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CHAPTER 9
General discussion

Introduction

This thesis presented the background, development and application of a registration method for coercive measures in psychiatry, named Argus. The first studies described in chapters 2 to 4 of this thesis showed that the current registration method in the Netherlands contains incomplete data and therefore appears to be not suitable for evaluation purposes. The lack of complete data has implications for evaluating projects aiming at reducing seclusion and restraint. These studies also seem to confirm the notion that coercive measures are used relatively frequently in the Netherlands. Argus was developed for assessing and calculating the use of coercive measures in Dutch psychiatric hospitals. The key ingredients of the Argus registration method have been described in chapter five of this thesis. During the last five years an increasing number of hospitals implemented Argus for evaluating their current practices of the use of coercive measures. Argus data from several hospitals were included in scientific research described in chapters 6 to 8 that clarified the use of coercive measures and trends in their use.

In this concluding chapter the three main questions formulated in the introductory chapter are discussed. First, we summarize the criteria for registration developed in the Argus approach, and discuss their merits. We then elaborate on the strengths and weaknesses of Argus. Next, the number of seclusions in the Netherlands when compared with data from other countries is addressed. We will elaborate on the outcomes of Argus registrations. Finally, we focus on the trends in the use of coercive measures. We will discuss the outcomes in relation to determining factors. We conclude this chapter with implications for practice and recommendations for further research.

Criteria for registration of coercive measures

This section deals with the first question presented in chapter one of this thesis: What are the criteria for a valid registration method on coercive measures allowing comparisons on ward, hospital, national and international level? We focus on the preconditions for measuring coercive measures. We also discuss whether the way in which these preconditions have been implemented in Argus is sufficient to provide results which are valid and relevant for clinical practice.

Complete and comparable data

Over the past ten years, several initiatives have been introduced to reduce the use of coercive measures in the Netherlands. To evaluate these initiatives, hospitals and wards need data on the use of coercive measures in practice. Until a few years ago, only reports to the Dutch Health Care

Inspectorate (IGZ) were available. These reports contain aggregated data from the registration of the IGZ that was used for supervision purposes and as a check for the correct application of coercive measures within the legal framework. They provide no detailed day to day information and therefore cannot be used for evaluation and research purposes. Therefore, five hospitals in the Netherlands, in cooperation with the GGZ Nederland and the IGZ developed the Argus registration method, that:

1. Contains uniform definitions on coercive measures, a reporting manual and calculation methods.
2. Is easy to fill out.
3. Reports all coercive measures, with and without patient' consent.
4. Portrays the daily practice of the use of coercive measures in an accurate way and allowing a clear view on its use.
5. Is sensitive to changes through time.
6. Can be used for feedback purposes in teams and management.

In the following we will go into each of these aspects in more detail.

Uniform definitions on coercive measures

The studies in chapter 2 to 4 showed that in order to compare data, clear and unambiguous definitions on coercive measures are crucial. Apart from that, a clear and uniform registration of each coercive measure is necessary. This includes agreement on the time of initiation, and time of ending, as well as information concerning the degree of resistance of the patient and the legal context of the incident.

The study in chapter 5 contributes to a consensus on definitions of coercive measures on a national and international level. Coercive measures were divided in three main groups: seclusion, mechanical or physical restraint and forced medication. These measures have been described in the introduction chapter of this thesis (see box 1, introduction chapter). In chapter 5, we defined the terms episodes, incidence, and duration as calculation and recording levels for each individual coercive measure per patient. In the Argus method every coercive measure used has to be recorded per patient. This allows registration of all measures and in this way contributes to an accurate registration, avoiding discussions on how and whether measures need to be registered. Argus is a rating scale providing information on the measures that are applied, regardless of the legal reasons underlying their application.

Easy to fill out

The Argus method is basically easy to fill out. Only a small amount of data on episode level has to be reported causing minimal disruption to administrative workload. In everyday practice, it has been

found that complexity of completing the data depends on the organisation of procedures for reporting and on the chosen software in the hospitals.

Reporting all coercive measures

As stated in the introduction chapter, the Special Admission in Psychiatric Hospitals act (Bopz) articles 38d, and 39a obliged all hospitals to register and immediately report all involuntary coercive measures to the IGZ (GIGV, 1994). In the legislative notes of explanation to this law it is emphasized that voluntary applied coercive measures should not be reported to the IGZ (GIGV, 1994). This leads to under-reporting. In chapter 2 we discussed that the interpretation of whether a patient consents to or resists a coercive measure depends on the assessment by the person who completes the registration. In Argus, all coercive measures are reported, without regard as to whether the patient agrees or disagrees, and whether the application is on voluntary or involuntary basis. The level of agreement and the basis on which the measure is taken is registered as adjacent information. Since 2012, this registration policy is obligatory in the implementation of the Bopz (Minister van VWS, 2011).

Portraying daily practice

In calculations of coercive measures the terms episodes, incidence, and duration are of major importance. As the forms are completed on a daily basis, the reported episodes of coercive measures provide daily information for calculations on incidence, length in hours and number of episodes per patient either at ward or hospital level.

Sensitive to changes through time

The way in which the data in Argus are assembled, enables detection of changes in number and duration of coercive measures. Once a coercive measure is started, nurses aim at ending these as soon as possible. In this process, the number and duration of coercive episodes may change over consecutive days. Daily monitoring of Argus reports provides information on possible patterns and changes in the use of measures through time. Short term evaluation of specific cases is important.

Useable for feedback purposes in teams and management

In chapter five and six we presented figures on seclusion use in Dutch psychiatric hospitals. Both chapters provided examples of tailored figures that explain the use of coercive measures. Similar figures can be used in evaluations of patients' treatment plans and feedback reports to nurses and management on the ward or hospital. Because Argus gathers information on a day to day basis, findings can be used to evaluate trends of coercive measures over time. Argus was designed in such a

way that feedback can be given at ward level, Data can also be aggregated on a hospital level and then included in evaluations of national trends.

In short, we conclude that the Argus method provides more precise and accurate data on coercive measures when compared with the existing register of the IGZ. Argus proposes definitions on coercive measures in line with international definitions. The proposed way of registration of each single measure contributes to a uniform registration, sensitive to daily changes. Calculation methods and formats of presentations are helpful for presenting the outcome in a similar and standardized way tailored to evaluate goals set within quality improvement projects at a ward level. This approach also serves as framework for comparisons between hospitals and countries and allows trends in the use of coercive measures to be studied.

The fact that almost all hospitals have implemented the Argus registration method indicates an acceptance of the method. However, there are still a number of flaws in the Argus method.

In the following we examine the most important ones; these are the lack of data on less restrictive measures, problems concerning the responsibilities for completing the reports, variations in accuracy and the limited degree to which data are used in feedback.

Reporting less restrictive measures

The Argus registration method only contains data on seclusion, restraint and forced medication.

Other, less restrictive, interventions such as one to one supervision, PRN medication and forced stay in one's own bedroom or on a closed ward are not included. As a result, effects of a reduction of coercive measures cannot be linked to a possible increase of less restrictive measures.

On the other hand, including registrations of these measures introduces the risk of an increase of bureaucracy and more time spent in reporting. An appropriate balance has to be found between the level of detail in the registration of coercion and the amount of time needed for registration.

Variations in accuracy in reporting coercive measures

In developing Argus, some attention was paid to the reliability of the figures. In four samples acquired in 2007 we compared the Argus data with nursing and IGZ reports as well as medical charts. We found an agreement between Argus and other sources with a Cohen's Kappa between 0.64 and 0.92. According to the criteria of Laundis & Koch, (1977) this can be interpreted as being "moderate to good" in clinical data. As the reliability was only studied once, we advise hospitals to pay specific attention to procedures. Controlling and completing the data by performing checks on consistency and content by administrators together with ward nurses may improve reliability. Both an

acknowledged sense of importance to monitor coercive measures (Huckshorn, 2004, Sapyta, et al. 2005), as well as a sense of urgency for this subject contribute to increased reliability and clinical validity of the registration (Seijts & Latham, 2000) and more valid data.

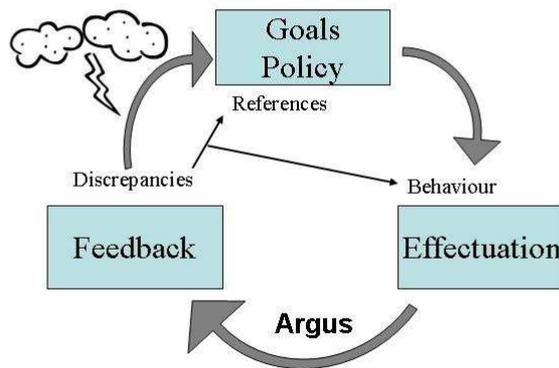
Responsibility for completing the Argus forms

In the Argus registration method, the responsibility for completing the forms is left to hospitals, and is not formally regulated. As a result, differences can exist between hospitals with regard to competency and responsibility for completing Argus forms. This may affect the accuracy. Before the implementation of the Bopz law in 1992, responsibility to report coercive measures was subject to discussion (van de Klippe, 1984, aan de Stegge, 2012). De “commissie van Dijk” considered the individual nurse to be responsible for their personal performance and the proper application and registration of coercive measures (aan de Stegge, 2012). However, in the current Dutch legislation (Bopz), psychiatrists are responsible for coercive measures. In the Bopz, the medical director is held accountable for keeping notes in the patients’ files (Bopz article 56) and for reporting the involuntary coercive measures to the IGZ (Bopz article 38, lid 6 and article 39, lid 3; IGZ, 2002). In the “extended arm construction”, it is actually the nurse on the wards who completes the reports when a patient is secluded or restrained (van de Klippe, 1984). It is seen as a part of his/her job, without formal competency and responsibility. In future Dutch laws for patients with a psychiatric disorder, where Argus method is mentioned as the way for reporting coercive measures, needs far more precise description on responsibilities for reporting. In the current data, we are dependent on the accuracy and professionalism of individual nurses.

Feedback

It is important that forms are completed accurately. Accuracy is fostered, if nurses see the relevance of the data. This can be shown through feedback (Carver & Scheier, 1981, Locke & Latham, 2002, Kluger & DeNisi, 1996). Feedback theory combines ‘Goal setting theory’, that presumes that conscious goals generate action (Locke & Latham, 2002) and ‘Control theory’ (Carver & Scheier, 1981) that argues that problem solving improves action (Kluger & DeNisi, 1996). These theories propose that a discrepancy between a desired goal and the actual current goal state causes a person to adjust his or her behaviour (Sapyta, et al. 2005, Hattie & Timperley, 2007).

Figure 1: Feedback cycle, based on feedback theory (based on Locke & Latham, 2002)



Central concepts in goal setting and control theories are: goals, sometimes formulated as references or success criteria (Hattie & Timperley, 2007), discrepancies and behaviour change (Kluger & DeNisi, 1996). In both theories feedback suggests behaviour change as the consequence of a discrepancy between the feedback information and the goals (Carver & Scheier, 1981), or the anticipated arousal (Locke & Latham, 2002). These authors discuss the use of data in a cyclic process (see figure 1), in which clear goals and policies are formulated and to which people can be referred. Goals and policy have to be translated in the daily practice. This requires appropriate actions and behaviour in accordance with the goals. Kluger & DeNisi, (1996) define feedback as actions taken by (an) external agent to provide information regarding some aspects of task performance.

Feedback supports reduction between current state and desired goals if the goals are clearly defined, attractive and feasible (Sapyta, et al. 2005). The discrepancy between current state and intended situation (references) has to be sufficiently clear for nurses to see a need to reduce it (Hattie & Timperly, 2007).

From the perspective of feedback theory, the intention of Dutch psychiatric hospitals to reduce seclusion and restraint by 10% a year (GGZ Nederland, 2004) is problematic. The content of this goal is vague. It is unclear what the 10% reduction should be. Does this relate to the duration of seclusions, the incidence of seclusions, or the number of patients experiencing seclusion? Individual hospitals do not specify this in clear goals and policy. Moreover, Dols & van Tilburg, (2010) conclude that there is consensus among all parties involved on the desirability to reduce coercive measures, but that stakeholders, such as branch organizations, institutes' board, medical directors, nurses, have different views on what it means to improve quality of care and to reduce the use of coercive measures. This may have negative implications for the involvement and goal commitment of the workers.

Goal commitment and self-efficacy can also be enhanced by leaders (Hattie & Timperly, 2007), communicating an inspiring vision and behaving supportively (Locke & Latham, 2002, Sapyta, et al. 2005). The importance of the goals can be influenced by providing financial resources, time and

necessary expertise. This suggests that in order to create commitment, all involved parties should cooperate intensively in specifying their goals. Beside this, they have to pay attention to the content and methods of communicating to convince nurses of the usefulness and necessity of proper recording of coercive measures.

Feedback is ideally discussed in a face to face context that is supported by a trained facilitator, according to Archer (2010). However, Neubert, (1998) found in effects of feedback little or no distinction between feedback presented personally or impersonally. A pre-requisite condition of feedback is the inclusion of information, containing knowledge of results (Kluger & DeNisi, 1996) or outcomes for one particular moment in time (Sapyta, et al. 2005) in relation to goals defined beforehand.

Feedback should be given frequently allowing the identification of change in processes and outcomes while occurring and also allowing the application of corrective actions when necessary (Sapyta, et al. 2005). In local feedback reports to ward staff, shorter time frames (i.e. month or quarter) may be used to raise the awareness of current patterns in coercive measures. These reports should also reflect on specific goals of local coercion reduction programs. It is important to use consistent time frames for providing feedback, since varying time frames complicate comparisons. For comparison, a time frame of 1 year is preferable, because shorter time frames are more sensitive to chance findings, seasonal variations etc.

The Argus method aims to improve the practice and use of coercive measures. Therefore, a complete and reliable registration of all coercive measures is required. Some of the conditions are incorporated into the development of the Argus method. Feedback theory posits that proper registration alone is not enough to improve practice. Clear goals and involvement of all professionals are important. It is also important that professionals receive periodical information about the results of their efforts. This means that the registration of coercive measures must be embedded in a practice of using data for treatment planning, as well as for evaluating ward and hospital policies. Therefore, hospitals must facilitate conditions for feedback to become a part of their structure and culture (Voskes, et al, 2012).

Data on coercive measures in the Netherlands compared with data from other countries

This section focuses on the second research question: How do data on coercive measures in the Netherlands compare to other countries? We will discuss this by using the results of chapter 2 to 6, as well as more recently published data. Furthermore, we will focus on trends in Dutch seclusion figures. Finally, we will look at aspects that have remained underexposed in previous chapters.

Dutch data in international context

International studies that cover data on coercive measures of more than one hospital per country are scarce. The reviews in chapter 3 and 4 and the review of van der Merwe, et al. (2009) present the results of available studies. The results are summarized in table 1. This table also contains results of four Dutch studies of Janssen, et al. (2009) and Noorthoorn, et al. (2010, 2011). Some calculations were made to simplify comparisons.

The review in chapter 3, as well as the review published by van der Merwe, et al. (2009) focused only on the use of seclusion, disregarding the use of restraint and forced medication. The review in chapter 4 focused on both seclusion and restraint. This review also contains unpublished materials, mainly from local studies.

Dutch psychiatric hospitals nowadays produce more accurate data on coercive measures than five years ago. On the basis of figures from chapter 5 and 6, and figures reported by Noorthoorn, et al. (2011) we can fill in most of the gaps in previous international comparisons. Dutch figures can be compared with other countries on four aspects. The last (number of seclusion hours per 1000 bed hours), was not earlier used in international studies.

Table 1. Summary of international seclusion figures.

Source		Mean duration of seclusion (hours)	N seclusions per 1000 admission	N seclusions per 1000 inpatient days	N seclusion per 100,000 inhabitants	N seclusion hours per 1000 bed hours
Chapter 3 (Janssen, et al. 2008)	USA	-	4 to 110	-	-	-
	Australia / NZ	-	-	1,3	-	-
	Europe	-	66 to 1517	5	-	-
	Netherlands¹	-	-	3.7 to 4.3	-	-
Chapter 4 (Steinert, et al. 2009)	USA	-	-	-	-	-
	Australia / NZ	14	-	-	539	-
	Europe	0 to 41	-	-	0 to 98.4	-
	Netherlands	294	-	-	115.8	-
Janssen, et al. 2009	Netherlands	103	-	5.1	-	
Van der Merwe, et al. 2009	USA ²	16	2.3 to 40	-	-	-
	UK ²	3	0.1 to 27	-	-	-
	Europe ²	7 to 55	0.7 to 0.8	-	-	-
Chapter 5 (Janssen, et al. 2011)	Netherlands³	69	259	2.1	82	6,0
Noorthoorn, et al. 2010	Netherlands⁴	-	-	2.9	78	8,1
Noorthoorn, et al. 2011	Netherlands⁵	62	81	0.8	62	7,2

¹ only seclusions reported to the IGZ.

² only acute ward / PICU.

³ calculations based on the figures in chapter 5, table 1 and 3 (fixed sample of wards)

⁴ calculations based on report 3 jaar Argus (number admissions and patients in seclusion not reported)

⁵ calculations based on report 4 jaar Argus

For making comparisons between Dutch hospitals and hospitals in other countries on the use of seclusion, the Dutch studies are shown in bold in table 1. With respect to the mean seclusion hours large differences were found between Dutch hospitals and hospitals in other countries. In most cases, Dutch figures seem to be higher than international figures, however the differences in samples and way of measurement makes comparison difficult (Chapter 3, this thesis). The most recent study of Noorthoorn, et al. (2011) showed that the mean duration of seclusion in admission wards of the Netherlands seems to be in line with some Finnish and Swiss figures (van de Merwe, et al. 2009).

Comparing Dutch hospitals or wards

In chapter 5 and 6 we presented figures of 12 Dutch psychiatric hospitals and 29 admission wards. In both chapters we observed large differences between hospitals and wards with respect to time in seclusion, which is in our opinion the most powerful value. Between the hospitals this varies from 0.3 to 18 hours per 1000 bed hours. On the admission wards we saw even larger differences. Here, we observed between 1 and 157 hours per 1000 admission hours. In the above mentioned studies we used data collected in 2009. At that moment a limited number of hospitals had implemented Argus. Both examples showed it is feasible to provide seclusion data over the entire country allowing a comparison between wards and hospitals.

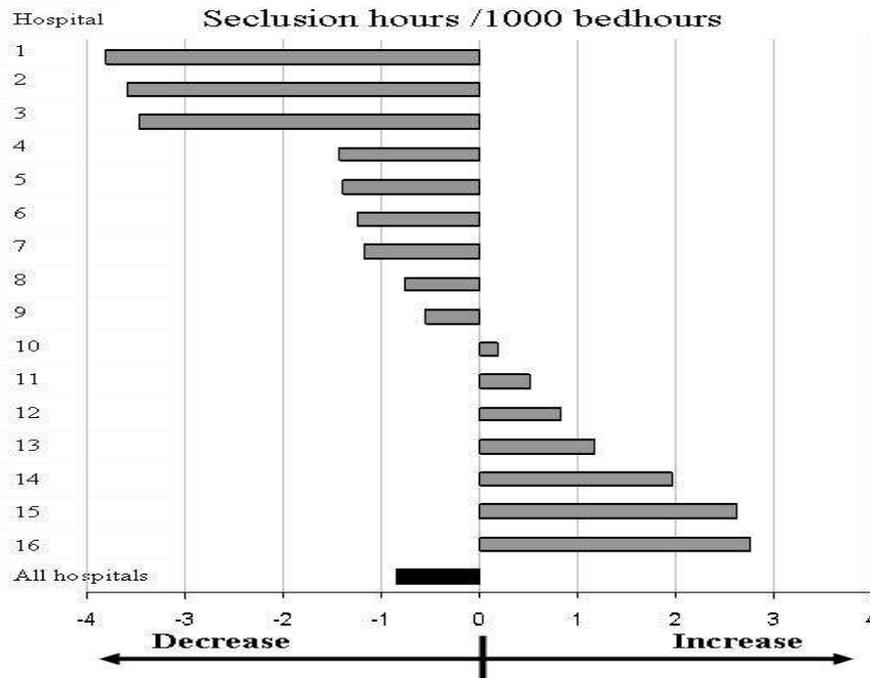
Trends in seclusion in Dutch hospitals

For studying trends in the use of coercive measures in Dutch psychiatric hospitals, the Dutch studies are shown in bold in table 1. The first two studies used data for the year 2002. The third study (Janssen, et al. 2009) used data for the year 2008. The last studies (chapters 5 and Noorthoorn, et al. 2010, 2011) used data from 2009 and 2010. From these studies we conclude that a number of Dutch hospitals reduced seclusion. However, others did not. The most recent figures (Noorthoorn, et al. 2011) showed a statistically significant decrease in seclusion, with respect to the mean duration, number of seclusion incidents per 1000 admission and number of seclusions per 100,000 inhabitants, compared to earlier publications of Janssen, et al. (2009) and chapter 5. This decrease is less than the ambitious goals set by the Government and GGZ Nederland (2004).

Figure 2 provides an over view of seclusion data in a sample of Dutch psychiatric hospitals. The 16 hospitals contributed for a number of years (average duration of participation is 2 to 4 years) in a nationwide benchmark study (Noorthoorn, et al. 2011). The hospitals provided data on the number and duration of seclusion and supplemental data on number of admissions and length of stay. In this figure, the results of the year 2010 are compared with the results of the year 2009. For both years the seclusion figures were calculated by the number of seclusion hours per 1000 bed hours.

The 16 hospitals achieved a reduction in duration of seclusion per 1000 bed hours in 2010 of 10.5% compared to 2009, shown in the black bar in the bottom of figure. Noorthoorn, et al. (2011) reported a decrease of 12.2 %, in the number of patients involved (from 3505 patients in 2009 to 3.076 patients in 2010). Nine hospitals, found at the top of the figure, reduced duration of seclusion. At the bottom we find hospitals in which the relative duration of seclusion increased.

Figure 2: Comparison of the number of seclusion hours per 1000 bed hours per hospital in 2009 and 2010.



From the studies mentioned above, in combination with more recently acquired data, we can make a comparison between several hospitals and wards in the Netherlands. In the international context the data presented in table 1 confirm the view that seclusion is a widely used intervention in the Netherlands, compared to the situation in many other European countries. Dutch psychiatric hospitals show the highest seclusion data when compared with other European countries. We were also able to present trends in the use of coercive measures, based on the published articles which contain Dutch figures but in more detail (as shown in figure 2). Nevertheless, such comparisons contain weaknesses. At hospital level, observed differences might be due to differences in composition of patient groups, ward admission policy or other specific factors. It is also unclear whether the lowest and the highest seclusion data in chapter 6 and figure 2 are structural, or the result of outlier data. In the next section we will elaborate on corrections which have to be made before ratio data can be used for comparison between wards (Chapter 6), hospitals (chapter 5) or countries (table 1).

Patient compilation

In chapter 5 and figure 2 we used data from several hospitals assuming the hospitals are equal in terms of the patient groups they treat. This is however a simplification of reality. Some of the hospitals described in chapter 5 have specializations and admit, for example, patients with substance abuse to especially equipped wards. Other hospitals have wards equipped for forensic patients or clinical beds

for children and adolescents. Such differences may influence the presented outcomes on the use of coercive measures. A possible solution is to make classifications on groups of patients or types of wards and present their figures in a similar way to the figures we show in chapter 2 and in figure 2. Several options are:

1. description of age groups, for example children, young adults, or elderly.
2. description of diagnosis, such anxiety disorders, mood disorders, bipolar disorders, psychotic disorders/schizophrenia or substance abuse.
3. description of the duration of admission, i.e. shorter than 1 year or for a longer period.
4. description of voluntary or forced admitted patients.
5. description of type of wards, as for example admission wards, drug abuse wards, organic disorder wards, forensic wards or wards for elderly

Using these classifications as a way to correct for observed differences takes into account that hospitals differ on the compilation of the admitted patients. They are a first step for clarifying differences in the use of coercive measures between the hospitals. Comparisons between wards with clearly defined patient groups show how several kinds of wards differ on the use of coercive measures of a certain kind over a certain frequency and duration. This also allows a more precise and correct evaluation of trends in the use of coercive measures within patient groups. In feedback to hospitals and wards this is important information. When comparing hospitals we therefore need a clear and unambiguous classification of groups of patients.

Experiences with studies on patient data, such as presented in chapter 6, suggest that classifications can be made with a limited number of determinants, available in patient administration databases. These databases have, however, limited value, because they were originally constructed for accountability to care insurance companies.

Comparisons between hospitals or wards

The variety of seclusion figures in studied hospitals and wards is large, if we look at the incidence and prevalence ratios shown in chapter 5 and 6. Interpretation of these results, however, needs to be treated with caution. Drawing conclusions from data with large ranges is difficult. A method that is less sensitive to extreme outliers is preferable.

One way to do this is to use mean and standard deviation. The underlying assumption is that most of the observations will be within two standard deviations around the mean. Skipping the first 2.5% and the last 2.5% of the data, which can be regarded as outlier data, creates a new range for making statements in comparing hospitals or wards. This approach has one flaw: it requires a symmetric distribution of the outcome. In our research, the data, however, are distributed in a skewed way.

Another approach is using the inter-quartile range (the 25th and the 75th percentile) around the median (Altman, 1999). This approach seems easier to grasp (see table 2).

Table 2. Inter-quartile range on seclusion hours per 1000 bed hours.

	12 hospitals (Chapter 5) Seclusion hours / 1000 bed hours	29 admission wards (Chapter 6) Seclusion hours / 1000 bed hours
Variance	0.3 to 18	1 to 157
Mean	6.27	17
Median	5.25	7.61
25 th percentile	4.21	2.30
75 th percentile	9.7	13.07

When we look in table 2 at the 12 hospitals, the 25th and 75th percentile values indicate that patients in the hospitals around 75th percentile were secluded over twice as longer as in the hospitals located around the 25th percentile. When we look at the 29 admission wards, the 25th and 75th percentile values indicate that the variation in duration of seclusion between the wards is substantial, namely six. When comparing hospitals and wards, using the 25th and 75th percentile values seems to be a valid and robust method to express the differences on the level of hospitals or wards.

Ratio figures for comparison purposes

Chapter 5 and table 1 provide some ratio figures for comparison purposes. For comparing hospitals we used the number of seclusion and restraint incidents per 100.000 inhabitants in a hospital's catchment area (see also chapter 4 and 5). The location of a hospital in either a rural or an urban catchment area may provide some explanation for the use of coercive measures in a specific hospital. However, when we use the number of seclusion and restraint incidents per 100.000 inhabitants, the catchment area needs to be clearly defined and it should have a stable number of inhabitants. Sound comparisons between hospitals on this measure require that patients from one catchment area are always treated in the same hospital. This is not always the case in the Netherlands. Therefore, a comparison on this level needs to be interpreted with caution.

Another way of expressing the number of seclusion and restraint incidents is to calculate the number of incidents per 1000 admissions. It should be taken into account that this calculation strategy is sensitive to hospital policy. A hospital or ward with a predominantly conservative policy, visible in a cautious and gradual reintegration of the patient on the ward, may have low numbers of incidents per 1000 admissions but often lengthy seclusions or restraints. In contrast, wards with a more progressive

policy, resulting in seclusions being ended sooner, could have higher incident rates per 1000 admission rates, but the average duration of these seclusion incidents could be lower. Reporting of such data may bias the comparison between hospitals or wards. This calculation strategy also suggests that newly admitted patients on acute psychiatric wards are most likely to be exposed to coercive measures. The number of incidents per 1000 admissions does not take into account that patients on long-term care wards are also at risk of being secluded. Therefore, this calculation strategy is preferred for comparison between admission wards only. To overcome the bias of this strategy for long term treatment wards we suggest that the number of incidents is reported per 1000 daily occupied beds or per 1000 bed hours. This calculation method is suitable for all types of wards but is also sensible for ward or hospital policy on the use of coercive measures.

In table 1 the duration of seclusion is expressed by using the mean. This value is used in many publications. We consequently followed this for comparison purposes. The duration of coercive measures, expressed in mean number of hours, is an important value for wards and hospitals. This value is sensitive to changes. Using the mean for comparison purposes has certain shortcomings. It does not take into account ward or hospital size. When using the mean duration of coercive measures diachronically we forego changes to ward and institution infrastructure (Bowers, 2000). It can be concluded that using the mean is not a proper way to compare data between hospitals and wards. In comparisons between wards and hospitals we therefore prefer expressing the duration of coercive measures in the number of hours per 1000 bed hours. This is a sensitive measure, since small changes in the number of seclusion hours effect the number of hours per 1000 bed hours.

In studies over the past four years, we used the number of hours per 1000 bed hours for comparison between wards and hospitals. We compared changes in the ward and the hospital, as well as differences between wards and hospitals. However, there are still some issues regarding the number of bed hours, which need clarification.

Firstly: should the number of bed hours be counted only for the wards with seclusion facilities or should the number of bed hours of the entire hospital be used? The risk of seclusion for patients admitted on wards without seclusion facilities is much lower than on wards that have seclusion facilities.

Secondly: calculations on all bed hours of the hospitals can lead to bias. As was described before, hospitals have facilities for special groups of patients, such as for children, young adults, or residential patients who stayed in facilities without seclusion rooms or restraining devices. Other hospitals do not have these facilities. Counting all the bed hours leads to a higher number of beds resulting in a more favourable image.

Determinants explaining the use of coercive measures

This section discusses the outcomes of the chapters 6, 7 and 8 for the purpose of the third question of this thesis: can the figures on coercive measures as well as possible trends in these figures be explained? Table 1 and figure 2 in this chapter show a clear downward trend in the use of seclusion in the Netherlands. Between 2002 and 2010, the mean number of seclusion hours decreases from 294 hours to 62 hours, the number of seclusions per 1000 admissions decreases from 259 seclusions to 81 seclusion per 1000 admissions, and the number of seclusions per 1000 inpatient days shows a remarkable decrease. The number of seclusions per 100,000 inhabitants is reduced to half. How can these trends be explained? We will first discuss the relationship between the use of seclusion and patient characteristics, studied in chapter 6. Second we will discuss the relationship to team coaching and training on the job, studied in chapter 7. Finally we will discuss the relationship between staff characteristic and seclusion, studied in chapter 8.

Patient characteristics

In contrast with the outcomes of earlier studies, describing the relationship between patient characteristics and seclusion, our study in chapter 6 suggests that patient characteristics predict the number and duration of seclusions only to a small extent (i.e., for about 1 %). Within this small range, younger age, having a psychotic disorder and a low GAF score are the most important determinants predicting seclusion hours. This is in accordance with Fiorillo, et al. (2012). The results of our study refute the assumption of ward managers and nurses that patient characteristics and severity of illness strongly predict the use of seclusion. Moreover this study showed patient characteristics did not explain much of the outcome. Our findings suggest that other determinants such as ward policy, culture and staffing levels are much more important.

Team coaching and training

The study in chapter seven focused on team coaching and training on the job of nurses in a quasi-experimental design. Based on previous findings (Fisher, 1994, Forster, et al. 1999) the experimental ward combined team coaching with training in aggression prevention, as well patient and family participation in ward activities, as means to improve patient contact and reduced seclusion use. In the experimental ward, seclusion use showed a tenfold reduction over two and a half years. Our study indicated that ward policy and culture seem to be important determinants for change. The design did not enable identification of the influence of individual interventions on reducing seclusion. This may be achieved by a stepwise implementation of interventions. In a stepwise design, interventions that

are implemented earlier may have a better effect on interventions that are implemented in the later phase. In our study, no attention was paid to the efficiency of team coaching and training in relation to seclusion use. The study only measured results during a limited period of time. More recent data of the same wards showed the outcome remained the same over a substantial number of years, with lower figures of seclusions on the experimental ward (Noorthoorn, et al. 2010).

Staff characteristics

The study presented in chapter eight examined in retrospect the associations between staff characteristics and the use of seclusion. Seclusion use and staff composition were measured on a daily basis. This study shows that staff composition is associated with the use of seclusion. The study suggests that variation in the amount of work experience in the team is related with less seclusion use, as may also be the case with the presence of more male than female staff members in the team. However, the reported correlations and the low Wald statistics indicated only a small relationship between staff characteristics and the use of seclusion. This can also be ascribed to the research design and availability of data on seclusion use. A more detailed study, including day-, evening- and night shift data, might provide a more clear view on the relation between the staff present and the use of seclusion.

The findings in this study show the importance of the composition of the nursing team as a whole, especially the experience of the nursing team. Variability in work experience in teams is a condition for more interaction and reflexivity (Benner, 1984) in the team and is therefore likely to sharpen the vision on coercive measures. Team reflexivity is highly correlated with the tendency to avoid seclusion, according to Boumans and colleagues, (2012).

The studies in chapter 6 to 8, however, have a number of limitations. The studies are relatively small and focus on single determinants in relation to the use of seclusion leaving out a number of possibly relevant ward and contextual variables. Some of the data are only partially available. Therefore, the generalizability of the studies, especially the study in chapter 7, can be questioned.

Size of the studies and number of determinants

Most studies in this thesis focus on mono-causal relationships between the main determinant and outcome. The studies have been done in natural settings. These settings are not structured on mono-causal relationships. Reality is multi-causal. Behind the determinant that interests us in, several other determinants may influence the outcome. The use of coercive measures takes place in a reality in which patients, staff, (building) environment, policy and legislation interact. The absence of control

over these determinants makes the tracking of cause – effect relations difficult. Correction for such factors would require larger databases.

On the other hand, large databases and multiple determinants need more complex techniques of analysis. Multi-level analysis (chapter 6) is an example of a complex technique. We used it for the first time in this field of research. The study in chapter 6 provides an example of analyzing and interpreting outcomes in a middle sized database with multiple determinants.

Availability of data

A limitation is the availability of data. Some patient characteristics are available in hospitals' databases. However, these data do not always contain accurate information. This is especially true for diagnosis and GAF scores. This is a limiting factor for studies like the one in chapter 6. GAF scores and - to a lesser extent - diagnosis vary considerably during a patients' admission. Because of this, the reliability and validity of the GAF score is debated (Jones, et al. 1995, Grootenboer, et al. 2009).

When diagnostic data are available it is not always clear what the most important diagnosis is. A majority of the patients had more than one diagnosis on DSM axis 1 or 2. In the study in chapter 6 we included the first diagnosis mentioned. We assumed that this was the most important diagnosis, but we could not check this. These structural problems in the construction of hospital' databases may lead to an underestimation of the influence of patient characteristics on the use and duration of seclusion.

Chapters 6, 7, and 8 indicated that changes in culture can explain trends in the use of seclusion. To confirm the outcomes more research is needed on a larger scale and in several hospitals. The database of 2011 and the one under construction for 2012 contain enough data to study multiple determinants in relation to the use of coercive measures. Chapters 6 to 8 also paid attention to the origins of the data. The studies showed that improvements in the quality of the data on patient and staff characteristics are necessary. More appropriate instruments covering psychiatric functioning on a daily basis are necessary. Instruments as the 'Crisismonitor' (Van de Sande, 2011) may provide relevant information clarifying variance. But also data on nurse compilation at a daily basis may be useful for explanation.

Further research

Based on the results in chapter 6 to 8 it can be assumed that staffing and staff culture are probably the most important determinants of the use of coercive measures. Further large scale research is necessary to confirm the findings in chapter 6 to 8. Moreover, we need a better understanding of the aspects of

culture on the ward. Which aspects of culture are helpful in reducing restrictive measures?

Quantitative research only shows relationships between determinants and outcomes. Qualitative research is needed to provide more concrete explanations and to describe aspects of culture and how these influences choices made by staff. For managers this is important information, as it may assist management and staff understanding underlying processes and improving working procedures in daily practice.

Less restrictive measures

In this thesis we focused only on seclusion, restraint and force medication. Other restrictive interventions, like one to one supervision, using intensive care units were not included. Therefore, effects of a reduction of coercive measures cannot be related to possible increases of less restrictive measures. Inclusion of less restrictive interventions in the Argus database means that attention must be given to the willingness to report them and to their reliability.

International comparisons

The available reviews (chapter 3 and van de Merwe, et al. 2009) focus only on the use of seclusion. Chapter 4 focused on seclusion and restraint. We concluded that in Europe the pattern of coercive measures varies widely between countries with regard to frequency, type and legal regulations. Involuntary medicating is highly restricted in the Netherlands and mechanical restraint is forbidden in the UK (see chapter 4). For comparisons between countries, it is important to focus on all coercive measures, including forced medication. In these comparisons we have to deal with many differences in ways measures are allowed and applied. To allow comparisons and bridge these differences it may be helpful to develop a coercion equivalent for seclusion, restraint and forced medication as Bowers suggests (personal conversation). Such equivalent can help to compare the use of coercive measures and making statements between different countries, in terms of minimal or high use. For example Dutch figures are high in seclusion, but low in medication. English figures are somewhat higher in medication, but far lower in seclusion. German figures are higher in restraint, but again lower in seclusion (Steinert, et al. 2009). International comparison on coercive measures can be helpful to review the effects of legislation as well as other factors in relation to their use. International comparisons between the Netherlands, Germany, Switzerland, Finland, Denmark and UK stand the best chance to be successful, because in these countries databases are available on coercive measures covering more than single hospitals or wards are available.

Determinants

More research is necessary into the effect of the combination of determinants on the incidence of the coercive measures, as well as on their duration. For further research it may be helpful to collect daily information of all admitted patients. We suggest scales such as Broset Violence Checklist (Almvik, et al. 2000), HoNOS (Wing, et al. 1998) or Kennedy axis 5 (Kennedy, 1984, van de Sande, et al. 2011) completed periodically, maybe daily, instead of the GAF.

Environmental determinants of wards (Broers & de Lange, 1996, van der Aalst, et al. 2010), staffing in detail, education (Janssen, et al. 2007, Morisson & Lehane, 1996), availability of distractive activities (Wijngaarden, et al. 2000) or effects of media attention to big events such European or World Championship football or Olympic games (Nijman, et al. 1996) and external factors such as legislation in different countries (Legemaate, et al. 2007) should also be taken into account in these studies.

Among these determinants we have to focus on the aspects that can be improved the practice in such a way that they support more reduction of coercive measures.

Conclusion

The Argus method and its implementation in psychiatric practice are an important step forwards. For hospitals that use the Argus method, more precise data is available. The data can be used in feedback, benchmark and scientific research on the use of coercive measures and determinants. Trends in the use of coercive measures can be examined.

Not all hospitals are equally willing to implement the Argus method. Therefore, hospitals have to be motivated to use the Argus method. An obligation to report all coercive measures using the Argus method (Minister van VWS, 2011) is not enough. The quality of the data provided by the hospitals needs constant attention. For Argus data and data on determinants, adjustments in the construction of hospitals' databases are necessary.

Data are indispensable for evaluating and discussing results of reduction activities. Of course, data by themselves do not improve practice. They are a static representation of the past. Feedback to teams and management is essential. In feedback, data need to be interpreted and returned to management, staff and nurses. The characteristics of seclusion and restraint should be analyzed by unit, shift, day and staff, in line with earlier studies (Huckshorn, 2004, Schreiner, et al. 2004, Gaskin, et al. 2007).

Learning is the key issue. Therefore in feedback, data on coercive measures should be used in a non-punitive way. Feedback on Argus data is essential. Hospitals and wards have to include structural

feedback of data about coercive measures. Implementation of the Argus registration method and using Argus data needs leadership and facilitators who help to implement and explain the data.

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