

A change in General Practitioners' daily behaviour finances Healthcare development

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In Denmark 70 billion Kroner per year is spent on healthcare - 8 percent of GDP. More than 80 percent is financed by taxes. The Healthcare Sector is under heavy economic pressure due to new medical and technological development. This makes it possible to treat people for whom there was no treatment before. Many of the existing medical procedures and technologies are being replaced by new more efficient and sensitive ones (minimal invasive) . The introduction of new medical technology is very expensive. One way of financing this development is to move well-known medical procedures from hospitals to general practitioners.

However, the GPs in Denmark claim they are very busy. In relation to this you should not forget that the GPs' overall workload to a large degree is a result of their own behaviour at the consultations. Comparing figures describing the daily work at different GPs show the range of behaviour. A System Dynamic model is used to illustrate how it is possible to make room for expanding the GPs' responsibility for more healthcare treatment through a change of behaviour.

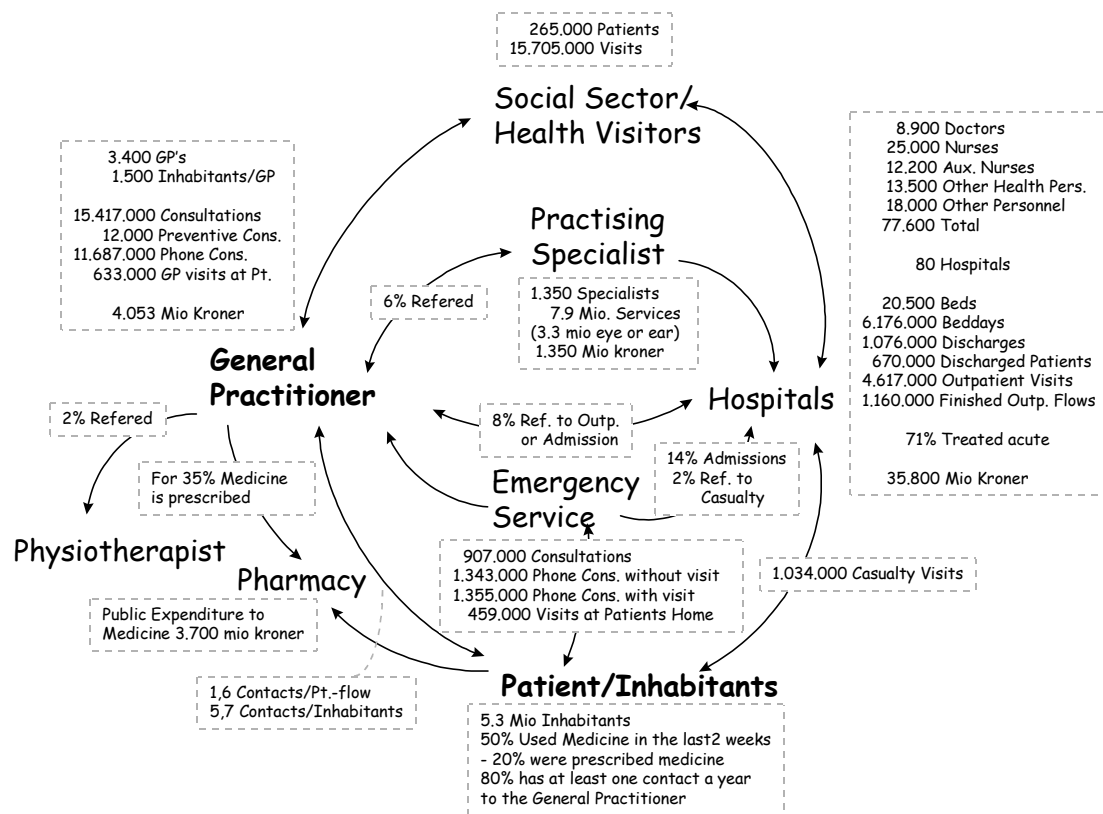
Background

The GP is an important person in securing the health of the population and the well-being of the Healthcare System. About 80 percent of the citizens in Denmark have at least one contact with the GP during a year. Nearly 90 percent of all enquiries to GPs due to health problems or preventive care are handled by the GPs alone.

The vital position of the GPs in the Healthcare System is shown in figure 1, where he or she as the gatekeeper is referring to examinations and treatment at specialist practitioners, admissions to hospitals, physiotherapists, health visitors and prescribing medicine.

Value for money in the Healthcare Sector depends very much on the cooperation between the GPs on the one side and the Hospitals - inclusive other healthcare providers - on the other. It concerns the effort done before referral to a Hospital, the care following a discharge from Hospital and in particular the effort done in General Practice alone.

Figure 1: The Danish Healthcare Sector - in big numbers



The public expenditures to General Practice and Medicine respectively amount to 4 and 3,7 billion kroner a year or approximately 1500 kroner per inhabitant a year in total. The overall public healthcare expenses are a little less than 57 billion kroner.

These figures alone should give you good reasons to have a closer look at how the daily work at General Practice is done, and to consider adjustments to secure the quality and an efficient use of resources. Such an interest in Denmark is stressed by the fact that we are experiencing an increasing demand for GP services.

Goals in General Practice

The overall goals for the Healthcare Sector in Denmark can be briefly summarised to:

- Free, equal and easy admission to Health Services
- Effective Health Services of high quality, continuously developed in accordance to the medical and technological knowledge
- Free choice of Hospital for treatment and possibility for choosing another GP once a year

General Practice works like a family-doctor system. All GPs are supposed to have a thorough and lasting knowledge of the patients and their families. As a consequence,

we expect the GP to be the patients' general advisor on Health problems and use of Health services. In relation to examination and treatment, the GP can choose to do it himself or refer the patient to another relevant Health Service provider. The co-ordination between GPs, Hospitals and the rest of the health and social sector is emphasised as an important factor in running an efficient Healthcare sector of high quality.

As mentioned, it should be easy to reach the GP in case you are in need of medical aid. It is therefore important that access by phone and direct contact in consultations are organised in a way that can fulfil these conditions.

The GP as a gatekeeper plays a leading role in the health care sector striving toward the good patient flow which starts and ends here in most cases. That is why its crucial that the GP:

- has enough time for the patient ,
- picks up his phone,
- goes on visits to old patients,
- co-operates with physiotherapist, practising specialist, social authorities, Hospitals and others and
- carries out preventive activities

Expectations to General Practice

The patients express their expectations to the GP in a number of statements about what they think he/she is supposed to do (note 1).

With respect to accessibility, the patients expects the GP to:

- have enough time during the consultation to listen and explain - 90 percent find this very important
- offer quick help in case of acute need - 88 percent find this very important
- offer a consultation within a short period of time - 73 percent find this very important

The fulfilling of these goals and expectations is strengthened if the GP is joining in-service training and quality improving projects.

Present problems in General Practice

During a day's work, the GP must take care of phone calls from patients, attendance in consultation, visits to patients and written and phone contacts with pharmacies, laboratories, other GPs, practising specialists and Hospitals.

The agreement between the Medical Association and the health authorities contains the economic frame that ensures the patients free access to medical assistance from

the GP in case of problems with the Health. It also gives some regulations about the patients possibilities to get in contact with the GP.

Apart from that it is up to each GP to employ the necessary assistance, purchase the technological equipment that is needed and to organise the daily routines in his practice.

The daily work in General Practice is busy and is leaving few options to analyse and consider the situation in ones own business. More than half of the GPs are working alone.

There is no tradition for production and quality control in General Practice in Denmark. However both from the GPs and the society's point of view quality control would be desirable. It would:

- raise the quality of health services in general,
- result in a more equal distribution of health services,
- make the Health Sector more cost-effective and
- stimulate and develop General Practice in particular.

The lack of follow up can be seen in the quality and the use of resources in General Practice.

- 33 percent of the population wish it was easier to get in contact with the GP (note 2)
- Blood pressure is taken on 17 percent of the patients in consultation on average - the variation among the GPs reaches from 5 to 65 percent (note 3)
- In 23 percent of all consultations no clinical examination is done - variation reaches from 5 to 50 percent (note 3)
- In 23 percent of all consultations no second visit is booked - variation among GPs reaches from 5 to 50 percent (note 3)
- The number of referred admissions to Hospital from GPs varies from 2 to 12 per 100 patients and only 20 percent of the variation can be explained by differences in the patient-mix (note 4).

Pilot project - a systemic description of General Practice

Organising the work schedule, allocation of time and the behaviour in each General Practice determine whether the good patient-flow is realised or not and it decides the cost-effectiveness in business. That is why it is important to focus on these elements when you are considering quality development in General Practice.

The efficient and goal-seeking quality improving process is starting with a consistent and specific analysis of the process you wish to improve. Such an analysis of General Practice has not been done in Denmark before 1997 where a pilot project in the County of Vejle developed a general model for a systemic description of the GP

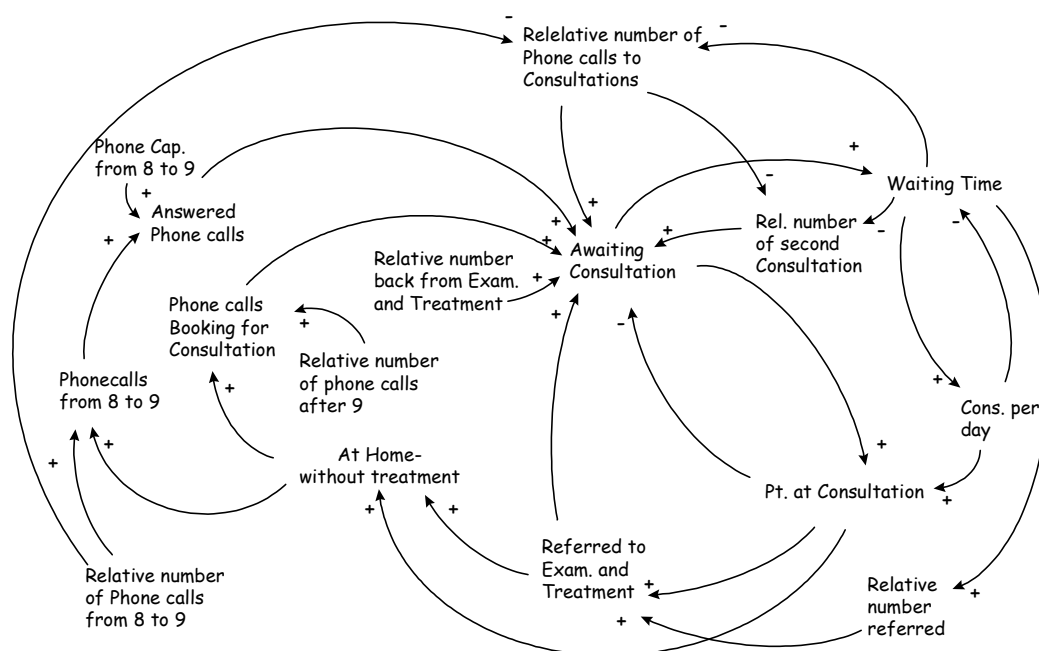
business. The intention is through this model to inspire the quality development in General Practice through Benchmarking.

The model resulting from the pilot project is partly shown in the diagram in figure 2. It represents the patient-flows at the GP and factors that express the patients' and the GP's behaviour. The variables in the diagram make up most of the central key figures that went into the description of the one General Practice that was on focus in the pilot project.

As shown in the figure the patient-flows in GPs started with a phone call from the patient. If he/she wishes to speak with the GP - hoping that the present problem can be taken care of during a consultation by phone - a call is made between 8 and 9 a.m. If he/she just wants to make an appointment for consultation the call is done after 9 a.m., where it is taken care of by the GP's secretary. In some of the phone consultations early in the morning, a booking is made for a consultation in practice later on.

Most of the patients must wait some days before they can visit the GP. The waiting time depends on the inflow on the booking-list (Awaiting Consultation) and the capacity in the practice - measured by the number of consultations per day. The capacity is influenced by the GP's own behaviour. How many consultations will he accept in a day? When the waiting time is getting longer he will use a little less time on each consultation, and due to that he will be able to handle a few more consultations.

Figure 2: Causal-loop diagram - patient-flow in General Practice.



At some of the consultations at the GP a second one is booked. Here too we have a parameter that is influenced by GP's behaviour. If the waiting time is long the GP will be less inclined to book another visit. A similar behaviour is shown at the phone consultations. The longer the waiting time is, the fewer of the phone consultations will get an appointment to show up in the practice.

Many patient-flows end right after the first consultation, but as mentioned some continue with one or more visits. Once in a while the GP decides to refer the patient to further examination or treatment at Practising Specialist, Hospital or another health care provider (Referred to Exam. and Treatment). After finishing the examination and treatment here some of them return to practice, while the patient-flow for others ends here and they return "Home".

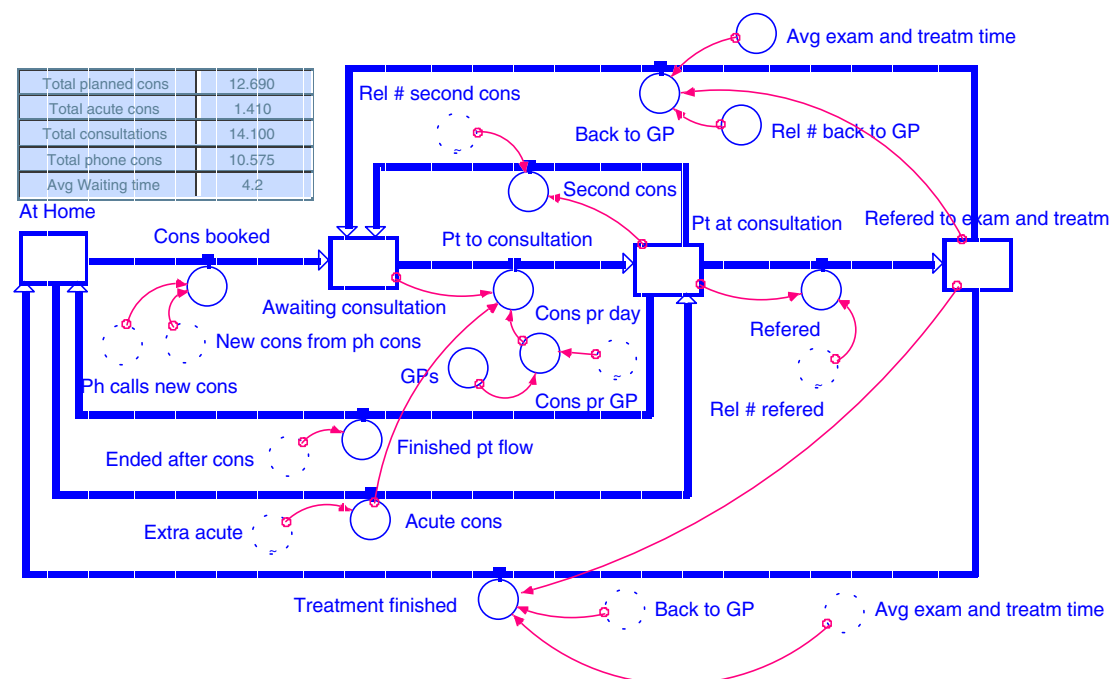
The diagram gives a systemic description of the business in General Practice that can be done for every GP. Each of them can make up their own key figures and by comparison with others they can find inspiration to develop and improve the organisation and the way of doing things themselves - Benchmarking.

A model of General Practice

Based on the diagram and a data description of each parameter a simulation model of a General Practice is made. The model can be used to find out the consequences of a changing behaviour among GPs.

Most of the model is shown in figure 3. It is made in I'think. It is focused on the patient-flows as they are observed in practice.

Figure 3: Simulation model of General Practice - a part of



Calling the GP results in a booking for consultation. The details of that part of the model is not shown in figure 3. As it is not possible for every one to visit the GP at day one you must wait until there is a room for you in the booking calendar. The number of planned consultations each day is depending on the number of GPs in consultation, the number of consultations each GP is performing and the number of acute consultations. The flow further on with referral to more examination and treatment, the return for a new consultation or the end of the patient-flow is shown on the I think-diagram.

Data from the Practice in the pilot project is used in the model. It is a 3-GP practice. When the data from the model simulations are compared with the figures from the Danish Health Care Sector they show a nice correspondence - 16 mio. consultations in General Practice according to the model (blown up to national level) against the official figures of 15,4 mio consultations and 12 mio. phone consultations from the model compare to the 11,7 mio in the statistics.

Consequences of changing behaviour in General Practice

As pointed out above there is a difference in how the GPs are running their business. Not all the variation that is seen is caused by different needs in the GPs population base. Some part is due to inefficient behaviour in practice. If it is possible to rectify some of this imbalance by a change in behaviour among the GPs, it will generate economic finances for new medical initiatives.

The simulation model can for example be used to examine what consequences the following behavioural adjustments will have on the total amount of Health Services delivered:

1. The relative number of phone consultations followed by the patients show up in practice is reduced from 30 percent to 20 percent.
2. The relative number of consultations, where a second consultation is booked, is reduced from 18 percent to 15 percent.
3. The relative number of patients referred to further examination and treatment is reduced from 16 percent to 12 percent.

The first adjustment results in a 8 - 10 percent decline in planned consultations and average waiting time. It counts for 4 percent of total expenses to General Practice. The effect from the other adjustments is far less.

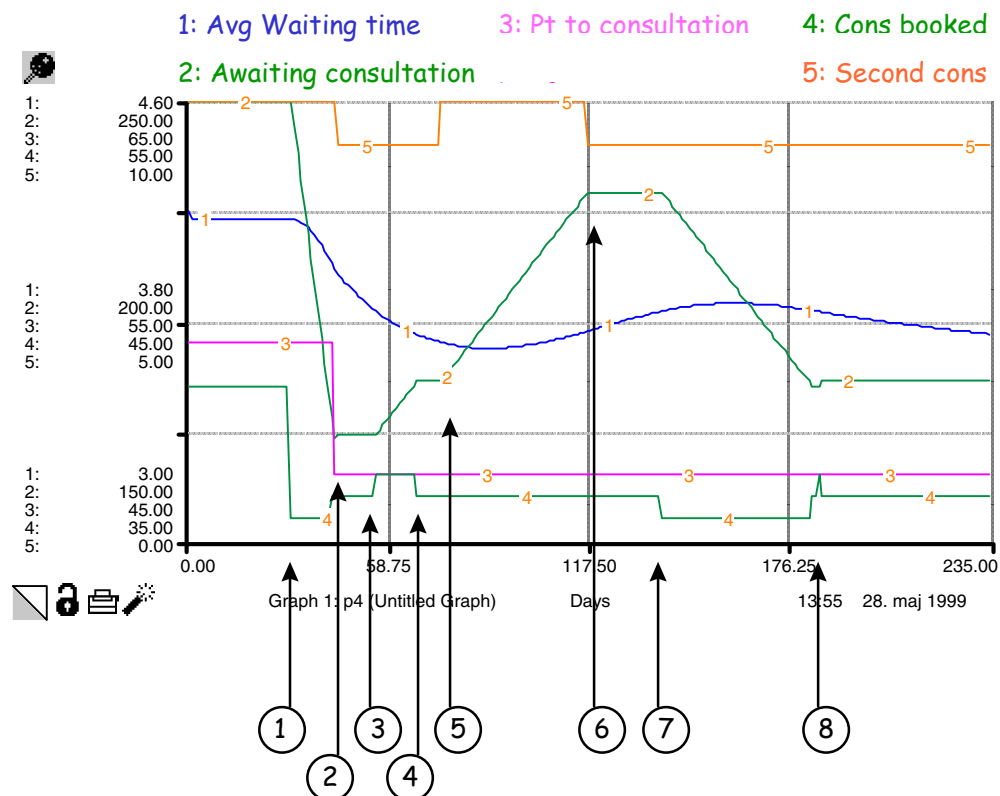
Such a model supported identification of what we can expect is a much more consistent way of considering alternative suggestions to changes in the Primary Health Care, than what is done by the Danish authorities today.

The Model can be used to consider the implementing of selective initiatives. How will General Practice react to the changes? What kind of precautions can be made to prevent unintended effects?

In the following figure 4 an example is shown where adjustment 1 from above is implemented. In the model it is assumed, that the adjustment will have effect right after 30 days in the practice year. This is not an realistic assumption, but accepted here for illustrative purpose. The reactions as expected according to the model are given short comments in chronological order. The number of the comments corresponds to the marked arrows in the dynamic history laid out in figure 4.

1. The relative number of phone consultations followed by the patients show up in practice is reduced. It results in a fall in the number of planned consultations (graph 4) and due to that a reduction in the number of patients waiting for consultation declines (graph 2). The average waiting time is going down (graph 1).
2. The number of consultations per day is reduced from 20 to 18 per GP - they are spending more time with each patient. At the same time, the lower number of consultations results in less second consultations (graph 5).
3. Planned consultations are rising due to a shorter waiting time (graph 4)
4. Planned consultation is reduced due to less at home without treatment (graph 4)
5. Extra consultations is raising due to a lower waiting time (graph 5). This makes the waiting time to go up.
6. Second consultations decline again due to waiting time moving up.
7. The longer waiting time reduces the number of consultations in practice booked in the mornings phone consultations (graph 4). This is dampening the rising waiting time.
8. The waiting time has now moved down again and more consultations in practice are booked at the phone consultations again.

Figure 4: Consequences of adjustment 1.



From such an analysis of the expected development, explicit opportunities are given to clarify intended as well as unintended effects, consider corrections and identify the element which is expected to be critical for reaching wanted results.

Perspectives

The model presented is certainly not a finished version. It is developed in continuation of a pilot project, where a framework for describing General Practice has been worked out. The framework was meant for evaluation of the business and improving through Benchmarking.

The model will be used to demonstrate how this kind of thinking and analysing can improve the basis for decisions and create knowledge that enlarge the chance of reaching what we aim for.

At DSI - Danish Institute for Health Services Research and Development we are working on ideas as these in order to make the Danish Health Authorities realise the value of using System Dynamic and simulation modelling.

Suggestions to improve this process and ideas to the modelling as well as others experiences from similar areas are highly appreciated.

Notes:

1. "Hvad forventer patienterne af de praktiserende læger?" - J. Mainz m.fl. Ugeskrift for læger 6. okt. 1997.
2. "Sundhed og sygelighed i Danmark 1994" - Rapport fra DIKE 1995.
3. "Audit Projekt Odense- kvalitetsvurdering ved intern medical audit" - Anders Munck i Månedsskrift for Praktisk Lægegerning (dato?)
4. "De praktiserende lægers indlæggelsesmønster - En undersøgelse i Fyns Amtskommune" - AKF-rapport fra 1987.

If you are interested in these references, please contact me.