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Health-economic analysis of digestive stents in France based on the French social insurance Healthcare database

Methods

Study design

Observational retrospective study conducted using the French national hospital database (Programme de Médicalisation des Systèmes d'Information, PMSI).

Aim

Describe cost of stays and implantation of digestive stents (DS) and simulate the impact of potential inclusion of DS in DRGs (Diagnosis Related Group).

Study population

Patients who received a DS implantation in France in 2019 and 2020. Hospital stays with less than 10 relevant codes for medical devices were included. Non-metallic expandable stents were not described because they were only use in DRG 06M03 and in fewer than 10 hospital stays.

Selection of DRG

Digestive stents are used for digestive and biliary indications. Given the diversity of DRGs in which these devices can be used (240 DRGs for the digestive location identified from diagnostic codes), the two DRGs most represented in each of these indication categories were selected for analysis.

Variables of interest

The costs of hospital stays were calculated for public and private hospitals, by taking into account the value reimbursed as compared to the price paid by the hospital.

We explored the impact of including the cost of the DS in the DRG, for biliary and nonbiliary locations in both the private and public hospital setting. The impact on the cost of the stay was calculated as follows:

Impact = *Cost after integration - Cost before integration :*

Cost before integration = *DRG tariff+ sum of MD purchase prices*

Cost after integration = *DRG tariff + 2019-2020 average price of MD/ hospital stay for the total number of stays.*

Conclusion

This analysis has highlighted the challenges of integrating DS into DRG tariffs :

- **The use in many DRGs (240 for digestive location) and therefore a difficulty in identifying "coherent" DRG in which to reintegrate the costs of DS, then economically penalizing the many cases of use outside of these DRGs**
- **The very low frequency of use of these products within coherent DRGs,**
- **The significant income loss observed, would be extremely detrimental for expert centers in these techniques.**

The integration of these products into the DRGs would result in a remuneration too high for establishments that use these products infrequently, and therefore a financial incentive not to use them. On the contrary, it would be an economic penalty for hospitals specializing in these procedures. These centres could have a loss of up to €-554,000 per hospital, which would be unsustainable. These establishments would then either have to switch to use another alternative, which could generate additional costs for the health insurance, or compensate for this shortfall on other patients. The consequences would be a detrimental impact on the care of patients who would no longer have access to these products, and would lead to uncertain savings for the health insurance system.

Results

Expandable metallic · Non-expandable non-metallic

Digestive localizations

1,034,900 stays — DRG 06K02

Therapeutic digestive endoscopies and anaesthesia: stays of less than 2 days

Public	Private
295,082 stays	739,804 stays
-293,922 stays (99.6%)	-738,597 stays (99.8%)

exclusion: Stays without DS

Hospital stays with DS

1,160 stays	1,207 stays
Expandable 1,066 91.9%	Expandable 757 62.7%
Non-Expandable 94 8.1%	Non-Expandable 450 37.3%

Frequency of use in the DRG

0.4% | 0.2%

Number of DS

1,260 DS	1,535 DS
1,121 (89.0%)	795 (51.8%)
139 (11.0%)	740 (48.2%)

Economic weight in DRG

Total cost of DS

€977,832	€775,112
€963,641 (98.5%)	€698,050 (90.1%)
€14,191 (1.5%)	€77,061 (9.9%)

Total of DRG tariff

€1,026,421	€572,296
€943,248 (91.9%)	€359,209 (62.8%)
€83,173 (8.1%)	€213,087 (37.2%)

Ratio between cost of DS and DRG tariff

102.2% | 95.3% | 17.1%

194.3% | 135.4% | 36,2%

Economic impact of the inclusion in the DRG tariff per hospital

Each bar of the graph represents the economic impact on one hospital

max: €8,500 … min: €-111,100

max: €5,700 … min: €-112,700

161,711 stays — 07M02

Biliary tract disorders

Public	Private
119,804 stays	40,857 stays
-108,710 stays (90,3%)	-34,022 stays (82,4%)

exclusion: Stays without DS

Hospital stays with DS

11,094 stays	6,835 stays
6,806 (61,3%)	4,357 (63,7%)
4,288 (38,7%)	2,478 (36,3%)

Frequency of use in the DRG

9,7% | 17,6%

Number of DS

13,850 DS	8,155 DS
8,060 (58,2%)	4,961 (60,8%)
5,790 (41,8%)	3,194 (39,2%)

Economic weight in DRG

Total cost of DS

€7,436,929	€4,688,657
€6,839,373 (92,0%)	€4,356,023 (92,9%)
€597,556€ (8,0%)	€332,634 (7,1%)

Total of DRG tariff

€42,361,253	€9,890,972
€26,933,121 (63,6%)	€6,603,392 (66,8%)
€15,428,132 (36,4%)	€3,287,580 (33,2%)

Ratio between cost of DS and DRG tariff

25,4% | 17,6% | 3,9%

66,0% | 47,4% | 10,1%

Economic impact of the inclusion in the DRG tariff per hospital

Each bar of the graph represents the economic impact on one hospital

max: €40,400 … min: €-554,000

max: €39,000 … min: €-111,000

280,800 stays — DRG 06M03

Other gastroenteritis and various diseases of the digestive tract, over 17 years of age

Public	Private
209,499 stays	71,291 stays
-208,348 stays (99.4%)	-70,629 stays (99.1%)

Hospital stays with DS

1,151 stays	662 stays
Expandable 1,108 96.3%	Expandable 637 96.2%
Non-Expandable 43 3.7%	Non-Expandable 25 3.8%

Frequency of use in the DRG

0.6% | 0.9%

Number of DS

1,261 DS	717 DS
1,197 (94.9%)	679 (94.7%)
64 (5.1%)	38 (5.3%)

Economic weight in DRG

Total cost of DS

€1,041,153	€600,157
€1,034,521 (99,4%)	€596,199 (99,3%)
€6,632 (0,6%)	€3,958 (0,7%)

Total of DRG tariff

€4,379,000	924,780
€4,245,355 (96,7%)	€885,537 (95,8%)
€133,674€ (3,1%)	€39,243 (4,2%)

Ratio between cost of DS and DRG tariff

24.0% | 24.0% | 5.0%

67.3% | 64.9% | 10.1%

Economic impact of the inclusion in the DRG tariff per hospital

Each bar of the graph represents the economic impact on one hospital

max: €6,700 … min: €-40,500

max: €9,700 … min: €-120,600

86,033 stays — 07M06

Malignant disorders of the hepatobiliary system or pancreas

Public	Private
65,830 stays	19,511 stays
-60,332 stays (91%)	-19,511 stays

Hospital stays with DS

5,498 stays	3,647 stays
4,463 (81,2%)	2,986 (81,9%)
1,035 (18,8%)	661 (18,1%)

Frequency of use in the DRG

9% | 19,6%

Number of DS

6,688 DS	4,244 DS
5,247 (78,5%)	3,378 (79,6%)
1,441 (21,5%)	866 (20,4%)

Economic weight in DRG

Total cost of DS

€4,624,381	€3,056,258
€4,475,997 (96,8%)	€2,966,076 (97,0%)
€148,384 (3,2%)	€90,182 (3,0%)

Total of DRG tariff

€30,417,015	€7,519,930€
€24,930,901 (82,0%)	€6,215,737 (82,7%)
€5,486,114 (18,0%)	€1,304,193 (17,3%)

Ratio between cost of DS and DRG tariff

18,0% | 15,2% | 2,7%

47,7% | 40,6% | 6,9%

Economic impact of the inclusion in the DRG tariff per hospital

Each bar of the graph represents the economic impact on one hospital

max: €-65,000 … min: €-138,500

max: €35,100 … min: €-199,000

PMSI bases provided by ATIH, Data controller: Becton, Dickinson (ex Bard France) (Declaration of conformity n° 2214421 of 07/17/2019), Boston Scientific SAS (Declaration of conformity n° 2207044 of 09/25/2018), COOK France (Declaration of conformity n° 2224320 of 11/22/2021), Duomed (ex Life Partners Europe) (Declaration of conformity n° 2223772 of 09/30/2021); Processing implementation officer: HEVA. Study registered under MR006 with the Health Data Hub on 29/09/2022.