

Hospitalizations Associated with Type 1 Diabetes Reported By the Mexican Public Sector, 2008-2020

Jones K¹, Baeza-Cruz G², Peniche-Otero G², Valencia J³

¹Medtronic, Mexico, ²Sinerfarma S.A. de C.V., Mexico, ³Medtronic, LatAm.

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BACKGROUND & OBJECTIVE: In Mexico, the prevalence of Diabetes Mellitus (DM) is 10.6% of the adult population¹ and is ranked as the second cause of mortality and comorbidity, after cardiovascular disease.

Yet, until March 2023, the General Health Law did not differentiate between the different types of diabetes, specifically Type 2 Diabetes (T2D), Type 1 Diabetes (T1D), and Gestational Diabetes (GD).

This lack of legal definitions created a barrier for disease specific data collection, budget allocation, and the development of disease specific programs for diagnosis, education, and treatment. As such, while diabetes mellitus is a national health priority, there is a natural prioritization of T2D for the size of the implicated population, to the detriment of T1D and GD.

The impact that this inattention towards T1D can be observed through small observational studies that report that only ~18% of patients maintain a target HbA1c <7%².

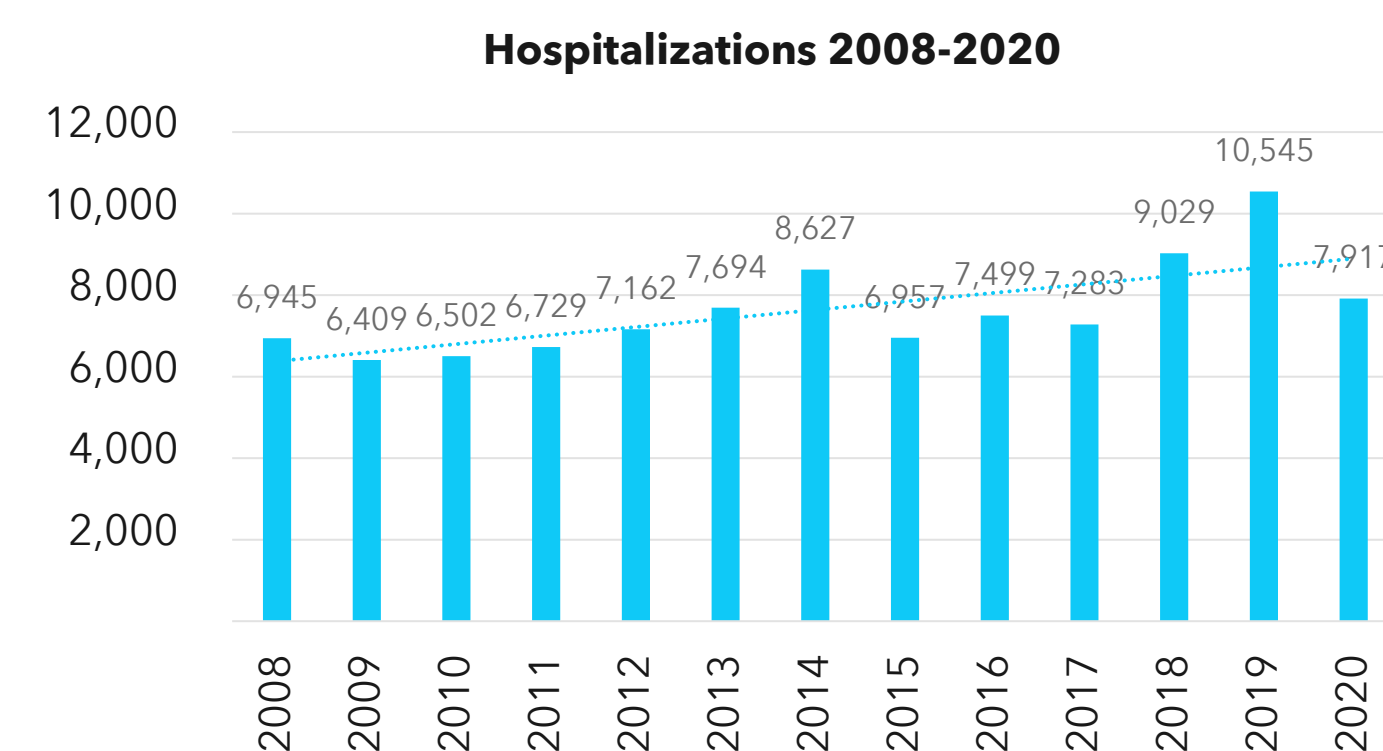
Awareness around the burden of disease of T1D will support disease specific data collection, investigation and the need for program development, to improve care for patients.

This study seeks to identify and describe inpatient hospitalizations associated with T1D in the Mexican public sector, using data collected by public institutes.

METHODS: Data was collected from the DGIS database (General Direction of Information on Health)³ on hospitalizations associated with T1D, as codified by The International Classification of Diseases (ICD) 10* codes E10-E109, between the years 2008-2020.

Variables included the number of hospitalizations, duration of stay, and demographic data. Data were analyzed per geography (state), year, institution, and per ICD 10 code. The average cost of hospitalization was estimated using the unitary cost per day published by the Mexican Social Security Institute (IMSS), in 2022 Mexican pesos.

RESULTS: A total of 99,298 hospitalizations were reported between 2008-2020, with an average of 7,638 per year, a high of 10,545 (2019), and a low of 6,409 (2009). The Secretary of Health and IMSS reported the most cases with 43.5 and 40.8%, respectively. Mexico City reported the most hospitalizations (12.6%), followed by the state of Jalisco (9.2%) and the State of Mexico (6.4%), Sonora (5.3%), and Nuevo Leon (5.2%).

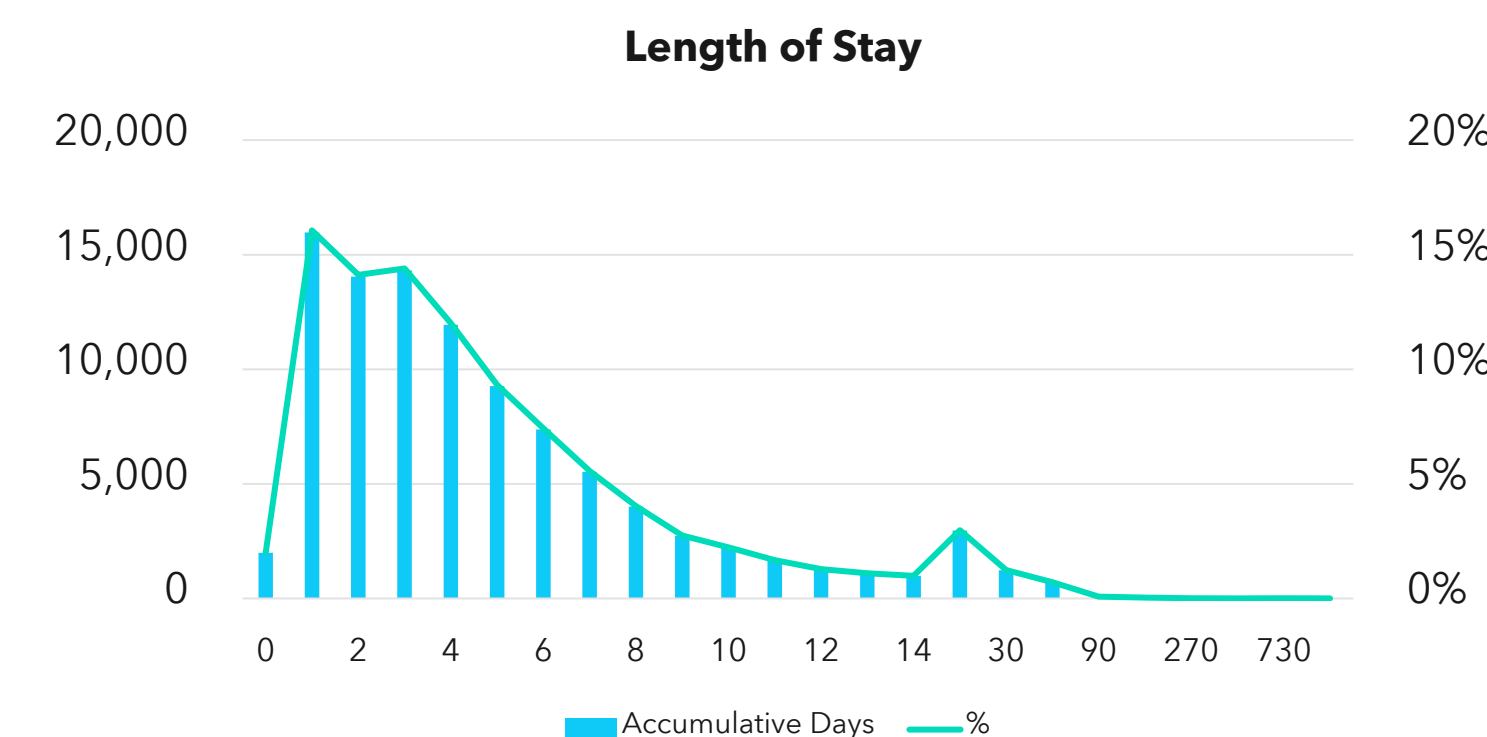


The complications associated with most hospitalizations were **E101** Ketoacidosis (25.0%) and **E105** Peripheral circulatory complications (17.4%). Complications not specified (**E106**, **E107**, **E108**, **E109**) summed to 44.8% of hospitalizations.

Hospitalizations by ICD-10 2008-2020

ICD-10 Code: type 1 diabetes	Hospitalizations	%
E100 with coma	2,159	2.2%
E101 with ketoacidosis	24,850	25.0%
E102, with kidney complications	5,944	6.0%
E103 with ophthalmic complications	2,715	2.7%
E104 with neurological complications	1,982	2.0%
E105 with peripheral circulatory complications	17,272	17.4%
E106 with other specified complications	5,653	5.7%
E107 with multiple complications	4,756	4.8%
E108 with unspecified complications	6,565	6.6%
E109 no mention of complication	27,522	27.7%
Total	99,418	100%

A total of 65.9% of hospitalizations were for between 1 (16.1%) and 5 (9.3%) days. All hospitalizations summed to a total of 567,074 days of inpatient care.



In an analysis of 2020, The average Length of Stay (LoS) in 2020 was 5.6 days, with a ranged from 2.2 days for ophthalmic complications (**E103**), to 6.7 and 7.1 days for peripheral circulatory complications (**E105**) and multiple complications (**E107**), respectively.

Hospitalization by ICD-10, 2020

ICD-10 Code	Hospitalizations	Total inpatient days	Average LoS
E100	62	306	4.9
E101	2,317	11,486	5.0
E102	294	1,962	6.7
E103	25	56	2.2
E104	114	513	4.5
E105	2,233	15,030	6.7
E106	367	2,309	6.3
E107	411	2,905	7.1
E108	414	2,294	5.5
E109	1,800	8,368	4.6
Total	8,037	45,229	5.6

The unitary cost for a day of hospitalization in 2022 was \$10,761 MXN (\$535.90 USD), for an estimated \$6.1 billion MXN (\$304 million USD) in the direct cost of hospitalization over the course of 12 years.

DISCUSSION & CONCLUSIONS: The annual number of hospitalizations associated with T1D in Mexico has remained consistent over the past twelve years.

Data regarding the distribution of complications could be improved; ~45% of the reported hospitalizations did not specify the complication. Data regarding specified complications, such as hypoglycemia (ICD 10 code: E10.64), were not included in the database.

Hospitalization by State - Total & Last year reported

State	AG	BC	BS	CM	CS	CH	CO	CL	DF	DG	GT	GR	HG	JA	EM	MI	MO	NA	NL	OA	PU	QT	QR	SL	SI	SO	TB	TM	TL	VE	YU	ZA	Not specified	Total
Total	1,377	4,101	1,691	1,031	3,394	771	1,915	3,838	12,493	1,669	4,380	1,803	1,709	9,090	6,392	4,667	889	818	5,157	1,414	1,654	739	1,842	1,790	4,310	5,253	1,347	4,759	651	4,866	937	2,535	16	99,298
% Total	1.4%	4.1%	1.7%	1.0%	3.4%	0.8%	1.9%	3.9%	12.6%	1.7%	4.4%	1.8%	1.7%	9.2%	6.4%	4.7%	0.9%	0.8%	5.2%	1.4%	1.7%	0.7%	1.9%	1.8%	4.3%	5.3%	1.4%	4.8%	0.7%	4.9%	0.9%	2.6%	0.0%	100%
2020	207	393	118	100	289	81	76	501	654	138	317	104	276	844	502	348	93	125	305	92	100	78	171	228	410	559	90	186	19	340	131	162	0	8,037
% Total	2.6%	4.9%	1.5%	1.2%	3.6%	1.0%	0.9%	6.2%	8.1%	1.7%	3.9%	1.3%	3.4%	10.5%	6.2%	4.3%	1.2%	1.6%	3.8%	1.1%	1.2%	1.0%	2.1%	2.8%	5.1%	7.0%	1.1%	2.3%	0.2%	4.2%	1.6%	2.0%	0.0%	100%

Hospitalization of patients for T1D reflects an important clinical and economic challenge for the Mexican public healthcare system. There is an opportunity to strengthen data collection for people with T1D with the objective of strengthening policy and care for this patient group.

Differentiation on the short and long-term burden of disease may facilitate investment in T1D care.

This is particularly important as the inclusion of the differentiation of T2D, T1D, and GD in General Health Law was approved in March 2023.