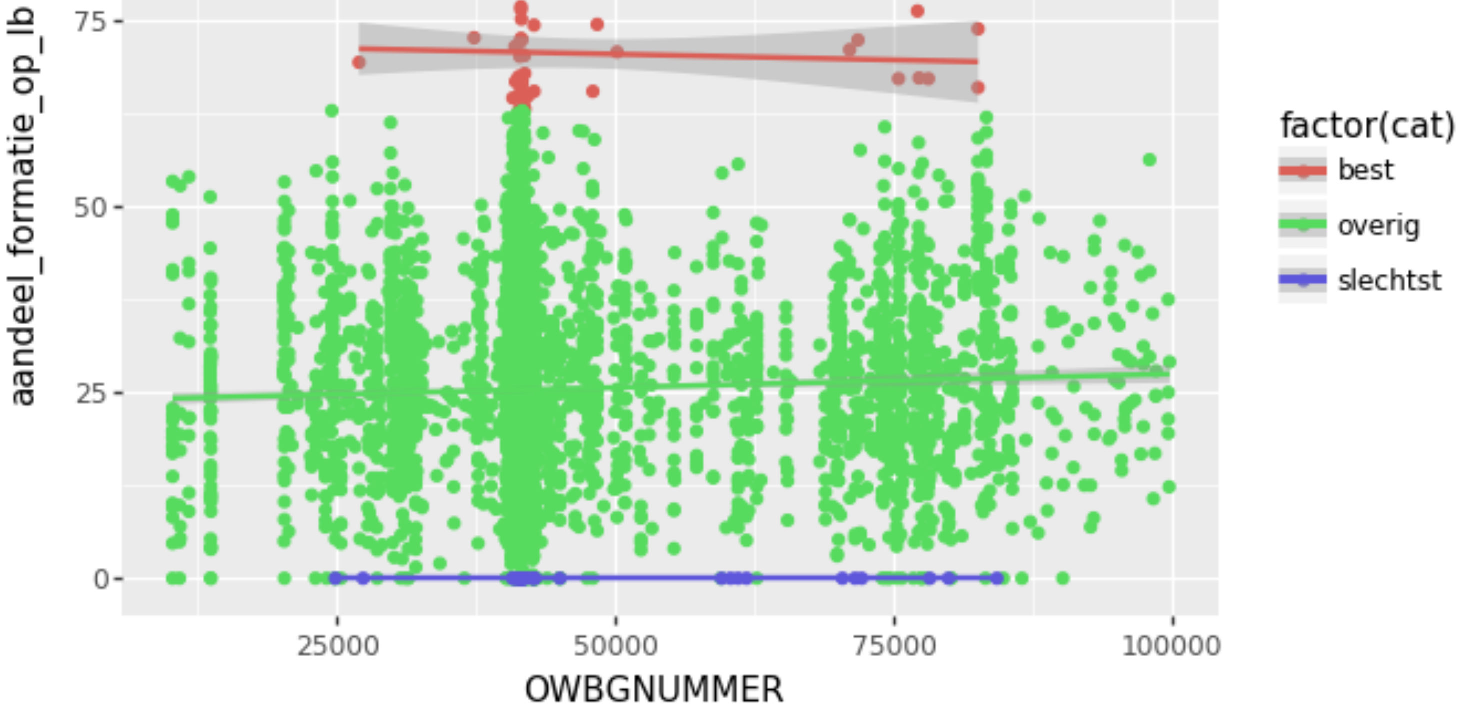

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merge_2016
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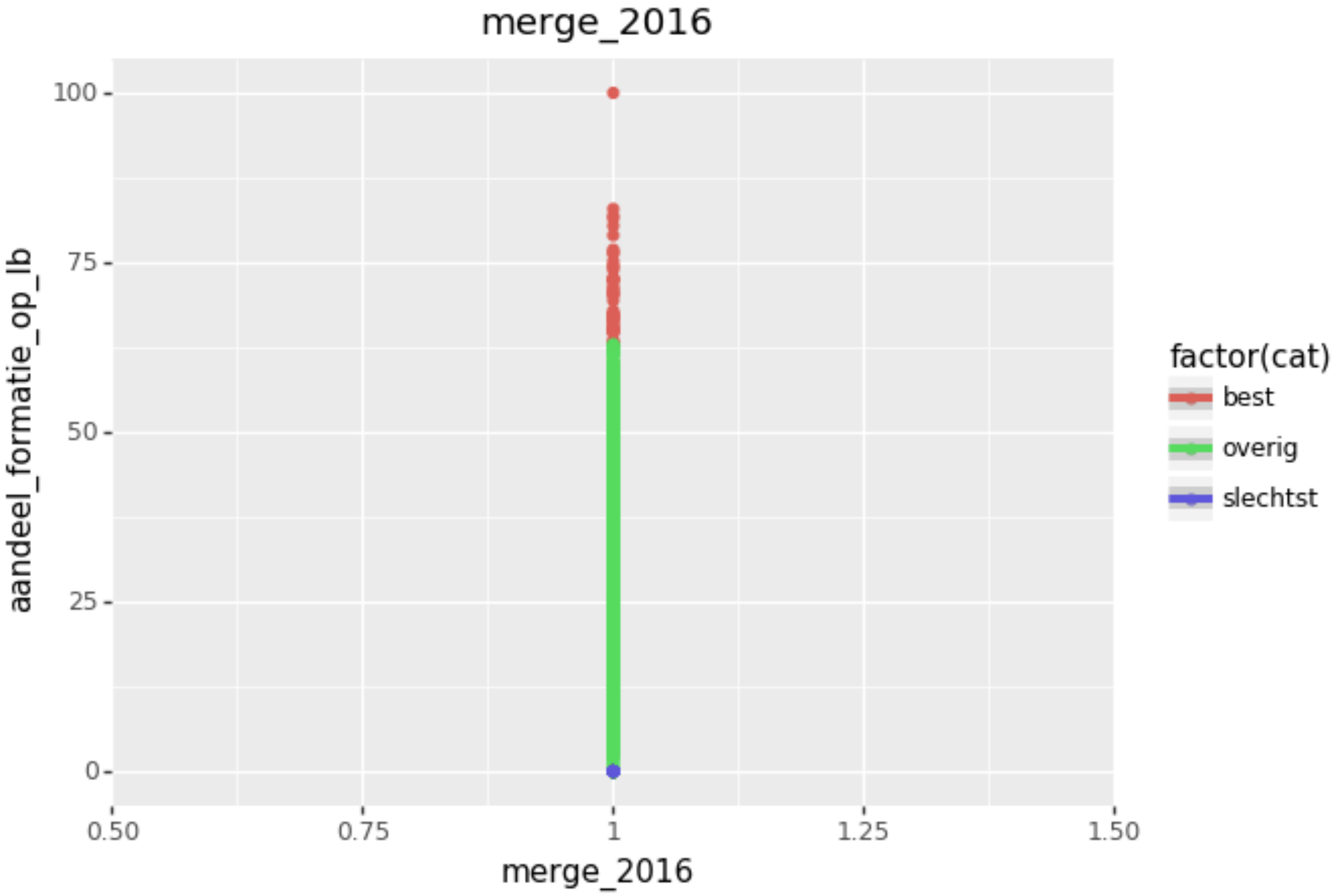

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merge_2017
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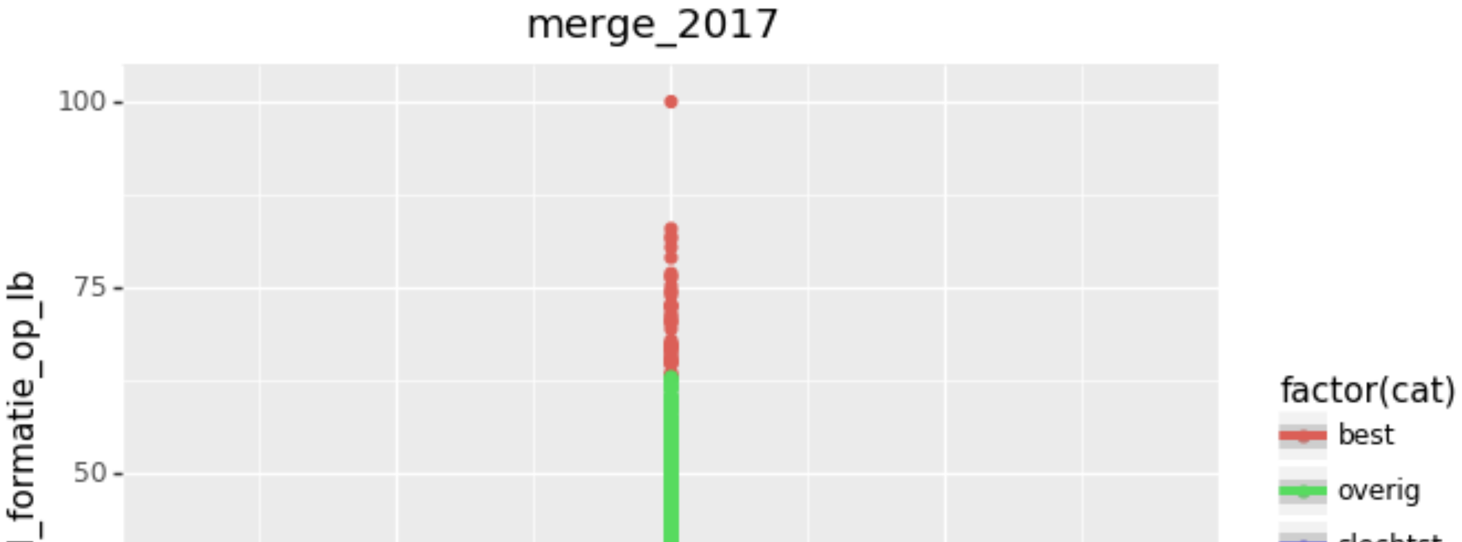

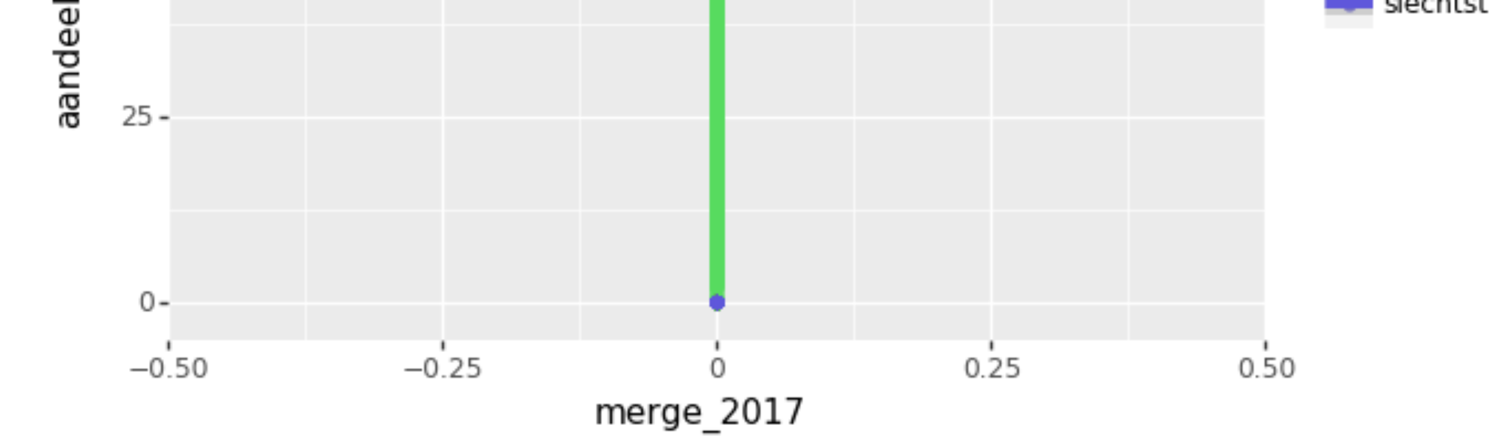

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_merge
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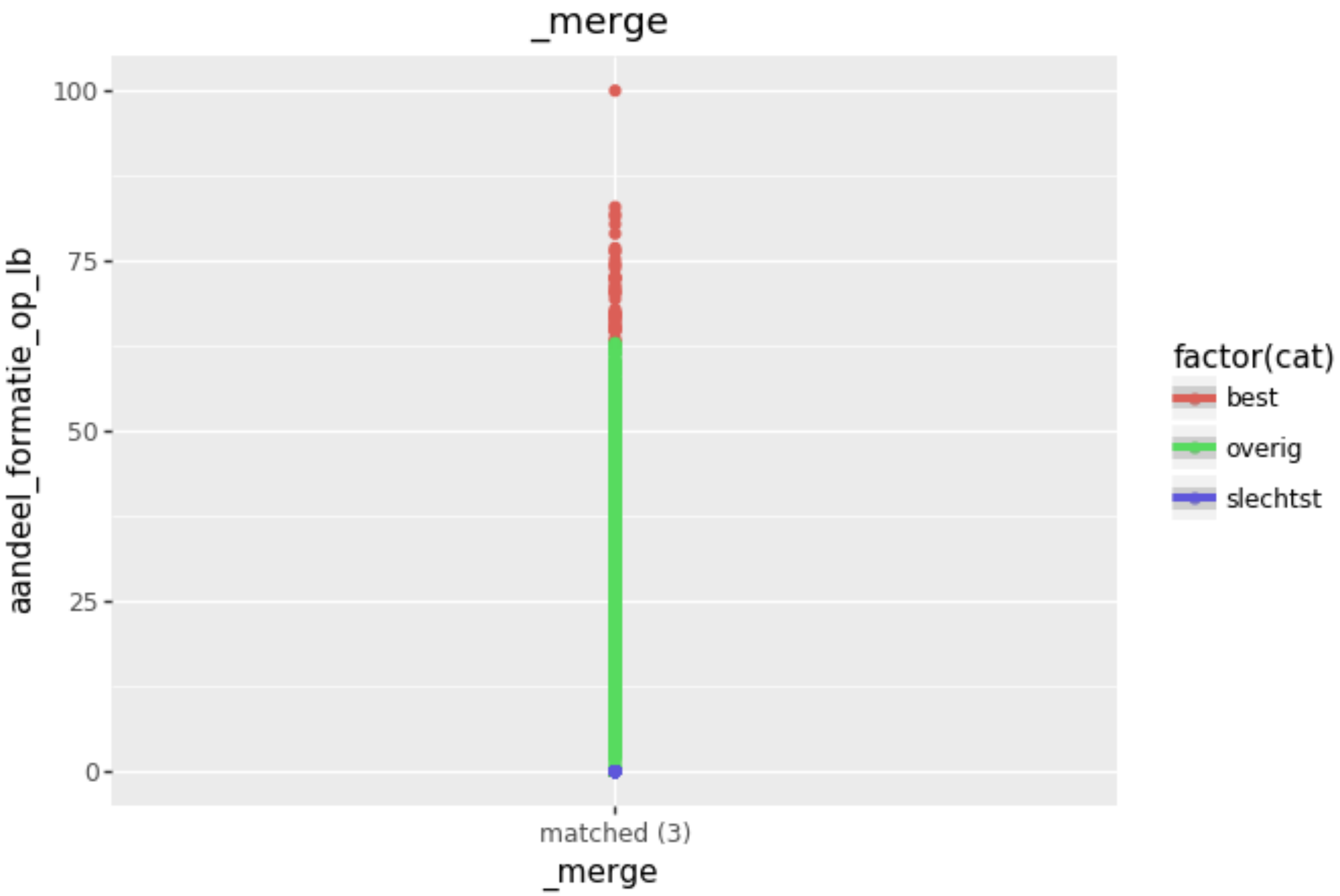

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merge2
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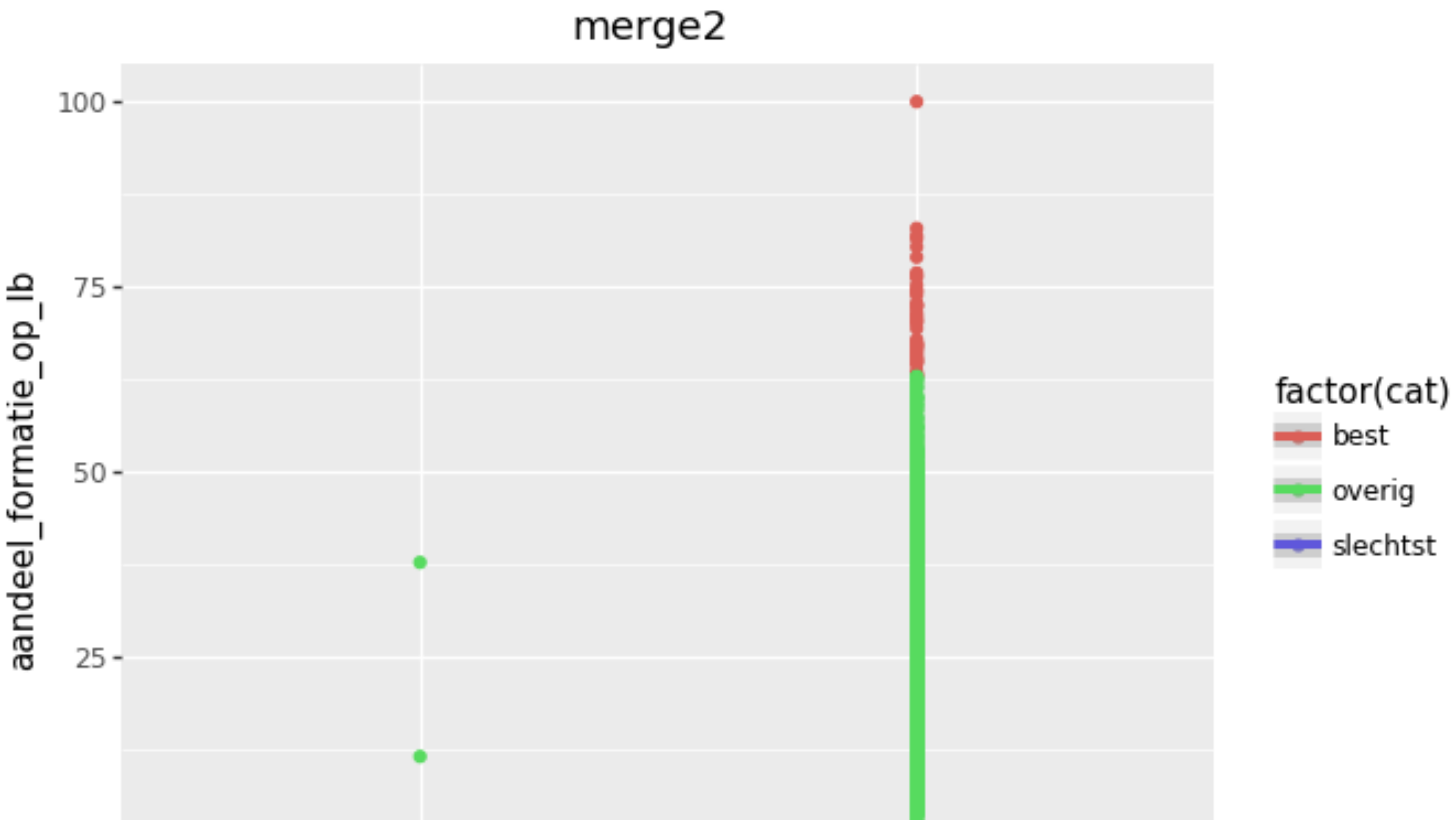

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<ggplot: (285906538)>
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Out[1]:

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[]
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In [ ]: