HEALTHCARE RESOURCE UTILIZATION FOR CHILDREN UNDER 15 YEARS OLD WITH TYPE 1 DIABETES: A RETROSPECTIVE MULTICENTER ANALYSIS

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BACKGROUND

- In Algeria, type 1 diabetes mellitus (T1DM) is particularly concerning. The country ranked among the highest in the MENA (Middle East and North Africa) region for T1DM incidence in 2019[1] and seventh globally in 2022[2].
- Data from the National Institute of Public Health (INSP) in Algiers in 2020, as well as studies conducted in Oran, Constantine, and Tlemcen indicate a significant increase in the incidence of T1DM among children under the age of 15.

OBJECTIVE

To estimate the healthcare resource utilization of type 1 diabetes mellitus for children under 15 from hospital perspective in Algeria, providing essential data to optimize health policies and medical resource allocation.

METHODS

This was an observational, retrospective, descriptive, and multicenter study conducted in Algeria.

Patient medical records from 2023 were analysed for over a year from January 1 to December 31.

The study was set up in CHU* Beni Messous, CHU* Nefissa Hamoud ex Parnet, EPH** Birtraria and Cervantes polyclinic, Algiers, Algeria.

The collected data included sex, age, type of care received, type of complication, duration of hospitalization, diagnostic tests, and treatments administered.

The direct costs of medical treatments, tests, and procedures were considered. Total resources consumed were calculated based on unit costs for each quantitative variable and its frequency.

*CHU: University hospital center **EPH: Public hospital estabilshment

RESULTS

- A total of 422 patient records were included. The sex ratio was 0.93, the mean age was 10 years. the hospitalization rate was 0.3 with an average hospital stay of 6 days and a consultation rate of 0.7.
- The direct cost of medical resources used was estimated at 272 207 €, with an average cost per patient of 645 € (289 € for drug costs, 261 € for blood glucose monitoring, 95 € for Tests and diagnosis costs).

	Average cost/patient
Drug costs	289 €
Blood glucose monitoring costs	261 €
Tests and diagnosis costs	95 €
Total	645 €

Table 01: Cost breakdown per patient.

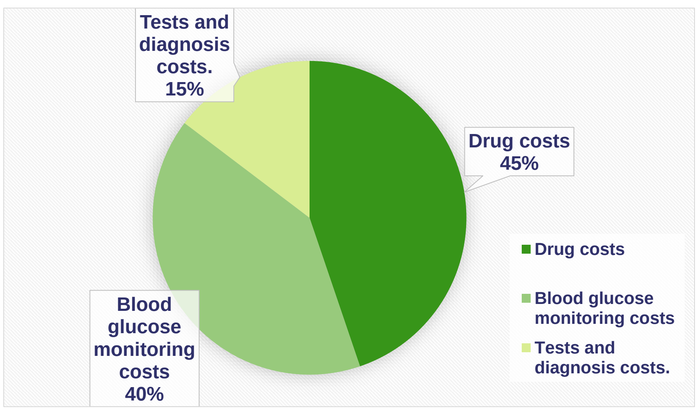

Figure 01: Cost breakdown per patient.

- The 10-14 age group accounted for 66.9% of the total healthcare consumption in this population. followed by the 5-9 age group and the 0-4 age group, representing 25.7% and 7.4% of the total healthcare consumption, respectively.

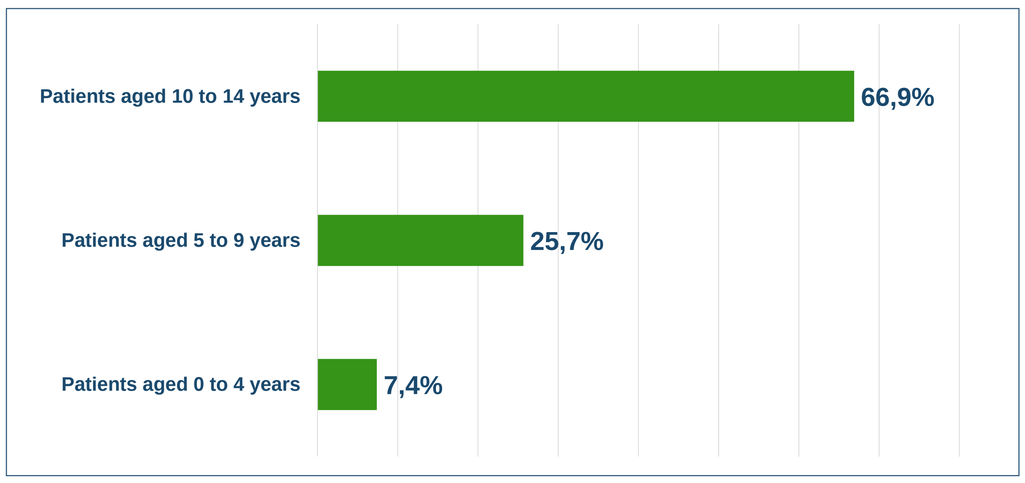

Figure 02: Consumption by age.

- **Hospitalization cost:**
- The direct cost of medical resources consumed by hospitalized patients was 27 130 €, for a total of 133 hospitalized patients, with an average cost per patient of 204 € (4 € for drug costs, 9 € for blood glucose monitoring, 190 € for Tests and diagnosis costs).

	Average cost/patient
Drug costs	4 €
Blood glucose monitoring costs	9 €
Tests and diagnosis costs.	190 €
Total	204 €

Table03: Cost breakdown per hospitalized patient.

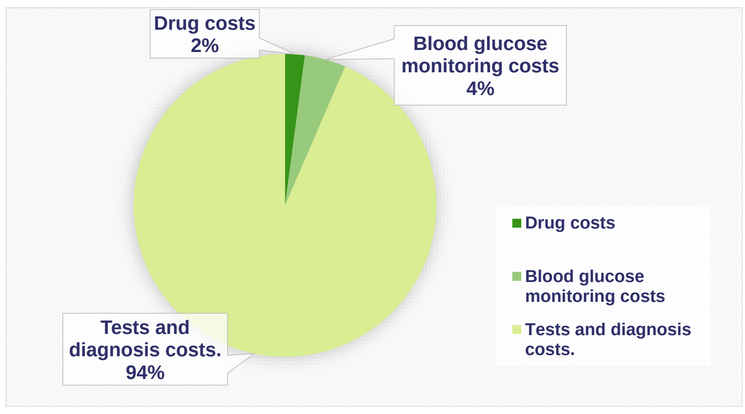

Figure 03: Cost breakdown per hospitalized patient.

- Medical resources consumed in hospitalization per complication were: 271 € for diabetic ketoacidosis, 194 € for diabetic ketosis, 159 € for hyperglycemia, and 158 € for hypoglycemia.
- **Visit cost:**
- The direct cost of healthcare resources for patients in consultation was estimated at 244 708 €, with an average cost per patient of 847 € (419 for drug costs, 378 € for blood glucose monitoring, 50 € for Tests and diagnosis costs).

	Average cost/patient
Drug costs	419 €
Blood glucose monitoring costs	378 €
Tests and diagnosis costs.	50 €
Total	847 €

Table 03: Cost breakdown per patient in consultation.

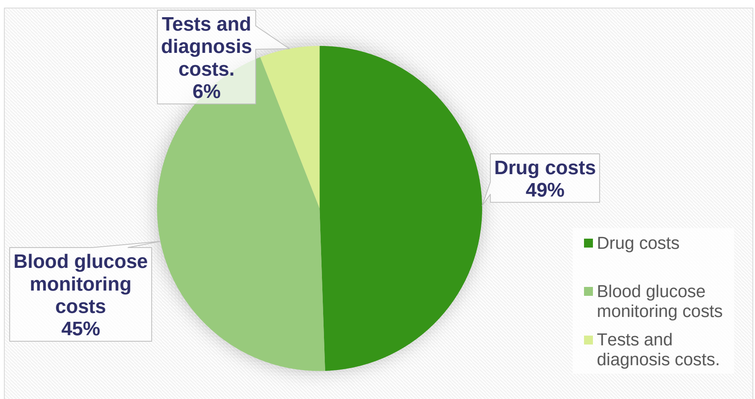

Figure 04: Cost breakdown per patient in consultation.

DISCUSSION

- Insulin therapy is the treatment for type 1 diabetes mellitus and its dosage is correlated with the patient's weight. This explains why more than two-thirds of the total resources (66.9%) are consumed by the 10-14 age group, which represents both the highest average weight and the largest number of patients.
- The cost estimated by this study is significantly lower than that estimated in Spain (4070 €)[3] and the Netherlands (5143 €)[4]. However, the proportion of this cost to GDP per capita in each country is similar: 14,7 % in Spain, 15,4 % in the Netherlands and 16 % in Algeria. this comparison highlights the significant financial burden of type 1 diabetes mellitus in the under-15s in Algeria, which is in line with the economic estimates made in Spain and the Netherlands.

❖ **The limits of this study**

Certain direct medical costs are excluded, such as physician fees, nurse fees, and hospitalization expenses. These medical services are not evaluated or priced in the public sector due to the absence of cost documentation in the hospital services.

CONCLUSIONS

This study was the first to assess the healthcare resource utilization of T1DM for children in Algeria. These data can serve to reassess the distribution of resources for managing T1DM in Algeria's from hospital perspective. The study further suggests the importance of enhancing early screening for T1DM, improving health information systems, and targeting appropriate interventions and tools to better manage the disease and reduce its burden.

Contribution : A Methodology and Technical support was provided by sanofi.

References: 1-Patterson, C. et all 2019/ 2-Diabetes atlas. 2022 / 3-LOPEZ-BASTIDA. et all 2017 / 4-DE VRIES. et all 2023