# National Dutch Healthcare Report

*Logistiek.nl , 2012*

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# Content

# 1. Introduction to the healthcare logistics landscape of the Netherlands

The Netherlands have 17 million inhabitants. The size of the country is comparable to Estonia (that is a little bit bigger country) and Belgium. The aim of the Dutch healthcare system is to offer accessible, payable healthcare, with equity among their citizens.

The Dutch healthcare system can be classified in different ways: purpose of healthcare, functional characteristics, place of healthcare provision and nature of the illness or disorder.

## 1.1 Purpose of healthcare

*Purpose of healthcare*

We can make four distinctions. Positive, preventative, curative and palliative healthcare.

- Positive healthcare means that the care is aimed at improving the lifestyle of people. People who live a healthier life are less likely to become ill.
- Preventative healthcare is focused on preventing illness. In this case vaccination and inoculation are the most used means.
- Curative care is recovering/improving someone's health.
- Palliative care is the lessening of people's pain for whom recovery is not possible. Terminal care and learning how to handle a handicap are the most common cases.

## 1.2 Functional characteristics of healthcare

*Functional characteristics*

Hereby a division is made in three echelons based on common functional characteristics
The basic echelon, the first echelon and the second echelon:

- The basis echelon is geared toward (high) risk groups who can become ill, with the main focus being preventative care. The patient has not initiated a question for help/care; the care provider took the initiative.
- The first echelon is aimed at those individuals who have asked for help from a healthcare provider, such as a general practitioner, or physical therapist. Both have a minimal specialisation and are directly accessible.
- The second echelon is for individuals who have asked for help at the first echelon stage. Professionals in the second echelon act on a referral from the first, and are therefore not directly accessible. Professionals in the second echelon have an advanced specialisation.

## 1.3 Other classifications of health care in the Netherlands

*Place*

The division is as follows: Extramural, Semi-mural and Intramural care.

- Extramural care is given in locations outside of institutions. For the most part it is care provided in the basic and first echelons.
- Semi-mural care is outpatient care provided by the second echelon, however, admission is generally not or hardly ever necessary; treatment is on a one-day basis.
- Intramural care is care provided to patients who (for a longer period) will be admitted to hospital.

*Based on the nature of the illness*

Hereby the differentiation is simply that of physical illness, requiring physical care, or mental illness, requiring mental healthcare. (*Mens en gezondheid, 2009*)

# 2 General information healthcare organisation in the Netherlands

## 2.1 Health policy and legislative framework, the 'governmental' part

The central government is responsible for determining priorities within healthcare and for the functioning of the healthcare system. If necessary this includes making changes in legislation, and safeguarding accessibility, quality and costs of the system.
The purpose of the current Dutch healthcare system is to provide healthcare of good quality to everyone, and to create solidarity with the help of mandatory and accessible healthcare insurance. (Ministry of Health, Welfare and Sport , 2016)

The central government is responsible for the complete healthcare system and determines the quality of healthcare requirements. Several governmental organisations are responsible for this:

- The Dutch Healthcare Authority ensures that the Healthcare Insurance Act is lawfully executed, and the authority is market supervisor for the healthcare market;
- The Netherlands Authority for Consumers & Markets who oversees the competition within healthcare in the interest of the patients and insured persons;
- Inspectorate for Health that supervises and enforces quality and safety of the healthcare system. (Ministry of Health, Welfare and Sport , 2016)

The healthcare system in the Netherlands is based on four Acts:

- Healthcare Insurance Act
- Long-Term Care Act
- Social Support Act
- Youth Act

## 2.2 Main law (Healthcare Insurance Act) , a public - private system

*Healthcare Insurance Act*
The Healthcare Insurance Act is the most important law for the healthcare system and has both public as well as private elements. This makes healthcare in the Netherlands a combined public and private system.

Public: The central government is directly involved with the implementation of the Healthcare Insurance Act, and sets a few public preconditions safeguarding the social character of the healthcare insurance:

- Citizens are required to take out a (basic) healthcare insurance and are free in choosing the provider;
- Healthcare insurers are required to accept citizens as clients regardless of their health situation;
- The contribution/premium of a specific policy is equal for every insured person (regardless of the general health situation, age or background);
- Healthcare insurers have the duty of care. They must guarantee that the care provided in the basic policy will be available to all their insured persons;

- The content and scale of the basic policy is legally determined by the central government It concerns medically necessary care, that everyone is entitled to. (Joost Wammes, 2016) The central government thus determines what type of care is covered in the policy and when it may be administered. The basic package has a wide scale, and includes most of the essential medical care, medicines and medical aids that meet the standard of academia and practice. The health insurance companies offer packages (for an additional) premium, for additional care. They can compete with each other, based on the differences between the additional offered care.

The central government is not directly involved with the *implementation* of the Healthcare Insurance Act. Implementation is determined by: healthcare providers, healthcare insurers and insured, i.e. the central (private) parties. The healthcare providers, determine how care is provided .(Ministry of Health, Welfare and Sport , 2016)

- Citizens may change their healthcare insurer annually, and choose a better healthcare insurer or another package;
- The healthcare insurers, monitor quality and effectiveness of care when it is procured, such as the waiting time/waitlist of their patients;

For most of the hospital care , a per-case payment system exists. The percent of cases where hospitals and insurers can negotiate the volume and price of each type of case has increased since 2005. This influences the specialists' productivity.

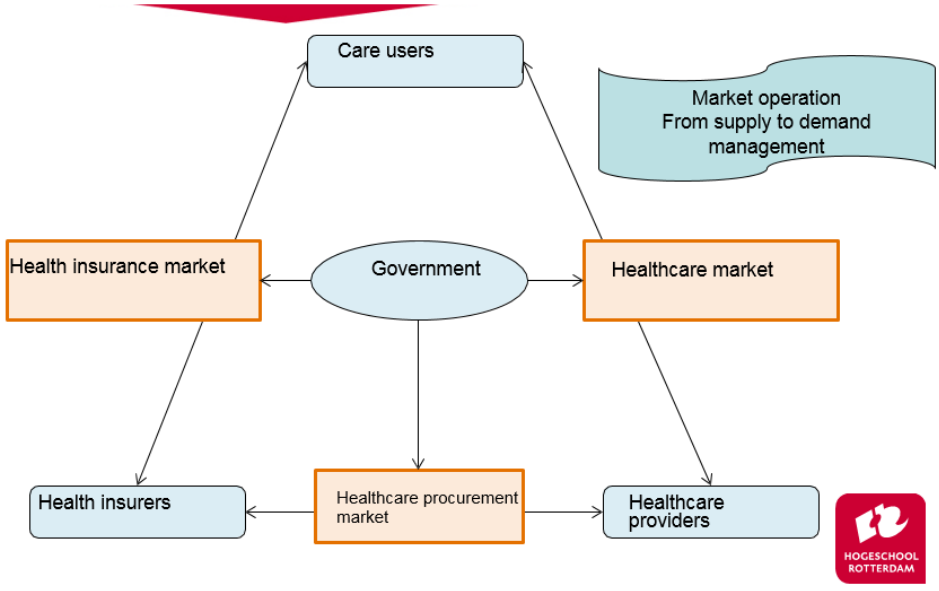



*Illustration 1 Dutch multi-payer model –semi-regulated market operation*

Financing

*Long-Term Care Act*
The Long-Term Care Act was introduced in 2015 for people who need 24-hour care, or permanent supervision. The Long-Term Care Act is executed nationally on the orders of the central government by 'Long-Term Care Act –administrators', who have in fact commissioned the execution

to ‘care administration offices’. The Long-Term Care Act is a mandatory social insurance which is based on solidarity: everyone in the Netherlands paying income tax contributes to it.

The most common uses of the Long-Term Care Act are:

- A stay in an institution: long-term admittance, housing in a nursing home, or a house/housing for mentally challenged people.
- Personal care: help with cleansing, dressing, using the toilet, eating and drinking.
- Guidance increasing the self-reliance: help with the planning of the day, in order to better get a handle on life, and to learn house-keeping.
- Nursing: medical help with wound care or injections.
- Long-Term Care Act -treatment: a medical, paramedical or behavioural treatment helping recovery or improvement of a disorder.
- Transportation to and from day activities and day care treatment: for people who, due to their disorder, cannot get to said treatment by themselves.

The most important parties in the Long-Term Care Act, are the clients and their representatives, the central government, the Care Assessment Centre, Dutch Healthcare Authority, the care administration offices and the healthcare providers. They determine the quality of the execution of the Act and the reimbursed care. In addition, they take initiatives to improve the quality of healthcare.

Financing/funding

## 2.3 Regional healthcare system

No regional healthcare system.

## 2.4 Municipal healthcare system

*Social Support Act*

With the introduction of the Social Support Act municipalities in the Netherlands have been commissioned to offer support to people with disabilities. This Act is administered on a municipal level. Examples are people with disabilities such as physical, mental, or psychological; slightly (mentally) disabled and senior citizens. The support is focused on having people join society, and helping them to live in their home for as long as possible.

The Social Support Act is based on the principle of custom work and the individual approach. The municipalities communicate with the clients about the support they require. In addition to individual custom measures, the municipalities are required to organise general services where people can go with their requests for support. The services focus on people being able to participate in society regardless of their limitations: the goal is inclusive society. With respect to the Social Support Act, the parties firstly involved are people with support requests, their informal caretakers, the municipalities and the providers. They determine the quality of the support covered in the Social Support Act. The Act includes a norm for basic quality; anything else is coordinated between municipalities, providers and clients. (Ministry of Health, Welfare and Sport , 2016)

*Youth Act*

With introduction of the Youth Act  in 2015, support, help, and care for children and youths (up to 18 years of age, with a possible increase to 23 years) was decentralised. The Act is executed at municipal level. This includes support, help, and care for them and their families in case of problems with child rearing, psychological problems, and disorders.


*Figure 1 Stakeholders in the Dutch Youth Act*

With regard to the Youth Act, the youths, their families, municipalities, and the providers of youth care are the most important parties involved, see Figure 1 Stakeholders in the Dutch Youth Act. The quality of youth care is for a large part determined by these parties. The Youth Act includes quality requirements. One of the important statutory requirements is that individual professionals offering youth care must be registered and must meet educational requirements. In addition, Dutch municipalities can make demands on the quality of youth care, and at a later date check the invoices of the providers of youth care to see if they match agreements. They also check if the services invoiced were in fact (efficiently) carried out. The municipal council sees to it that the Municipal Executive performs the Youth Act duties properly.

## 2.5 Healthcare organisation private sector

In the Netherlands care is provided by private persons and by organisations. Organisations such as : hospitals, nursing homes, home-care organisations; and persons such as general practitioners, medical specialists and physical therapists.
Care is provided based on private contracts between healthcare insurer, provider and recipient. The actual healthcare provision is a matter between private parties. The care recipient comes to a business agreement with a person or organisation to receive care. Although the recipient does not pay the invoice. The care recipient also has a business agreement with the insurer. The recipient pays the insurer a premium and the insurer pays the invoice if deemed correct. All involved parties are natural or legal persons and their agreements are covered in the rules of private regulation, the Dutch Civil Code.

Private care is non-insured care, often provided by private clinics. This type of care is growing, but in the Netherlands still quite small-scale, so not part of this study.  Also some private care institutions need a permit for their healthcare services.

## 2.6 Healthcare organisation public sector

When high claims are filed by someone, or when someone has many incidents, insurers will want to increase the premium of this person, or decline to insure him/her. We want to prevent this type of

situation in our healthcare. In the Netherlands we try to prevent premiums increasing without limit, or people being excluded from care.

The central government has defined regulations to keep healthcare accessible for everyone. The central government compiles a basic package with types of care that must be provided and the corresponding premium/contribution. In this way the central government forces the insurers to offer the same basic package with the same premium. At the same time the central government requires all citizens to be insured with the basic package and pay the premium.

The total costs for society cannot be predicted. The total costs could only be covered if each year the premiums are adjusted to match the cost of claims. This is deemed undesirable in Dutch healthcare, because it has a negative effect on people with a lower/minimal income. For this reason the central government attempts to maximise the premiums and develop systems to objectify the right to healthcare.

Healthcare in the Netherlands is therefore a **mixed public and private system**. Public influence is not limited to financing only. In addition the central government considers itself responsible to find a good balance for the health infrastructure. For this reason the central government gets involved in admittance of private parties to the healthcare market, the functioning of the healthcare market, and the quality of the parties of the market.

## 2.7 Occupational healthcare system

Although an occupational healthcare system does exist in the Netherlands, it is just that small and therefore not relevant for the context of this report.

## 3. Effects of the system

The effects of the system are (among others)  the total expenses of healthcare and the delivered quality of the healthcare.

In international perspective, the Dutch system is, within the European union, one of the bigger ‘spenders’.

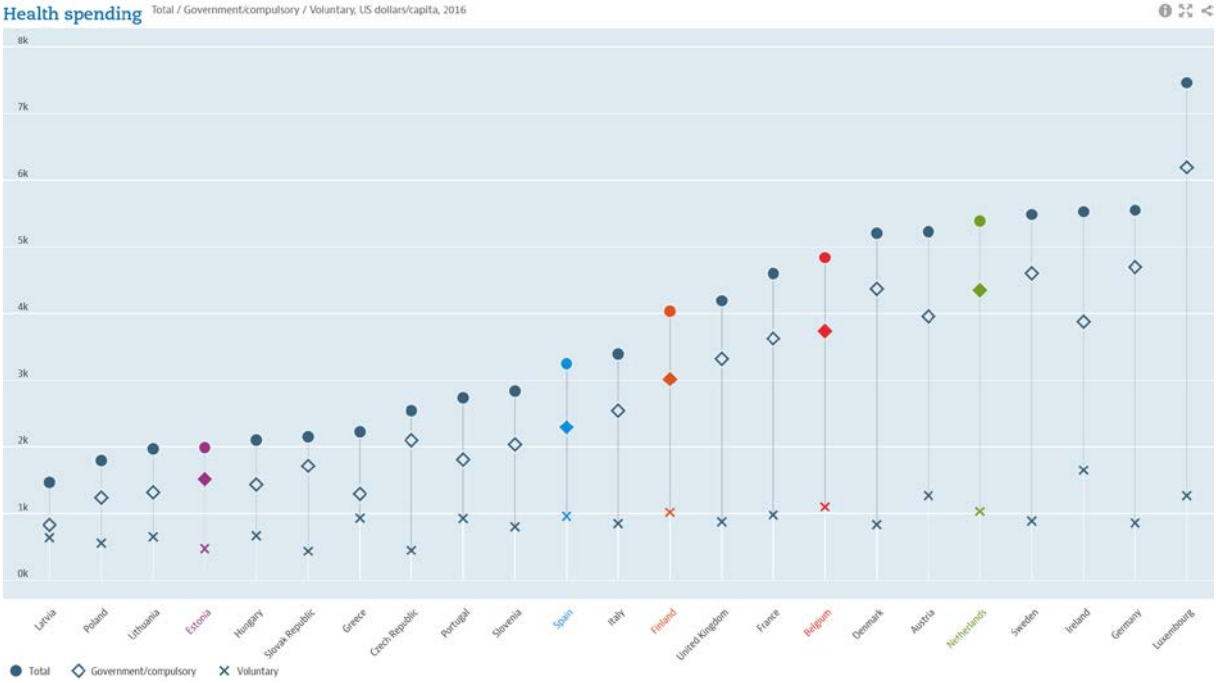



*Figure 2 Health spending in the European union, 2016 in US dollars/capita*

Health spending measures the final consumption of health care goods and services (i.e. current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments.

The expenses under the healthcare insurance act are shown in Figure 3 Total expenses under insurance act.

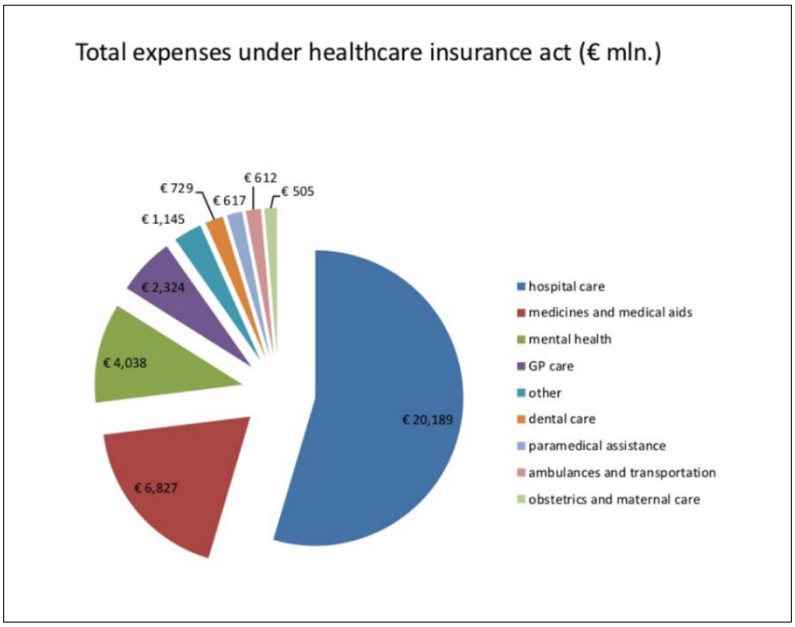



*Figure 3 Total expenses under insurance act*

The figure above show that hospital care causes the largest part of the expenses .
The Dutch system is an expensive system. But the delivered patient quality according the Euro Health consumer index , shows that quality of healthcare is high. This index is based on xxx indicators that define the quality. Some (logistic) examples are …, ……., ….

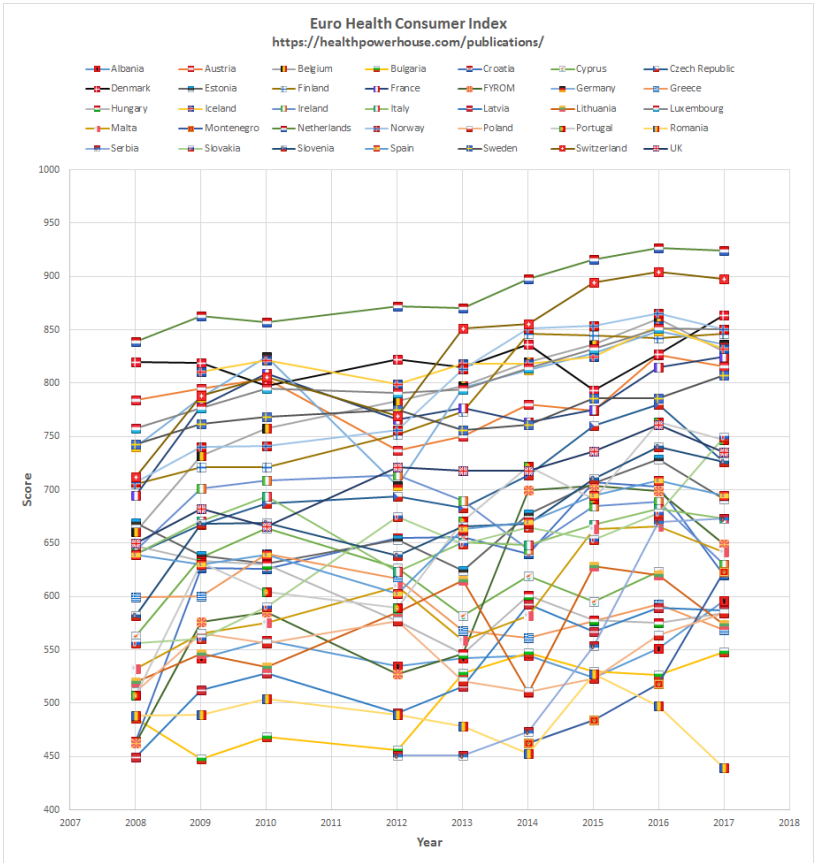



*Figure 4 Health consumer index*

The delivered patient quality according the Euro Health consumer index (Figure 4 Health consumer index), shows that quality of Dutch healthcare is high.

The index is based on indicators that define the quality. Some (logistic) examples are access times, ……., ….

# 3. Healthcare logistics

The Dutch health care system consists of multiple, different parties and facilities, of varying sizes. The different health care facilities are connected by the patients who go through many different services within the system. The patient can use the system in different ways; the patient can use only the cure facilities, only the care facilities, or a combination of both cure and care facilities.

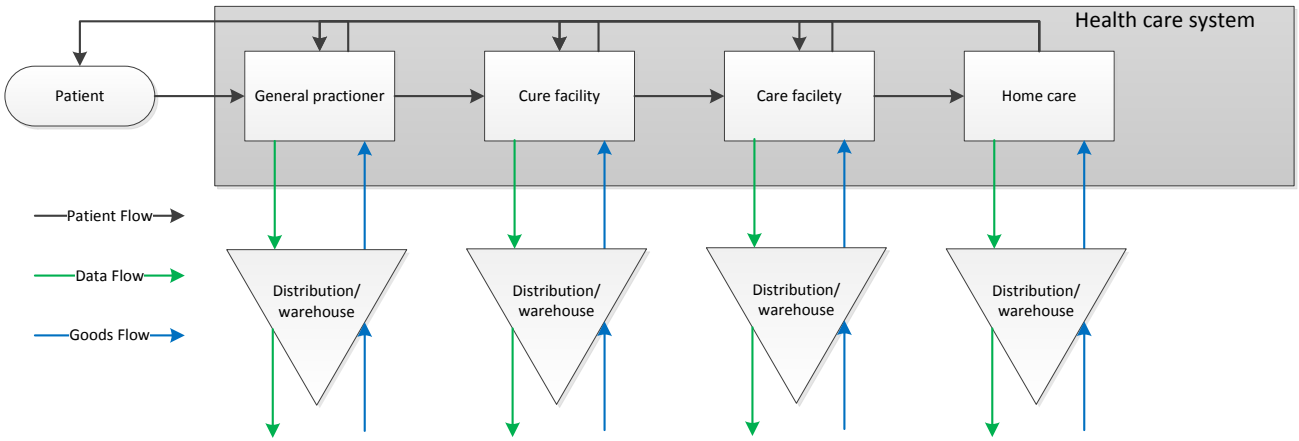



*Illustration 0-1 General overview of health care system ( (Oomen, 2016)*

Connected to the healthcare system is the goods logistics supply chain, as shown in Illustration 0-1 General overview of health care system ( (Oomen, 2016)
Both process flows are linked. No cure or care without goods, and no goods if no cure or care is needed.

Therefore healthcare logistics can be defined as

> *"the control of treatment/care/support activities and the related staff planning, information and flow of goods in such a way that the preferences of clients/patients will be met cost effectively"* (Moeke & Verkooijen, 2013)

Healthcare logistics concerns goods logistics and patient logistics.

## 3.1 Goods logistics - Inbound healthcare logistics

Goods Logistics: *Effective and efficient propulsion of goods flows and information flows between goods suppliers and healthcare institutions, so that the right product is present at the right place and at the right time of the right quality for the patients.*

The goods supply chain in the Dutch healthcare system consists of the chain between supplier and customer, with the customer being the healthcare facilities. The connection between those two parties is the demand forwarded by the purchasing department of the health care facilities and the freight traveling from the supplier to the client and all parties in between. The amount of parties

involved in this supply chain is variable between facilities. Some facilities have their own warehouse and directly purchase from the different suppliers or wholesalers. Other facilities have external parties maintain their warehouses or they outsource the whole external freight logistics.
In the next illustration the supply chain of the goods logistics in the health care system is visualised.

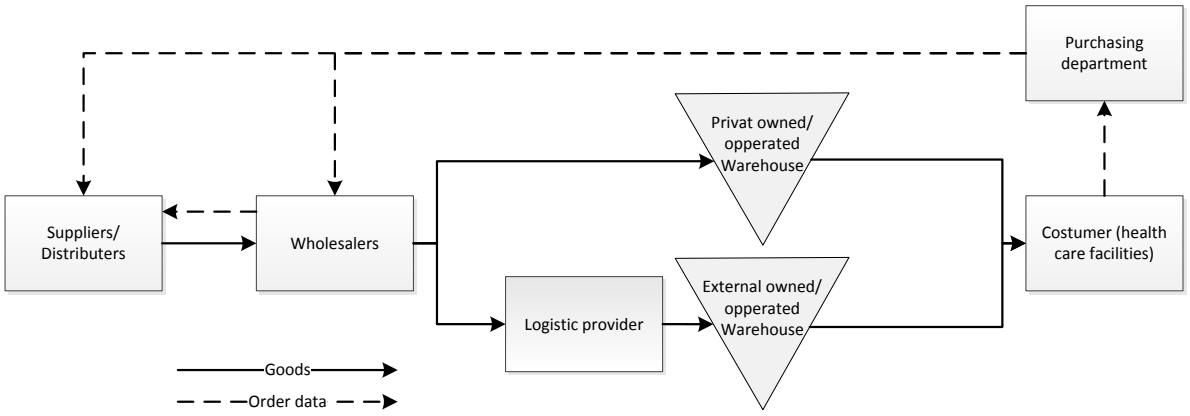



*Illustration 2 Goods logistics supply chain (Oomen, 2016)*

The goods for a care institution can be divided in the following

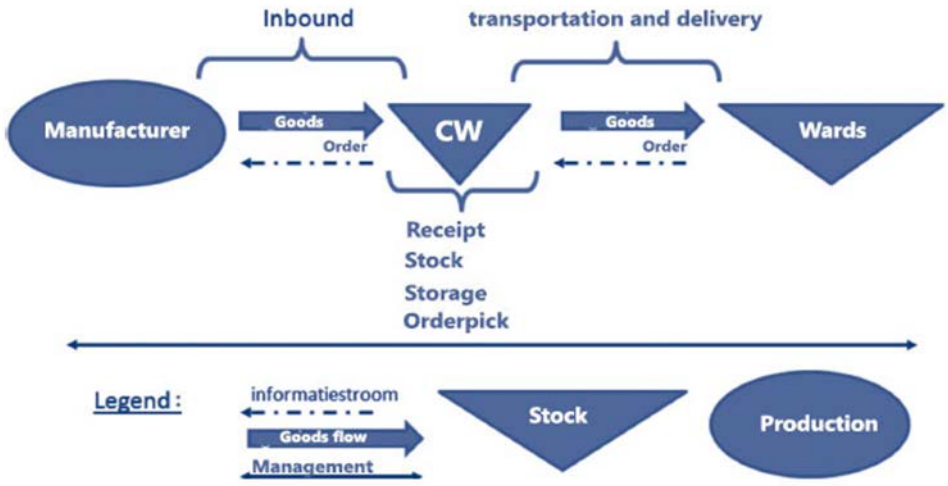
- Medicines
- Medical aids (sterile / non-sterile)
- Uniforms, On-duty clothing and linnen
- Post
- Beds
- Instrumentarium (for the operating room / out-patient actions)
- Nutrition / meals

## 3.2 Goods logistics -In-house healthcare logistics

Within the Dutch healthcare institutions there is much demand for the In-house logistics department. This department ensures correct administration and handling of the goods flow within the healthcare institutions.

The logistics of goods in the larger health care facilities start with a supplier delivering goods to a central warehouse, which in turn will distribute the goods to the different departments within the facility, as seen in illustration 4. From this central warehouse, the goods will be delivered to the different departments and the de-central storage of these departments. The goods delivered to a large health care facility will most likely not all come from a single supplier, but rather from multiple suppliers. Similarly, there can be multiple central warehouses which cater to one or more facilities. These warehouses are also sometimes controlled by an external party who is specialised in goods logistics. This chain is shown in illustration 0-2.

*Illustration 0-2 General goods logistics plan (CW is the central warehouse) (RICHARD WESTERMAN, 2009)*




The In-house logistics department processes orders from diverse departments within the healthcare institution. These orders/requests are handled by administration, or by means of a stock management system. They determine the order period and order amounts using specific formulas. These orders are sorted per division warehouse. When an order is booked, it will be delivered at the appropriate warehouse via administration. The order simply includes simply which products are needed for which department. Orders are differentiated by regular and rush orders (Vries, 2005). In Illustration 0-3 the steps of the order process are shown.

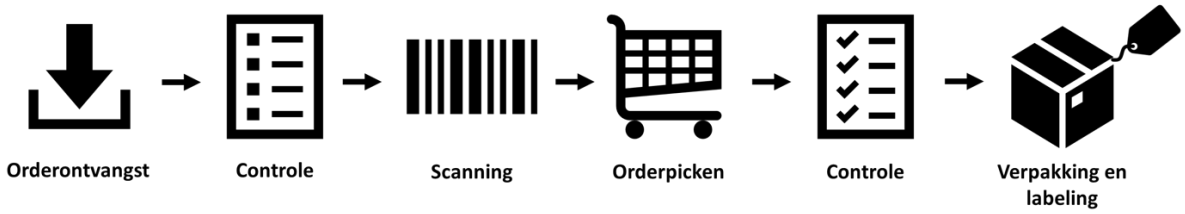



*Illustration 0-3 Order processing in warehouse*

Within healthcare institutions different departments often have their own stock location such as small pantries. These small stock locations are supplied from a central warehouse. Products with a high circulation speed are stored in these small stock locations. (Pintelon, 2011). As doctors exert control they prefer to have a sufficient supply of products at hand; it is not always standardised.

## 3.3 Outbound logistics

The outgoing flow is much smaller than the incoming flow of goods. Waste leaves the care institution. Different recognisable flows are fat(s), foods, paper/carton, specific hospital waste.

This waste is picked up by the logistics staff member and brought to the central waste station. From the central waste station it is taken away by an external logistics services party, specialised in recycling.
Finally the healthcare institutions have a postal flow. This, as well, is picked up by a logistics staff member. Then it is taken away by a postal service.
Uniforms/work clothing: Picked by the laundry service, cleansed and returned.

# 4. Healthcare logistics – patient logistics

The definition of patient logistics: *The optimisation of the cure/ care chain that a patient goes through from the first contact with the healthcare provider up to the termination of the care, taking into account the existing preconditions such as personnel, goods, equipment, buildings and organisation.*

The patient health care flow (see illustration below) usually starts with the general practitioner. This party will provide the first healthcare or redirect to a cure or care facility. The patient will travel throughout the healthcare system to preferably be cured and go back home.

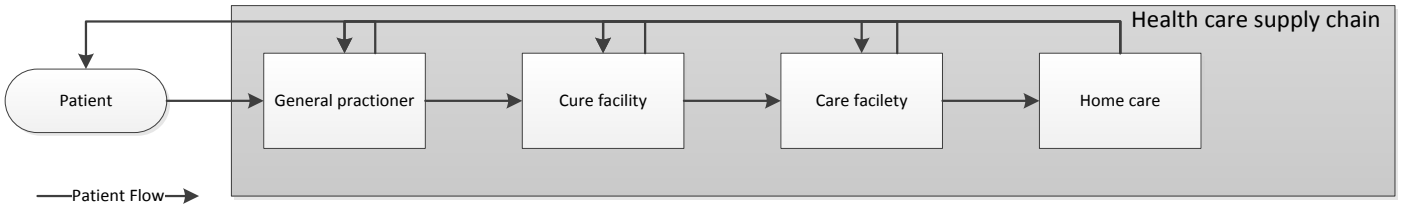



*Figure 5 Healthcare system overview (Oomen, 2016)*

In the Netherlands patient logistics has three approaches:

- Process management: it concerns the orderly steps that a patient/client takes during his diagnosis / treatment process. (Care paths)
- Capacity management: it concerns the control of people and means that will be used. There is consideration for the improvement of the demand for care in relation to the available capacity.
- Planning of resources and processes: it concerns the planning of operational, tactical and strategic level, for example: Operation Room planning.

*Some logistical key-performance indicators*
To measure 'the optimisation' mentioned in the definition of patient logistics, several patient logistic key performance indicators would give some insight: improvement of 'quality of care' at lower costs.

*Cycle time in hospitals*: In the past years the average stay in general hospitals has declined to 4,2 days per admittance in 2016. The decline is stabilising (Sector report Dutch Hospitals Association, NVZ, 2017) The cycle time in academic hospitals is unknown from 2015, before that year it was about 7 days per stay.

*Waiting time*: Health insurers monitor waiting times (which hospitals must publish), and assist patients with finding the shortest waits (sometimes abroad). Average waits for most surgery were 5 weeks or less by 2011 (Siciliani, Borowitz and Moran, 2013, pp. 184, 187, 189-195).[17]

In 2010, 70% of Dutch respondents to the Commonwealth Fund 2010 Health Policy Survey in 11 Countries said they waited less than 4 weeks to see a specialist. A moderate 16% said they waited 2 months or more. 59% waited less than 1 month for elective surgery. Only 5% waited 4 months or more, similar to American respondents (The Commonwealth Fund, 2010)

In the strategic policy-making of the large healthcare institutions, patient logistics often does not have a prominent role. An element in patient logistics projects are island initiatives, and sometimes the structures in healthcare are inconvenient in order to organise the processes having to do with the patient. (Weijers & Gloeckner, 2009).

## 3.1 The geographic distribution and accessibility of hospitals throughout the Netherlands

In general, there are three types of hospitals in the Netherlands: university hospitals, general hospitals, and an in-between category called "top-clinical" teaching hospitals. There are eight academic hospitals, or *university medical centers*, each of which is directly connected with the medicine faculty of a major Dutch university. These are the largest hospitals in the country, and they have the largest number and greatest variety of specialists and researchers working for them. They are able to provide the most complex and specialised treatment.[10]

The illustration below, 3.1, shows the geographic distribution of the healthcare institutions in the Netherlands. It is mapped/made clear in order to get an impression about accessibility of healthcare for the patient. On this map the private clinics are excluded. The map shows 121 hospital locations and 144 outpatient clinics. In 2009 the Netherlands had 61 outpatient clinics and in 2016 this was 144. However, the number of hospital locations has decreased somewhat. (Public Healthcare, 2018)

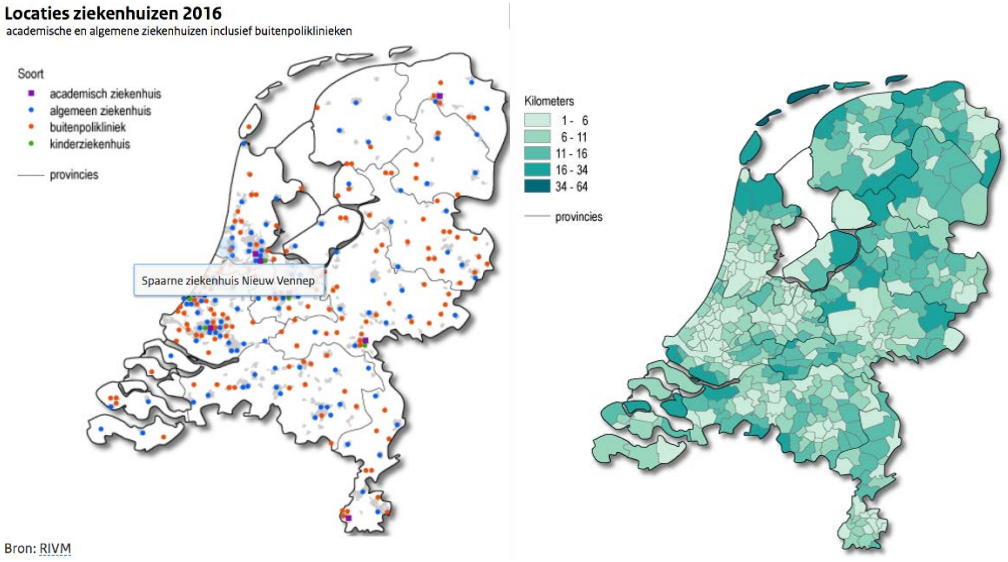



*Illustration 3.1: De geographic distribution and 3.2 accessibility (Statistics Netherlands,2017)*

In general, most Dutch people (99% of the Dutch population) can reach a hospital quite well. This would be within 30 minutes. The location that has more difficulty with accessibility is the northern part of the country. Longer travel times are necessary for the following locations: Frisian Islands/Wadden Sea Islands, South-west Friesland, or North Groningen. (the two provinces north-east and the islands above) On average Dutch people live within 6,5 kilometres from the nearest hospital.

# 5. Example of healthcare logistics in a public sector organisation

One example of how goods logistics are organised, is at 'Clinical Services and Assortment Control' (*Klinische Dienstverlening en Assortimentsbeheer)*, UMCG (University Medical Centre in Groningen province). The In-house logistics departments are responsible for ordering and supplying of

medication of the concerned departments within a healthcare institution. In appendix I the process is shown in a Value Stream Map. This is an example of such an organisational process at the In-house logistics department (Lottermans, 2017).

Example 2 goods logistics

Example patient logistics

Most improvement projects on patient logistics are implemented in the cure sector, less in the care sector. Typical Dutch patient logistic questions and cases in the applied research field / bachelor level student research:

- How to reduce the costs of the whole patient diagnosis/treatment (so a specific diagnosis/treatment), while the quality of care remains at least at the same level?
- What action can be taken to reduce the lead times within a specific department (E.g. diagnosis department like Radiology)
- To decrease the access times , what to do without a rising budget?
- How can the patient process be redeveloped, in order to realise a smoother shift from Intensive Care to Ward?

# 6 The future of healthcare logistics in the Netherlands

In the area of logistics the Netherlands care system is lagging far behind. The result is growth potential for innovations from other sectors where logistics are further developed. Coordination between chains is not optimal. The badly coordinated logistics processes result in low effectiveness and efficiency in combination with unclear performance indicators.

In order to solve the low effectiveness and efficiency within healthcare logistics, it is a goal to draft reference models with which the desired performance indicators can be made clear. Then the performance of the care logistics chain can be compared to the logistics chains of the more developed sectors of the Netherlands. Lean Six Sigma is distinguished and one of the most used process optimisation method in order to achieve capacity reduction and cost reduction.

The big challenge for Dutch healthcare is that we have to deliver better care for a growing population (healthy ageing) at lower costs per person. Within the Dutch society healthcare costs continue to rise due to healthy ageing and increasing possible treatments and better technology. In addition, patients are becoming increasingly outspoken. On the one hand, this requires that we have to pay more attention to the patient needs, and on the other hand it means that the client/ patient will primarily fulfil these needs himself/herself, or with the help of the personal care network. (O.vd Reyken, 26. March 2018, blog Skipper,skipr.nl)

*Trends*

A) Value-based healthcare
   Among Dutch care institutions there is a growing interest in healthcare based on Michael Porter's theory of value-based healthcare. Value-based healthcare focuses on the best patient outcome per euros spent. In other words: central guideline in value-based healthcare is the patient outcome for a medical diagnosis/treatment in the whole care chain. Best example in the Netherlands is a group of 6 hospitals (the Santeon group) that adopted value-based healthcare.
B) Integral capacity management
   In most of the Dutch hospitals, the admittance planning is based on the Operation Room planning. The metric of "bed numbers" is still commonly used in hospital planning, but it fails to capture key aspects of how hospital services are delivered.
   There is an upcoming shift towards integral capacity management (Operation room planning and bed planning, attention paid to the whole diagnosis-treatment process, clinical paths).
C) Shift from second echelon to first echelon
   Due to growing technological possibilities and the urge for efficiency, more and more patients are given care and treatment at home (home help / home care). The general practitioner is end-responsible. Example: developments after chemotherapy with monitoring at home.
D) Collaboration and development of networks of care institutions
   The design of a patient process delivered by hybrid care. In such networks new processes are developed. Care and cure institutions work together; delivering better and cheaper healthcare.
E) Growing use technology and ICT (digitisation, supporting the trends C and D
   Further digitisation of the patient/client information. In the last 3 years more than fifty percent of the hospitals switched to an integrated EPD/HIS from the suppliers Chipsoft /HIX (Dutch supplier) and Epic (American supplier).

Goal: One record for one patient during his whole hybrid comorbid care, based on patient self-management of his health record.

F) More informal care (the participation society)
In the 'Speech from the Throne September 2013' the Dutch King introduced 'the participation society', based on already existing plans: a growing role for the network of the patient (informal care).The big change was on 1-1-2015, with the introduction of the Long-term Care Act

G) Track and trace (e.g. (body) implants)

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# Appendix 1

## Bijlage 1 Value stream map in-house logistics