ORIGINAL ARTICLE

# Network governance of Dutch intensive care units: state of affairs after implementation of the Quality Standard

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## Abstract

*Objective:* To study the current state of affairs concerning Dutch intensive care network governance in relation to known effective governance structures of network organisations.

*Methods:* Six characteristics of intensive care networks were defined to determine the four contingency factors from the Provan & Kenis network governance models. The contingency factors were determined for all Dutch intensive care networks. An overview of the networks and characteristics was created by triangulation, using information from two national intensive care network meetings (November 2017 and June 2018) and semi-structured interviews by telephone with 10 network intensivists and / or network managers.

*Results:* Based on the chosen characteristics, none of the Dutch intensive care networks has a governance structure according to one of the Provan & Kenis successful forms of governance. Each of the present networks has a governance structure with elements from two or three different types. Characteristics of the network administrative organisation and shared governance form overlap in 10 out of 15 networks. All networks have a form of governance in which at least one intensivist is represented.

*Conclusion:* After implementation of the Quality Standard, the presence of networks of intensive care units covering the Netherlands is a fact. The network governance that has developed varies but none of the networks has a governance structure that matches with a proven effective governance structure. Based on theory, the network administrative organisation seems to be the most effective for larger networks, and shared governance for smaller networks.

## Introduction

The Quality Standard 'Organisation of Intensive Care', which was adopted in 2016 stated: 'A nationwide network system should be set up to maximise the efficiency and outcomes of intensive care.'[1] This was the official introduction of intensive care unit networks in the Dutch intensive care community. There has been cooperation between intensive care units for much longer but formalising network relationships aiming at improving the efficiency and (joint) outcomes of intensive care was new. Between 2016 and 2019, a nationwide intensive care network cooperation and governance has grown. During a network meeting of the Healthcare Institute on 30 November 2017, a map of the Dutch intensive care networks was built *(figure 1)*.

Network organisations are developing not only among intensive care units but more broadly in healthcare. According to management scientist Mintzberg, this is a natural development since patients are often not limited to a single medical specialty or pathophysiological 'pigeonholes' on which our healthcare system is designed.[2] The Parkinson's network[3] and the COPD chain organisation are examples in which multidisciplinary cooperation takes place to obtain the best result for the patient.[4] A network can be defined as a complex of organisations that work together to achieve a specific goal.[5] The aim of networking in intensive care medicine is, according to the Quality Standard, to provide the right care at the right time in the right place.

Provan & Kenis studied the governance of networks to find out what the best kind of 'governance' is for a network organisation to achieve the intended objective(s).[6] Unfortunately, there is no uniform answer for all network organisations. These researchers state that the success of a form of governance depends on four structural factors of relations (contingency factors). The contingency factors are: 1) mutual trust between the different organisations, 2) the number of organisations within the network, 3) consensus on the objective of the network (goal consensus), and 4) the need to work together as a network (need for network level competencies).[6] These factors are summarised in *figure 2*.
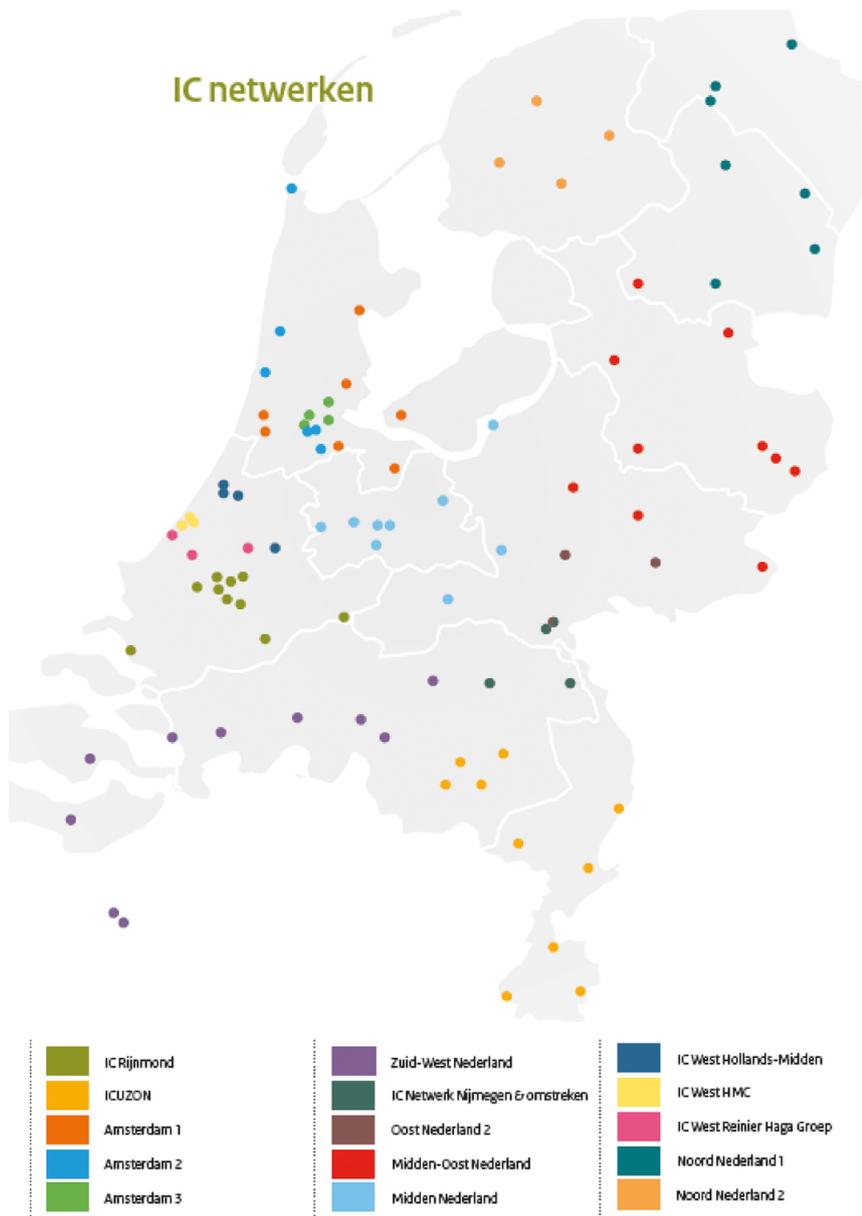
**Figure 1.** Overview of Dutch Intensive Care networks as presented at the National Network Meeting: Landelijke Netwerk bijeenkomst Zorg Instituut Nederland, November 2017

## Key Predictors of Effectiveness of Network Governance Forms

| Governance Forms | Trust | Number of Participants | Goal Consensus | Need for Network-Level Competencies |
|---|---|---|---|---|
| Shared governance | High density | Few | High | Low |
| Lead organization | Low density, highly centralized | Moderate number | Moderately low | Moderate |
| Network administrative organization | Moderate density, NAO monitored by members | Moderate to many | Moderately high | High |

**Figure 2.** The Provan & Kenis network governance model NAO = network administrative organisation

**Table 1.** Characteristics of the intensive care networks for the contingency factors

| Contingency factor | Criterion | Score | Type of governance |
|---|---|---|---|
| Trust density | Do the intensivists of the network visit other network partners? | 0 = no<br><br>1 = only for scientific meetings<br><br>2 = to watch and learn from each other | 0 = LO<br><br>1 = NAO<br><br>2 = SG |
| Number of participants' | How many ICs participate in the network? | Number of ICs | ≤3 = SG<br><br>4-6 = LO<br><br>≥7 = NAO |
| Goal consensus | Does an agreement exist for cooperation in the network signed by all organisations?<br><br>Did the network cooperation start before the Quality Standard? | 0 = no<br><br>1 = yes<br><br><br>0 = no<br><br>1 = yes | 0 = LO<br><br>1 = NAO<br><br>2 = SG |
| Need for network level competencies | Is an academic hospital present in the network?<br><br>Does the network have a dedicated network manager? | 0 = no<br><br>1 = yes<br><br>0 = no<br><br>1 = yes | 0 = SG<br><br>1 = LO<br><br>2 = NAO |

LO = lead organisation;
NAO = network administrative organisation;
SG = shared governance

Provan & Kenis define three proven effective basic forms of network governance based on the four factors above. These are:
- Shared governed network: The board is formed by the network members themselves. This kind of governance includes, for example, partnerships between physicians and paramedics that aim to improve care through coordinated collaboration without setting up a separate organisation.
- Lead organisation-governed network: Important activities and decisions are made by one of the participating network organisations, which acts as the leading organisation. Examples of this are the Education and Training Regions for the training of medical specialists where the academic centres are the lead organisations.
- Network administrative organisation (NAO): In this governance form, there is a separate administrative entity that manages the network and organises the activities. This 'NAO' is not part of the primary process of the network. An example of this is the National Acute Care Network, which organises the network activities for the acute care regions.

The aforementioned four contingency factors determine the effectiveness of network governance. The aim of this study is to investigate how the current intensive care networks develop within the Quality Standard and what we can learn about

**Table 2.** Results for the contingency factors per network

| Network number | Trust density | Number of participants | Goal consensus | Need for network level competencies | Best fitting type of network governance* |
|---|---|---|---|---|---|
| 1 | 2 | 10 | 2 | 2 | **NAO / SG** |
| 2 | 1 | 4 | 2 | 2 | **NAO** / SG / LO |
| 3 | NA | 3 | NA | 2 | NA |
| 4 | 1 | 7 | 1 | 1 | **NAO** / LO |
| 5 | 2 | 9 | 2 | 1 | NAO / **SG** / LO |
| 6 | 1 | 8 | 2 | 1 | **NAO** / SG / LO |
| 7 | 2 | 9 | 2 | 2 | **NAO** / SG |
| 8 | 2 | 3 | 1 | 1 | NAO / **SG** / LO |
| 9 | 2 | 3 | 1 | 0 | NAO / **SG** |
| 10 | NA | 3 | 2 | 0 | NA |
| 11 | 2 | 7 | 1 | 1 | **NAO** / SG / LO |
| 12 | 1 | 3 | 1 | 1 | **NAO** / SG / LO |
| 13 | NA | 7 | 1 | 1 | NA |
| 14 | 1 | 7 | 1 | 1 | **NAO** / LO |
| 15 | 1 | 4 | 1 | 0 | **NAO** / SG / LO |

*bold when ≥2 factors are present.

NA = not available; LO = lead organisation; NAO = network administrative organisation; SG = shared governance

network governance from the described governance models. The primary endpoint is the classification of the networks according to the Provan & Kenis model.

## Methods

An overview of the Dutch intensive care networks was created by combining information obtained from three sources (triangulation). First, information collected during the National Healthcare Institute (Zorginstituut Nederland) meeting in November 2017, second information from the national intensive care network meeting in June 2018 and third information from semi-structured interviews by telephone with 10 network intensivists and / or dedicated network managers who are responsible for organising the network activities on behalf of the network. The interviewer made inquiries about the way in which the network was formed, about the current agreements within the network and about the criteria necessary for classification according to the Provan & Kenis model, as shown in *table 1*.

The Provan & Kenis model does not in itself describe the criteria by which the contingency factors can be interpreted. For the intensive care networks, information as shown in *table 1* was collected. An arbitrary choice was made for the variables, by consensus with the research group, that describe the contingency factors in the specific intensive care unit setting, as well as for the scoring that determines the classification. The

**Table 3.** Number of intensive care networks per contingency factor following the governance structures described by Provan & Kenis

| Number of participants | Few | Moderate | Many |
|---|---|---|---|
| **Number of participants** | SG | LO | NAO |
| No. IC networks | 5 | 2 | 8 |
| **Trust density** | **Low** | **Moderate** | **High** |
| No. IC networks | LO | NAO | SG |
|  | 0 | 6 | 6 |
| **Goal consensus** | **Low** | **Moderate** | **High** |
|  | LO | NAO | SG |
| No. IC networks |  | 8 | 6 |
| **Need for network-level competencies** | **Low** | **Moderate** | **High** |
|  | SG | LO | NAO |
| No. IC networks | 3 | 8 | 4 |

LO = lead organisation;
NAO = network administrative organisation;
SG = shared governance

degree of mutual trust is subjective and may vary from moment to moment. As working on mutual relationships contributes to the development of trust, it was studied by questioning in the interviews whether participants from the networks are actively visiting each other professionally. In the analysis, the collected data are mirrored to the Provan & Kenis model so that an overview is created of the intensive care network governance structures in the Netherlands.

### Results and analyses
It appears that 15 intensive care network organisations have been formed, which completely cover the Netherlands. As there are 11 acute care regions (ROAZ), not every intensive care network matches the ROAZ region. There appear to be an average of 5.8 intensive care locations in a network, the range is from 3 to 10 locations.

All 15 networks were found to have written agreements concerning the cooperation within the network in any form, in accordance with the criteria described in the Quality Standard. All networks have in this way worked on the contingency factor 'goal consensus'. Six networks were already in a more or less advanced stage of network creation or cooperation before the 2016 Quality Standard was introduced, the other networks were established following the Quality Standard. Each intensive care network appears to have established a form of management, with at least one intensivist on the board or in the steering committee.

The results for the contingency factors are summarised in *table 2.* In the last column, the network governance model that fits

best, based on the contingency factors, is shown in bold type. Less well fitting types of network governance - with few features of a proven model - are given as well, but in standard font. Getting to know each other, as a method of building trust, appears to be encouraged in all networks through joint meetings. In addition, people visit each other actively in six networks. This can be seen as a way to become oriented to the work processes of other intensive care units. This can be focused on a specific topic, or in some cases the exchange of nursing staff for a fixed period of time. Getting to know each other professionally is also achieved by organising joint scientific meetings. Two-thirds of the networks emphasised that knowing each other is a contributory factor for network success.

Six of the networks have a network manager for coordinating tasks. The network managers indicate that their presence facilitates accessibility to contact at the organisational level between the networks themselves. These contacts between network managers resulted in the National Consultation Intensive Care Regions, a consultative body, under the flag of the Dutch Intensive Care Society (NVIC). In meetings of this National Consultation experiences and developments concerning network formation are shared and, if necessary, discussed with the NVIC. *Table 3* shows, for every contingency factor, the classification of each network according to the different forms of governance of Provan & Kenis.[6]

### Discussion
The main finding from our analysis of intensive care networks is that none of the networks is organised according to one of the network governance structures as described by Provan & Kenis. Characteristics of the NAO and shared governance form overlap in 10 out of 15 networks. A larger network makes its management more complex due to an increase in the number of inter-organisational relationships. Hence, according to Provan & Kenis, larger networks (more than 6-8 organisations) benefit from an NAO or lead organisation governance and smaller networks suffice with a shared governance model because mutual coordination is easier with fewer parties.

Consensus on the objectives to be achieved results in more efficient cooperation. Under NAO and shared governance, active participation of the network participants is required and a higher degree of alignment will be needed. With a lesser degree of consensus, collaboration can still be successful with a lead organisation governance structure. A lead organisation is able to make strategic and operational decisions more objectively, which produces results in the short term. It is important that mutual relationships are well managed.

NAO appears to be the most effective form of management because of the relatively large number of intensive care units per network in combination with the, for some, dependent position

of the smaller or the academic intensive care departments within the network. One lead organisation within the network that performs administrative tasks and facilitates network tasks is a possibility when mutual trust has to be worked on and when shared goal consensus has not yet been achieved. A shared governance model can be successful in a small network with three equal intensive care departments with a great deal of mutual trust and with agreement about the objectives to be achieved. Our study is the first one to summarise the current state of affairs concerning intensive care networks after the implementation of the Quality Standard. Various forms of networks have emerged. Our study has limitations concerning a number of issues. First, data were collected from a combination of sources in which subjective assessment by network spokespersons played a role. Some inaccuracy may therefore be present. We think it is likely, however, that a good overall picture has emerged about the network cooperation of intensive care units in the Netherlands. The field is moving so that this report should be seen as a snapshot. The chosen model of Provan & Kenis has the advantage that a classification based on proven effectiveness of network governance is given. However, it has not previously been used and validated for intensive care networks. It is therefore possible that other forms of network governance in the intensive care setting are also effective. We have chosen a limited number of arbitrary criteria to determine the contingency factors. Other choices could have been made as well. Finally, we have not tested our classification against measures of effectiveness such as treatment duration or mortality.

We believe that our overview can help to look carefully at the design of network governance and to develop the most appropriate type of network governance. The purpose is to create effective intensive care networks that truly achieve a maximum efficiency and the best outcomes for intensive care patients. Our study suggests that in creating a network, the first step is to generate insight into the characteristics of the participating organisations (both the intensive care units and the hospital as a whole) within the network. It seems important to aim for goal consensus in the next step and to study complementarity within the collaboration. Mutual relationships and the associated trust are likely to grow by working together during these steps.

## Conclusion

After implementation of the Quality Standard, a network governance structure of intensive care departments covering the Netherlands has been established. The networks are managed in different ways. For larger networks, theoretically the NAO type of governance seems to be the most effective and for small networks, when consisting of equivalent intensive care units, this is the shared governance form. Nine intensive care networks have characteristics of this type of network. However, most networks overlap in type of governance structure, which can be a risk for the effectiveness of the network. According to Provan & Kenis, governance is an underexposed topic in the literature of network organisations, while effective governance contributes to the success of a network. The next step is to study the efficiency and outcomes of the networks in relation to their governance structure. In addition, intensive care networks might learn about their governance structure with and from each other.

## Disclosures

### References

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