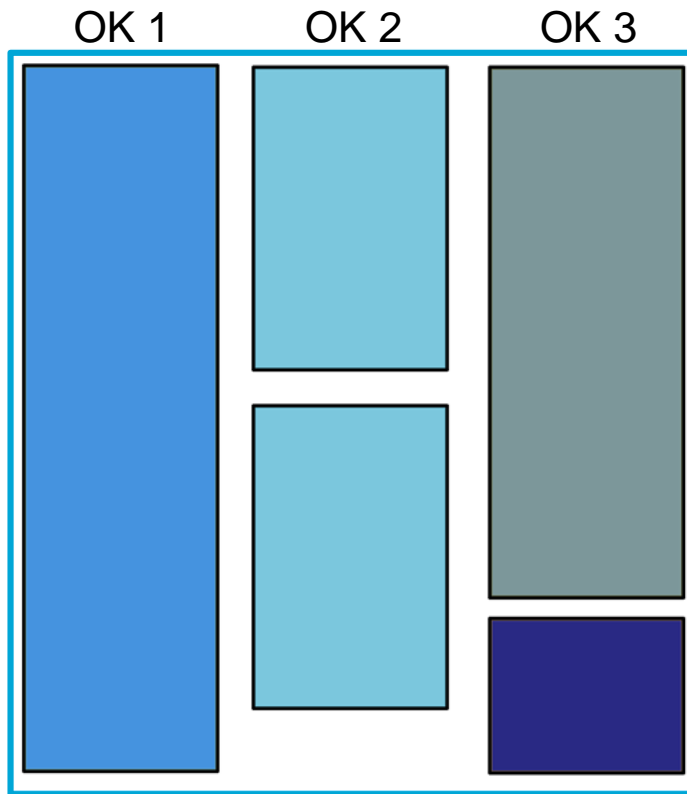
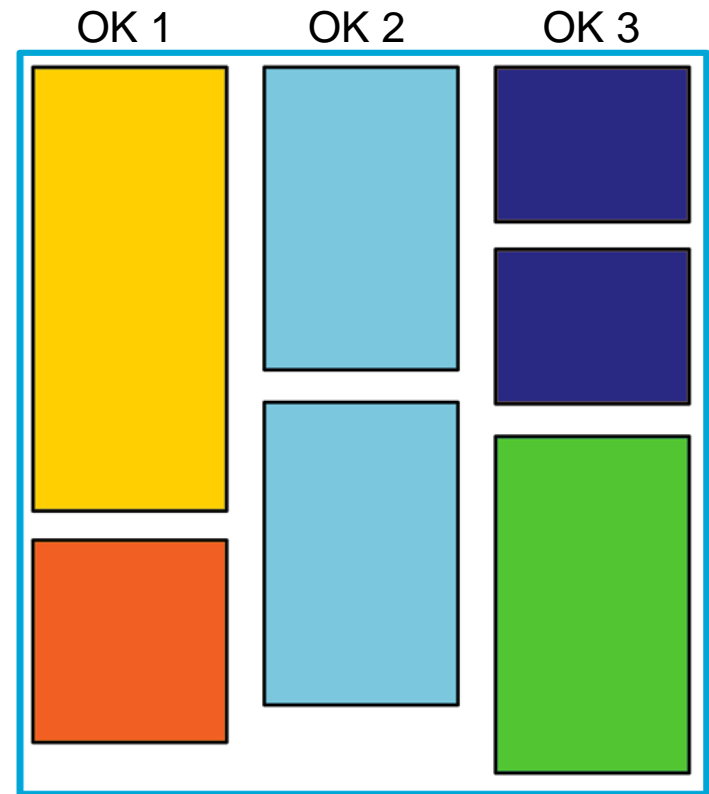


# Minimaliseer variatie bedbezetting door planning operatiegroepen

Maandag

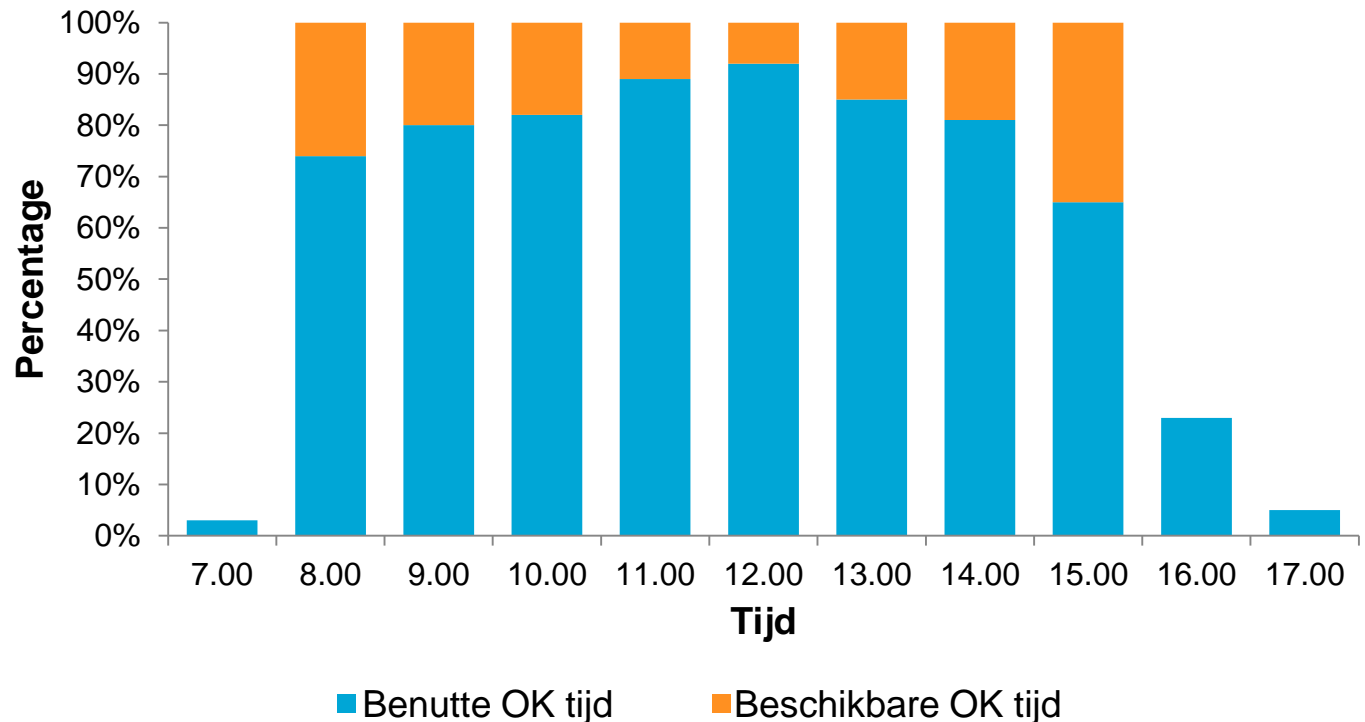


Dinsdag



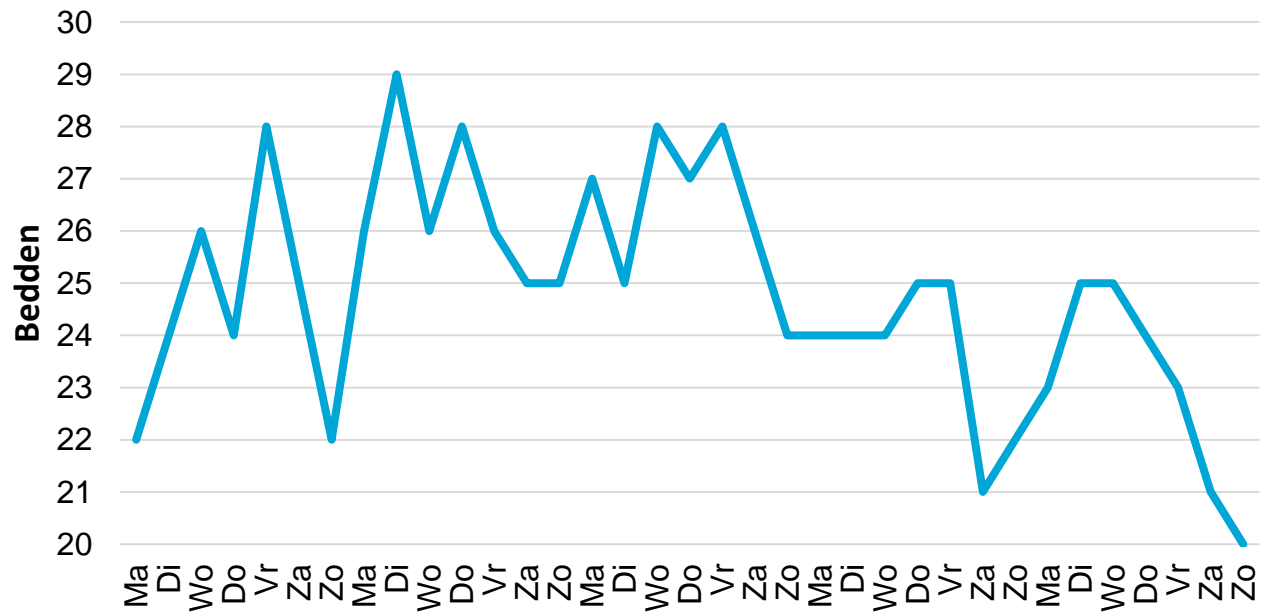
# OK bezetting & overtijd

- Gemiddelde bezetting: 73%
- Overtijd: 32%



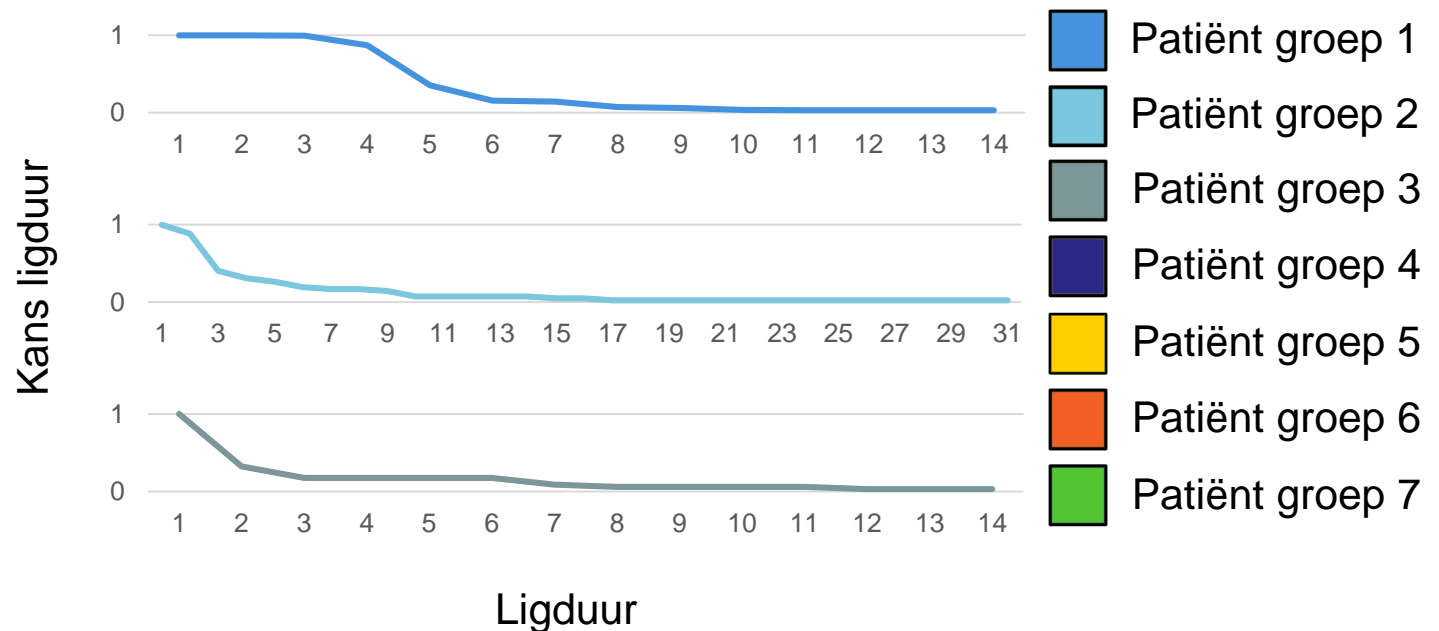
# Hoge variatie bedbezetting

- 12% van de operaties herpland
- 3% van de operaties herpland <24 uur voor operatie



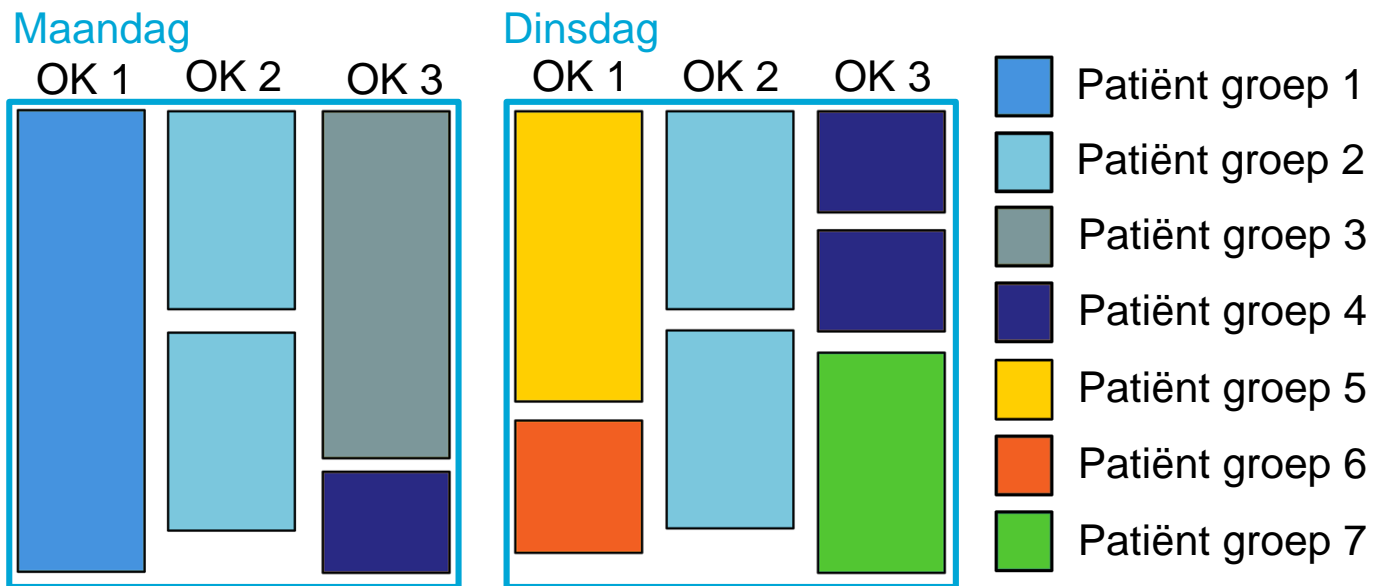
# Aanpak

- Operaties clusteren in groepen
- Verdeling ligduur en operatieduur bepalen per groep



# Aanpak

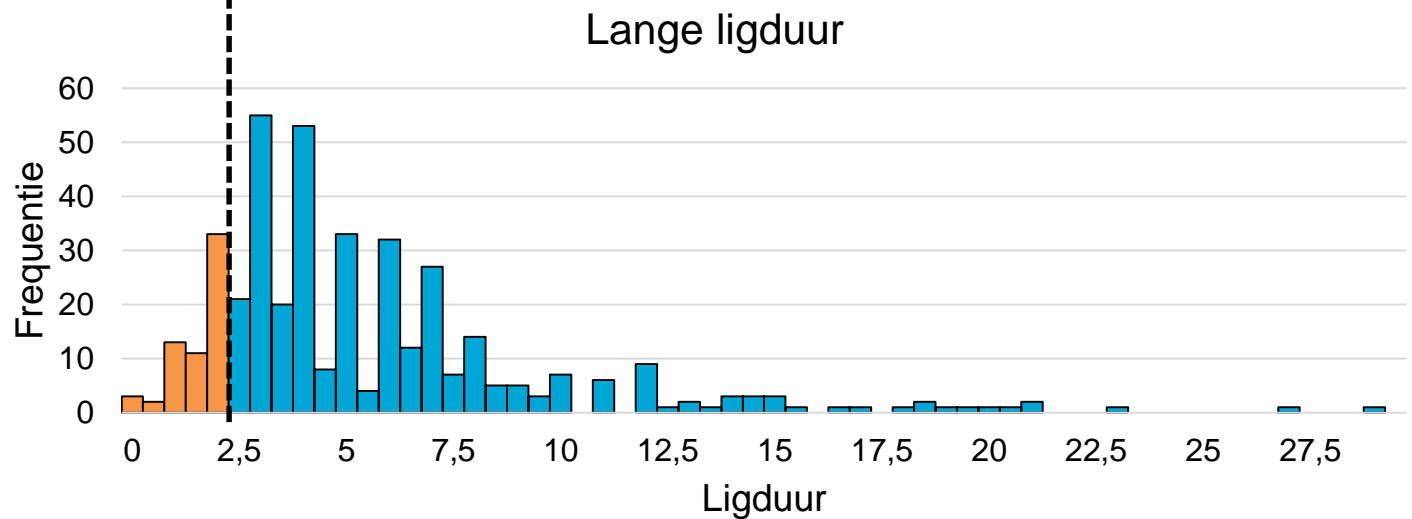
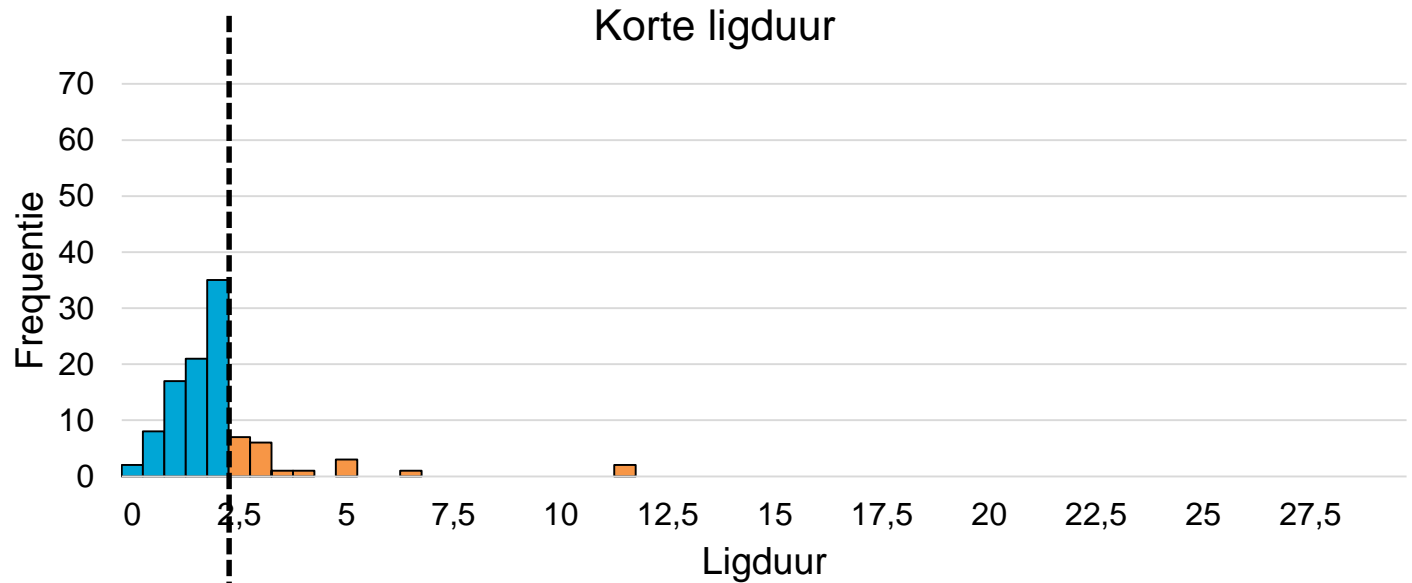
- Operaties clusteren in groepen
- Verdeling ligduur en operatieduur bepalen per groep
- Operatiegroepen plannen



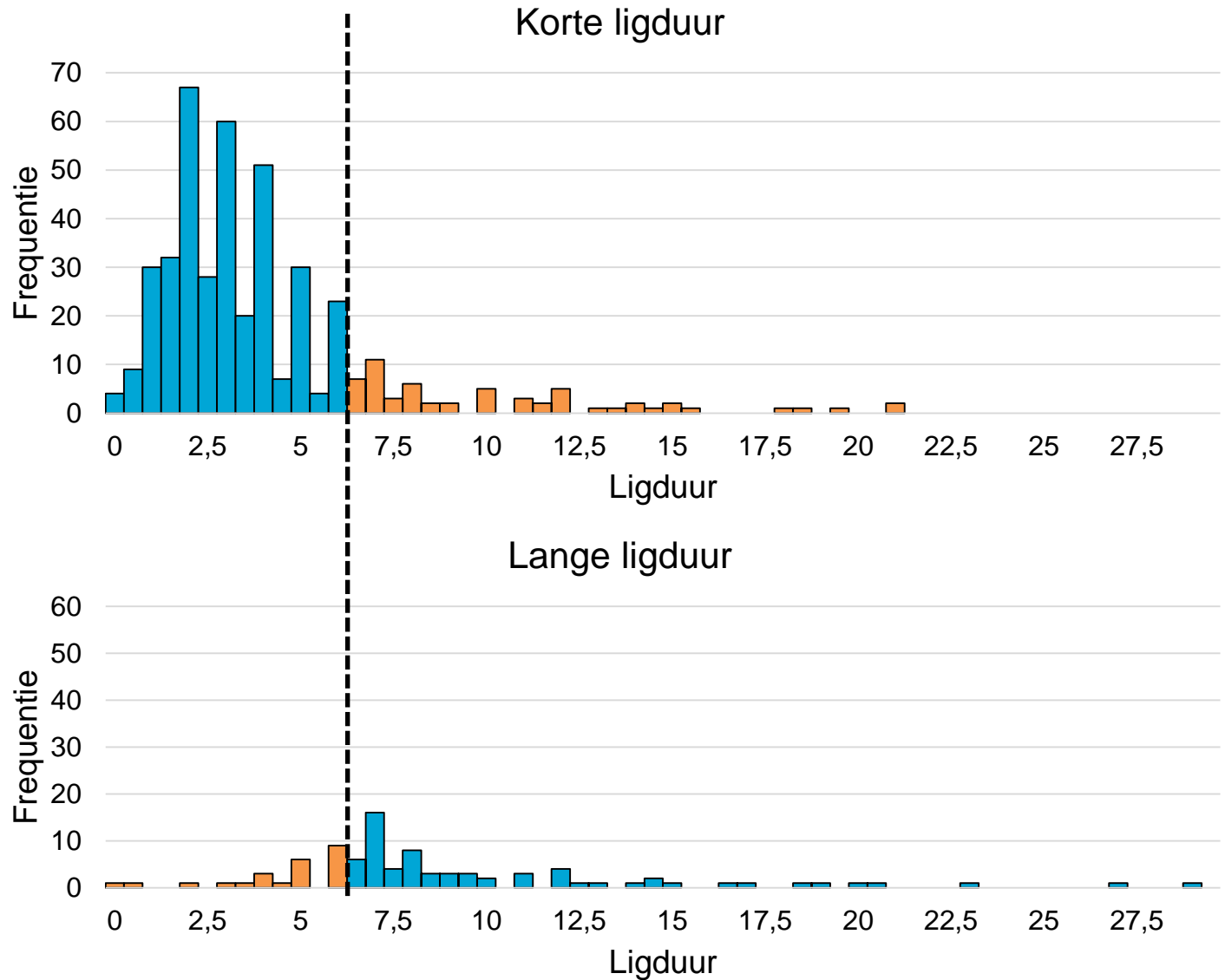
# Operaties clusteren

- Specialisme
- Ligduur: kort of lang
- Operatieduur: kort-lang of kort-middel-lang

# Operaties clusteren

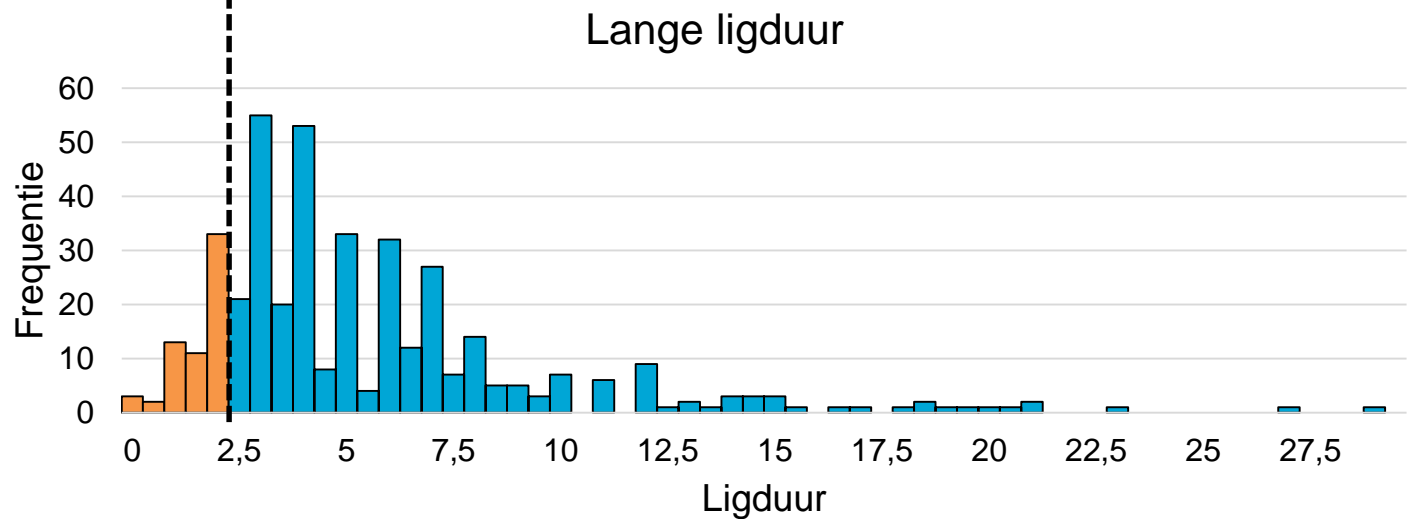
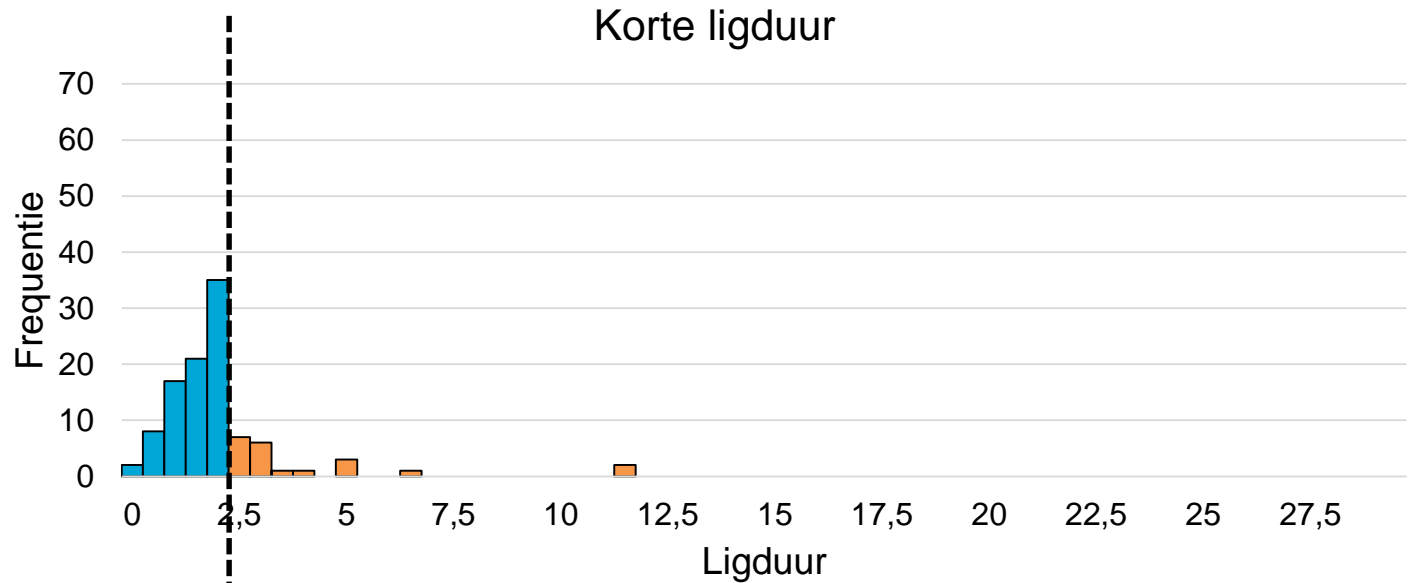


# Operaties clusteren

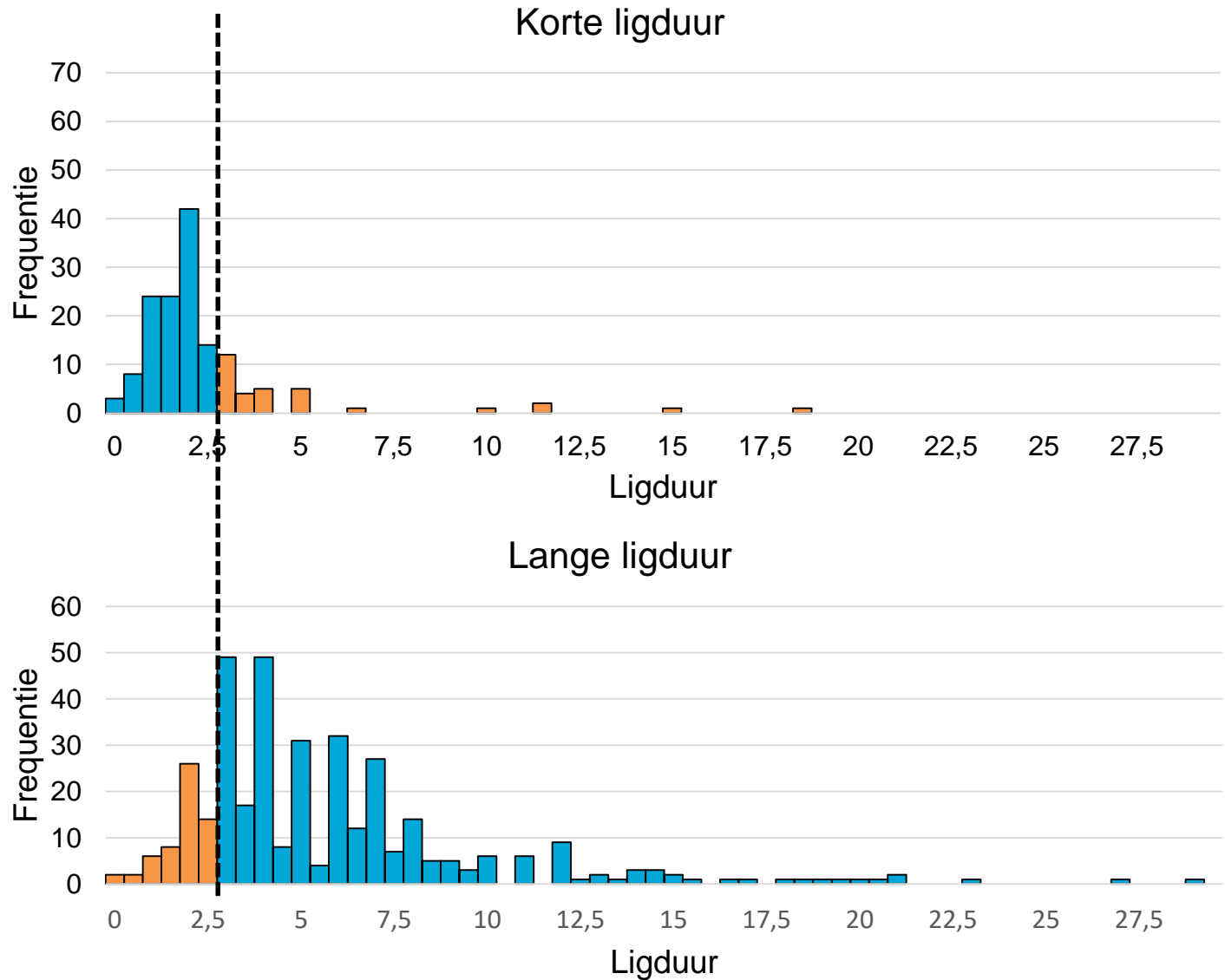




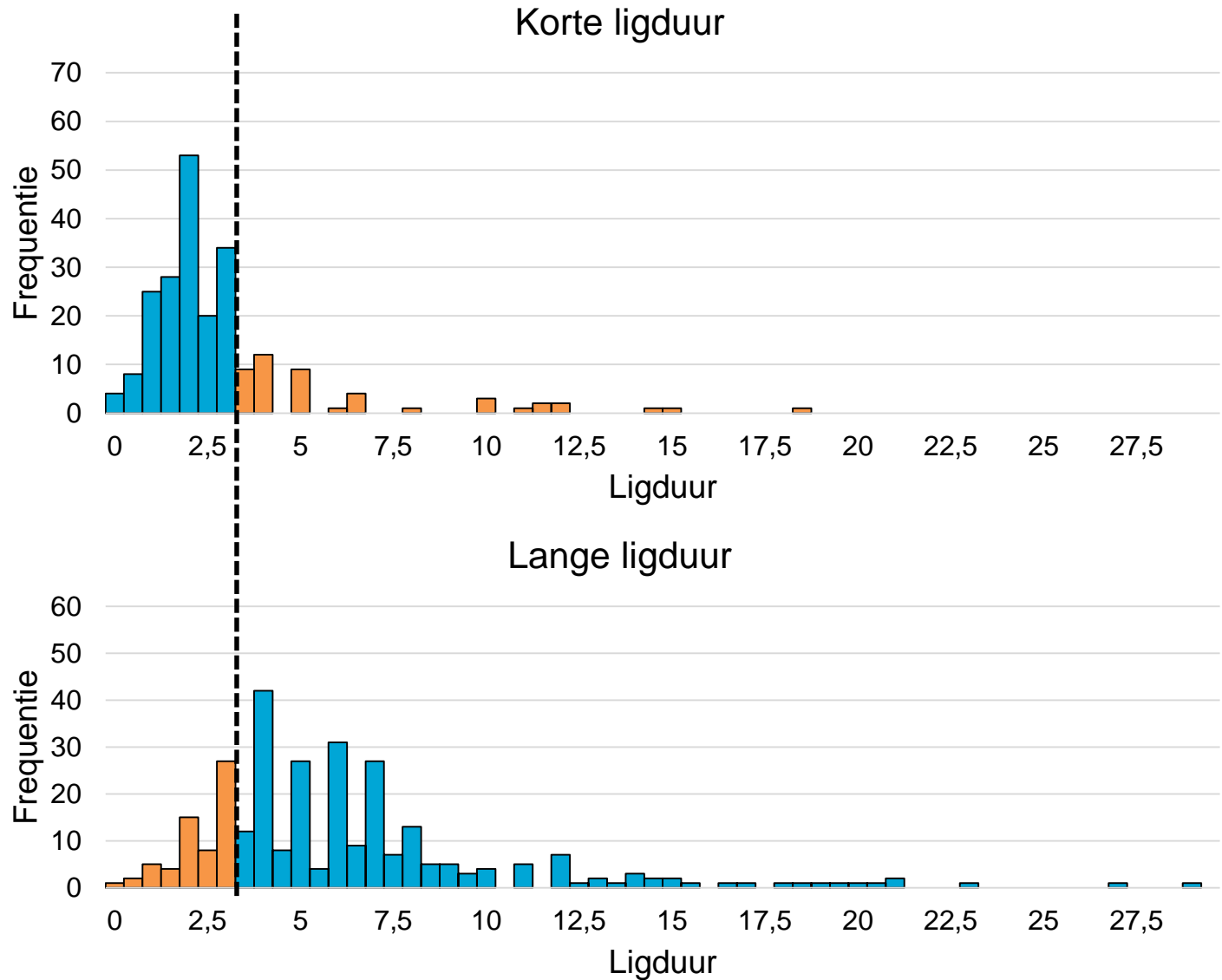
# Operaties clusteren



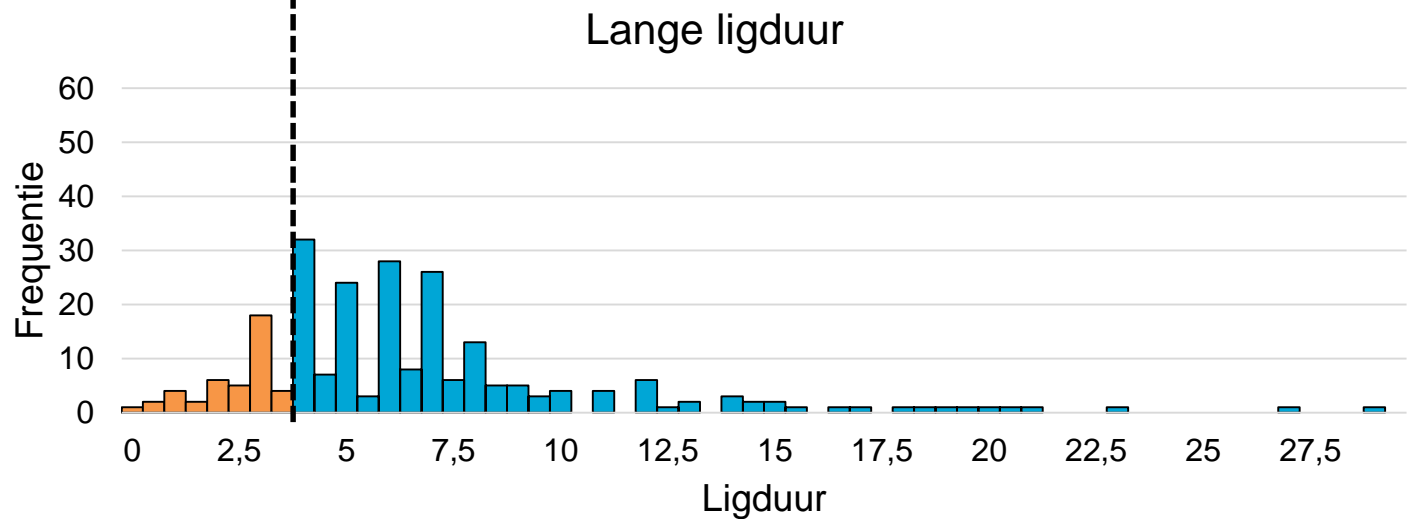
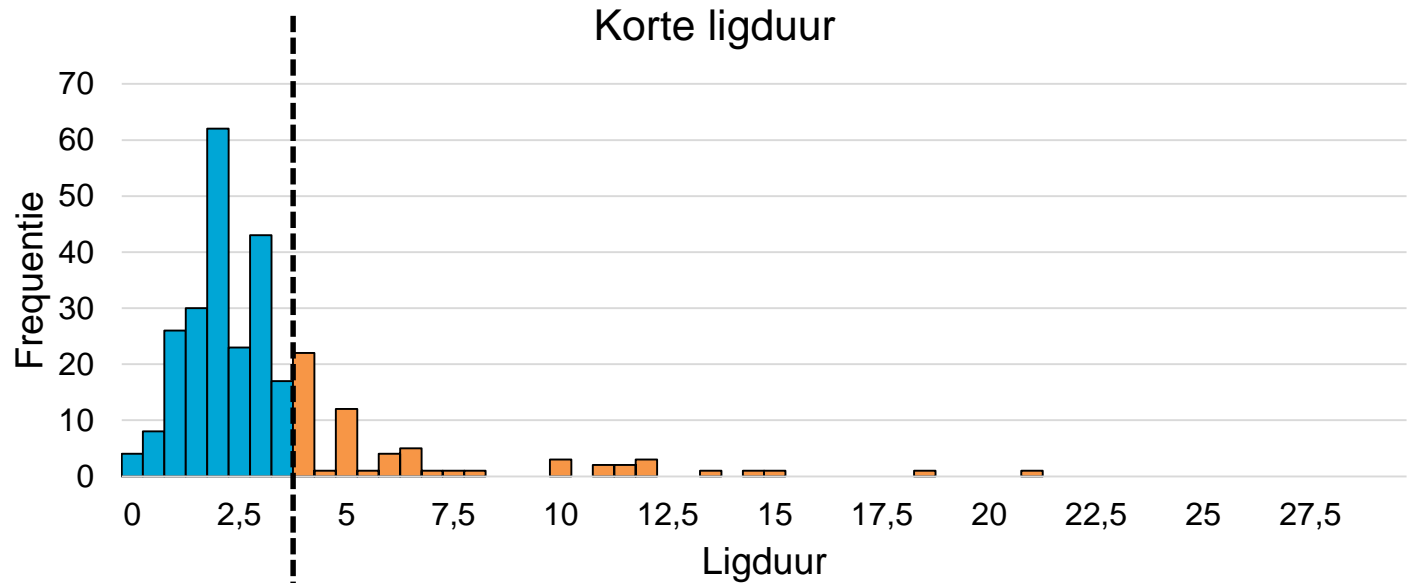
# Operaties clusteren



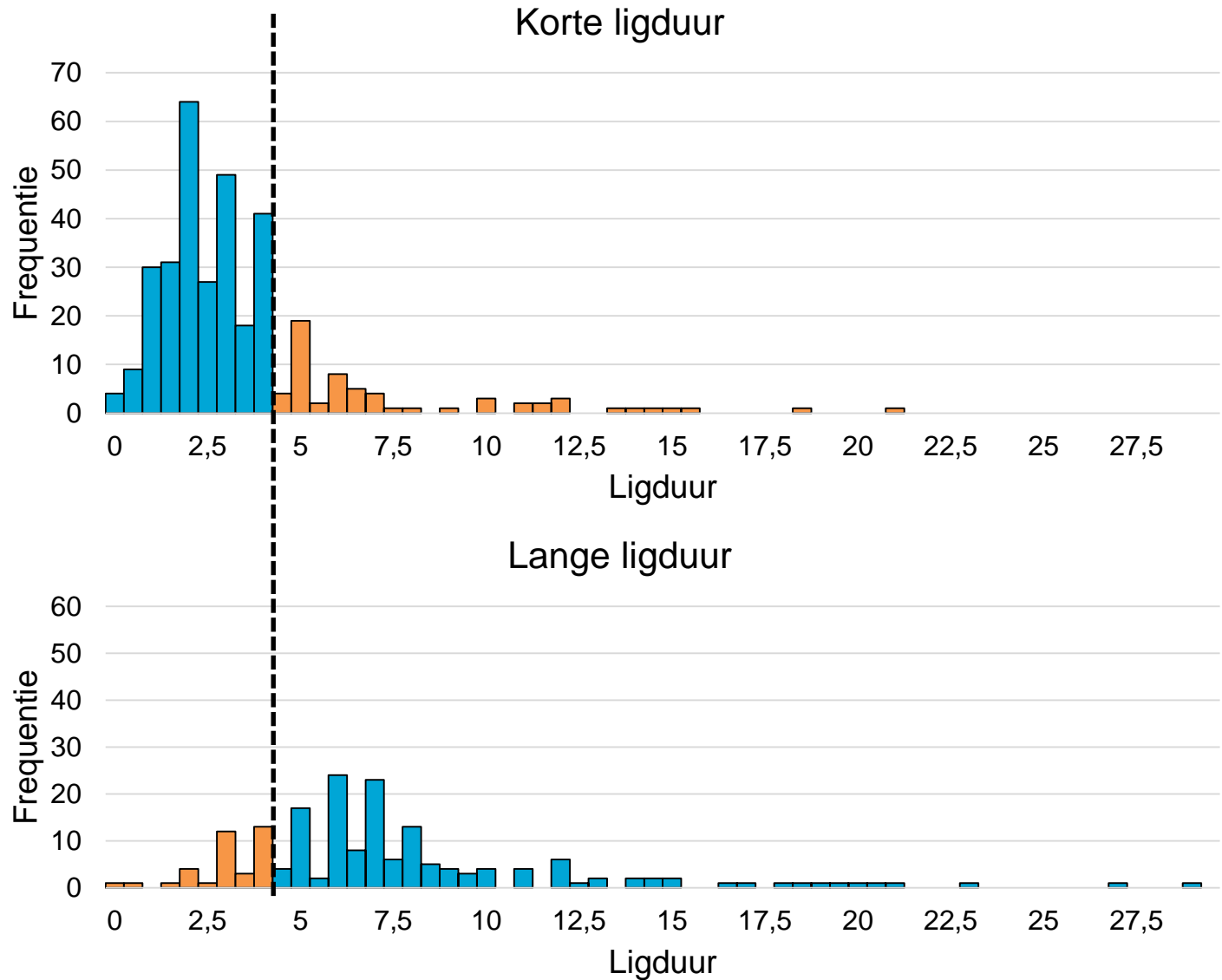
# Operaties clusteren



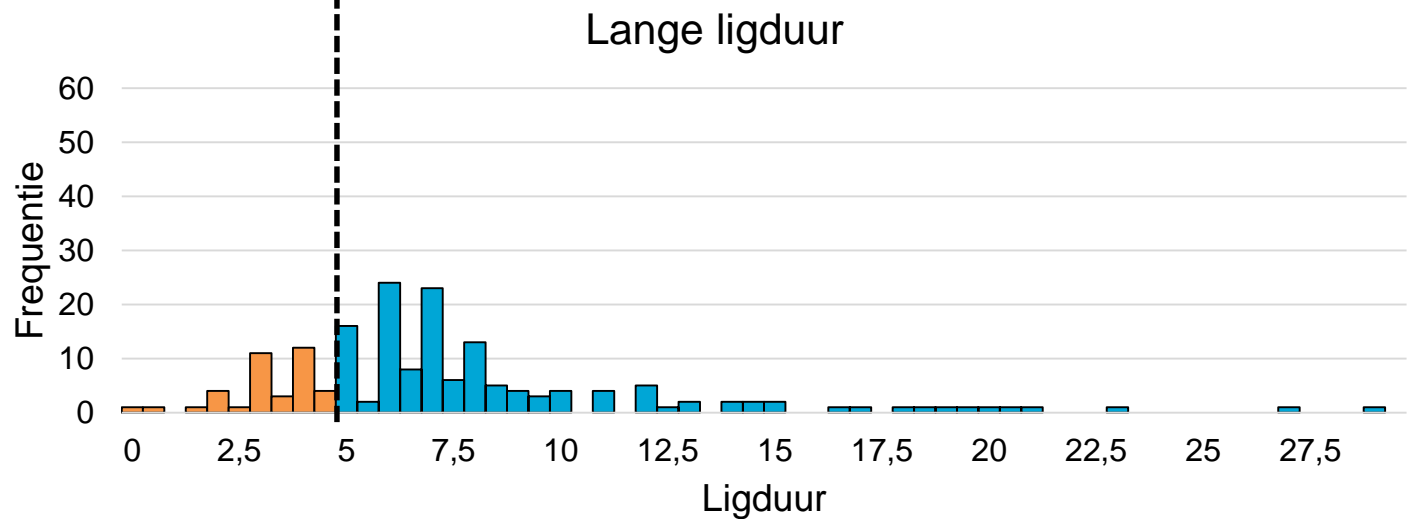
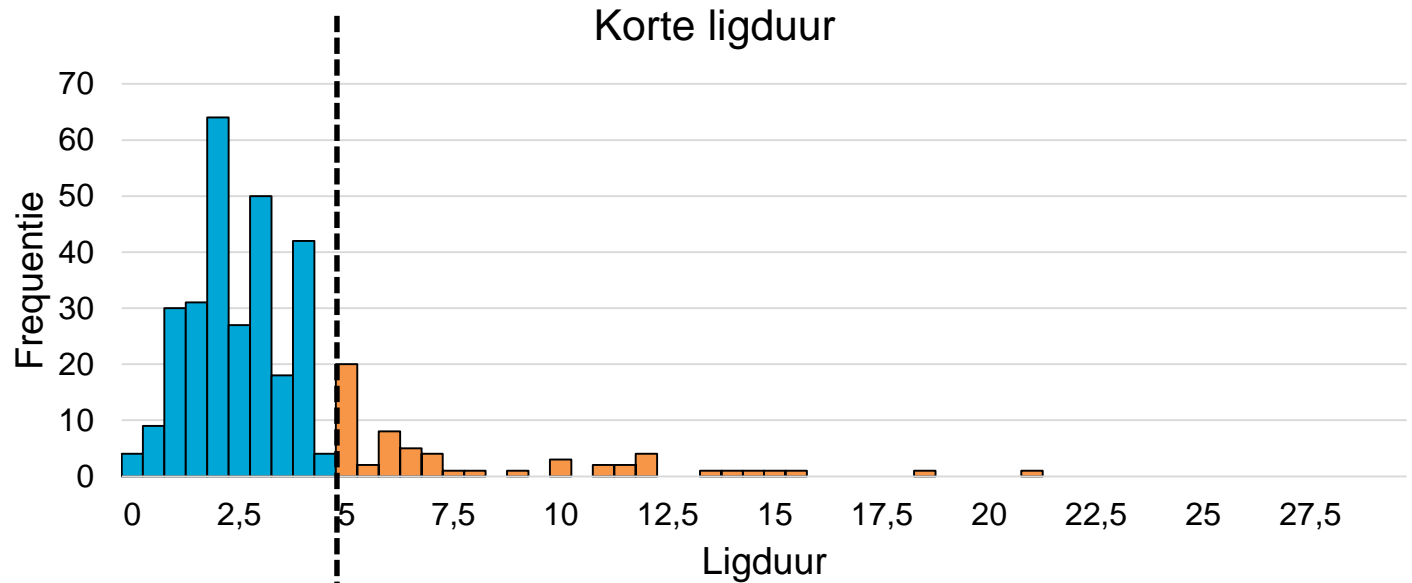
# Operaties clusteren



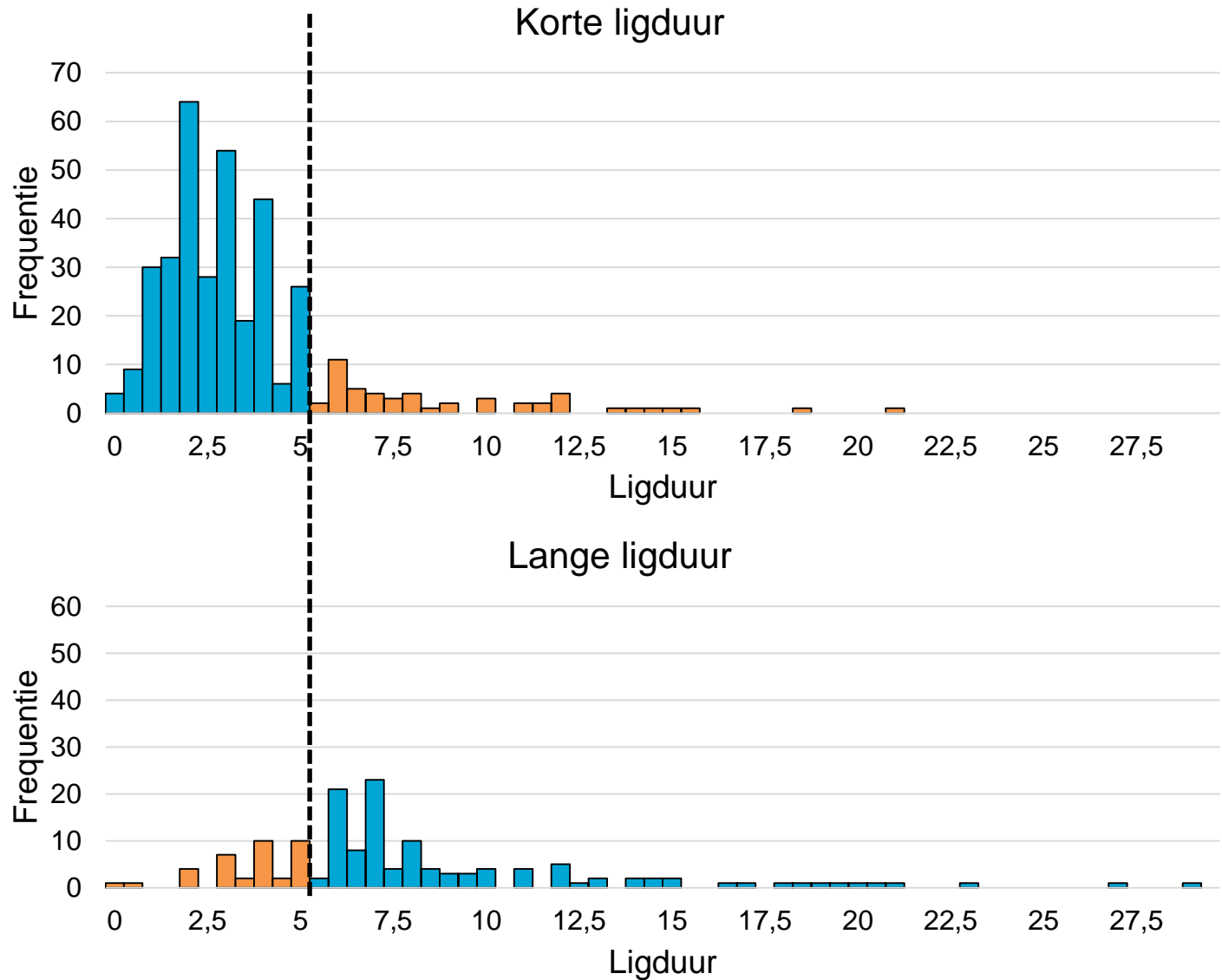
# Operaties clusteren



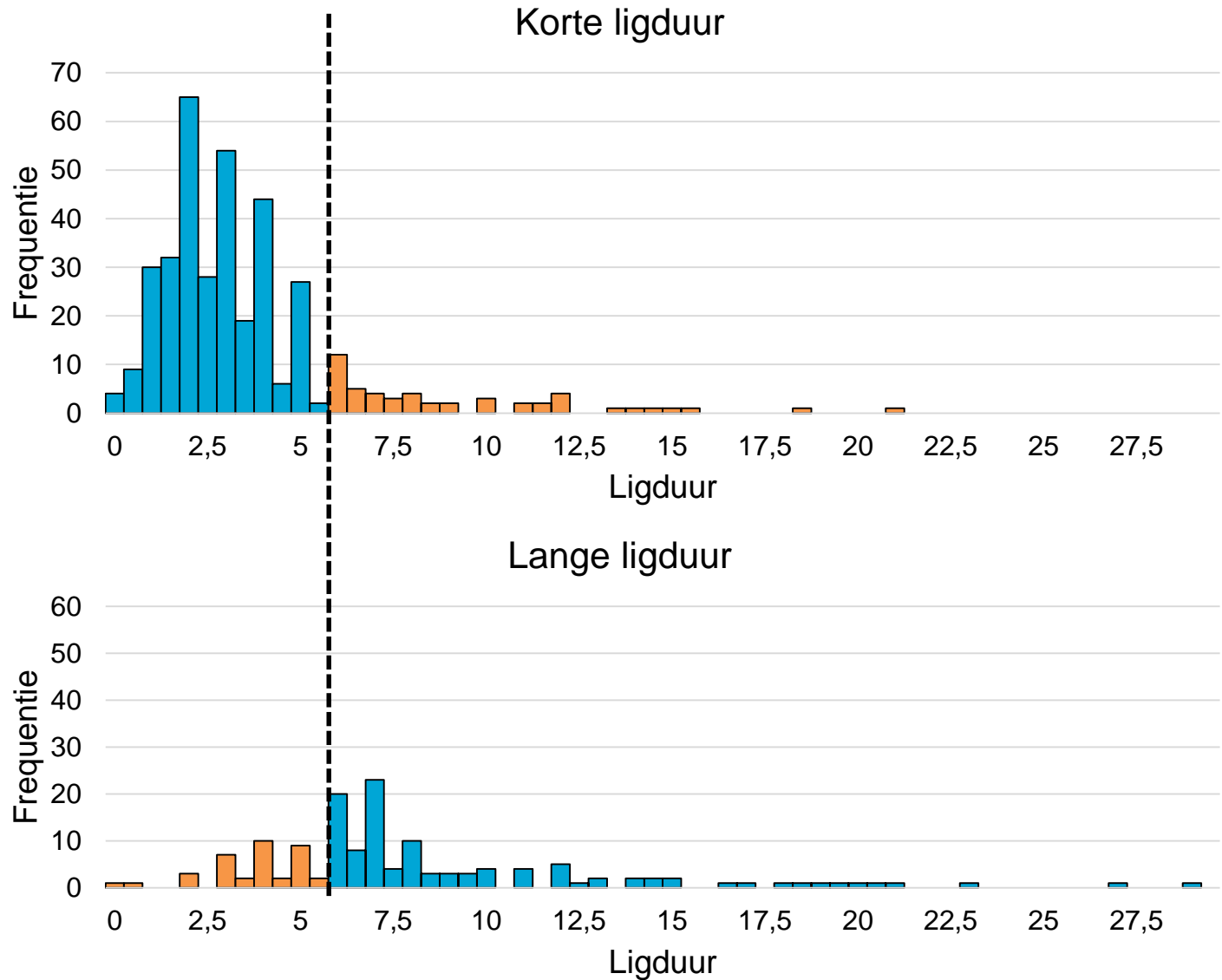
# Operaties clusteren



# Operaties clusteren

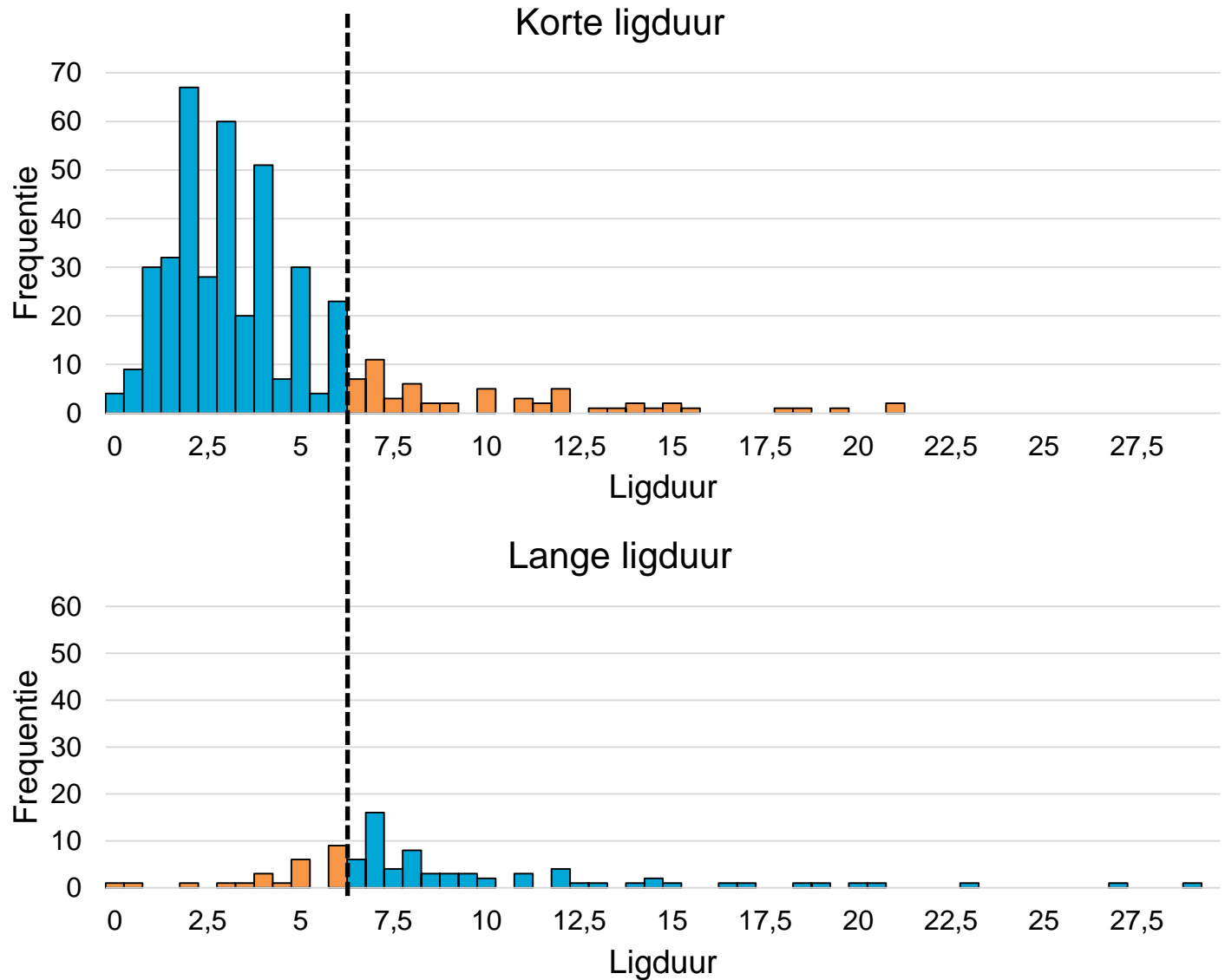


# Operaties clusteren

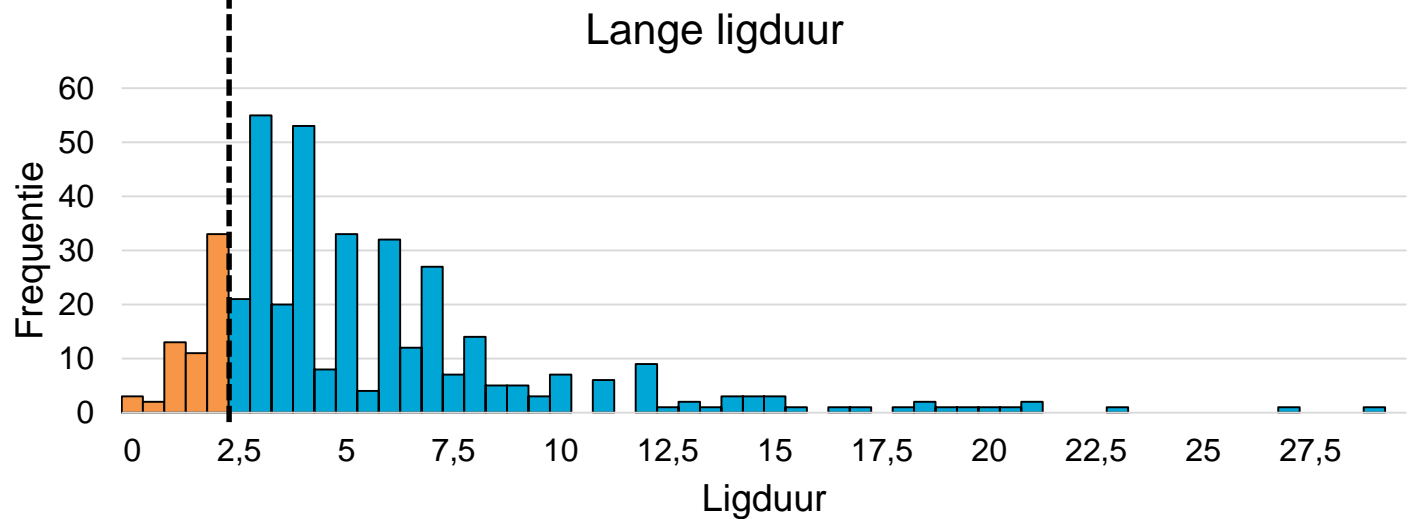
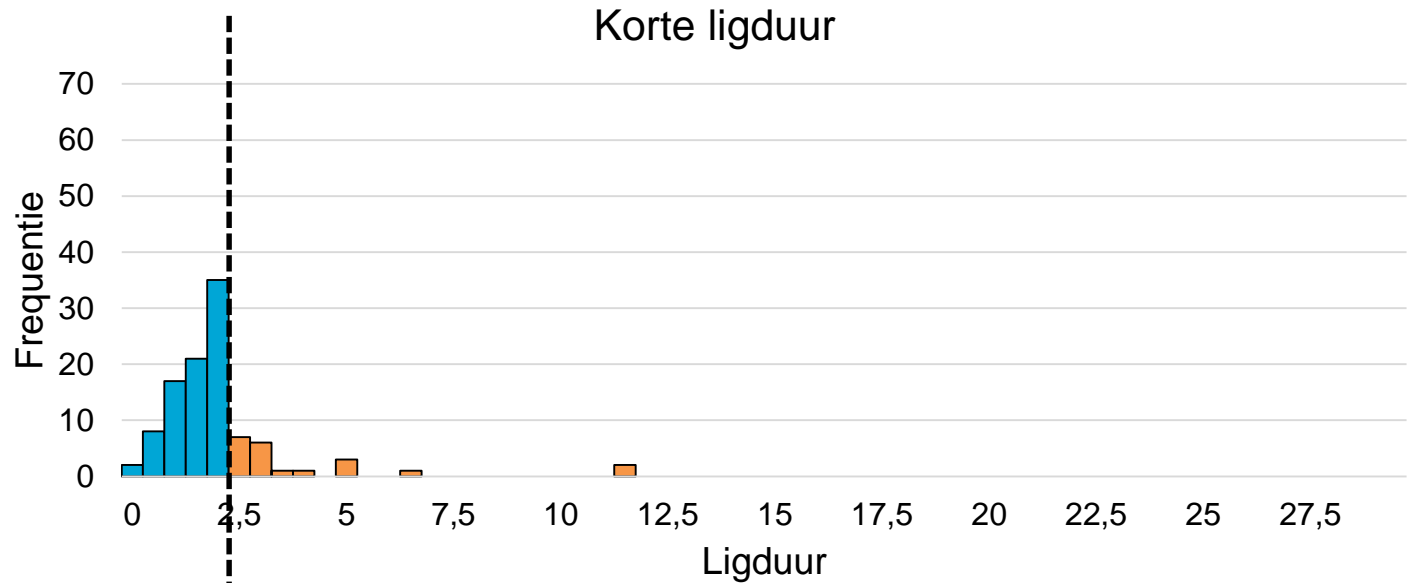




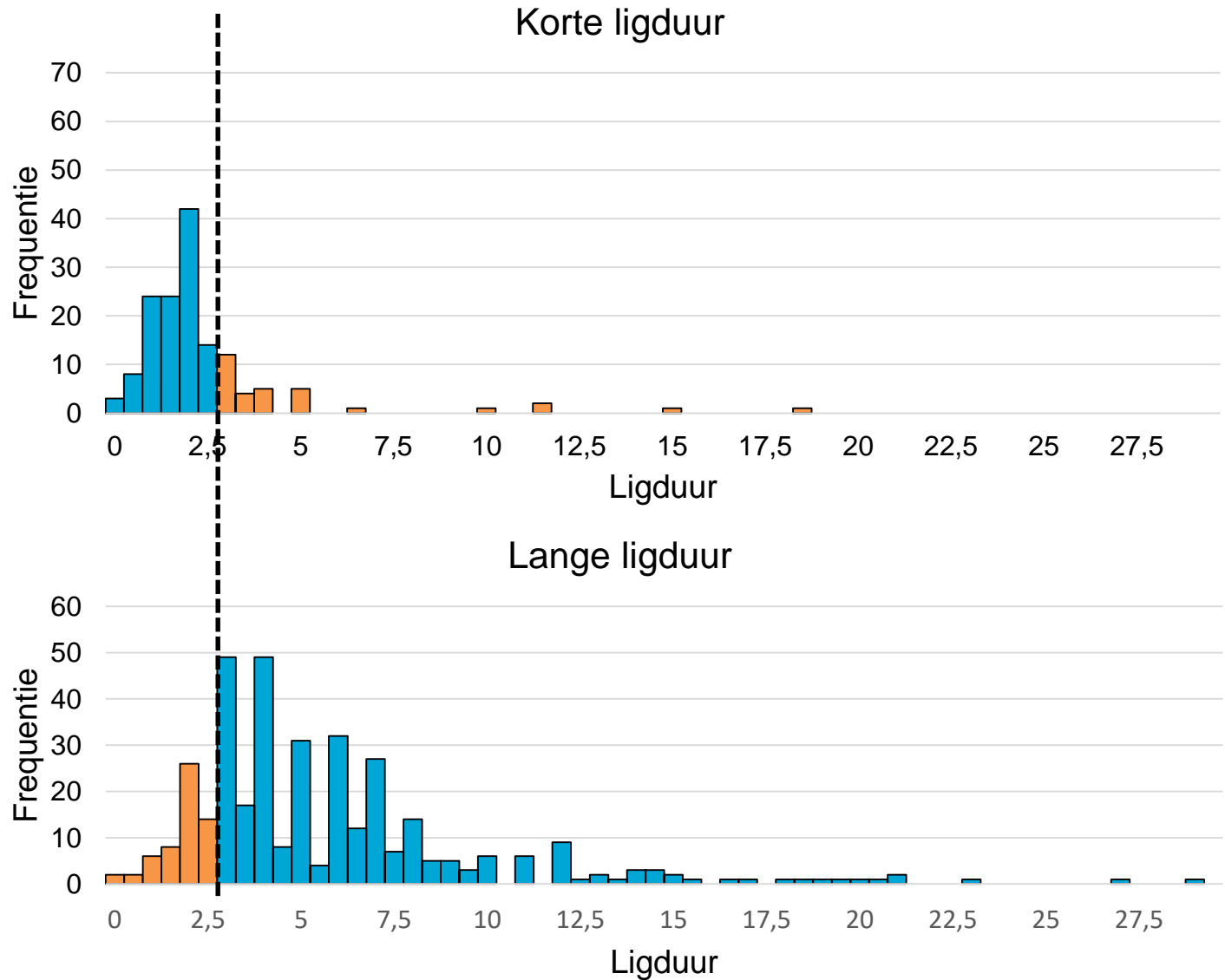
# Operaties clusteren



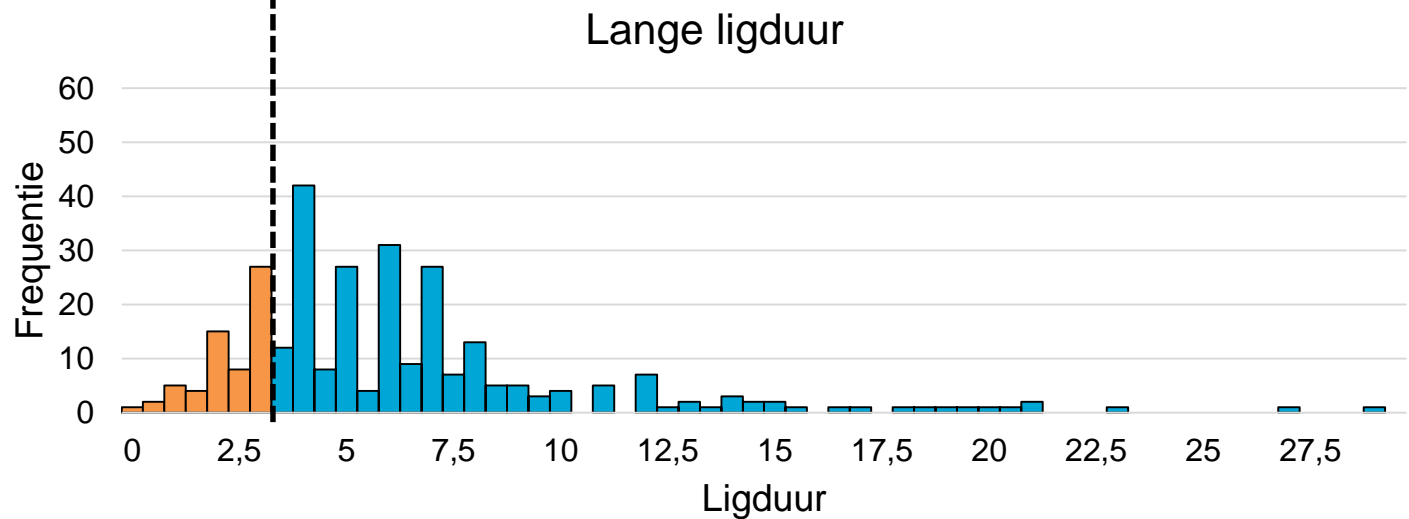
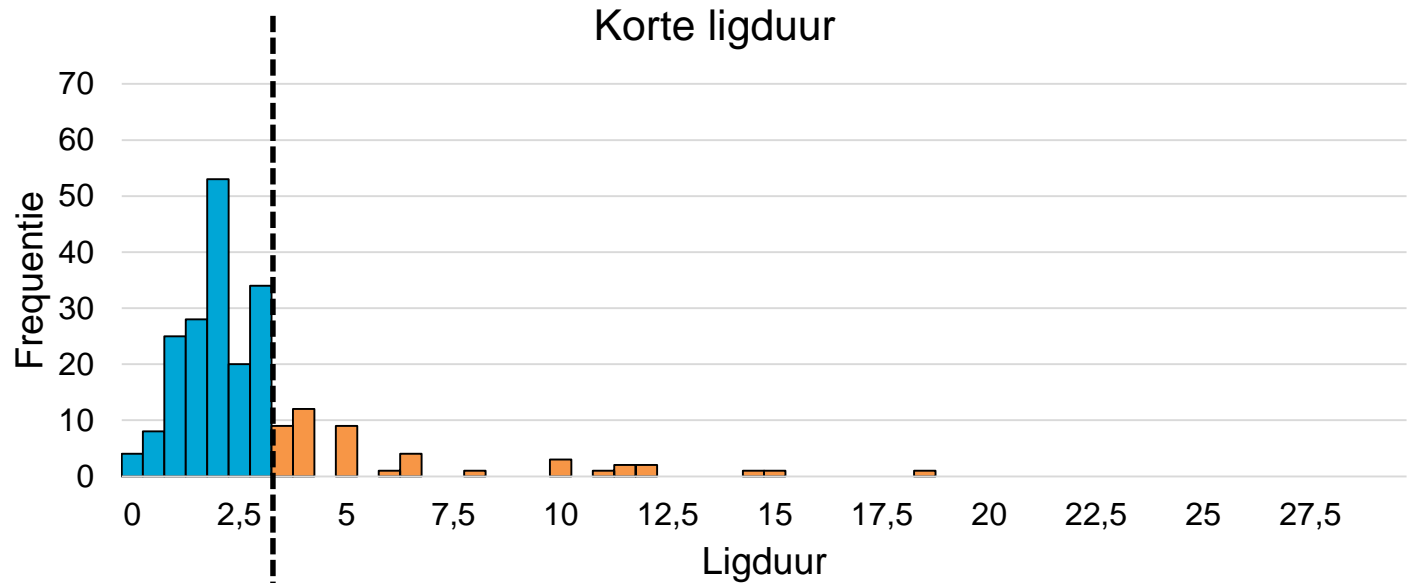
# Operaties clusteren



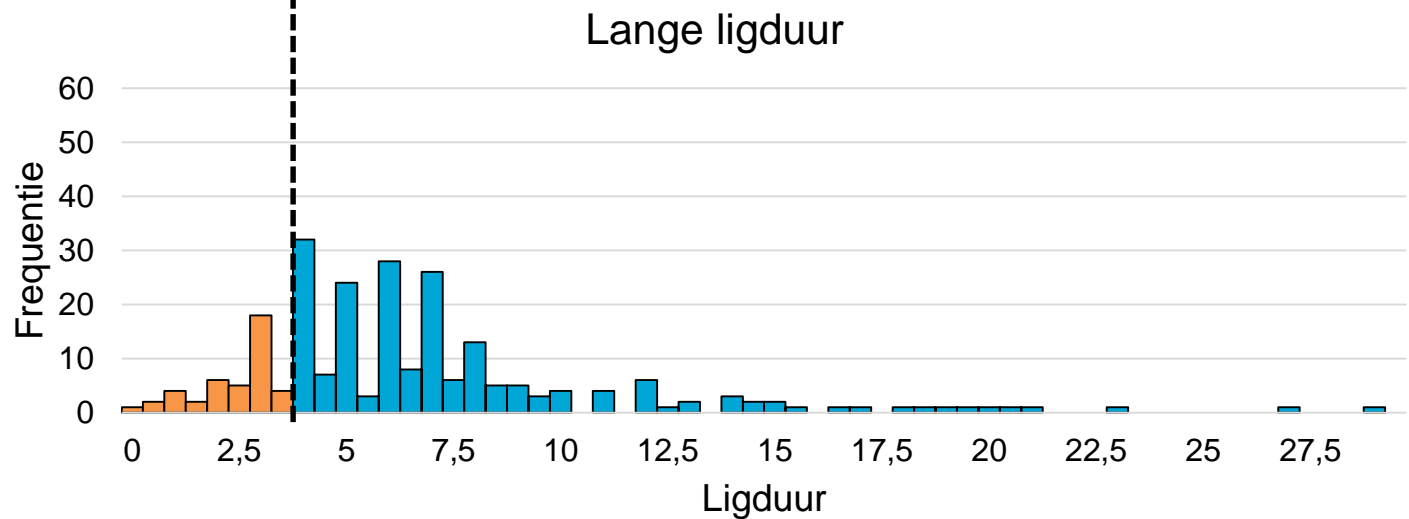
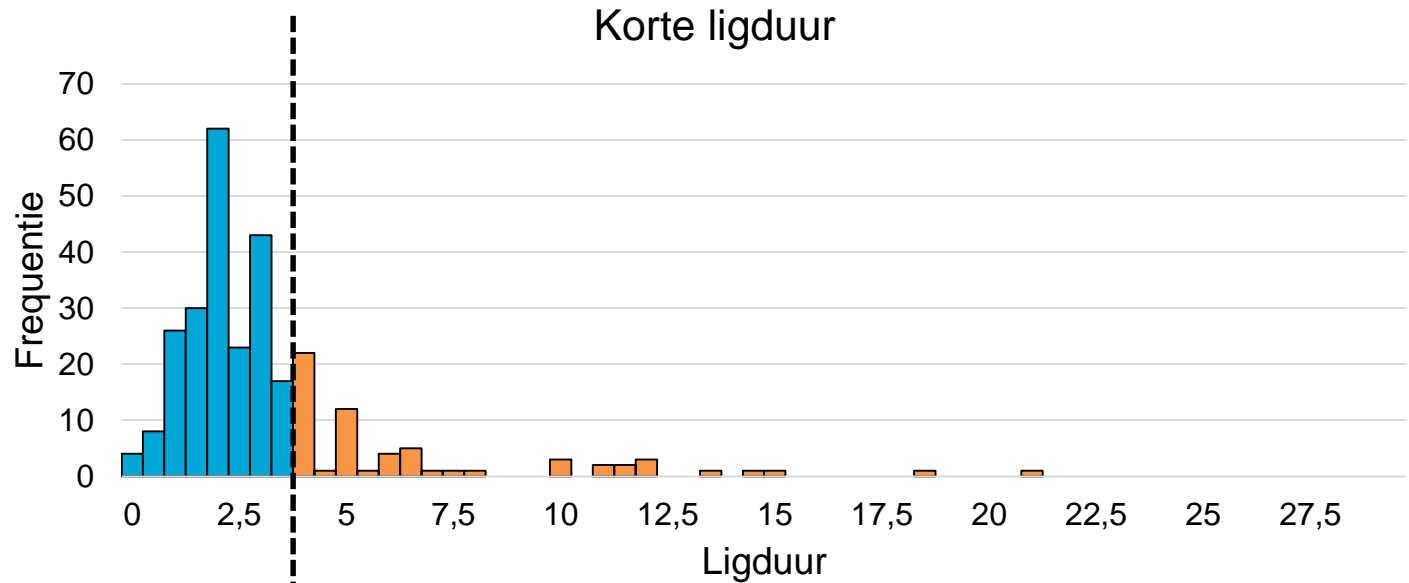
# Operaties clusteren



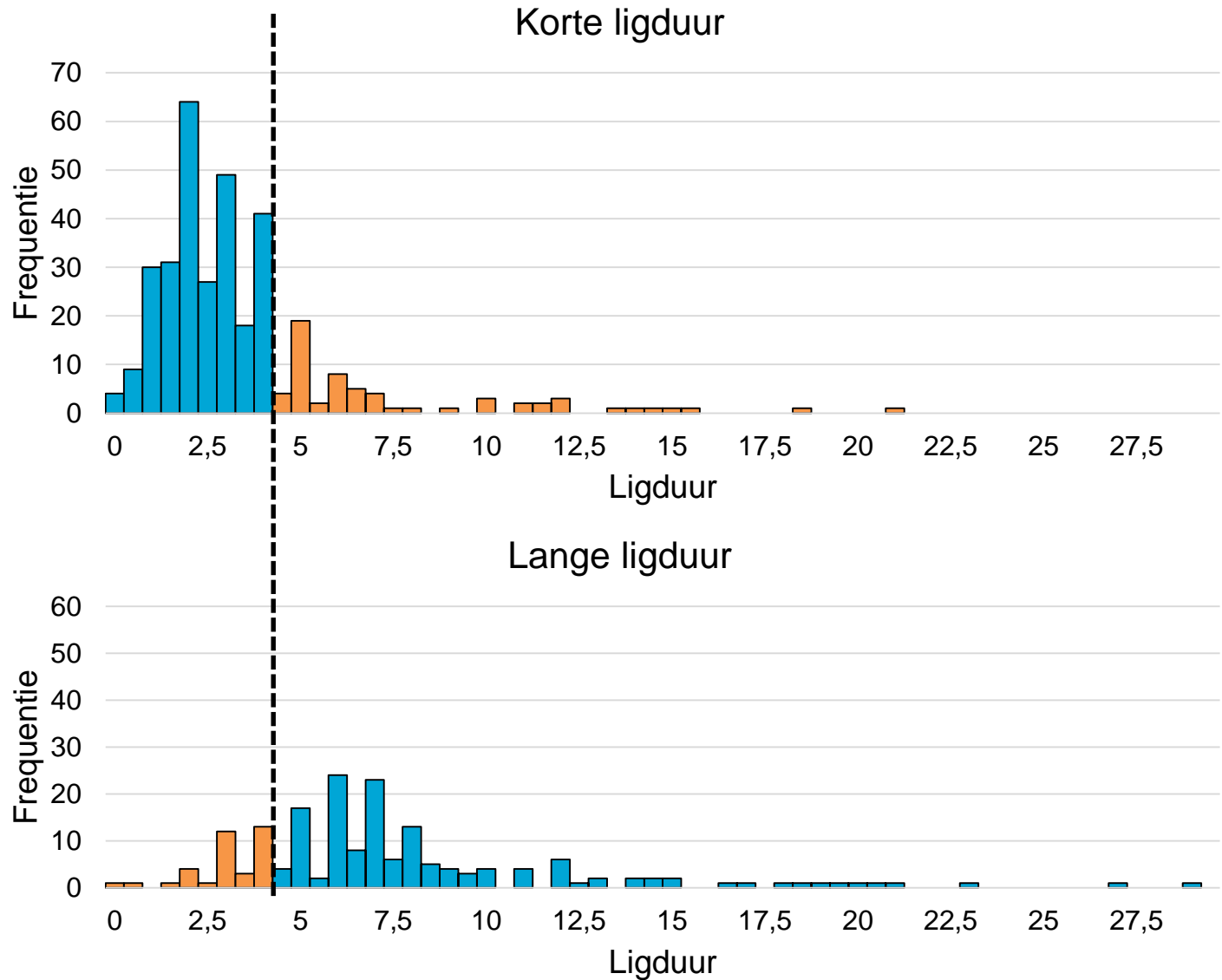
# Operaties clusteren



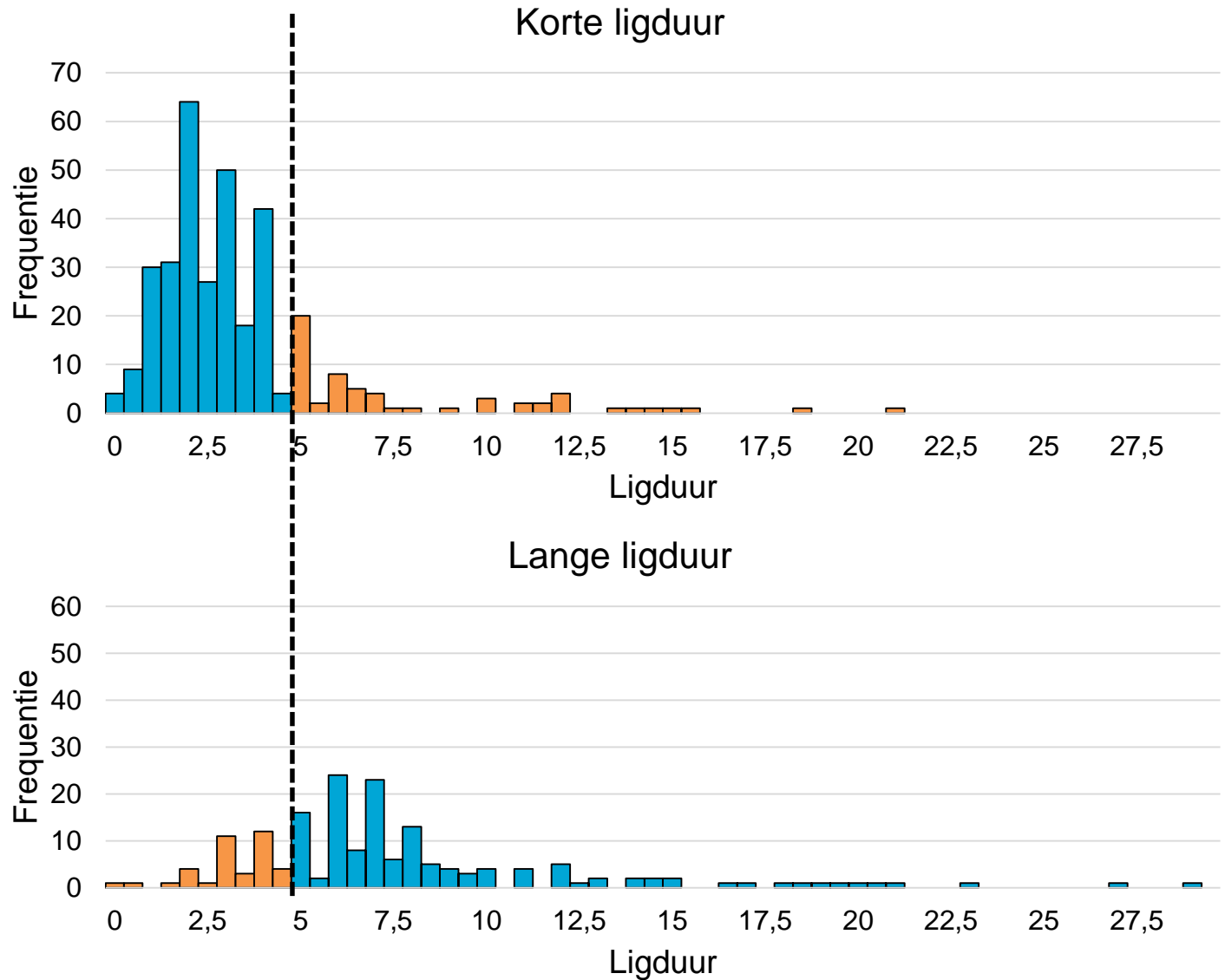
# Operaties clusteren



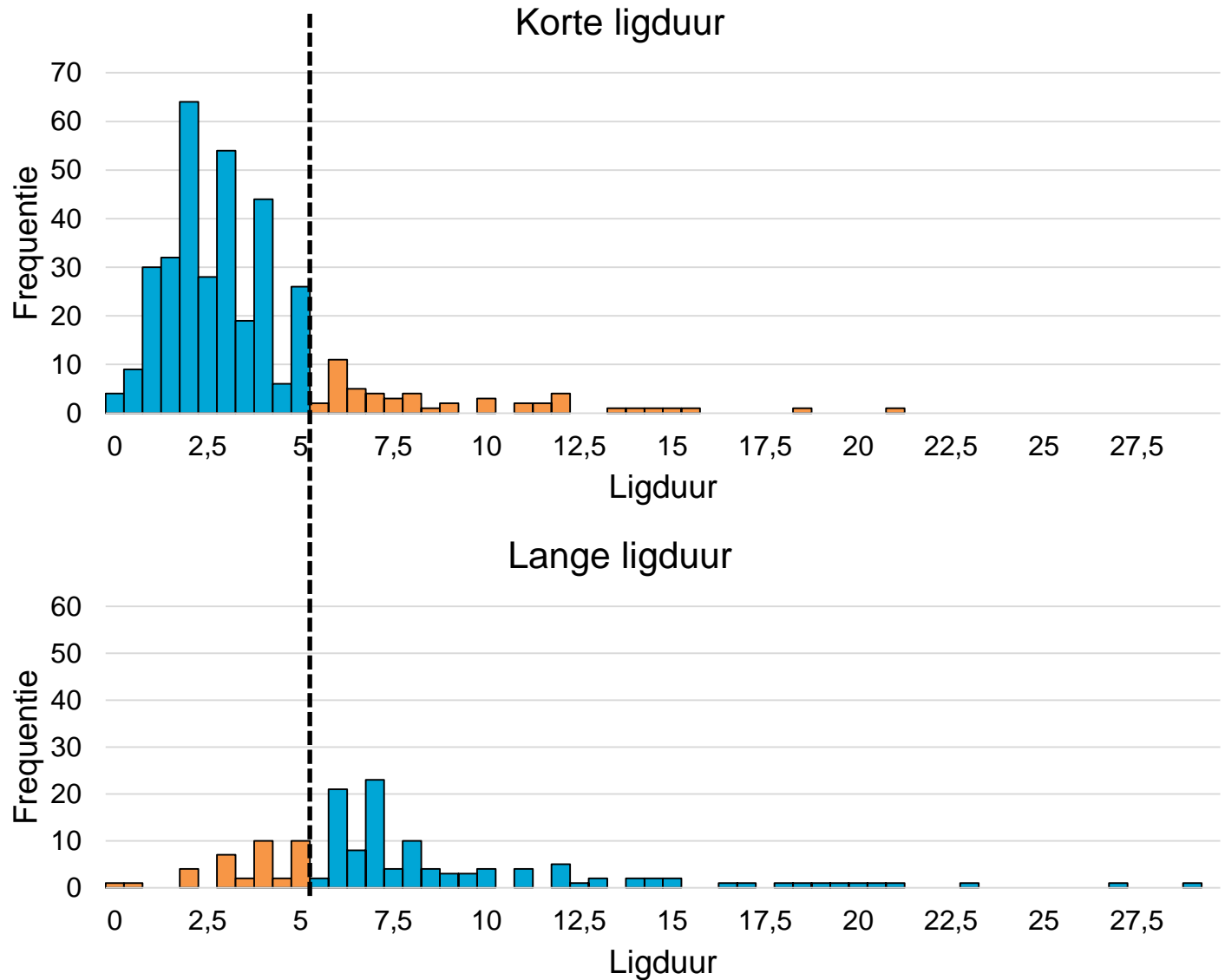
# Operaties clusteren



# Operaties clusteren

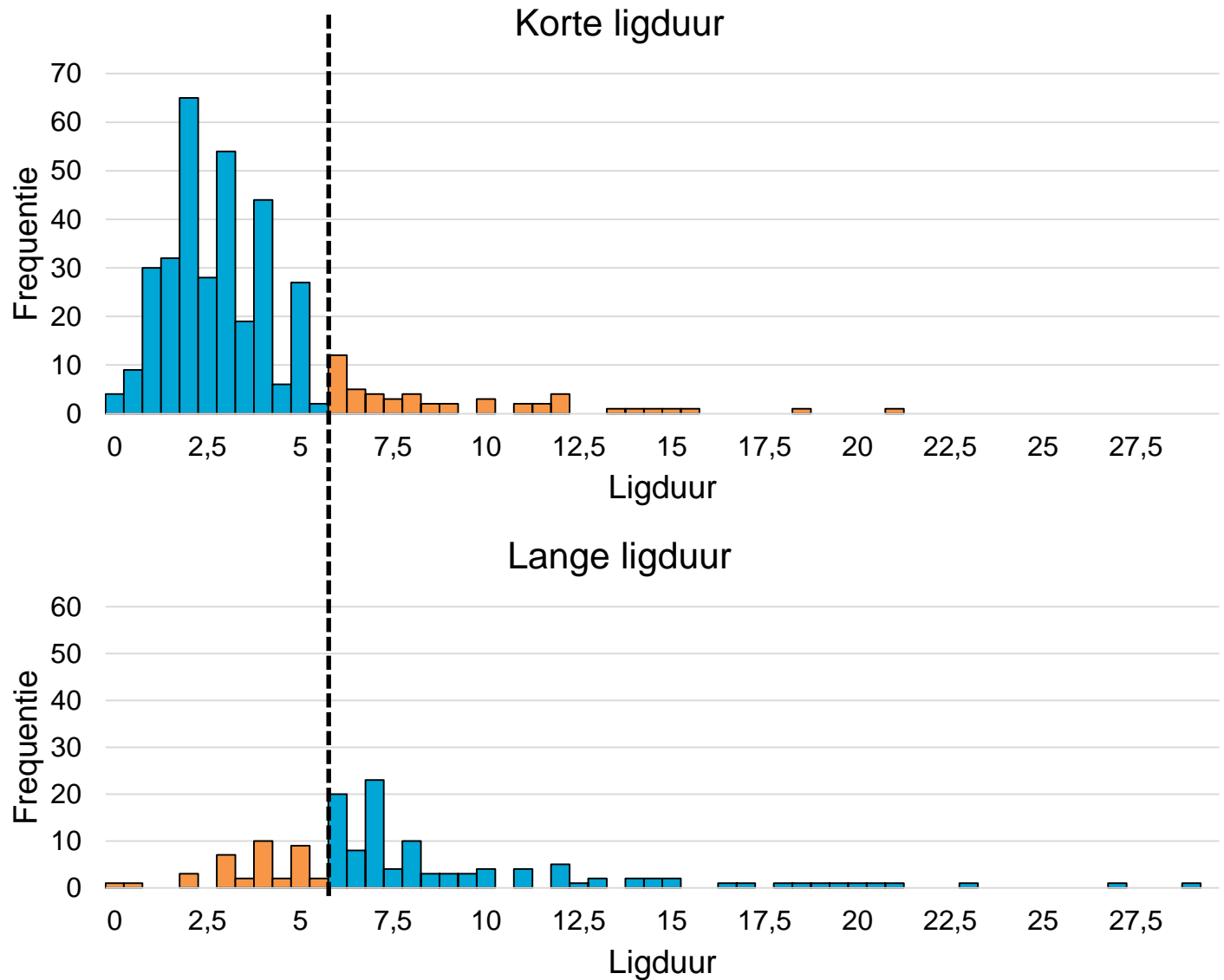


# Operaties clusteren

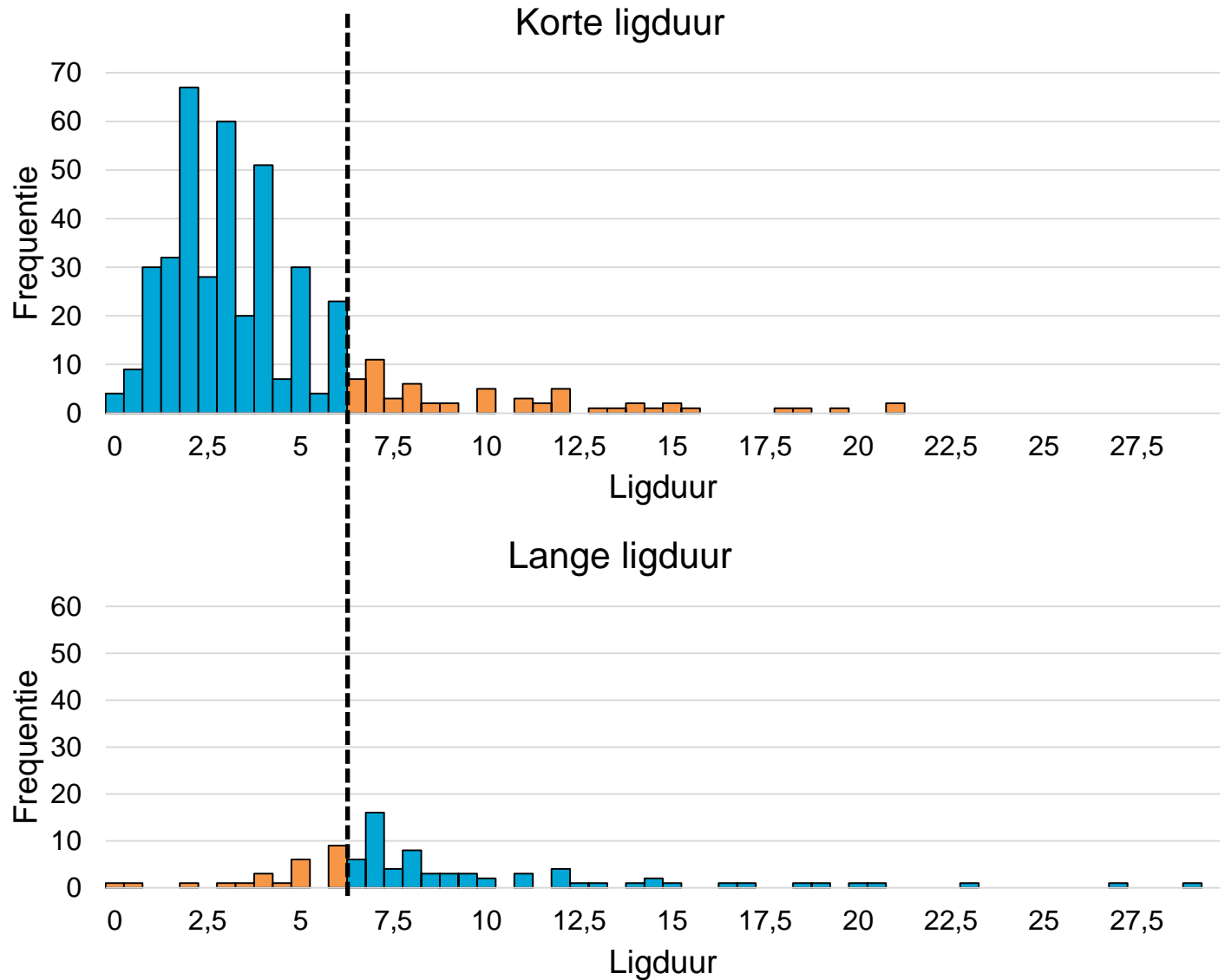




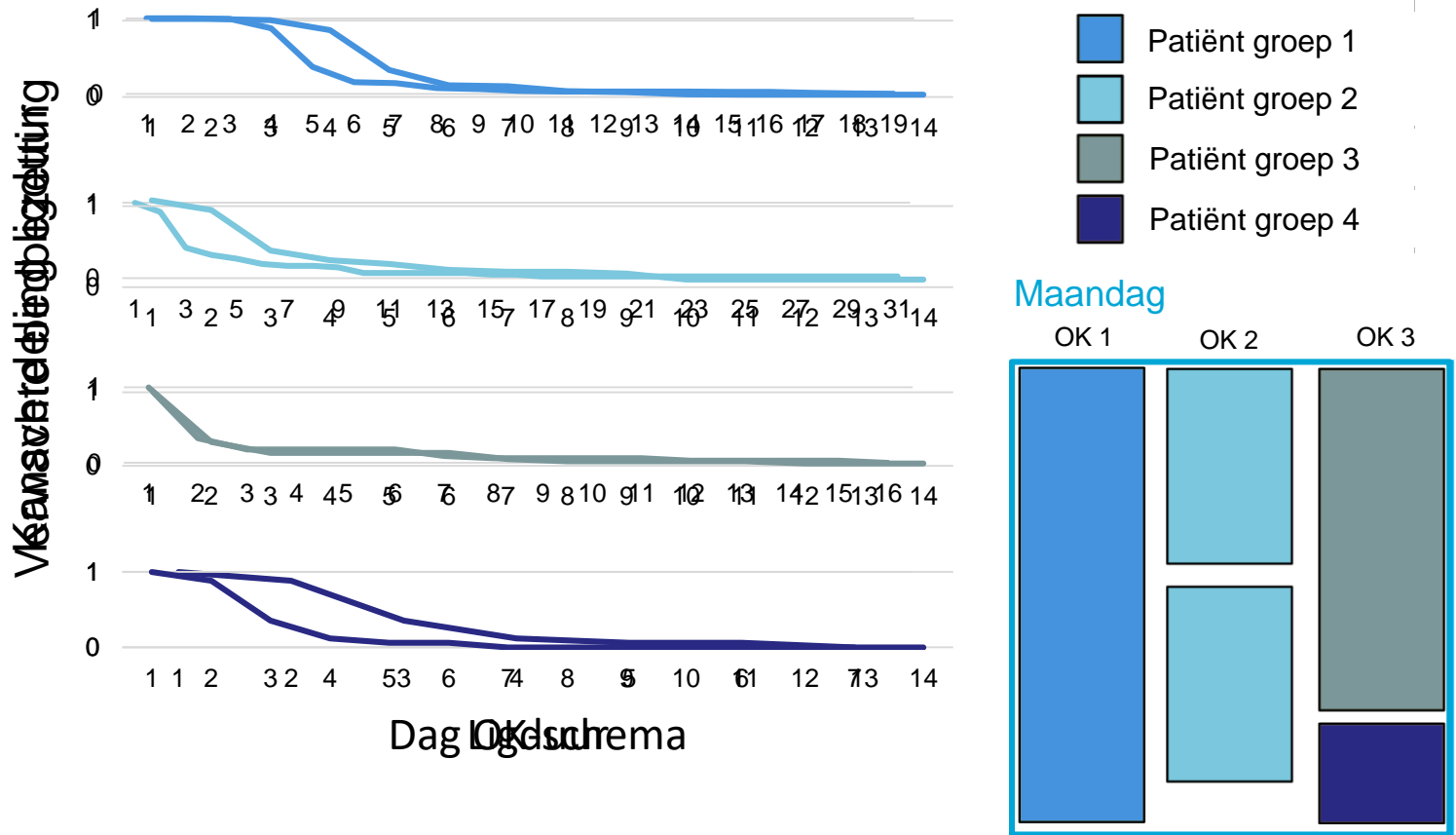
# Operaties clusteren



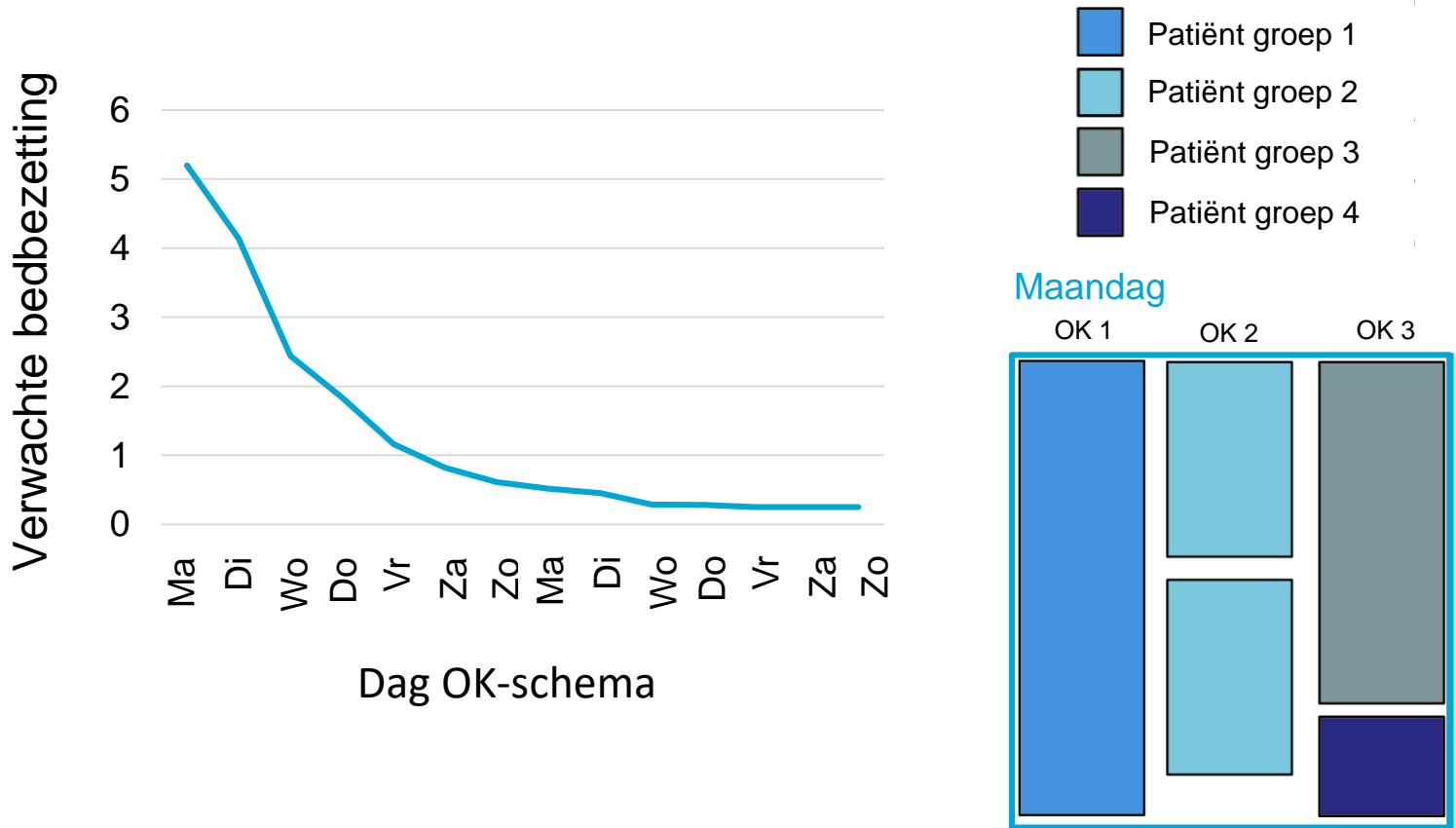
# Operaties clusteren



# Verdeling ligduur operatiegroep



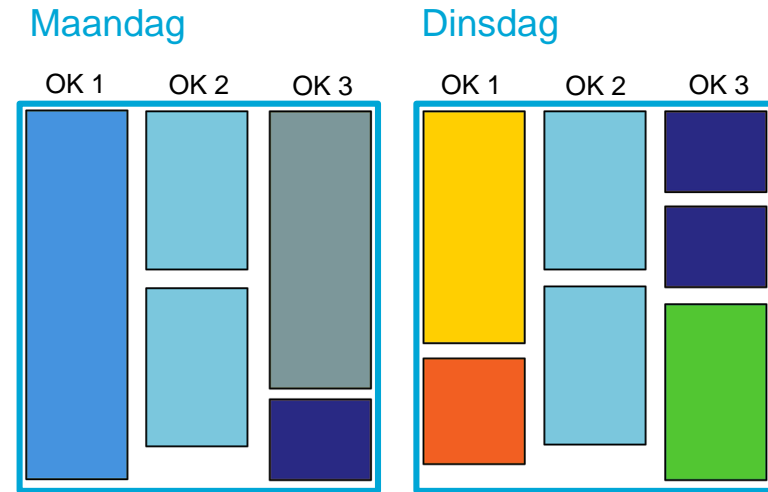
# Verdeling ligduur operatiegroep



# Operatiegroepen plannen

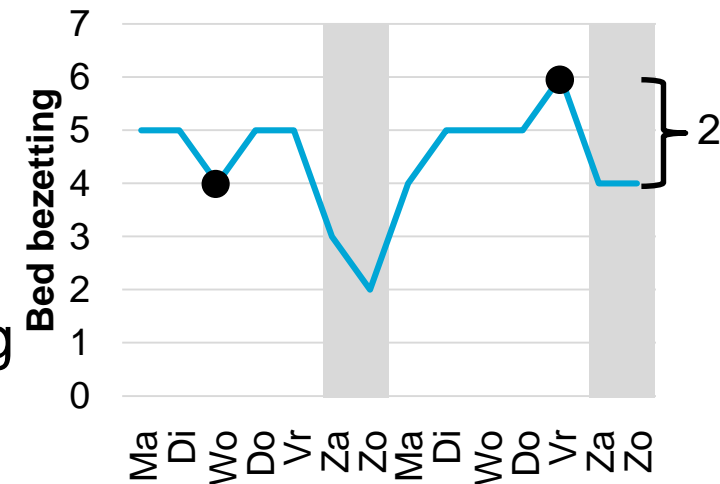
## Restricties

- Operatiegroepen alleen plannen op dag van eigen specialisme
- Beschikbare OK-tijd
- Ondergrens op aantal geplande operaties per operatiegroep



## Doelfunctie

- Maximaliseer OK benutting
- Minimaliseer variatie doordeweekse bedbezetting



# Oplosmethoden

- NP-hard probleem → optimale oplossing kan niet binnen een redelijke tijd gevonden worden

## LUMC data

- 6 operatiegroepen per specialisme
  - 4 operaties per OK-dag
- 126 mogelijkheden per OK-dag

# Oplosmethoden

- NP-hard probleem → optimale oplossing kan niet binnen een redelijke tijd gevonden worden

## LUMC data

- 20 OK's
  - Tweewekelijks OK-schema
- $126^{20 \cdot 10}$  mogelijke oplossingen

$126^{200} = 1,186,066,456,075,785,231,044,725,046,030,210,717,895,514,169,536,441,923,328,151,583,267,902,127,582,509,299,604,196,146,929,090,986,186,397,643,800,316,664,730,620,281,634,197,930,048,861,799,828,756,857,927,749,037,541,213,502,742,225,059,834,042,948,550,508,783,558,957,474,850,441,423,091,982,648,259,673,418,030,678,045,851,519,146,703,185,713,509,942,836,542,575,281,917,682,755,170,781,955,380,401,548,465,792,426,756,157,212,610,271,717,118,062,210,386,022,594,645,130,832,265,782,279,348,388,161,416,181,069,790,155,680,826,150,918,067,281,121,509,376$

# Oplosmethoden

- NP-hard probleem → optimale oplossing kan niet binnen een redelijke tijd gevonden worden
- 2 methoden om optimale oplossing te benaderen

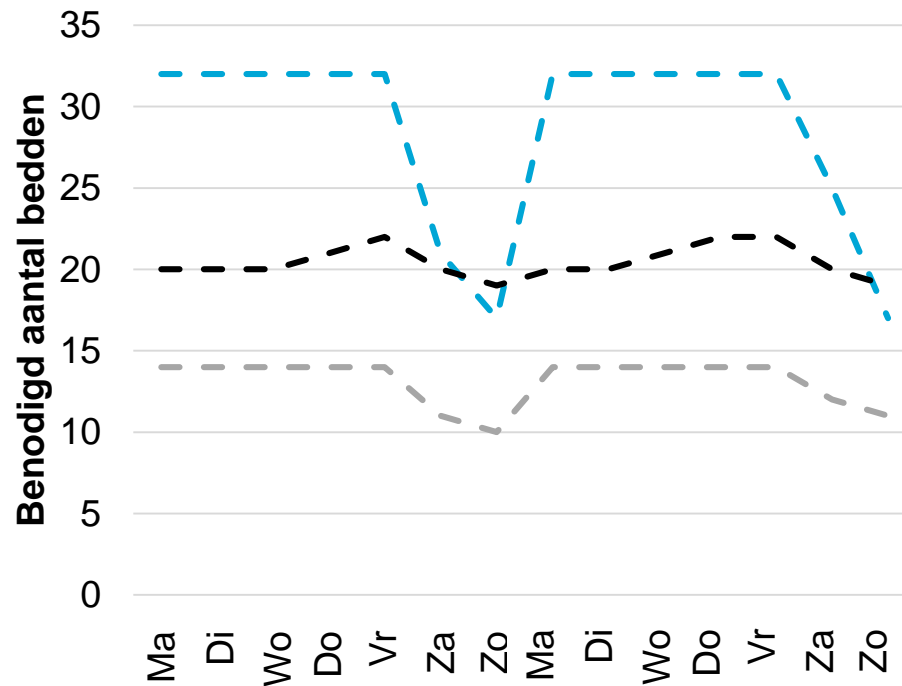


# Data - LUMC

- 20 OK's
- 11 chirurgische specialismen  
→ 62 operatiegroepen
- 14 verpleegafdelingen (inclusief IC)
- Tweewekelijks OK-schema
- Historische data 2015 – 2016

# Resultaten

- OK bezetting 73% → 84%
- OK overtijd 32% → 5%
- Variatie bedbezetting 53 → 12



# Resultaten – zonder blokplanning

	<b>Met blokplanning</b>	<b>Zonder blokplanning</b>
<b>Doelfunctiewaarde</b>	41778	41847
<b>OK benutting</b>	84%	87.5%
<b>Aantal bedden</b>	152	162
<b>Variatie bedbezetting</b>	12	16
<b>Rekentijd</b>	1,5 uur	6 uur

# Vergelijking model HagaZiekenhuis

- Data HagaZiekenhuis
- 43 operatiegroepen orthopedie afdeling

	<b>Model Haga</b>	<b>Model LUMC</b>
<b>OK benutting</b>	91%	89.6%
<b>Aantal bedden</b>	45	39
<b>Rekentijd</b>	< 1 minuut	1,5 uur

# Conclusie

- Hogere OK benutting
- Lagere OK overtijd
- Lagere variatie in bedbezetting  
→ minder operaties herpland

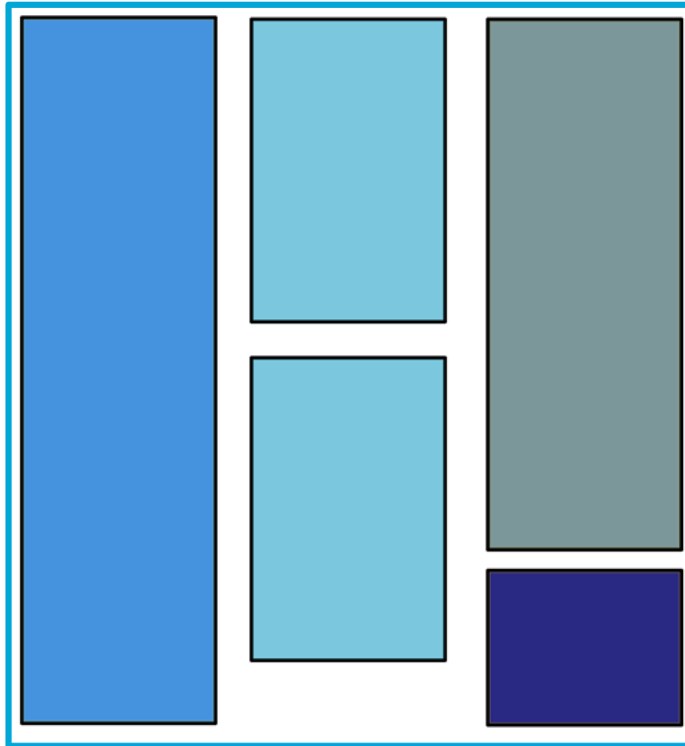
# Vragen?

Maandag

OK 1

OK 2

OK 3



Dinsdag

OK 1

OK 2

OK 3

