Rijksinstituut voor Volksgezondheid
en Milieu
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# Bijlage bij rapport 2023-0470

# Inhoudsopgave



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# Bijlage A: Beschrijving van de onderzoeksmethoden van rapport Vijf jaar integrale bekostiging van de geboortezorg: effecten op zorggebruik, gezondheidsuitkomsten en zorguitgaven (in English)

To evaluate the effects of the experiment with bundled payments for maternity care based on longitudinal observational data, we employ a statistical design that mimics a setup for a realistic randomized experiment as closely as possible. This setup involves randomizing the treatment on Maternity Care Network (MCN) level and pregnancy level: for a given pair of MCNs that are similar in terms of MCN characteristics, one MCN would be randomly assigned eligibility for the treatment. If the pregnancies within this pair of MCNs are dissimilar in terms of pregnancy characteristics, only those pregnancies in the MCN with eligibility will be selected for treatment if they have similar counterparts in the corresponding MCN without eligibility. This setup is realistic in the sense that in real life the bundled payment adoption is at the MCN level, rather on an individual level.

Our approach is based on the use of MCN data that take the form of repeated cross-sections. This implies that, if we exclusively focus on first-time mothers, in each year a 'cohort' of new women give birth and are registered in our data, and that any statistical comparison that follows will involve the comparison of different cohorts of mothers at different points of time. We focus on first-time mothers to ensure independently distributed observations.

More specifically, we evaluate the effects of the bundled payment model using the Difference-in-Differences approach (DiD; see Lechner, 2011). That is, we estimate the differences in outcome between the treated and control individuals both in the period prior to the implementation of the bundled payment model (2015) and in the period after implementation (from 2018 onwards), and then evaluate the difference in these differences. This approach is attractive, because it can take into account any autonomous longitudinal trends in the cohorts of women over time.

In trying to mimic the setup for randomized experiment, we use k-means clustering to determine which MCNs are similar to each other. Generalized Linear Models are then used within each stratum to estimate a stratum-specific DiD in the form of a regression coefficient (one model for each outcome of interest). We consider this regression coefficient as the treatment effect in that stratum. Using some standard rules for variance, we can pool the stratum-specific regression coefficient to an overall coefficient with corresponding standard errors. Because the stratification leads to some MCNs not being included in the analysis (because of their lack of similarity to other MCNs in our dataset), the overall coefficient in principle represents an *Average Treatment Effect for the Treated (ATT)*. Because the coefficients are defined on a non-linear GLM scale and are not straightforwardly interpretable in terms of effect size, we transformed these coefficients to the original scale of the outcomes through bootstrapping.

In order for the estimate to correctly represent an ATT, the following three assumptions need to be plausible:

- The strong ignorability assumption (Rosenbaum, 1983; Stuart, 2010), which implies that conditional on the observed covariates the treatment assignment is as good as random;
- The parallel trends assumptions the key identifying assumption in a DiD-setting (Angrist, 2009): the treatment and control groups need to largely show similar trends prior to the intervention;
- The no-anticipation effect, which states there must no effect on the outcome purely caused by anticipation of the treatment.

We will discuss the plausibility of these assumptions in detail. We use a combination of reasoning, visual and statistical checks to evaluate the plausibility each assumption for each outcome, and conclude whether the plausibility is high enough for the analysis to have a meaningful interpretation.

The following content will be organized with two sections. Section one elaborates our methodology in the main analysis with four subsections (1.1 – 1.4). Section 1.1 describes the approach used to form clusters of MCNs that are part of our matching design Section 1.2 deals with the plausibility of the assumptions needed for our design. Section 1.3 describes the identification of the individual-level covariates used to check the assumptions. Finally,  section 1.4 elaborates on the approach to estimate treatment effect. Section 2 discusses the details of our sensitivity analysis.

# 1 Main analysis

## 1.1 Clustering of MCNs

In non-experimental studies, which is our case, we need to posit an assignment mechanism to determine which individuals (MCN in our project) receive treatment and which receive control. A key assumption in non-experimental studies is that strong ignorability, which assumes that there are no (strong) unobserved differences between the treatment and control groups that could influence both treatment assignment and the outcome of interest, conditional on the observed covariates. Therefore, it is important to include in the matching procedure all variables known to be related to both treatment assignment and the outcome (Stuart, 2010). We hypothesize that that the level of collaboration between disciplines in maternity care (i.e. gynaecologists, midwifes, postpartum care professionals) affects the (baseline) quality of maternal care and is therefore strongly correlated to both the outcomes and the treatment assignment. In addition, it is known that the level of collaboration in the treatment group is high and the level of collaboration in the control group varies widely, and this can have a strong effect on the outcomes under study. We thus argue that comparing MCNs with similar levels of collaboration will increase the plausibility of the strong ignorability assumption.

Because there is no nationwide, quantitative measure available (yet) of the level of collaboration in each MCN, we depend on observable characteristics as proxies for the level of collaboration in maternity care. We selected the average urbanization degree (as measured by the Dutch census (Degree of urbanisation, 2023)) and total number of pregnancies served during 2013-2016 as proxies for the level of collaboration. The reasoning behind this is that collaboration is more difficult in either very highly dense or rural areas because of a multitude of different organization with each their own interests or a large distance between the organizations and few pregnancies served respectively. As for the number of pregnancies served during 2013-2016, this gives an indication of the level of professionalization and coordination in an organization or region and the need for a higher level of collaboration. In this subsection, we will describe how we use k-means clustering to come to a clustering of MCNs based on the urbanization degree and number of pregnancies served during 2013-2016 (as proxies of the level of collaboration). Two sensitivity analyses with alternative control groups were performed to test the robustness of this choice of clustering. We elaborate on this in Section 2.

Preprocessing
Prior to forming clusters of MCNs, we excluded a total of 17 MCNs from our dataset:

- Two of these MCNs exhibited strong volatility in the annual recorded number of pregnancies. More specifically, they showed strong declines in certain years that were not line with the number of births as recorded by the Dutch Municipality Register ( Dutch abbrevaiation: BRP) from the Dutch census, and were therefore considered unreliable;

- We opted to exclude ten MCNs that specifically deal with complicated pregnancies. These include MCNs that have a Neonatal Intensive Care Unit (NICU) or have affiliations with universities (academic Hospitals);
- Two MCNs were excluded because they merged during the observation period in which our dataset falls, as the merger itself can have unpredictable effects on the outcome.
- Three MCNs were excluded because they adopted Bundle Payment at a later stage (that is, after the official introduction in 2017).

In appendix B, there is a flow chart visualizing our processing procedure. With these exclusions, 55 MCNs were kept in our dataset.

K-means clustering
One way to form clusters of MCNs is to manually define bins or intervals for urbanization degree and number of pregnancies, but choosing these bins is not straightforward and perhaps even arbitrary to some extent. Instead, we used a data-driven approach based on K-means clustering to form clusters of MCNs. K-means clustering is a simple and elegant algorithm for partitioning a data set into K distinct, non-overlapping clusters (James, 2021). The algorithm attempts to make partitions such that the differences between instances within clusters are as small as possible, and simultaneously, the differences between (the means of the) clusters are as large as possible.

Two aspects are crucial for K-means clustering: distance definition and choice of number of clusters. To define a distance, two elements are needed: a measure of distance, and the covariates based on which the distance will be measured. Squared Euclidean Distance was used as the distance measure, since it is by far the most common choice (James, 2021). As mentioned before, we chose two covariates to form the clusters: average urbanization degree and total number of pregnancy in 2013-2016 (four years). For purposes of the distance, however, we divide them their respective standard deviation to ensure both covariates have similar scale.

To make the choice of number of clusters, we checked the following three aspects: within-cluster variation, the number of controls that belong to the same clusters as the six MCNs that implemented the bundle payment model in 2017, and the Standard Mean Difference between control and treatment. As a result, we find that these three aspects are quite comparable when cluster number set to 15, 16, and 17. These three parameter setting lead to the same clustering results. We chose 16 in the end.

As a result of this choice, in the main analysis, the six MCNs that implemented bundled payment were assigned to six different clusters. In addition, these six clusters contains 20 control MCNs. Figure 1 visualizes the clustering results.

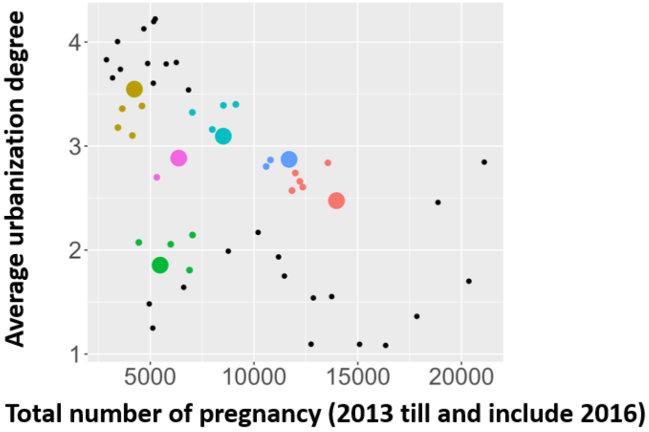


*Figure 1 K-means clustering results (one MCN was removed to be compliant with CBS exporting rules because this MCN has less than 10 records). The size of the data point represents treatment status. Big size corresponds to a MCN adopted bundled payment, i.e. treatment. Colored MCNs are either treatment MCN or a control MCN matched with one treatment MCN.*

## 1.2 Checking of relevant assumptions

Before effect estimation, we closely investigated the plausibility of several assumptions.

### *1.2.1 Strong ignorability assumption*

We discussed the definition of ignorability assumption in the previous section. To eliminate differences between control and treatment group, we need to match on the covariates that influence both the assignment and the outcomes. As discussed before, we argue that there are two levels of such covariates: on MCN level and on individual level. Covariates shall be matched on both levels to increase the plausibility of the strong ignorability assumption. We already discussed how on MCN level matching was performed in section 1.1., whereas the individual level matching will be discussed in Section 1.3.

### *1.2.2 Parallel-trend assumption and no-anticipation assumption*

In the coming section, we discuss how the parallel assumption and no anticipation on the pre-treatment population were checked. We conclude that there is violation of PT and there is anticipation effect for some of the outcomes.

#### 1.2.2.1 Parallel trends assumption

Making a decision about parallel trends assumption remains challenging. Lechner defines parallel trend as (Lechner, 2011):

$$\mathbb{E}(Y_1^0|X = x, G = 1) - \mathbb{E}(Y_0^0|X = x, G = 1) \\ = \mathbb{E}(Y_1^0|X = x, D = 0) - \mathbb{E}(Y_0^0|X = x, G = 0)$$

where $Y_T^G$ represents a *potential* outcome with $G \in \{0, 1\}$ corresponding to control and treatment group and $T \in \{0, 1\}$ corresponding to pre- and post-intervention period. However, $\mathbb{E}(Y_1^0|X = x, G = 1)$ being unobservable makes justifying parallel trend assumption impossible.

Despite the impossibility, parallel trends test is still used by many researchers to justify parallel trend assumption. Nevertheless, this approach can be incorrect and frequently misleading. One disadvantage of such test is that model assumption tests are oriented toward statistical, rather than practical, significance (Bilinski, 2018).

To check parallel trend assumption, we built a model. For a binary outcome, the model has the form of:

$$Y_{g,j} \sim Bern(p)$$
$$logit\left(\mathbb{E}\left[Y_{g,j}\right]\right) = \alpha_g + \beta_j + \gamma \cdot G \cdot J$$

For a continuous outcome, i.e. maternity care spending, the model has the form of:

$$Y_{g,j} \sim \Gamma(\mu, \nu)$$
$$log\ (\mathbb{E}\left[Y_{g,j}\right]) = \alpha_g + \beta_j + \gamma \cdot G \cdot J$$

where $G \in \{treatment, control\}$ and $J \in \{2008, 2009, \dots 2016\}$[1]. $\alpha_g$ represents a group-specific (but time-invariant) effect. $\beta_j$ represents a time/year-specific (but group-invariant) effect[2]. How $\gamma$ changes during the pre-intervention period were examined.

#### 1.2.2.2 No anticipation on the pre-treatment population

No anticipation assumption states that future treatment does not affect potential outcomes or the treatment has no causal effect prior to its implementation (Zeldow & Hatfield, 2021; Roth, 2023). When visually checking outcomes on crude level, for part of the outcomes, we concluded that treatment group and control underwent unequal change comparing 2015 and 2016. As a result, for the binary outcomes, we chose 2015 as the reference year to evaluate effects.

## 1.3 Confounders identification

To be further compliant with ignorability assumption, 18 plausible confounders were selected on individual level[3]. A data-driven method was implemented to confirm their confounding effects, whereas on MCN level, we assumed directly the influence of averaged urbanization degree and total number of pregnancy. Meanwhile, we argue that all the outcomes share the same 18 plausible confounders. This means that we consider all outcomes simultaneously, rather than customizing the modeling for one outcome at a time. This treat-all-the-same method gains efficiency. Nevertheless, by doing so, we implicitly assume that there is no interaction among outcomes.

We performed a two-step data-driven method to identify confounders. In step one, among the selected plausible confounders, we selected out

[1] For maternity care spending, this is checked up to four year before 2017: 2013, 2014, 2015, and 2016.
[2] We shall not confuse the use of "fixed effects": It represent an unobserved effect to control for some types of unmeasured confounders. Its usage is very different than in that of the statistical literature (Gunasekara, 2014).
[3] The selected potential confounders are: urbanization, healthcare expenditures of the father 2 years prior delivery, distance to hospital, age of mother during delivery, age of father during delivery, healthcare expenditures of the mother 2 years prior delivery, level of education of the mother, household income, level of education of the father, household size, medication use of the father, gravidity, migration background of the father, migration background of the mother, medication use of the mother, type of household, sex of the infant, debts or defaulters of the parents.

the covariates that demonstrated a changing $\Delta_j = x_{treatment,j} - x_{control,j}$ over year $j \in \{2013, 2014, 2015, 2016\}$. These selected covariates will be denoted as $\mathcal{B}_{selected}$, which is a subset of the 18 selected plausible covariates. In step two, we performed standardization using $\mathcal{B}_{selected}$. In the following content, we elaborate our motivation and details about these two steps.

Covariates that differ by treatment group and are associated with outcome *trends* are confounders in DiD. (Zeldow & Hatfield, 2021). Under the assumption that their influence, if any, on the outcome is time-invariant, we first investigated the trend of each of the selected 18 covariates. As a result, in the main analysis, five covariates, namely $\mathcal{B}_{selected}$, were identified as showing a time-varying treatment-control difference (changing $\Delta_j$ over year $j \in \{2013, 2014, 2015, 2016\}$)[4]. $\mathcal{B}_{selected}$ will be used to form strata in the standardization step.

Standardization typically reweights the stratum-specific rates so that exposure categories become comparable (Keiding, 2014). In this project, we performed standardization to confirm $\mathcal{B}_{selected}$'s influence on the outcomes. In detail, a reference year ($t'_{ref}$) was chosen. In year $t'_{ref}$, in both control and treatment group, $V_c$ (for control) and $V_t$ (for treatment) strata were formed with $\mathcal{B}_{selected}$ in the previous step. Each stratum has a weight, denoted by $w_{s_c}$ for control group and $w_{s_t}$ for treatment group. The weight is calculated by $w_{s_c} = n_{s_c} / \sum_{s_c=1}^{V_c} n_{s_c}$, $n_{s_c}$ representing the number of birth that belongs to the stratum $s_c$. For a continuous outcome from the control group, the standardized outcomes were calculated using the following equation

$$y_{std} = \sum_{s_c=1}^{V_c} w_{s_c} \times \frac{1}{n_{s_c}} \times \sum_{k \in s_c} y_k$$ [5]

For a binary outcome in the control group, the following equation was used:

$$y_{std} = \sum_{s_c=1}^{V_c} w_{s_c} \times \log\left(\frac{\sum_{k \in s_c} \mathbf{1}_{[y_k==1]}}{\sum_{k \in s_c} \mathbf{1}_{[y_k==0]}}\right)$$

Comparing the results of standardization and the crude-level calculation, no convincing confounders were found. Thus, no confounder was taken into consideration in the modeling step.

## 1.4 Estimation of treatment effect

In this section, we will elaborate how treatment effect is calculated. We study the treatment effect on the latent space. Thus, coefficients from the model were reported. This is still meaningful since our transformations are strictly monotonic increasing function (Puhani,

[4] In the main analysis, these five covariates are distance to hospital, medical spending of the mother 2 years prior delivery, medical spending of the father 2 years prior delivery, age of mum during delivery, and age of father during delivery.
[5] Replacing $c$ with $t$ corresponds to the formula for treatment group.

2012). Moreover, we performed bootstrapping, preserving the k-means results, to recover the treatment effect back to the original space.

### 1.4.1 *Study population*

Some additional selection of observations was done to make estimation of the treatment effect possible.

- Only first-time mothers with singleton pregnancies were included, as this removes correlations between data points (which may occur when mothers have multiple pregnancies during the observation period, or when they give birth to twins or triplets). Removing correlations justifies the independent and identically distributed assumption and thus the use of GLM. This process was illustrated in the flowchart.
- Pregnancies that ended prematurely (under 24 weeks) were excluded. This is a standard analysis step. In addition, this filtering ensures the data quality that the registration is complete.
- For models pertaining to health care cost-related outcomes, observations with zero costs were omitted, for technical limitations related to our choice of model (GLM under Gamma family). These observations were rare, however (<<1% of all observations).

### 1.4.2 *Estimation Strategy*

In this project, a basic 2 × 2 design was implemented for DiD modeling. It is the simplest form of DiD. It involves a single treatment, two discrete periods (pre- and post-treatment), and two groups: treatment group and control group. The treatment effect on the outcome of interest can be estimated empirically by comparing the change in the average outcome in the treated units to the change in the average outcome in the control units.

Regression model was implemented for it has two benefits. First, it is easy to include covariates. Second, it provides the standard error for the estimates. More specifically, Generalized Linear Model (GLM) was used. It is worthwhile to mention that with GLM, the coefficients does not represent the treatment effect on the original scale. We address this problem via bootstrapping. Section 1.4.3 gives more details.

#### 1.4.2.1 Equations

In the main analysis, the estimation was calculated within each of the six clusters. With the assumption that these clusters are independent from each other, the results were pooled across the six clusters to form our final results. Specifically, in each cluster $c$, the following models are used for binary outcomes and continuous outcomes, with $G \in \{treatment, control\}$ and $T \in \{pre-intervention, post-intervention\}$ in the main analysis:

$$Y_c \sim Bern(p_c)$$

$$logit\big(\mathbb{E}(Y_c = 1)\big) = \beta_{intercept,c} + \beta_{t,c} \times T + \beta_{g,c} \times G + \beta_{did,c} \times T \times G$$

$$Y_c \sim \Gamma(\mu_c, \nu_c)^6$$

[6] This notation follows the notation in Generalized Linear Model (McCullagh, 1989)

$$\log(\mathbb{E}(Y_c)) = \beta_{intercept,c} + \beta_{t,c} \times T + \beta_{g,c} \times G + \beta_{did,c} \times T \times G$$

For a binary outcome, the choice of Bernoulli distribution is straightforward. Link function is set to be the canonical link function of Binominal distribution because logit link function relates to odds ratio. In other words, we implemented a logistic regression for the estimation.

For expenditure outcomes, i.e., the outcomes from Vektis, we checked the relation between mean and variance, grouped by the combination of, cluster, $G$, and $T$, the distribution, and the zero compositions. In result, we decided to only focus on total spending. There are two reasons. First, it is the most important one. Second, total spending does not show multi-mode distribution and shows a mean-variance relationship that closely follows that of a Gamma family GLM and can therefore be modelled relatively straightforwardly.

In the pooling step in the main analysis, we calculated the estimation and its variance $VAR$ using the following equations, where $N$ is the total number of available outcomes and $N_c$ is the number of available outcomes in cluster $c$.

$$\beta_{pool} = \sum_{c=1}^{6} \frac{N_c}{N} \beta_{did,c}$$ [7]

$$SE_{pool} = \sqrt{\sum_{c=1}^{6} (\frac{N_c}{N})^2 \times VAR_{did,c}}$$

Test statistics is calculated by $t_{pool} = \frac{\beta_{pool}}{SE_{pool}}$. To calculate p-value, we treated $t_{pool}$ as z-test statistic for binary outcomes and as Student's t-test statistic for continuous outcomes.

#### 1.4.2.2 Encoding

In our 2 x 2 setting, for a binary outcome, we encoded 2015 as our pre-intervention year, since we suspect an anticipation effect in 2016. For one outcome from Vektis, 2016 was encoded as pre-intervention year because 2015 data is not reliable. To encode post-intervention time, each year from 2018 onwards (till 2021 for binary outcomes; till 2020 for the Vektis outcome) were encoded as post-intervention time together.

### *1.4.3 Bootstrapping*

To transfer the coefficients to the original scale, bootstrap was used. Estimating an unknown parameter ($\tau$), two questions are of interests: what estimator should be used ($\hat{\tau}$)? Having chosen to use a particular $\hat{\tau}$, how accurate is it as an estimator of $\tau$? The bootstrap is a general methodology for answering the second question (Efron, 1986).

We denote the fundamental true treatment effect as $\tau$. In our project, corresponding to cluster-level and pooling-level truth, we need two

[7] In the main analysis, six clusters were formed. Thus, the summation is up to six.

notations: one on cluster level and one on pooling level. We use $\tau_c$ to denote the true treatment effect for a cluster $c$ and $\tau_{pool}$ as the true treatment effect on the pooling level.

We can perform estimation for the unknown fundamental truth. The estimation will always have a hat. We denote the sampled observed response, its covariates, and the assignment to a cluster as

$(\boldsymbol{y}_{obs}, \boldsymbol{x}_{obs}, \boldsymbol{c}_{obs})$. With $(\boldsymbol{y}_{obs}, \boldsymbol{x}_{obs}, \boldsymbol{c}_{obs})$, following our method, for a cluster, we estimate a treatment effect by $\hat{\tau}_c = sigmoid(\beta_{intercept,c} + \beta_{t,c} + \beta_{g,c} + \beta_{did,c}) - sigmoid(\beta_{intercept,c} + \beta_{t,c} + \beta_{g,c})$ or $\hat{\tau}_c = exp(\beta_{intercept,c} + \beta_{t,c} + \beta_{g,c} + \beta_{did,c}) - exp(\beta_{intercept,c} + \beta_{t,c} + \beta_{g,c})$. On pooling level, we have $\hat{\tau}_{pool} = sigmoid(\beta_{intercept,pool} + \beta_{t,pool} + \beta_{g,pool} + \beta_{did,pool}) - sigmoid(\beta_{intercept,pool} + \beta_{t,pool} + \beta_{g,pool})$ or $\hat{\tau}_{pool} = exp(\beta_{intercept,pool} + \beta_{t,pool} + \beta_{g,pool} + \beta_{did,pool}) - exp(\beta_{intercept,pool} + \beta_{t,pool} + \beta_{g,pool})$.

Using bootstrapping, we aim to answer the 2nd question, how accurate are these estimations, namely $\hat{\tau}_c$ and $\hat{\tau}_{pool}$. We decide to implement a non-parametric resampling plan. In detail, we

- sample cases $(\boldsymbol{y}_{obs}, \boldsymbol{x}_{obs}, \boldsymbol{c}_{obs})$ randomly with replacement to obtain a bootstrap data set, denoted as $(\boldsymbol{y}^*, \boldsymbol{x}^*, \boldsymbol{c}^*)$.
- calculate a new estimation of the treatment effect $\hat{\tau}_c^*$ on cluster level and $\hat{\tau}_{pool}^*$ on pooling level. Asterisk denotes a bootstrap result.

Repeat the above two steps, for $\boldsymbol{B}$ times, resulting a series of estimation $\hat{\tau}_{c,1}^*, \hat{\tau}_{c,2}^*, \dots \hat{\tau}_{c,B}^*$ and $\hat{\tau}_{pool,1}^*, \hat{\tau}_{pool,2}^*, \dots \hat{\tau}_{pool,B}^*$.

After resampling, non-studentized pivotal method is used. This method is also known as reverse percentile interval (Hesterberg, 2015). Even though this method can have substantial coverage error (Carpenter, 2000; Hesterberg, 2015), due to its simplicity, we decide to use it. In order to estimate $\hat{\delta}_c = \hat{\tau}_c - \tau_c$ and $\hat{\delta}_{pool} = \hat{\tau}_{pool} - \tau_{pool}$, we use the bootstrap results to calculate $\hat{\delta}_c^* = \hat{\tau}_c^* - \hat{\tau}_c$ and $\hat{\delta}_{pool}^* = \hat{\tau}_{pool}^* - \hat{\tau}_{pool}$. $Q_{\alpha,c}$ and $Q_{\alpha,pool}$ represent the $100 \cdot \alpha$ quantile of $\hat{\tau}_c^*$ and $\hat{\tau}_{pool}^*$correspondingly. We have the confidence interval as $(2 \cdot \hat{\tau}_c - Q_{1-\alpha/2,c}, 2 \cdot \hat{\tau}_c + Q_{\alpha,c})$ and $(2 \cdot \hat{\tau}_{pool} - Q_{1-\alpha/2,pool}, 2 \cdot \hat{\tau}_{pool} + Q_{\alpha,pool})$.

# 2 Sensitivity analysis

In this project, four sensitivity analyses were performed. Table 1 lists the details. In the coming content, we describe the motivation per analysis.

*Table 1 Sensitivity analyses overview*

| Number | Name | Detail |
|---|---|---|
| 1 | Cluster effect | Investigate the effect per cluster |
| 2 | Effect per post-intervention | Different post-intervention periods |
| 3 | Parameter in K-means clustering | Investigate the influence of parameters selection during clustering step |
| 4 | Change control group | Use expert-based as control |

## 2.1 Cluster effect

In the main analysis, the final results were pooled across six clusters. In this sensitivity analysis, we investigate what is the effect estimation per cluster. This analysis is meaningful as in practice, each MCN focuses on different components in the episode of care. Checking the results per cluster links these different implementation to the effects.

## 2.2 Effect per post-intervention

In the main analysis, 2018 till and include 2021 (2018 till and include 2020 for Vektis outcome) were encoded as post-intervention time. In this sensitivity analysis, we encode each year separately as post-intervention time. That is to say, instead of setting $T \in \{pre - intervention, post - intervention\}$, we have $T \in \{2018, 2019, 2020, 2021\}$[8].

## 2.3 Parameter in K-means clustering

In this sensitivity analysis, average urbanization degree was replaced by average vulnerability. Vulnerability is defined using latent class analysis (Molenaar, 2023). In our project, we treated vulnerability as a binary outcome, where only class 1 was used to indicated a positive vulnerability. This replacement is to test the robustness of our selection of proxies to measure collaboration degree on the MCN level. As a results, four clusters were formed, with two clusters containing two treatment MCNs. In total, 34 MCNs were kept with number of clusters set to 11.

Besides the differences, the procedure was kept as the same as the main analysis. Therefore, first-time mum with singleton whose pregnancy week is at least 24 weeks were kept. Parallel trend and anticipation effects were checked. We followed the same two-step data-driven to confirm choice of confounders on individual level. This time, $\mathcal{B}_{selected}$ contains four covariates[9]. As a results, following these procedure, we made similar conclusions as in the main analysis. First, there is anticipation effect in 2016. Thus, $t'_{ref}$ is set to 2015[10]. This

[8] 2021 data of outcome from Vektis was not available.
[9] These four covariates are: household size, medication use of the mother, healthcare expenditures of the mother 2 years prior delivery, healthcare expenditures of the father 2 years prior delivery
[10] Vektis is 2016, due to data quality issue of the year 2015.

choice aligns with the choice in the main analysis, which strengthen the comparability between main and sensitivity analysis. Second, parallel trend assumption is violated for some outcomes. Last, no convincing confounders were found.

## 2.4 Change control group

In 2023, the control MCNs were evaluated by experts who are representatives from Federation of Maternity Care Networks (Federatie van VSV's). In total, 10 MCNs were selected by the experts as having good collaboration. These 10 selected MCNs[11] were used as control in this sensitivity analysis, bypassing the k-means clustering step. This sensitivity analysis serves the same goal as the previous sensitivity analysis to test the robustness of our elimination of unobserved differences between treatment and control group.

Even though a data-driven method was not implemented in this sensitivity analysis, we followed the same criteria described in Section Preprocessing to ensure data quality and to make ignorability assumptions plausible. In result, three MCNs were excluded. Moreover, the procedure of checking parallel trend, checking anticipation effect, and identifying confounder were kept the same. $\mathcal{B}_{selected}$ contains two covariates[12]. The conclusions from this procedure were the same as both the main analysis and the sensitivity analysis where vulnerability was used.

[11] Ultimately, seven MCNs were used since three of them either has NICU or is a UMC.

[12] These two covariates are distance to hospital and gravidity .

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# Bijlage B Beschrijvende statistieken

### *Beschrijving onderzoekspopulatie*

Van alle pasgeborenen die opgenomen zijn in de Basisregistratie Personen (BRP) in de jaren 2013 tot en met 2021 kon meer dan 90% gekoppeld worden aan de data binnen DIAPER. Dit percentage ligt in het jaar 2021 lager (91,8%) dan in de jaren 2013-2020 (96%). Dit komt doordat in 2021 de data (nog) niet compleet beschikbaar is (Bijlage B Tabel B1.2). De karakteristieken van de pasgeborenen in het BRP zijn vergelijkbaar met die van de pasgeborenen die binnen DIAPER gekoppeld konden worden met betrekking tot leeftijd moeder, opleidingsniveau moeder, herkomstland moeder, huishoudinkomen en huishoudsamenstelling (Bijlage B Tabel B1.3). Deze goede vergelijkbaarheid impliceert dat de pasgeborenen die gekoppeld konden worden binnen DIAPER geen selectieve groep betreft. De uitkomsten van de analyse worden niet beïnvloed door verschillen in de DIAPER populatie in vergelijking tot de algemene populatie. Na exclusie van vsv's met academische ziekenhuizen en/of een neonatale intensive care unit (NICU), meerlingen en zwangerschappen met een zwangerschapsduur korter dan 24 weken (Bijlage B Figuur B1.2) is de matching op basis van k-means clustering op het niveau van igo's/vsv's uitgevoerd. Deze clustering heeft geleid tot een controlegroep van 20 vsv's ten opzichte van 6 igo's (Figuur B1.1). Na de matching op basis van urbanisatiegraad en aantal zwangerschappen in de jaren 2013 tot en met 2016 bestond de controlegroep uit 159.159 zwangerschappen en de interventiegroep uit 49.531 zwangerschappen.

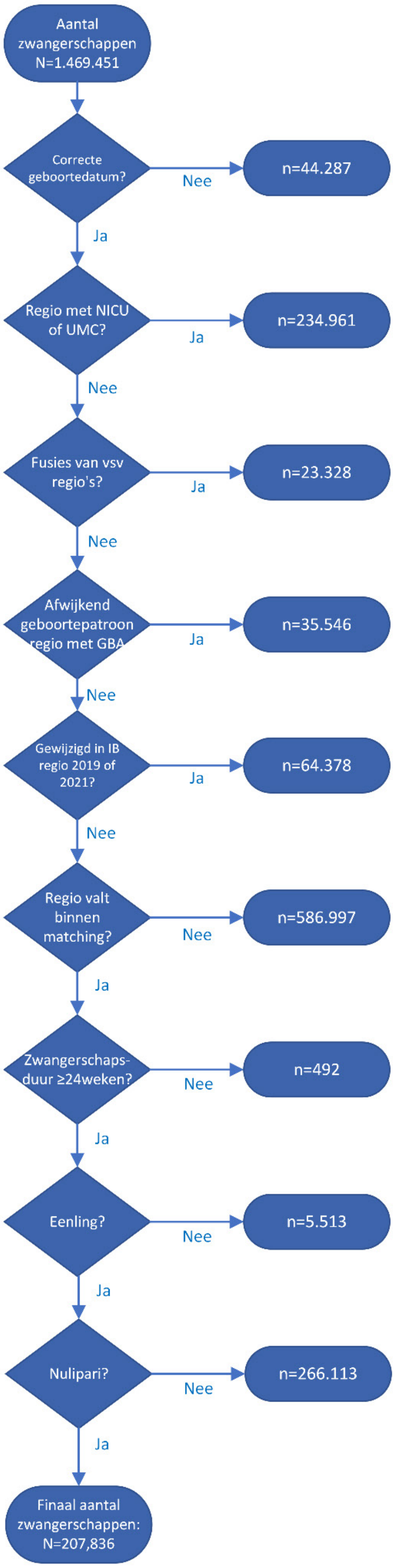
*Tabel B1.1 Aantal geboorten binnen DIAPER en CBS*

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|
| CBS[1] | 171.341 | 175.181 | 170.628 | 172.520 | 169.836 | 168.525 | 169.680 | 168.682 | 179.441 |
| DIAPER[2] | 166.802 | 170.671 | 165.502 | 168.370 | 165.656 | 161.748 | 164.028 | 164.949 | 164.257 |
| Percentage | 97,4 | 97,4 | 97,0 | 97,6 | 97,5 | 96,0 | 96,7 | 97,8 | 91,5 |

1. Aantal levend geborenen binnen de Basisregistratie Personen (BRP)
2. Aantal geboorten binnen Perined welke aan CBS karakteristieken gekoppeld kunnen worden

*Tabel B1.2 Beschrijvende karakteristieken van zwangerschappen binnen DIAPER & CBS*

| | DIAPER | CBS |
|---|---|---|
| Aantal zwangerschappen | 1,437,125 | 1,521,369 |
| | **gem./n (sd/%)** | **gem./n (sd/%)** |
| Leeftijd moeder | 30,8 (4,7) | 30,8 (4,7) |
| Opleidingsniveau moeder | | |
| - Laag | 174.424 (13,9) | 183.762 (13,8) |
| - Midden | 508.862 (40,4) | 536.608 (40,4) |
| - Hoog | 575.013 (45,7) | 609.176 (45,8) |
| Herkomstland moeder | | |
| - Nederland | 989.149 (68,8) | 1.044.599 (68,7) |
| - Europe (exl. Nederland) | 116.471 (8,1) | 125.786 (8,3) |
| - Turkije | 50.804 (3,5) | 53.818 (3,5) |
| - Marokko | 61.663 (4,3) | 65.414 (4,3) |
| - Suriname | 36.831 (2,6) | 38.935 (2,6) |
| - Nederlandse Cariben | 19.096 (1,3) | 20.237 (1,3) |
| - Indonesië | 25.074 (1,7) | 26.405 (1,7) |
| - Overig Afrika | 41.528 (2,9) | 44.264 (2,9) |
| - Overig Azië | 71.899 (5,0) | 75.995 (5,0) |
| - Overig Amerika en Oceanië | 24.258 (1,7) | 25.915 (1,7) |
| Huishoudinkomen (percentielen) | | |
| - 1-20 | 222.292 (15,7) | 235.025 (15,7) |
| - 20-40 | 172.546 (12,2) | 182.569 (12,2) |
| - 40-60 | 258.352 (18,2) | 272.909 (18,2) |
| - 60-80 | 356.411 (25,2) | 376.312 (25,1) |
| - 80-100 | 406.603 (28,7) | 429.929 (28,7) |
| Huishoudsamenstelling | | |
| - eenouder | 86.335 (6,1) | 91.419 (6,1) |
| - eenpersoonshuishouden | 83.023 (5,9) | 87.187 (5,8) |
| - instellingen, inrichtingen en tehuizen | 4.848 (0,3) | 5.122 (0,3) |
| - overig meerspersoonshuishouden | 11.111 (0,8) | 11.759 (0,8) |
| - paar met kinderen | 712.246 (50,3) | 758.135 (50,7) |
| - paar zonder kinderen | 518.575 (36,6) | 543.049 (36,3) |




*Figuur B1.1 Flowchart met aantal zwangerschappen geïncludeerd binnen analyses*

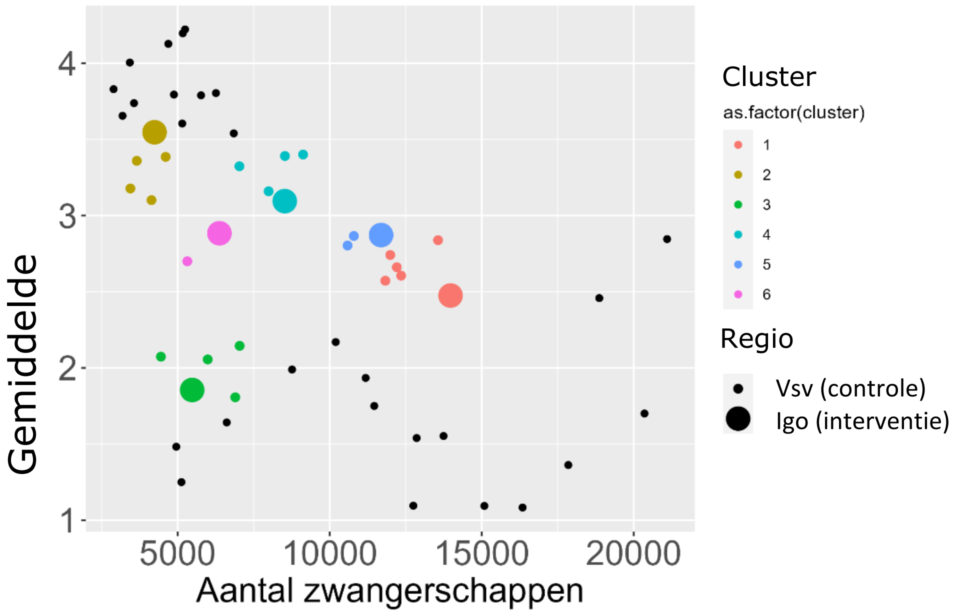
**Welke zwangerschappen worden meegenomen in de analyses?**

Een selectie van zwangerschappen binnen DIAPER is gebruikt voor het analyseren van de effecten van integrale bekostiging van de geboortezorg op zorggebruik, gezondheidsuitkomsten en zorguitgaven.

Zwangerschappen waarvan geen correcte of valide geboortedatum van de kinderen beschikbaar is zijn uitgesloten. Ten tweede zijn regio's uitgesloten waar een Neonatale Intensive Care Unit (NICU) of Universitair Medisch Centrum (UMC) gevestigd is. Om zo een eerlijke vergelijking te kunnen maken qua zorgzwaarte tussen de regio's, aangezien geen één van de igo's een UMC of NICU bevat. Eén van de vsv regio's is gefuseerd, om een goed vergelijk tussen regio's over de jaren te maken is deze regio ook uitgesloten. In twee regio's was een afwijkend patroon in het aantal zwangerschappen over de jaren te zien in vergelijking met het aantal geboorten geregistreerd binnen de Basisregistratie Personen (BRP, voorheen GBA) deze regio's zijn geëxcludeerd. In de jaren 2019 en 2021 hebben drie regio's integrale bekostiging geïmplementeerd, omdat deze igo's een korte follow-up periode hebben zijn deze regio's geëxcludeerd van de analyses.

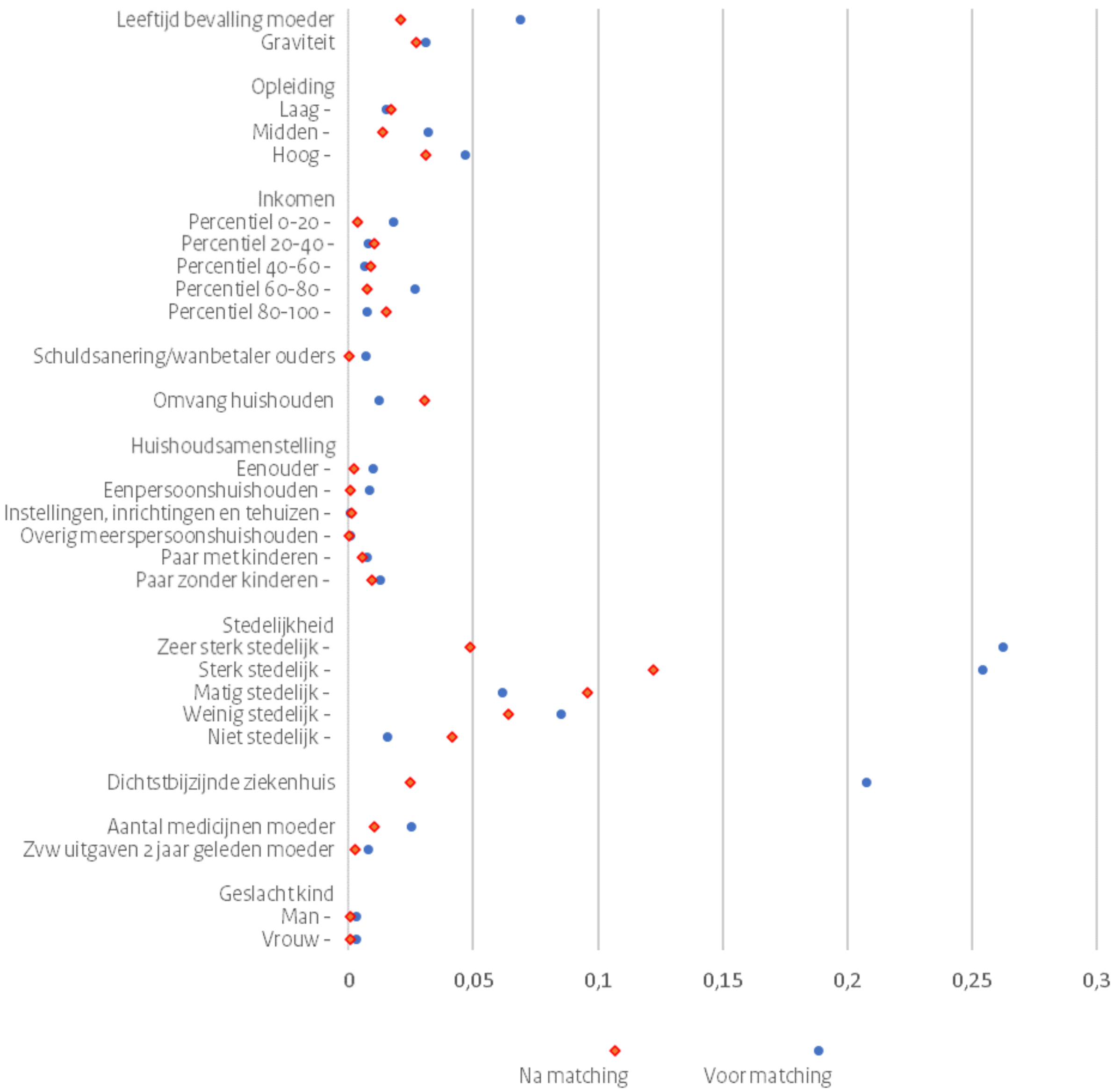
Na het toepassen van k-means clusterings-matching zijn naast de zes igo's, 20 vsv's als controlegroep geïncludeerd. Zwangerschappen in overige vsv's buiten de matching zijn niet meegenomen (in de hoofdanalyse).

Binnen de Perined data hebben wij een betrouwbaar beeld van de zwangerschappen van 24 weken of langer, zwangerschappen korter dan deze periode worden niet meegenomen. Zwangerschappen met een meerling hebben een grotere kans op complicaties, om uitkomsten in zwangerschappen en geboorte goed te vergelijken worden deze geëxcludeerd. De meest risicovolle zwangerschappen zijn over het algemeen de eerste van een vrouw. Hier valt tevens de meeste impact te behalen met nieuwe preventieve maatregelen. Vandaar dat wij enkel nullipari, eerste zwangerschappen, meenemen in de finale set gegevens. die geanalyseerd worden.




*Figuur B1.2 K-means clustering*

Selectie van vsv's voor de controlegroep (n=20) door middel van matching op basis van urbanisatiegraad (regio) en aantal zwangerschappen (per regio gedurende de onderzoeksperiode).




*Figuur B1.3 Adjusted standardized mean difference karakteristieken zwangerschappen voor en na matching*

*Tabel B1.3 Uitkomstmaten*

**Uitkomstmaten**

***Zorggebruik***

Overdracht van 1e naar de 2e lijn
- Totaal
- Voor bevalling
- Tijdens bevalling
- Na bevalling

Plaats bevalling
- Thuis
- Poliklinisch
- Ziekenhuis

Pijnbestrijding
- Epiduraal
- Anders

Wijze bevalling
- Spontane start bevalling
- Inleiding
- Keizersnede (totaal)
- Geplande keizersnede
- Spoed keizersnede
- Kunstverlossing

***Gezondheidsuitkomsten moeder***
- Fluxus
- Ernstige ruptuur

***Gezondheidsuitkomsten kind***
- Lage Apgar score (<7 bij 5 min)
- BIG2
- Laag geboortegewicht
- Vroeggeboorte

**Zorguitgaven (totaal)**

***Relevantie uitkomsten zoals aangegeven door de igo's***

| **N = ...** | **Indicator** |
|---|---|
| 2 | % thuisbevallingen |
| 3 | % poliklinische bevalling olv eerstelijnsverloskundige |
| 3 | % ziekenhuisbevallingen olv gynaecoloog |
| 1 | % epidurale analgesie |
| 2 | % inductie |
| 2 | % primaire sectio |
| 2 | % secundaire sectio |
| 3 | % start zorg in 1$^{e}$ lijn |
| 3 | % tot aan bevalling in 1$^{e}$ lijn |
| 3 | % episiotomie |
| 2 | zorguitgaven alle deelprestaties |
| 2 | zorguitgaven prenatale fase |
| 2 | zorguitgaven natale fase |
| 1 | zorguitgaven postnatale fase |
| 1 | zorguitgaven kraamzorg |
| 2 | % apgar score <7 na 5 min |

| N = … | Indicator |
|---|---|
| 2 | % nicu-opnames |
| 2 | % (sub)totaalruptuur |
| 2 | % fluxus post partum |
| 2 | % vroeggeboorte |
| 2 | % laag geboortegewicht |

**Ingevoerde interventies en zorgverschuivingen door de igo's (zoals uitgevraagd in 2022)**

*Samenwerking:*
- MDO: n=6
- Multidisciplinair EPD: n=3
- Buddy spreekuur: n=2
- Integrale procedure kwaliteit & veiligheid en intervisie: n=2
- Gezamenlijke voorlichting voor zwangere: n=2
- Integrale scholingen en trainingen: n=3
- Integrale richtlijnencommissie/werkgroepen: n=2
- Gezamenlijk versie spreekuur: n=2
- Counseling gezamenlijk: n=1
- Samenwerking kwetsbare zwangere: n=1
- Moederraad: n=1

*Zorgverschuivingen:*
- Begeleiding bevalling bij meconiumhoudend vruchtwater: n = 2
- Begeleiding zwangerschap bij diabetes: n = 1
- Begeleiding bevalling bij fluxus in de anamnese: n = 2
- Begeleiding zwangerschap bij IUGR in de anamnese: n = 2
- Hypertensie in eerste lijn: n=1
- Gemelli in eerste lijn: n=1
- Balloninleidingen in de eerste lijn: n=3
- Start zwangerschapsbegeleiding in de eerste lijn: n=2
- CTG in de eerste lijn: n=2
- GBS in eerste lijn: n=3
- Adipositas / Bariatrie i.a. in eerste lijn: n = 2
- Pijnbestrijding met Relivopan (lachgassedatie) in eerste lijn: n = 1
- Begeleiding van zwangerschapsdiabetes in eerste lijn: n = 2
- Ascal zonder VG in 1e lijn: n = 1
- Progesteron gebruik na partus > 33w in 1e lijn: n = 1

*Tabel B1.4 Beschrijvende karakteristieken onderzoekspopulatie voor en na matchen op basis van de jaren 2013 tot en met 2016, uitgesplitst naar igo's en vsv's*

| | Interventiegroep (n=6 igo's) | | Controlegroep (n=20 gematchte vsv's) | |
|---|---|---|---|---|
| | **Baseline 2013 t/m 2016** | | **Baseline 2013 t/m 2016** | |
| | Voor matching | Na matching | Voor matching | Na matching |
| Aantal zwangerschappen (2013 tot en met 2016) | 51.006 | 49.531 | 593.928 | 159.159 |
| Gem aantal zwangerschappen per igo/vsv per jaar | 8.501 | 8.255 | 29.696 | 7957 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| **Achtergrondkarakteristieken** | | | | |
| Leeftijd moeder bij bevalling | 30,2 (4,7) | 30,2 (4,7) | 30,6 (4,8) | 30,3 (4,7) |
| Opleidingsniveau moeder | | | | |
| - Laag | 17,0 | 16,9 | 13,4 | 15,1 |
| - Midden | 43,0 | 43,0 | 33,9 | 41,7 |
| - Hoog | 39,9 | 40,1 | 39,0 | 43,2 |
| Herkomstland moeder | | | | |
| - Nederland | 75,5 | 75,6 | 69,8 | 77,1 |
| - Europa (excl. Nederland) | 8,2 | 8,2 | 7,5 | 6,5 |
| - Turkije | 2,5 | 2,5 | 3,6 | 2,4 |
| - Marokko | 3,6 | 3,5 | 4,4 | 2,8 |
| - Suriname | 1,2 | 1,2 | 2,7 | 1,4 |
| - Nederlandse Cariben | 0,7 | 0,7 | 1,4 | 0,9 |
| - Indonesië | 1,6 | 1,6 | 2,0 | 1,9 |
| - Overig Afrika | 2,4 | 2,4 | 2,6 | 2,0 |
| - Overig Azië | 3,3 | 3,3 | 4,3 | 3,8 |
| - Overig Amerika en Oceanië | 1,0 | 1,0 | 1,6 | 1,3 |
| Huishoudinkomen (in percentielen) | | | | |
| - 1 – 20 | 14,8 | 14,7 | 16,7 | 15,0 |
| - 20 – 40 | 14,3 | 14,2 | 15,4 | 15,5 |
| - 40 – 60 | 26,1 | 26,1 | 25,9 | 27,8 |
| - 60 – 80 | 31,5 | 31,5 | 28,8 | 30,8 |
| - 80 – 100 | 30,3 | 30,4 | 32,1 | 28,7 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2169 (3808) | 2169 (3813) | 2214 (4208) | 2186 (3800) |
| Meervoudige kwetsbaarheid* | 7,0 | 7,0 | 8,4 | 7,3 |

*Op basis van definitie multidimensionale kwetsbaarheid door Molenaar et al. [15, 16]
Afkortingen: gem.: gemiddelde; sd: standaard deviatie

*Tabel B1.5 Beschrijvende karakteristieken over de jaren voor igo's en vsv's (voor matching)*

| **Jaar** | 2013 | | 2014 | |
|---|---|---|---|---|
| | igo | vsv | igo | vsv |
| Aantal zwangerschappen | 12.415 | 147.428 | 13.095 | 150.763 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| Leeftijd moeder bij bevalling | 30,2 (4,7) | 30,5 (4,9) | 30,2 (4,7) | 30,6 (4,8) |
| Opleidingsniveau moeder | | | | |
| - Laag | 17,6 | 16,3 | 17,2 | 15,8 |
| - Midden | 41,5 | 38,1 | 43,3 | 39,0 |
| - Hoog | 40,9 | 45,5 | 39,5 | 45,2 |
| Herkomstland moeder | | | | |
| - Nederland | 76,9 | 70,9 | 75,6 | 70,4 |
| - Europa (excl. Nederland) | 7,7 | 7,1 | 8,1 | 7,3 |
| - Turkije | 2,3 | 3,5 | 2,6 | 3,6 |
| - Marokko | 3,4 | 4,4 | 3,9 | 4,4 |
| - Suriname | 1,3 | 2,8 | 1,1 | 2,7 |
| - Nederlandse Cariben | 0,7 | 1,3 | 0,7 | 1,3 |
| - Indonesië | 1,7 | 2,1 | 1,7 | 2,0 |
| - Overig Afrika | 2,3 | 2,6 | 2,4 | 2,5 |
| - Overig Azië | 2,7 | 3,8 | 3,0 | 4,1 |
| - Overig Amerika en Oceanië | 1,0 | 1,5 | 1,0 | 1,6 |
| Huishoudinkomen (percentielen) | | | | |
| - 1 – 20 | 14,1 | 16,3 | 15,2 | 16,8 |
| - 20 – 40 | 12,8 | 13,4 | 12,1 | 13,2 |
| - 40 – 60 | 19,6 | 19,1 | 20,1 | 18,7 |
| - 60 – 80 | 27,0 | 24,4 | 27,2 | 24,4 |
| - 80 – 100 | 26,5 | 26,7 | 25,4 | 26,8 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2146,71 (3832,58) | 2190,76 (3818,62) | 2150,38 (3888,54) | 2214,72 (4748,02) |
| Medicijngebruik | 2,1 (2,1) | 2,2 (2,2) | 2,0 (2,1) | 2,1 (2,2) |
| Huishoudsamenstelling | | | | |
| - Eenouder | 4,5 | 5,8 | 5,0 | 5,9 |
| - Eenpersoonshuishouden | 4,9 | 6,1 | 5,1 | 6,1 |
| - instellingen, inrichtingen en tehuizen | 0,1 | 0,2 | 0,1 | 0,3 |
| - overig meerspersoonshuishouden | 0,7 | 0,8 | 0,6 | 0,8 |
| - paar met kinderen | 51,5 | 50,3 | 51,6 | 50,4 |
| - paar zonder kinderen | 38,3 | 36,9 | 37,6 | 36,5 |
| ZVW wanbetaler | 4,3 | 5,5 | 4,9 | 5,6 |
| Schuldsanering | 1,0 | 0,6 | 0,9 | 0,7 |
| Stedelijkheid | | | | |
| - Zeer sterk stedelijk | 4,2 | 32,2 | 4,1 | 32,2 |
| - Sterk stedelijk | 54,9 | 28,2 | 55,0 | 28,1 |
| - matig stedelijk | 9,4 | 15,3 | 8,9 | 15,6 |
| - weinig stedelijk | 26,2 | 18,2 | 26,7 | 18,0 |
| - niet stedelijk | 5,3 | 6,1 | 5,3 | 6,0 |
| Afstand ziekenhuis (meters) | 7261 (5589) | 6036 (5023) | 7340 (5645) | 6101 (5063) |
| Geslacht | | | | |
| - Jongen | 51,6 | 51,3 | 50,6 | 51,1 |
| - Meisje | 48,4 | 48,7 | 49,4 | 48,9 |

| **Jaar** | 2015 | | 2016 | |
|---|---|---|---|---|
| | igo | vsv | igo | vsv |
| Aantal zwangerschappen | 12.611 | 146.279 | 12.885 | 146.288 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| Leeftijd moeder bij bevalling | 30,2 (4,6) | 30,6 (4,8) | 30,3 (4,6) | 30,8 (4,8) |
| Opleidingsniveau moeder | | | | |
| - Laag | 17,0 | 15,2 | 16,4 | 14,7 |
| - Midden | 43,0 | 39,7 | 44,2 | 40,1 |
| - Hoog | 40,0 | 45,1 | 39,4 | 45,1 |
| Herkomstland moeder | | | | |
| - Nederland | 75,3 | 69,5 | 74,4 | 68,6 |
| - Europa (excl. Nederland) | 8,4 | 7,8 | 8,7 | 7,9 |
| - Turkije | 2,6 | 3,6 | 2,5 | 3,7 |
| - Marokko | 3,3 | 4,4 | 3,6 | 4,4 |
| - Suriname | 1,3 | 2,7 | 1,0 | 2,7 |
| - Nederlandse Cariben | 0,7 | 1,3 | 0,6 | 1,4 |
| - Indonesië | 1,7 | 2,0 | 1,3 | 1,8 |
| - Overig Afrika | 2,4 | 2,7 | 2,6 | 2,7 |
| - Overig Azië | 3,1 | 4,4 | 4,2 | 5,1 |
| - Overig Amerika en Oceanië | 1,2 | 1,6 | 0,9 | 1,7 |
| Huishoudinkomen (percentielen) | | | | |
| - 1 – 20 | 14,8 | 16,8 | 15,1 | 16,7 |
| - 20 – 40 | 12,3 | 13,2 | 12,2 | 12,5 |
| - 40 – 60 | 19,6 | 18,6 | 18,3 | 18,0 |
| - 60 – 80 | 27,6 | 24,5 | 27,1 | 24,4 |
| - 80 – 100 | 25,7 | 26,9 | 27,4 | 28,4 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2184,41 (3919,76) | 2193,53 (4157,16) | 2192,94 (3584,16) | 2255,62 (4039,09) |
| Meervoudig kwetsbaarheid* | - | - | 7,0 | 8,4 |
| Medicijngebruik | 2,0 (2,1) | 2,1 (2,2) | 2,0 (2,1) | 2,1 (2,2) |
| Huishoudsamenstelling | | | | |
| - Eenouder | 4,9 | 6,1 | 5,3 | 6,3 |
| - Eenpersoonshuishouden | 5,5 | 6,2 | 5,3 | 6,1 |
| - instellingen, inrichtingen en tehuizen | 0,2 | 0,2 | 0,3 | 0,4 |
| - overig meerspersoonshuishouden | 0,6 | 0,8 | 0,8 | 0,8 |
| - paar met kinderen | 51,2 | 50,6 | 51,6 | 50,6 |
| - paar zonder kinderen | 37,6 | 36,1 | 36,7 | 35,9 |
| ZVW wanbetaler | 4,3 | 5,5 | 4,0 | 4,8 |
| Schuldsanering | 0,9 | 0,6 | 0,8 | 0,6 |
| Stedelijkheid | | | | |
| - Zeer sterk stedelijk | 4,2 | 32,1 | 3,8 | 32,0 |
| - Sterk stedelijk | 54,4 | 28,2 | 54,1 | 28,0 |
| - matig stedelijk | 9,4 | 15,5 | 9,4 | 15,6 |
| - weinig stedelijk | 26,9 | 18,1 | 27,5 | 18,4 |
| - niet stedelijk | 5,0 | 6,1 | 5,2 | 6,0 |
| Afstand ziekenhuis (meters) | 7459 (5664) | 6316 (5267) | 7743 (6035) | 6417 (5246) |
| Geslacht | | | | |
| - Jongen | 51,2 | 51,2 | 50,4 | 51,4 |
| - Meisje | 48,8 | 48,8 | 49,6 | 48,6 |

| **Jaar** | 2017 | | 2018 | |
|---|---|---|---|---|
| | igo | vsv | igo | vsv |
| Aantal zwangerschappen | 13.105 | 146.288 | 12.465 | 143.302 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| Leeftijd moeder bij bevalling | 30,4 (4,5) | 30,8 (4,7) | 30,4 (4,5) | 30,9 (4,70 |
| Opleidingsniveau moeder | | | | |
| - Laag | 15,2 | 13,7 | 14,9 | 13,2 |
| - Midden | 44,2 | 40,6 | 44,2 | 40,8 |
| - Hoog | 40,6 | 45,7 | 40,9 | 46,0 |
| Herkomstland moeder | | | | |
| - Nederland | 73,4 | 68,2 | 73,4 | 67,3 |
| - Europe (exl. Nederland) | 9,4 | 8,1 | 9,0 | 8,3 |
| - Turkije | 2,6 | 3,7 | 2,5 | 3,7 |
| - Marokko | 3,5 | 4,3 | 3,2 | 4,3 |
| - Suriname | 1,2 | 2,7 | 0,9 | 2,7 |
| - Nederlandse Cariben | 0,7 | 1,3 | 0,8 | 1,4 |
| - Indonesië | 1,5 | 1,8 | 1,4 | 1,7 |
| - Overig Afrika | 2,4 | 2,9 | 2,9 | 3,2 |
| - Overig Azië | 4,4 | 5,3 | 4,5 | 5,8 |
| - Overig Amerika en Oceanië | 1,1 | 1,7 | 1,4 | 1,8 |
| Huishoudinkomen (percentielen) | | | | |
| - 1 – 20 | 14,8 | 16,3 | 14,5 | 16,2 |
| - 20 – 40 | 10,7 | 12,3 | 10,9 | 11,5 |
| - 40 – 60 | 18,7 | 18,1 | 19,4 | 17,8 |
| - 60 – 80 | 28,1 | 24,9 | 27,0 | 25,1 |
| - 80 – 100 | 27,7 | 28,4 | 28,2 | 29,3 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2003,18 (3275,37) | 2121,81 (4011,44) | 2103,55 (3618,20) | 2150,87 (3944,09) |
| Meervoudig kwetsbaarheid* | 6,7 | 8,1 | 6,8 | 7,9 |
| Medicijngebruik | 2,0 (2,1) | 2,2 (2,2) | 2,1 (2,2) | 2,2 (2,2) |
| Huishoudsamenstelling | | | | |
| - Eenouder | 5,5 | 6,4 | 5,1 | 6,4 |
| - Eenpersoonshuishouden | 4,9 | 6,1 | 4,9 | 5,8 |
| - instellingen, inrichtingen en tehuizen | 0,3 | 0,5 | 0,3 | 0,5 |
| - overig meerspersoonshuishouden | 0,7 | 0,8 | 0,7 | 0,8 |
| - paar met kinderen | 50,7 | 50,4 | 51,9 | 50,5 |
| - paar zonder kinderen | 38,0 | 35,9 | 37,1 | 36,1 |
| ZVW wanbetaler | 3,5 | 4,3 | 3,2 | 3,9 |
| Schuldsanering | 0,6 | 0,5 | 0,5 | 0,4 |
| Stedelijkheid | | | | |
| - Zeer sterk stedelijk | 4,1 | 31,7 | 4,0 | 30,9 |
| - Sterk stedelijk | 53,2 | 27,8 | 52,1 | 28,1 |
| - matig stedelijk | 9,8 | 15,9 | 10,2 | 15,9 |
| - weinig stedelijk | 27,4 | 18,5 | 27,6 | 18,8 |
| - niet stedelijk | 5,5 | 6,1 | 6,1 | 6,3 |
| Afstand ziekenhuis (meters) | 7790 (6048) | 6489 (5322) | 7901 (5994) | 6633 (5326) |
| Geslacht | | | | |
| - Jongen | 51,3 | 51,3 | 50,8 | 51,2 |
| - Meisje | 48,7 | 48,7 | 49,2 | 48,8 |

| **Jaar** | 2019 | | 2020 | |
|---|---|---|---|---|
| | igo | vsv | igo | vsv |
| Aantal zwangerschappen | 12.272 | 145.324 | 12.181 | 145.936 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| Leeftijd moeder bij bevalling | 30,6 (4,6) | 31,0 (4,7) | 30,7 (4,5) | 31,1 (4,7) |
| Opleidingsniveau moeder | | | | |
| - Laag | 14,3 | 12,5 | 12,8 | 11,7 |
| - Midden | 44,5 | 40,8 | 45,5 | 40,9 |
| - Hoog | 41,3 | 46,7 | 41,8 | 47,4 |
| Herkomstland moeder | | | | |
| - Nederland | 72,5 | 66,7 | 73,1 | 66,8 |
| - Europa (excl. Nederland) | 9,7 | 8,5 | 9,2 | 8,6 |
| - Turkije | 2,7 | 3,6 | 2,4 | 3,5 |
| - Marokko | 3,4 | 4,4 | 3,3 | 4,4 |
| - Suriname | 1,1 | 2,6 | 1,0 | 2,7 |
| - Nederlandse Cariben | 0,7 | 1,4 | 0,9 | 1,5 |
| - Indonesië | 1,2 | 1,6 | 1,0 | 1,5 |
| - Overig Afrika | 2,9 | 3,3 | 2,8 | 3,2 |
| - Overig Azië | 4,5 | 5,9 | 4,6 | 5,8 |
| - Overig Amerika en Oceanië | 1,2 | 1,9 | 1,4 | 1,9 |
| Huishoudinkomen (percentielen) | | | | |
| - 1 – 20 | 13,6 | 15,7 | 13,5 | 14,3 |
| - 20 – 40 | 11,4 | 11,6 | 10,2 | 11,4 |
| - 40 – 60 | 18,9 | 17,8 | 18,7 | 17,9 |
| - 60 – 80 | 28,1 | 25,4 | 28,1 | 25,5 |
| - 80 – 100 | 27,9 | 29,5 | 29,4 | 30,9 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2168,12 (3661,31) | 2210,96 (4622,72) | 2253,95 (3674,97) | 2295,15 (4570,76) |
| Meervoudig kwetsbaarheid* | 6,9 | 7,9 | 6,9 | 7,6 |
| Medicijngebruik | 2,2 (2,2) | 2,2 (2,2) | 2,1 (2,1) | 2,1 (2,2) |
| Huishoudsamenstelling | | | | |
| - Eenouder | 5,1 | 6,4 | 5,6 | 6,3 |
| - Eenpersoonshuishouden | 5,6 | 5,8 | 4,9 | 5,7 |
| - instellingen, inrichtingen en tehuizen | 0,1 | 0,5 | 0,3 | 0,4 |
| - overig meerspersoonshuishouden | 0,8 | 0,8 | 0,7 | 0,8 |
| - paar met kinderen | 51,4 | 50,5 | 50,1 | 50,0 |
| - paar zonder kinderen | 37,1 | 36,1 | 38,5 | 36,8 |
| ZVW wanbetaler | 2,8 | 3,6 | 2,5 | 3,2 |
| Schuldsanering | 0,4 | 0,3 | 0,2 | 0,3 |
| Stedelijkheid | | | | |
| - Zeer sterk stedelijk | 4,4 | 31,3 | 4,4 | 30,8 |
| - Sterk stedelijk | 52,0 | 28,1 | 51,4 | 28,0 |
| - matig stedelijk | 10,0 | 15,7 | 9,7 | 15,9 |
| - weinig stedelijk | 27,7 | 18,6 | 28,6 | 18,9 |
| - niet stedelijk | 5,8 | 6,3 | 5,9 | 6,3 |
| Afstand ziekenhuis (meters) | 7764 (5924) | 6761 (5719) | 7919 (5994) | 6832 (5662) |
| Geslacht | | | | |
| - Jongen | 51,5 | 51,2 | 50,9 | 51,3 |
| - Meisje | 48,5 | 48,8 | 49,1 | 48,7 |

| **Jaar** | 2021 | |
|---|---|---|
| | igo | vsv |
| Aantal zwangerschappen | 13.044 | 148.274 |
| | gem. (sd)/% | gem. (sd)/% |
| Leeftijd moeder bij bevalling | 30,8 (4,5) | 31,2 (4,6) |
| Opleidingsniveau moeder | | |
| - Laag | 11,6 | 10,7 |
| - Midden | 46,5 | 40,9 |
| - Hoog | 41,9 | 48,3 |
| Herkomstland moeder | | |
| - Nederland | 73,7 | 66,7 |
| - Europe (exl. Nederland) | 9,6 | 8,7 |
| - Turkije | 2,3 | 3,6 |
| - Marokko | 3,2 | 4,3 |
| - Suriname | 1,2 | 2,6 |
| - Nederlandse Cariben | 0,8 | 1,4 |
| - Indonesië | 1,0 | 1,5 |
| - Overig Afrika | 2,7 | 3,2 |
| - Overig Azië | 4,3 | 5,8 |
| - Overig Amerika en Oceanië | 1,2 | 2,1 |
| Huishoudinkomen (percentielen) | | |
| - 1 – 20 | 12,1 | 13,2 |
| - 20 – 40 | 10,2 | 11,0 |
| - 40 – 60 | 18,3 | 17,5 |
| - 60 – 80 | 29,1 | 25,8 |
| - 80 – 100 | 30,3 | 32,4 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 2366,44 (3705,82) | 2411,55 (4496,64) |
| Meervoudig kwetsbaarheid* | 5,6 | 7,3 |
| Medicijngebruik | 2,2 (2,2) | 2,2 (2,2) |
| Huishoudsamenstelling | | |
| - Eenouder | 5,0 | 6,0 |
| - Eenpersoonshuishouden | 4,8 | 5,4 |
| - instellingen, inrichtingen en tehuizen | 0,1 | 0,4 |
| - overig meerspersoonshuishouden | 0,7 | 0,8 |
| - paar met kinderen | 49,9 | 49,7 |
| - paar zonder kinderen | 39,5 | 37,7 |
| ZVW wanbetaler | 2,3 | 2,9 |
| Schuldsanering | 0,2 | 0,2 |
| Stedelijkheid | | |
| - Zeer sterk stedelijk | 4,4 | 30,8 |
| - Sterk stedelijk | 49,8 | 28,3 |
| - matig stedelijk | 11,2 | 16,2 |
| - weinig stedelijk | 28,6 | 18,6 |
| - niet stedelijk | 6,0 | 6,1 |
| Afstand ziekenhuis (meters) | 7955 (5911) | 6813 (5694) |
| Geslacht | | |
| - Jongen | 51,0 | 51,3 |
| - Meisje | 49,0 | 48,7 |

*Op basis van definitie multidimensionale kwetsbaarheid door Molenaar et al. (8, 9) beschikbaar vanaf jaar 2016.
Afkortingen: gem, gemiddelde; sd, standaard deviatie

*Tabel B1.6 Beschrijvende karakteristieken van de populaties in de vsv's en igo's (na matching) voor en na invoering integrale bekostiging*

| | Igo's | | Vsv's | |
|---|---|---|---|---|
| | **Pre-interventie** | **Post-interventie** | **Pre-interventie** | **Post-interventie** |
| Aantal zwangerschappen | 22,307 | 27,713 | 69,496 | 88,320 |
| | *gem. (sd)/%* | *gem. (sd)/%* | *gem. (sd)/%* | *gem. (sd)/%* |
| Leeftijd moeder bij bevalling | 28.6 (4.5) | 29.1 (4.4) | 28.7 (4.7) | 29.2 (4.5) |
| Graviditeit | 1.3 (0.6) | 1.3 (0.6) | 1.3 (0.6) | 1.3 (0.7) |
| Opleidingsniveau moeder | | | | |
| - Laag | 14.2 | 11.5 | 12.8 | 10.1 |
| - Midden | 45.9 | 46.3 | 44.3 | 43.7 |
| - Hoog | 39.9 | 42.2 | 42.9 | 46.2 |
| Herkomstland moeder (volgens oude indeling) | | | | |
| - Nederland | 77.2 | 75.4 | 78.0 | 75.3 |
| - Overig westers | 11.8 | 12.5 | 10.1 | 10.8 |
| - Overig niet-westers | 10.9 | 12.1 | 11.8 | 14.0 |
| Huishoudinkomen (percentielen) | | | | |
| - 1 – 20 | 9.7 | 8.4 | 10.3 | 9.0 |
| - 20 – 40 | 9.1 | 7.5 | 9.7 | 8.3 |
| - 40 – 60 | 14.5 | 13.0 | 15.4 | 13.6 |
| - 60 – 80 | 29.2 | 29.1 | 29.5 | 29.2 |
| - 80 – 100 | 37.5 | 41.9 | 35.1 | 40.0 |
| Zvw uitgaven moeder 2 jaar voor bevalling | 1231.88 (3571.72) | 1242.13 (3123.52) | 1238.40 (3492.94) | 1240.73 (3402.71) |
| Medicijngebruik | 2.01 (2.05) | 2.07 (2.10) | 2.03 (2.05) | 2.03 (2.06) |
| Huishoudsamenstelling | | | | |
| - Eenouder | 2.0 | 1.8 | 2.1 | 1.8 |
| - Eenpersoonshuishouden | 10.5 | 10.2 | 11.0 | 10.9 |
| - instellingen, inrichtingen en tehuizen | 0.2 | 0.2 | 0.3 | 0.3 |
| - overig meerspersoonshuishouden | 1.0 | 0.9 | 0.9 | 1.0 |
| - paar met kinderen | 6.2 | 5.6 | 6.0 | 5.4 |
| - paar zonder kinderen | 80.1 | 81.3 | 79.7 | 80.5 |
| Eén of beide ouder(s) ZVW wanbetaler of in de schuldsanering | | | | |
| - Ja | 4.3 | 2.5 | 4.3 | 2.7 |
| - Nee | 95.7 | 97.5 | 95.7 | 97.3 |
| Stedelijkheid | | | | |
| - Zeer sterk stedelijk | 4.5 | 4.7 | 9.8 | 11.0 |
| - Sterk stedelijk | 54.8 | 52.2 | 42.9 | 40.3 |
| - matig stedelijk | 9.2 | 10.3 | 19.0 | 19.9 |
| - weinig stedelijk | 26.7 | 27.4 | 19.3 | 20.0 |
| - niet stedelijk | 4.8 | 5.3 | 9.0 | 8.9 |
| Afstand ziekenhuis (meter) | 7360.51 (5729.01) | 7655.71 (5901.30) | 7330.02 (5512.59) | 7746.11 (5656.22) |
| Geslacht | | | | |
| - Jongen | 50.7 | 51.1 | 50.9 | 51.2 |
| - Meisje | 49.3 | 48.9 | 49.1 | 48.8 |

*Op basis van definitie multidimensionale kwetsbaarheid door Molenaar et al. (8, 9) beschikbaar vanaf jaar 2016. Afkortingen: gem, gemiddelde; sd, standaard deviatie

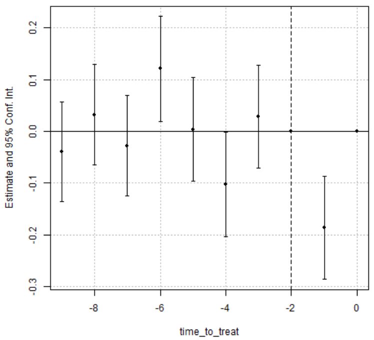
*Tabel B1.7 Zorggebruik en -uitkomsten (voor invoering integrale bekostiging)*

| | igo | | vsv | |
|---|---|---|---|---|
| | **Baseline 2013 - 2016** | | **Baseline 2013 - 2016** | |
| | Voor matching | Na matching | Voor matching | Na matching |
| Aantal zwangerschappen | 51.006 | 49.531 | 593.928 | 159.159 |
| | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% | gem. (sd)/% |
| **Zorggebruik** | | | | |
| Overdracht verantwoordelijkheid zorg van 1e naar de 2e lijn | | | | |
| - voor bevalling | 36,1 | 36,1 | 33,6 | 33,2 |
| - tijdens bevalling | 26,0 | 26,3 | 23,8 | 24,6 |
| - na bevalling | 1,3 | 1,3 | 1,3 | 1,4 |
| Plaats bevalling | | | | |
| - Thuis | 12,8 | 12,9 | 14,0 | 17,4 |
| - Poliklinisch | 8,3 | 8,5 | 11,1 | 11,8 |
| - Ziekenhuis | 73,0 | 73,2 | 71,7 | 69,4 |
| Pijnbestrijding | | | | |
| - Epiduraal | 22,1 | 22,3 | 18,9 | 17,6 |
| - Anders | 24,6 | 24,7 | 21,8 | 19,9 |
| Wijze bevalling | | | | |
| - Spontaan | 72,3 | 72,9 | 71,1 | 72,8 |
| - Inleiden | 23,0 | 23,1 | 21,2 | 19,8 |
| - Keizersnede (totaal) | 15,3 | 15,4 | 15,7 | 14,5 |
| - Geplande keizersnede | 7,4 | 7,4 | 7,6 | 6,9 |
| - Spoed keizersnede | 8,0 | 8,0 | 8,1 | 7,6 |
| - Kunstverlossing | 7,6 | 7,7 | 8,3 | 8,6 |
| **Uitkomsten** | | | | |
| Moeder | | | | |
| - Fluxus ( > 1000 mL) | 6,1 | 6,2 | 6,2 | 6,1 |
| - Ernstige ruptuur (3e of 4e graads) | 1,9 | 1,9 | 2,1 | 2,2 |
| Kind | | | | |
| - Lage Apgar ( <7) | 1,4 | 1,3 | 2,1 | 1,6 |
| - BIG2 (Hoftiezer <10 of geboorte < 37 weken) | 15,1 | 14,7 | 16,3 | 14,1 |
| - Laag geboortegewicht (Hoftiezer <10) | 10,3 | 10,2 | 10,7 | 9,8 |
| - Vroeggeboorte (< 37 weken) | 6,0 | 5,5 | 7,2 | 5,3 |

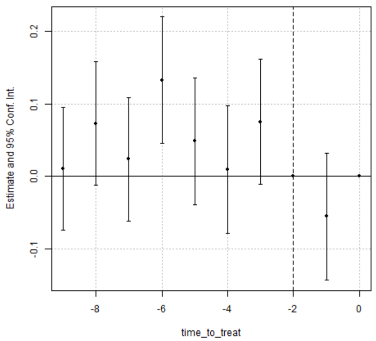
# Bijlage C Aanvullende figuren DiD assumpties en analyses

De parallelle trend houdt in dat de uitkomsten in de interventie- en controlegroep hetzelfde beloop hebben voorafgaand aan de interventie. Om dit te beoordelen is voor iedere uitkomstmaat het verschil tussen de igo’s en vsv’s in het jaar 2015 als referentie genomen. Vervolgens is in de jaren vóór 2015 gekeken of het verschil tussen de igo’s en vsv’s overeenkwam. Een trend voldoet niet aan parallelle trend als minimaal twee jaren vóór 2015 een confidence interval buiten de nul lijn (referentiejaar) hebben.

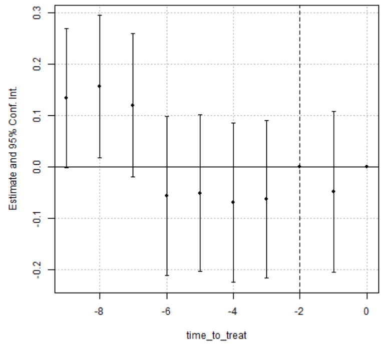
*Figuren C1.1 DiD parallelle trend assumptie pre-interventie*



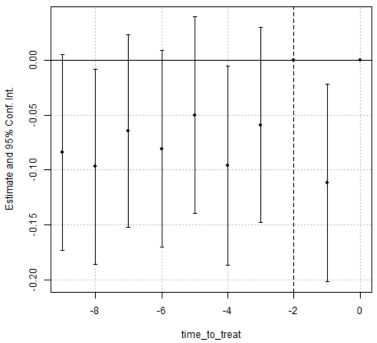

*Figuur C1.1.1 Overdracht 1e – 2e lijn totaal*



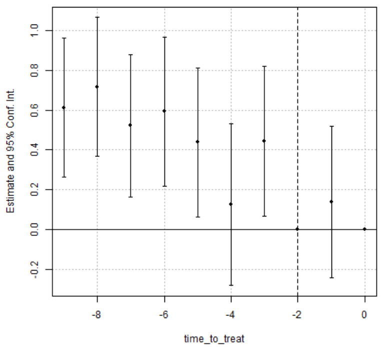

*Figuur C1.1.3 Overdracht 1e – 2e lijn tijdens bevalling*



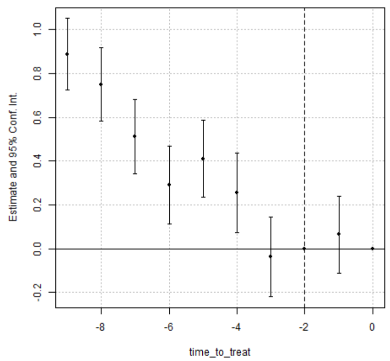

*Figuur C1.1.5 Thuisbevalling*



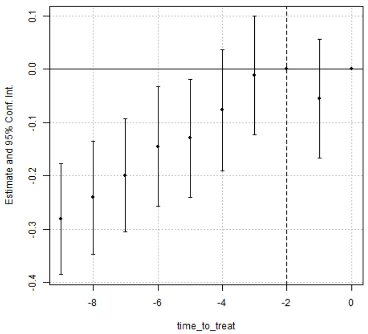

*Figuur C1.1.2*
*Overdracht 1e – 2e lijn voor bevalling*



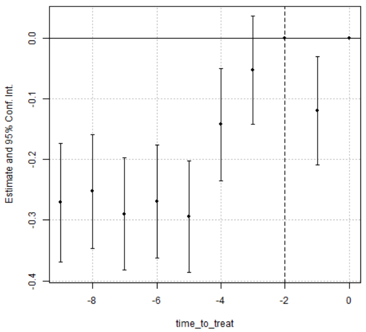

*Figuur C1.1.4 Overdracht 1e – 2e lijn na bevalling*



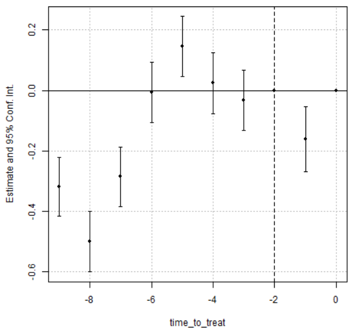

*Figuur C1.1.6 Polilklinische bevalling*



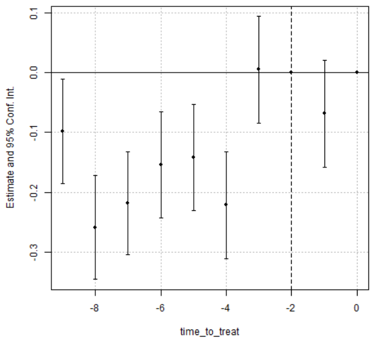

*Figuur C1.1.7 Ziekenhuisbevalling*



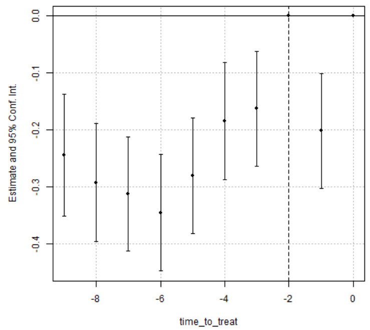

*Figuur C1.1.8 Epiduraal*



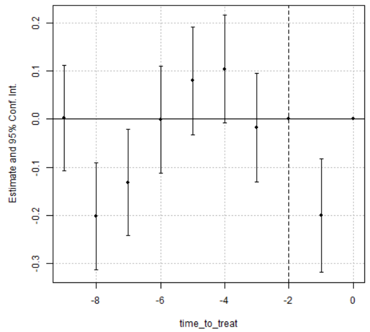

*Figuur C1.1.9 Pijn anders*



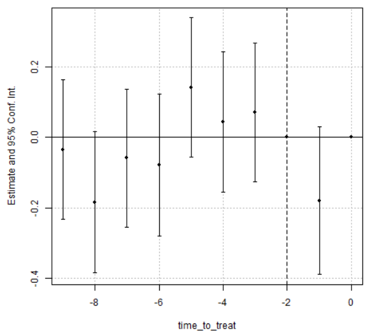

*Figuur C1.1.10 Spontane bevalling*



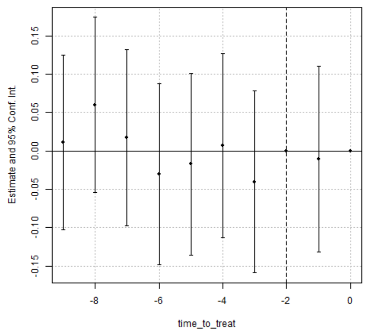

*Figuur C1.1.11 Inleiding*



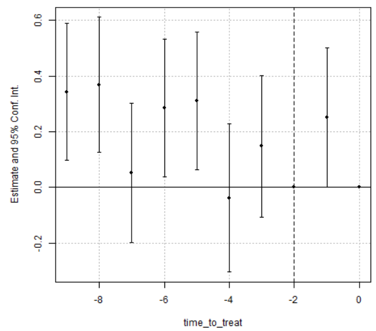

*Figuur C1.1.12 Keizersnede totaal*



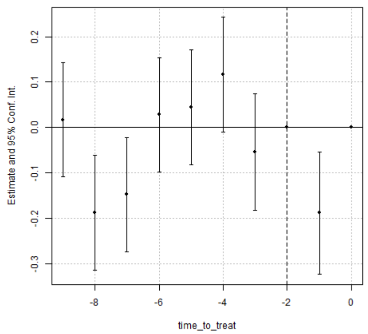

*Figuur C1.1.13 Keizersnede primair*



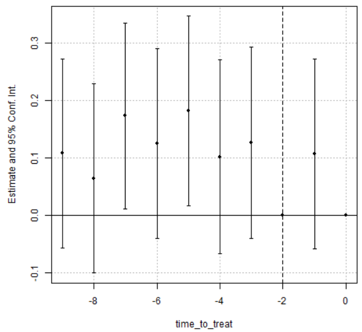

*Figuur C1.1.15 Kunstverlossing*



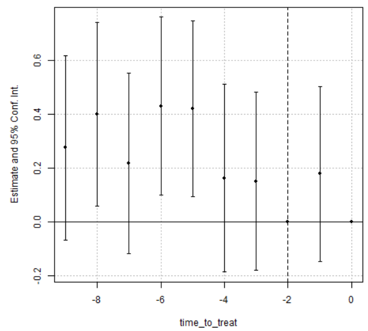

*Figuur C1.1.17 Ruptuur ernstig*



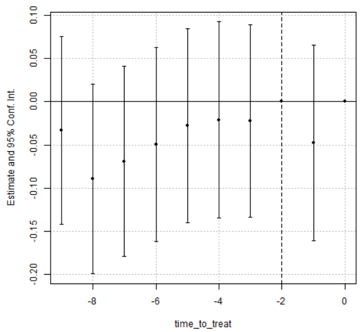

*Figuur C1.1.14 Keizersnede secundair*



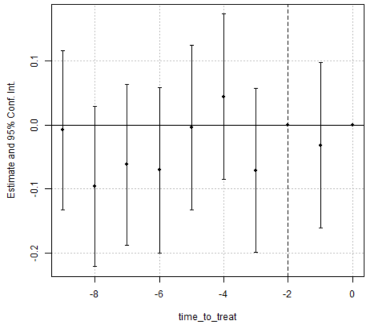

*Figuur C1.1.16 Fluxus*



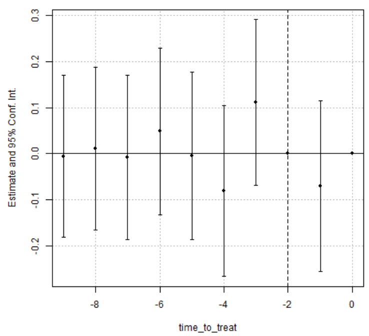

*Figuur C1.1.18 Lage apgar <7*



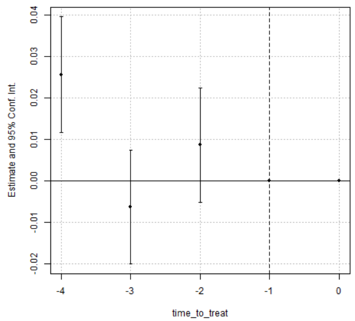

*Figuur C1.1.19 BIG2*




*Figuur C1.1.20 Laag geboortegewicht*

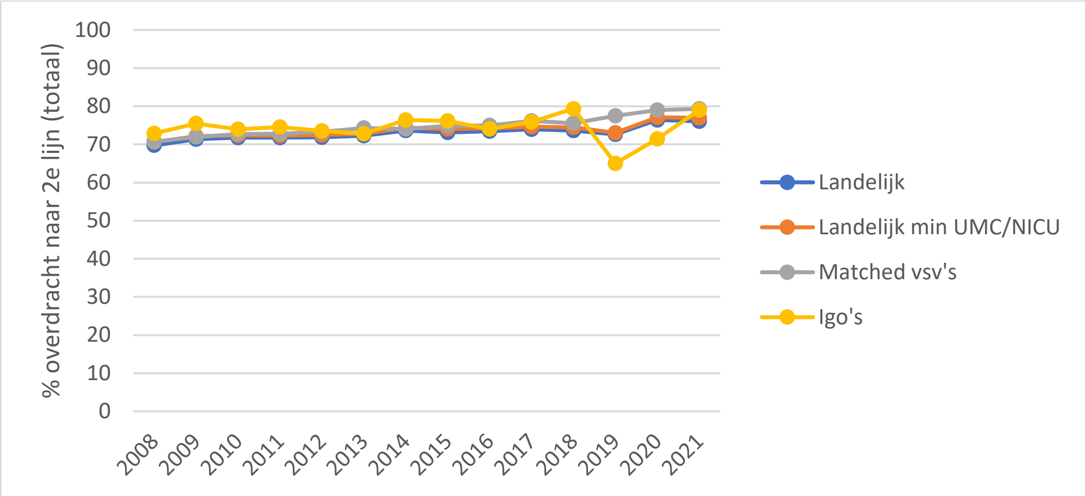



*Figuur C1.1.21 Vroeggeboorte*

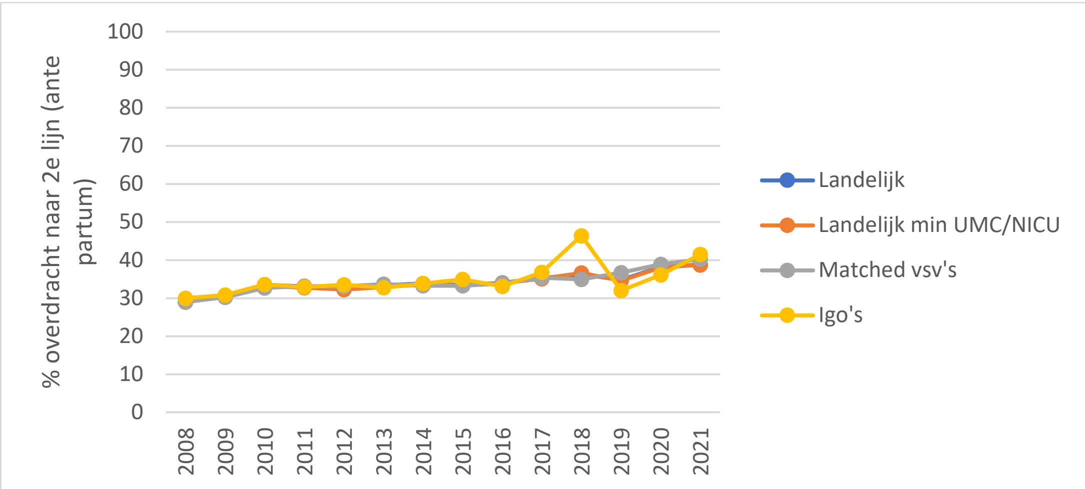



*Figuur C1.1.22 Zorguitgaven*

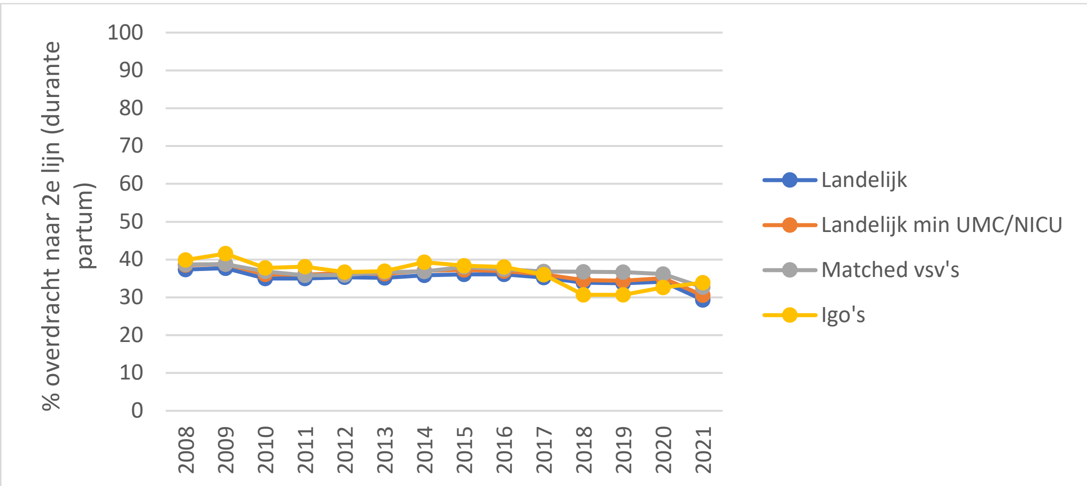
*Figuren C1.2 Trends in uitkomsten per jaar*



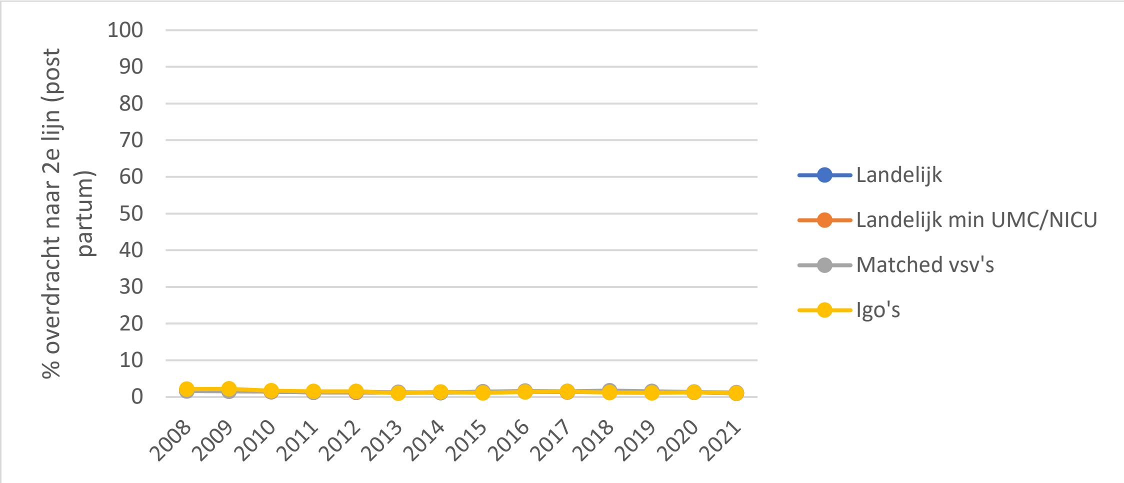

*Figuur C1.2.1 Overdracht 1ste naar 2de lijn – totaal*



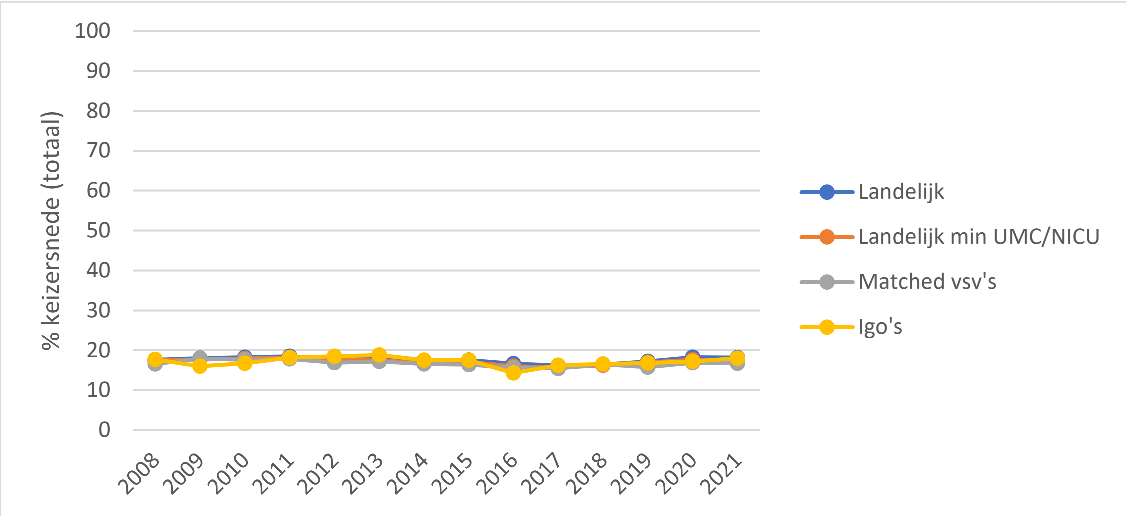

*Figuur C1.2.2 Overdracht 1ste naar 2de lijn – voor de bevalling*



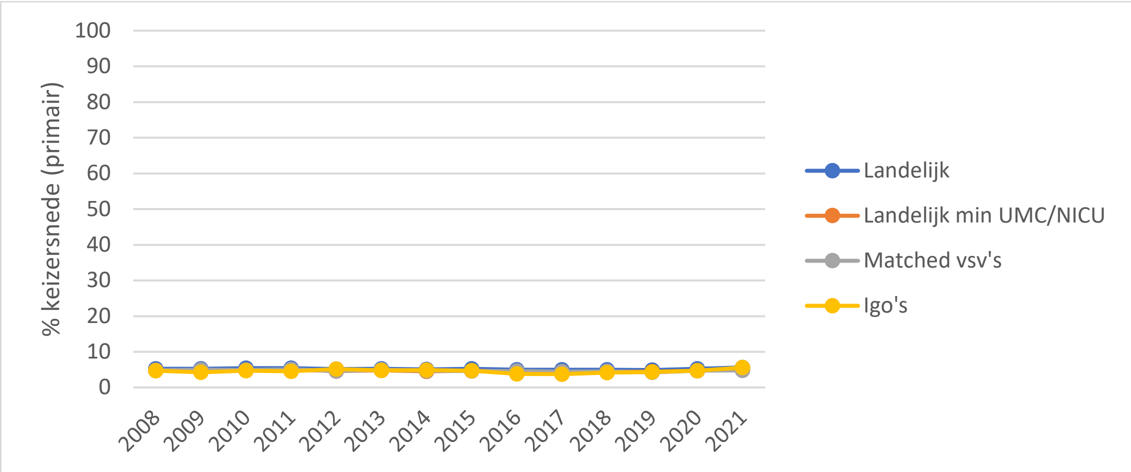

*Figuur C1.2.3 Overdracht 1ste naar 2de lijn – tijdens de bevalling*



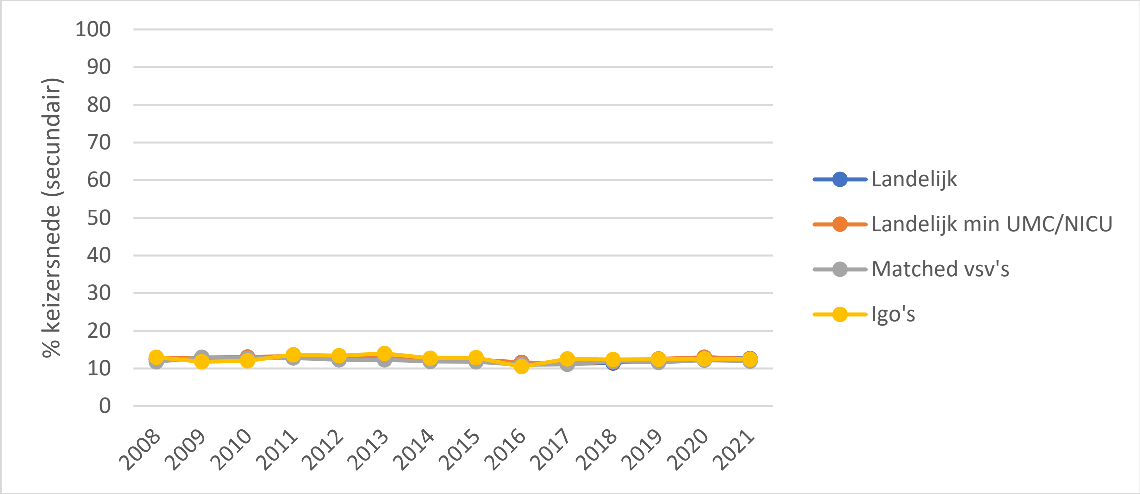

*Figuur C1.2.4 Overdracht 1ste naar 2de lijn – na de bevalling*



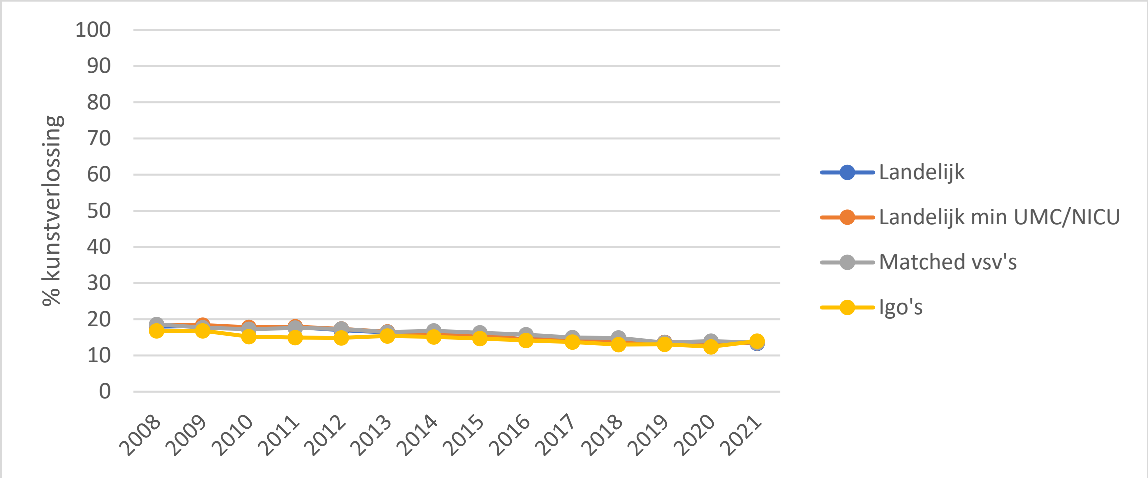

*Figuur C1.2.5 Keizersnede totaal*



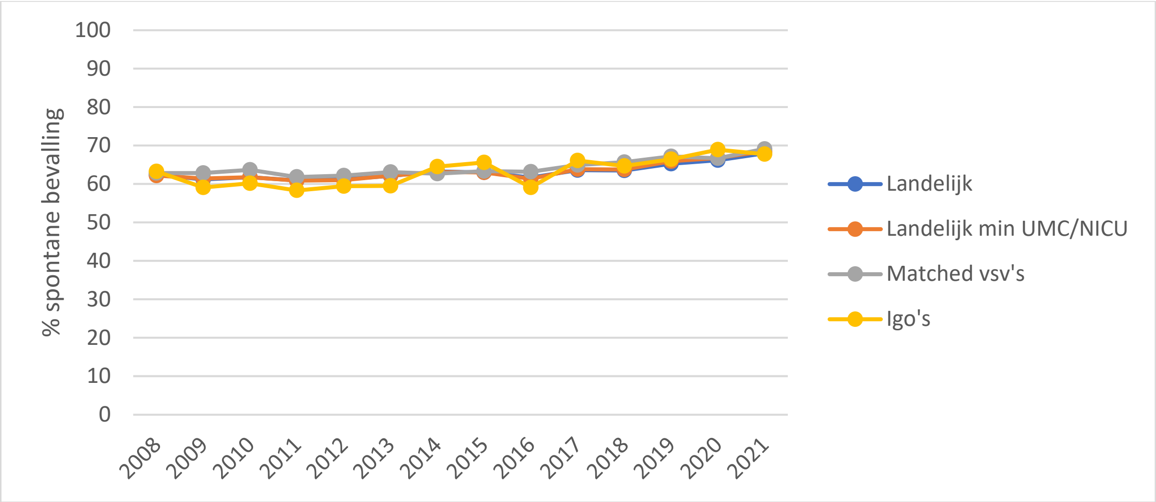

*Figuur C1.2.6 Keizersnede primair*



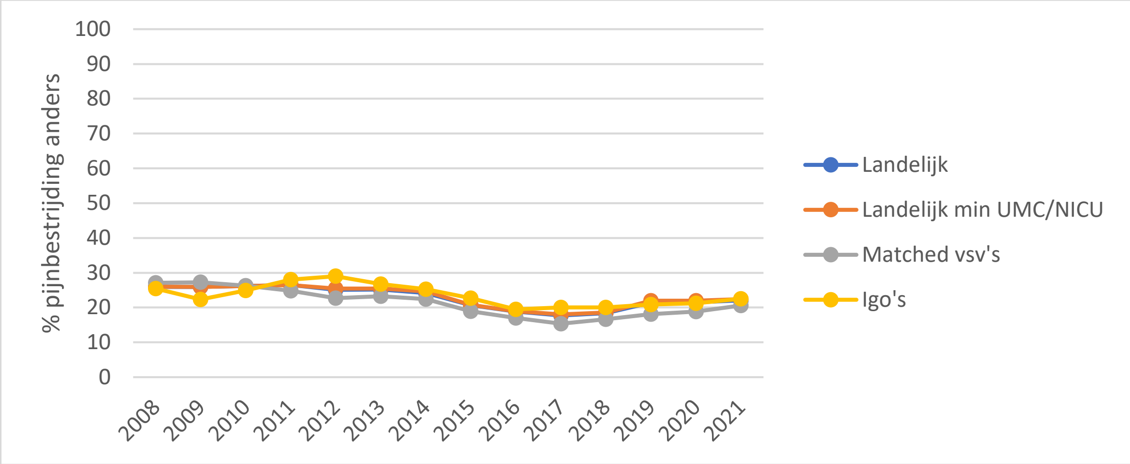

*Figuur C1.2.7 Keizersnede secundair*



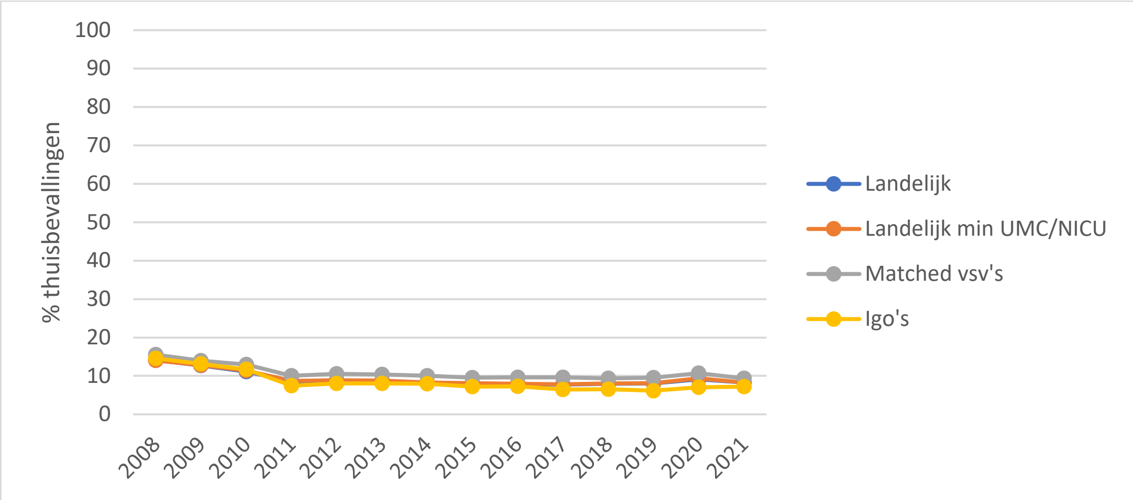

*Figuur C1.2.8 Kunstverlossing*



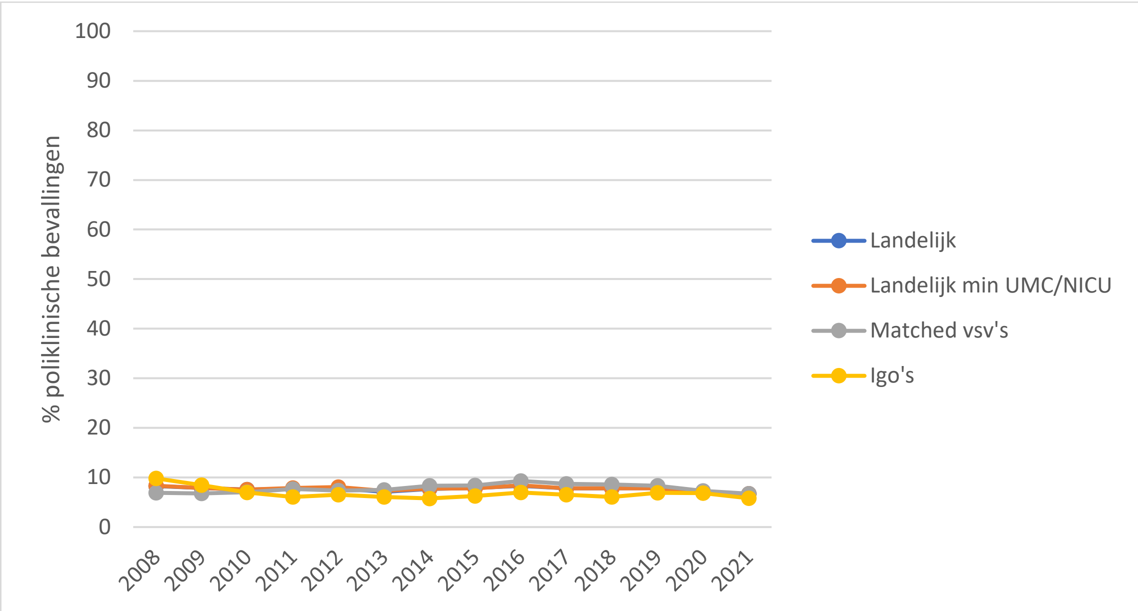

*Figuur C1.2.9 Spontane bevalling*



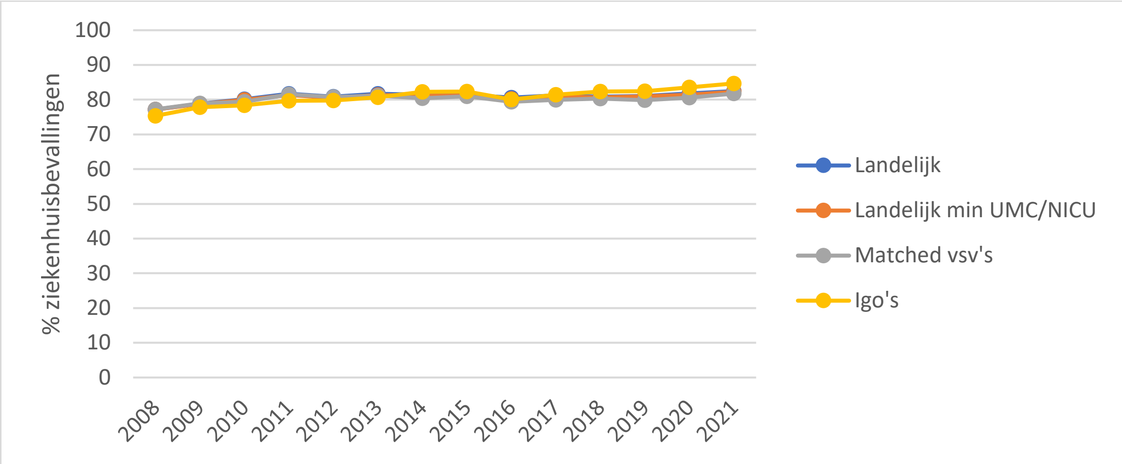

*Figuur C1.2.10 Pijnbestrijding anders dan epiduraal*



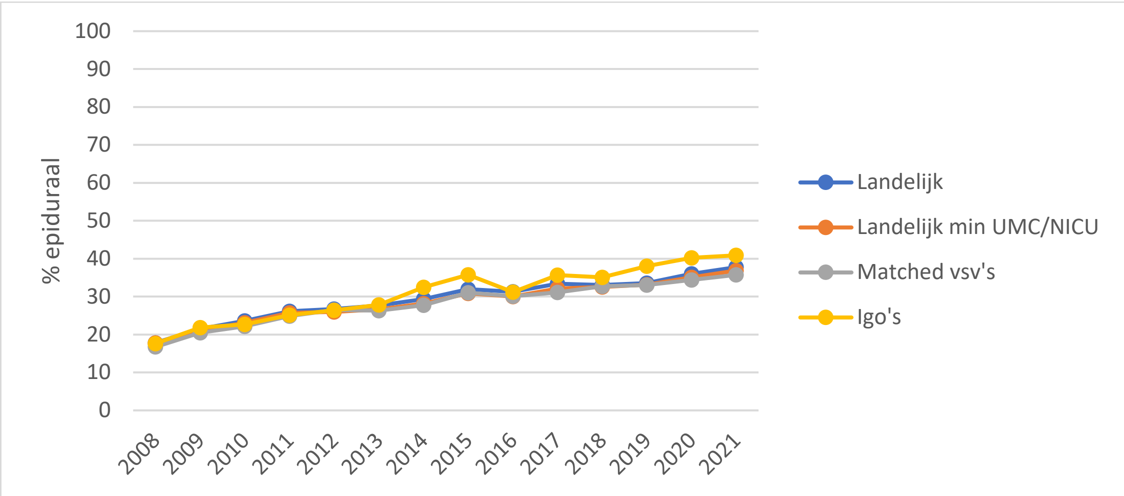

*Figuur C1.2.11Thuisbevalling*



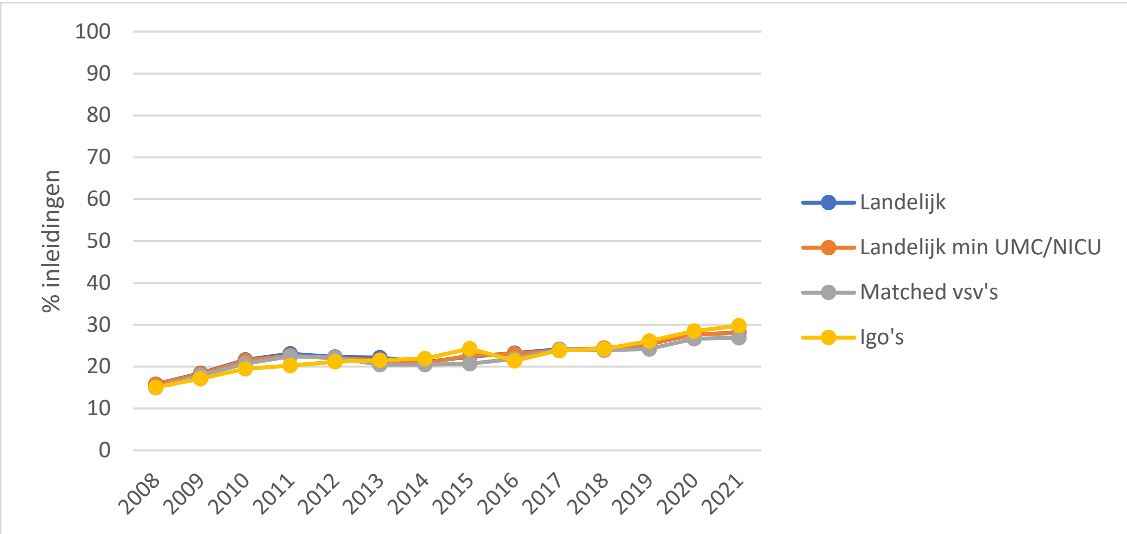

*Figuur C1.2.12 Poliklinische bevalling*



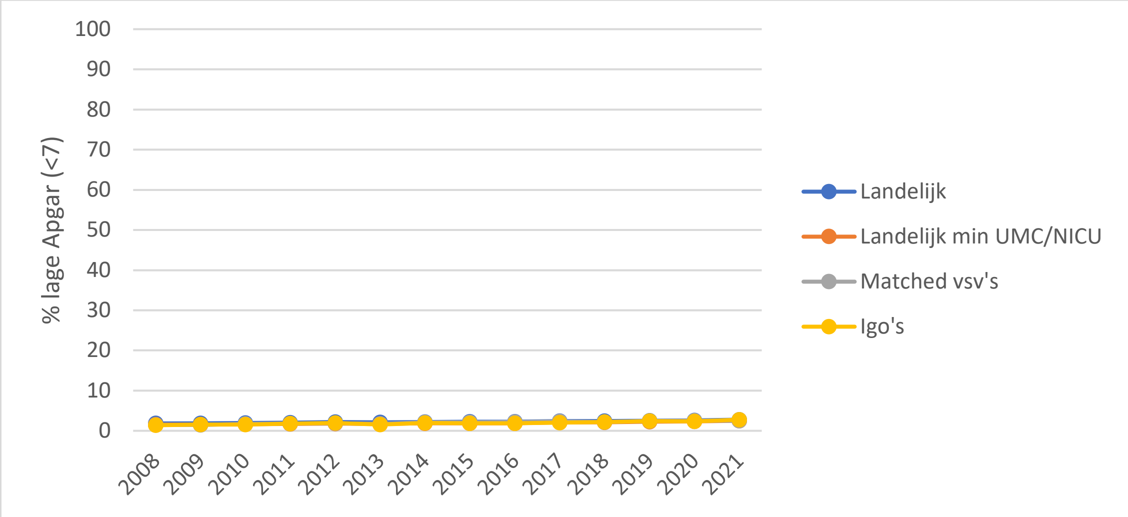

*Figuur C1.2.13 Ziekenhuisbevalling*



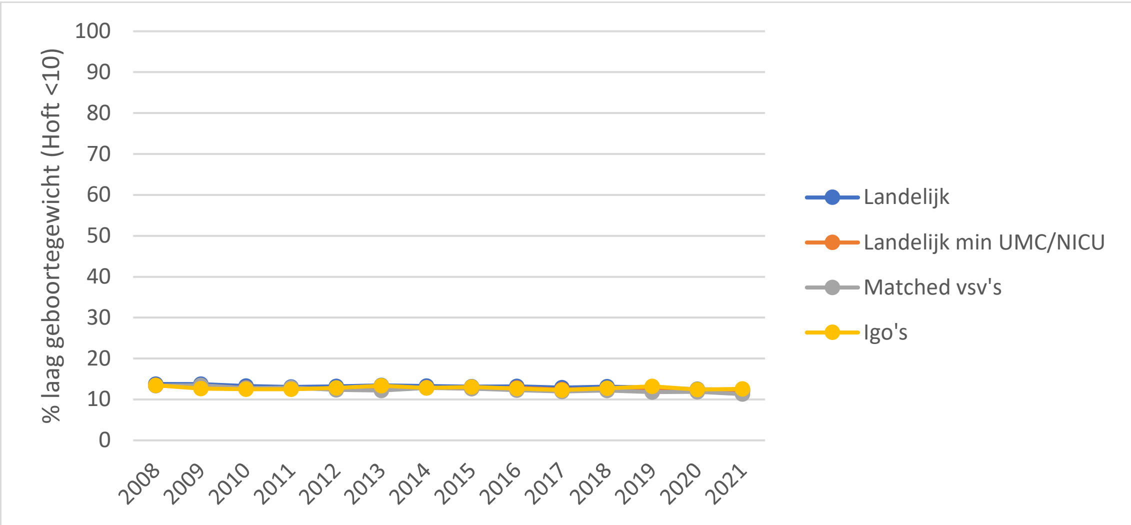

*Figuur C1.2.14 Epiduraal*



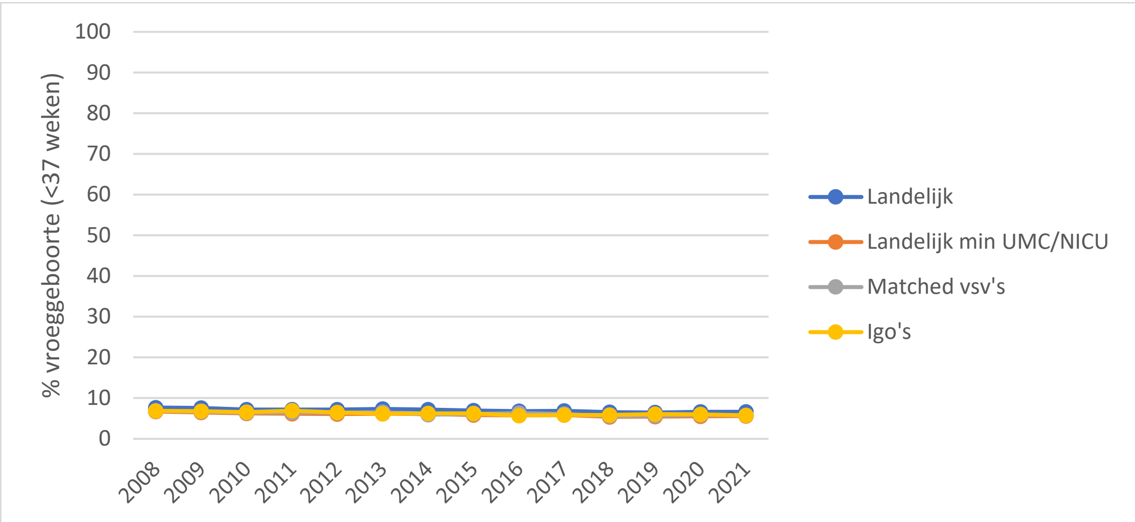

*Figuur C1.2.15 Inleiding*



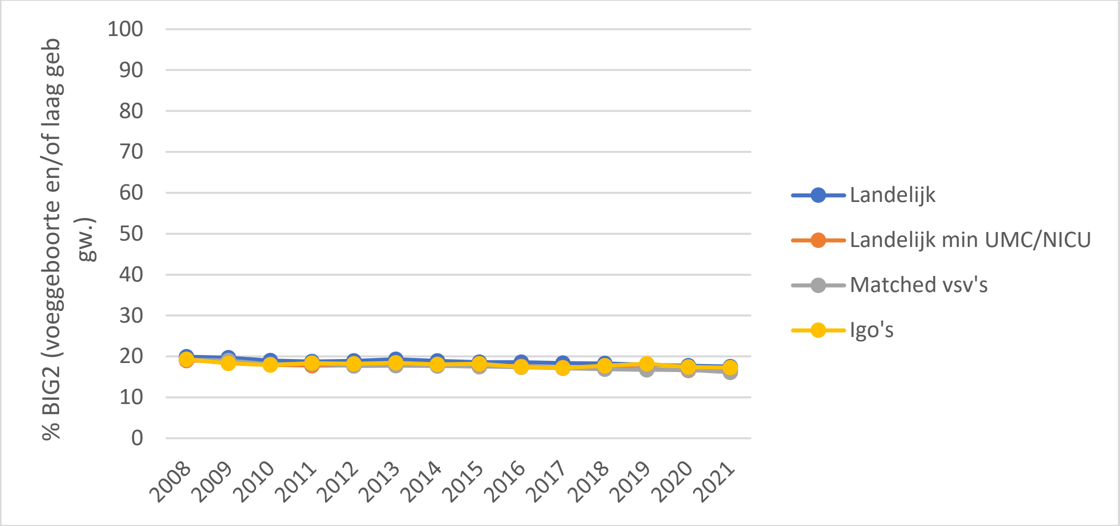

*Figuur C1.2.16 Lage Apgar (<7)*



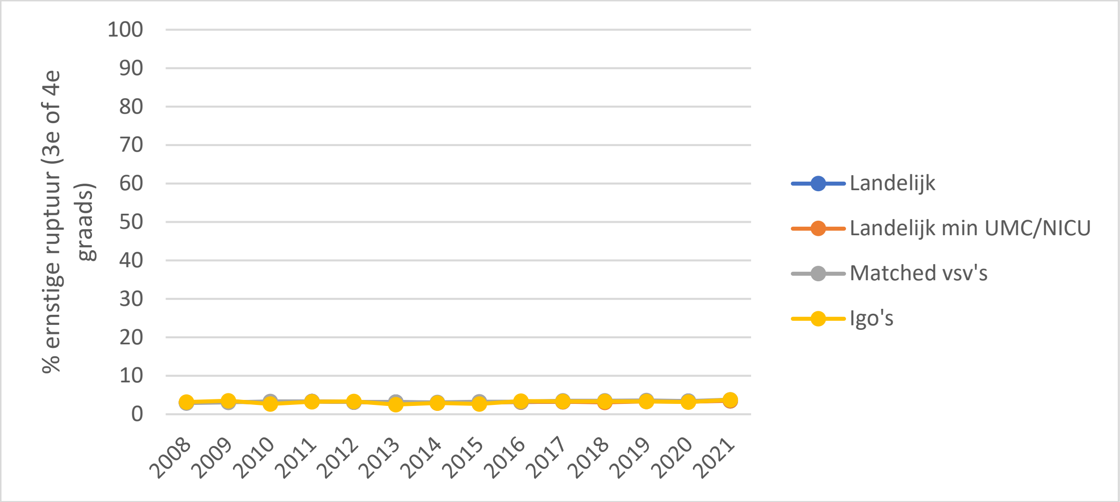

*Figuur C1.2.17 Laag geboortegewicht (Hoftiezer <10)*



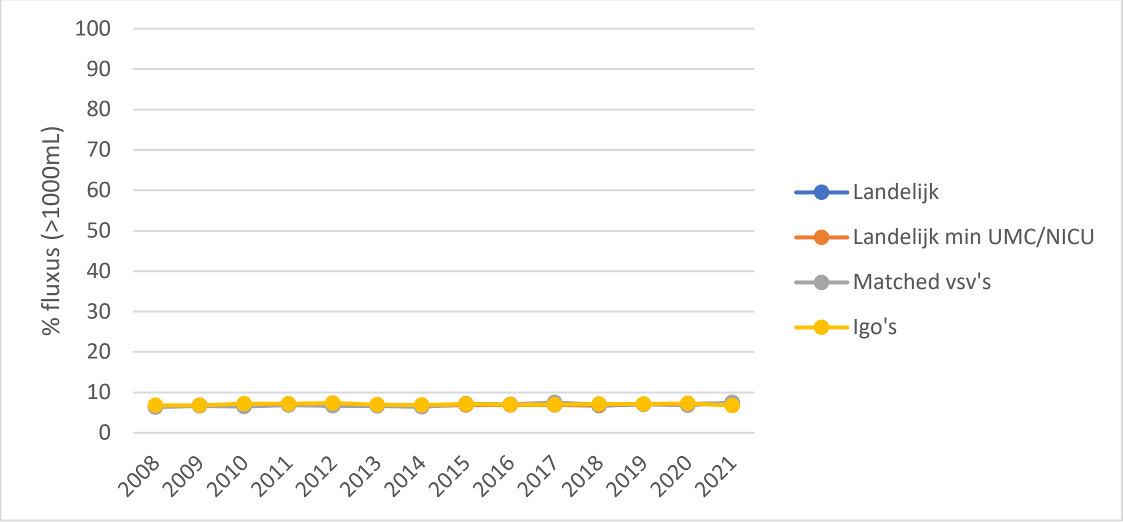

*Figuur C1.2.18 Vroeggeboorte (<37 weken)*



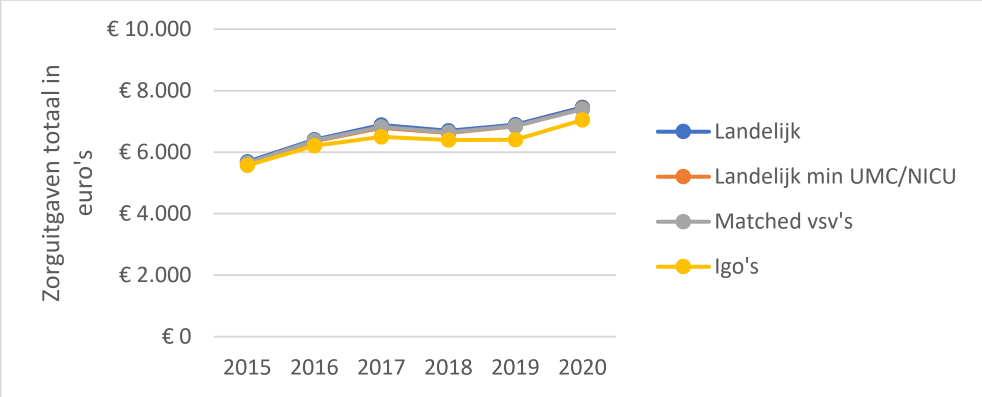

*Figuur C1.2.19 BIG2 (vroeggeboorte en/of laag geboortegewicht)*




*Figuur C1.2.20 Ernstige ruptuur (3e of 4e graads)*




*Figuur C1.2.21 Fluxus (>1000 mL)*

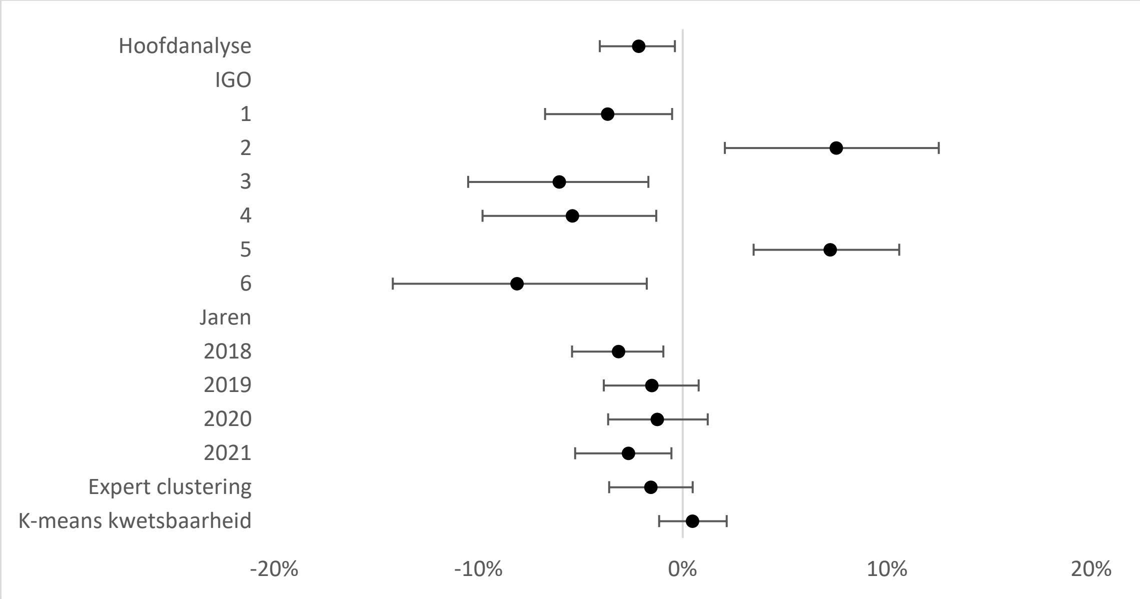



*Figuur C1.2.22 Zorguitgaven totaal (rondom zwangerschap, bevalling en kraamperiode)*

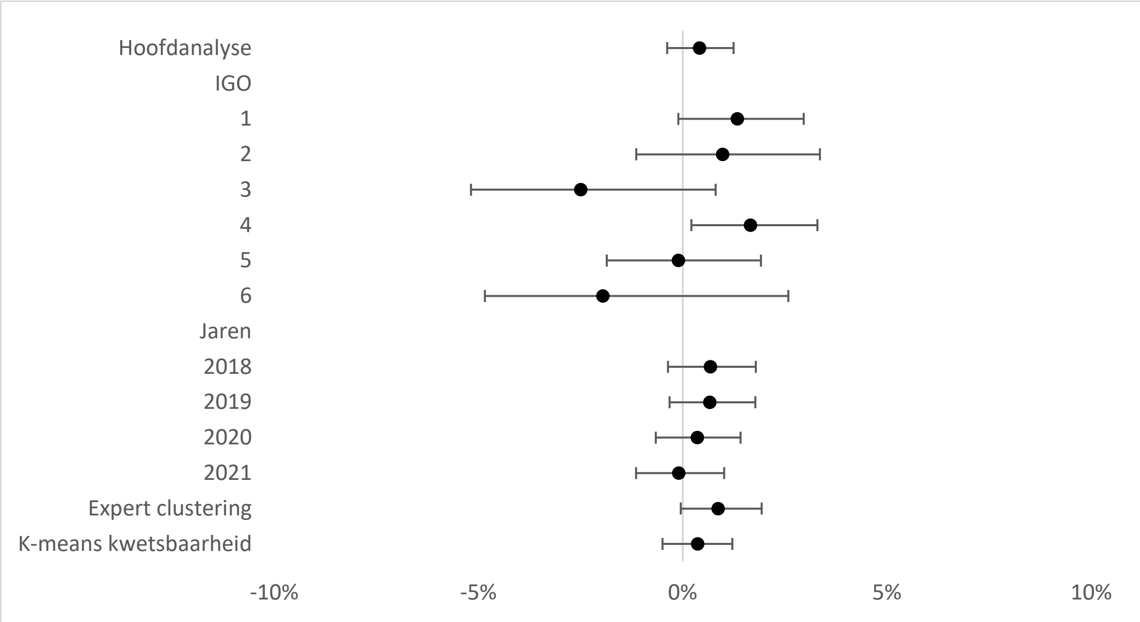
*Figuren C1.3: Resultaten uitgesplitst per IGO en per kalenderjaar (verdiepende analyses) en sensitiviteitsanalyses met alternatieve controlegroepen*

Om de resultaten gepresenteerd binnen deze rapportage te verifiëren zijn er verschillende verdiepings- en sensitiviteitsanalyses uitgevoerd. In de hoofdanalyse zijn de verschillende igo regio's gebundeld als ook de effect maten over de jaren 2018 tot en met 2021. In de onderstaande sectie zijn naast deze methodiek twee verdiepingsanalyses als ook twee sensitiviteitsanalyses uitgevoerd. De eerste verdiepende analyse richt zich op de effecten van de individuele igo regio's, clusters één tot en met zes. De tweede verdiepende analyse richt zich op de effecten over de specifieke jaren, 2018 tot en met 2021, uitgezonderd zorgkosten waarbij er gekeken wordt naar de jaren 2018 tot en met 2021.

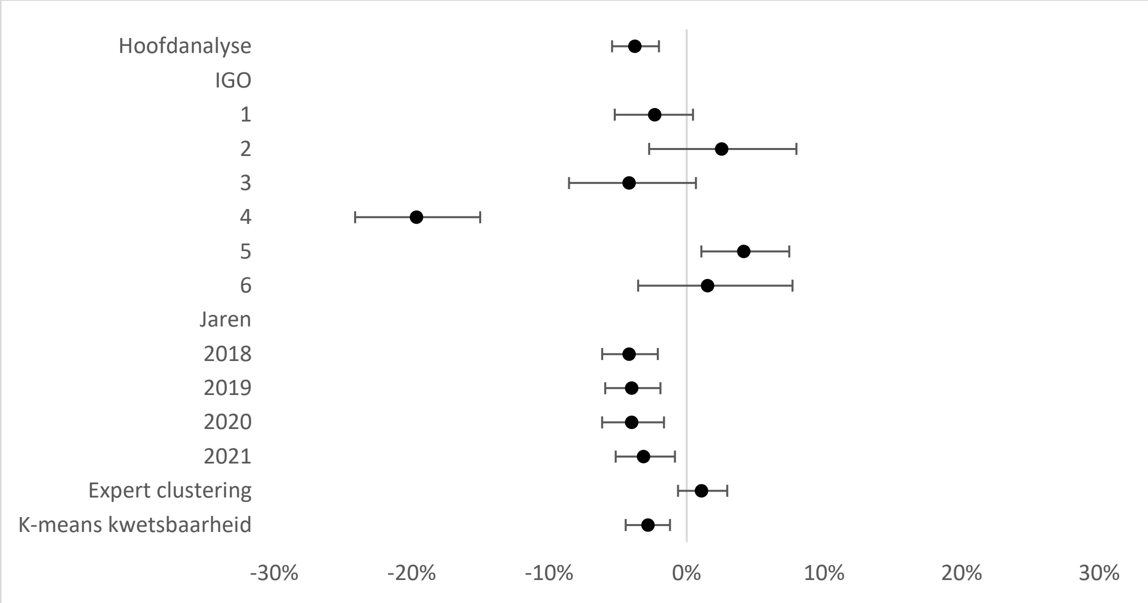
Een sensitiviteitsanalyse is uitgevoerd waarbij de igo regio's worden vergeleken met goed samenwerkende vsv regio's, deze regio's zijn op basis van expert kennis bepaald. Ten tweede is er gekeken welk effect een andere matchingsvariabele heeft op het resultaat van de k-means clustering. Hierbij is gematcht op het aandeel meervoudig kwetsbare vrouwen in een regio en het aantal zwangerschappen per jaar in een regio (dit is hetzelfde als bij de initiële matching).



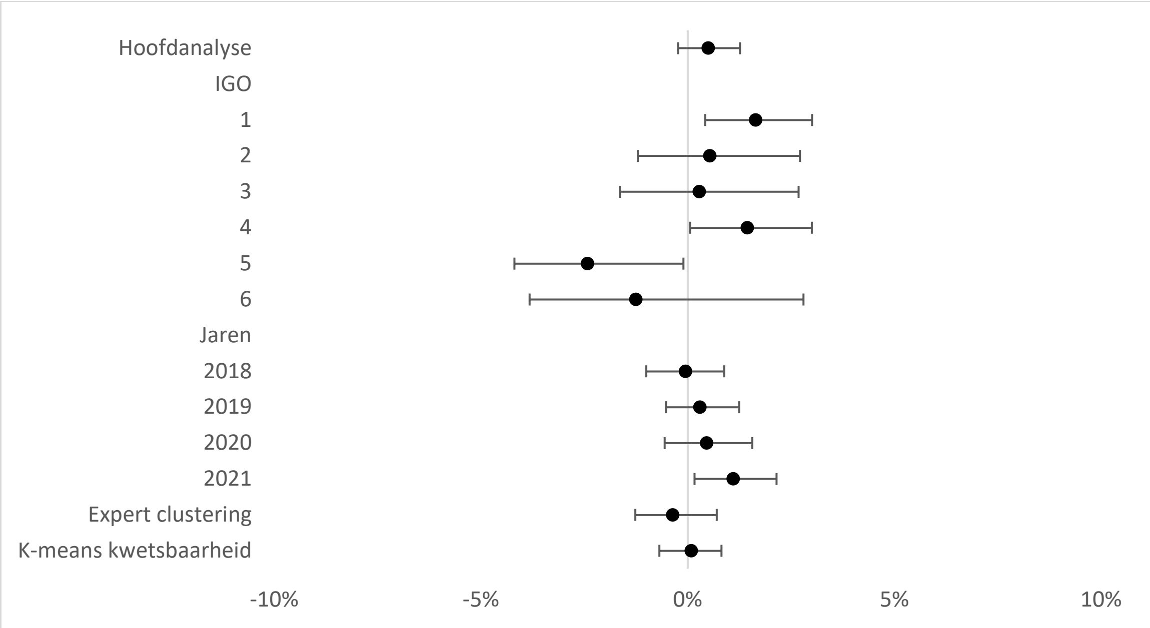
*Figuur C1.3.1 Epiduraal*



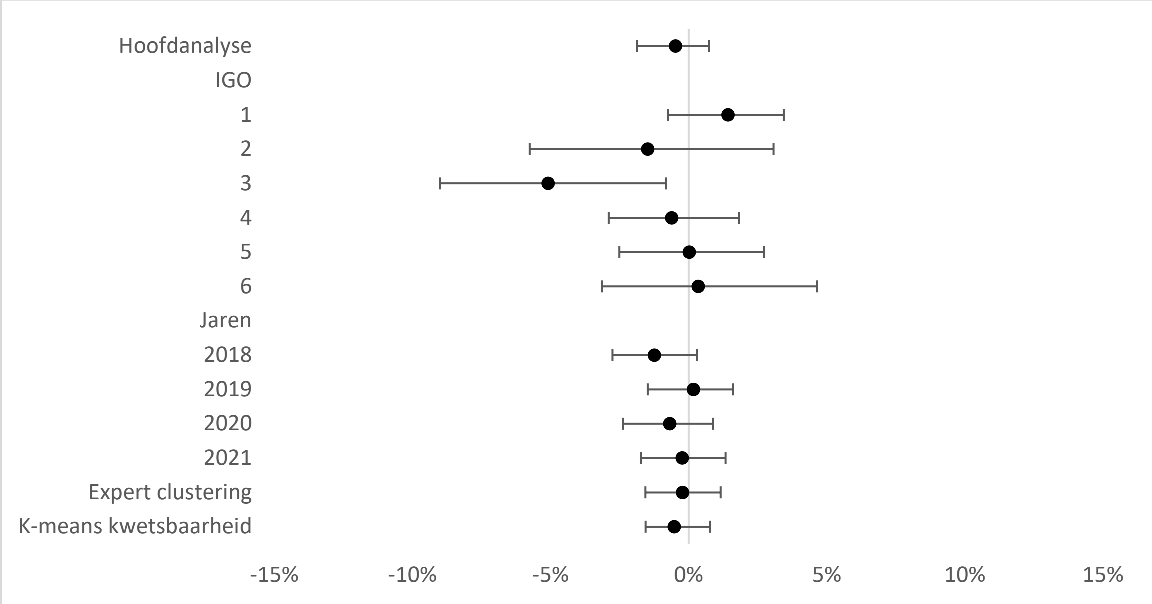
*Figuur C1.3.2 Fluxus*



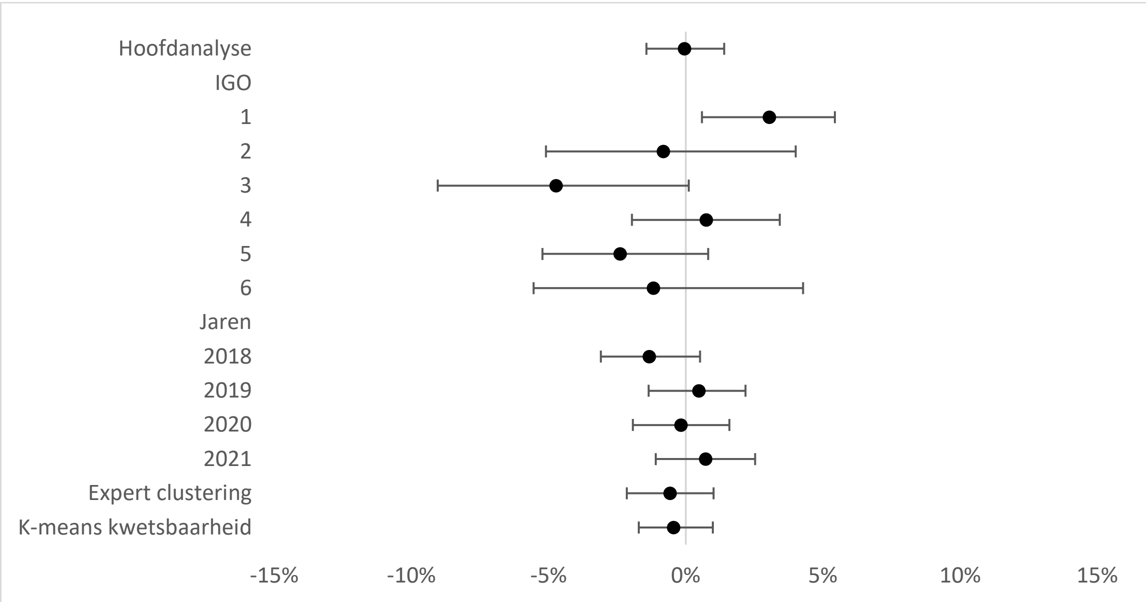

*Figuur C1.3.3 Inleiding*



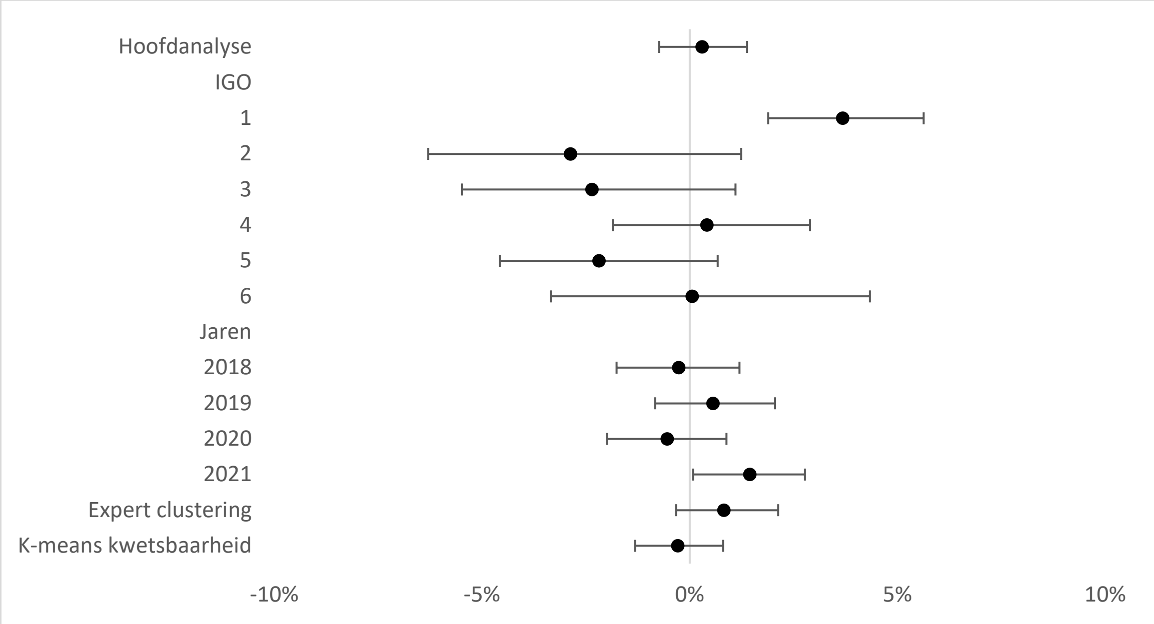

*Figuur C1.3.4 Keizersnede primair*



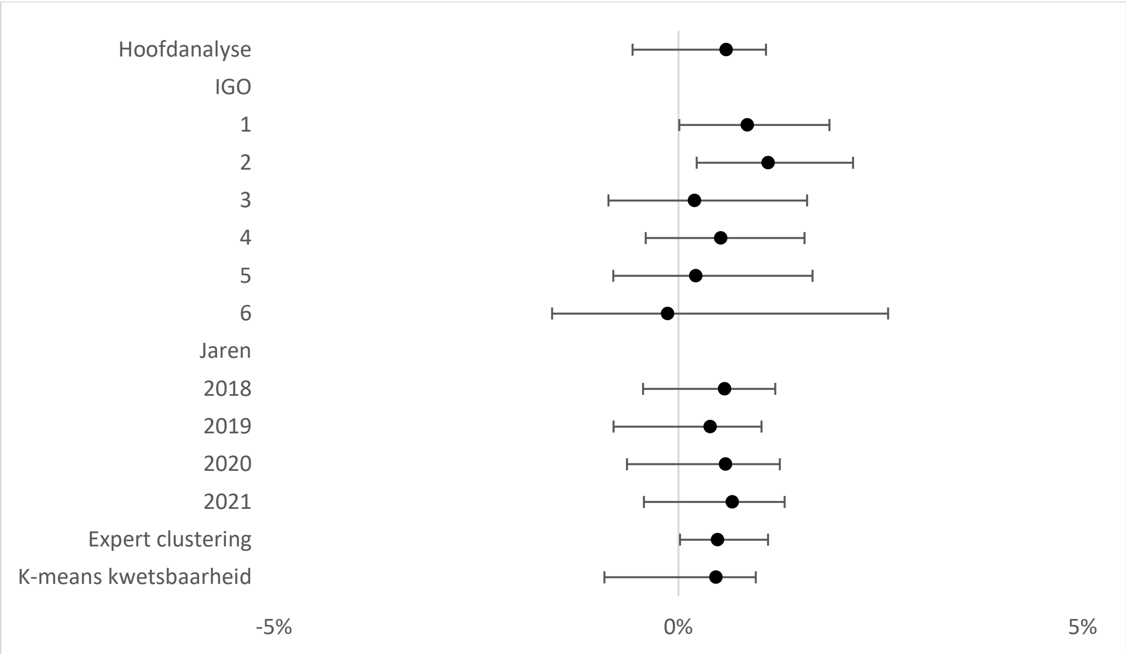

*Figuur C1.3.5 Keizersnede secundair*



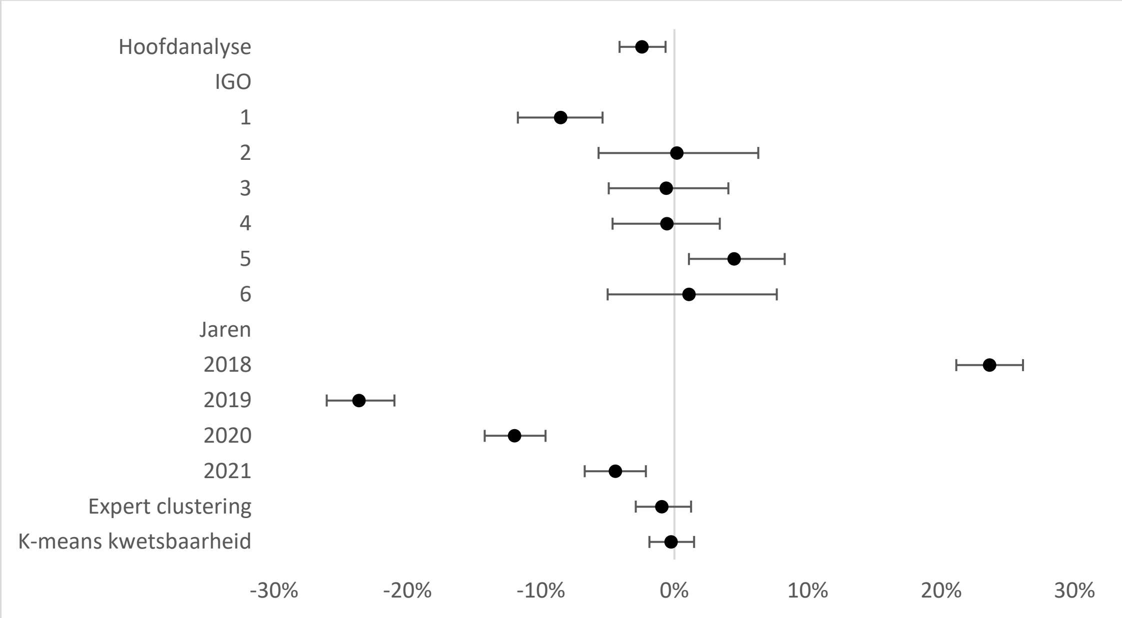

*Figuur C1.3.6 Keizersnede totaal*



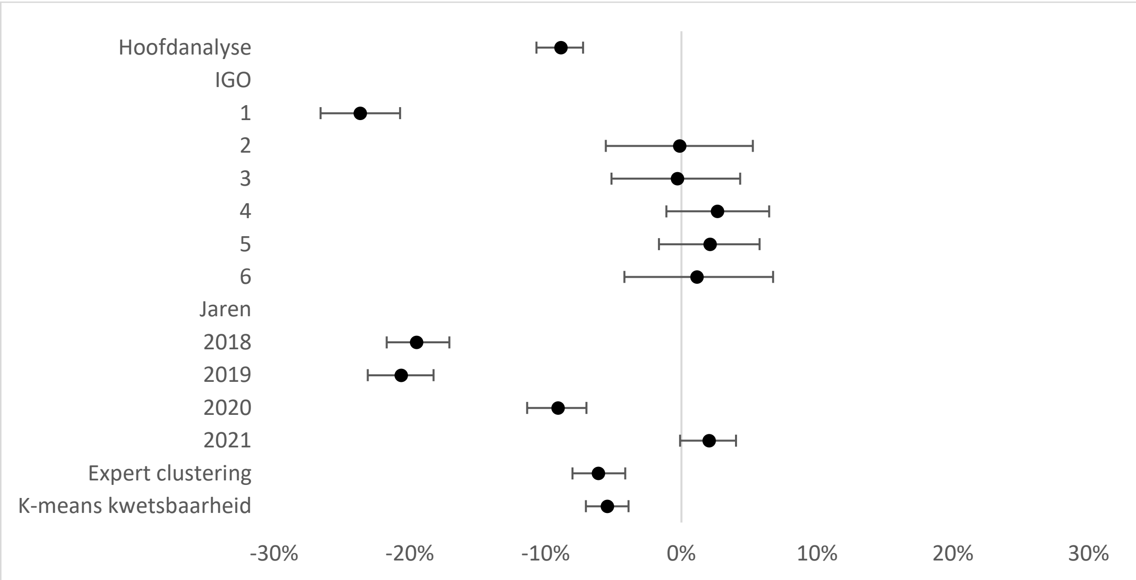

*Figuur C1.3.7 Kunstverlossing*



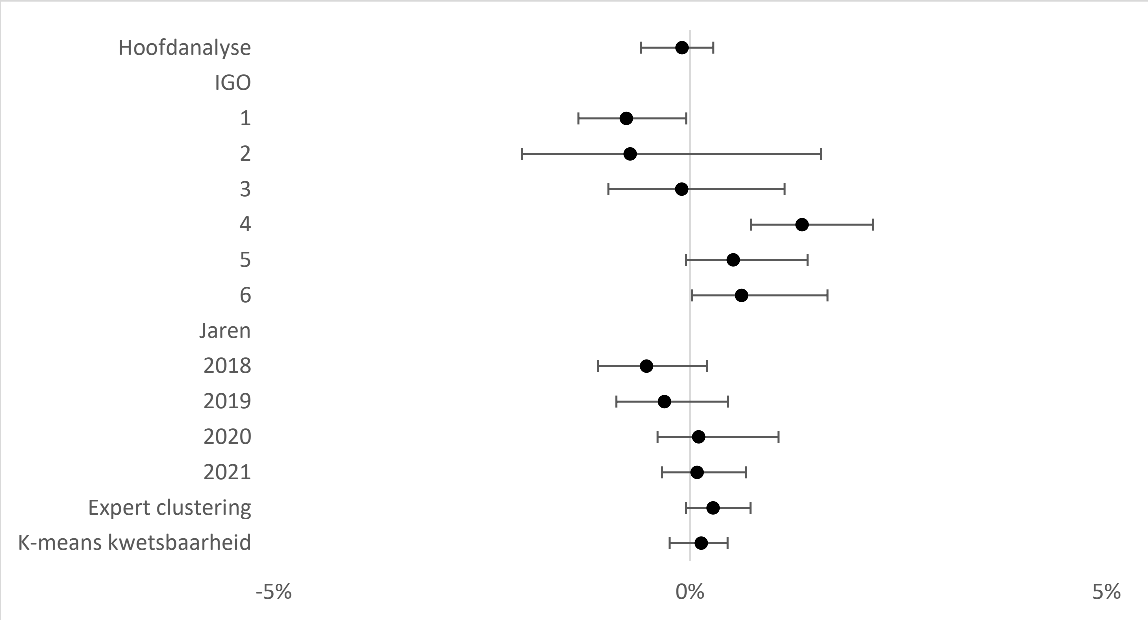

*Figuur C1.3.8 Lage Apgar <7*



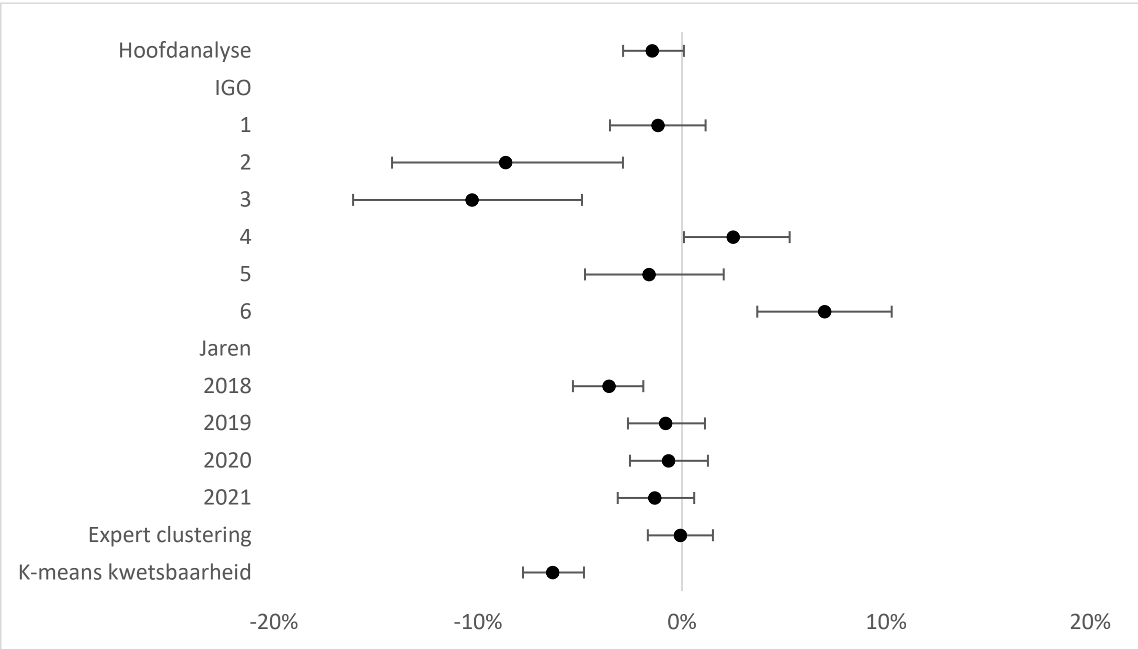

*Figuur C1.3.9 Overdracht 1ste naar 2de lijn – ante partum*



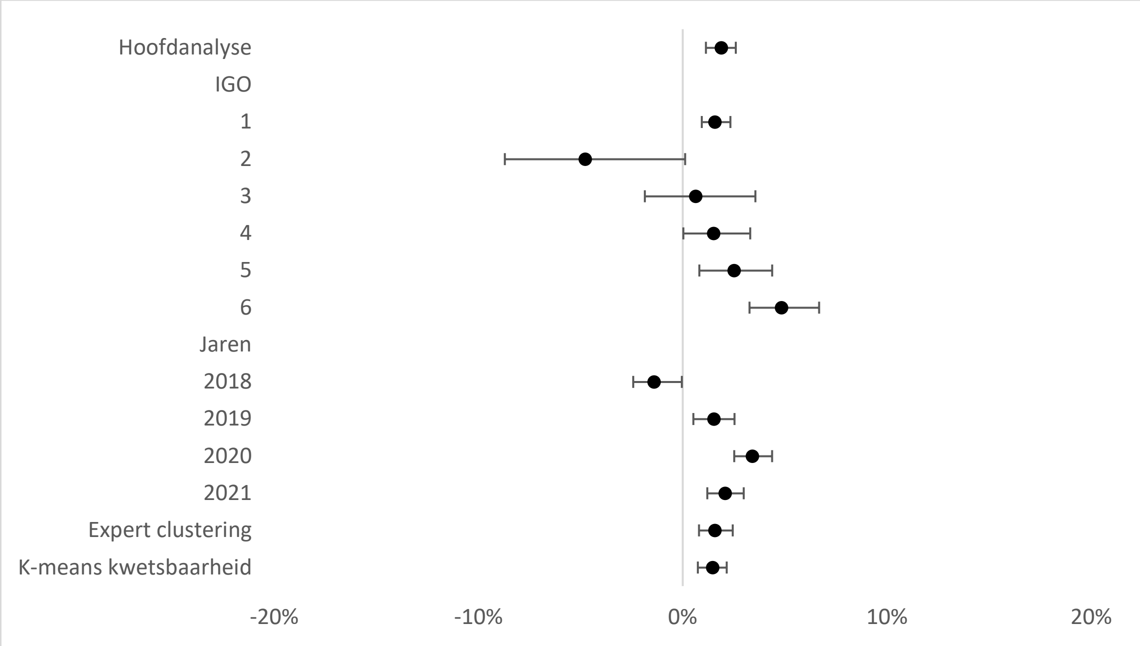

*Figuur C1.3.10 Overdracht 1ste naar 2de lijn – durante partum*



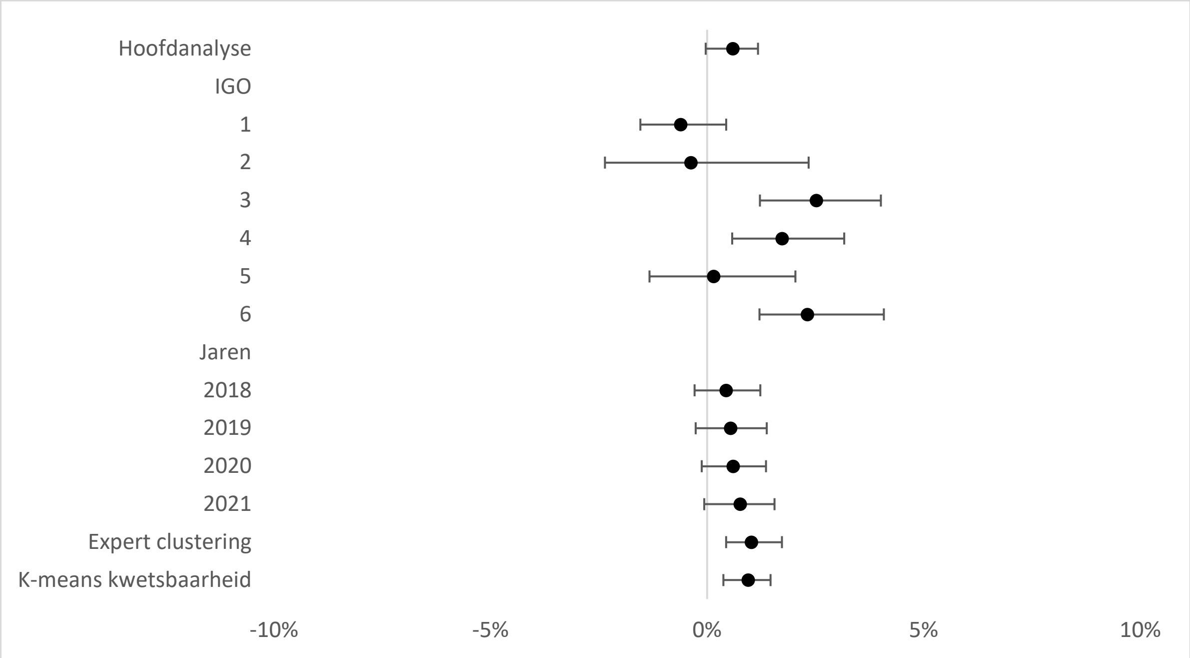

*Figuur C1.3.11 Overdracht 1ste naar 2de lijn – post partum*



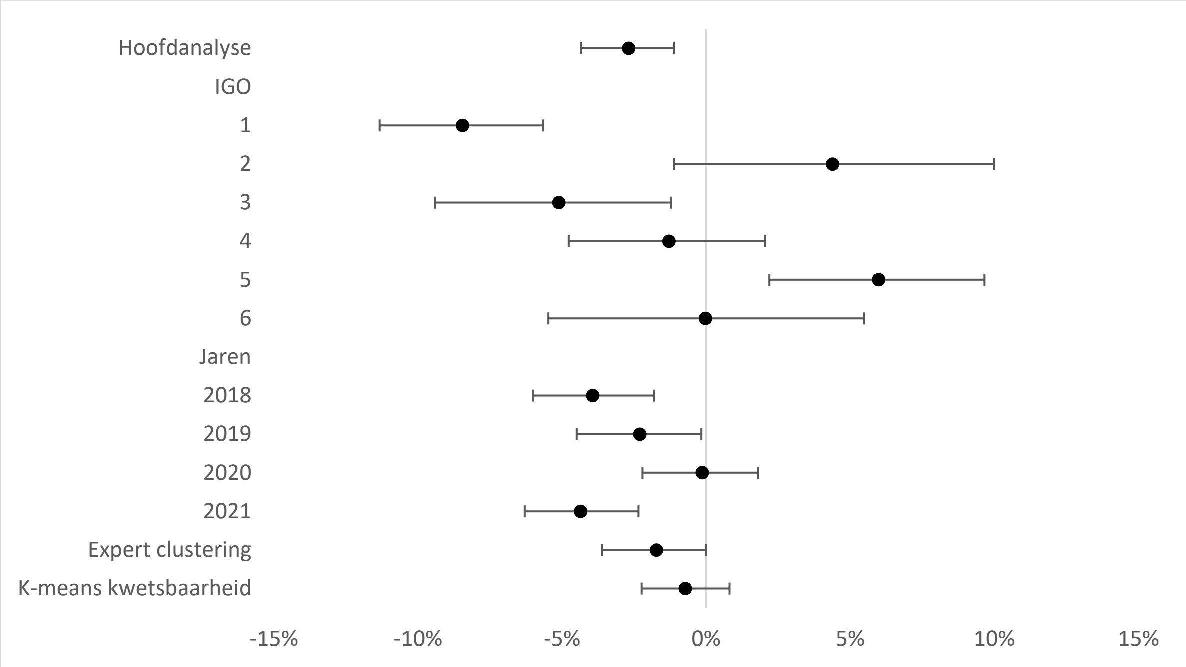

*Figuur C1.3.12 Pijnbestrijding anders*



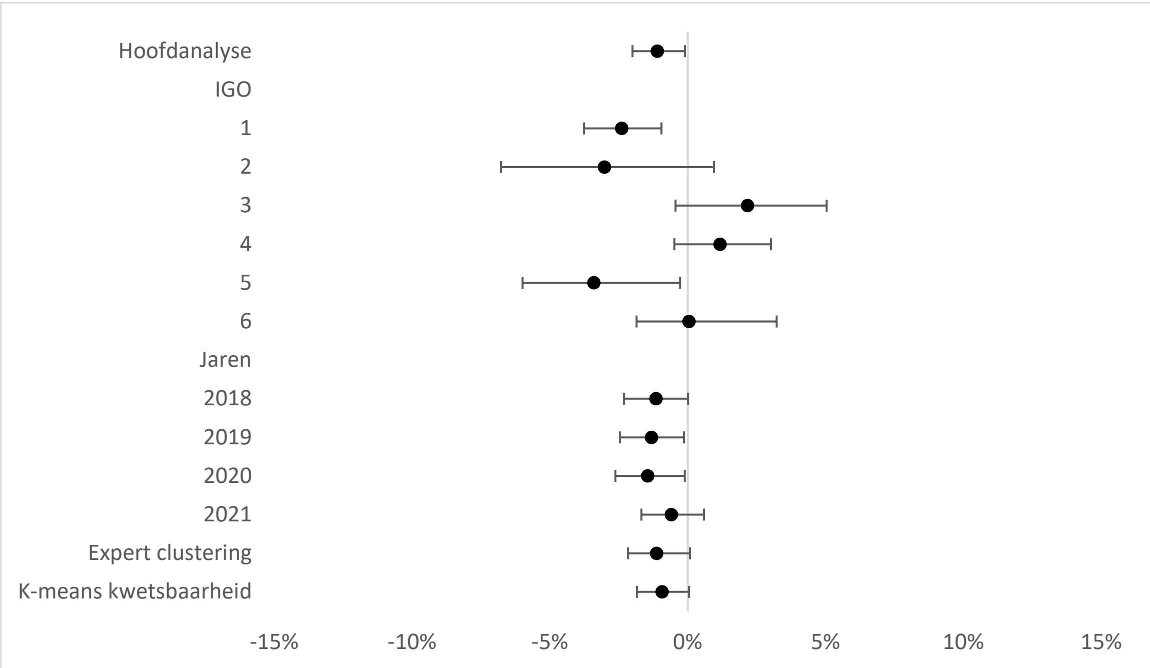

*Figuur C1.3.13 Poliklinische bevallingen*



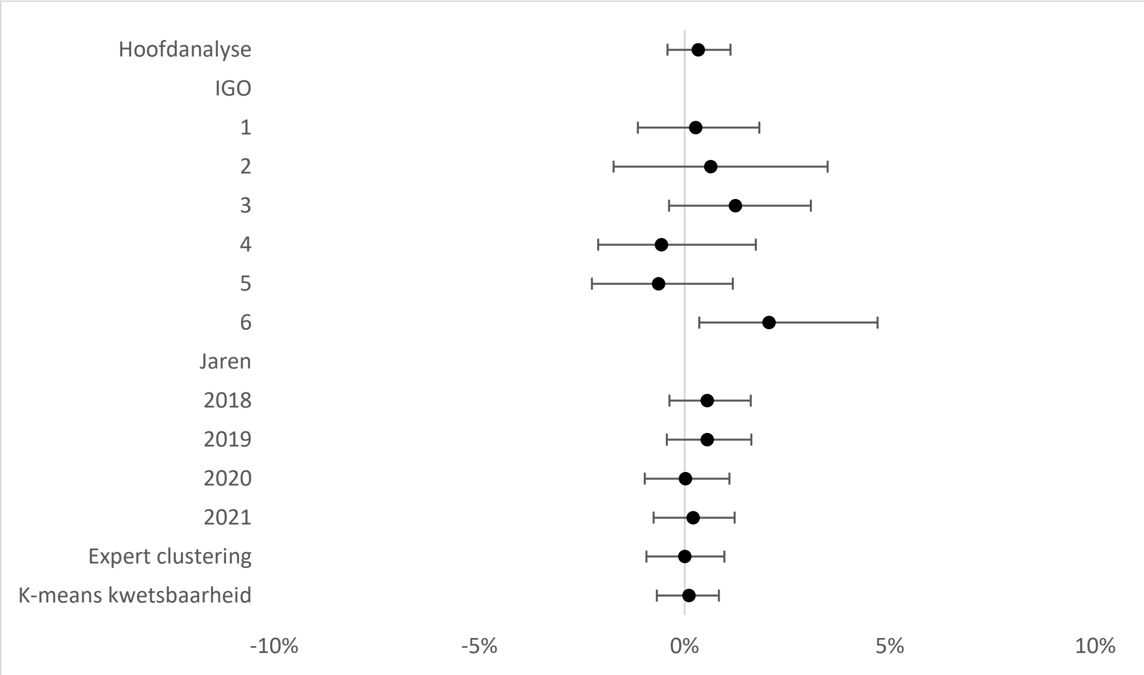

*Figuur C1.3.14 Ruptuur ernstig (3e/4e graads)*



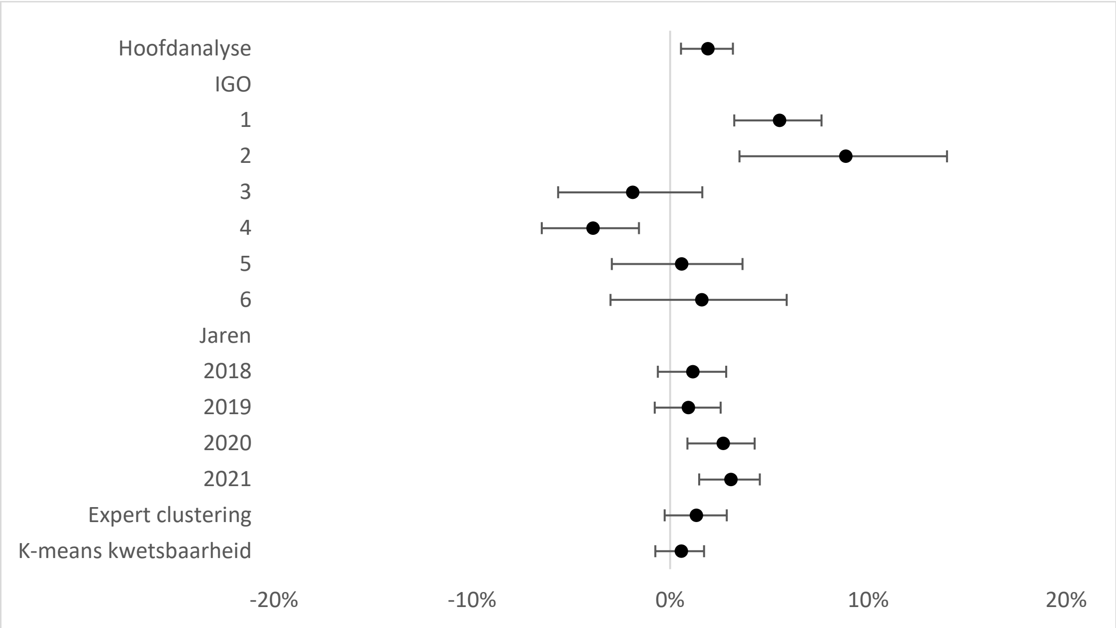

*Figuur C1.3.15 Spontane bevalling*




*Figuur C1.3.16 Thuisbevalling*




*Figuur C1.3.17 Vroeggeboorte*




*Figuur C1.3.18 Ziekenhuisbevalling*