

OBSTACLES IN A PERFORMANCE MEASUREMENT SYSTEM IMPLEMENTATION

This project is about the obstacles one faces when implementing a performance measurement system in an organization.

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Preface

This report is the result of my bachelor thesis project for the study Economics & Informatics at the Erasmus University Rotterdam. At first, I had no clear idea what subject was suitable for me to do research on for my thesis project. After consultation with the thesis coordinator for E&I, Uzay Kaymak, I decided to do my research at GGzE. I had no experience at all with the mental health care sector, but I thought it would be an interesting field for doing research.

At the beginning of the project the main goal was to look into their implementation process of a performance measurement system and identify the difficulties they had to cope with. When doing the research some basic implementation problems showed up. So the goal slightly expanded from only identifying and describing the challenges, towards giving a basis for solving these problems also.

Further, I would like to thank my supervisors for their support, feedback and input during this project. I would thank Uzay Kaymak for his feedback and his criticism on the report.

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1. Introduction

1.1 Problem definition

In the Netherlands a large number of people are in need of mental health care. In the year 2009 936.887 clients were in treatment within a GGZ (Geestelijke GezondheidsZorg, Dutch abbreviation for mental health care) institution. According to the latest available data, this number is growing over the past years (12% from 2007 to 2009) and is expected to grow further.

In order to meet this growing demand for mental health care business processes need to be as efficient as possible. That's why it is important to have clear insight in the processes regarding patient treatment. Performance measurement systems (PMS) can help in giving better insight in the process. However, in practice it is hard to get the right definitions and correct data for obtaining the desired information.

According to their mission statement, GGzE is a mental health care provider which aims to treat patients efficiently and effectively. One of their goals is to have insight in the demand and the results of their processes. They started a pilot with a PMS to create better insight in their processes. While implementing the system they ran into some difficulties. At this moment it is sometimes hard to interpret the outcome. This is mainly because there is no clear insight into what part of the basic data is included in the calculations, and what the included data mean. Because of the gap between the desired information output and the current situation there is a need for structuring the data.

1.2 Objectives

The main objective for this research project is to get better insight in the validity of the information that is obtained by a performance measurement system. Therefore it is important to have clear definitions and a good overview what happens within the system. This study focuses on the GGzE measurement system and tries to extract the bottlenecks of this PMS implementation.

Determine and document the pitfalls for implementing a performance measurement system.

In order to get better insight in the information a PMS provides, it is useful to cope with the problems that arise when implementing a PMS. Therefore it is necessary to get insight in the problems that are known or occurring when using the PMS. The main focus is on how data can be used in the PMS.

Do a case study at GGzE into their performance measurement system and improve their performance tool where necessary.

In the current situation GGzE uses a PMS that is based on previous research (2011, Performance Measurement in Mental Healthcare, L.C.G. Pieters). This performance system gives information about certain processes. But some of the given information is ambiguous. It should be clear which part of the data is used in the calculations of the performance indicators, and how valid the used data is. So the system has to be updated during the process of analyzing the data and the calculations. If necessary, new performance indicators will be defined and implemented in the system.

1.3 Research question

The central research question for this project can be formulated as:

“What are the obstacles when implementing a performance measurement system in a mental health care institute?”

In order to be able to answer this question a few sub questions can be asked. The sub questions for this project are:

- What are the known problems in literature when implementing a PMS?
- What are the problems in practice at GGzE?
- How can these problems be solved?
- What can be concluded from this case study when implementing a PMS in a mental health care institute?

1.4 Methodology

In order to answer the research question and the sub questions it is necessary to know something about Performance Measurement Systems in mental health care. Digital databases like Google Scholar and digital university databases will be searched for useful literature about this subject. Because performance measurement nowadays is directly linked to performance indicators (KPI), these indicators are also part of the literature study.

The study of the PMS at GGzE is a continuation of a previous project about performance measurement. (Pieters, 2011). Therefore the literature that is used for that research is also relevant to this project. Some information that is gathered during this project is also used. In cooperation with the Research & Development (R&D) department of GGzE this data was updated or extended when needed. Also other prior research at GGzE was gathered and used when necessary.

The data that is used in the PMS at GGzE is stored in a database. This database is available and used for this project. The data is analyzed and checked. If the data is ambiguous or the meaning of the data is not clear, an explanation of these information is asked to and given by the R&D department of GGzE. Data that has no influence on the outcome of the performance measurement, and provide no other useful information is considered as irrelevant and is not used in the calculations of the performance of GGzE.

The data is analyzed and categorized and used to build a model to clarify the underlying structure of the data. By performing some checks on the data, the validity is checked.

Only valid data is used to create visualizations of the performance of the data.

The software tool that is used by GGzE to visualize the outcome of the calculations of the performance indicators is MagnaView. This project also uses this software tool to visualize important pieces of information for GGzE.

To be able to build further on previous research and on an already existing part of programming in MagnaView by GGzE, there has been regular contact with the R&D department at GGzE. In addition to this a meeting with the MagnaView staff is planned in order to gain more knowledge of the program.

1.5 Scope

Performance measurement is commonly used nowadays, in business as well as in the health care system. The scope of this project is not the implementation of performance

measurement systems in general, but the focus is only on mental health care. So the used literature will be on mental health care problems. More common challenges of implementing a PMS in other parts of the market are left out of this research

The final delivery of this project will be a BSc thesis about Performance Measurement Systems in mental health care, which focuses on the GGzE. The deliverable that is included in this thesis project is an improved reporting tool for the researchers at GGzE that gives better information about the important processes for this mental health care clinic and creates more insight in the process of obtaining this information. Therefore the data will be analyzed and explained whenever necessary. For this project only the given database will be used. The way how data is gathered for this database is beyond the scope of this project.

The improved tool will be based on the tool that is used when starting this project. The improved tool aims to deliver better and clearer information about the processes, but will not be a final application.

In chapter 2 a short overview of the relevant literature is given. This will give an idea about performance measurement implementation in general.

The measurement tool that is used by the GGzE, MagnaView, is discussed in the third chapter.

After some explanation of MagnaView a new performance indicator is introduced in chapter 4. Both the visualization and the definition of this indicator can be found there. The next chapter is about performance measurement systems in practice. This chapter reviews the use of MagnaView as well as the underlying database structure.

The final chapter lists the conclusions, and gives some recommendations on basis of the research.

2. Literature review

2.1 Identification of papers

In order to find other relevant academic papers Google Scholar is used to search through internet databases of universities, papers and other institutions. The ISI Web of Science is also used to find interesting research papers on this topic. Some background literature about (implementation of) performance measurement systems in general is gathered by searching for articles with the keywords 'performance measurement' and 'implementation of PMS'. To get more specific results the tags 'health care' or 'mental health care' are added.

Two papers are of special relevance for this project. The first paper is about monitoring processes in health care (Bij, 1999) and the second one is a paper about the present situation and future possibilities of performance measurement in mental health care (Baars, 2010).

2.2 Performance Measurement

Performance measurement in health care has three common purposes. These three purposes are accountability, quality improvement and performance management. The first purpose is the comparison between the performance information gathered in a company or institution and other services or standards. Quality improvement focuses on facilitating improvement activities. So the first purpose is making the comparison and the second one is using this information for the actual improvement.

The third and most important purpose is performance management. Beside the use of systematic methods, "it also involves the capability of an organization to provide relevant information for decisions on future performances". So the goal of performance measurement is not only using data to create information, but it is also about making use of the obtained information in order to steer and predict outcomes in the (near) future.

This research focuses mostly on gathering the performance information in a way that creates reliable data and using the gathered information for performance management purposes.

2.3 Implementation and use of Performance Measurement Systems

In the previous part it is explained what a performance measurement system is, and why it is meaningful to have one. The problem is that only identifying the need for a PMS is not sufficient, it has to be implemented within the current structure of the institution. Literature provides some useful information about the development process of a PMS. The development of a PMS can be divided in three phases. These phases are:

1. The design of the performance measures.
2. The implementation of the performance measures.
3. The use of the performance measures.

The first step of the process can be divided again into two parts. The first thing to do is identifying the key objectives that are to be measured. After identifying the objectives, the measures can be designed themselves.

The next step in the implementation process is the adaption of the organizational structure. This is necessary to facilitate the collection and processing of data at a regular base. The organization has to adjust in such a way that data is available on the moment that information is needed. Depending on the organizational structure this can be continually or on regular moments.

The last phase of the development process is the use of the performance measures. The performance measures provide information about certain processes within the organization. With this information the strategy of the organization can be challenged. The outcomes of the performance measures can be compared with the targets and goals that are defined within the organizations strategy. If the outcome of the measurement does not match with the expectations, things have to change.

It is important to keep in mind that measuring only is one part of using the performance measures. "A forum is needed to review the measures and ideally to agree action. To do this a regular meeting is required, attended by the directors and managers who have responsibility for the performance being measured." (Bourne, 2000) So, next to just collecting data and creating information with this data it is important to act. Regular meetings with the people who understand the measures and together with the people responsible the measured processes are vital for the functioning of the Performance Measurement System as a whole.

2.4 Obstacles to implement a PMS

In order to answer the research question of this project it is also important to know more about the pitfalls of the PMS implementation. Literature describes the main obstacles for a good implementation of a PMS in the designing, implementing and the use phase of a PMS implementation. These obstacles are (Bourne, 2000):

1. Resistance to measurement, occurring during design and use phases;
2. Computer systems issues, occurring during implementation of the measures;
3. Top management commitment being distracted, occurring between the design and implementation phases.

In most cases there are people who do not see the need of change. These people are not likely to cooperate in the process of changing the organizational structure. Sometimes the information these people have is vital for a good design of the performance measures, or for the use of them. That is why it is important to convince these people of the need of change. Sometimes managers or other people with responsibility for the processes are afraid that measures hinder them in their tasks. They need to be persuaded that these measures are good for the business.

Another main obstacle can be computer system issues. Sometimes data is lost because old, ageing systems fail and backup facilities are minimal or corrupt. Or old data types are not compatible with current used types so that the data of older systems cannot be used in newer systems.

The last main obstacle is about distraction of the top management. This means that (part of) the management is busy with other things that seem to be more important than the implementation of the PMS. In most cases senior management support is vital for the implementation of a performance measurement system and that is why management needs to be aware of the development of the PMS implementation process.

This review shows some difficulties that can occur during the implementation of a performance measurement system. In the remaining chapters we will look to the implementation process in practice. We will see what obstacles are found in an implementation process, and give some guidance and recommendations for avoiding or solving these problems.

3. MagnaView

3.1 Introduction

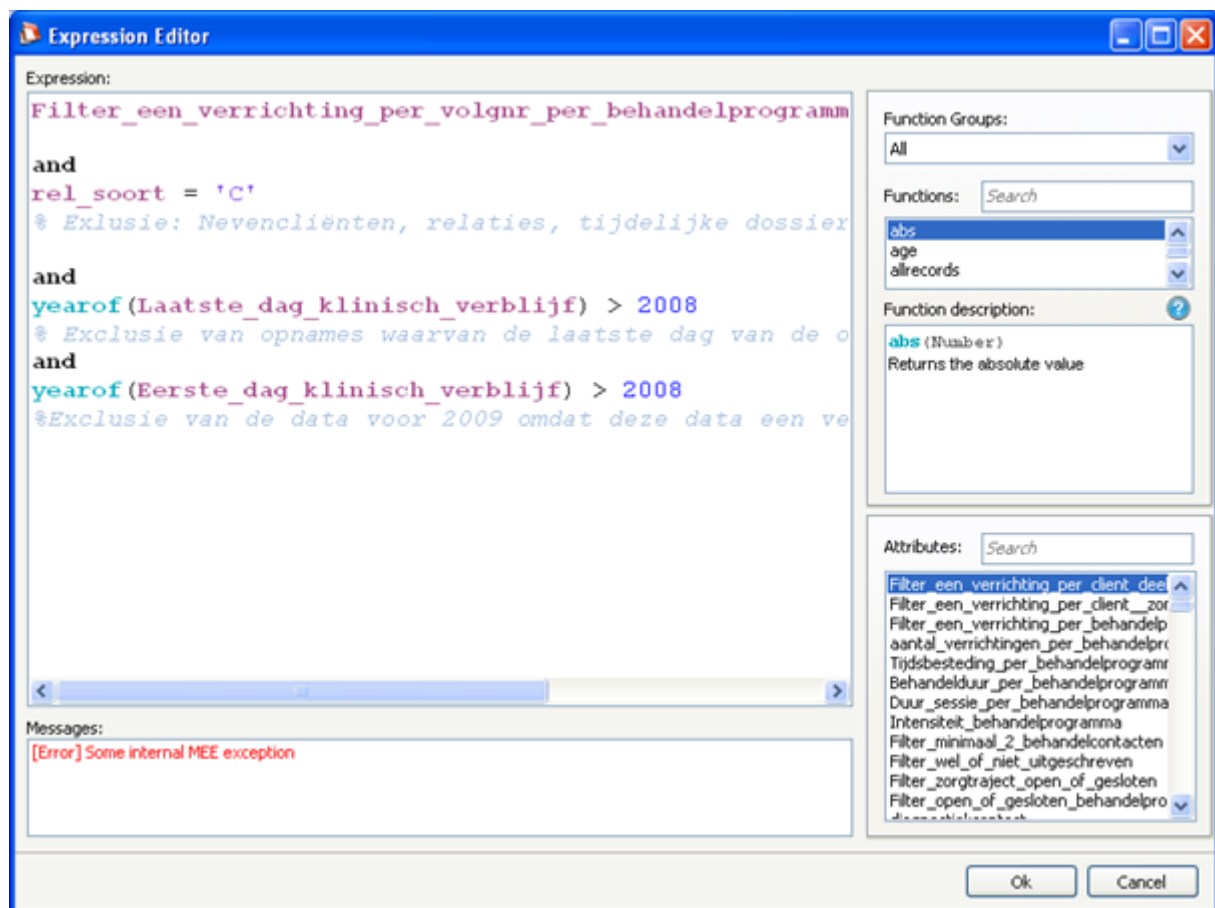
As stated before in this report, GGzE has selected MagnaView Designer as their performance measurement system. MagnaView is a business intelligence software tool that can be used for analyzing data. According to their website a “...user can analyze data, choose visualizations, add interactivity, and store the result as a project for use by others.” (Magnaview, 2012). In addition to this “Designer also offers MagnaView’s powerful Expression Editor with over 100 functions”.

3.2 Short explanation of MagnaView

A MagnaView project needs a data source. The project in MagnaView creates references to the data source in order to get the data. The records from the database are imported to the project and stored as data source attributes.

In addition to these attributes, expressions can be declared. An expression is a query in which one can use data source attributes (or other expressions) for calculations or selections. The result of an expression is new data field.

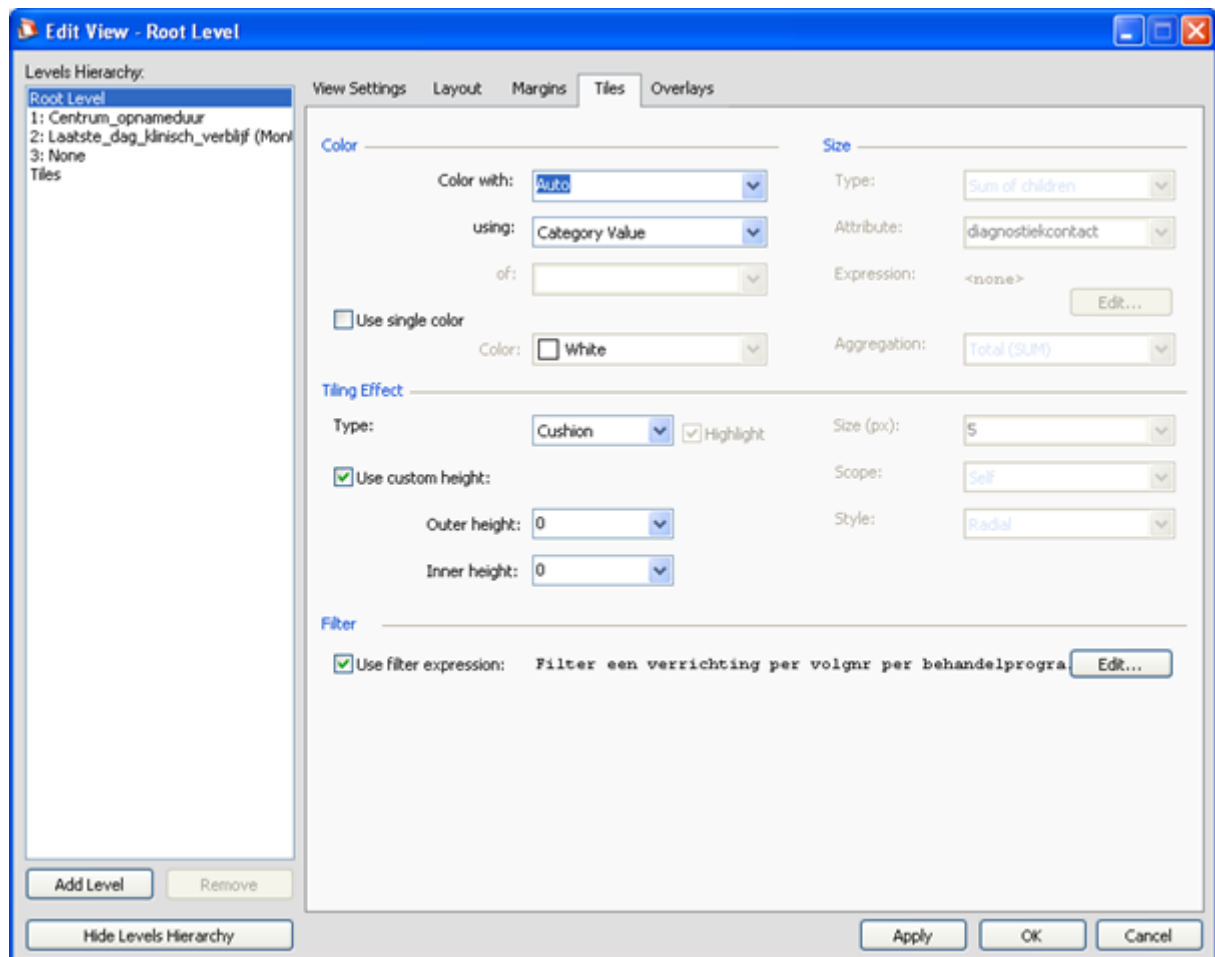
Figure 1: MagnaView's Expression editor



MagnaView offers the ability to create so-called ‘views’. These views actually visualize the data. A view can be very simple with only one data source and a time element, the

number of visits per day for example, but can also be quite complex. This is because a view itself can contain, next to multiple attributes, expressions and filters.

Figure 2: Magaview's View editor



The end result of a view is a graph, chart or table. Putting a variable against a time period is a standard functionality of a view. The data that is visualized is easy filtered by using a predefined filter. This gives the user the possibility to look into the performance of only one or a few departments for example. This creates quick insight into a certain variable on whatever level needed, and give the opportunity for comparison among levels or departments.

3.3 MagnaView at GGzE

After defining some key performance indicators for the GGzE, employees at the R&D department of the GGzE started to implement these indicators into MagnaView. They used a Microsoft Excel file as their data source. That file contains all the available data to the GGzE that was gathered over time. Next to these available attributes some expressions and filters were declared. A total list of all the declared variables is in Appendix C.

The views are built by using a combination of the attributes and expressions and putting these variables against time. By the time this project started the following views were created:

1. Admission time
2. Treatment waiting time
3. Treatment duration
4. Admission-to-last treatment duration
5. Admission-to-last contact duration
6. Registrations per month
7. Deregistration's per month
8. Ratio incoming - leaving clients
9. No show percentage

All these Views were created on both GGzE and center level. These views give insight in how the organization is performing. On GGzE level these views can be used to see the performance over time and on center level, next to performance over time, the different department can be compared.

4. Key Indicator 'Admission Time'

4.1 Introduction

As stated before, several key indicators to the GGzE were defined in previous research. These indicators are:

1. Admission time
2. Treatment waiting time
3. Treatment duration
4. Ratio incoming - leaving clients
5. Resource occupancy level
6. No show percentage

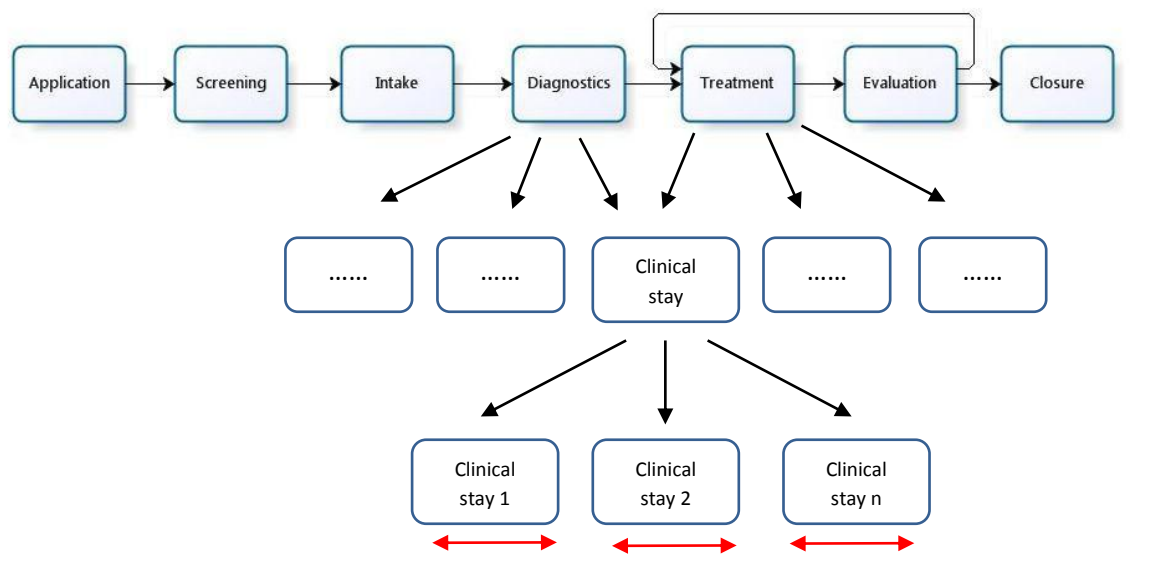
In addition to these indicators the GGzE wanted a new indicator to be defined and implemented in their performance measurement system. This indicator should give insight in the length of an admission and is therefore called 'admission time'. The implementation of this indicator gives, next to the value to the GGzE better insight in how the performance measurement tool MagnaView really works.

4.2 Admission time definition

The main target of this performance indicator is to measure how many days a bed is used for a certain admission. Because only clinical stays are relevant for this, other admission types (e.g. an emergency) are not measured. Admission time is, in consultation with the responsible manager, defined as follows:

The difference in days between the first nursing day of a 'clinical stay' admission (within a treatment program within a care trajectory of a certain financing dossier) and the last nursing day of that particular admission

Figure 3: Admission time visualization



As visualized in figure 3, a clinical stay can take place both in the diagnostics phase and in the treatment phase of the care process. Because both sorts of clinical stays require a bed, so they are both relevant for this performance indicator.

This information leads to the following formula:

$$\text{Formula } AT(n, c, ts, tp = CS) = \text{LND}(n, c, ts, tp = CS) - \text{FND}(n, c, ts, tp = CS)$$

Variables:

n = clientID

c = care type

ts = treatment sequence number

tp = treatment program

CS = A. Clinical Stay

$AT(\dots)$ = Admission time

$\text{LND}(\dots)$ = Last Nursing Day

$\text{FND}(\dots)$ = First Nursing Day

Some choices had to be made for this performance indicator. After proposing some choices and processing the input the following is decided:

- Admission time is only relevant in days. The reason for this is that it is important to know how many days a bed is used. Admission time of less than 24 hours is seen as a day. Therefore, admission time is round upward to the nearest whole day
- The calculation of admission time is per month. An admission counts only for the month in which the admission ends. This is the month with the last nursing day of that specific admission. Clients who are still in nursing can be included in the calculation. In that case the value for the last nursing day is the current day.
- Admissions whose first nursing day is before 01-01-2009 can be in the dataset, but are not included in the calculations of admission time. The information stored in the data before this date is only partial and therefore not reliable enough to use.

4.3 Admission time implementation

The new defined key indicator is valuable for the performance measurement at the GGzE and therefore it needs to be implemented in the measurement tool MagnaView. Because MagnaView has many configurational options a workshop by the developers of the tool was followed.

From the previous section we learn that admission time, simply said, is the difference between the first and last nursing day. So, in order to create a view of admission time these two variables must be declared.

The first nursing day is selected by getting the first date out of a column with treatment program start dates, where the client number and the treatment program number are unique. These results are filtered so that only the clinical stays are taking in consideration. This leads to the following expression in MagnaView:

EERSTE_DAG_KLINISCH_VERBLIJF

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
setmin
(
    filter
    (
        tiles;Klinisch_verblijf=1
    ).beha_dat_start
)
```

The last nursing day is selected by getting the last date out of a column with treatment program end dates, where the client number and the treatment program number are unique. If the treatment program end date equals '0' (still open) the current date is selected. These results are filtered so that only the clinical stays are taking in consideration. This leads to the following expression in MagnaView:

LAATSTE_DAG_KLINISCH_VERBLIJF

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
setmin
(
    filter
    (
        tiles;Klinisch_verblijf=1
    ).if(beha_dat_eind = 0; now; beha_dat_eind)
)
```

After declaring the expressions for the first and last nursing day, the expression of admission time can be made. This was the difference in days between the first and last nursing day what results in the following declaration in MagnaView:

OPNAMEDUUR

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
```



```
datediff(  
    'hour'  
    ;Eerste_dag_klinisch_verblijf  
    ;Laatste_dag_klinisch_verblijf  
)
```

After declaring all the expressions, the View was created. I choose to create two Views, one for the GGzE as a whole, and one on center level. While

5. Performance Measurement System in practice

5.1 Data meaning

The dataset used for this project was provided by the Research & Development department of the GGzE Data before April 2009 was not useable due to conversion errors from an old database and therefore not used in the computations of the key indicators.

When using data, it is important to know what the data really means. Clear and unambiguous data naming helps understanding the data. One of the problems encountered in this project at the GGzE, is that data variables were interpreted in different ways. For example, a variable named Duur could be interpreted as total time needed for an activity, or only the time that is needed for the contact with a client. This phenomenon can lead to wrongly used variables in the computations, and eventually lead to faulty outcomes and conclusions.

In order to decrease the level of interpretation an existing list of variable definitions is checked, updated and extended (Appendix C). This list is adapted in consultation with the database specialist at GGzE who reviewed and commented my adaptations in order to get a clear and correct definition of the used variables. Unfortunately, only an up-to-date list of the meaning of the variables is not enough. There may be an agreement on what a variable means, but that is no guarantee that the value of that variable matches with reality. To achieve the best possible consistency with reality, the input is crucial. Ambiguous inputs that seem logical which is not cleared (See section 5.3), can give a distorted picture of reality. An example is found in the GGzE database:

In the variables list (Appendix C) a distinction is made between direct time (DUUR, *Total duration of the planned contact with the client in minutes*) and indirect time (INDIRECTE_TIJD, *Duration of the indirect time in minutes, the time the caregiver needs for the client without the client being present*). The direct time is defined in terms of a planned contact with the client (face-to-face for example). Indirect time is 'extra' time that is needed for administration purposes or meetings about a client, without the client being present. An activity which requires the client presence is handled well. The direct time is entered into the system and in addition to this the extra time needed for administration about this client is entered in the correct column. But if an activity includes *only* indirect time, a meeting about a client for example, the only time entered in the system is inserted in the database under column DUUR (direct time). In order to be sure that DUUR is direct time another column has to be checked what kind of activity is executed. When performing calculations with the data these extra checks are easily forgotten, which leads to wrong outcomes. Therefore this situation is not desirable. Users of the database should not be able to enter the data in such a manner. So the structure of the input fields needs to be adapted in such a way that the input automatically is placed under the right column.

Another problem with the meaning of the data is coding. Coding is commonly used to reduce the volume of a database. In itself there is nothing wrong with coding, but it is very important that there are descriptions of the used codes available. If changes are applied to the codes, these should be included in the relevant documents.

In the data set used by the GGzE two different kinds of numbering for the divisions are used. There are 2 digit codes and 4 digit codes. At first sight it looked that the 4 digit code existed of the division code combined with the group number (also a 2 digit code), but there were discrepancies. After inquiry at GGzE it became clear that the 4 digit code a new standard was. The first 2 digits of this code were taken from the old code. The meaning of the other digits two digits remained unclear. There are probably people in the organization who know exactly what it means, but that knowledge is clearly not easily interchangeable. Good and regular updated documentation that is widely useable within the organization will help in the process of improvement

5.2 Data structure

A second problem encountered at GGzE was the structure of the database. There are multiple levels in the data, but that was not clear at first sight. Every level has a variable with a unique ID for that particular level. Only a list of the variables was available, but from this list it was not clear which variable belongs to which level. This situation could lead to confusion about the meaning of the used data column and eventually leads, if a variable is used on a wrong level, to faulty conclusions.

In order to solve this problem a database model was created. This model was created by using Rational Rose Data Modeler. The model consists of the different layers, the relations between these layers and the relevant variables.

First the layers need to be identified. These layers correspond to a level in the database. These levels are not physical parted tables, but different organizational levels that are also included in the database. After structuring the data and consultation with the Research & Development department the following layers were identified:

- Client (every client has an unique ID)
- Registration (about the registration of a client)
- Care trajectory (about a care trajectory of a client)
- Type (about the financing type of a care program)
- Treatment program (information about the chosen treatment program)
- Activities (about the actual activities within a treatment program)

Every higher layer has a 1 – n relation with the layer directly below itself. This means for example that layer Registration (with a certain ID, in combination with a Client ID) can

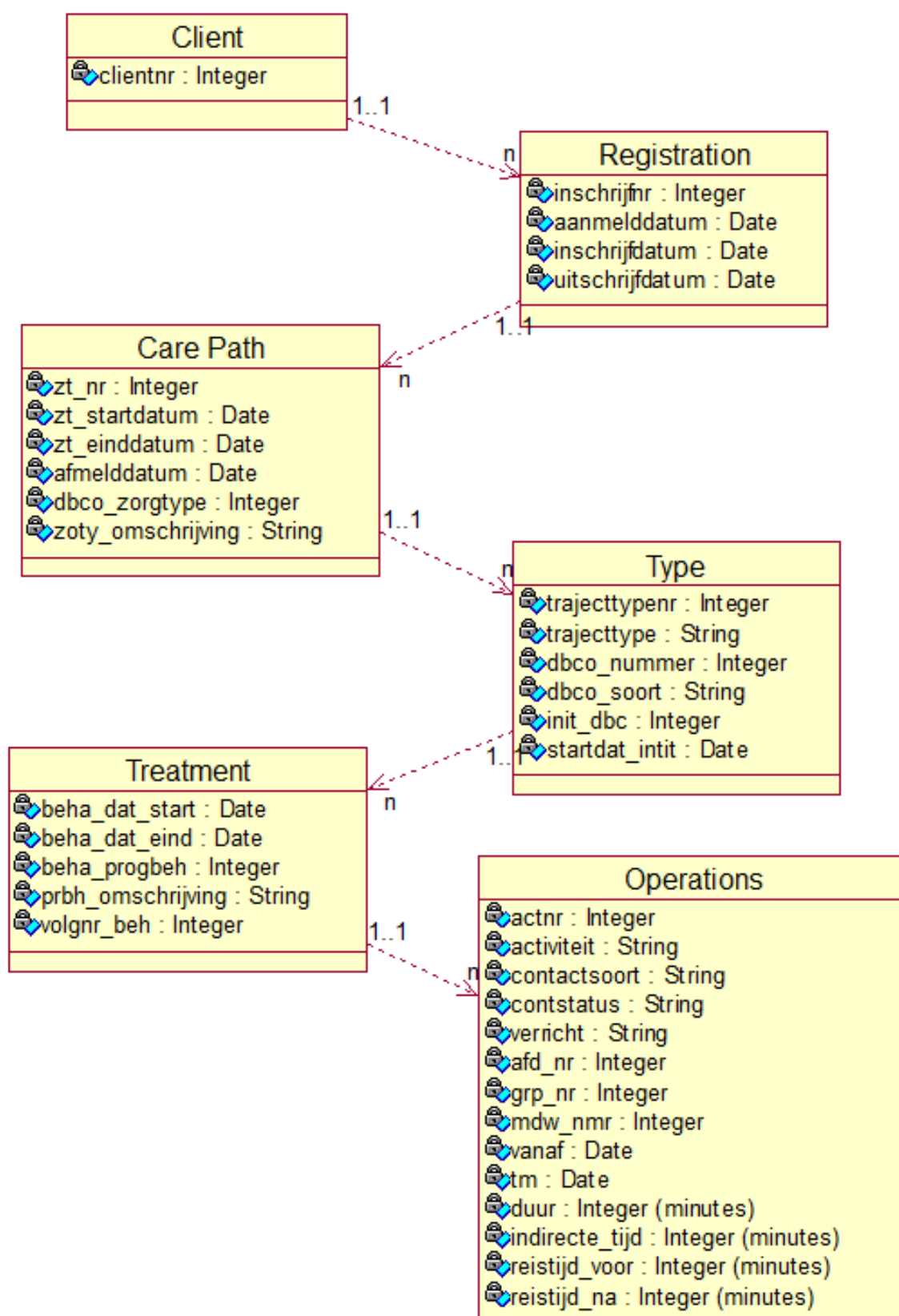
have more than one Care trajectory ID's underneath, but a certain Care trajectory ID (in combination with a Client ID) cannot be part of more than 1 Registration.

The database model is a hierarchical model. This means that every child (a lower level in the structure) can have one parent (higher level in the structure).

Every layer in the model has one or more variables. These variables are the variables that are defined before in this project (see appendix C). In the model every variable has a type. This is to clarify what kind of input is required for a certain variable. If a variable is a time period a time unit is added.

- Integer: Round number
- String: Plain Text
- Date: Date

Figure 4: Data model GGzE



5.3 Data check

Consensus about the meaning of the variables does not automatically mean great data integrity. The data itself needs to be checked for errors, wrong input or unrealistic data. The data that is used for the calculations should be cleared from these wrong records in order to obtain realistic results.

The data that is used in the pilot with the PMS at GGzE was not yet checked. Even when it is hard to give wrong input while adding data to a database, it needs to be checked before using the data for performance conclusions. It is recommended to check the data source every now and then in order to get the most reliable results. An appropriate time period to check depends on the amount of data. The data can be checked every time management uses the data for steering purposes but regular check every quarter will be sufficient to keep the data clean.

After creating a data model, some checks could easily be created and performed on the dataset. The used dataset from April 2009 to May 2011 contains 795125 rows. For this project ten checks are used to look whether the data is clean or not:

- Check for invalid dates (where INSCHRIJFNR is unique). All date checks give the number of appearances for which the formula holds. A greater than sign ('>') means that the first date is more recent than the last date. The less than sign ('<') means that the first date lies before the second date.

1. $AANMELDDATUM > ZT_STARTDATUM = 8420$

A care trajectory can never be started ($ZT_STARTDATUM$) before a person has indicated that care from GGzE is desirable because that is always the first contact with the GGzE ($AANMELDDATUM$). But in more than 1 percent ($(8420/795125) * 100$) of the data this situation seems to exist. This must be a wrong input so this data must be excluded from calculations.

2. $UITSCHRIJFDATUM < ZT_EINDDATUM = 723$

The care trajectory cannot be open ($ZT_EINDDATUM$) after a person is deregistered ($UITSCHRIJFDATUM$). Still, in 0,09% ($(723/795125) * 100$) of the data this situation is registered. A deregistration is, according to the GGzE always the latest possible date so this data must also be excluded from the calculations.

3. $AANMELDDATUM > INSCHRIJFDATUM = 0$

No actions can take place before ($INSCHRIJFDATUM$) a client has had a contact with GGzE ($AANMELDDATUM$). There are no false records according to this check.

4. $UITSCHRIJFDATUM < AFMELDDATUM = 0$

No actions can take place after (UITSCHRIJFDATUM) a client is deregistered (AFMELDDATUM). There are no false records according to this check.

- Check for reasonless empty records

5. DBCO_ZORGTYPE = 61259
6. DBCO_NUMMER = 44021
7. DBCO_SOORT = 44021
8. AANMELDDATUM = 0
9. TRAJECTTYPENR = 0
10. CLIENT_NR = 0

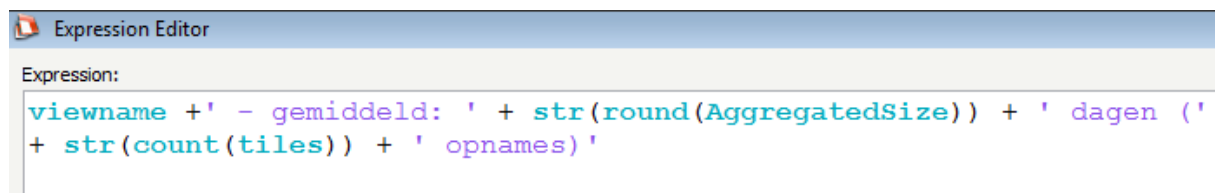
Normally these records are filled in. Still there are quite a few empty records. There can be good explanations for these gaps. But only by checking the data integrity one will know if there are errors or not.

5.4 Data overview in MagnaView

MagnaView can be used create a lot of tables and graph which all look quite nice. A well-known problem with graphs is that they are easily misinterpreted. That is why it is important to have, next to the graph, a clear indication of the data used for the graph. In order to comply with this requirement I implemented some code in the views.

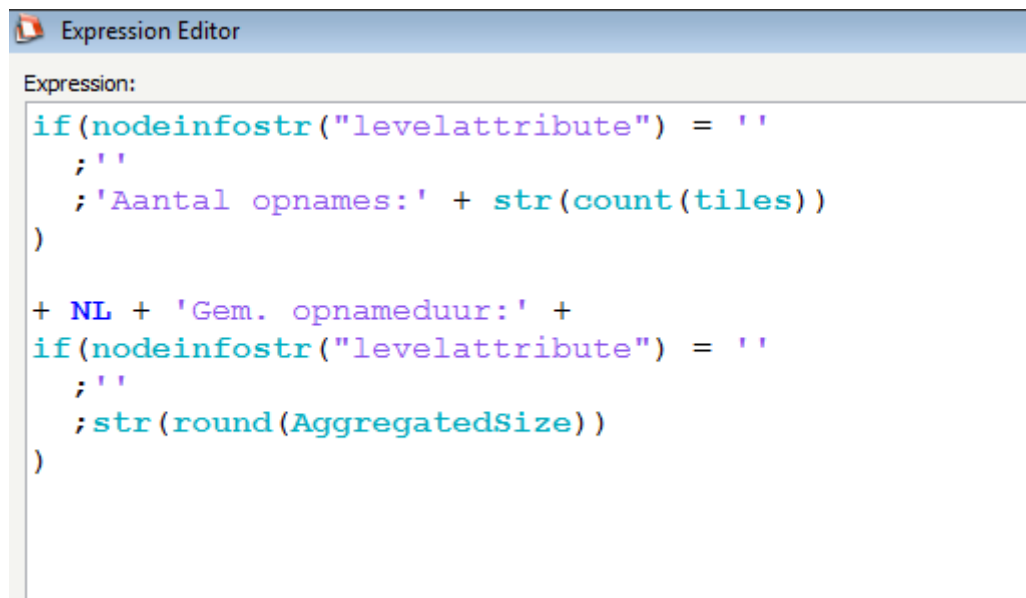
The first piece of code generates two numbers that are always visible in the View: one number by counting the amount of records (admissions) used for this particular view and one by rounding the aggregated size of all the values of variable days.

Figure 5: View 'Admission Time' Text Label always



The second part of the code generates the same numbers, but is only visible if you point to something, for example one month, in the View with your mouse. Because these numbers are smaller (they are only a part of the available data), there is an if-statement. This statement checks whether an attribute is empty or not, and give the numbers accordingly.

Figure 6: View 'Admission Time' Text Label on hover



```
Expression:
if(nodeinfostr("levelattribute") = ''
; ''
; 'Aantal opnames:' + str(count(tiles))
)
+ NL + 'Gem. opnameduur:' +
if(nodeinfostr("levelattribute") = ''
; ''
; str(round(AggregatedSize))
)
```

5.4 Summary

From this chapter we can learn that it is crucial to understand the database structure and the meaning of the used variables. Examples from practice show that ambiguous data can lead to incomplete or faulty conclusions. So a check on the data is necessary, but also a good overview. If these conditions are met you will have a nice basis for performance measurement.

6. Conclusions & recommendations

6.1 Data

In order to get clear information out of a PMS, the used data has to be clear. So, insight of the data structure and the actual meaning of specific data is important. Ambiguous data can lead to faulty outcomes of performance measures, which can lead to a different picture of reality. Incomplete data(sets), even if used correctly, can lead to strange conclusions. For example, a comparison between two month, one with only 1 data record and the other with 100 records, on a time mean does not really give worthy information.

Logical naming of new data entries is advised at all times. Double or unclear names can lead to misinterpretation of the data. But even with logical naming it is recommended keeping a record of all the used attributes of the database with an explanation of their meaning. A clear explanation is not easily misinterpreted, while only a (logical) name can give to little information.

The users that enter information in the system should be aware of the consequences of invalid or incomplete input. The entry fields have to be as clear and unambiguous as possible. The IT department can inquire the users for their interpretation in order to be sure that there is no gap between real meaning and interpretation of the input fields.

Coding is a good thing to keep the database volume within boundaries. But as explained before, it is crucial to keep record of the coded items. Someone within the IT department should get responsibility for maintaining the document with the coded items.

6.2 Management

Management needs to be informed on a regular basis about the performance of the indicators. It is crucial for a PMS that the right people have access to the right information. If only people without any influence on a process get information about that process, the information is worthless. Meetings with users of the PMS and management both, will result in mutual understanding and capability of steering.

As stated before, clear and complete data is essential for a PMS. In order to get a good database, all users of the data system must see the need to properly and completely fill the records. Managers should ensure that this happens by explaining why it is necessary.

6.3 Performance Measurement Tool

A Performance Measurement Tool like MagnaView is a great tool for visualization of large amounts of data. In a glance you see how a certain indicator performs over time. But the problem with visualization is that it easily leads to wrong conclusions. The chosen filters, the time frame for example, have major influence on how the graph looks. That's why two things are important:

First, it is crucial that the amount of records used, is clearly visible. A quick view of the units used is also useful. These things prevents from using (too) few examples while drawing conclusions. As showed in chapter 5.4 the performance measurement tool MagnaView, if used correctly, is able to create insight in the used records.

Secondly it is important that those who use the results of the performance measurement have their saying in the process of developing these measures. Meetings with the programmers and the users in the development stage of a measure are vital for useful information in the end.

6.4 Recommendations

In previous research at GGzE is noted that not all the descriptions of the data records are adequate. In this project these description are verified and where necessary adapted or complemented. It is strongly advised that these descriptions are updated whenever changes are made to the data records. In that way the knowledge stays interchangeable.

Further, it is recommended explaining the expressions created in MagnaView. Just like the data and its structure, knowledge about the structure and meaning of the expressions can be secured. This avoids misinterpretation and makes it is easier to adapt to code in the future.

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Appendices

A. Clinical Stay

A clinical stay is defined as a treatment program that is described in an internal document of the GGzE (behandelprogramma's.xls) as a clinical stay. A selection of the clinical stays in this document, based on the description produces the following table

Table 1: definition of Clinical stay

57	Klinisch gemeentebed G01	Volwassenen Klinisch
244	Klinisch verblijf F15	Overig
240	Klinisch verblijf F16	Overig
812	Klinisch verblijf K11	Overig
821	Klinisch verblijf K12	Overig
839	Klinisch verblijf K13	Overig
814	Klinisch verblijf K15	Overig
243	Klinisch verblijf SGLVG+	Forensische Behand. klinisch
241	Klinisch verblijf TIV	Overig
779	Klinisch verblijf V12	Overig
780	Klinisch verblijf V13	Overig
781	Klinisch verblijf V21	Overig
782	Klinisch verblijf V22	Overig
783	Klinisch verblijf V23	Overig
784	Klinisch verblijf V24	Overig
785	Klinisch verblijf V25	Overig
907	Klinisch verblijf ZZP	Overig

This means, if the treatment program is:

57 ||240||241|| 243|| 244|| 779 || 780 || 781 || 782 || 783 || 784 || 785 || 812 ||814
||821|| 839 || 907

There is a clinical stay.

B. Performance Indicator 'Admission Time'

EXPRESSIES

Klinisch verblijf

*/*De query kijkt of een behandeling een klinisch verblijf betreft1 = klinisch verblijf0 = andere behandeling*/*

```
if (beha_progbeh = 57 or beha_progbeh = 240 or beha_progbeh = 241
or beha_progbeh = 243 or beha_progbeh = 244 or beha_progbeh = 779
or beha_progbeh = 780 or beha_progbeh = 781 or beha_progbeh = 782
or beha_progbeh = 783 or beha_progbeh = 784 or beha_progbeh = 785
or beha_progbeh = 812 or beha_progbeh = 814 or beha_progbeh = 821
or beha_progbeh = 839 or beha_progbeh = 907
;1
;0
)
```

Laatste_dag_klinisch_verblijf

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
setmin
(
  filter
  (
    tiles;Klinisch_verblijf=1
  ).if(beha_dat_eind = 0; now; beha_dat_eind)
)
```

Eerste_dag_klinisch_verblijf

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
setmin
(
  filter
  (
    tiles;Klinisch_verblijf=1
  ).beha_dat_start
)
```

Opnameduur

```
(aggregate: clientnt->volgnr_beh->beha_prog->tiles)
datediff(
  'hour'
;Eerste_dag_klinisch_verblijf
```

```
;Laatste_dag_klinisch_verblijf  
)
```

Centrum opnameduur

```
if (left (string(afd_nr_einde_opnameduur);2) = '11'  
; 'A&S'  
;if (left (string(afd_nr_einde_opnameduur);2) = '12'  
; 'D&A'  
;if (left (string(afd_nr_einde_opnameduur);2) = '13'  
; 'K&J'  
;if (left (string(afd_nr_einde_opnameduur);2) = '14'  
; 'Merk X'  
;if (left (string(afd_nr_einde_opnameduur);2) = '15'  
; 'Persoonlijkheidsstoornissen'  
;if (left (string(afd_nr_einde_opnameduur);2) = '16'  
; 'Psychotrauma'  
;if (left (string(afd_nr_einde_opnameduur);2) = '17'  
; 'Spoedeisende Psychiatrie'  
;if (left (string(afd_nr_einde_opnameduur);2) = '18'  
; 'Bemoeizorg'  
;if (left (string(afd_nr_einde_opnameduur);2) = '19'  
; 'Portaal040'  
;if (left (string(afd_nr_einde_opnameduur);2) = '20'  
; 'Autisme'  
;if (left (string(afd_nr_einde_opnameduur);2) = '21'  
; 'Ouderenpsychiatrie, incl. CS'  
;if (left (string(afd_nr_einde_opnameduur);2) = '22'  
; 'Psychotische stoornissen'  
;if (left (string(afd_nr_einde_opnameduur);2) = '23'  
; 'Woonbegeleiding'  
;if (left (string(afd_nr_einde_opnameduur);2) = '24'  
; 'Forensische Behandeling'  
;if (left (string(afd_nr_einde_opnameduur);2) = '25'  
; 'Intensieve Behandeling'  
;if (left (string(afd_nr_einde_opnameduur);2) = '26'  
; 'Opsy'  
;if (left (string(afd_nr_einde_opnameduur);2) = '27'  
; 'De Boei'  
;if (left (string(afd_nr_einde_opnameduur);2) = '28'  
; 'Promenzo'  
;if (left (string(afd_nr_einde_opnameduur);2) = '29'  
; 'De gebakken Peer'  
;if (left (string(afd_nr_einde_opnameduur);2) = '30'  
; 'Meriadoc'  
;if (left (string(afd_nr_einde_opnameduur);2) = '31'  
; 'WMO'  
; 'Conversie / Ondersteuning'  
))))))))))))))
```

Afd_nr_einde_opnameduur

(aggregate: clientnt->volgnr_beh->beha_prog->**tiles**)

```
setmin (  
  filter  
  (  
    tiles;  
    Laatste_dag_klinisch_verblijf = beha_dat_eind  
    or  
    datetimetostring(Laatste_dag_klinisch_verblijf;'dddd, yyyy')=  
    datetimetostring(now;'dddd, yyyy')  
  ).afd_nr)
```

Filter_een_verrichting_per_volgnr_per_behandelprogramma

(aggregate: clientnt->inschrijfnr-> volgnr_beh->beha_prog->**tiles**)

```
if (self.Id = any(parent.tiles.Id)  
;1  
;0  
)
```

VIEW - OPNAMEDUUR GGzE NIVEAU

Filter

Filter_een_verrichting_per_volgnr_per_behandelprogramma = 1

and

rel_soort = 'C'

% Exclusie: Nevencliënten, relaties, tijdelijke dossiers en bezoek zijn uitgesloten.

and

yearof(Laatste_dag_klinisch_verblijf) >= 2010

% Exclusie van opnames waarvan de laatste dag van de opname voor 2010 ligt

and

yearof(Eerste_dag_klinisch_verblijf) >= 2009

%Exclusie van de data voor 2009 omdat deze data een vertekend beeld in de view geeft

Weergave

Type: Column chart

Attribuut kolommen: Laatste dag klinisch verblijf, gesorteerd op maand per jaar

Grootte kolommen: Gemiddelde opnameduur voor de betreffende maand

Overlays

Root level: text label (always) met expressie

```
viewname + ' - gemiddeld: ' + str(round(AggregatedSize)) + ' dagen ('  
+ str(count(tiles)) + ' opnames)'
```

Laatste dag klinisch verblijf: text label (always) met expressie

```
if(nodeinfostr("levelattribute") = "  
;"  
;str(count(tiles))  
)
```

Laatste dag klinisch verblijf: text label (on mouse hover) met expressie

```
if(nodeinfostr("levelattribute") = "  
;"  
;'Aantal opnames:' + str(count(tiles))  
)
```

```
+ NL + 'Gem. opnameduur:' +  
if(nodeinfostr("levelattribute") = "  
;"  
;str(round(AggregatedSize))  
)
```

VIEW – OPNAMEDUUR CENTRUM NIVEAU

Filter

Filter_een_verrichting_per_volgnr_per_behandelprogramma = 1

and

rel_soort = 'C'

% Exclusie: Nevencliënten, relaties, tijdelijke dossiers en bezoek zijn uitgesloten.

and

yearof(Laatste_dag_klinisch_verblijf) >= 2010

% Exclusie van opnames waarvan de laatste dag van de opname voor 2010 ligt

and

yearof(Eerste_dag_klinisch_verblijf) >= 2009

%Exclusie van de data voor 2009 omdat deze data een vertekend beeld in de view geeft

Weergave

Type: 2 level line graph

Attribuut lijnen: centrum opnameduur

Attribuut x-as: Laatste dag klinisch verblijf

Hoogte lijnen: Gemiddelde opnameduur voor de betreffende maand

C. Variables definition

AANMELDDATUM	Date on which the client or referrer indicate that care from GGzE is desirable (first time in touch with GGzE).
ACTIVITEIT	Description of the activity corresponding to ACTNR.
ACTNR	Code that indicates the activity of the treatment program. Corresponding to an activity, multiple executions can take place.
AFD_NR	Number that indicates the department corresponding to the contact.
AFMELDDATUM	Date of cancellation of a care trajectory. A treatment program that was planned but not started yet is terminated.
BEHA_DAT_EIND	Date on which the treatment program is ended.
BEHA_PROGBEH	Code that indicates the kind of treatment program.
BEHA_DAT_START	Start date and start time from a treatment program. This treatment program is automatically started when the first contact corresponding to the program is registered.
CLIENTNR	Serial number of a specific client.
CONTACTSOORT	Description of contact type
CONTSTATUS	Description of the contact status of a contact
DBCO_NUMMER	Serial number indicating a unique financing dossier
DBCO_SOORT	Indicates if selected traject is initial or continued within a care trajectory
DBCO_ZORGTYPE	Number that indicates the type of care trajectory to which the treatment program is coupled.
DUUR	Total duration of the planned contact with the client in minutes.
GRP_NR	Number that indicates the group corresponding to the contact.
INDIRECTE_TIJD	Duration of the indirect time in minutes, the time the caregiver needs for the client without the client being present.
INIT_DBC	Serial number indicating the first dossier coupled to the selected care trajectory
INSCHRIJFDATUM	Date on which the client is registered.
INSCHRIJFNR	Serial number of a specific client

	registration
MDW_NR	Code that corresponds to the caregiver that is present during a contact
PRBH_OMSCHRIJVING	Description of the kind of treatment program corresponding to BEHA_PROGBEH.
REISTIJD_NA	The travel duration after the contact in minutes Only applicable when the contact is external.
REISTIJD_VOOR	The travel duration before the contact in minutes Only applicable when the contact is external.
STARTDATUM_INIT	Start date of the initial dossier within the selected care trajectory
TM	End time (with date) of a contact between the client and the caregiver.
TRAJECTTYPE	Indicating which traject type/financing type is coupled to a care trajectory
TRAJECTTYPENR	Number coupled to TRAJECTTYPE
UITSCHRIJFDATUM	Date on which the client is deregistered, the registration is terminated. Deregistration is possible when all treatments and DRGs are finished and closed.
VANAF	Start time (with date) of a contact between the client and the caregiver.
VERRICHT	Code indicating under which type of execution an activity falls
VOLGNR_BEH	Sequence number of the selected treatment program within a care trajectory
ZOTY_OMSCHRIJVING	Description of the kind of care trajectory corresponding to DBCO_ZORGTYPE.
ZT_EINDDATUM	Date on which the care trajectory of the client is finished.
ZT_NR	Serial number indicating a unique care trajectory
ZT_STARTDATUM	Date on which the care trajectory of the client is started.

D. Overview of MagnaView expressions

HULPVARIABLEN

AANTAL INSCHRIJVINGEN PER MAAND PER CLIENT(INSCHRIJVING)

(Aggregate: Inschrijfjaar maand->none->none->clientnr->inschrijfnr)

count(children.children.children.children)

AANTAL UITSCHRIJVINGEN PER INSCHRIJFMAAND PER CLIENT(INSCHRIJVING)

(Aggregate: Inschrijfjaar maand->none->none->none-> inschrijfnr)

```
if (yearof(any(tiles.inschrijfdatum)) < 2009
;0
;any(
filter(root.tiles; Uitschrijfjaar maand = self.categoryname)
)
.Aantal_uitschrijvingen_per_uitschrijfmaand_per_client_inschrijving_
)
```

AANTAL UITSCHRIJVINGEN PER UITSCHRIJFMAAND PER CLIENT(INSCHRIJVING)

(Aggregate: Uitschrijfjaar maand->none->none->clientnr-> inschrijfnr)

count(children.children.children.children)

AFD_NR_EINDE_AANMELDWACHTTIJD

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
setmin (filter (tiles; datum_eerste_diagnostiekcontact
= vanaf).afd_nr)
```

AFD_NR_EINDE_BEHANDELWACHTTIJD

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
setmin (filter (tiles; datum_eerste_behandelcontact
```

= **vanaf**).afd_nr)

AFD_NR_LAATSTE BEHANDELCONTACT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

setmin (**filter** (**tiles**; **Datum_laatste_behandelcontact**
= **vanaf**).afd_nr)

AFD_NR_LAATSTE CONTACT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

setmin (**filter** (**tiles**; **Datum_laatste_contact**
= **vanaf**).afd_nr)

EERSTE DBC CRISIS?

*% deze query bepaalt of de eerste DBC van een cliënt een crisis is.
% Dat is zo als dbco_zorgtype = 2((eenmalig) spoedeisend consult)
% of als dbco_zorgtype = 3 (acute opname)
% Alle andere mogelijkheden geeft false*

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
if (any(  
  filter(tiles; setmin_zt_startdatum = zt_startdatum)  
  .tiles.dbco_zorgtype) = 2 or  
  any(  
    filter(tiles; setmin_zt_startdatum = zt_startdatum)  
    .tiles.dbco_zorgtype) = 3  
  ;true  
  ;false  
)
```

EERSTE DBC INITIEEL?

*% deze query bepaalt of de eerste DBC in onze dataset ook de initiele
% dbc van een patient is en geeft dan als waarde true.
% Bij andere financieringstypes dan dbc's geeft deze query altijd true*

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
if (any(  
  filter(tiles; setmin_zt_startdatum = zt_startdatum)  
  .tiles.dbco_soort) = 'V'  
  ;FALSE  
  ;TRUE
```

)

EXPRESSION OF AANMELDDATUM

Aanmelddatum

INSCHRIJFJAARMAAND

`datetimestostring(inschrijfdatum; 'yyyy mm')`

SETMAX_ZT_EINDDATUM

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

`setmax(tiles.zt_einddatum)`

SETMIN_ZT_STARTDATUM

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

`setmin(tiles.zt_startdatum)`

UITSCHRIJFDATUM_INSCHRIJVING

*% Een cliënt heeft een uitschrijfdatum of een afmelddatum
% Deze variabele kijkt welke van de twee bij een patiënt gevuld is
% en geeft die datum weer*

```
if (yearof(uitschrijfdatum) > 1899
; uitschrijfdatum
; if (yearof(afmelddatum) > 1899
; afmelddatum
; 0
)
```

)

UITSCHRIJFJAARMAAND

*% Een cliënt heeft een uitschrijfdatum of een afmelddatum
% Deze variabele kijkt welke van de twee bij een patiënt gevuld is
% en geeft die datum weer*

```
if (yearof(uitschrijfdatum) > 1899
; datetimestostring(uitschrijfdatum; 'yyyy mm')
```

```

; if (yearof(afmelddatum) > 1899
; datetimetosting(afmelddatum; 'yyyy mm')
; datetimetosting(0; 'yyyy mm')
)
)

```

AANTAL BEHANDELPROGRAMMA'S PER CLIENT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
count(unique(tiles.beha_progbeh))
```

BEHANDELCONTACT

```

if(verricht = 'F104' or verricht = 'F105' or
   verricht = 'F106' or verricht = 'F107' or
   verricht = 'F134' or verricht = 'F135' or
   verricht = 'F136' or verricht = 'F137' or
   verricht = 'F154' or verricht = 'F155' or
   verricht = 'F156' or verricht = 'F157' or
   verricht = 'F204' or verricht = 'F205' or
   verricht = 'F206' or verricht = 'F207' or
   verricht = 'F221' or verricht = 'F222' or
   verricht = 'F223' or verricht = 'F224' or
   verricht = 'F225'
;1
;0
)

```

DATUM_EERSTE_BEHANDELCONTACT (LAATSTE)

```

Setmin (setmax) (
filter(

```

```

        tiles;Behandelcontact=1
    )
    .tiles.vanaf
)

```

DIAGNOSTIEKCONTACT

```

if (verricht = 'F102' or verricht = 'F103' or
    verricht = 'F132' or verricht = 'F133' or
    verricht = 'F152' or verricht = 'F153' or
    verricht = 'F202' or verricht = 'F203'
;1
;0
)
/* 102 en 103 is volwassenen, 152, 153 is jeugd132, 133 is ouderen*/

```

DATUM_EERSTE_DIAGNOSTIEKCONTACT

```

Setmin (setmax) (
    filter(
        tiles; diagnostiekcontact=1
    )
    .tiles.vanaf
)

```

CENTRUM

```

if (left (string(afd_nr);2) = '11'
; 'A&S'
;if (left (string(afd_nr);2) = '12'
; 'D&A'
;if (left (string(afd_nr);2) = '13'
; 'K&J'

```



```
;if (left (string(afd_nr);2) = '14'  
    ;'Merk X'  
;if (left (string(afd_nr);2) = '15'  
    ;'Persoonlijkheidsstoornissen'  
;if (left (string(afd_nr);2) = '16'  
    ;'Psychotrauma'  
;if (left (string(afd_nr);2) = '17'  
    ;'Spoedeisende Psychiatrie'  
;if (left (string(afd_nr);2) = '18'  
    ;'Bemoeizorg'  
;if (left (string(afd_nr);2) = '19'  
    ;'Portaal040'  
;if (left (string(afd_nr);2) = '20'  
    ;'Autisme'  
;if (left (string(afd_nr);2) = '21'  
    ;'Ouderenpsychiatrie, incl. CS'  
;if (left (string(afd_nr);2) = '22'  
    ;'Psychotische stoornissen'  
;if (left (string(afd_nr);2) = '23'  
    ;'Woonbegeleiding'  
;if (left (string(afd_nr);2) = '24'  
    ;'Forensische Behandeling'  
;if (left (string(afd_nr);2) = '25'  
    ;'Intensieve Behandeling'  
;if (left (string(afd_nr);2) = '26'  
    ;'Opsy'  
;if (left (string(afd_nr);2) = '27'  
    ;'De Boei'
```

```

; if (left (string(afd_nr);2) = '28'
; 'Promenzo'
; if (left (string(afd_nr);2) = '29'
; 'De gebakken Peer'
; if (left (string(afd_nr);2) = '30'
; 'Meriadoc'
; if (left (string(afd_nr);2) = '31'
; 'WMO'
; 'Conversie / Ondersteuning'

))))))))))))))))))

```

AANTAL_BEHANDELPROGRAMMA'S_PER_CLIENT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
count(unique(tiles.beha_progbeh))
```

CENTRUM_AANMELDWACHTTIJD

```

if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '11'
; 'A&S'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '12'
; 'D&A'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '13'
; 'K&J'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '14'
; 'Merk X'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '15'
; 'Persoonlijkheidsstoornissen'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '16'
; 'Psychotrauma'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '17'
; 'Spoedeisende Psychiatrie'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '18'
; 'Bemoeizorg'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '19'
; 'Portaal040'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '20'
; 'Autisme'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '21'

```

```

; 'Ouderenpsychiatrie, incl. CS'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '22'
; 'Psychotische stoornissen'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '23'
; 'Woonbegeleiding'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '24'
; 'Forensische Behandeling'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '25'
; 'Intensieve Behandeling'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '26'
; 'Opsy'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '27'
; 'De Boei'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '28'
; 'Promenzo'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '29'
; 'De gebakken Peer'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '30'
; 'Meriadoc'
; if (left (string(afd_nr_einde_aanmeldwachttijd);2) = '31'
; 'WMO'
; 'Conversie / Ondersteuning'
))))))))))))))))))

```

CENTRUM_BEHANDELDUUR

```

if (left (string(afd_nr_laatste_behandelcontact);2) = '11'
; 'A&S'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '12'
; 'D&A'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '13'
; 'K&J'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '14'
; 'Merk X'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '15'
; 'Persoonlijkheidsstoornissen'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '16'
; 'Psychotrauma'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '17'
; 'Spoedeisende Psychiatrie'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '18'
; 'Bemoeizorg'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '19'
; 'Portaal040'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '20'
; 'Autisme'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '21'

```

```

; 'Ouderenpsychiatrie, incl. CS'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '22'
; 'Psychotische stoornissen'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '23'
; 'Woonbegeleiding'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '24'
; 'Forensische Behandeling'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '25'
; 'Intensieve Behandeling'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '26'
; 'Opsy'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '27'
; 'De Boei'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '28'
; 'Promenzo'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '29'
; 'De gebakken Peer'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '30'
; 'Meriadoc'
; if (left (string(afd_nr_laatste_behandelcontact);2) = '31'
; 'WMO'
; 'Conversie / Ondersteuning'
))))))))))))))))))

```

CENTRUM_BEHANDELWACHTTIJD

```

if (left (string(afd_nr_einde_behandelwachttijd);2) = '11'
; 'A&S'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '12'
; 'D&A'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '13'
; 'K&J'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '14'
; 'Merk X'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '15'
; 'Persoonlijkheidsstoornissen'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '16'
; 'Psychotrauma'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '17'
; 'Spoedeisende Psychiatrie'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '18'
; 'Bemoeizorg'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '19'
; 'Portaal040'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '20'
; 'Autisme'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '21'

```

```

; 'Ouderenpsychiatrie, incl. CS'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '22'
; 'Psychotische stoornissen'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '23'
; 'Woonbegeleiding'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '24'
; 'Forensische Behandeling'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '25'
; 'Intensieve Behandeling'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '26'
; 'Opsy'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '27'
; 'De Boei'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '28'
; 'Promenzo'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '29'
; 'De gebakken Peer'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '30'
; 'Meriadoc'
; if (left (string(afd_nr_einde_behandelwachttijd);2) = '31'
; 'WMO'
; 'Conversie / Ondersteuning'
))))))))))))))))))

```

CENTRUM_INSCHRIJFDUUR_CONTACT

% LET OP: NIET GEBRUIKEN VOOR INSCHRIJFDUUR T/M LAATSTE BEHANDELCONTACT!!

```

if (left (string(afd_nr_laatste_contact);2) = '11'
; 'A&S'
; if (left (string(afd_nr_laatste_contact);2) = '12'
; 'D&A'
; if (left (string(afd_nr_laatste_contact);2) = '13'
; 'K&J'
; if (left (string(afd_nr_laatste_contact);2) = '14'
; 'Merk X'
; if (left (string(afd_nr_laatste_contact);2) = '15'
; 'Persoonlijkheidsstoornissen'
; if (left (string(afd_nr_laatste_contact);2) = '16'
; 'Psychotrauma'
; if (left (string(afd_nr_laatste_contact);2) = '17'
; 'Spoedeisende Psychiatrie'
; if (left (string(afd_nr_laatste_contact);2) = '18'
; 'Bemoeizorg'
; if (left (string(afd_nr_laatste_contact);2) = '19'
; 'Portaal040'
; if (left (string(afd_nr_laatste_contact);2) = '20'

```

```

; 'Autisme'
; if (left (string (afd_nr_laatste_contact); 2) = '21'
; 'Ouderenpsychiatrie, incl. CS'
; if (left (string (afd_nr_laatste_contact); 2) = '22'
; 'Psychotische stoornissen'
; if (left (string (afd_nr_laatste_contact); 2) = '23'
; 'Woonbegeleiding'
; if (left (string (afd_nr_laatste_contact); 2) = '24'
; 'Forensische Behandeling'
; if (left (string (afd_nr_laatste_contact); 2) = '25'
; 'Intensieve Behandeling'
; if (left (string (afd_nr_laatste_contact); 2) = '26'
; 'Opsy'
; if (left (string (afd_nr_laatste_contact); 2) = '27'
; 'De Boei'
; if (left (string (afd_nr_laatste_contact); 2) = '28'
; 'Promenzo'
; if (left (string (afd_nr_laatste_contact); 2) = '29'
; 'De gebakken Peer'
; if (left (string (afd_nr_laatste_contact); 2) = '30'
; 'Meriadoc'
; if (left (string (afd_nr_laatste_contact); 2) = '31'
; 'WMO'
; 'Conversie / Ondersteuning'
))))))))))))))))))

```

DATUM_LAATSTE_CONTACT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

setmax (tiles.vanaf)

LOGISTIEKE VARIABELEN GGZE EN CENTRUMNIVEAU

AANMELDINGSWACHTTIJD

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
datediff (  
    'day'  
    ;setmin(  
        tiles.zt_startdatum)  
    ;any(  
        tiles.Datum_eerste_diagnostiekcontact)  
    )
```

BEHANDELDUUR

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
datediff (  
    'day'  
    ; any(tiles.Datum_eerste_behandelcontact)  
    ; any(tiles.Datum_laatste_behandelcontact)  
    )
```

BEHANDELWACHTTIJD

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
datediff (  
    'day'  
    ;any(tiles.datum_eerste_diagnostiekcontact)  
    ;any(tiles.Datum_eerste_behandelcontact)  
    )
```

INSCHRIJFDUUR T/M LAATSTE BEHANDELCONTACT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
datediff(  
    'day'  
    ;any(tiles.setmin_ZT_startdatum)  
    ;any(tiles.datum_laatste_behandelcontact)  
)
```

INSCHRIJFDUUR T/M LAATSTE CONTACT

(Aggregate: trajecttype->clientnr->inschrijfnr->tiles)

```
datediff(  
    'day'  
    ;any(tiles.setmin_ZT_startdatum)  
    ;any(tiles.datum_laatste_contact)  
)
```

RATIO IN/UIT

```
round(  
    Aantal_inschrijvingen_per_maand_per_client_inschrijving_  
    /  
    Aantal_uitschrijvingen_per_inschrijfmaand_per_client_inschrijving_  
    ;2)
```


LOGISTIEKE VARIABELEN BEHANDELPROGRAMMANIVEAU

AANTAL VERRICHTINGEN PER BEHANDELPROGRAMMA

(Aggregate: trajecttype->clientnr->inschrijfnr->Centrum->prbh_omschrijving->tiles)

Childcount

BEHANDELDUUR PER BEHANDELPROGRAMMA

(Aggregate: trajecttype->clientnr->inschrijfnr->Centrum->prbh_omschrijving->tiles)

```
datediff (  
  'day'  
  ; setmin(tiles.vanaf)  
  ; setmax(tiles.vanaf)  
) + 1
```

DUUR SESSIE PER BEHANDELPROGRAMMA

Tijdsbesteding_per_behandelprogramma
/
aantal_verrichtingen_per_behandelprogramma

INTENSITEIT BEHANDELPROGRAMMA

Behandelduur_per_behandelprogramma
/
(aantal_verrichtingen_per_behandelprogramma - 1)

TIJDSBESTEDING PER BEHANDELPROGRAMMA

(Aggregate: trajecttype->clientnr->inschrijfnr->Centrum->prbh_omschrijving->tiles)

```
(  
  sum(tiles.duur)  
  +
```

```
sum(tiles.indirecte_tijd)  
+  
sum(tiles.reistijd_voor)  
+  
sum(tiles.reistijd_na)  
)  
/60
```

FILTERS

FILTER EEN VERRICHTING PER CLIENT, ZONDER TRAJECTTYPE

(Aggregate: clientnr->inschrijfnr->tiles)

```
if (self.Id = any(parent.tiles.Id)
;1
;0
)
```

FILTER EEN VERRICHTING PER CLIENT DEEL 1

(Aggregate: trajecttype-> clientnr->inschrijfnr->tiles)

```
if (self.Id = any(parent.tiles.Id)
;1
;0
)
```

FILTER MINIMAAL 2 BEHANDELCONTACTEN

(Aggregate: trajecttype-> clientnr->inschrijfnr->tiles)

```
if (sum(tiles.behandelcontact) > 1
; 'Inclusie'
; 'Exlusie'
)
```

FILTER OPEN OF GESLOTEN BEHANDELPROGRAMMA'S

```
if (yearof(beha_dat_eind) = 1899
; 'Openstaand behandelprogramma'
; 'Afgesloten behandelprogramma'
)
```

FILTER WEL OF NIET UITGESCHREVEN

```
if (uitschrijfdatum = 0
; 'Nog niet uitgeschreven'
; 'Wel uitgeschreven'
)
```

FILTER ZORGTRAJECT OPEN OF GESLOTEN

(Aggregate:trajecttype-> clientnr->inschrijfnr->tiles)

```
if (setmax(tiles.zt_einddatum) < setmax(tiles.vanaf))  
; 'Openstaand zorgtraject'  
; 'Afgesloten zorgtraject'  
)
```