Cost Utility Analysis of Influenza Vaccine among People Aged 50 Years and Older Living with Comorbidities in Egypt

Eldissoky A[1], Ibrahim A[2], Anan I[3], Eskander N[1], Amiche A[4]

[1] Sanofi, Cairo, Egypt, [2] Accsight DWC, Dubai, UAE, [3] Accsight LLC, Cairo, Egypt, [4] Sanofi, Dubai, UAE

INTRODUCTION

- In Egypt, influenza poses a significant public health burden with seasonal outbreaks occurring annually. The annual rate of seasonal influenza was estimated to be 20%–30% in children and 5%–10% in adults.[1]
- The prevalence of influenza varies by region and season, with higher transmission rates in densely populated areas.[1,2]
- The economic impact of influenza in Egypt includes healthcare costs, lost productivity, and school/work absenteeism.
- Vaccination campaigns are conducted to mitigate the burden, often with suboptimal levels of vaccine coverage across the population.
- Using a quadrivalent influenza vaccine (QIV) within high-risk populations can be advantageous both from a public health and economic standpoint.[3]
- To validate this, a cost utility analysis was carried out to assess the beneficial impact of introducing QIV with 75% coverage to 50+ year adults living with comorbidities.

OBJECTIVES

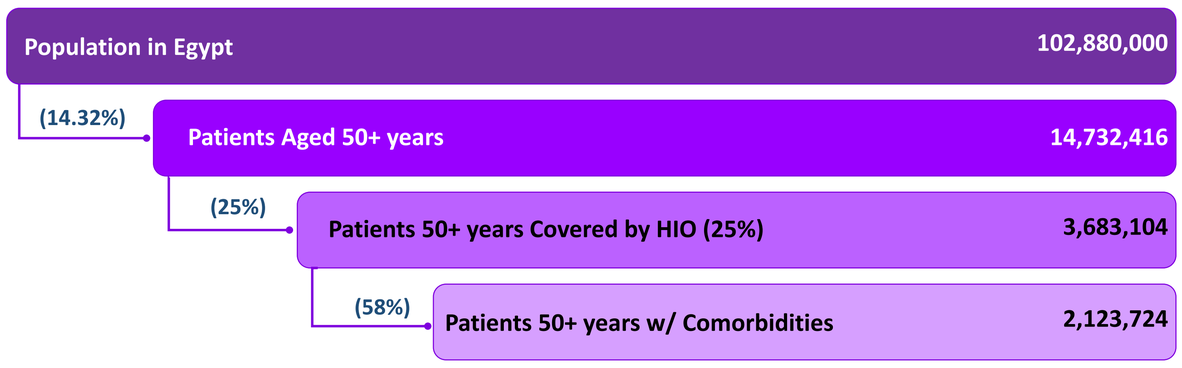
- The aim of this study is to evaluate the economic and public health consequences associated with the introduction of a quadrivalent influenza vaccine (QIV) up to a coverage of 75% among high-risk population from a public payer perspective in Egypt.

METHODOLOGY

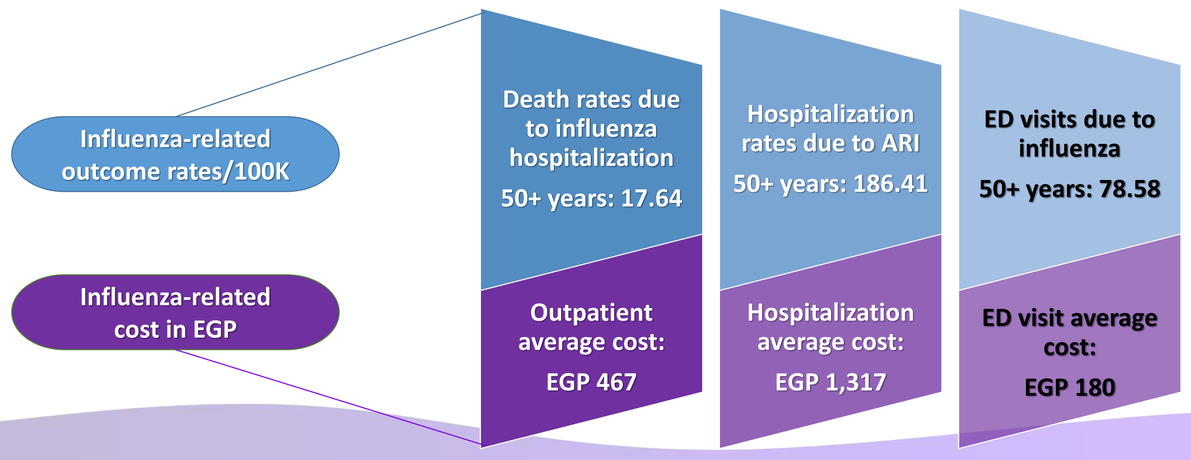
- A static decision-analytic model was used to assess the cost-utility of influenza vaccination up to 75% coverage vs no vaccination,
- The target population includes adults aged ≥50 years old with hypertension, diabetes, and/or cardiovascular and respiratory chronic diseases.
- A cost-of-illness model was used to estimate the cost of influenza treatment and management in different settings.
- The influenza costing model relies on expert opinion to outline the path of influenza patients. It then calculates costs by multiplying the probabilities of resource use items by their unit costs respectively

Model Inputs

- **Target Population**



- **Outcomes and Costs**



RESULTS

The introduction of QIV with a **75% coverage** within the public payer target group would result in the avoidance of:

- **221,915** cases of influenza,
- **43,970** outpatient consultations,
- **671** hospitalisations,
- **93** deaths
- **63,799** workdays lost

And would generate a total of 6,259 of gained QALYs

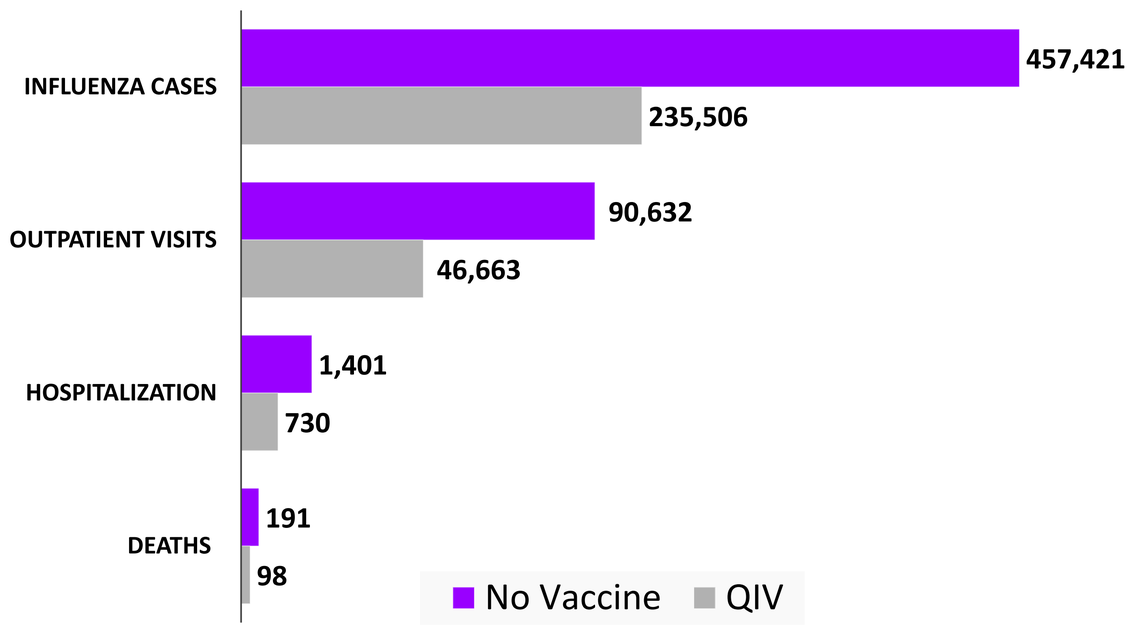


Figure 1. QIV Clinical Outcomes Compared to No Vaccination

Resource Utilization Offsets Due to QIV Compared to No Vaccination

- Total Incremental Costs of QIV introduction at 75% coverage is **EGP 257,011,633. QIV** generates cost-offsets as follow:

Table 1. QIV Economic Cost-offsets due to QIV Vaccination

Age group	[1] GP consultations	[2] ED consultations	Hospitalizations	Prescription	[3] OTC	Productivity losses
50+ years	EGP 14,422,034	EGP 74,396	EGP 723,148	EGP 6,507,503	EGP 4,438,293	EGP 21,216,790

[1] General Physician [2] Emergency Department [3] Over The Counter

- From a public payer perspective, the introduction of QIV would lead to an incremental cost utility ratio of **EGP 41,061 per QALY**,
- The ICER is below one GDP per capita in Egypt.
- Sensitivity analysis confirmed model robustness.

CONCLUSION

- QIV can be considered as a cost-effective solution for adults at risk of severe influenza in Egypt.
- Moreover, results from societal perspective showed added value and lower ICER of EGP 36,962 per QALY gained.
- These results would inform Egyptian decision makers and payers for efficient resources allocation in influenza prevention.

REFERENCES AND ACKNOWLEDGMENT

REFERENCES:

1. Refaey S, et al. Incidence of influenza virus-associated severe acute respiratory infection in Damanhour District, Egypt. 2013. Eastern Mediterranean Health Journal. 2016;22:499–508.

2. Rowlinson E, et al. Incidence and etiology of hospitalized acute respiratory infections in the Egyptian delta. Influenza and Other Respiratory Viruses. 2016;11:23–32.

3. Shields GE, et al. A systematic review of economic evaluations of seasonal influenza vaccination for the elderly population in the European Union. BMJ Open. 2017;7.

Conflict of Interest: Amiche A, Eskander N, Eldissoky A are employees of Sanofi and may hold shares and/or stock options in the company. Ibrahim A and Anan I are employees of Accsight. Accsight received funding from Sanofi for the involvement of their employees in this research.

FUNDING: This study was funded by Sanofi