**Modeling Type 1 Diabetes  
Environmental Drivers in Metropolitan France**

Business Data Challenge Report

|  |  |  |  |
| --- | --- | --- | --- |
| **Elea Bordais** | **Ismael Dembele** | **Paul  Toudret** | **Patryk Wiśniewski** |
| (ENSAE) | (ENSAE) | (ENSAE) | (ENSAE) |

**Abstract**

This study investigated environmental and socioeconomic drivers of regional Type 1 Diabetes (T1D) incidence in metropolitan France using 2023 hospital (PMSI) and aggregate data with regression and machine learning models. Key findings indicate a protective association for sunshine duration (proxying Vitamin D) and a positive association for regional tobacco addiction prevalence (especially in males), alongside socioeconomic factors. While suggesting these factors modulate regional T1D risk, those findings require cautious interpretation and further investigation.

**ENSAE Paris  
Academic Year 2024-2025**

**Academic Supervisor: Professor Khaleghi  
Business Data Challenge (2025)**