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# Dutch Healthcare: An Overview and Application

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## **Dutch Healthcare: An Overview and Application**

Research in progress

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### **Abstract**

*The Dutch healthcare system has changed towards a system of regulated competition to contain costs and to improve efficiency and quality of care. This paper provides: (1) a brief as-is overview of the changes for primary care, based on explorative literature reviews; (2) provides noteworthy remarks as for the way primary and secondary healthcare is organised; (3) an*

*example of an E-health portal illustrating implemented processes within the Dutch context and (4) a proposed research agenda on various e-health topics. Noteworthy remarks are: (1) government, insurer, healthcare provider and patient are main actors within the Dutch healthcare system; (2) general practitioners (GP's) are gatekeepers to secondary and other care providers; (3) the illustrated portal with a patient oriented design, provides access to applications implemented at care providers resulting in increased electronic availability and increased patient satisfaction; (4) a variety of fragmented information systems at health care providers exists, which leaves room for standardisation and increased efficiency. We end with suggestions for future research.*

**Keywords:** E-Health, healthcare processes the Netherlands, e-health portal, PAZIO, Healthcare efficiency.

## **1 Introduction**

The healthcare sector in the Netherlands is an innovative sector that has undergone some severe changes as a result of the implementation of a healthcare reform plan to contain costs, as costs have been increasing for the past years now (Centraal Bureau voor de Statistiek, 2013; Erkelens, J. v., & Galen, 2012; Rutten, 2004). The Dutch government has launched various programmes to contain costs and it has been advocating an increased utilisation of ICT within healthcare. Therefore the Dutch government has been investing in many ICT initiatives to improve efficiency in health care delivery and supporting processes (Ministry of Health Welfare and Sport, 2012). In this paper we will present (1) an overview of Dutch Healthcare and related stakeholders within primary and secondary care and (2) a good e-health practise: a portal with a focus on primary care and secondary care. The purpose is to illustrate offered services through an E-health portal taking the Dutch health care system into account.

## **2 Method**

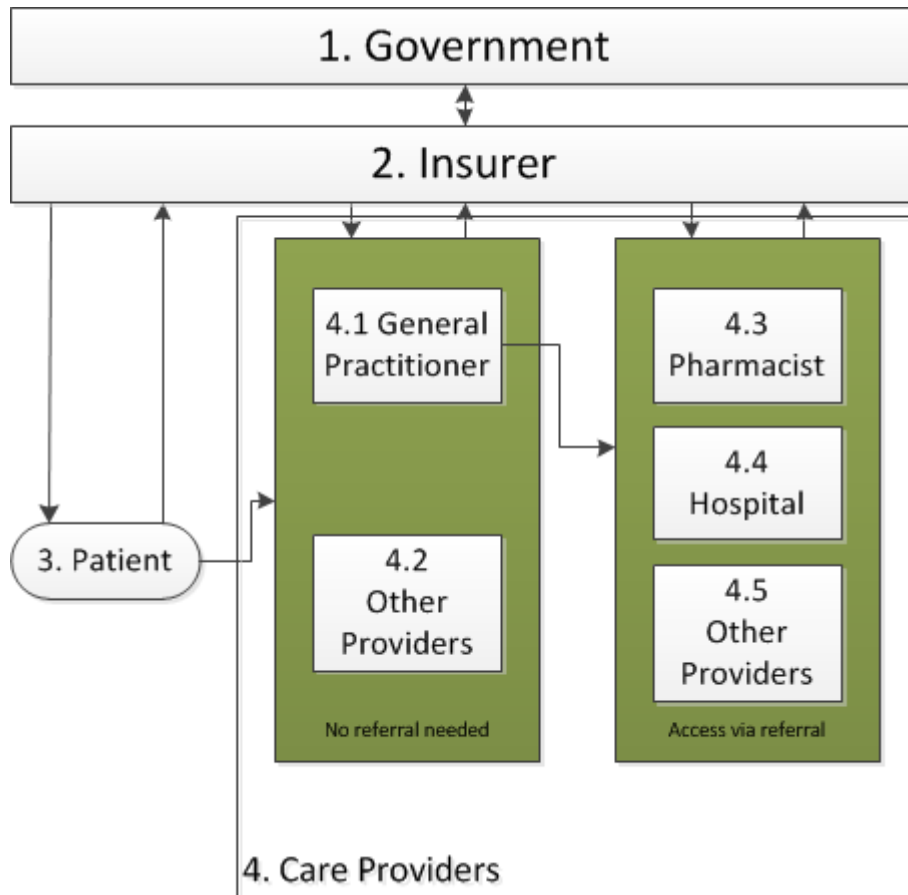
The process of data gathering was divided into three phases: (i) an explorative literature review to provide an overview on the healthcare system focussing on primary and secondary care in The Netherlands; (ii) the selection of a good e-health practise in The Netherlands and (iii) gathering data based on documentation illustrating how services are offered by this good practise. In the first phase we explored professional and scientific literature on the Dutch healthcare sector focussing on primary and secondary care. In addition to this a public relations officer of the Dutch healthcare insurer ONVZ was approached to illustrate the process of insurance coverage and reimbursements. In search of a good e-health practise in The Netherlands, an explorative search on e-health cases in The Netherlands was conducted in the second phase (ii). As search results on Dutch e-health cases were limited, further exploration was justified. An inquiry at the chamber of commerce in the city of Utrecht on successful e-health initiatives around Utrecht (NL) resulted in a referral to the e-health portal PAZIO (Pazio.nl). In the third phase we contacted the developers of this portal, with a request to share information on this portal. PAZIO was developed by the University Medical Center Utrecht and it is a portal that provides access to electronic applications which the care provider has

implemented. This is accessible to various stakeholders such as patients, general practitioners and pharmacists. PAZIO shared existing available documents and referred to published documents available on their website. A live demonstration on this concluded this phase.

Next we consider the organisation and related stakeholders within the healthcare system in the Netherlands (section 3) with a focus on primary and secondary care and the use of the e-health portal PAZIO (section 4). Finally, a research agenda is proposed in section 5.

### **3 Organisation And Stakeholders In Dutch Primary Healthcare**

The Dutch healthcare system has been reformed in 2006 mainly from income based insurance, with a national health insurance and healthcare schemes provided by private insurers, to a system with regulated competition (Helderman et al, 2005; Okma, 2008). This system entails a mandatory basic health insurance for each citizen, purchased through private insurers; annual consumer choice of insurer and products; insurers are obliged to accept all consumers for the basic insurance and they are compensated via a risk equalization system; a mandatory deductible of Euro 360 for 2014; insurers are expected to contract competing healthcare providers; quality information is released to the government by healthcare providers; Diagnosis Treatment Combinations (DTC's) were defined and implemented to enable provider competition and General Practitioners serve as gatekeepers (Enthoven & Ven, 2007; Ikkersheim & Koolman, 2012; Ministry of Health Welfare and Sport, 2014; Tuijn et al, 2011). For this system to work efficiently key stakeholders are healthcare consumers or patients; general public; healthcare providers; healthcare professionals; governmental agencies and inspectorates; health insurance companies; centres of excellence (Lamping, Raab, & Kenis, 2013). For the purpose of this paper key stakeholders are limited to healthcare consumers (patients), healthcare providers, healthcare insurers and the government. These stakeholders fulfil a vital role in the care process. In figure 1 an example of a particular care situation and care process is visualised.



**Figure 1** Healthcare process and stakeholders

The government, the Dutch Ministry of Healthcare, Welfare and Sport, annually decides the coverage of the basic and mandatory health insurance scheme. Healthcare consumers or patients choose a healthcare insurer with the mandatory basic insurance policy and based on their preference a non-mandatory supplementing insurance (Ikkersheim & Koolman, 2012). Insurers provide data to the government and to other (public) entities such as the inspectorate of health (Delnoij, Rademakers, & Groenewegen, 2010). The Dutch healthcare system distinguishes primary healthcare and secondary healthcare. Primary healthcare is care that is available without a referral from a general practitioner (GP). Examples of primary healthcare are the dentist, general practitioner (GP), physiotherapist or social worker. The government considers it important that primary healthcare is available to everyone and it is described as a short term general treatment (Bos, Koevoets, & Oosterwaal, 2011). GP care is generalist medical care which is accessible for all people close to their homes, resulting in a dense network of GP's (Groenewegen, 2013). Secondary healthcare is specialised care that a patient receives after referral by a GP. Secondary healthcare distinguishes medical care or cure, nursing, social and pedagogical care. Medical care or cure consists of diagnosis and therapy for instance hospital or specialist care. Nursing care consists of nursing care, observation, coaching and personal care. Social care in a specialised facility consists of lodging, food, clothing, offering employment or education, cultural and welfare activities and other intangible assistance. Pedagogical care consists of teaching and education in the context of mental, physical or sensory disability (Boot, 2010).

Figure 1 implies a relation with care providers and insurers: sourcing contracts between parties are negotiated regarding volumes, the level of service and prices for delivered services according to DTC's (Ikkersheim & Koolman, 2012). Generally health care providers send their invoices including Diagnose Treatment Combinations (DTC's) for provided care per patient to contracted insurers.

Care providers and insurers use specific systems that support care processes (figure 1), information processes and financial processes. In general, healthcare providers use their own local patient records and information systems. To facilitate standardisation in information systems and processes within the healthcare chain, the government proposed an initiative to parliament to implement a national electronic patient record (EPR) as an open infrastructure to access source systems at care providers. Medical data, treatment data and patient information would be recorded in this EPR. Data was supposed to be owned by the care provider and the ambition was a secure exchange of data among care providers and patients. This initiative of a *national* EPR was voted down by the Dutch Senate. This initiative is now being picked up as a *standardised* EPR and it is being introduced by private entities with an opt-in enrolment for patients. The private entities, the Association of care providers and care communication (VZVC) and its Country wide Switchpoint (Landelijk Schakelpunt) (VZVZ.nl, n.d.), are partly reusing the previously developed infrastructure (Smits, 2013). Opt-in enrolments via pharmacies have picked up from 0.8 million records in august 2013 to 2.3 million records in January 2014 (Dorrestijn, 2014). Noteworthy remarks are:

- GP's are gatekeeper in the healthcare chain. After their assessment patients can be referred to specialised care.
- Standardised diagnosed treatment combinations (DTC) have been implemented, addressing and facilitating care processes;
- Although a system of regulated competition is implemented, the government still defines the coverage of the national and mandatory insurance scheme;
- The introduction of sourcing contracts between care providers and insurers is boosting the drive for (cost) efficient care processes by providers;
- Effective use of ICT, standardised applications and standardised EPR's across the healthcare chain contribute to standardised processes.

#### **4 A Good Practise: PAZIO E-health Portal**

PAZIO (Patient Oriented Healthcare Information Environment) is an e-health portal that was developed by the University Medical Center Utrecht (UMCU) in cooperation with innovative ICT partners. It was partly funded by the municipality of Utrecht with the vision to provide access to e-healthcare processes from healthcare providers (Pazio, n.d.). PAZIO fits Osborn's definition of a secure internet based platform which enables patients to view their personal health information and interact with health care providers (Immink, 2013; Osborn et al, 2013). This portal (figure 2) provides access to a range of patient centred services for primary and secondary care and it offers access to basic applications and additional applications. The portal enables customers to interact electronically with their care provider. (A-tjak et al, 2012; Pazio, n.d.).

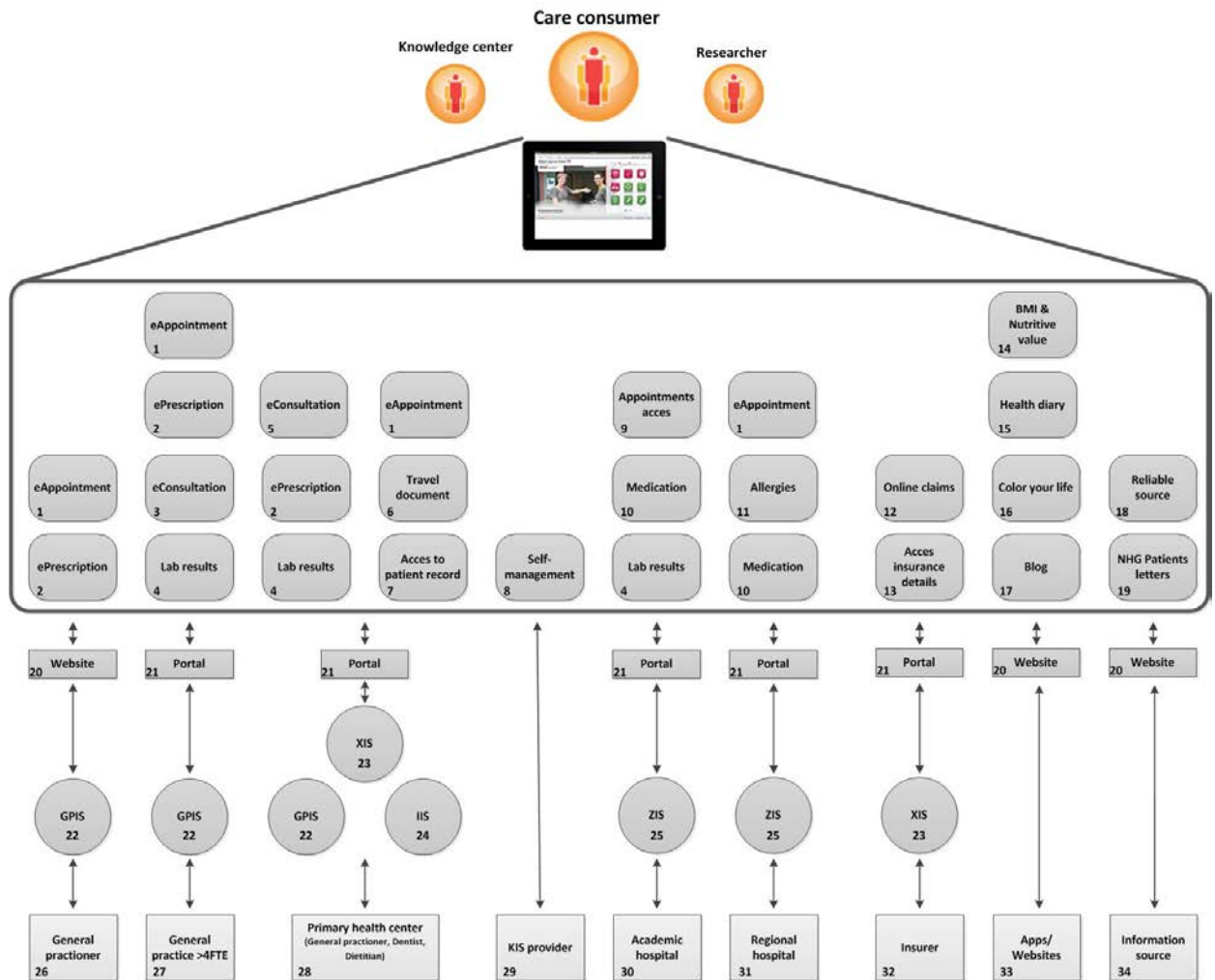


Figure 2 Pazio E-health Portal (Pazio, n.d.)

PAZIO enables access and provides interaction with basic applications:

- Scheduling appointments (1)
- Prescription refills (2)
- Online Lab results (4)
- Online consults or e-consult (3,5)
- Self-management for certain chronic illnesses (8)

Additional applications are prevention programs, research tools, self-management and self-help programs(14-17) (Pazio, n.d.). These applications can fully be integrated with information systems within the general practice or hospital (22-25), entailing that information submitted in an e-consult is saved and is accessible in the GP’s information system (Immink, 2013). During the implementation of the portal, the type of interaction between care provider and patient will be determined depending on the application. Electronic interaction at any given time is facilitated when electronic consults are scheduled and lab-results are accessed by the patient. Single Sign On (SSO) to available applications via the portal is enabled with the secure Digid with text message authentication (A-tjak et al, 2012; Zorgvoorinnovieren.nl, n.d.). Digid, abbreviation for Digital Identification, is a national authentication service for citizens, that can be used

by all public organisations and nongovernmental organisations to authorise access to their systems. All Dutch citizens are issued a citizen service number (BSN) and this number is linked to the Digid-account. This Digid consists of a username and password and security to the authentication procedure can be increased with the use of text messaging services (SMS) during log on (Digid, 2014; Janssen, Kuk, & Wagenaar, 2008). After successful log on, patients get access to a secure portal area (PAZIO) with a look and feel that is preferred by the care provider. Based on figure 2, when a patient logs on at the portal accessible via the website of the General Practitioner, s/he gets access to the available functionalities. Patients are able to schedule an appointment or look for information, access their health record or request for a (non-urgent) electronic consult. These basic functionalities are generally applications that the care provider has implemented within its practice. Depending on the patients query, responses can be sent to the patient and/or additional requests filed to other care providers. In case of a request for a prescription refill, the GP assesses this request within his information system (GPIS) and after approval the prescription is electronically transmitted to the contracted or related pharmacist. The pharmacist processes this request in its own information system and the patient can pick prescribed medicaments up at the pharmacy. Advantages of the use of this portal are: increased electronic availability of the care provider, self-service applications increase efficiency at general practices (A-tjak et al, 2012).

Immink's (2013) use, usability and persuasiveness study to PAZIO at a General Practise shows that when this portal is implemented about 70 percent of registered users used this portal and that the respondents positively valued the separate services, the simplicity, velocity (response time), clarity, support and practical outcome (Immink, 2013). Noteworthy elements from PAZIO are:

- A variety of different information systems and e-health applications are available and being used, displaying fragmentation (A-tjak et al, 2012);
- It is a personalised, white label and interactive portal with main functionality to connect securely to a variety of e-health applications and information systems.
- Secure access and secure portal areas have shown to be key to the success of the portal (A-tjak et al, 2012);
- Processes are logically modelled according to patients care pathways (Zorgvoorinnovaren.nl, n.d.);
- Increased electronic availability of the care provider for patients and increased practise efficiency (Immink, 2013);
- Recognisable services for patients, simplicity, quick response times, clarity and support are valued highly (Immink, 2013).

## **5 Proposed research agenda**

In this paper we have provided an overview of the health care sector with a focus on primary and secondary care based on an explorative literature review. With the brief description of an e-health portal we illustrated the possibilities and functionalities within the Dutch context. Based on these overviews limitations to this paper are: (1) the used method entailed an explorative research on secondary and tertiary literature rather than an in-depth review using primary literature on the Dutch Healthcare system and portal; (2) one case within the Dutch context is briefly described based on existing material and demonstrations and (3) other international perspectives are not included in this research.



Based on the presented notable remarks and taking these limitations into account, we propose the following research agenda:

- (1) The government, insurers, providers, care consumers and other entities are more and more interlinked and interdependent stakeholders within the healthcare chain. This may require a new ways of organising, new services and business models within the healthcare chain. Research on changing interorganisational business models on these aspects may be of interest;
- (2) A large diversity on health applications are implemented at care providers. Figure 2 shows a fragmentation of applications at one care provider. A portal as a good practise shows the need of standardisation within enterprise architectures. Research on available (e-health) applications is suggested to contribute to solutions for standardisation and preferably dominant designs for healthcare and e-health applications;
- (3) As sourcing contracts between insurers and care providers are increasing, the need for efficiency and efficiently running interorganisational and intraorganisational processes increases. Research on standardisation of processes within the healthcare chain, while delivering care according to DTC's is proposed;
- (4) The illustrated portal demonstrates patient orientation; processes are logically modelled according to patients' needs. The healthcare system with all stakeholders and providers seems less patient oriented, as the role of the government is dominant in coverage and financial issues. Research on shifts from the current situation to a more patient oriented healthcare system or chain is suggested;
- (5) During the demonstration of the portal, aspects around security, secure access to data and secure exchange of data were pointed as important success factors for e-health initiatives. We propose further research on security aspects within the healthcare chain.

## **Acknowledgements**

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## **Abbreviations**

BSN:	Unique citizen service number issued to everyone registered in the 'Basisregistratie Personen' (BRP, formerly the GBA), or the Municipal Personal Records Database.
Digid:	National authentication service for citizens
DTC:	Diagnosed Treatment Combinations
E-consult:	Online electronic consult with an healthcare provider
EPR:	Electronic Patient Record
FTE:	Full-time equivalent
GP:	General Practitioner
GPIS:	General Practitioner Information System
ICT:	Information and Communication Technology

IIS:	Internet Information Service
KIS:	Chain information providers
NHG:	Dutch Association of General Practitioners
SSO:	Single Sign On to available applications
SMS:	Short Messaging Services
UMCU:	University Medical Center Utrecht
VZVC:	Association for care providers and care communication
XIS:	Other system suppliers
ZIS:	Hospital Information System

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