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## How to Pay for Telemedicine: A Comparison of Ten Health Systems

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### ABSTRACT

Telemedicine has the opportunity to improve clinical effectiveness, health care access, cost-savings, and patient care. However, payment systems may form important obstacles to optimally use telemedicine and enable its opportunities. Little is known about payment systems for telemedicine. Therefore, this research aims to increase knowledge on paying for telemedicine by comparing payment systems for telemedicine and identifying similarities and differences. Based on the countries' official physician fee schedules, listing all reimbursed medical services performed by physicians, a comparative analysis of telemedicine payment systems in ten countries was conducted. Findings show that many countries lacked tele-expertise and telemonitoring payment, with the exception for some specific payments such as for telemonitoring in patients with cardiac implantable electronic devices. Moreover, a wide variety of benefit specifications were implemented in all countries to specify which type of clinician contact should be used (remote versus physical) in which circumstances. Payment parity between video and in-person visits was established only in a few countries. Furthermore, fee-for-service was the dominant payment system, although two countries used a capitation-based or hybrid system. The results imply several potential payment challenges when implementing telemedicine: complex benefit specifications, payment parity discussions, and risk of overconsumption due to the dominant fee-for-service system. These challenges appear to be less present in capitation-based or hybrid systems. However, the latter needs to be further explored to harness the full potential of telemedicine.

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Comparison; health system; payment; reimbursement; telemedicine



## Introduction


The possibilities and use of telemedicine have increased during recent decades.<sup>1</sup> This trend was recently boosted by the COVID-19 pandemic.<sup>2</sup> Telemedicine refers to “the application of information and communication technology (ICT) for providing health care services at a distance without the need for direct patient contact.”<sup>3</sup> Clinicians have been realizing that a face-to-face interaction and a physical examination are not always required for the management and follow-up of patients, especially for patients with chronic diseases. For the management of chronic patients, telemedicine may offer the opportunity to improve clinical efficiency, access to health, and patient care.<sup>4</sup>

Telemedicine can be separated in three components: (1) a televisit, (2) telemonitoring, (3) and tele-expertise.<sup>1</sup> A *televisit* occurs between a provider and patient, and by telephone, videoconferencing software, or via a secured e-mail-system.<sup>1</sup> Televisits have the advantage to reduce the burden of care for some patients, especially for patients living in areas with limited access to specialists and for patients with difficulty of traveling.<sup>5,6</sup> Studies

indicated that televisits are as effective as in-person visits in improving clinical outcomes,<sup>7,8</sup> reduce costs and are cost-effective.<sup>9,10</sup> Moreover, patient satisfaction was reported to be equal for televisits and in-person visits, in terms of patient-centered communication, and physician's clinical competence.<sup>11</sup> Patient convenience was indicated to be higher for televisits.<sup>11</sup> Research on quality of life (QOL) related to televisits is scarce, and only some report enhanced QOL.<sup>10,12</sup>

*Telemonitoring* refers to following patients' symptoms or disease progression with wearables, mobile devices, or having patients report via Internet or telephone to their health care providers.<sup>3</sup> Telemonitoring has the advantage that clinicians can intervene early if there is evidence of clinical deterioration.<sup>13</sup> Several studies have indicated the effectiveness of telemonitoring for chronic disease management in cardiology,<sup>13,14</sup> endocrinology,<sup>15</sup> pneumology,<sup>16</sup> and other medical fields. Telemonitoring can occur by telephone,<sup>13,14</sup> through apps,<sup>17</sup> wearables,<sup>18</sup> and devices such as cardiac implantable electronic devices<sup>19</sup> (e.g., pacemakers, and

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implantable cardioverter-defibrillators) or continuous glucose monitoring devices.<sup>20</sup> Moreover, studies indicated that telemonitoring might reduce costs, increase QOL, and be cost-effective.<sup>21,22</sup>

*Tele-expertise* typically takes place remotely by a radiologist or other expert physician using transferred images, records, and laboratory results.<sup>1</sup> A health care professional can transfer this patient data to an expert, and request his medical opinion by telephone, videoconferencing software, or via a secured email-system.<sup>23</sup> This service is called tele-expertise.<sup>23</sup> Tele-expertise may reduce access time to a specialist opinion, improve coordinated care, and gradually build expertise of the requesting physician.<sup>23</sup> It is especially well developed in dermatology and ophthalmology, because it often involves the transfer of skin or eye images to experts, which is facilitated by using ICT applications.<sup>23,24</sup> In ophthalmology, a study indicated that tele-expertise reduced costs and was cost-effective.<sup>23</sup> However, a dermatology study indicated that diagnostic accuracy remained higher in in-person visits compared to tele-expertise.<sup>24</sup>

Several barriers exist to implement telemedicine in health care systems. Not only concerns around legal liability, privacy and confidentiality, and security of data are important barriers, but also increased workload is an important barrier for providers.<sup>25,26</sup> Patient issues also pose an important barrier, including limited computer literacy, bandwidth problems, or unawareness of the existence of telemedicine services.<sup>26</sup> Additionally, reimbursement issues were identified as one of the most frequent barriers of telemedicine adoption.<sup>26,27</sup>

Although telemedicine provides numerous opportunities, payment systems can form an important obstacle for the optimal use of telemedicine. Many researchers have already identified that the lack of payment for telemedicine services is a major adoption barrier.<sup>26,27</sup> Both the extent to which services are covered as well as the payment system influence telemedicine use. However, little is known about paying for telemedicine. By comparing payment systems across ten countries, this research aims to identify similarities and differences between telemedicine payment systems.

## Materials and Methods

This study compared the physician fee schedules of Australia, Belgium, Denmark, France, Germany, Luxembourg, the Netherlands, Canada (Ontario province), Switzerland, and the United Kingdom. Only Western countries were chosen. Moreover, the countries were chosen because at the time of our study in 2021, they each had a homogeneous national health

insurance or service covering to some extent telemedicine. Based on these criteria, the following countries were excluded: Austria, Finland, Greece, Hungary, Ireland, Italy, Poland, Portugal, Slovakia, Spain, Sweden, and the US. Since in Canada the payment system differs between provinces, only one province was selected.

The physician fee schedules were retrieved from the websites of the institutions responsible for managing and updating the fee schedules. Details on the fee schedules used in the analysis and their sources can be found in the Supplementary Materials. For the analyses of Ontario, not only the physician fee schedule was used, but also a separate reimbursement scheme, called the Ontario Virtual Care program.<sup>28</sup> The Ontario Virtual Care program reimbursed televisits temporarily in Ontario. When the study was conducted, the fees were no longer valid, hence the monetary value is zero. Moreover, Switzerland only recently developed a new fee schedule, named TARDOC. To compare between the new and the old Swiss system, they were both included in the analysis.

Following the framework of Bashshur et al.,<sup>1</sup> data about televisits, telemonitoring, and tele-expertise was extracted from the physician fee schedules. Similar to the study of Ohannessian et al.,<sup>23</sup> which analyzed the fees of tele-expertise in France, our research extracted the following data for each telemedicine service: (1) telemedicine fees in the domestic currency, (2) the type (e.g., telephone, videoconferencing software, e-mail), (3) benefit specifications (specifying what the claim should look like to qualify for coverage), and (4) the maximum number of times that a fee can be submitted to receive payment per time period (or volume restrictions). For tele-expertise, data on the referring professional, the expert consultant, and the patient scope were also extracted.<sup>23</sup>

Our study extracted additional data to the data analyzed by Ohannessian et al.<sup>23</sup> The telemedicine fees were extracted in the domestic currency, except for the Swiss fees. Swiss fees are expressed in a relative value scale, called tax points (TP). The telemedicine fees were converted to euro using the average exchange rate of 2021, published by the European Central Bank.<sup>29</sup> For televisits, payment parity in each country was examined. Payment parity means that the fee of an in-person visit is equal to a televisit fee.<sup>30</sup> If there was no payment parity, we extracted whether a televisit fee was higher or lower than the in-person visit fee. However, the issue of payment parity is only applicable in countries with a fee-for-service (FFS) payment system. Therefore, the type of payment system was also collected. For telemonitoring, the medical discipline being able to submit

a claim to request telemonitoring payment is also important data, and was therefore extracted.

## Results

This research examined three telemedicine services: tele-visits, telemonitoring, and tele-expertise (Tables 1–3).

### Televisits

Table 1 presents the analysis of the televisit fees. Physicians are compensated for televisits in all analyzed countries, but only temporarily in Belgium and Luxembourg. Several similarities and differences between the fee schedules exist.

Televisits are paid across the investigated countries according to three characteristics: the duration of a televisit, the physician performing the service (general practitioner or specialist-physician), and the communication medium used (videoconferencing software, telephone, or email). The televisit fees in Switzerland and the Netherlands depend on the duration of the televisit. However, in both countries the duration may not exceed 20 minutes. In the Netherlands, physicians receive a higher fee per minute when the televisit duration is below 5 or more than 20 minutes, and they receive a lower fee per minute when the duration is between 5 and 20 minutes. Similar to the Netherlands, Swiss physicians receive the highest fee for the first minutes, but they receive a lower fee for the last minutes. The televisit fees in France, the Netherlands, and Denmark depend on the physician performing the service: general practitioner (GP) or specialist-physician. In Denmark, specialist-physicians receive more for televisits than GPs. French GPs receive more for televisits than specialist-physicians, but both groups also receive a supplement for the complexity level. The fees in Germany and Denmark depend on the communication medium used. In both countries, physicians receive more for a video televisit than for a telephone televisit.

Several benefit specifications exist for televisits, specifying what the claim should look like to qualify for coverage. Firstly, specifications in terms of which communication medium is allowed, exist in all countries. Belgium and Switzerland (TARMED) compensate only telephone televisits, while Australia, France and Ontario only compensate video televisits. Germany and the Netherlands compensate both telephone and video televisits. Additionally, the Netherlands compensates physicians to send messages via a secured email-system. Secondly, specific benefit specifications apply for televisits in each country. France and the Netherlands do not

allow to replace the first contact between a physician and his patient with a televisit. Belgium, the Netherlands, and Switzerland (TARMED fee schedule) specify that the conclusions of the televisit should be written in the medical file of the patient. A televisit in Australia, France, Luxembourg, and Ontario is only possible at the physician's discretion. In every country a televisit requires also a contact (obviously not physical) with the patient.

In France, Luxembourg (only for GPs and geriatricians), the Netherlands (only for GPs), and Switzerland, payment parity is offered between televisits and visits in person, meaning that physicians are offered the same fee for both services. Payment parity is also offered between telephone and video televisits in the Netherlands (for GPs). Furthermore, physicians receive a lower fee for televisits compared to in-person visits in four countries: Australia, Belgium, Canada (Ontario), and the UK. In Luxembourg, some specialist-physicians (e.g., pneumologists, rheumatologists, surgeons, anesthetists, and radiologists) receive a much higher fee for televisits compared to in-person visits. Moreover, physicians receive a higher fee for video televisits than telephone televisits in two countries: Denmark and Germany.

### Telemonitoring

Table 2 shows the analysis of the telemonitoring fees, which are limited. Physicians are compensated for telemonitoring in case of pain management in the Netherlands, and for telemonitoring patients with cardiac implantable electronic devices (CIEDs) in Australia, Germany, and Switzerland. More specifically, the types of CIEDs for which telemonitoring is compensated are: pacemakers in Switzerland and Australia, implantable cardioverter-defibrillators (ICD) in Germany and Australia, and cardiac-resynchronization-therapy pacemaker (CRT-P) and -defibrillator (CRT-D) in Germany. In Australia, pacemaker and CRT-P telemonitoring have a lower fee than ICD telemonitoring. However, in Germany ICD telemonitoring has a lower fee than CRT-P and CRT-D telemonitoring.

In Germany and Switzerland, telemonitoring is compensated through a FFS-system. However, the payment systems in Australia and the Netherlands are not FFS. In Australia, physicians are compensated for telemonitoring through a fee per year, i.e., an episodic payment system. In the Netherlands, physicians are compensated with a capitation-based system, called a diagnosis-treatment combination. One diagnosis-treatment combination contains all necessary medical services to diagnose and treat the patient.

Table 1. Comparison of televisit fees.

Country	Type	Fee system	Fees in domestic currency [in €]	Benefit specifications (what the claim should look like to qualify for coverage)	Volume restrictions (max)	Payment parity in case of FFS fee system (Yes/No)?
Australia	Video	FFS	Specialist televisit: 50% less than a face-to-face consultation Specialist televisit < 10 min: \$67.20 [€42.67]	Interview with patient; at the physician's discretion; the patient should be situated at least 15 kms by road from the specialist; The televisit should be the first contact between the patient and physician.	No restrictions	No. Lower <sup>b</sup>
Belgium	Telephone	FFS	To triage patients for COVID-19: €20; To give advice about continuity of care: €20	Interview with patient; contact and conclusions must be written in the medical file of the patient.	Maximum 5 per patient/physician per 30 days Maximum 5 per patient/physician per 30 days	No. Lower <sup>b</sup>
Denmark	Telephone, video, and e-mail	FFS	GP televisit: - Telephone televisit: DKK 28.63 [€3.85] - Video televisit: DKK 166.21 [€22.34] - E-Mail televisit: DKK 45.97 [€6.18] Specialist televisit: - Telephone/e-mail televisit: DKK 129 [€17.35] - Control of CPAP device: DKK 396 [€53.24] - Control of an implantable cardioverter-defibrillator (ICD), pacemaker, or loop recorder: DKK 1,133 [€152.35] - Control during anticoagulation therapy: DKK 237 [€31.87] - Inflammatory rheumatological control: DKK 832 [€111.87] - Diabetes control: DKK 2.984 [€401.24] - Wound assessment: DKK 231 [€31.06]	GP e-mail visit: short contact between patient and physician; not for urgent questions.	GP video visit: only for COVID-19	No. Higher except for GP telephone visit, GP e-mail visit, and specialist telephone/e-mail visit <sup>b</sup>
France	Video	FFS	GP televisit: €25 + supplement for complexity Specialist televisit: €23 + supplement for complexity	Interview with patient; clinical examination (if the patient is accompanied by a health professional); Examination of the documents transmitted by patient; cannot replace the first contact between physician and patient; at the physician's discretion. Interview with patient	No restrictions	Yes
Germany	Telephone, or video	FFS	Telephone televisit: € 9.97 Video televisit: supplement of €4.45 on top of the fee of a face-to-face consultation		Maximum 1 per treatment	No. Lower for telephone visit and higher for video visit <sup>b</sup>

(Continued)

**Table 1. (Continued).**

Country	Type	Fee system	Fees in domestic currency [in €]	Benefit specifications (what the claim should look like to qualify for coverage)	Volume restrictions (max)	Payment parity in case of FFS fee system (Yes/No)?
Luxembourg	Video	FFS	Televisit in the context of the COVID-19 pandemic: €52.30	At the physician's discretion	No restrictions	Yes, only for GP and geriatrician. Fee is lower/higher depending on medical discipline <sup>b</sup>
Netherlands	Telephone, video, and e-mail	GPs: FFS Specialists: capitation	GP televisit: -Televisit < 5 min: €5.26 -Televisit < 20 min: €10.15 -Televisit > 20 min: €21.03 Specialist televisit: -Video -Telephone -Mail	Interview with patient; must be comparable to a face-to-face consultation in terms of content and duration; contact and conclusions must be written in the medical file; cannot replace the first contact between physician and patient.	No restrictions	Yes, for a GP
Ontario (Canada)	Video	FFS	Televisit with patient being at a patient host site <sup>a</sup> : \$0.00 Televisit with patient being at location of choice: \$0.00 Televisit first 5 min: 12.45 TP Televisit additional min: 2.49 TP	Interview with patient; At the physician's discretion; Physicians must be registered for the Ontario Virtual Care Program.	No restrictions	No. Lower <sup>b</sup>
Switzerland (TARDOC)	Video	FFS		Interview with patient or with family or caregivers of patients having difficulty expressing themselves.	Maximum 1 per televisit Maximum 15 per televisit	Yes
Switzerland (TARMED)	Telephone (video only) during COVID-19)	FFS	Televisit first 5 min: 10.42 TP Televisit additional 5 min: 10.42 TP Televisit last 5 min: 5.21 TP	Interview with patient; contact and conclusions must be written in the medical file of the patient.	Maximum 1 per televisit Maximum 2 per televisit Maximum 1 per televisit	Yes

<sup>a</sup>Patient host site: is a location offered by an organization to provide patients with convenient access to videoconferencing technology.

<sup>b</sup>Lower or higher: indicates whether the televisit fee is respectively more than 5% lower or higher than the in-person fee.

Televisit fees where the physician discipline is not specified, are applicable for both GPs and specialist physicians.

The fee in the Netherlands is not specified for the specialist, because the country does not use a fee-for-service system to compensate its specialists. Instead, the Netherlands uses a capitation-based system. Abbreviations: Fee-for-service (FFS), Danish krone (DKK), General practitioner (GP), Tax Points (TP).

**Table 2.** Comparison of telemonitoring fees.

Country	Fees in domestic currency [in €]	Benefit specifications (what the claim should look like to qualify for coverage)	Volume restrictions	Medical discipline
Australia	Implanted pacemaker remote monitoring, including CRT-P: \$68.90 per year [€43.75 per year] Implanted defibrillator remote monitoring: \$195.45 per year [€124.10 per year]	Reviews (without patient attendance) of arrhythmias, lead and device parameters	Minimum 1 remote review per year Minimum 2 remote reviews per year	Cardiology
Germany	Tele-medical control of a defibrillator: €43.95 Tele-medical functional analysis of the CRT-P and CRT-D: €54.06	No specifications	Maximum 5, except when patient underwent radiation therapy (then unrestricted)	Cardiology
Netherlands	Telemonitoring for pain management	No specifications	Minimum 1 per care path	Anesthesiology
Switzerland (TARDOC)	Telemonitoring for evaluating pacemaker data: 2.49 Pt	No specifications	Maximum 30 per 360 days	Cardiology

The fee in the Netherlands is not specified for the specialist, because the country does not use a fee-for-service system to compensate its specialists. Instead, the Netherlands uses a capitation-based system. Abbreviations: Cardiac Resynchronization Therapy Defibrillator (CRT-D), Cardiac Resynchronization Therapy Pacemaker (CRT-P).

### Tele-expertise

Table 3 offers the analysis of the tele-expertise fees. Only three countries compensate health professionals for tele-expertise: France, Canada (Ontario), and the Netherlands.

Health professionals are compensated for tele-expertise based on two methods. Firstly, France compensates tele-expertise based on the complexity level (i.e., thoroughly studying the medical situation or not). Secondly, France and Ontario compensate both the health professional demanding the advice (referring professional), and the health professional giving the advice (expert consultant) for tele-expertise.

In Canada (Ontario) and the Netherlands, a specific fee exists for certain expert consultants: for dermatologists in both countries, and for ophthalmologists in Ontario. The tele-expertise fees in Ontario are higher for dermatologists and ophthalmologists than for other physicians.

### Discussion

This study compared ten payment systems for telemedicine. The results indicated that televisits are paid across countries according to one of three characteristics: the duration of a televisit, the physician performing the service, and the communication medium used. In Switzerland and the Netherlands, televisit fees increase according to the duration. In the Netherlands, physicians receive the highest fee per minute when the televisit duration is less than 5 or more than 20 minutes, but they receive the lowest fee per minute when the duration is between 5 and 20 minutes. Thus, in situations that require less time, for instance when examination results are discussed but no treatment changes are necessary, physicians are financially incentivized to reduce the visit time. However, in situations that typically require more

visit time, physicians receive an incentive to take their time. The latter is, for instance, the case for patients with cancer, where visits typically require more time.<sup>31</sup>

In France, the Netherlands, and Denmark, televisit fees depend on the physician performing the service. In Denmark, specialist-physicians receive more for televisits than GPs. In France, GPs receive more for a basic televisit than specialist-physicians, but both groups receive a supplement for complexity. Indeed, in France, the televisit fee is probably influenced by the anticipated complexity level. A recent study suggested that internal medicine was associated with the most complex in-person visits based on diagnostic and medication complexity, followed by family medicine, neurology, and dermatology.<sup>32</sup> Besides the complexity level, the televisit fee might also be influenced by the duration. We refer again to the study showing that oncologists perform longer in-person visits than other specialist-physicians.<sup>31</sup>

In Germany and Denmark, televisit fees depend on the communication medium used. In both countries, physicians receive more for a video televisit than for a telephone televisit. Research indicated that video televisits typically take longer and count more diagnoses than telephone televisits.<sup>33</sup> That might be a reason why televisit fees are higher for video televisits in Germany and Denmark compared to telephone televisits.

France, Luxembourg, the Netherlands, and Switzerland offer payment parity across in-person visits and televisits, meaning that televisits are equally compensated as in-person visits. Opponents of payment parity argue that televisits are not equivalent to in-person visits, in terms of high risks and possible lower quality of care, and should therefore receive lower payments.<sup>34</sup> Moreover, they argue that lower payments will decrease unnecessary overconsumption of televisits. Proponents argue that parity supports the growth and development of televisits and encourages physicians to

**Table 3. Comparison of tele-expertise fees.**

Country	Type	Referring physician fee in domestic currency [in €]	Expert consultant fee in domestic currency [in €]	Referring professional	Expert consultant	Patient scope	Benefit specifications	Volume restrictions
France	Telephone, video, mail	Tele-expertise level 1: €5 Tele-expertise level 2: €10	Tele-expertise level 1: €12 Tele-expertise level 2: €20	All physicians	Physicians	Long-term diseases; rare patients living in underserved areas, elderly care home, or nursing homes; detainees	No	Tele-expertise level 1: maximum 4 per physician/patient/year Tele-expertise level 2: maximum €500 per physician/year
Netherlands	Video, and mail	Teledermatology	Teledermatology	GP	Dermatologist	All	No	No volume restrictions
Ontario (Canada)	Not specified	Tele-expertise: \$16 [€10.79]	Tele-expertise: \$20.50 [€13.83]	GP (only when GP is required to collect additional data not present in medical record), nurse practitioner	Physicians, except dermatologists and ophthalmologists	All	Summary must be written in medical record; answer sent max 30 days after request.	Maximum 1 per day/patient/physician, Maximum 6 per year/patient/physician, Maximum 400 per year/physician
	Initial: written, Repeated and follow-up: telephone		Dermatologist: <ul style="list-style-type: none"> <li>● Initial: \$44.45 [€29.98]</li> <li>● Repeated: \$29 [€19.56]</li> <li>● Follow-up: \$21.90 [€14.77]</li> </ul> Ophthalmologist: <ul style="list-style-type: none"> <li>● Initial: \$45.85 [€30.93]</li> <li>● Repeated: \$43.30 [€29.21]</li> <li>● Follow-up: \$28.95 [€19.53]</li> </ul>	No requirements	Dermatologist or ophthalmologist	All	No	Initial and repeat: maximum 1 per year/patient/physician for the same diagnosis; Follow-up: maximum 1 per day/patient/physician, maximum 4 per year/patient/physician, maximum 4,000 per year

Tele-expertise level 1 is advice given without the need of thoroughly studying the medical situation; Tele-expertise level 2 is a detailed advice about a patient with a complex medical situation, which requires a thorough study.

The fee in the Netherlands is not specified for the specialist, because the country does not use a fee-for-service system to compensate its specialists. Instead, the Netherlands uses a capitation-based system.



use this method of care.<sup>34</sup> Moreover, potential benefits and cost-savings associated with lower televisit fees might never be realized because providers might stay with in-person visits to recover their costs.<sup>34</sup>

The discussion of payment parity should be held, but this discussion is complex, certainly because payers are concerned that the increased accessibility and convenience associated with telemedicine might lead to increased health care costs.<sup>35</sup> However, previous research indicated that payment parity was not associated with the rate of telemedicine use in the emergency department.<sup>36</sup> Furthermore, our results indicated that physicians in Australia, Belgium, Canada (Ontario), and the UK receive a much lower fee for televisits compared to in-person visits. Research indicated that physicians tend to increase the frequency of services in response to the increase of the associated fee.<sup>37,38</sup> Thus, a lower fee for televisits compared to in-person visits might discourage physicians to use televisits and encourage them to use in-person visits instead. In Luxembourg, some specialist-physicians (e.g., pneumologists, rheumatologists, surgeons, anesthetists, radiologists) receive a much higher fee for televisits compared to in-person visits. These specialist-physicians might be encouraged to use televisits instead of in-person visits.

The results indicated that many countries lack telemonitoring and tele-expertise payment. However, this does not mean that telemonitoring and tele-expertise are not performed in these countries. For instance, a Belgian survey conducted in 2021 indicated that 36,231 CIED patients were telemonitored in 17 centers, although no payment existed.<sup>39</sup> Only France, the Netherlands, and Ontario have payment for tele-expertise, and only Australia, Germany, the Netherlands, and Switzerland (TARDOC) have telemonitoring payment. Moreover, Australia, Germany, and Switzerland compensate physicians for telemonitoring pacemaker or ICD patients, which includes telemonitoring the device functioning and the cardiovascular physiology and risk of the patient.<sup>40</sup> In Australia, pacemaker telemonitoring has a higher fee than ICD telemonitoring. There might be several reasons for the latter. A study found that the mean physician time for pacemaker telemonitoring was 4.7 minutes per patient/year, while it was 7.5 minutes per patient/year for ICD telemonitoring.<sup>41</sup> Thus, physician time might influence the telemonitoring fee. Not only the physician time was significantly higher for ICD telemonitoring in that study as compared to pacemaker telemonitoring, but also the cost for emergency room admissions (€47 vs. €38 per patient/year), hospitalization cost (€572 vs. €0 per patient/year), and medication cost (€726 vs. €569 per patient/year).<sup>41</sup> Thus, it seems that more serious and costly clinical events occur

when telemonitoring ICDs as compared to telemonitoring pacemakers. This might also influence the telemonitoring fee. Furthermore, telemonitoring might be useful for many other indications. Therefore, France, the UK and Belgium have set up projects to gain insight in the telemonitoring of other indications, including heart failure, renal failure, respiratory failure, diabetes, CIEDs, and COVID-19.<sup>42–44</sup> Although several countries compensate physicians for telemonitoring, results did not indicate payment for telemonitoring performed by other health care professionals, such as nurses and technicians.

The results of our study indicated that tele-expertise fees differ across countries. The tele-expertise fee in France is separated based on whether the medical situation is thoroughly studied (tele-expertise levels 1 and 2). However, this will be simplified into one fee in 2022 to eliminate any bias for healthcare professionals when they choose between the two levels of medical complexity.<sup>45</sup> Moreover, the new tele-expertise fee will be equal to the current tele-expertise level 2 fee, in response to the low level of use of the tele-expertise fees.<sup>45</sup> Furthermore, the tele-expertise fees in Canada (Ontario) are higher for dermatologists and ophthalmologists than for other physicians, probably because tele-expertise is currently better developed in these two disciplines, as it involves the transfer of skin or eye images.<sup>23,24</sup> A higher televisit fee in these disciplines might stimulate the use of the fee, which was also the reason to the increase of the televisit fee in France.<sup>45</sup>

The results indicated a wide variety of benefit specifications for televisits and tele-expertise in every country. Australia, France, the Netherlands, and the UK do not allow televisits as the first contact between the patient and physician, probably because televisits do not allow for a physical examination, which is needed for some diagnoses.<sup>46</sup> However, some physicians use televisits as first contact to triage patients. Triage has been indicated to increase cost-savings and improve access and quality of care.<sup>47</sup> Restricting televisits to follow-up only, will not allow physicians to use televisits to triage patients, and therefore reduce health care access. Furthermore, Belgium, the Netherlands, and Switzerland (TARMED) specify that conclusions must be written in the medical file of the patient, making it accessible for stakeholders. This gives patients the opportunity to provide feedback when necessary, increasing patient empowerment. Additionally, many countries allow televisits and tele-expertise through videoconferencing software and/or telephone. There are some differences in use between the two for televisits. Compared to telephone televisits, video televisits allow for some aspects of physical

examination and a more personal connection between physicians and patients.<sup>48</sup> Other factors also influence the choice between a telephone and a video televisit, including patient access to technology, an organization's telemedicine infrastructure, and patient and physician preferences.<sup>48</sup> Many other benefit specifications are mentioned in the results. They are often put into place to determine which form of interaction should be used (physical versus remote).<sup>49</sup>

Almost every fee schedule compensates telemedicine via a FFS-system. The type of payment system might have several consequences for telemedicine. Firstly, payment systems might have an impact on the health care utilization: a systematic review found that FFS-systems were associated with increased service utilization, while capitation-based systems were associated with reduced utilization.<sup>50</sup> However, the study indicated that the utilization of elective services and surgeries are more likely to be sensitive to payment reforms than the utilization of urgent services and in-person visits.<sup>50</sup> These results might also apply to telemedicine services, as urgent telemedicine services or televisits might be less sensitive to payment reform than elective telemedicine services and surgeries. Secondly, payment systems might have an impact on patient selection. A study comparing patient selection between FFS and salaried specialist-physicians indicated that salaried specialists saw more seriously ill patients and saw these patients more frequently during follow-up visits, although the result was not statistically significant.<sup>51</sup> Thirdly, payment systems might influence the duration of televisits, as several studies found evidence that payment systems influence in-person visit duration.<sup>31,50</sup> One study indicated that physicians with revenues linked to performance-based payment measures were associated with reduced in-person visit time, probably because these physicians may have incentives to increase patient volume by reducing visit time per patient to meet productivity aims.<sup>31</sup> The study also found that physicians with increased capitation revenue were spending less time with their patients.<sup>31</sup> Moreover, another study indicated that a mixed compensation model (i.e., physicians received a flat per diem rate for each day worked plus an additional fee for certain services provided) was associated with a decrease in clinical time spent in private offices, but was not associated with a decrease in time spent in hospitals.<sup>50</sup> Thus, physicians seem to respond differently to payment systems in different settings.

FFS-systems appear to create several challenges when implementing telemedicine in the payment system. A first challenge is that FFS-systems might increase the risk of overconsumption for telemedicine.<sup>52</sup> A second

challenge, which can also be noticed in our results, is that not all telemedicine services are covered. For instance, the results indicated no compensation for continuous glucose monitoring across the investigated countries. FFS-systems focus on providing individual services, but when no compensation exists for certain services performed by a health care professional, health care professionals might be discouraged from providing that care.<sup>53</sup> Consequently, the quality of care may decrease.<sup>53</sup>

A third challenge is that FFS-systems need complex benefit specifications to indicate when a telemedicine encounter (versus physical encounter) is appropriate.<sup>49</sup> From our results, it can be noticed that a variety of benefit specifications exist for telemedicine. This might increase the complexity of FFS-systems, of which patients already highlighted its difficulty and burdensome nature.<sup>53</sup> Moreover, administrative costs might increase because of the potential increased number of claims submitted (for newly reimbursed telemedicine services such as telemonitoring and tele-expertise) and because of complex benefit specifications and related documentation.<sup>49</sup> For instance, a physician submitting a claim for the coverage of televisits in the Netherlands must: (1) make sure that the content and duration is comparable to an in-person visit, (2) write the contact and conclusions in the medical file, and (3) prove that the televisit is not the first contact with the patient. A fourth challenge is that FFS-systems lead to discussions related to payment parity. These discussions tend to be complex, which might explain why not all countries in our results made the same decision about payment parity.

These challenges appear to be less present in capitation-based or hybrid systems.<sup>49</sup> Our results indicated two of these systems. Firstly, in the Netherlands specialist-physicians are compensated with a diagnosis-treatment combination. One diagnosis-treatment combination contains all medical services that are necessary to diagnose and treat a patient with a certain pathology.<sup>54</sup> With this system, a single price is paid for a whole package of services and products that meet patients' needs.<sup>55</sup> Secondly, telemonitoring CIED patients in Australia is compensated via an episodic payment system. Previous research indicated that telemonitoring might reduce the number of follow-up visits.<sup>19</sup> However, a FFS-system might hamper the possible reduction of follow-up visits. Therefore, literature has preferred episodic payment systems for this telemonitoring type.<sup>56,57</sup> Capitation-based systems stimulate patients and physicians to choose between telemedicine and physical encounters, based on what makes sense clinically and practically.<sup>49</sup> Several complexities would be encountered when shifting to

capitation, such as risk of underconsumption, and complex discussions about the ideal timing of payments (e.g. monthly versus yearly).<sup>49</sup> Although the challenges of this payment systems are not trivial, further research on this topic is necessary to allow to harness all opportunities that technology brings us.<sup>49</sup>

This research provides valuable lessons for countries when implementing telemedicine in their payment system. Firstly, the results indicated that across the investigated countries a variety of benefit specifications for telemedicine exists. To facilitate the process of requesting coverage, countries should keep the benefit specifications as simple as possible. Secondly, payment parity between televisits and in-person visits was only implemented in a few countries. However, the risk of not implementing payment parity and providing a higher/lower fee for the televisits instead of in-person visits might stimulate physicians to provide the service with the highest fee. In our results, four countries provide a lower fee for televisits. This might not stimulate physicians to provide televisits. To stimulate physicians to provide televisits, we believe that payment parity should be encouraged. Thirdly, most countries in our study compensate telemedicine via FFS-systems. However, this causes several potential challenges, as discussed before. Therefore, the sustainability of FFS-systems may be questioned, as they might not be the best way to stimulate the use of certain technological innovations, such as telemedicine.

The results of this study should be carefully interpreted for several reasons. Firstly, several countries have started to conduct research on telemedicine and might have included temporary fees for these experiments. Although they were not investigated, future research could analyze these temporary fees for additional similarities and differences. Secondly, it is unclear from the results which factors the countries considered for determining the telemedicine fees, and what the impact of the fees were. Therefore, we strongly recommend that future researchers investigate the determinants and impacts of telemedicine fees. Thirdly, this research did not investigate which political, cultural, economic, and health system factors influence payment policies across countries. Future researchers should focus on analyzing these factors, as its findings would be of added value to the literature. For instance, this research did not analyze whether the payment systems of telemedicine depend on the specificities of the health care systems. To reduce this bias, this study investigated ten payment systems, giving a stronger foundation for identifying similarities and differences between telemedicine payment systems.

## Conclusions

This study compared existing payment systems for telemedicine across ten countries, and identified several similarities and differences. Firstly, many countries lack payment for telemonitoring and tele-expertise, therefore missing the potential advantages of these technologies. Secondly, a variety of benefit specifications are put into place, mostly to determine which form of interaction should be used (physical versus remote). Thirdly, a few countries established payment parity between video televisits and in-person visits. The other countries established a higher or lower payment for televisits compared to in-person visits, creating a risk that physicians provide the service with the highest payment. Lastly, the dominant payment system for telemedicine is a FFS-system, which might increase the risk of overconsumption. A payment system with some form of capitation might avoid these potential challenges, but this needs to be further explored. Our results show two existing capitation-based or hybrid systems: diagnosis-treatment combination payment, where a single price is paid for all used diagnosis and treatment services; and an episodic payment for telemonitoring, where a single price is paid for telemonitoring provided for that episode. Challenging and innovating the existing payment system can help harness the full potential of telemedicine and direct health care systems toward a more patient-centered, efficient, and integrated care.

## Disclosure Statement

No potential conflict of interest was reported by the author(s).

## Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the supplementary material at <https://doi.org/10.1080/23288604.2022.2116088>.

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## References

- Bashshur R, Shannon G, Krupinski E, Grigsby J. The taxonomy of telemedicine. *Telemed J E Health*. 2011;17(6):484–94. doi:10.1089/tmj.2011.0103.
- Bajowala SS, Milosch J, Bansal C. Telemedicine pays: billing and coding update. *Curr Allergy Asthma Rep*. 2020;20(10):60. doi:10.1007/s11882-020-00956-y.
- Siegel CA. Transforming gastroenterology care with telemedicine. *Gastroenterol*. 2017;152(5):958–63. doi:10.1053/j.gastro.2017.01.048.
- Dorsey ER, Topol EJ. State of telehealth. *N Engl J Med*. 2016;375(2):154–61. doi:10.1056/NEJMra1601705.
- Paganoni S, van de Rijn M, Drake K, Burke K, Doyle M, Ellrodt AS, Nicholson K, Atassi N, de Marchi F, Babu S. Adjusted cost analysis of video televisits for the care of people with amyotrophic lateral sclerosis. *Muscle Nerve*. 2019;60(2):147–54. doi:10.1002/mus.26606.
- Wechsler LR. Advantages and limitations of teleneurology. *JAMA Neurol*. 2015;72(3):349–54. doi:10.1001/jamaneurol.2014.3844.
- Carrillo de Albornoz S, Sia KL, Harris A. The effectiveness of teleconsultations in primary care: systematic review. *Fam Pract*. 2022;39(1):168–82. doi:10.1093/fampra/cmab077.
- Harrigan M, Cartmel B, Loftfield E, Sanft T, Chagpar AB, Zhou Y, Playdon M, Li F, Irwin ML. Randomized trial comparing telephone versus in-person weight loss counseling on body composition and circulating biomarkers in women treated for breast cancer: the Lifestyle, Exercise, And Nutrition (LEAN) Study. *J Clin Oncol*. 2016;34(7):669–76. doi:10.1200/jco.2015.61.6375.
- Anderson D, Villagra V, Coman EN, Zlateva I, Hutchinson A, Villagra J, Olayiwola JN. A cost-effectiveness analysis of cardiology eConsults for medicaid patients. *Am J Manag Care*. 2018;24:e9–e16.
- Buvik A, Bergmo TS, Bugge E, Smaabrekke A, Wilsgaard T, Olsen JA. Cost-effectiveness of telemedicine in remote orthopedic consultations: randomized controlled trial. *J Med Internet Res*. 2019;21(2):e11330. doi:10.2196/11330.
- Agha Z, Schapira RM, Laud PW, McNutt G, Roter DL. Patient satisfaction with physician-patient communication during telemedicine. *Telemed J E Health*. 2009;15(9):830–39. doi:10.1089/tmj.2009.0030.
- Verhoeven F, Tanja-Dijkstra K, Nijland N, Eysenbach G, van Gemert-Pijnen L. Asynchronous and synchronous teleconsultation for diabetes care: a systematic literature review. *J Diabetes Sci Technol*. 2010;4(3):666–84. doi:10.1177/193229681000400323.
- Chaudhry SI, Mattern JA, Curtis JP, Spertus JA, Herrin J, Lin Z, Phillips CO, Hodshon BV, Cooper LS, Krumholz HM, et al. Telemonitoring in patients with heart failure. *N Engl J Med*. 2010;363(24):2301–09. doi:10.1056/NEJMoa1010029.
- Ong MK, Romano PS, Edgington S, Aronow HU, Auerbach AD, Black JT, De Marco T, Escarce JJ, Evangelista LS, Hanna B, et al. Effectiveness of remote patient monitoring after discharge of hospitalized patients with heart failure: the Better Effectiveness After Transition – Heart Failure (BEAT-HF) randomized clinical trial. *JAMA Intern Med*. 2016;176(3):310–18. doi:10.1001/jamainternmed.2015.7712.
- Huang Z, Tao H, Meng Q, Jing L. Management of endocrine disease. Effects of telecare intervention on glycemic control in type 2 diabetes: a systematic review and meta-analysis of randomized controlled trials. *Eur J Endocrinol*. 2015;172(3):R93–101. doi:10.1530/eje-14-0441.
- McDowell JE, McClean S, FitzGibbon F, Tate S. A randomised clinical trial of the effectiveness of home-based health care with telemonitoring in patients with COPD. *J Telemed Telecare*. 2015;21(2):80–87. doi:10.1177/1357633x14566575.
- Suso-Ribera C, Castilla D, Zaragoza I, Mesas Á, Server A, Medel J, García-Palacios A. Telemonitoring in Chronic pain management using smartphone apps: a randomized controlled trial comparing usual assessment against app-based monitoring with and without clinical alarms. *Int J Environ Res Public Health*. 2020;17(18):6568. doi:10.3390/ijerph17186568.
- Hillmann HAK, Soltani S, Mueller-Leisse J, Hohmann S, Duncker D. Cardiac rhythm monitoring using wearables for clinical guidance before and after catheter ablation. *J Clin Med*. 2022;11(9):2428. doi:10.3390/jcm11092428.
- Klersy C, Boriani G, De Silvestri A, Mairesse GH, Braunschweig F, Scotti V, Balduini A, Cowie MR, Leyva F. Effect of telemonitoring of cardiac implantable electronic devices on healthcare utilization: a meta-analysis of randomized controlled trials in patients with heart failure. *Eur J Heart Fail*. 2016;18(2):195–204. doi:10.1002/ejhf.470.
- Peek ME, Thomas CC. Broadening access to continuous glucose monitoring for patients with type 2 diabetes. *Jama*. 2021;325(22):2255–57. doi:10.1001/jama.2021.6208.
- Fasterholdt I, Gerstrøm M, Rasmussen BSB, Yderstræde KB, Kidholm K, Pedersen KM. Cost-effectiveness of telemonitoring of diabetic foot ulcer patients. *Health Informatics J*. 2018;24(3):245–58. doi:10.1177/1460458216663026.
- Grustam AS, Severens JL, De Massari D, Buyukkaramikli N, Koymans R, Vrijhoef HJM. Cost-effectiveness analysis in telehealth: a comparison between home telemonitoring, nurse telephone support, and usual care in chronic heart failure management. *Value Health*. 2018;21(7):772–82. doi:10.1016/j.jval.2017.11.011.
- Ohannessian R, Yaghobian S, Duong TA, Medeiros de Bustos E, Le Douarin Y-M, Moulin T, Salles N. Letter to the editor: France is the first country to reimburse tele-expertise at a national level to all medical doctors. *Telemed J E Health*. 2021;27(4):378–81. doi:10.1089/tmj.2020.0083.
- Finnane A, Dallest K, Janda M, Soyer HP. Teledermatology for the diagnosis and management of skin cancer: a systematic review. *JAMA Dermatol*. 2017;153(3):319–27. doi:10.1001/jamadermatol.2016.4361.
- Hopstaken JS, Verweij L, van Laarhoven C, Blijlevens NMA, Stommel MWJ, Hermens RPMG. Effect of digital care platforms on quality of care for

- oncological patients and barriers and facilitators for their implementation. *Syst Rev J Med Internet Res*. 2021;23(9):e28869. doi:10.2196/28869.
26. Scott Kruse C, Karem P, Shifflett K, Vegi L, Ravi K, Brooks M. Evaluating barriers to adopting telemedicine worldwide: a systematic review. *J Telemed Telecare*. 2018;24(1):4–12. doi:10.1177/1357633x16674087.
  27. Almatham HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: systematic literature review. *J Med Internet Res*. 2020;22(2):e16407. doi:10.2196/16407.
  28. Ontario Ministry of Health. Virtual care billing information manual. 2020. [accessed 2020 December 13]. <https://support.otn.ca/sites/default/files/virtual-care-billing-information-manual.pdf>.
  29. European Central Bank. Euro foreign exchange reference rates: Danish krone; 2022 [accessed 2022 Aug 2]. [https://www.ecb.europa.eu/stats/policy\\_and\\_exchange\\_rates/euro\\_reference\\_exchange\\_rates/html/eurofxref-graph-dkk.en.html](https://www.ecb.europa.eu/stats/policy_and_exchange_rates/euro_reference_exchange_rates/html/eurofxref-graph-dkk.en.html).
  30. Eberly LA, Khatana SAM, Nathan AS, Snider C, Julien HM, Deleener ME, Adusumalli S. Telemedicine outpatient cardiovascular care during the COVID-19 pandemic: bridging or opening the digital divide? *Circulation*. 2020;142(5):510–12. doi:10.1161/circulationaha.120.048185.
  31. Guy GPs Jr., Richardson LC. Visit duration for outpatient physician office visits among patients with cancer. *J Oncol Pract*. 2012;8(3 Suppl):2s–8s. doi:10.1200/jop.2011.000493.
  32. Goodson JD, Shahbazi S, Rao K, Song Z. Differences in the complexity of office visits by physician specialty: NAMCS 2013-2016. *J Gen Intern Med*. 2020;35(6):1715–20. doi:10.1007/s11606-019-05624-0.
  33. Schifeling CH, Shanbhag P, Johnson A, Atwater RC, Koljack C, Parnes BL, Vejar MM, Farro SA, Phimphasone-Brady P, Lum HD, et al. Disparities in video and telephone visits among older adults during the COVID-19 pandemic: cross-sectional analysis. *JMIR Aging*. 2020;3(2):e23176. doi:10.2196/23176.
  34. Health Affairs. Telehealth parity laws. Ongoing reforms are expanding the landscape of telehealth in the US health care system, but challenges remain. Washington (DC); 2016 [accessed 2022 Oct 3]. [https://www.healthaffairs.org/doi/10.1377/hpb20160815.244795/full/healthpolicybrief\\_162.pdf](https://www.healthaffairs.org/doi/10.1377/hpb20160815.244795/full/healthpolicybrief_162.pdf).
  35. Aremu EO, Heffernan JL, Kvedar JC. The difference in practice expense costs between telehealth and in-office care could serve as the basis for differential reimbursement structures. *Telemed J E Health*. 2021. doi:10.1089/tmj.2021.0229.
  36. Zachrisson KS, Boggs KM, Cash RE, Burton KR, Espinola JA, Hayden EM, Sauser JP, Mehrotra A, Camargo CA. Are state telemedicine parity laws associated with greater use of telemedicine in the emergency department? *J Am Coll Emerg Physicians Open*. 2021;2(1):e212359. doi:10.1002/emp2.12359.
  37. Coey D. Physicians' financial incentives and treatment choices in heart attack management. *Quant Econom*. 2015;6(3):703–48. doi:10.3982/QE365.
  38. Brekke KR, Holmås TH, Monstad K, Straume OR. Do treatment decisions depend on physicians' financial incentives? *J Public Econ*. 2017;155:74–92.
  39. KCE. Remote monitoring of patients with cardiovascular implantable electronic devices: a health technology assessment; 2022 [accessed 2022 Aug 5]. [https://kce.fgov.be/sites/default/files/2021-11/KCE\\_345\\_Remote\\_Monitoring\\_Patients\\_CIED\\_Report.pdf](https://kce.fgov.be/sites/default/files/2021-11/KCE_345_Remote_Monitoring_Patients_CIED_Report.pdf).
  40. Slotwiner D, Varma N, Akar JG, Annas G, Beardsall M, Fogel RI, Galizio NO, Glotzer TV, Leahy RA, Love CJ, et al. HRS expert consensus statement on remote interrogation and monitoring for cardiovascular implantable electronic devices. *Heart Rhythm*. 2015;12(7):e69–100. doi:10.1016/j.hrthm.2015.05.008.
  41. Dario C, Delise P, Gubian L, Saccavini C, Brandolino G, Mancin S. Large controlled observational study on remote monitoring of pacemakers and implantable cardiac defibrillators: a clinical, economic, and organizational evaluation. *Interact J Med Res*. 2016;5(1):e4. doi:10.2196/ijmr.4270.
  42. Ministère des solidarités et de la santé. La télésurveillance: ETAPES; 2021 [accessed 2021 Dec 16]. <https://solidarites-sante.gouv.fr/soins-et-maladies/prises-en-charge-specialisees/telesante-pour-l-acces-de-tous-a-des-soins-a-distance/article/la-telesurveillance-etapes>.
  43. National Health Service. Remote monitoring of COVID-19 patients in primary care and secondary care; 2020 [accessed 2021 Nov 5]. <https://www.nhs.uk/covid-19-response/technology-nhs/remote-monitoring-of-covid-19-patients-in-primary-care-and-secondary-care/>.
  44. RIZIV. Tarieven; tijdelijke verstrekkingen in de context van Covid-19; 2020. [accessed Dec 2021 12]. [https://www.riziv.fgov.be/SiteCollectionDocuments/Tarieven\\_COVID-19\\_20200314.pdf](https://www.riziv.fgov.be/SiteCollectionDocuments/Tarieven_COVID-19_20200314.pdf).
  45. Yaghobian S, Ohannessian R, Duong TA, Medeiros de Bustos E, Le Douarin Y-M, Moulin T. France extends its tele-expertise funding model nationally after COVID-19. *J Telemed Telecare*. 2022;28(3):233–35. doi:10.1177/1357633x211067067.
  46. Cals JW, Francis NA. Acute cough in adults. *Bmj*. 2010;340:c574. doi:10.1136/bmj.c574.
  47. Cui S, Sedney CL, Daffner SD, Large MJ, Davis SK, Crossley L, France JC. Effects of telemedicine triage on efficiency and cost-effectiveness in spinal care. *Spine J*. 2021;21(5):779–84. doi:10.1016/j.spinee.2021.01.006.
  48. Rodriguez JA, Betancourt JR, Sequist TD, Ganguli I. Differences in the use of telephone and video telemedicine visits during the COVID-19 pandemic. *Am J Manag Care*. 2021;27(1):21–26. doi:10.37765/ajmc.2021.88573.
  49. Adler-Milstein J, Mehrotra A. Paying for digital health care - problems with the fee-for-service system. *N Engl J Med*. 2021;385(10):871–73. doi:10.1056/NEJMp2107879.
  50. Quinn AE, Trachtenberg AJ, McBrien KA, Ogundeji Y, Souri S, Manns L, Rennert-May E, Ronksley P, Au F, Arora N. Impact of payment model on the behaviour of specialist physicians: a systematic review. *Health Policy (New York)*. 2020;124(4):345–58. doi:10.1016/j.healthpol.2020.02.007.

51. Quinn AE, Hemmelgarn BR, Tonelli M, McBrien KA, Edwards A, Senior P, Faris P, Au F, Ma Z, Weaver RG. Association of specialist physician payment model with visit frequency, quality, and costs of care for people with chronic disease. *JAMA Netw Open*. 2019;2(11):e1914861. doi:10.1001/jamanetworkopen.2019.14861.
52. Jegers M, Kesteloot K, De Graeve D, Gilles W. A typology for provider payment systems in health care. *Health Policy (New York)*. 2002;60(3):255–73. doi:10.1016/s0168-8510(01)00216-0.
53. McCauley LPRL, Meisnere M, Robinson SK. Implementing high-quality primary care: rebuilding the foundation of health care. Washington (DC): The National Academies Press; 2021.
54. Nederlandse Zorgautoriteit. Regeling medisch-specialistische zorg; 2020 [accessed 2020 Dec 10]. [https://puc.overheid.nl/nza/doc/PUC\\_320022\\_22/1/](https://puc.overheid.nl/nza/doc/PUC_320022_22/1/).
55. Porter ME, Kaplan RS. How to pay for health care. *Harv Bus Rev*. 2016;94:88–98.
56. Heidbuchel H. Telemonitoring of implantable cardiac devices: hurdles towards personalised medicine. *Heart*. 2011;97(11):931–39. doi:10.1136/hrt.2009.188789.
57. Maillard N, Perrotton F, Delage E, Gourraud J-B, Lande G, Solnon A, Probst V, Grimandi G, Clouet J. Cardiac remote monitoring in France. *Arch Cardiovasc Dis*. 2014;107(4):253–60. doi:10.1016/j.acvd.2014.02.004.