



Original article

How to value the full cost of medical consultations in France? Results from MOVIE project

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ABSTRACT

In France, the lack of standardized unit cost data is a major barrier to high-quality, easily comparable health economic evaluations. The objective of the MOVIE project was to standardize costing methods and provide accurate estimates of unit costs for French healthcare services.

More than 200 million general practitioner (GP) consultations were recorded in France in 2021, at a total billed cost of €10.5 billion – approximately 80% of which was covered by the state health insurance system. In the same year, there were 125 million consultations with specialist physicians, for a total billed cost of €13.9 billion. The baseline per-consultation tariff was €25 for a GP and €31.5–€58.5 for a specialist; however, these figure excluded additional costs and thus were potentially underestimated. The MOVIE project took account of consultation fees, procedure fees, the patient's out-of-pocket payments, and annual physician incentives linked to quality, prevention, and public health activities.

In an analysis of a representative 2% sample (the *Échantillon du Système National des Données de Santé*) of the French National Health Database, the mean GP consultation cost was €39.8 but could amount to as much as €75.1 when additional medical procedures were included. The cost of a consultation with a specialist was €66.1 on average but ranged from €40.2 (for an oncologist) to €104.3 (for a neurologist). Cost variability was driven by the type of consultation, additional procedures, the medical specialty, the practice setting, the patient's age, and the geographic region.

By capturing all the relevant cost components, this MOVIE study (i) provides the first comprehensive, validated assessment of medical consultation costs in France (enabling more accurate, more easily comparable economic evaluations) (ii) supports healthcare policy, budget impact analyses, and clinical trial modeling, and (iii) highlights key cost drivers and regional differences.

1. Introduction

Although access to reliable cost data is essential for informed healthcare resource allocation, consistent guidance on how these costs should be valued is often lacking. Differences in costing methods lead to significant variations in unit cost estimates, which undermine both the outcomes and the comparability of economic evaluations from different health systems or countries [1–4]. The results of a systematic review of national reference unit costs showed that current practices and international guidelines require substantial improvement and harmonization [5].

To address these methodological challenges, the “Programme in Costing, resource use measurement and outcome valuation for Use in

multi-sectoral National and International health economic evaluation” (PECUNIA) European H2020 project was launched in Austria, the United Kingdom, Germany, Hungary, The Netherlands, and Spain [6]. The PECUNIA project's goal was to develop standardized tools for costing and valuation in multisectoral health economic evaluations at both the national and international levels [7]. In France, the “*Méthodes et Outils de Valorisation en medico-economie*” (MOVIE) project developed the country's first reference framework for unit costs (incorporating the amount billed and the patient's out-of-pocket (OOP) expenses) across 22 types of healthcare service [8]. The MOVIE project's main objectives are to limit uncertainty in the evaluation of healthcare cost and thereby to promote consistent, reliable, economic evaluations. Here, we describe the part of the MOVIE project that focuses on consultations with general

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practitioners (GPs) and other specialist physicians. This apparently simple healthcare service is particularly interesting because a large number of factors can substantially influence the estimation of the cost of a consultation.

Outpatient physician services in France are financed by a statutory health insurance (SHI) system through a mixed payment scheme that combines fee-for-service payments and annual lump-sum transfers. Firstly, the fee-for-service payments are based on regulated tariffs negotiated at the national level between medical associations and the SHI system. These tariffs include a standard clinical examination fee and additional payments associated with the provision of complementary technical procedures (e.g. diagnostic imaging) or specific service delivery conditions (such as home visits or consultations on public holidays). These regulated tariffs are paid to physicians by the SHI system. Depending on their contractual status within the SHI system, physicians may engage in balance billing and charge fees in excess of the regulated tariff (referred to as "sector 2" in France). Balance billing is prevalent in the private sector (where the excess charge can be substantial) but is prohibited in the public sector. If a patient has voluntary health insurance, the latter may cover these excess charges in whole or in part. Secondly, physicians receive annual lump-sum transfers and capitation-fee intended to drive changes in medical practices, organize out-of-hours care, and strengthen the role of primary care physicians in coordinating care and overseeing preventive health actions.

More than 200 million GP consultations were recorded in France in 2021. The corresponding total expenditure (i.e. by the SHI system and patients) was €10.5 billion. Fee-for-service payments accounted for 78% of this amount, and the remaining 22% consisted of annual payments for the implementation of public health initiatives and partial exoneration/payment of social security contributions. In 2021, the SHI system covered approximately 80% of the total expenditure. There were 125 million consultations with specialists; the total expenditure was €13.9 billion, and 93.6% of this amount correspond to fee-for-service payments. On average, the SHI system reimbursed 69% of the cost of a specialist consultation. In 2021, medical consultations accounted for 11% of the SHI system's total expenditure of €226.7 billion.

In health economics evaluations, the production cost must be assessed whenever possible. Mayer et al.'s costing analysis assessed the impact and implications of different calculation methods and data sources on the unit cost of GP consultations in Austria [9]. Six different unit cost calculation methods were explored. The broad range in the calculated mean unit cost (from €15.6 to €42.6) highlighted the difficulty of obtaining accurate estimates.

In France, a healthcare service's production cost is usually estimated by considering its tariff as a proxy marker. However, tariffs do not address all the methodological challenges present. As in many other countries, medical fee agreements in France have considerably increased the complexity of healthcare service billing classifications by introducing highly variable pricing that depends on (i) the extent of coverage, which depends notably on whether or not the patient is enrolled in a long-term illness (*affection de longue durée*) scheme, and (ii) possible deductibles or additional charges related to the medical situation or the circumstances under which the service is provided (night vs. day, home visit vs. office consultation, etc.). Lastly, variations in cost from one geographical area to another can lead to the "regional effect" observed in some studies.

In 2021, the French national tariff for a GP consultation without any additional procedures (i.e. the crude tariff) was €25. The tariff for a consultation with a specialist physician ranged from €31.5 for a gynecologist to €58.5 for a psychiatrist. However, these amounts do not account for additional fees that generally arise through (a) the French healthcare system's flat-rate contributions, (b) OOP expenses that depend on the medical specialty, (c) any medical procedures performed during the consultation, and (d) the location of the consultation (in the physician's office, at an outpatient facility, or at the patient's home). Given this context, using the crude tariff as the unit cost may lead to underestimation of the cost of the consultation. Moreover, all the required information is

rarely collected in full, which limits an analyst's ability to accurately estimate the complete unit costs in health economic evaluations and most often leads to underestimation of costs. In the absence of a full set of information, cost estimates are highly dependent on the assumptions made by the analyst. The objective of the present study was to assess the full unit cost of medical consultation services from several perspectives and as a function of multiple cost drivers.

2. Materials and methods

2.1. Data

France has a highly centralized SHI scheme, which is part of the country's social security system. The French National Health Database (*Système National des Données de Santé*, SNDS) holds individual-level socio-demographic and medical information on nearly 68 million beneficiaries, together with coded data on reimbursements for hospital and outpatient care services [10]. By design, the SNDS database only includes data on healthcare services that are eligible for at least partial reimbursement and thus excludes all services not covered by the SHI system. From 2022 onwards, researchers have been given strictly regulated, monitored access to a representative 2% sample of the SNDS: the *Échantillon du Système National des Données de Santé* (ESND) database. The current study was conducted with the ESND and thus adopted the SHI perspective. However, the patient's perspective was also considered through the estimation of OOP expenses, defined as patient contributions before potential reimbursement by voluntary health insurance. This study was registered in the French national registry maintained by the Health Data Hub (www.health-data-hub.fr; reference: F20230203132707).

2.2. Population

All services provided by GPs and specialists in 2021 were included in the analysis: consultations, additional fees, and medical procedures performed during a consultation. If these services were delivered in emergency departments or during inpatient stays (whether in the public or private sector), they were excluded from the present analysis and assessed in another part of the MOVIE project. Medical specialties were grouped into 26 categories (Appendix 1). Some specialties were excluded because they were not relevant to health economics evaluations or their activities were included in other healthcare service categories covered by the broader MOVIE project. To avoid double-counting, the excluded specialties were medical laboratory directors, experts in forensic and legal medicine, anatomy and pathology services, public health and social medicine, radiotherapy (classified under "medical session" with chemotherapy and dialysis session), nuclear medicine (classified under "medical imaging"), stomatology and dentistry (classified under "dental care"), and emergency medicine (classified under "emergency care").

The selected patients lived in mainland France and were covered by the *régime général* ("general scheme") part of the SHI system, which covers nearly all of the country's population. The statistical unit was defined as a single patient consultation with a specific physician on a given day and during which one or more additional medical procedures may or may not have been performed. COVID-19 vaccination services were excluded. Hence, the unit costs comprised healthcare service fees, additional fees, procedure supplements, and the patient's OOP expenses. Some of the total billed amounts recorded were negative and corresponded to adjustments following payment errors; these observations were excluded from the analysis, along with cases in which the reimbursed amount exceeded the billed amount.

2.3. Outcomes

In accordance with the study's perspective, the endpoints assessed with the ESND were the billed amounts. The latter included the amounts

Table 1
Results of cost composition of general practitioner and specialist consultations.

Cost Composition (€ 2021)	GP	Specialist
Mean Billed Amount (activity-based remuneration observed in ESND)	29.5 (12.6)	60.1 (36.7)
Total Additional (Annual) Funding	10.3	7.6
Primary Care Physician Capitation Fee	4.2	.
Support for Social Security Contributions	2.6	5.7
Facility-Based Payment	0.8	.
On-Call Service Allowance	1.1	.
Public Health Objective-Based Payment	1.7	.
Contractual and Related Allowances for Specialist Physicians	.	1.9
Total	39.8 (12.6)	66.1 (37.1)

covered by the SHI system and the patient's OOP expenses. For all end-points, descriptive statistics (including the count, mean, standard deviation, median, and range) and distributions were reported. The overall mean amount was estimated for each medical specialty and stratified according to the identified cost drivers. In order to capture the full cost of a healthcare service, we added all annual complementary payments to the mean billed amount. These payments included capitation fees, support for social security contributions, facility-based payments, on-call service allowances, performance-based payments linked to public health targets, and other contractual supplements for specialist physicians. These amounts take the form of annual lump-sum allocations and are independent of the number of consultations. In order to allocate these amounts on a per-consultation basis and in the absence of individual-level data, the remuneration related to public health activities and practice improvement incentives was estimated as the average annual amount per physician (based on macroeconomic data) [11] and was allocated across healthcare services. The same approach was applied to partial financing of social security contributions.

2.4. The study methodology

The methodology consists of three steps designed to ensure the reliability and robustness of the study's results. Firstly, key cost drivers were identified in a review of the literature. Secondly, to ensure reliability, all analyses were performed separately and then cross-validated by two independent teams of researchers from the MOVIE project. The results were recalculated iteratively until the mean difference in unit cost was less than €0.5. Lastly, to ensure that the population counts observed in the database were consistent with the figures reported in official statistics, the 2% sample-based national estimates were extrapolated to the national level and compared with macroeconomic data published annually by official institutions.

3. Results

3.1. GP consultations

Approximately 4.3 million GP service were identified in 2021 in the sample; 89% of these were performed in the physician's office and 11% were either performed at the patient's home or via teleconsultation. The mean amount billed for a GP service was €39.8 (SD €12.6), of which €7.2 (SD €7.5) corresponded to OOP expenses, €22.3 (SD €11.1) corresponded to the amount reimbursed by the SHI system, and €10.3 corresponded to annual payments. Ninety-six percent of the consultations did not involve any additional medical procedures (Appendix 2) and so the cost variability was low; the mean value (€37.4 (SD €7.1)), median value and fifth-percentile values were closely aligned. In contrast, greater variability was observed for GP service that included a medical

procedure, for which the mean billed amount was €75.1 (SD €33.1). Seventy-four percent of the total cost corresponded to activities performed during the visit, while the remainder reflected payments for quality-of-care, prevention, and public health activities delivered to patients (Table 1). OOP expenses varied little from one region to another because most GPs are contracted with the SHI system and therefore do not engage in balance billing (Fig. 2). The identified cost drivers for GP consultations were the location (office vs. home), the presence or absence of additional medical procedures, the patient's age, and the patient's county of residence.

3.2. Specialist consultations

In contrast to GP consultations, almost all consultations with specialist physicians take place in their office: there are no home visits. Additional medical procedures were performed in 39% of specialist consultations, which resulted in greater heterogeneity in the mean cost (Fig. 1). The mean billed amount for a specialist consultation was €66.1 (SD €37.1) overall and varied marked from one medical specialty to another (Appendix 3). Indeed, the mean consultation cost ranged from €40.2 (SD €19.0) for medical oncologists to €104.3 (SD €63.0) for neurologists. Ophthalmology accounted for the largest share of specialist consultations in France (18.4%). The primary source (91%) of the physicians' remuneration was activity-based (i.e. consultations and medical procedures) (Table 1), although some (primarily pediatricians, cardiologists, gastroenterologists, and endocrinologists) received annual performance-based payments tied to public health objectives. The mean cost of a specialist consultation showed substantial geographic variability and ranged from €57 to €84, depending on the region (Fig. 2). Consequently, patient OOP expenses after SHI system reimbursement varied widely (from €13 to €42) by region and also by medical specialty; the OOP expense ranged from around €3 (SD €9.2) for nephrology or oncology consultations to approximately €27 (SD €27.3) for ophthalmology consultations (Appendix 4).

In France, specialist physicians can work in private-practice outpatient settings and/or in public-sector outpatient departments. The pattern of practice varies considerably from one specialty to another. Internal medicine and medical genetics consultations are mainly performed in public hospital outpatient departments (82% and 92%, respectively) (Appendix 3), whereas other specialties show a more balanced distribution. The mean billed amount was €69.8 (SD €36.1) in private practice and €52.7 (SD €37.7) in public outpatient consultations (Appendix 2). In public hospital outpatient departments, physicians are not allowed to charge additional fees (i.e. fees not reimbursed by the SHI system), and consultations may involve other healthcare professionals and allied professionals: medical assistants, midwives (in gynecology), orthoptists (in ophthalmology), nurses (in infectious diseases), and podiatrists and physiotherapists (in various specialties). The specialty

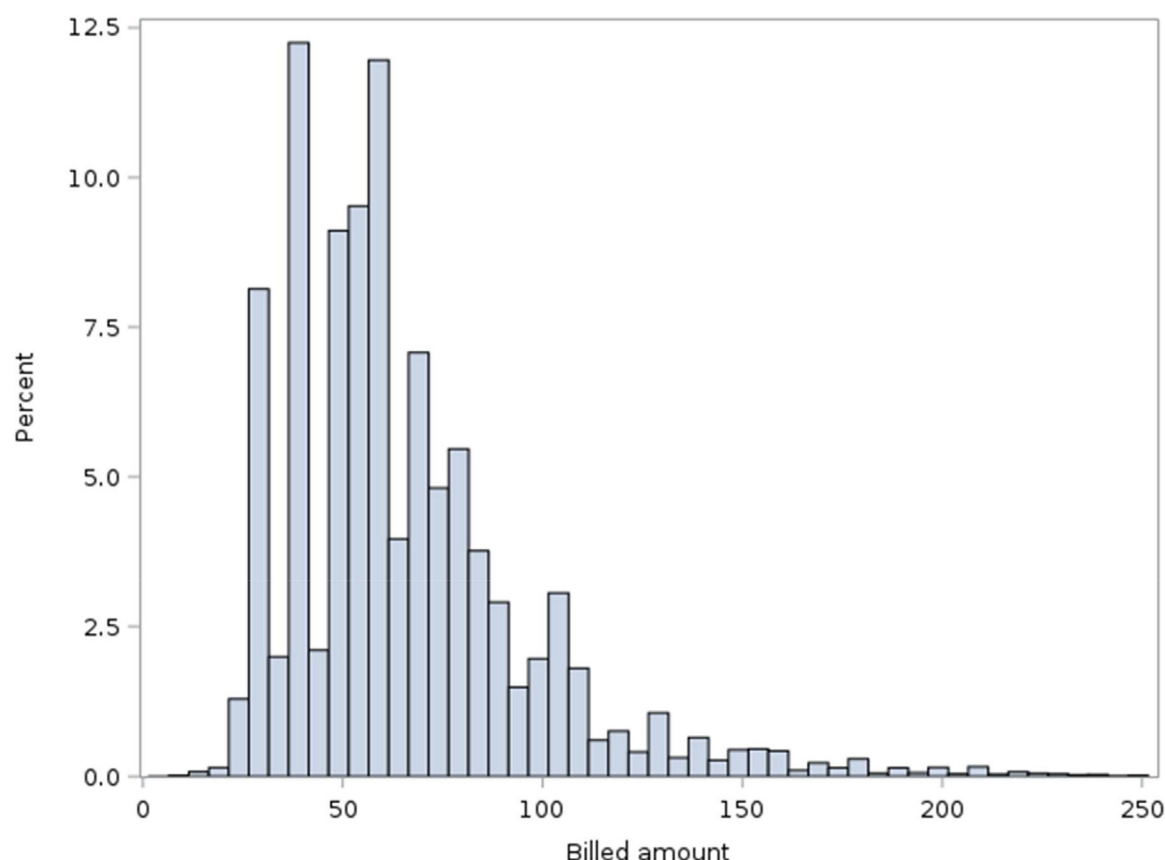


Fig. 1. Distribution of billed amount (euros 2021) for specialist physicians.

with the highest proportion of consultations involved an additional healthcare professional (50.5%) was infectious and tropical diseases. Each service provided by an additional healthcare professional is billed and can be reimbursed by the SHI system. These costs were attributed to the medical consultation because they represent hospital resource inputs required for the production of outpatient care.

The identified cost drivers for specialist consultations were the location of the consultation (private-sector vs. public-sector settings), the presence or absence of additional medical procedures, the medical specialty, the patient's age, and the patient's department of residence.

3.3. Comparison with national-level aggregated data

Our 2%-sample-based estimates for GP consultations were extrapolated to the national level and compared with macroeconomic data (Appendix 5). Differences of €1.8 billion [11] in the total billed expenditure and €556 million in the OOP expenses were observed. This discrepancy reflects the fact that national figures include expenditures from the "general scheme" and 16 other special schemes, whereas the MOVIE project covers the 81% [12] of beneficiaries living in mainland France and who are covered by the SHI's general scheme. Adjustment for this proportion aligned our estimates with the published data: €1,700 million for OOP payments and €6,625 million for fees (compared with €6,327 million reported in the ESND). Minor differences also arise from the inclusion of fixed co-payments in our dataset (€138 million) and the exclusion of COVID-19 vaccine injections (€200 million). Overall, our expenditure estimates for 2021 appear to be consistent with the national statistics. This comparison could not be performed for specialist

physician consultations because their private practice activity and hospital outpatient consultations (sometimes including medical assistants) were incorporated into our ESND dataset but not in the national data.

4. Discussion

In the present study, we estimated the costs of consultations with GPs and specialists in France in 2021. A key feature of this work is that it provided a comprehensive cost assessment including the consultation fee, associated procedures (when applicable), balance billing, patient OOP expenses, and annual incentivizing "best practice" payments. The latter account for up to 25% of total billing and contribute to changes in practice, management of out-of-hours care services, GP coordination of care, and health prevention, and thus encourage physicians to join the regulated sector.

Several large-scale international initiatives have addressed the issue of unit costs. For example, the Universities of Kent and York [13] and the National Health Care Institute in the Netherlands [14] have developed methods for estimating healthcare service production costs, and the European PECUNIA [6] project (not involving France) produced reference unit costs. These projects seek to harmonize evaluation methods, promote transferability, and increase the quality of economic evaluations internationally. However, the scope of these projects is often limited by methodological complexity; for example, the PECUNIA project evaluated only nine type of healthcare service. Our study adopted a similar unit cost estimation approach but had different objectives: to reduce variability in cost estimates of care pathways in the absence of a national reference framework outside hospitals. The use of a national medical-administrative

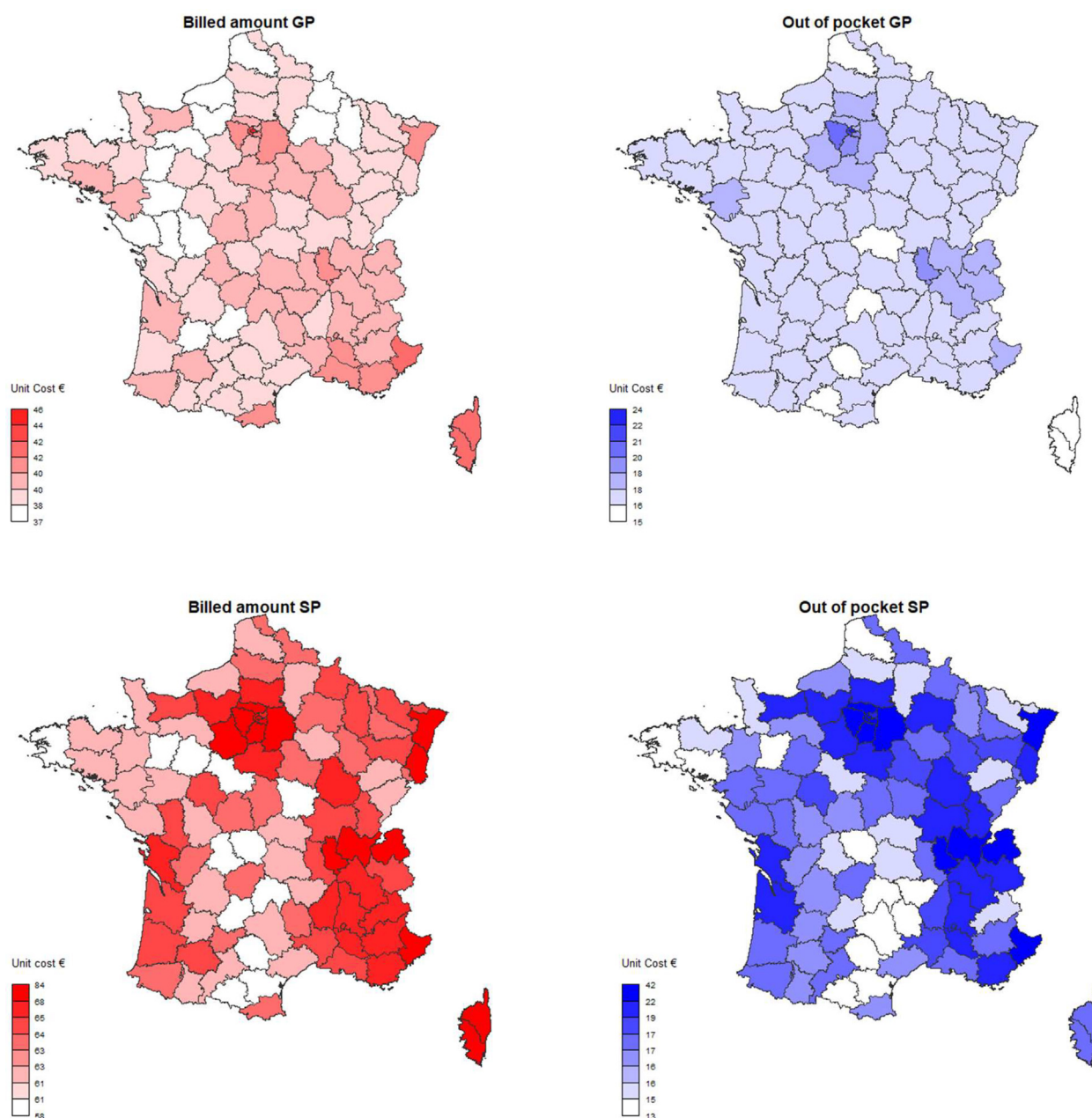


Fig. 2. Billed amounts (euros 2021) and out-of-pocket payments for general practitioner (GP) and specialist (SP) consultations across french counties, results from the MOVIE study.

database that records amounts billed and reimbursed by the SHI system means that a specific valuation method must be used; hence, methodological arbitrations across transnational frameworks are not necessary.

The present study therefore provided a national reference for unit costs, in order to improve the quality of economic evaluations, reduce uncertainty, and harmonize valuation practices. The use of a sample of SNDS data ensures methodological robustness and reflects the actual costs (including context-specific, annual lump-sum payments) borne by the French SHI system.

We estimated the mean cost of a consultation to be €39.8 (SD €12.6) for GPs and €66.1 (SD €37.1) for other specialist physicians. Several cost drivers were identified: the type/location of the consultation (the physician's office, the patient's home, or teleconsultation), whether a medical procedure was performed during the consultation, the patient's age and county of residence, and the practice's sector (a public-sector

hospital vs. private practice). The greatest variability was observed in consultations involving medical procedures (from €42.5 (5th percentile) to €163.9 (95th percentile)), with marked differences from one specialty to another. Other factors contributing to this variation included (i) regional differences in the proportion of "sector 2" physicians authorized to charge fees above the regulated tariff and (ii) heterogeneous distributions of patient age and disease incidence. These factors influence both the volume and complexity of consultations and procedures and thus generate cost variability.

At the national level, 212 million GP consultations were recorded. In 2021, the SNDS captured data from 4,294,409 healthcare services, and the total billed amount was €126 million. The ESND is a representative sample of 2% of the SHI beneficiaries in the SNDS. Extrapolated to the national population, the ESND represents nearly 215 million healthcare services, with reimbursements of €4,787 million and total expenditure

of €6,331 million for the general scheme (all payers). This difference arises because only the SHI system's general scheme and counties in mainland France were considered. These results confirm the high quality of the study's database queries.

In health economics evaluations of consultations, the 2021 baseline tariff of €25 is often used. However, we found that the cost was between €35.3 and €65.3 in 90% of cases (between the 5th and 95th percentiles). The difference reflects the omission of additional costs, such as excess charges and annual physician incentives. In a study of GP consultations in Austria in 2015, Mayer et al. [9] explored six different costing methods; the broad range in the resulting costs (from €15.6 to €42.6) highlights the importance of considering the method used. This variability might affect incremental cost-effectiveness ratios. The difference becomes even more pronounced when studies focus on populations with high consultation rates, such as older or frail populations. In such cases, consultation costs are underestimated even more.

To the best of our knowledge, the present study is the first of its kind in France. We expect that use of the study's results will increase the quality of economic evaluations. The study's outputs are ready for use in the wide range of health economic evaluations that require care pathways valuations. The results are relevant for clinical trials that are not paired with the SNDS, as well as for modelling studies, expert-based analyses, and budget impact analyses – all of which require cost data on care pathways. Furthermore, the study's results can be applied to other French projects or to comparative, non-French projects seeking to adapt their unit costs to the French healthcare context.

The study had several notable strengths. Firstly, comprehensive data on consultation expenses were available in the ESND, which corresponds to almost 2% of the population in France. Secondly, the results were reported not only for billed amounts but also for patient OOP expenses, which are rarely analyzed but are particularly relevant for specialists charging excess fees. As concerns about equity continue to grow in the field of health economics, this information is increasingly essential [15].

The study also had some limitations. Firstly, our analysis was restricted to the French SHI's general scheme; although the latter covers nearly the whole French population, the exclusion of certain subgroups potentially limits the generalizability of our findings. Furthermore, French overseas counties and territories were excluded from our study because they were not sufficiently represented in the ESND database. Secondly, and even though the ESND database is representative of the French population, the healthcare services recorded therein might not be fully representative of the services actually delivered. However, we systematically compared our extrapolated, ESND-based estimates with national population and expenditure data, which are the only indicators published annually by the authorities.

The primary objective of the present analysis was to promote consistency in practice, rather than to provide precise estimates of healthcare production costs. Use of the SNDS database required several assumptions to be made: (i) official tariffs were used as a proxy for production costs, even though they are regulated and cannot capture costs per year, per hour of work, or per patient contact; (ii) additional amounts related to annual allocations and social contribution support (not available in the SNDS) were distributed uniformly across healthcare professionals, based on annual consultation volumes per patient; and (iii) the SNDS sample in the ESND is representative of French beneficiaries but not of individual healthcare services. While these assumptions may introduce

some bias, they do not compromise the main goal of fostering consistent practices through the establishment of a reference framework for unit costs. Lastly, consultation tariffs change over time, and so our estimates will have to be updated on a regular basis. Indeed, funding will be sought to allow the project team to update the results using the same methodology. We shall have to determine how frequently such updates should be performed. For many years, healthcare service tariffs in France changed very little. However, the scope of general practice has been considerably expanded and prompted the revision of the consultation tariff. The fee for a GP consultation (set to €22 in 2000) was increased to €23 in 2011, €25 in 2017, €26.5 in 2023, and €30 in 2024. The fee for specialist consultation (though varying by specialty) was set to around €25 in the 2000s and has risen only slightly since to around €26.5. Very few of the 8,000 procedures listed in the *Classification Commune des Actes Médicaux* reference classification have been revised. In Germany, similar tariff-based work was initiated in 2015 and then updated in 2020 to account for price changes during the COVID-19 pandemic [16]. Revision of our results every five years might therefore be appropriate.

5. Conclusion

The present study provided the first comprehensive assessment of consultation costs for GPs and specialists in France. It captured billed amounts, patient OOP expenses, and annual incentivizing payments. Our results highlighted substantial variability in consultation costs as a function of the type of service, medical specialty, and geographic region. The key cost drivers were the consultation setting, the procedures performed, and the type of practice. By offering a more accurate, detailed costing framework, the present research should help to improve economic evaluations and guide resource allocation in the French healthcare system.

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Contribution of authors

CC: conception and design of the study, analysis and interpretation of data, writing the article, Final approval of the version to be submitted.

MM: conception and design of the study, analysis and interpretation of data, revising article critically for important intellectual content, Final approval of the version to be submitted.

NC: conception and design of the study, interpretation of data, revising article critically for important intellectual content, Final approval of the version to be submitted.

Declaration of competing interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Appendix 1. Medical specialty groups

GROUP	MEDICAL SPECIALTIES
ALLERGOLOGY	ALLERGOLOGY
VASCULAR MEDICINE	VASCULAR MEDICINE
INFECTIOUS AND TROPICAL DISEASES	INFECTIOUS AND TROPICAL DISEASES
MEDICAL GENETICS	MEDICAL GENETICS
MEDICAL ONCOLOGY	MEDICAL ONCOLOGY
HEMATOLOGY	HEMATOLOGY
ENDOCRINOLOGY AND METABOLISM	ENDOCRINOLOGY AND METABOLISM
SURGERY	ORAL SURGERY VISCERAL AND DIGESTIVE SURGERY VASCULAR SURGERY THORACIC AND CARDIOVASCULAR SURGERY PLASTIC, RECONSTRUCTIVE, AND AESTHETIC SURGERY MAXILLOFACIAL SURGERY AND STOMATOLOGY MAXILLOFACIAL SURGERY PEDIATRIC SURGERY ORTHOPEDIC AND TRAUMA SURGERY UROLOGICAL SURGERY NEUROSURGERY GENERAL SURGERY
NEPHROLOGY	NEPHROLOGY
GERIATRICS	GERIATRICS
PSYCHIATRY	CHILD AND ADOLESCENT PSYCHIATRY GENERAL PSYCHIATRY NEUROPSYCHIATRY
NEUROLOGY	NEUROLOGY
PHYSICAL MEDICINE AND REHABILITATION	PHYSICAL MEDICINE AND REHABILITATION
OPHTHALMOLOGY	OPHTHALMOLOGY
RHEUMATOLOGY	RHEUMATOLOGY
PULMONOLOGY	PULMONOLOGY
PEDIATRICS	PEDIATRICS
OTORHINOLARYNGOLOGY	OTORHINOLARYNGOLOGY
INTERNAL MEDICINE	INTERNAL MEDICINE
GASTROENTEROLOGY AND HEPATOLOGY	GASTROENTEROLOGY AND HEPATOLOGY
GYNECOLOGY AND OBSTETRICS	OBSTETRICS AND GYNECOLOGY / MEDICAL GYNECOLOGY OBSTETRICS MEDICAL GYNECOLOGY OBSTETRICS AND GYNECOLOGY
DERMATOLOGY AND VENEREOLOGY	DERMATOLOGY AND VENEREOLOGY
CARDIOVASCULAR MEDICINE	CARDIOVASCULAR MEDICINE
ANESTHESIOLOGY AND INTENSIVE CARE	MEDICAL INTENSIVE CARE ANESTHESIOLOGY AND SURGICAL INTENSIVE CARE

Appendix 2. Distribution of consultation costs (euros 2021) for general practitioners and specialist physicians

	Medical Specialties	Count	P5	Mean	SD	Median	P95
Amount billed							
Consultation	GP	3,828,059	35.3	38.9	12.0	35.3	60.3
Consultation	Specialist	2,524,516	30.0	66.4	37.3	57.6	127.6
Private practice	Specialist	2,029,124	37.6	69.8	36.4	59.8	127.6
outpatient	Specialist	547,788	25.0	52.7	37.7	42.6	130.2
Consultation							
Without procedure	Specialist	1,548,710	30.0	53.3	19.7	53.6	87.6
Without procedure	GP	3,678,912	35.3	37.4	7.1	35.3	50.4
With procedure	Specialist	975,806	42.5	87.1	47.8	77.6	163.9
With procedure	GP	149,147	38.7	75.1	33.1	72.8	127.7
Teleconsultation							
	Specialist	51,208	28.0	54.8	24.0	54.3	107.6
	GP	169,370	35.3	37.6	7.5	35.3	54.4
Home Visit							
	Specialist	1,188	34.4	65.2	28.8	57.6	127.6
	GP	296,980	45.3	53.0	14.1	45.3	81.3
Total	GP	4,294,409	35.3	39.8	12.5	35.3	65.3
	Specialist	2,576,912	30.0	66.1	37.1	57.6	127.6
Out-of-pocket							
Consultation	GP	3,828,059	10.3	18.0	7.4	18.8	28.8
Consultation	Specialist	2,524,516	0.0	20.9	24.1	15.0	59.9
Private practice	Specialist	2,029,124	0.0	24.5	25.4	19.0	64.9
outpatient	Specialist	547,788	0.0	6.9	9.7	0.0	24.8
Consultation							
Without procedure	Specialist	1,548,710	0.00	18.06	18.92	14.01	54.90
Without procedure	GP	3,678,912	10.3	17.6	6.4	18.8	28.8

(continued)

(Continued)

	Medical Specialties	Count	P5	Mean	SD	Median	P95
With procedure	Specialist	975,806	0.0	25.4	30.0	21.5	68.2
With procedure	GP	149,147	10.3	27.8	17.8	24.1	56.2
Teleconsultation							
	Specialist	51,208	0.0	12.4	21.9	1.0	62.0
	GP	169,370	10.3	12.7	4.8	11.3	19.3
Home Visit							
	Specialist	1,188	0.0	18.9	28.2	1.0	83.9
	GP	296,980	10.3	15.0	7.7	11.3	31.6
Total	GP	4,294,409	0.0	7.2	7.5	8.5	18.5
	Specialist	2,576,912	0.0	20.7	24.1	15.0	59.9

Appendix 3. Distribution of consultation costs (billed amount € 2021) according to the medical specialty

Medical Specialty	Proportion (%) of outpatient consultations	Count	P5	Mean	SD	Median	P95
ALLERGOLOGY	1	8,679	36.4	61.6	23.3	59.0	102.9
ANESTHESIOLOGY AND INTENSIVE CARE	36	117,503	28.0	48.1	18.7	50.0	72.6
SURGERY	36	315,049	30.0	59.8	47.6	55.0	107.6
DERMATOLOGY AND VENEREOLOGY	11	165,521	30.0	57.4	28.2	53.6	102.2
ENDOCRINOLOGY AND METABOLISM	30	48,692	30.0	54.2	20.8	53.6	87.6
GASTROENTEROLOGY AND HEPATOLOGY	31	82,980	30.0	60.2	40.6	57.6	117.6
MEDICAL GENETICS	92	2,186	25.0	46.4	22.6	50.0	77.5
GERIATRICS	52	3,044	30.0	51.1	32.2	37.6	106.8
GYNECOLOGY AND OBSTETRICS	24	295,141	30.0	68.1	34.1	62.6	132.6
HEMATOLOGY	85	10,831	28.0	42.6	18.3	35.0	72.6
INFECTIOUS AND TROPICAL DISEASES	32	337	25.0	43.8	15.8	37.6	72.6
GENERAL PRACTICE	0*	4,294,409	35.3	39.8	12.6	35.3	65.3
INTERNAL MEDICINE	82	30,458	28.0	50.4	30.9	46.2	107.6
PHYSICAL MEDICINE AND REHABILITATION	14	18,590	25.8	65.6	49.6	52.6	169.7
VASCULAR MEDICINE	2	19,929	36.4	87.2	30.1	83.2	127.9
NEPHROLOGY	58	14,519	30.0	44.3	16.6	37.6	66.5
NEUROLOGY	34	46,283	46.7	104.3	63.0	70.1	217.7
MEDICAL ONCOLOGY	68	23,142	28.0	40.2	18.9	35.0	67.6
OPHTHALMOLOGY	10	474,553	35.6	69.7	36.6	62.6	132.6
OTORHINOLARYNGOLOGY	20	136,657	30.0	67.5	33.6	60.7	117.6
CARDIOVASCULAR MEDICINE	17	228,474	44.3	91.4	36.4	84.6	157.6
PEDIATRICS	14	169,047	30.0	50.8	19.8	39.6	84.6
PULMONOLOGY	30	69,571	30.0	82.9	43.9	84.4	153.5
PSYCHIATRY	3	208,702	46.7	64.9	21.9	54.3	107.6
RHEUMATOLOGY	14	87,024	30.0	62.3	28.9	57.6	117.6

*There is no GP consultation in outpatient care.

Appendix 4. Distribution of OOP costs (€ 2021) according to the medical specialty

Medical Specialty	Count	P5	Mean	SD	Median	P95
ALLERGOLOGY	8,679	1.0	19.9	14.5	16.0	47.2
ANESTHESIOLOGY AND INTENSIVE CARE	117,503	0.0	14.4	15.0	10.0	40.9
SURGERY	315,049	0.0	21.6	31.1	15.0	56.0
DERMATOLOGY AND VENEREOLOGY	165,521	0.0	21.7	21.9	15.0	62.8
ENDOCRINOLOGY AND METABOLISM	48,692	0.0	14.2	19.4	9.0	48.0
GASTROENTEROLOGY AND HEPATOLOGY	82,980	0.0	14.9	17.1	15.0	43.8
MEDICAL GENETICS	2,186	0.0	8.2	13.2	3.0	22.6
GERIATRICS	3,044	0.0	9.4	20.1	1.0	51.0
GYNECOLOGY AND OBSTETRICS	295,141	0.0	25.6	24.6	18.8	70.0
HEMATOLOGY	10,831	0.0	4.7	11.9	0.0	18.8
INFECTIOUS AND TROPICAL DISEASES	337	0.0	11.8	12.6	9.0	40.0
GENERAL PRACTICE	4,294,409	0.0	7.2	7.5	8.5	18.5
INTERNAL MEDICINE	30,458	0.0	9.4	18.4	0.0	40.0
PHYSICAL MEDICINE AND REHABILITATION	18,590	0.0	20.7	23.8	13.6	64.9
VASCULAR MEDICINE	19,929	0.0	19.6	18.9	21.9	53.1
NEPHROLOGY	14,519	0.0	3.0	9.2	0.0	16.0
NEUROLOGY	46,283	0.0	20.1	28.4	13.2	70.7
MEDICAL ONCOLOGY	23,142	0.0	3.2	14.1	0.0	16.0
OPHTHALMOLOGY	474,553	0.0	27.3	26.2	23.2	64.6
OTORHINOLARYNGOLOGY	136,657	0.0	23.8	21.7	18.9	56.0
CARDIOVASCULAR MEDICINE	228,474	0.0	15.5	21.3	2.0	54.5
PEDIATRICS	169,047	0.0	15.8	16.1	9.6	47.6
PULMONOLOGY	69,571	0.0	14.7	17.3	10.0	45.2
PSYCHIATRY	208,702	0.0	20.5	24.6	15.0	72.7
RHEUMATOLOGY	87,024	0.0	20.3	19.6	16.0	55.8

Appendix 5. National expenditures of GP service: comparison of estimated data with national aggregated data

	NATIONAL AGREGATED DATA (MILLION)	ESND 2021 (2%)	NATIONAL EXTRAPOLATED 2021 (100%)	DIFFERENCE
COUNT	213*	4.29	214.6	1.6
NATIONAL EXPENDITURE	8,179	126.6	6,331	1,848
NATIONAL OOP	2,100	30.9	1,544	556

* <https://www.assurance-maladie.ameli.fr/etudes-et-donnees/activite-medecins-liberaux-ape-region>

References

[1] Fischer C, Mayer S, Perić N, Simon J. Harmonization issues in unit costing of service use for multi-country, multi-sectoral health economic evaluations: a scoping review. *Health Econ Rev* 2022;12(1):42. Aug 3.

[2] Mogyorosy Z. The main methodological issues in costing health care services. 2005;

[3] Oostenbrink JB, Koopmanschap MA, Rutten FFH. Standardisation of costs. *PharmacoEconomics* 2002;20(7):443–54 Jun 1.

[4] Riewpaiboon A. Standard cost lists for health economic evaluation in Thailand. *J Med Assoc Thai* 2014;97(Suppl 5):S127–34 May 1.

[5] Vo T. National reference unit cost of health-care services: international experiences. *Asian J Pharm* 2018;12:S27–37 Aug 1.

[6] Mayer S, Berger M, Konnopka A, Brodsky V, Evers S, Hakkaart-van Roijen L, et al. In search for comparability: the PECUNIA reference unit costs for health and social care services in europe. *Int J Environ Res Public Health* 2022;19(6):3500. Mar 16.

[7] Mayer S, Berger M, Perić N, Fischer C, Konnopka A, Brodsky V, et al. The development of a new approach for the harmonized multi-sectoral and multi-country cost valuation of services: the PECUNIA reference unit cost (RUC) templates. *Appl Health Econ Health Policy* 2024;22(6):783–96 Nov 1.

[8] Castelli C, Mounié M, Costa N. Le défi de la standardisation des coûts : construction d'un référentiel statistique de coûts unitaires des prestations en santé. *J Gest Déconomie Santé* 2024;1(1):58–72 May 7.

[9] Mayer S, Fischer C, Zechmeister-Koss I, Ostermann H, Simon J. Are unit costs the same? A case study comparing different valuation methods for unit cost calculation of general practitioner consultations. *Value Health J Int Soc Pharmacoeconomics Outcomes Res* 2020 Sep;23(9):1142–8.

[10] Tuppin P, Rudant J, Constantinou P, Gastaldi-Ménager C, Rachas A, de Roquefeuil L, et al. Value of a national administrative database to guide public decisions: From the système national d'information interrégimes de l'Assurance Maladie (SNIIRAM) to the système national des données de santé (SNDS) in France. *Rev Épidémiologie Santé Publique* 2017;5278(1004):141–242 Oct.

[11] Jabri K. (DREES/OSAM/BES). Les dépenses de santé en 2019 >édition 2020 >DREES.

[12] 2021-10-SpF-SNDS-ce-qu'il-faut-savoir-v3-MPL-2.0.pdf [Internet]. [cited 2026 Feb 13]. Available from: https://documentation-snds.health-data-hub.fr/files/Sante_publique_France/2021-10-SpF-SNDS-ce-qu'il-faut-savoir-v3-MPL-2.0.pdf

[13] Unit Costs 2022-2027 [Internet]. Care and Outcomes Research Centre. [cited 2026 Feb 10]. Available from: <https://research.kent.ac.uk/corec/unit-costs-2022-2027/>

[14] Guideline for economic evaluations in healthcare | National Health Care Institute [Internet]. [cited 2026 Feb 10]. Available from: <https://english.zorginstituutnederland.nl/about-us/working-methods-and-procedures/guideline-for-economic-evaluations-in-healthcare>

[15] Ward T, Mujica-Mota RE, Spencer AE, Medina-Lara A. Incorporating equity concerns in cost-effectiveness analyses: a systematic literature review. *PharmacoEconomics* 2022;40(1):45–64 Jan.

[16] Muntendorf LK, Brettschneider C, Konnopka A, König HH. Aktualisierung der standardisierten Bewertungssätze aus gesellschaftlicher Perspektive für gesundheitsökonomische Evaluationen. *Gesundheitswesen* 2024 May;86(05):389–93.