

# Online Health Care Communication in Denmark: Changing the Playing Field?

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## Abstract

*This paper brings forward five propositions on the use of online communication in health care, its potential impacts on efficiency and effectiveness in health care, and which role government should play in moving forward the use of online communication. In the paper, each of the five propositions is illustrated with point of departure in the Danish health sector.*

**Keywords:** *IT in health care, social media, online consultations, health care costs, digital divide*

## Introduction

With the uptake of online communication and social media in particular, the belief in information and communication technology (ICT) being a potent vehicle for a transformation of health care has gain a worldwide revival. With social media and the associated user driven content and synchronous voice, video and text communication, the technological utopist are claiming that patients are being empowered and ability to retrieve extended health care in locations and at time where physical point-of-contact are not able to meet the demand due to lack of financial and man power resources. Contrasting this positive view of ICT-based transformation, the medical literature is showing less favorable impacts [1] [2].

While many studies have examined how the use of technology transforms activities within hospitals [3] [4] [5], less attention has been directed to the changes technology brings for the communication between the patients and the primary and secondary health care sector. This paper explores the changes brought about in the communication between the health care professionals and patients by the use of online health care ICT.

With social media and the associated user driven content and synchronous voice, video and text communication, patients are being empowered and provided the ability to retrieve extended health care in locations and at time where physical point-of-contact are not able to meet the demand due to lack of financial and man power resources.

A prominent example of this transformative view is the US Secretary of Health and Human Services that oversees a budget of approximately \$700 billion and approximately 65,000 employees. With the policy ambitions to provide more inclu-

sive and accessible health care, the Obama administration stimulates "...the use of non-traditional ways to access healthcare through the use of trusted sources, community based interventions, telemedicine, mobile medicine and social media" [6]. The Affordable Care Act includes technological platforms as healthcare.gov to disseminate information and engage citizen in sharing their health stories and help others. Governments are becoming placemakers [7] using ICT to win new territory and potentially save costs.

Protein internet technologies and among these social media in particular, hold the promises to help reduce the overall costs through less and more flexible communication channels. Citizens may use technologies to book time with general practitioners, find health related information at the internet, and join health forums in a magnitude and with a frequency that will ease the lines at the hospital clinics and waiting rooms at the general practitioners. Also, social media offers new ways of monitoring chronic diseases, spread of viruses, and post-operation treatment. Our aim is to ground the knowledge on this new playing field that so far has been studied relative fragmented [8] [9] [10] [11].

## Materials and Method

The paper is part of larger, international effort to study the transformation of how patients and the health care professionals communicate online. We have not included clinical and electronic patient records technologies in our research scope. We have reported the details and the grounding of the framework in another forthcoming paper. This paper can be received by contacting the corresponding author of this SHI-paper.

In the present paper we have not detailed the literature grounding of the propositions on the magnitude of the use of online communication in health care, the potential impacts on consequences on efficiency and effectiveness, and which role government should play in moving forward the use of online communication.

In the following sections of this paper we put forward five propositions on online communication in the Danish health care sector. We have conducted interviews with health care administrators, logging and analysis of data at Netdoctor and Sundhed, analysis of data base from Eurostat and Statistics Denmark, and secondary data of previous analysis of online communication in the Danish health care sector. We have focused on bringing forward stimulating propositions for discussing where to focus research efforts. Clearly, the style of presentation of the propositions is not to advocate for strong

data validity or solid research design. Our work on the online communication is at this point at a too early stage to apply these.

## Propositions

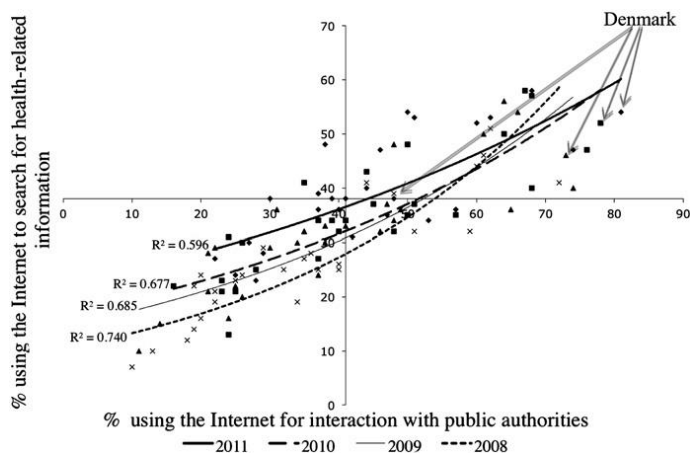
### Proposition 1: Rapid Uptake of Internet Search for Information

Our first proposition is stating that citizens are increasingly using the internet to search for health related information.

In 2005, 24% of the Danes aged 16 to 74 years were using the internet to search for health related information. By 2011, this had escalated to 54%. On average, the EU had jumped from 16% in 2005 to 41% in 2011. National and local government in Denmark can demonstrate a very high uptake of online services. With more than 80% of the population using the internet for interacting with public authorities, Denmark is at the very top level in international benchmark studies from UN and OECD.

Using data from Eurostat, we have analyzed the percentage of the population in European countries, and among these Denmark, that are using the internet for interacting with the public sector (horizontal axis) and searching for health related information (vertical axis) for 2008-2011.

The analysis shows a growing trend for communication with the public sector and health care information retrieval, with the search for health care information growing more rapidly. For the four years combined, there is an average of 41% of the Europeans interacting with the public sector through the internet and an average annual growth rate of 5%. On average for the four years, 37% were searching for health related information but an annual growth rate of 20%. Denmark is in the North-East corner of the diagram giving them a comfortable lead in both general public sector interaction (81% in 2011) and health related internet use (54% in 2011).



Source. [8]

Figure 1 - Use of internet to search for health related information and for interacting with public authorities, 2008-2011

### Proposition 2: Reinforcement of socio-economic gaps, shriveling age-divide

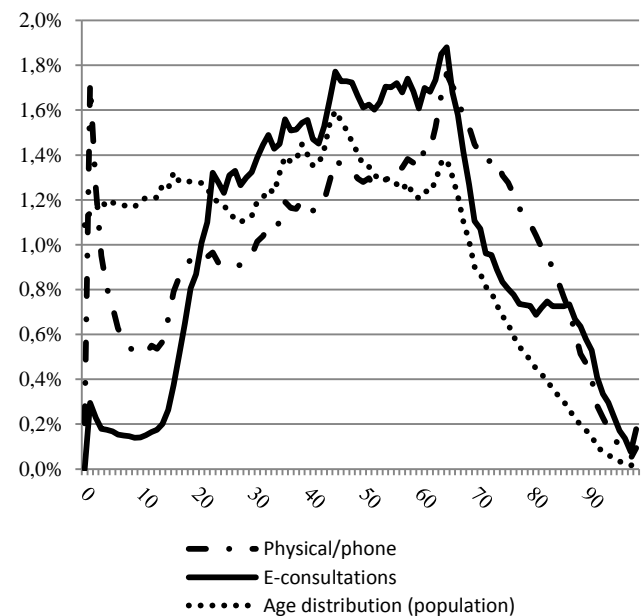
The second proposition is stating that the uptake of technology in health care communication between patients and doctors will reinforce gender and socio-economic gaps (income, education, urban-rural), but will reduce the age-divide gap. In proposition 1 we have described a rapid uptake of online communication. In this second proposition we bring the analysis one step forward and have analyzed whether the uptake is

reinforcing already existing age- and socioeconomic gaps in the use of the health care sector.

Our analysis shows that the uptake of e-consultation is primarily an urban phenomena, primarily used by people with higher income, the well-educated and women. This uptake-pattern is consistent with the socio-economic gap in health care.

The uptake of online communication distributed on age groups has a significant different distribution than physical/phone based consultations distributed on age groups. The age group 50-65 years has less frequency of online communication as compared to physical consultation. Whereas it expected that that citizens in the age group 20-49 years are relative more frequent users of online communication than physical communication, the Danish data show surprisingly that the age group older than 65 years has a relative high use of online communication.

In Figure 2 we have visualized the age distribution along the horizontal axis age in years and along the vertical axis age the use of online communication between the patient and the general practitioner (e-consultation) and physical/ phone consultations. The Figure shows that whereas the 45 year old has a share of 1.8% of the online consultations, the 45 year old only has 1.4% share of the physical consultations. This age group has 1.6% of the total population. Thus, for the age group of 25-65 years old there is an uptake of online consultations that is higher than physical consultations and more than their age group has as population share.



Source. [9]

Figure 2 - Visits to GPs distributed on age (Percent). Age distribution and Online and Physical Consultations, 2011

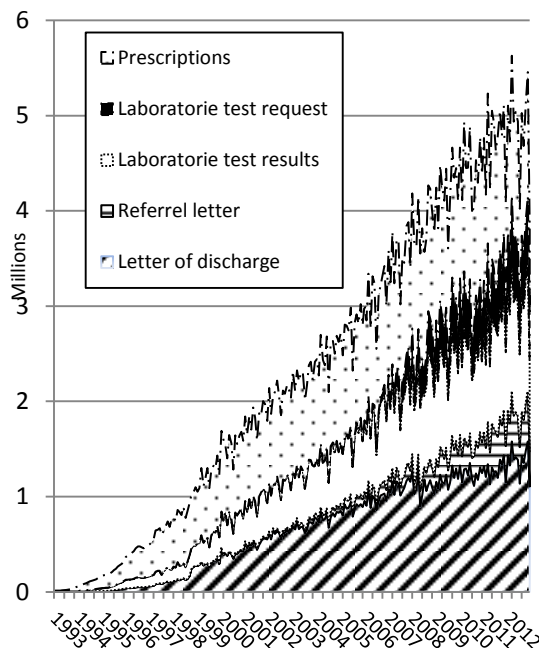
### Proposition 3: Positive impacts on quality and efficiency

Our third proposition is that technology use in health care communication brings forward new forms of communication and improvement of quality and efficiency.

A prominent indicator of these impacts is the rapid technical induced communication changes in the number of messages exchanged through the Danish national MedCom data infrastructure. MedCom facilitates transmission of letter of discharge, prescription letters, laboratory test requests, laboratory test results, and referral letters. The communication regarding these issues between 1) the 2,100 private general

practitioners clinics and 330 pharmacies, 2) the public sector hospitals, and 3) the patients are now close to 100% of the total communication.

In Figure 3 we have displayed the number of messages per month exchanged in the MedCom network for a twenty year span (1992-2012). Prescription letters from the general practitioners to the pharmacies started being electronic transmitted (EDI) in 1992 and has, along with letter of discharge and laboratory test results, escalated. The national communication network enables for examples pharmacies and patients to access the prescription letters at online document repositories and in pick-up medicine at a pharmacy of the patients choice. Also, the MedCom network has resulted in improvement in data reliability and reduction of data redundancy.



Source. [10]

Figure 3 - MedCom Messages 1992-2012

The rapid growth of MedCom has virtualized the transmission of messages and has connected the health actors in a by international standard unique setting. Close to all messages are digitalized enabling trace-and-track options and more smoothly interactions.

#### Proposition 4. Reduction in marginal costs, increase in total costs

Our fourth proposition is that the uptake of communication through the internet and social media will reduce marginal communication costs but paradoxically lead to increase in total health care costs. The overall uptake of social media in Denmark is following the trend in most other First World countries with an increasing use and a strong bias of the younger generating posting messages to social media sites and instant messaging. Only 11% of the 65-74 year age group were active social media users in 2012, whereas the 53% of the 25-54 years and 86% of the 16-24 years used social media in Denmark (Eurostat 2013).

The introduction of online consultation in Denmark has led to quite extensive public debate whether or not the number of online consultations will increase due to time savings, a simpler service, reduced transport demand, and increased availability.

In January 2009 a ministerial order made it mandatory for the private general practitioners to offer online consultations with the patients. Also, government launched online health forums and digital communication to cope with areas of health care where supply of medicare was limited and in areas where sensitive issues but prevent citizens from seeking medicare. Citizens have taken onboard the new channels, but the overall numbers of consultations have increased. Hence, the total costs are escalating.

In Table 1 we have displayed the number and costs of general practitioner consultations for year 2008 and 2012. These data has been computed through access to health care statistics. The distributions on three channels (physical, phone, and e-mail consultations) show an increase in the number of e-mail consultations of more than 100% during the period 2008-2012. There has been a minor reduction on phone based consultations but also an increase in daytime physical consultations.

*Table 1. Consultations by General Practitioners: Proximity, Number of Consultations, and Costs (1,000 USD) of Consultations, 2008, 2012*

Proximity	2008		2012	
	N	Cost	N	Cost
Physical (day)	19,151,421	313,731	20,280,154	351,567
Physical (night)	938,069	24,524	916,470	24,431
Phone (day)	14,840,136	49,715	13,479,966	45,582
Phone (night)	1,645,846	21,405	1,626,629	21,575
Online	1,284,336	8,607	2,860,303	16,681
Σ	40,727,703	909,906	41,588,137	1,017,268

Source. [9]

#### **Proposition 5: Government involvement in open social media**

Our fifth proposition is addressing what role government can play in use of social media in health care. Our daring proposition is that government fails when it attempt to create and manage open, online social media based health care forums. Government is much more successful when it focuses on social media use where the access to the groups and communication is restricted.

At Aalborg University Hospital, an online patient book was implemented in 2009 for male patients with prostate cancer undergoing radical prostatectomy surgery. The ambition with the online patient book was to meet the patients need for information, support, and dialogue with other patients and with healthcare professionals [11]. Since 2009, 400 patients have used the online consultation forum.

The number of men diagnosed with prostate cancer increased significantly from 2000 to 2009. Previously, these men (typi-

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cally in their fifties or older) were hospitalized up till twenty days including the surgery. Today they are hospitalized less than three days, and the time still decreases towards planned discharge the day after surgery. One of the reasons for the short stay at the hospital is the use of robots to undertake the surgery. In addition, the men have to visit the outpatient clinic numerous times both before and after the surgery.

The use of Online Patient Book© has transformed the place of communication between the patient and the health professional to a closed virtual space with six members (patients) where the pre-assigned group members can see the questions and answers from others in their group. The patients can ask questions to health professionals that will answer the questions within 24 hours. The communication is done in native language (Danish) and with local health professionals.

According to the administrative manager of the online patient book, Anette Højer Mikkelsen, the main reasons for why the patients use the online forum are that the patient felt comforted by the ability to ask questions to health professionals they have been physical introduced to and the use of native language in the communication. The communication includes general and individualized information and support empowering the men, as it assists the patients in being active participants in their own care with the freedom to use the tool. The patients experience an increased ability to stay in control, which reduces the dependence on the healthcare professionals.

Also, the national health care portal (sundhed.dk) is trying to use new media for interaction. Building a national health portal with access to electronic patient records, letter of discharge, prescriptions, etc. is far more extensive than what is being offered at the US war veteran online communication site and Keizer Permanente. This Danish national health portal is linking all the actors and institutions into one virtual territory. The health communication has moved to a virtual place.

The portal aims at ensuring consistent patient treatment and improving patients' ability to take care of their health. As of January 2008, the portal had about 300,000 registered users. By January 2013, the number of registered users had grown to 850,000. However, the impact of Sundhed.dk on citizens should not be measured only by the number of visitors to the portal, but also by the extent to which patients are more informed, know where to go for the health services, and by the amount of time freed for those working daily in the health sector. With the exception of debate on recurrent miscarriages and cervical cancer, the open communication forum is not used much of the citizens. By contrast, online communication, postings, and re-tweets at the private run social network as Netdoktor.dk and various Facebook and LinkedIn groups are growing rapidly in numbers.

Sundhed.dk increasingly faces the competition from the privately funded and operated fora, and from patient-driven fora. These health fora do not aim at minimizing online traffic and interaction, but at maximizing them. The underlying business logic of Web 2.0 applications and that of the majority of private health fora is to reach a high volume of traffic and a high turnover ratio. For example, the netdoktor.dk's business model is that it sells marketing relevant data collected at the health communication oriented website to online marketing companies. Thus, more users generate more data that can be sold. By contrast, the government operated health care communication platform has assigned health care professionals to intervene in case the communication result in dialogue and advises that are against national health care rules. Thus, the costs of adding more users are not approaching zero for the government operated sites since the number of postings will increase with more users.

Table 2. Postings at the Online Patient Network at Sundhed.dk, July 2011-February 2013. Accumulated Number of Postings and Number of Users (N)

Patient Network	July 2011		November 2011		June 2012		February 2013	
	P	U	P	U	P	U	P	U
Miscarriages <sup>1</sup>	935	388	1081	430	1159	477	1239	543
Cervical cancer <sup>1</sup>	266	362	292	380	332	412	352	458
Incontinence	32	83	48	127	70	182	81	225
Rape	29	65	39	105	67	152	95	196
Lymphoedema	6	22	8	32	16	42	22	66
Modic changes	32	44	50	87	74	146	84	206
Overweight	4	12	6	24	6	31	6	55

Note. P is the number of postings, U equals the number of users.

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