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Telemedicine and the Welfare State: The Swedish Experience

Mårten Blix and Johanna Jeansson

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Abstract

Sweden combines a vibrant market economy with a large public sector. This combination of public and private also characterizes the country's comprehensive tax-financed welfare services. More than one-third of primary health care is today produced in the private sector. This substantial share has broad implications for how digitalization reshapes those welfare services. In this paper, we focus on how *telemedicine* is set to transform primary health care in Sweden, where doctors have been available via video calls on smartphone apps since 2016. The novel element in Swedish health care is that the doctors are available as a public welfare service but by *private* providers. With some exceptions, patients pay a small fee, but most of the cost is borne by the tax-payers. While the benefits of telemedicine are many – such as easier access to doctors and a reduction of non-essential travel – the downside for public finances is that the demand for care, and hence costs, may increase dramatically. As telemedicine becomes more popular, the tensions in regards to financing and regulation are already in evidence and look set to rise further. We outline steps that could better integrate telemedicine into the health care system.

Keywords: Primary health care; Telemedicine; Welfare state; Digitalization; Privatization; Outsourcing.

JEL codes: H75, I11, I18.

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“Take this app and call me in the morning.”

– Singer (2018, para.1).

1. Introduction

Health care in Sweden finds itself at a cross-road with regards to digitalization. In this paper, we will focus on one issue in particular that is causing consternation among primary care physicians: The rapid increase in popularity of *telemedicine*. Via smartphone apps, patients can at the press of a button make video calls directly with doctors, rather than having to wait days, or weeks, for a non-emergency meeting with a doctor at a physical care center. Apart from reducing waiting times, this development brings a host of other benefits for patients, such as removing the inconvenience of travel and lessening the risk of contagion at care centers (Mohr et al., 2018). Online consultations also use the physicians’ time more efficiently. But the development is not without its predicaments and one issue in particular stands out. The substantial government subsidy for primary care visits, in combination with vastly improved accessibility, could result in unsustainable cost increases for tax-payers. As we show in this paper based on new, original data, the number of digital health consultations has already grown dramatically. Hence, it remains to be seen if this lessens the number of physical visits or simply adds volume and thus total health care costs.

Although the health care system is continuously undergoing change, the remuneration system in Swedish primary care is mostly through capitation (Anell, Glenngård and Merkur, 2012). But digitalization is now raising new issues. For one, the rules and governance of health care are increasingly at odds with what is possible and efficient through digitalization, where scale and network effects are important. Since the Swedish health care lies under the responsibility of the 21 county councils, their legally mandated regional autonomy is increasingly in conflict with providing efficient digital health care available nationally. The county councils have the authority to tax citizens and shape health care, subject to some general government guidelines, but regional institutions lack the benefit of scale available at the national level. The county councils need to find a way to centralize – at least temporarily – some aspects of digital health care, such as price, remuneration and best practice, while retaining autonomy in the choices that matter for its citizens. This will not be easy.

To get a sense of how rapidly things are changing, consider that telemedicine in Sweden in its current form began in 2016 and that it had grown to represent almost 2 percent of all primary care visits by the end of 2017 (Blix and Jeansson, 2018). During this period, the Swedish Association of Local Authorities and Regions (commonly known as “SALAR”, or “SKL” in Swedish), the organization that represents the autonomous regions, has been more or less forced to make some uncharacteristically quick changes to the recommended pricing of digital services.

Notably, in March 2018 the Board of Governors of SALAR endorsed a recommendation to the county councils to impose a minimum fee of SEK 100 (\approx €10) for telemedicine (SALAR, 2018). The reason was a peculiar combination of regional pricing and the borderless reach of digital services. One single county council representing just under 3 percent of the population in 2017 offers primary care free of charge (i.e., wholly subsidized by the tax-payers). Through a digital entrepreneur, *gratis* primary care suddenly became available in the whole country from 1 January 2018, a state of affair that created political tensions (Alskog, 2018). It only took 75 days before SALAR quickly introduced a recommended minimum fee for telemedicine, though the county council in question has delayed implementing the recommendation.

Going forward, the role of telemedicine hangs in the balance from the political choices made in the next few years. There is substantial need of reform in a system characterized by considerable inertia, but future decisions will likely prove more difficult. Addressing remuneration systems and how triage patients between digital and physical care will be key issues. If digitalization is not well managed, it may lead to tensions that cause Swedish health care costs to hemorrhage. It could also lead to other challenges for health care, for example on the skills needed in the profession but these issues are beyond the scope of this paper.

The rest of this paper is structured as follows. First, we briefly discuss the persistent issue of poor accessibility to Swedish primary care. Next, we describe how digital doctors and telemedicine are transforming primary care, which age groups and regions that are using the service and the increased tensions telemedicine bring to the Swedish health care system.

Finally, we conclude with three reform areas that could improve the framework and pricing for telemedicine in Sweden.

2. Pervasively Low Scores for Health Care Accessibility

Sweden's health care system is often acknowledged to deliver high-quality care even as the costs are among the higher in the OECD (apart from the US). Measured per capita, or as a share of GDP, Sweden is one of the countries that spend the highest amount on health care (OECD, 2017). Based on various measures of quality, Sweden's rank is high in international comparisons:

- The mortality in cancer and the prescription of antibiotics are among the lower within the OECD (2017)
- There are more doctors and nurses per capita than in many other countries (OECD and European Observatory on Health Systems and Policies, 2017)
- There is a low proportion of unmet health needs caused by cost constraints (OECD and European Observatory on Health Systems and Policies, 2017; OECD, 2017; The Commonwealth Fund, 2017).

At the same time Sweden ranks as one of the *worst* countries when measuring quality based on patients' experience of care and waiting times (Vårdanalys, 2014). For example, Swedish health care is in the lower third of the OECD countries based on the amount of time a doctor spends with a patient during a visit, and the level of transparency the patients receives in treatment (OECD, 2017). Senior citizens in Sweden (together with Germany and Canada) may also wait longer for care than in other western countries (The Commonwealth Fund, 2017; Vårdanalys, 2017).

3. Health Care Disruption

a. New Health Care Providers: The Emergence of Telemedicine in Sweden

In 2016, the digital entrepreneurs *Kry* and *Min Doktor* launched their respective telemedicine app. Since then, their popularity has steadily increased as measured by a rapid increase in the number of digital visits (see Figure 1 below), with more companies entering the field.

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Also, *Kry* has expanded to other countries, notably to Norway and Spain, and has plans to enter other markets, notably France and the UK (Ram, 2018).

The novel element of the Swedish telemedicine apps is that they are designed to work seamlessly as part of the public welfare system. In contrast to other telemedicine companies, for example in the US, the remuneration of telemedicine in Sweden is part of an existing mechanism put in place by the 21 county councils. The advantage is that patients (so far) pay the same fee as for a physical care visit and that the barriers for patients to access the service are minimal.

It works as follows: The patient accesses the *app* and their identity is confirmed via a mobile BankID. The mobile BankID is a stand-alone technology originally developed by the banks but has, in our judgement, become a *de facto* standard in Sweden for a host of other services outside the financial sector, including the tax authorities. Sweden has *one* mobile BankID that works for all applications, so users *do not* need to access multiple identification tools.

The design choice of integration with public welfare services means that the patient's access works smoothly, while all complicated interactions with regards to the technology and the health care bureaucracy occur in the background, out-of-sight.

The most notable of these complicated interactions is how costs are reimbursed. Within primary health care in Sweden, the primary funding is through capitation (Anell, Glenngård and Merkur, 2012). Each primary health provider receives funding based on the number of listed patients, with some adjustment for other factors, such as socioeconomic attributes and age. Telemedicine companies are not yet allowed to list patients. Instead, their remuneration is based on a legal construction known as *out-of-county* visits that is established in a legal bill (Sveriges Riksdag, 2017). All Swedish citizens have access to health care throughout the country, but the cost for each visit is borne by the home county council where the patient pays regional tax. For example, a person living in Stockholm utilizing care in the city of Malmö will pay the out-of-pocket fee established by the county council responsible for Malmö. Subsequently, that council will bill

the Stockholm county council for a visit according to their own fee structure. Though such visits were not infrequent before telemedicine apps, the scope was too small to make it a contested political issue.

Telemedicine rests on this construction of *out-of-county* visits combined with the law of freedom-of-choice ("LOV") enacted in 2009–10 (Swedish government, 2008).³ This freedom-of-choice law was a signature bill of the center-right coalition (2006–2014) to create private alternatives to publicly provided welfare services. It gave private health care actors the right to establish their services anywhere in Sweden as long as they fulfil the regulatory requirements. The same law forms the legal basis for telemedicine doctors. By the same token, just as for private health care providers, the telemedicine doctors can also establish their services anywhere as long as they fulfil the same regulatory requirements. It is unclear – even unlikely – that this later development was foreseen by the legislators at the time.

In practical terms, the digital entrepreneurs *Kry* and *Min Doktor* connected their services to the county council of Jönköping, which represents slightly less than two percent of the national population. Formally, they are subcontractors to two private primary health care centres, Tranås and Wetterhålsan, supervised by the local authorities. Suddenly, starting in 2016, with this somewhat artificial construction, Sweden had a form of hybrid health care system; a *national* primary digital health care accessible for all, but with local regulators responsible for supervision and financing.

Essentially, the private providers were able to produce an innovative and popular service resting on top of existing regulation and rules. In itself, the emergence of telemedicine was only a matter of time. Video calls via the internet have been available at least since Skype was launched in 2003, and in the US digital doctors have been using such technologies with paying insurance customers almost since smartphones were introduced. But the few Swedish county councils that have experimented with video calls, have not had much impact as the services have been awkward and not particularly user-friendly. Instead, it took privately owned

³ The freedom of choice model ("LOV") was already established in five regions (Halland, Stockholm, Västmanland, Region Skåne and Västra Götaland) out of 21 before the law was fully adopted.

companies to make the decisive steps in developing a smooth and convenient service through smartphones.

b. Digital Transformation in Primary Health Care

Digitalization has already transformed many service sectors. Although health care is unique in many ways, there are fundamental similarities in two central aspects: *network effects* and *scale*. In one way or another, most of the strengths and benefits from digitalization stem from these two features (Brynjolfsson and McAfee, 2016). The network effect implies that as more people use the service, the more useful it becomes. The scale effect means that the cost of the digital service is low and that the marginal cost of adding additional users is almost zero. These elements also have some bearing on telemedicine. Doctors can meet more patients in the same time-frame and patients from faraway can communicate with specialists locally unavailable.

The US physician Eric Topol has provided a perspective on these developments and argues that digitalization upsets the power balance between doctor and patients (Topol, 2015). The main argument is that digital technologies are providing patients with tools and information that were previously not available to them. In this way, digitalization makes health care more democratic. Patients can compare notes online with other patients displaying similar symptoms and diagnosis, even in instances when it occurs only rarely. Patients can also find information more easily and read-up on treatments and side-effects. This will likely increase the pressure on health care both in terms of volume and quality.

Telemedicine is part of this digital transformation. From a patient perspective, quality is improved as patients can await doctor's video call at a place of their own convenience (their home), instead of traveling to the care center or an emergency room. By the time the video call comes through, some of the bureaucracy in the identification and explaining of the symptoms have already been processed and both doctors and patients can spend their time more efficiently on medical questions rather than on administrative formalities. If a doctor writes a prescription, an electronic recipe makes it possible to visit any pharmacy to buy the medicine. Recently, it has also become possible to order home delivery of medicine, something especially useful for

the elderly or those with mobility restrictions. But as we have already mentioned, increased accessibility may raise costs and there are also issues of regulating this new form of health care.

c. Criticisms against Telemedicine

The most scathing comments against telemedicine come from within the medical profession. Perhaps this is no surprise. Health care has long-developed traditions and set hierarchies. As an added economic irritant to physical health care providers, some county councils reduce their remuneration for the physical care centers when their listed patients use telemedicine.

The criticism against telemedicine in Sweden can be summarized in three points (Andersson, Sjögren and Åsberg, 2017; Ahlzén et al., 2018):

- That diagnosis cannot be done by video call alone, but requires a physical examination
- That online doctors tends to overprescribe of medicine, notably antibiotics, while underusing diagnostic tests
- That overconsumption of health care is encouraged, resulting in large volumes of trivial or unwarranted e-visits at the expense of patients with comprehensive needs.

Overprescription of antibiotics is a global problem, but much less of an issue in Sweden. Recommendations and some use of pay-for-performance incentives have also proved successful in Sweden (Ellegard, Dietrichson and Anell, 2018). With telemedicine doctors, the incentive may yet again be stronger also in Sweden to overprescribe antibiotics, since this what patients may demand, and they can shop-around more easily for a doctor who may then be more prone to acquiesce. Indeed, there have been some alleged instances of oversubscription of antibiotics from medical doctors on behalf of the regulators (Lägermo and Bengnér, 2017a, c, b; d) but the methodology and results have been criticized by the chief medical officer at Min Doktor (Cederberg, 2017). After these investigations, regulation and oversight has been strengthened. All aspects of regulating physical health care are also present in telemedicine and it is important to maintain oversight so that the same standard is applied regardless of the format.

It is also clear that many diagnoses still require physical interaction between doctor and patients, for example regarding ear and throat exams or when a bone may be broken. In regards to diagnosis, the telemedicine doctors argue that much information about a patient can be learned from a video call (Schildt et al., 2017). Supporting their case is the fact that as technology advances, the range of diagnoses that may be feasible through telemedicine

increases. For example, blood-pressure monitors can easily be connected to smartphones, as well as an expanding range of measuring and monitoring tools. As in other areas, increased competition and globalization also imply that lower costs for new medical instruments will make them more feasible for homeownership, which is especially vital for patients who often require access to health care. There are also promising results for using telemedicine to treat mental illness, and a literature review shows that there is no significant difference in diagnosis compared with physical visits (Hilty et al., 2013).

d. Telemedicine and Privatization of Welfare Services

In Sweden, there are historical antecedents to the criticism against telemedicine in the private production of welfare services. While we will not try to summarize all arguments of this debate, we note that one motivating factor is the presumption that private producers boost demand in order to increase profit or reduce quality in order cut costs. The Swedish discussion has been ongoing with varying strength since the mid-1980s and when the socialist-green coalition came to power in 2014, it resurfaced with renewed vigor.

The first, and by far the most vitriolic conflict, occurred not in health care, but in another area of welfare, namely that of preschool for children aged 1–6. In 1984, the private preschool, *Pyslingen*, met a storm of protests and legislation and the then prime Minister Olof Palme asked rhetorically if Sweden should allow “Kentucky-fried children” (sic), alluding to the alleged horrors of for-profit tax financed welfare services (Svanborg-Sjövall, 2013). Another example is elderly care where towards the end of the 1980s, political strife erupted around outsourcing in the municipality of Danderyd. Since then, private production has increased across most areas of welfare production from preschools and schools to health care. Today, private production plays an extensive role in health care in general and in primary health care in particular, where private providers account for 36 percent of all production as measured by the share of net cost in 2015 (Jordahl, 2013).

It is within this broader debate about profits within tax financed welfare services that telemedicine may become even more controversial than today. During 2016–17, the telemedicine providers were loss-making, as is often the case with start-ups. But at

some point in the future, their private financiers will want to see a return on their investments. The stage is then set for more political conflict.

4. Telemedicine Use in Sweden

Telemedicine is on the rise in many countries. It comes in many shapes and forms, from automated advice with avatars, as developed at the USC Center for Body Computing (Saxon, 2015), to video-calls with online physicians. In Table 1, we illustrate some of the available apps.

Table 1: Examples of health care apps in Sweden, the UK and the USA.

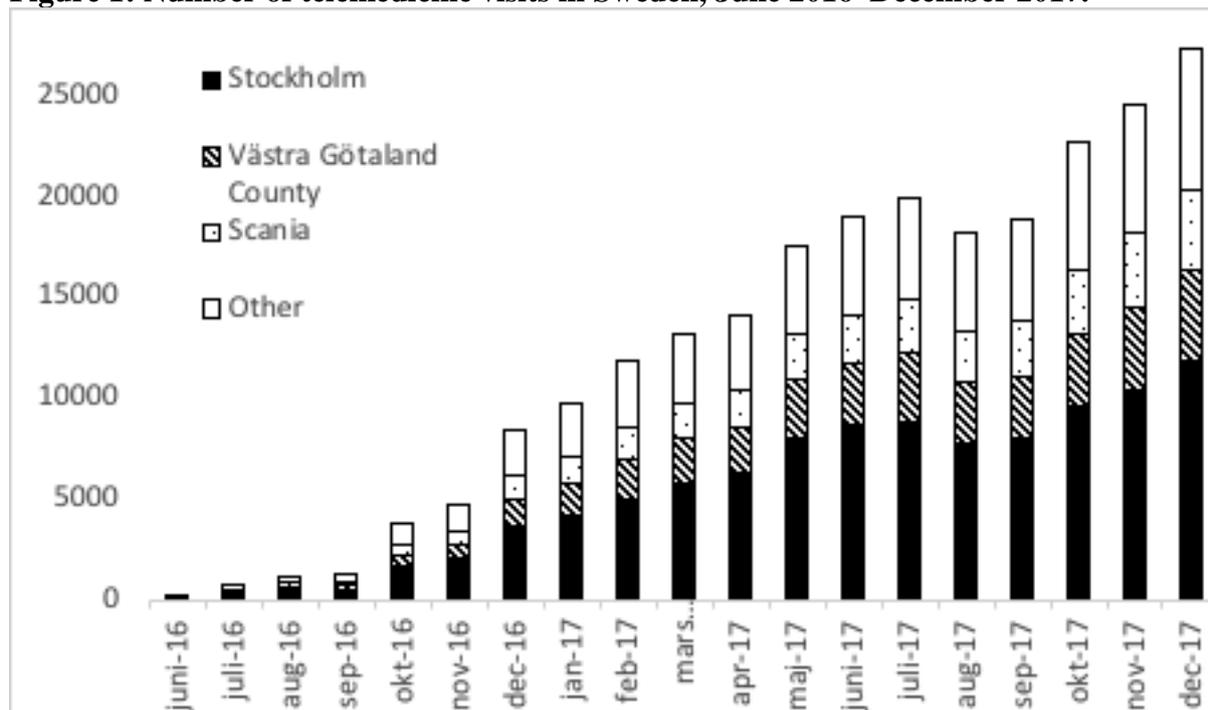
| Sweden | UK | USA |
|---|---|---|
| Kry, Min Doktor, Doktor.se, Doktor24, A & O i Vården, Min Vård, Mediceck, Närhälsan online, Videmöte SLL, First Derm, iDoc24, Medicoo | Babylon Health, Push Doctor, Dr Now, Vitality GP, Ada Personal Health Companion | Doctor on demand, LiveHealth Online, Teladoc, Amwell, HealthTap, MDLive, American Well, StatDoctors, MeMD |

Note: Some apps have limited functionality outside their respective country.

Data on the total number, age, and region of residence of telemedicine users are available in Sweden. As can be seen from Figure 1, the number of visits has increased steadily since 2016, and in December 2017 they amounted to about 27,000 persons. In 2017 (December-December), the increase is almost 230 percent, albeit starting from a low level.

As expected, it is also apparent from Figure 1 that it is the most populous regions that account for most of the digital care visits during the period June 2016 to December 2017. Perhaps more surprising is how much the large regions dominate as a share of digital visits. Sweden’s capital Stockholm, which accounts for 43 percent of all visits, is almost twice overrepresented relative to its population share of about 23 percent in 2017. On the other hand, residents from the other two big regions, Scania and Västra Götaland, consume digital care almost in parity with their respective population shares.

Figure 1: Number of telemedicine visits in Sweden, June 2016–December 2017.



Note: The visits illustrate those recorded at Region Jönköping county council. Source: Jönköping county council.

A relevant question with regards to the future of telemedicine is whether the above figures are evidence of socioeconomic segregation, with high-income earners from the capital being main beneficiaries of telemedicine, while other regions benefit less? While no data on socioeconomic characteristics are available, digital care is available on an equal footing to all citizens – low and high-income earners alike. Such broad accessibility is a choice of design and was by no means inevitable. The digital entrepreneurs *Kry* and *Min Doktor* could have created a service accepting only insurance customers or those paying directly, such as in the US (for some sense of how this is organized in other countries, see Hassan et al. (2018, p.14). Instead, *Kry* and *Min Doktor* both target the whole population. Moreover, telemedicine also provides improved access compared with primary non-emergency care by upping their staff of doctors in evenings and on weekends.

The increased use of telemedicine in Sweden as well as international studies suggests the service is appreciated by patients. All that is required for access is a smartphone or a reasonably modern computer with an internet connection. And Sweden is one of the countries with the highest Internet penetration in the world. The ease of access should make telemedicine an attractive option for the elderly, for people with disabilities or chronic diseases as well as those living in rural areas. Still, so far neither the elderly nor rural areas are especially frequent users of telemedicine.

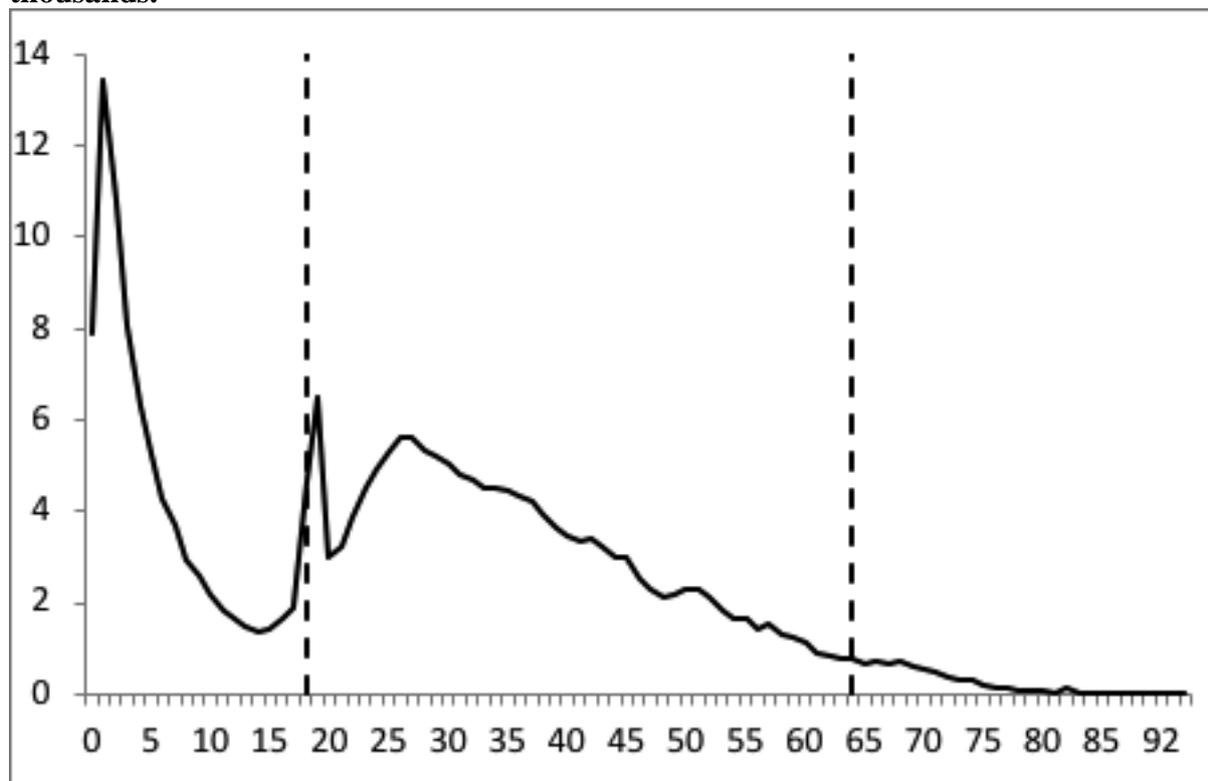
Figure 1 showed that large cities dominate in numbers of digital visits. Table 2 and Figure 2 show that the elderly are underrepresented with regards to the age distribution of telemedicine use. Instead, young children aged 0–4 years are overrepresented as they account for almost 20 percent of the visits but represent only about six percent of the population. Evidently, around toddler age and above, kids are sick more often. Moreover, the large share could reflect heightened parental worry for the smallest, more vulnerable, children. It is rather the other end of the age-spectrum that stands out in its own right. People above the age of 65 have a low level of use of digital care in relation to their (large) population share. This feature likely reflects the group’s lower digital maturity. But as today's smartphone users age, it is reasonable to assume that the use of telemedicine will increase for the elderly and that the age distribution gradually will go from less like a “L”- towards more of a “U”-shape.

Table 2: Share of telemedicine visits compared to population shares 2016–17.

| Age group | 0-19 | 20-64 | 65+ |
|---------------------------|-------|-------|------|
| Share telemedicine visits | 37.86 | 59.47 | 2.67 |
| Population share | 22.9 | 57.3 | 19.8 |

Note: The population shares are dated November 2017. The number of telemedicine visits covers the whole period, starting from June 2016 to December 2017. Source: Statistics Sweden and Region Jönköping.

Figure 2: Number of telemedicine visits according to age, June 2016–December 2017, thousands.



Note: The visits illustrate those recorded at Region Jönköping county council. Source: Jönköping county council.

5. Price, Demand, and Quality in Telemedicine

Swedish health care has long been struggling to achieve high-quality medical care that is both accessible and cost-effective at the same time. A theme has been that health care should be based on medical need rather than be demand-driven.

One way of dampening demand is by calibrating the fee for health care. At the same time, studies show that the price sensitivity to health care fees in Sweden is low in the sense that the number of visits to doctors does not change much when the price changes (Jakobsson and Svensson, 2016). Also, the cap on medicine and health care spending for patients, above which the government subsidy costs, drastically reduces the importance of a fee. Those with outlays above the ceiling (in 2018 set to SEK 1 100 over a twelve-month period, or about €107) pay no fee at all. The same is true for children 0–19 as well as those above the age of 85. While we know how many young and old are exempt from health care fees, statistics on the number of patients benefiting from the ceiling is not centralized and therefore inaccessible.

Today, rationing of care is mostly done through longer waiting times, which probably explains the dissatisfaction with primary care availability.

a. Increased Tension in Remuneration Systems

With telemedicine, the combination of easy access at a today's low fees has led to rapidly increasing demand. As shown in Figure 2 above, small children represent a large share of digital primary care visits. This is not without benefits. Small children are often ill, and with digital visits, both they and their parents are spared the journey to the health center where there may also be other infections. Moreover, the time gained from telemedicine eases the burden for children, parents and employers and thus, eventually also on public finances. The reason is the generous system of sick-pay available when children are sick and need parental supervision. To convey the magnitude of the sick-pay benefit in Swedish social security, consider that in 2016, a total of approximately 870,000 individuals or about 20 percent of all employed applied for compensation for temporary parental benefit from the Swedish Social Insurance Fund, and approximately SEK 7.2 billion (\approx €0.7 billion) was paid for the care of sick children. With such a large amount it can give significant cost savings if children are just a *little* healthier and the parents can spend a little *more* time at work.

Still, with virtually free of charge health care for children and improved accessibility, all constraints a rationing are essentially removed. In emergency care, there are already some indications that the treatment of those with extensive medical needs are neglected when parents and children seek care for less serious ills that that could have been treated in primary care or at home (Ludvigsson, 2017).

When primary care is closed, telemedicine offers an attractive alternative to visiting the emergency room. But if the costs of telemedicine increase without alleviating the demand for primary care, there is an overt risk that the prioritization of care will deteriorate. But this is not the fault of telemedicine doctors. Apparently, they offer a medical service that patients demand.

The goal should be that primary care, emergency care and digital care in its various guises form a coherent whole where the patient is matched to the appropriate level of care. There is, of course, an insight into these tensions at the county council, but little has happened.

b. Remuneration and Future Innovation

In 2017, the total remuneration for telemedicine visits was set to SEK 650 (\approx €63), including the out-of-pocket patient fee that patients pay. Initially, the remuneration was more than three times higher, but SALAR in short order lowered the rate on two occasions. Without putting too much significance into these quick revisions, it still gives some indication of a system under pressure.

Indeed, it is fair to say that the construction of out-of-county visits that rests on regulations intended for something else, has created additional administration. In principle, it is possible to track the new flows of payments between telemedicine providers and counties. The quantitative budgetary impacts, however, are more difficult to assess – even for the experts. The county councils themselves are responsible for their own budgetary systems, and we do not yet have a comprehensive analysis of how cost and compensation are affected by the developments that began in 2016. The remuneration flows are not exactly rocket science, but complicated enough to conclude that overall budget effects are not known and that lack of transparency is a concern.

As the use of telemedicine increases, the remuneration system will come under increased pressure. Digital care is being pushed onto an existing system operated through loose and mostly non-mandatory cooperation between the 21 autonomous county councils and health care is a regional responsibility. This means there is a risk that reforms tend to be incremental and that mainly minimum resistance steps are possible.

Fees and remuneration for telemedicine are likely to grow in both economic and political importance. Profit for telemedicine introduces new complications. In other welfare services, county councils and municipalities set the standard for the level of compensation based on relevant comparisons. For schools, this comparison would be the cost of a student in a school operated by the municipality. Within health care the relevant comparison would be a health care provider run by the county council. But as the country councils do not yet provide pure telemedicine, this standard is lacking. It is noteworthy, however, that the

compensation for a digital visit is but *one-third* of the weighted average cost of a physical visit to a primary care center (which was SEK 1,706 in 2016).

The challenge for reforming remuneration is that big profits in telemedicine would cause political anger and irritation among primary care physicians. But if profits are too small – or if there is an extended period of loss-making – private investors may lose patience and innovation could grind to a halt. Another risk is that the county council change the conditions to such an extent that the telemedicine doctors change their business model in order to focus only on private customers through insurance or fees. Already there are signs that advertising is increasing. Future innovation in telemedicine and its place in health care is thus hanging on a thread. It is essential that the county councils take this into account when considering reforms.

Today, digital care visits have quickly grown to almost two percent of all physical primary care visits and within only a few years the share could edge up towards 10 percent. What happens to the remuneration system if telemedicine would account for 20, 50 or even 90 percent of primary care visits?

c. Increased Availability or Overuse?

A key issue is if telemedicine can reduce the burden on total primary health care by increasing efficiency or if it results in extra demand and therefore increases strain on the same resources. Studies show that the effects are greatly influenced by the way telemedicine is designed. A US study of 300,000 patients between 2011 and 2013 found a volume increase of 88 percent but only 12 percent relief on primary care (Ashwood et al., 2017). However, in a six-month pilot trial at Hurley Group, a group of health care centers in the UK, telemedicine led to nearly one-fifth of patients no longer feeling the need for a physical visit (Madan, 2014). The total time for visits to doctors also fell.

In the UK study, patients had access to digital solutions such as self-help guides, telephone counseling 24 hours a day and e-consultation with their GP as a complement to the contact they already had with their primary health care center. The result showed more satisfied doctors and patients, where about 80 percent of the doctors wanted to implement the program and about 80 percent of patients would recommend online care to others. The results indicate

that *coordination* and *continuity* are central aspects of improving the quality and cost-effectiveness of health care by telemedicine. In Sweden today, however, telemedicine risks interrupting the continuity of care. This is partly because patients so far can only be listed with physical care centers, not with telemedicine doctors.

d. Incentives and Regulations Determine the Quality

To start a telemedicine company, regulatory approval from the Health and Social Care Inspectorate (IVO) is required, but it is the county council where the online physicians are registered that is responsible for regular supervision.

An area that is under particular scrutiny is the prescription of antibiotics. Here, a review of a series of reviews of county council (Lägermo and Bengnér, 2017a, c, b; d) showed that the telemedicine doctors had not followed the guidelines on diagnosis for pneumonia and throat infections. In a majority of cases, the region's criteria for diagnosis were not met, yet several doctors wrote antibiotics. Since then, Region Jönköping has implemented stricter rules. For example, restrictions are imposed on which diagnoses the telemedicine doctors can make and that more information about patient visits needs to be disclosed.

If guidelines are not followed, it is worrisome. To our knowledge there is no compelling evidence of telemedicine providers generally being more likely to transcribe drugs or make erroneous diagnoses. A smaller American study comparing digital and physical visits showed no symptomatic oversubscriptions, although there were vast differences between health care providers (Schoenfeld et al., 2016). Research on Swedish data shows that some calibration in the compensation systems reduces the prescription of antibiotics (Ellegard, Dietrichson and Anell, 2018).

It is understandable that issues arise in the first phase of telemedicine and supervisors and telemedicine doctors should draw lessons from this experience. Here it is important that the knowledge of best practice for digital care does not stop at an individual county council and that the knowledge is conveyed to all. Better and aggregate statistics on telemedicine are therefore important. Although it is still early days for Swedish telemedicine, knowledge of how

to conduct digital health care is improving fast and new digital tools are developed. Perhaps in the future, visiting a physical health care center will be equally rare as a visit to the bank today?

Another pressing issue is that the lack of national coordination between county councils creates artificial barriers to digital care. For example, the requirements for laboratory tests vary, and there is no available national registry for patients. The combination of private telemedicine providers that have an incentive to as quickly as possible satisfy new patients, while there are bureaucratic obstacles in sending samples for analysis can very well lead to *underutilization* of diagnostics and overuse of medical prescriptions.

In comparing telemedicine to physical health care, it is also central that all are held to the same standard, be it private production or county council centers. There are examples of private providers that are kept to a higher standard than equivalent public-sector providers. Also, extensive distortion of competition occurs when county councils allocate more resources to their own care centers compared to what private actors receive, this according to the governmental agency responsible for competition in Sweden (Swedish Competition Authority, 2014). Despite this, *more* than half of the health care centers run by county councils are loss-making.

6. Conclusions

Telemedicine has the potential to alleviate the lack of accessibility of primary care. Video calls save time for patients, reduce the risk of infection during physical visits and increase physicians' working time flexibility. Queues and waiting times can be shortened if digital care providers reduce the burden on physical primary and hospital care regarding simple diagnoses, prescriptions, and referrals. A digital solution can also be used for preventive purposes, to speed up referrals, to coordinate patient information or to help healthcare providers improve their diagnoses. Finally, digitalization makes it possible for more care to be provided at home or remotely, which reduces the costs of hospital care and has the potential to improve access to care across the country. Better access to care in many sparsely populated areas of Sweden, would be a considerable improvement. But so far, it is mostly children and metropolitan residents who have used telemedicine in Sweden. The elderly, those with chronic

diseases and rural residents should in the years ahead be able to benefit much more from telemedicine.

At the same time, there is a significant risk that telemedicine will cause increased pressures in several dimensions. In part, as public finances may suffer because the rationing of health care is weakened, and the bill is sent to the taxpayers. In part, for health care as a whole since telemedicine practitioners may disrupt the continuity of care for those with multiple or complex needs. The latter is, in our view, an apparent risk as long as the digital care providers are not allowed to list their own patients and thus become fully responsible for them.

The dramatic increase in telemedicine visits since the beginning of 2016 clearly shows the dormant forces that have been released. Going forward, three key issues should be addressed for a better future with telemedicine:

- 1) There must be incentives for caregivers to provide coherent and preventive care and not encourage overuse. In order to avoid overuse and promote cost efficiency, remuneration systems should be reformed to induce care providers with greater cohesive responsibility for the patient. A simple first step is for existing physical health care providers to take much better advantage of existing digital innovations and integrate those tools into their own services. This can be done either through improved cooperation between existing physical and digital health care providers or as physical health care providers develop their own digital services. Coherence and cooperation between health care actors could increase if there were a model of sharing remuneration from listed patients and fees from telemedicine visits. The responsible political actors should launch an inquiry into how this could be done.

- 2) Primary care should no longer be free of charge for children when there is almost no barrier to access. Socioeconomically weak groups can instead be supported by better designed cost ceilings. Increased digital accessibility already exacerbates the economic consequences of lack of overall coherence in the county system. While public finances may not exactly hemorrhage in the near term, the specter of dubious choices and priorities increases. A low fee for children's access to telemedicine at least restores a symbolic barrier with only minor reduction in accessibility. Whether telemedicine and physical health care visits should have the same fee or not is a difficult question. A higher fee for telemedicine could be motivated to

reduce overconsumption of care. However, we believe that for the time being the fee should be the same so as not to stifle innovation and the opportunities for telemedicine to reduce the burden on physical health care centers and emergency care. The remuneration system between county councils and telemedicine providers should also be reformed without the risk of holding back innovation – be that from the private or public sector.

3) More effort should be devoted to developing *best practice* for digital care. There is need for better and more systematic knowledge about which forms of care that can be provided by the telemedicine companies. Coordination among the 21 county councils with regards to experiences and protocols for telemedicine should be strengthened and preferably with a strong, but perhaps temporary, mandate for central control.

An example of a digital triage function has been developed by *Min Doktor*, which includes several questions to identify patients who have weak medical reasons to visit a doctor visit or who might better be supported in other parts of the health care system. This a step in the right direction. Such functionality should be encouraged and developed further in order to improve matching of health care needs and resources. New technology has the potential to strengthen the chain of health care and help patients to the appropriate level of care. Done right, patients should be able to get *more* health care without significant cost increases. This is also the experience from other sectors, where the gains of digitalization are closely linked to scale and network effects.

It will also be necessary to strengthen regulation and supervision. Centralizing and analyzing data from digital care and telemedicine are key steps in this direction. Data collection should not only aim to improve telemedicine but also support research on medication and other effects for better health and prevention.

Some critical voices pejoratively dismiss the increase in telemedicine as “luxury consumption.” It would be unfortunate if such an epithet were to gain ground because it implicitly implies a view of the “correct” amount of health care, while also suggesting that the current level of health care consumption is the appropriate one.

However, the benefits should not be taken for granted. They depend crucially on continued reform. If *status quo* remains, costs will increase, and the prioritization in health care will have more detrimental consequences for patients with comprehensive medical needs. It is the remuneration systems and supervision that should be reformed, not the patients' demand for more and better health care.

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References

- Ahlzén, R., Berggren, L., Metsini, A., Olsson, L. and Tegelberg, Å., 2018. *Vetenskapligt stöd saknas för digitala diagnoser [Scientific evidence missing for diagnosis with video call]*. [online] Dagens Nyheter. Available at: <<https://www.dn.se/debatt/vetenskapligt-stod-saknas-for-digitala-diagnoser>> [Accessed 3 Jul. 2018].
- Alskog, J., 2018. *SKL vill stoppa gratis digital vård i Sörmland [SKL Want to Stop Free Digital Care in Sörmland]*. [online] Altinget: Vård och hälsa. Available at: <<https://www.altinget.se/varld/artikel/skl-vill-stoppa-gratis-digital-vaard-i-sormland>> [Accessed 7 Jul. 2018].
- Andersson, O., Sjögren, J. and Åsberg, H., 2017. *Nätläkarbolagen dränerar en underfinansierad primärvård [Telemedicine doctors drain resources from an underfunded primary care]*. [online] Dagens Nyheter, March 2. Available at: <<https://www.dn.se/debatt/natlakarbolagen-dranerar-en-underfinansierad-primarvard>> [Accessed 3 Jul. 2018].
- Anell, A., Glenngård, A.H. and Merkur, S., 2012. Sweden health system review. *Health Syst Transit.*, 14(5), pp.1–159.
- Ashwood, J.S., Mehrotra, A., Cowling, D. and Uscher-Pines, L., 2017. Direct-to-consumer telehealth may increase access to care but does not decrease spending. *Health Affairs*, 36(3), pp.485–491.
- Blix, M. and Jeansson, J., 2018. *Synliga vårdbehov och osynliga kostnader [Visible Care Needs and Invisible Costs]*. [online] Dagens Samhälle. Available at: <<https://www.dagenssamhalle.se/nyhet/synliga-varldbehov-och-osynliga-kostnader-21896>> [Accessed 3 Jul. 2018].
- Brynjolfsson, E. and McAfee, A., 2016. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. New York: W. W. Norton & Company.
- Cederberg, J., 2017. *Min doktor ger Jönköping skarp kritik [Min Doktor Issues Sharp Reprimand to Jönköping]*. [online] Läkartidningen. Available at: <<http://lakartidningen.se/Aktuellt/Nyheter/2017/05/Min-doktor-ger-Jonkoping-skarp-kritik>> [Accessed 8 Jul. 2018].
- Ellegard, L.M., Dietrichson, J. and Anell, A., 2018. Can pay-for-performance to primary care providers stimulate appropriate use of antibiotics? *Health Economics*, 27(1), pp.e39–e54.
- Hassan, A., Dorsey, E.R., Goetz, C.G., Bloem, B.R., Guttman, M., Tanner, C.M., Mari, Z., Pantelyat, A., Galifianakis, N.B., Bajwa, J.A., Gatto, E.M. and Cubo, E., 2018. Telemedicine use for movement disorders: A global survey. *Telemedicine and e-Health*, (Forthcoming).
- Hilty, D.M., Ferrer, D.C., Parish, M.B., Johnston, B., Callahan, E.J. and Yellowlees, P.M., 2013. The Effectiveness of Telemental Health: A 2013 Review. *Telemedicine and e-Health*, 19(6), pp.444–454.
- Jakobsson, N. and Svensson, M., 2016. The effect of copayments on primary care utilization: results from a quasi-experiment. *Applied Economics*, 48(39), pp.3752–3762.
- Jordahl, H., 2013. *Välfärdstjänster i privat regi [Social Welfare Services in Private Production]*. Stockholm, Sweden: SNS Förlag.
- Lägermo, A. and Bengné, M., 2017a. *Bedömning av Läkarhuset Tranås/Kryss följsamhet till*

Fakta avseende handläggningen av pneumoni respektive tonsillit vid 'digitala besök' under perioden 160701-170228 [Assessment of Läkarhuset Tranås/Kry adherence to facts regarding the processing of...]. Jönköping, Sweden [Unpublished Memo from Region Jönköping].

Lägermo, A. and Bengnér, M., 2017b. *Bedömning av Wetterhälsan/Min Doktors följsamhet till Fakta avseende handläggningen av pneumoni respektive tonsillit vid 'digitala besök' under perioden 160701-170228 [Assessment of Wetterhälsan/Min Doktor adherence to facts regarding the processing...].* Jönköping, Sweden [Unpublished Memo from Region Jönköping].

Lägermo, A. and Bengnér, M., 2017c. *Uppföljning av Läkarhuset Tranås/Krys följsamhet till Fakta avssende handläggning av tonsollit respektive pneumoni vid digitala vårdmöten under perioden 170601-0831 [Assessment of Läkarhuset Tranås/kry adherence to facts regarding the processing...].* Jönköping, Sweden [Unpublished Memo from Region Jönköping].

Lägermo, A. and Bengnér, M., 2017d. *Uppföljning av Wetterhälsan/Min Doktors följsamhet till Fakta avseende handläggningen av pneumoni respektive tonsillit vid digitala vårdmöten under perioden 170601-0831 [Assessment of Wetterhälsan/Min Doktor adherence to facts...].* Jönköping, Sweden [Unpublished Memo from Region Jönköping].

Ludvigsson, J., 2017. *Barnläkare: Ta betalt för barns besök på akuten [Pediatrician: Introduce a Fee for Children's visit to Emergency Care].* [online] Svenska Dagbladet. Available at: <<https://www.svd.se/barnlakare-ta-betalt-for-barns-besok-pa-akuten>> [Accessed 3 Jul. 2018].

Madan, A., 2014. *WebGP: The Virtual General Practice Executive Summary.* [online] Available at: <<https://gpaccess.uk/wordpress/wp-content/uploads/2015/08/e-consult-pilot-report-2014.pdf>> [Accessed 3 Jul. 2018].

Mohr, N.M., Young, T., Harland, K.K., Skow, B., Wittrock, A., Bell, A. and Ward, M.M., 2018. Emergency department telemedicine shortens rural time-to-provider and emergency department transfer times. *Telemedicine and e-Health*, (Forthcoming).

OECD, 2017. *Health at a Glance 2017: OECD Indicators.* Paris, France: OECD Publishing.

OECD and European Observatory on Health Systems and Policies, 2017. *Sweden: Country Health Profile 2017, State of Health in the EU.* Paris & Brussels: OECD Publishing//European Observatory on Health Systems and Policies.

Ram, A., 2018. *The Doctor Will See You Now - On Your Smartphone.* [online] Financial Times. Available at: <<https://www.ft.com/content/6e5f28ae-2948-11e8-9274-2b13fccdc744>> [Accessed 3 Jul. 2018].

SALAR, 2018. *Patientavgifter vid digitala vårdmöten [Fees for Patients in Telemedicine].* [online] Sveriges Kommuner och Landsting, 18/00003. Available at: <<https://skl.se/download/18.2819ed29162193bf8f26137e/1521195006266/05-2018-WEBB-Patientavgifter-vid-digitala-vardmoten.pdf>> [Accessed 3 Jul. 2018].

Saxon, L., 2015. *Center for Body Computing, USC.* [online] Available at: <<http://usbodycomputing.org>> [Accessed 3 Jul. 2018].

Schildt, J., Flodin, J., Nilsson, M., Rodhe, A. and Stolt, R., 2017. *Företrädare för Kry: "Videobesök spelar viktig roll i framtidens vård" [Representative for Kry: 'Videocalls play an important role for the future of health care'].* [online] Dagens Nyheter. Available at:

<<https://www.dn.se/debatt/repliker/videobesok-spelar-viktig-roll-i-framtidens-varld>> [Accessed 3 Jul. 2018].

Schoenfeld, A.J., Davies, J.M., Marafino, B.J., Dean, M., Dejong, C., Bardach, N.S., Kazi, D.S., Boscardin, W.J., Lin, G.A., Duseja, R., Mei, Y.J., Mehrotra, A. and Dudley, R.A., 2016. Variation in quality of urgent health care provided during commercial virtual visits. *JAMA Internal Medicine*, 176(5), pp.635–642.

Singer, N., 2018. *Take This App and Call Me in the Morning*. [online] The New York Times. Available at: <<https://www.nytimes.com/2018/03/18/technology/take-this-app-and-call-me-in-the-morning.html>> [Accessed 3 Jul. 2018].

Svanborg-Sjövall, K., 2013. *Kentucky fried Children*. Stockholm: Timbro.

Sveriges Riksdag, 2017. *Hälso- och sjukvårdslag 2017:30 [Health- and sickness bill]*. [online] Ministry of Health and Social Affairs. Available at: <https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/halso--och-sjukvardslag_sfs-2017-30> [Accessed 3 Jul. 2018].

Swedish Competition Authority, 2014. *Etablering och konkurrens bland vårdcentraler - En kvalitetsdriven konkurrens och ekonomiska villkor [Establishment and Competition Among Health Care Providers - A Quality Driven Competition and Economic Conditions]*. [online] Available at: <<http://www.konkurrensverket.se/publikationer/etablering-och-konkurrens-bland-varldcentraler--om-kvalitetsdriven-konkurrens-och-ekonomiska-villkor>> [Accessed 3 Jul. 2018].

Swedish government, 2008. *Vårdval i primärvården 2008/09:74 [Choice in primary care]*. [online] Regeringen [Swedish government]. Available at: <https://www.riksdagen.se/sv/dokument-lagar/dokument/proposition/varldval-i-primarvarden_GW0374> [Accessed 3 Jul. 2018].

The Commonwealth Fund, 2017. *2017 Commonwealth Fund International Health Policy Survey of Older Adults in 11 Countries*. [online] Infographic. Available at: <<https://www.commonwealthfund.org/publications/infographic/2017/dec/2017-commonwealth-fund-international-health-policy-survey-older>> [Accessed 3 Jul. 2018].

Topol, E., 2015. *The Patient Will See You Now: The Future of Medicine is in Your Hands*. New York: Basic Books.

Vårdanalys, 2014. *Låt den rätte komma in [Let the Right One in]*. Stockholm, Sweden: Vårdanalys [Swedish Agency for Health and Care Services Analysis].

Vårdanalys, 2017. *Vården ur patienternas perspektiv – 65 år och äldre [Health care from a patient perspective - 65 years and older]*. Stockholm, Sweden: Vårdanalys [The Swedish Agency for Health and Care Services Analysis].