

# Strengthening Influenza Vaccination Strategies through Gamified Modelling: Let's Control Flu tool expansion to Germany and Czech Republic

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## 1 INTRODUCTION

Seasonal influenza remains a **major global public health challenge**, causing around **1 billion infections**, **3–5 million severe cases**, and up to **650,000 deaths every year**<sup>1,2</sup>. Despite **WHO and ECDC recommendations**, **vaccination coverage rates (VCR) across Europe continue to fall below the 75% target**<sup>3</sup>.

The **Let's Control Flu (LCF) project** developed an **interactive gamified modelling tool to support evidence-based decision-making on improving influenza vaccination strategies**. By simulating the **potential impact of public health policies (PHP) on the influenza burden** in different countries, the tool enables stakeholders to **compare outcomes in different health and socioeconomic indicators by key target populations over a 10 year period**.

After its initial pilot in Sweden, **the model was adapted and validated for Germany and the Czech Republic**. This poster presents the **main results** of these national applications.

## 2 METHODS

The **LCF tool**<sup>4</sup> is based on a **mathematical compartmental model** that allows to **simulate the impact of PHP on influenza burden**. Building on the **framework by Kassianos et al.**<sup>5</sup>, **13 policies** were chosen **across the same five strategic pillars** of interventions to **increase VCR** were included in the model.

The model enables the **simulation for both the total population and five target groups** (older adults (≥65 years old), pregnant women, children, healthcare professionals, and high-risk individuals (aged 15-64 years with ≥1 chronic condition)) **projecting seven influenza-related outcomes** - including infections, General Practitioner (GP) consultations, hospitalizations, deaths, productivity losses, and cardiovascular complications - **over a 10-year period**.

For **adaptation to Germany and Czechia**, the following steps were undertaken:

- Selection of modelled vaccination policies**: The **13 policies** selected for inclusion in the LCF model were **validated by each country's National Advisory Board (NAB)**, composed of **key opinion leaders in epidemiology, health policy, and vaccination**.
- Literature Review**: A **literature review** was conducted to gather **country-specific inputs**, including **estimated impact of PHPs on VCRs and epidemiological and demographic data** that underpin the statistical algorithm.
- Validation of modelling approach and model inputs**: **Draft models** were reviewed by the **NABs** to ensure **alignment with national contexts and available data**.
- Model operationalization**: The **validated models** were operationalized on the **official LCF website (www.letscontrolflu.com)**, enabling users to **explore policy combinations and simulate national influenza vaccination strategies**.

## 4 CONCLUSIONS

The **multi-country application of the LCF model** illustrates its **scalability and relevance for public health planning across diverse cultural, demographic and political contexts**, including **adaptation of new strategies on children vaccination**. This tool offers a **data-driven approach to explore strategies with potential to improve vaccination coverage and preparedness**, offering **scientifically validated projections** to decision-makers, including policymakers, health professionals, organizations, and patient associations and the broader community.

**Results from Germany and Czechia suggest meaningful potential to strengthen influenza vaccination efforts and reduce disease burden through coordinated policy action.**

### References:

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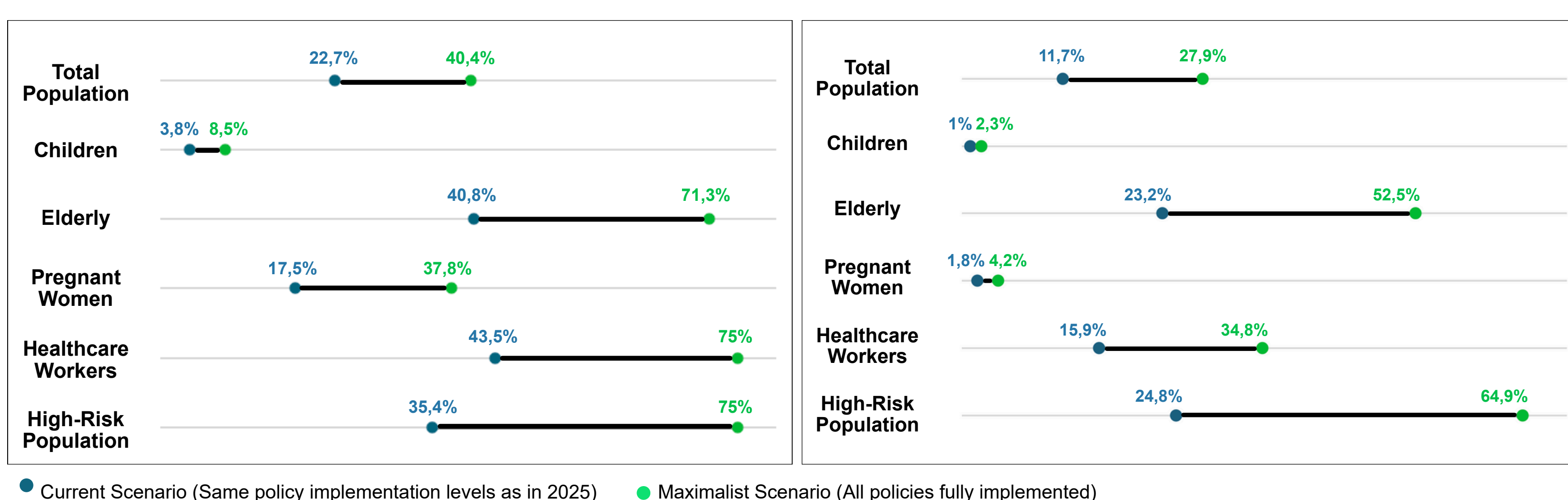
## 3 RESULTS

This section presents the **main insights** for **two main scenarios** generated by the LCF model for **Czechia and Germany in 2035**: the **Current Scenario** and the **Maximalist Scenario**. The analysis compares the **potential benefits and trade-offs of maintaining current PHP implementation levels, observed in 2025, versus implementing all policies**.

Results show that in a **maximalist scenario there are clear opportunities to increase vaccination coverage and reduce the influenza burden of disease in both countries**.

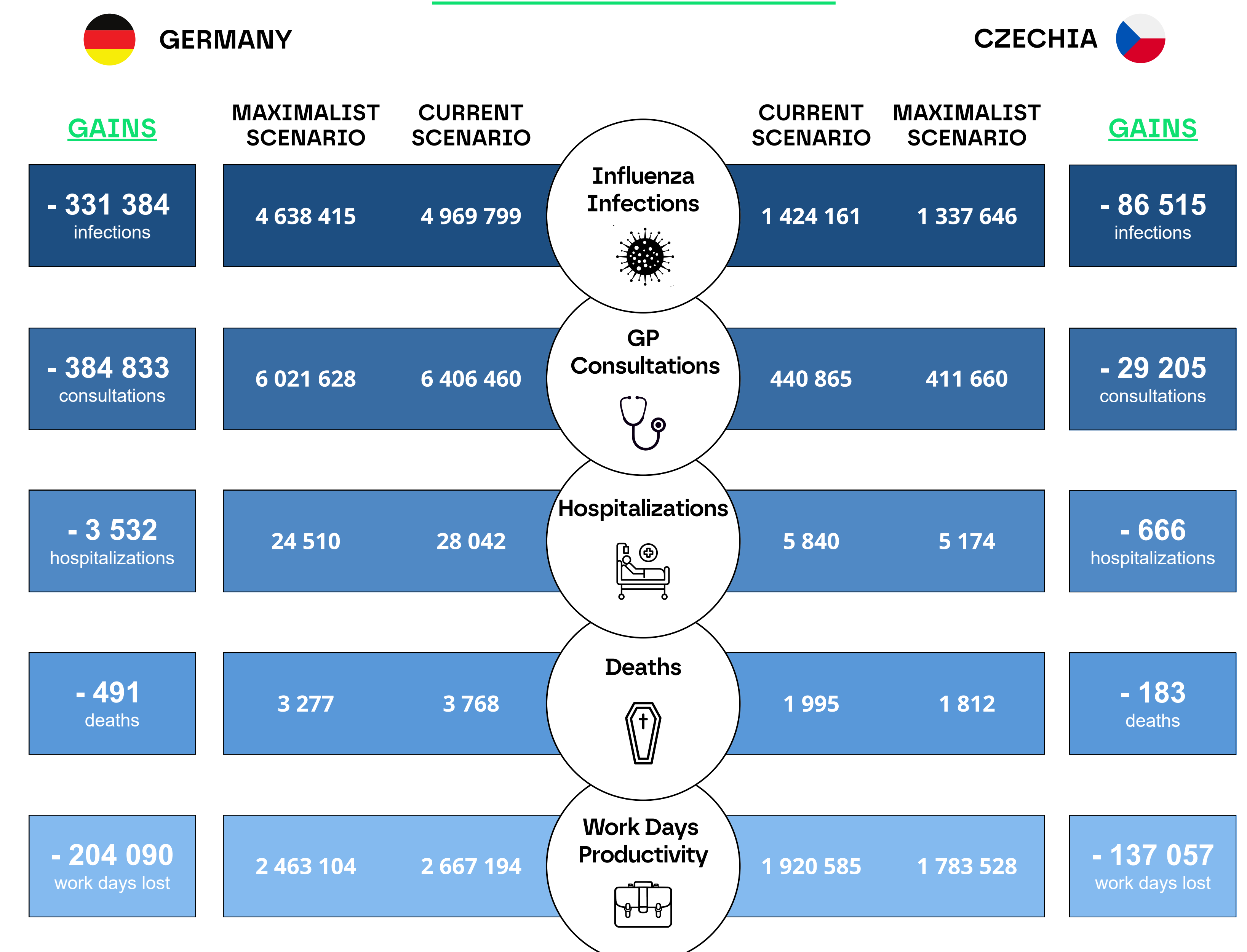
### MAIN INSIGHTS

#### POTENTIAL GAINS IN VACCINATION COVERAGE RATES BY 2035



**Figure 1.** Comparison of LCF model projections for vaccination coverage rates in 2035, by country (Germany left) and Czechia (right) and population, considering the results for the Current and Maximalist PHP scenarios.

#### HEALTH AND SOCIOECONOMIC GAINS FOR THE TOTAL POPULATION BY 2035



**Figure 2.** Potential gains in reducing the influenza burden of disease in each country total population, by indicator, considering the comparison of LCF model projections for 2035 between the Current and Maximalist PHP scenarios.

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