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Implementing a new methodology to forecast the hospital activity in France until 2027

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Introduction

The COVID-19 crisis led to a sharp decline in hospital activity. Initially, this decrease was due to the shutdown of certain hospital services during the pandemic, and it was subsequently exacerbated by a shortage of human resources in hospitals. This sudden and significant shift in hospital activity called into question the reliability of pre-crisis forecasting models. As a result, a new long-term forecasting methodology became necessary.
Having a long-term forecasting methodology is useful in order to calibrate a multi-year trajectory of hospital funding.

Methods

The new forecasting model integrates demographic projections with projections of average individual healthcare consumption.

We utilized historical data from the 2013-2023 period, ensuring high granularity by segmenting data as follows:
* Major diagnostic categories,
* Types of care activities (e.g., medicine, outpatient care, surgery, etc.),
* Population subdivisions by 5-year age groups and gender.

For each sub-segment (major diagnostic category × type of care activity × gender and age group), historical data were used to forecast average hospital activity. The forecasting relied on time series analysis, accounting for the years 2020, 2021, and 2022 as level shifts to mitigate the impact of the COVID-19 crisis on the forecasts.

The forecasted average hospital activity per age and gender group was then combined with demographic projections to produce an aggregate hospital activity forecast extending to 2027.

Results

The results of this new forecasting model indicate that by the end of 2024, hospital activity is expected to reach its pre-crisis trend. A notable strength of this methodology is its ability to differentiate forecasts by major diagnostic categories and types of care activities.

For instance :
* For some diagnostic categories, such as eye diseases, the growth rate of hospital activity is predicted to exceed pre-crisis levels significantly.
* Conversely, for other categories, such as nervous system diseases, a persistent gap with pre-crisis trends is expected to remain.

Additionally, the model highlights that nearly two-thirds of the predicted growth in hospital activity is attributable to individuals aged 75 years and older.

Discussion

Although this forecasting methodology relies on demographic data, it is fundamentally a statistical approach. Enhancing the model with expert input on changes in medical practices, variations in care burden, and epidemiological trends could improve its accuracy.

Comparing the projected data for 2024 and 2025 with actual observations will provide insights into the model's precision, allowing its validation for future forecasting efforts.

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