Cost Objects: The ED Dilemma. How is your ED performing?

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Abstract

Background The aim of this study is to propose a list of cost objects that can be used by any ED to compute costs considering that the resulting data must facilitate unit management by improving the information available for decision-making. Methods This study considers two stages, first, We analyzed the case-mix of two hospitals collecting their data to define and diagram their processes, activities and to obtain their cost objects, second, we used four additional hospitals to validate our initial findings. Results We recognized 59 cost objects. Hospitals may have all these cost objects or just a subset of them depending on the services they provide. Conclusions Among the main benefits of our cost objects definition are: the possibility of tracing the processes generated by the services delivered by EDs, the economic sense in its grouping, the chance of using any costing methodology, the flexibility with other classification systems such as DRGs and ICDs, and the opportunity of costing for both diseases and treatments. Furthermore, cost comparison among hospitals using our final 59 cost objects list is more accurate and based on comparable units. In different EDs, each cost object will be the result of a similar combination of activities performed. We also present the results of applying this cost objects list to a particular ED. A total of 54 out of 59 cost objects were identified for that particular unit within a calendar year.

Background

Emergency care expenditures are a growing problem both in Chile and worldwide. The level of emergency care spending in the United States is between 5% and 6% of the total health expenditure, reaching 10% in some states(1). However, it is still unclear how much it costs to deliver emergency care worldwide. The reason is twofold. Firstly, cost calculation of clinical processes of Emergency Departments (EDs) does not allow comparison between healthcare units or services. Secondly, no standardized categorization for grouping costs has been defined, i.e. cost objects. A cost object is anything for which a separate measurement of costs is desired(2). In health care, cost objects could be patients, products, projects, service contracts, and any other work unit(3).

Cost Objects

Different published studies use various types of cost objects for EDs. For example, cost objects of an ED can be classified into three types based on the patient's status: Urgency; Emergency and Non-Emergency(4). This definition addresses the classification of patients from a more macro perspective. Other key cost objects that have been used for allocation are: Diagnostic Related Groups (DRGs)(5) and case-mix by using the international classification of diseases (ICD)(6). These two classifications do not provide complete information about ED services, since they were designed to facilitate billing considering ED charges according to the acuity level of the patient and the intensity of supplies and services provided, so most of the time EDs are seen as an intermediate service. Therefore, DRGs and ICDs do not describe the mix of services that hospitals provide to emergency patients.

Other studies consider cost objects just for a subset of ED cases, such as: division costs for services to specific patients, for example hospitalized patients(7) and pre-selected diseases(8). Another methodology to compute the costs of the clinical processes in EDs, uses homogeneous functional groups, which are defined based on similar consumption activities followed by an imputation to clinical processes(9). However, the authors proposing this methodology do not present the cost objects and suggest that each hospital should code their own diseases according to the ICD. Similarly, other authors define cost objects clustering as groups whose services similar demands for ED functions (i.e. ambulatory patient groups, physicians' current procedural terminology groups)(10). This study uses a hypothetical ED and as the authors mentioned the system can be refined.

Other studies use cost centers related to patients. For example, a study of emergency care costs in a tertiary care level hospital identified cost centers related to the ED, and then, estimating the total costs of providing emergency care dividing by year, day, hour and patient(11). However, this study does not distinguish the different services and processes carried out by the ED. Therefore, it can be observed that there is still no consensus on how to classify cost objects for EDs. In fact, the choice of cost objects is difficult given the variety of services provided, yet very important. In this study we consider that a correct definition of cost objects should aim to measure the costs of either treatments or diseases if needed, and trace the processes and services provided by the ED considering the whole set of processes and activities the ED perform not just a subset.

Cost objects have enormous financial importance because they are the foundations of health insurance billing, and thus are tied up to health systems financing. The lack of standardization and homogeneity in defining cost objects make comparing among units/services difficult and sometimes even impossible. Being unable to make comparisons hinders decision-making within the ED. Therefore a common definition of cost objects is required, in other words the same vocabulary for recording, reporting and monitoring emergency health problems. Thus, this paper aims to create a standardized list of cost objects for EDs that can be used to collect feasible data for decision-making purposes and to provide global data for analysis. Additionally, in order to test the viability of implementing this list of cost objects with a costing methodology, in this particular case we use the activity-based costing (ABC) method.

The ABC methodology has being posed as a promising model for measuring costs and for making effective cost improvement decisions for the ED. ABC is a costing methodology that identifies activities in an organization for assigning overhead costs in a more precise manner (indirect costs) to products or services(12). In the healthcare sector, there have been attempts to apply the ABC costing methodology since the 1990s due to the need to have more accurate and practical costing systems for a more effective cost control(13–15).

Authors who applied ABC to EDs argue that this methodology allows for a better imputation of costs, eases processes monitoring, allows inter and intra-hospital comparisons, provides more realistic information and adapts better to the clinical decision process based on protocols(9). Another application of ABC in EDs includes a cross-sectional study using accounting data from an Iranian hospital(16). They

compared the results obtained through ABC to those obtained through traditional costing, concluding that hospitals managers have a more valuable accounting system using ABC, which provides a true insight into the organizational cost of each department within the hospital. Another application computed the costs for all healthcare services, arguing that these results can be directly applied for pricing and management purposes and also that it is feasible to apply ABC in a developing country setting(17). This study was conducted in a Peruvian Non-Governmental Organization (NGO) providing healthcare services including those from emergency consultations. Finally, another study computed the total cost of patient care in an ED using Time-Driven Activity-Based Costing (TDABD)(18). The total cost of any healthcare condition or symptom was calculated as the total cost of all processes during an ED visit.

Consequently, in this study we identified a list of cost objects for EDs and applied activity-based costing methodology to test the feasibility of using the cost objects list proposed for a specific ED. The main contribution of this research is that it provides EDs with a standardized list that would benefit them through tracing their processes, computing costs and allowing comparisons among other ED hospitals. The next section presents the methodology used to achieve these purposes.

Methods

In order to determine cost objects in EDs, this study considers two stages and a sample including a total of six hospitals. The first stage includes both on-site observations and interviews conducted in two different EDs. To ensure a more representative sample, the first hospital selected (hospital 1 in Table 1) is located in Santiago (the Chilean capital), while the second hospital selected is located in a smaller urban city (hospital 2 in Table 1). The observation and interviewing process lasted approximately three months in each ED, and as a result, diagrams using the Unified Modeling Language (UML) were constructed for each unit. The diagrams were then validated with personnel with at least five years of work experience at the unit. Subsequently, to elaborate a more comprehensive diagram that included the complexity of both cases observed so far, the diagrams were compared to each other considering the similarity and variability of the tasks required in each process and the resources needed to performed them.

The purpose of the second stage of this study was to validate the resources employed (direct and indirect costs), as well as the activities performed and services delivered (cost objects) for EDs. Using convenience sampling, four additional EDs were selected to further validate the diagram (hospitals 3 through 6 in Table 1). Table 1 shows some relevant descriptive information about the hospitals included in this study, as well as descriptive information on the healthcare professionals that were involved in the validation process.

In the following paragraphs we present a step by step description of the methodology executed to construct cost objects for EDs. Steps 1 through 5 correspond to stage 1 of this study, while step 6 and 7 correspond to stage 2.

Step 1: ***Collecting the data to define processes***. Through observation and interviews with all healthcare professionals working at the two EDs included in this study at this point (hospital 1 and 2), all the processes performed within the ED were identified, considering all the tasks needed to carry them out. Each one of the tasks is considered an activity and a comprehensive list including all the activities identified was elaborated. Observation occurred at different points in time (season, day of the week and time during the day) to account for seasonal effects.

Step 2: ***Diagraming the processes***. Using a workflow chart (using UML), all the activities identified in the previous step were diagramed considering which ones needed to be performed in sequence and which ones could be conducted in parallel.

Step 3: ***Checking the databases available to complete the process information***. To make sure that all the processes needed to provide services that could be performed at the ED were considered, a list of all services accounted for each patient within the last two years was checked. When services provided very unfrequently were detected, the processes needed to provide them were included in the workflow charts, and therefore, the processes needed to perform them were identified.

Step 4: ***Elaborating and validating processes and activities performed by the ED***. All the tasks (activities) for each process were defined. The comprehensive list of activities identified, now all included in a workflow chart, were validated using the expertise of at least one physician and one nurse from the ED, preferably those that had being working at the department the longest (see Table 1). Validation of both the description and the succession of the activities occurred.

Step 5: ***Defining cost objects for the ED***. Once the list of identified activities was validated, groups of activities were created using three criteria. Firstly, activities were grouped according to their nature and sequence. The groups must be mutually exclusive in terms of activities, to avoid double counting when costing patients and represent 100% of the services provided by the ED. The latter translates into having combinations of groups of activities that are consumed by patients without having an overlap of activities performed, unless those activities are in actuality executed multiple times. Each one of the groups elaborated will become a cost object of the ED. Secondly, these cost objects will allow us to trace back the processes and services the ED perform. Thirdly, these cost objects can be aggregated in order to compute the costs of treatments and diseases (using any coding system).

Stage 2: Validating the cost objects

Step 6: ***External validation of the activities.*** The final list of activities from stage 1 was validated in four EDs by healthcare professionals with expertise at the unit (see hospital 3 to 6 in Table 1).

Step 7: ***External validation of the cost objects.*** The final list of cost objects from stage 1 was validated in the same four EDs by the same healthcare professionals as the previous step (see hospital 3 to 6 in Table 1).

After the validation process we tested the feasibility of applying these cost objects in order to calculate costs using the ABC method at a particular ED. The list of cost objects and activities derived from this study as well as the application of the ABC method are presented in the results section.

< Insert Table 1, here >

Results

As shown in Table 2, we identified a total of 59 cost objects for EDs. A particular ED may provide all the services listed in Table 2 or a subset of them.

< Insert Table 2, here >

Below we present the costs for all the cost objects identified in the ED from Hospital 1, using the ABC method. We calculated the cost of 54 out of the 59 cost objects that this ED provided within a calendar year. We identified and costed 6 processes and 73 activities. Figure 1 shows the indirect costs of the processes that took place in the selected ED.

< Insert Figure 1, here >

As shown in Figure 1, the medical care process has the higher proportion (36.9%) of indirect costs whereas the administrative and logistic processes consume more than half (52.1%) of the indirect resources. In order to carry out ABC, we need to recognize the tasks that make up these processes, i.e. the activities. Table 3 presents the eight most expensive activities from this ED.

< Insert Table 3, here >

The next step of ABC is to allocate the cost of the activities to the cost objects. The cost objects are the 54 services provided by the ED. Table 4 shows the final allocation of direct and indirect costs to these services. The services with the highest total costs are medical consultation, phleboclysis and Preparation of patients for hospitalization. However, if the unit cost is considered, the most expensive services correspond to teaching activities, referral and resuscitation.

< Insert Table 4, here >

The proposed cost objects list can also be used to accumulate costs at different levels, such as patient or diagnoses. Table 5 shows an example of how costs can be aggregated at a diagnosis level, using the Pneumonia due to Streptococcus pneumoniae diagnosis (code J13 in the ICD-10 coding system).

< Insert Table 5, here >

As shown in Table 5, treating a patient diagnosed with Pneumonia due to Streptococcus pneumoniae costs $43,710. This cost includes only the services provided by the Emergency Department. However, the revenue linked to those services could be imputed to the ED or to another unit at the hospital, given the

classification of the services for billing purposes. In this particular case, the total revenue imputed to the ED corresponded to $19,050. Hence, the ED had losses for an average of $24,660 per patient treated for that diagnosis in the time period included in the analysis.

The results are discussed in the next section.

Discussion

This study proposes a methodology to identify a cost objects list for EDs that facilitates their management by improving the information available for decision-making. The analyzed case-mix allowed us to recognize 59 cost objects. This list of cost objects is better than the proposals to date because it meets with the following three design criteria: 1) Cost Objects are related to diseases, their treatments and their associated activity groups; 2) they are mutually exclusive and represent 100% of the services; 3) It allow us to trace back the processes and services provided by the ED. Hospitals may have all these cost objects or just a subset of them depending on the services they provide. The method proposed in this study can be applied to any hospital; however the final list of cost objects may differ depending on the treated cases.

Both the method to define cost objects for EDs and the cost objects list proposed are independent of the costing methodology employed. For instance, either activity-based costing or volume-based costing may be used to calculate costs.

In comparison with previous studies, such as those using patient's severity status as cost objects (Urgency; Emergency and Non-Emergency)(4), our proposed cost objects may both reach this level of aggregation as well as others, such as diagnoses, pre-selected diseases, case-mix and services. The same advantage can be seen when comparing to the cost objects proposal by several other authors(5,7,8) Among the main benefits of our cost objects definition are: the possibility of tracing the processes generated by the services delivered by EDs, the economic sense in its grouping, the chance of using any costing methodology, the flexibility with other classification systems such as DRGs and ICDs, and the opportunity of costing for both diseases and treatments. Furthermore, cost comparison among hospitals using our final 59 cost objects list is more accurate and based on comparable units. In different EDs, each cost object will be the result of a similar combination of activities performed.

The definition of cost objects is crucial, because hospital managers can expand their analysis by focusing on continuous improvement to increase the value of care. Additionally, calculating costs through ABC would help focus improvement efforts even more, for example, it would help detect which activities do not add value, optimize processes of providing services and provide more realistic cost estimates(19).

The use of the proposed methodology makes it possible to associate cost objects with service revenue. This enables assessing the margin by each group of services. In addition, it facilitates the creation of transfer prices between different units of a hospital. In the case of the emergency unit this is especially

important because many of the patients are transferred to or attended by other units. In these cases the ED does not receive the proportional compensation corresponding to the services delivered, such as, management of imaging tests, preparation of patients for surgery and medical interconsultation. Therefore, this methodology could help assess the potential economic impact of an ED within the hospital.

The proposed methodology for defining cost objects is applicable to any case. However, the list of cost objects generated as a result of this study may not include all the services that could be provided in an ED for three reasons. First, this study analyzed a sample of six EDs. Second, technological advances could change services currently provided and make others obsolete. Lastly, epidemiological changes may demand new services.

The systematic application of this cost objects definition will enable managers to have better cost information for analysis and decision-making to avoid underfunding of EDs. Additionally, calculating these cost objects over time will allow internal comparability and benchmarking with other ED facilities. Governments should encourage these types of methodologies in order to promote transparency, efficiency, and cost control through a better calculation of ED charges.

Future research could use this cost objects list to assess whether the systematic comparison of income and costs within the emergency unit, as well as between different EDs, would allow us to detect opportunities for improvement indicating which processes should be intervened.

CONCLUSIONS

Cost objects have financial importance because they are the foundations of health insurance billing, and thus are tied up to health systems financing. Different published studies use various types of cost objects for EDs. However, the lack of standardization and homogeneity in defining cost objects make comparing among units/services difficult and sometimes even impossible.

This study provides EDs with a standardized list that facilitates their management. This list is better than the proposals to date and can be applied to any hospital. Hospitals may have all these cost objects or just a subset of them depending on the services they provide. This list allows to trace processes, compute costs and comparability among other EDs, provides an economic sense in its grouping, and it is flexible with any costing methodology and classification system.

Abbreviations

EDs: Emergency Departments.

DRGs: Diagnostic Related Groups

ICD: International Classification of Diseases

ABC: Activity-Based Costing

NGO: Non-Governmental Organization

TDABD: Time-Driven Activity-Based Costing

UML: Unified Modeling Language

Declarations

Ethics approval and consent to participate

This article does not require ethics approval. There is not human involvement in this study. Consent from the patient is not required, this study reports an assessment of the hospital situation not at the patient level. A consent form was written and signed to participate in the project.

Consent for publication

Not Applicable

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare no competing interests

Authors' contributions

The contribution of the author was as followed: VF developed the original research idea and questions, obtained the data for this study, conducted data analysis, interpreted the results, and wrote the manuscript. LN contributed to the original research idea and questions, interpreted the results, and contributed to the writing and revisions of the manuscript. AN conducted data analysis, interpreted the results, and wrote the manuscript. RM contributed to the writing and revisions of the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1: Hospitals ED included in the sample.

Institution	Used in	Characteristic	Number of beds	Interviewee's position	Years of Experience
Hospital 1	Stage 1	High Complexity and Teaching Hospital	607	Physician	6
				Physician	8
				Nurse	10
Hospital 2	Stage 1	High Complexity Hospital	466	Nurse	11
				Nurse	8
Hospital 3	Stage 2	High Complexity Hospital	340	Physician	7
				Physician	5
				Nurse	18
Hospital 4	Stage 2	Specialty High Complexity Hospital	176	Physician	12
				Nurse	21
				Technician	6
Hospital 5	Stage 2	High Complexity Hospital	211	Physician	8
Hospital 6	Stage 2	High Complexity Hospital	545	Physician	8
				Physician	8

Table 2: List of Cost Objects for EDs.

N°	Services
1	Administration of drugs by subcutaneous or intravenous injection
2	Administration of noninjectable drugs
3	Administration of noninjectable prescribed drugs
4	Administration of prescribed drugs by subcutaneous or intravenous injection
5	Alcohol screening test
6	Application of a larger orthopedic medical cast
7	Application of a shorter orthopedic medical cast
8	Arterial blood gas sample
9	Black braded silk suture
10	Bladder instillation
11	Blood culture sample
12	Blood glucose test
13	Blood sampling
14	Burn wound dressing
15	Catgut suture
16	Complex foreign body extraction
17	Complex wound dressing
18	Diagnostic and therapeutic puncture
19	Diagnostic puncture

Table 2: List of Cost Objects for EDs (continue)

N°	Services
20	Discharge of deceased patients
21	Electrocardiogram
22	Endotracheal intubation
23	Enema
24	Feeding tube insertion
25	Histoacryl
26	Intramuscular drugs administration
27	Intramuscular prescribed drugs administration
28	Installation of a removable cast walker boot
29	IV fluid change
30	Life risk care management
31	Management of imaging tests
32	Medical attention of patients arrived by ambulance
33	Medical consultation
34	Medical interconsultation
35	Medium-complex foreign body extraction
36	Monofilament nylon suture
37	Nebulization
38	Observation day
39	Orthopedic trauma medical attention
40	Oxygen therapy
41	Phleboclysis
42	Polypropylene suture
43	Preparation of patients for hospitalization
44	Preparation of patients for surgery
45	Reduction
46	Referral
47	Resuscitation
48	Secretion clearance
49	Simple foreign body extraction
50	Simple wound dressing
51	Skin suture
52	Splinting
53	Stomach pumping
54	Stool sample
55	Teaching activities
56	Urethral sounding
57	Urine specimen collection
58	Verify injuries
59	Vicryl suture

Table 3: Eight most expensive activities (CLP).

Ranking	Activity name	Process name	Annual Cost (CLP)
1	Medical re-evaluation	Medical care	$ 152,047,070
2	Medical evaluation	Medical care	$ 146,054,786
3	Record indications to the patient	Administrative process	$ 88,170,350
4	Patient management for imaging examination	Logistic process	$ 54,408,062
5	Management of the unit	Administrative process	$ 37,020,211
6	Clinical admission	Administrative process	$ 36,199,886
7	Withdraw supplies for procedures, meds administration and sample taking	Logistic process	$ 34,493,631
8	Take vital signs	Diagnosis support procedures	$ 29,179,405

Table 4: Total Costs for ED Cost Objects (CLP)

Ranking	Services	Indirect Costs	Direct Costs	Total Costs	Unit Costs
1	Medical consultation	$ 487,445,524		$ 487,445,524	$ 11,710
2	Phleboclysis	$ 67,044,073	$ 30,557,075	$ 97,601,148	$ 7,426
3	Preparation of patients for hospitalization	$ 91,101,584	$ 1,912,126	$ 93,013,711	$ 17,007
4	Management of imaging tests	$ 71,325,226		$ 71,325,226	$ 5,689
5	Resuscitation	$ 37,052,388		$ 37,052,388	$ 131,859
6	Blood sampling	$ 30,124,604	$ 392,805	$ 30,517,409	$ 5,795
7	Urine specimen collection	$ 18,900,132	$ 56,725	$ 18,956,857	$ 4,180
8	Electrocardiogram	$ 10,555,702	$ 150,097	$ 10,705,798	$ 4,603
9	Preparation of patients for surgery	$ 8,932,030	$ 438,436	$ 9,370,466	$ 7,472
10	Life risk care management	$ 9,080,651		$ 9,080,651	$ 9,053
11	Referral	$ 7,801,401		$ 7,801,401	$ 134,507
12	Administration of prescribed drugs by subcutaneous or intravenous injection	$ 7,655,239	$ 80,933	$ 7,736,172	$ 7,130
13	Administration of noninjectable prescribed drugs	$ 7,451,112		$ 7,451,112	$ 5,714
14	Monofilament nylon suture	$ 6,892,450	$ 290,026	$ 7,182,476	$ 24,265
15	Simple wound dressing	$ 6,744,059	$ 333,805	$ 7,077,865	$ 7,327
16	Complex wound dressing	$ 6,889,495	$ 122,572	$ 7,012,068	$ 23,530

Table 4: Total Costs for ED Cost Objects (CLP) (continue)

Ranking	Services	Indirect Costs	Direct Costs	Total Costs	Unit Costs
17	Administration of drugs by subcutaneous or intravenous injection	$ 6,201,138	$ 112,933	$ 6,314,072	$ 4,170
18	Teaching activities	$ 6,225,455		$ 6,225,455	$ 6,225,455
19	Administration of noninjectable drugs	$ 5,515,973		$ 5,515,973	$ 3,032
20	Nebulization	$ 4,330,711	$ 1,005,900	$ 5,336,612	$ 4,202
21	Arterial blood gas sample	$ 5,286,625		$ 5,286,625	$ 3,876
22	Splinting	$ 2,187,641	$ 2,262,020	$ 4,449,661	$ 15,135
23	Blood glucose test	$ 2,945,942	$ 147,546	$ 3,093,488	$ 4,701
24	Application of a shorter orthopedic medical cast	$ 1,904,884	$ 955,495	$ 2,860,379	$ 11,173
25	Installation of a removable cast walker boot	$ 289,805	$ 2,509,500	$ 2,799,305	$ 26,660
26	Orthopedic trauma medical attention	$ 2,348,362		$ 2,348,362	$ 6,452
27	Black braded silk suture	$ 2,212,104	$ 80,069	$ 2,292,173	$ 24,128
28	Intramuscular prescribed drugs administration	$ 1,848,525	$ 20,737	$ 1,869,262	$ 6,724
29	Medical interconsultation	$ 1,724,532		$ 1,724,532	$ 1,342
30	Intramuscular drugs administration	$ 1,476,210	$ 28,942	$ 1,505,152	$ 3,879
31	Application of a larger orthopedic medical cast	$ 622,032	$ 855,619	$ 1,477,650	$ 24,628
32	Stool sample	$ 1,461,081	$ 4,253	$ 1,465,334	$ 4,310
33	Skin suture	$ 1,280,692	$ 29,963	$ 1,310,655	$ 23,830
34	Stomach pumping	$ 983,161	$ 92,603	$ 1,075,764	$ 12,225
35	Vicryl suture	$ 745,130	$ 35,083	$ 780,212	$ 24,382
36	Histoacryl	$ 528,726	$ 10,882	$ 539,608	$ 12,549
37	Endotracheal intubation	$ 478,748	$ 23,326	$ 502,074	$ 12,246
38	Diagnostic puncture	$ 453,459	$ 21,398	$ 474,857	$ 29,679
39	Diagnostic and therapeutic puncture	$ 390,482	$ 44,779	$ 435,261	$ 43,526
	Alcohol screening test	$		$	$ 19,782

40		375,863		375,863	
41	Medical attention of patients arrived by ambulance	$ 254,133		$ 254,133	$ 12,707
42	Catgut suture	$ 209,568	$ 9,610	$ 219,178	$ 24,353
43	Blood culture sample	$ 207,715	$ 8,157	$ 215,873	$ 6,349
44	Polypropylene suture	$ 186,282	$ 19,626	$ 205,909	$ 25,739
45	Discharge of deceased patients	$ 146,451		$ 146,451	$ 9,763
46	Urethral sounding	$ 118,086	$ 12,822	$ 130,908	$ 32,727

Table 4: Total Costs for ED Cost Objects (CLP) (continue)

Ranking	Services	Indirect Costs	Direct Costs	Total Costs	Unit Costs
47	Complex foreign body extraction	$ 117,215	$ 590	$ 117,806	$ 16,829
48	IV fluid change	$ 95,742	$ 5,622	$ 101,364	$ 2,981
49	Reduction	$ 95,091		$ 95,091	$ 5,283
50	Oxygen therapy	$ 36,802	$ 23,757	$ 60,558	$ 3,785
51	Verify injuries	$ 51,283		$ 51,283	$ 4,274
52	Medium-complex foreign body extraction	$ 16,662		$ 16,662	$ 16,662
53	Simple foreign body extraction	$ 16,579		$ 16,579	$ 16,579

Table 5: Example of costing at a diagnosis level (CLP).

Cost Objects	ICD-10 Code
	J13: Pneumonia due to Streptococcus pneumoniae
Medical consultation	$11,710
Arterial blood gas sample	$3,876
Blood sampling	$5,795
Management of imaging tests	$5,689
Intramuscular prescribed drugs administration	$6,724
Administration of noninjectable prescribed drugs	$5,714
Nebulization	$4,202
Total Cost	**$43,710**

Figures

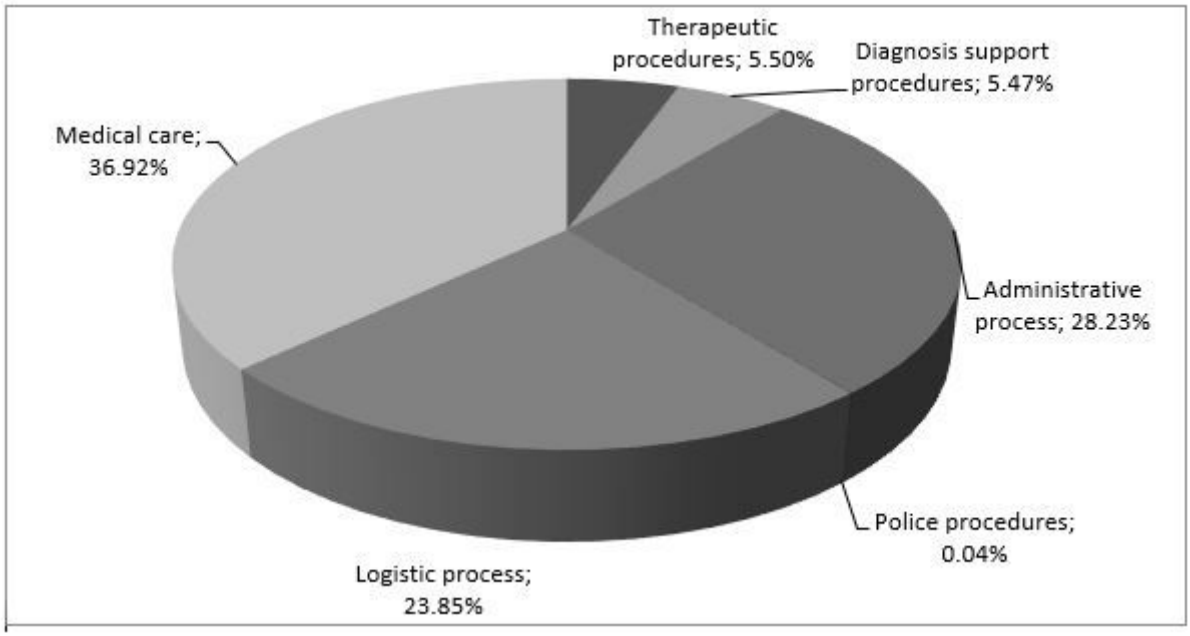

Figure 1

Indirect Costs of the processes from the selected ED.