Economic Impact and Public Health Benefit of Influenza Immunization by Pharmacists in France

M. Nascimento Costa[1], G. Ménin[2], F.P. Alvarez[2], F. Bianic[3], P. Net[3]

1. Syneos Health, Value Access & HEOR, London, UK; 2. Sanofi Pasteur, Lyon, France; 3. Syneos Health, Value Access & HEOR, Montrouge, France.

Background

- **Influenza vaccination by pharmacists** is a well-established health policy in several countries, allowing **increased VCR** and also **saving costs** compared to vaccination by **GPs** and **nurses** [1,2]
- In France, this policy has been fully effective since **2019**, but its effects have not been evaluated yet, both in terms of public health and economic impact

Objective

- **The objective of the study was to evaluate the public health and economic impact of influenza vaccination by pharmacists in the elderly French population using a budget impact model**

Methods

- We adapted the model from Net *et al.* (2021)[3] and implemented administration costs for **GPs, Ns and Ps**. Two additional outcomes were also added: **medical time saved** and **time taken off** per vaccination. (Figure 1)
- Our intervention considered influenza immunization by GPs/Ns/Ps under an even distribution (⅓; ⅓; ⅓) and compared it to vaccination by GPs/Ns with (½; ½) distribution
- Analyses were conducted under a payer perspective
- **High-dose** (Efluelda®) and **standard dose** vaccine (Vaxigrip Tetra®/Influvac Tetra®) were considered under an assumed 70/30 distribution. SD vaccines were assumed to share the same efficacy while a rVE of 24.2% was considered for HD QIV
- We assumed vaccination by pharmacists was associated with a **+1.7% increase in VCR** in our new intervention **(Table I)**
- Uncertainty was explored in **3 scenario analyses** looking at the impact of vaccination by GPs and pharmacists while still assuming a +1.7% increase in VCR

Figure 1: *Model structure*

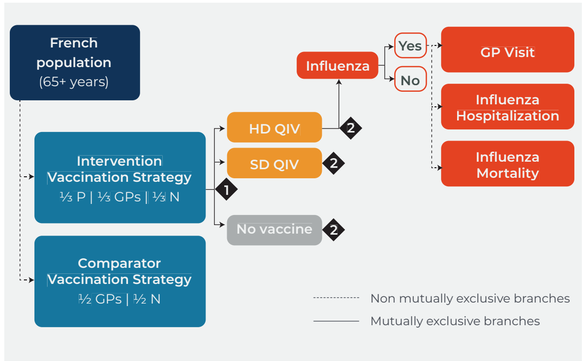

Table I: *Model inputs*

INPUT	VALUE	REF
French population (65+ y)	12.91 M	(4)
VCR (65+ y ; based on the 2019/20 season)	52.0%	(5)
Attack Rate (65+ y)	7.2%	(6)
VE SD QIV (Strain A | B)	50.0% | 50.0%	(7)
rVE HD QIV vs SD QIV	24.2%	(8)
Probability of GP visits (65–74 y / 75+ y)	29.2% / 17.9%	(9)
$P_{(Hospitalization,\ influenza\ A)}$ 65–74 y / 75+ y	0.30% / 1.54%	(9)
$P_{(Hospitalization,\ influenza\ B)}$ 65–74 y / 75+ y	0.13% / 0.64%	(9)
Cost SD QIV *(Vaxigrip Tetra®/Influvac Tetra®)*	€11.11 / €11.11	(10)
Cost HD QIV *(Efluelda®)*	€30.25	(10)
Dispensation fee	€1.02	(9)
Administration cost *(payer perspective)*		
GP	€16.50	(9)
Nurse	€5.28	(9)
Pharmacist	€6.30	(9)
Hospitalization cost	€6,291.33	(9)
GP consultation	€25.00	(11)
Time per GP consultation	17 min	(12)
Patient time taken off per GP vaccination	120 min	(2)
Patient time taken off per P/N vaccination	0 min	

Results

- Assuming a +1.7% increase in VCR, immunization by pharmacists would prevent an additional **9,841 cases, 2,358 GP visits, 123 hospitalizations and 123 deaths** while allowing a saving of **€3.61M (Table II)**
- Under a same VCR, immunization by pharmacists would save **€10.94M** due to reduction in administration costs
- The intervention was **cost-saving** as the increase in vaccine costs **(€5.96M)** has been offset by the reduction of administration costs by **€8.75M**
- In the base case scenario, **315,576 hours** in GP time were saved and patient time taken off for vaccination at the GP was reduced by **2.23 million hours**

Table II: *Model results*

	Base case	Scenario 1a *VCR +0.0%*	Scenario 1b *VCR +3.5%*	Scenario 2 *% vaccination P=50%*	Scenario 3 *GP administration costs –50%**
Costs					
Vaccination Acquisition (Million)	5.97 €	0 €	12.29 €	5.97 €	5.97 €
Vaccine Administration (Million)	-8.75 €	-10.94 €	-6.44 €	-14.40 €	0.44 €
Influenza-related GP Visits	-58,961 €	0 €	-121,390 €	-58,961 €	-58,961 €
Influenza-related Hospitalizations	-770,878 €	0 €	-1,587,102 €	-770,878 €	-770,878 €
Total	**-3,611,930 €**	**-10,939,960 €**	**4,147,161 €**	**-9,260,736 €**	**3,359,118 €**
Health Outcomes					
Influenza Cases	-9,841	0	-20,261	-9,841	-9,841
Influenza-related GP Visits	-2,358	0	-4,856	-2,358	-2,358
Influenza-related Hospitalizations	-123	0	-252	-123	-123
Influenza-related Deaths	-123	0	-254	-123	-123
Lost Work Days Due to Influenza	-60,399	0	-124,352	-60,399	-60,399
Time Taken Off Per GP Vaccination (h)	-2,227,594	-2,383,434	-2,062,587	-3,458,270	-2,227,594
GP Time Used For Vaccination (h)	-315,576	-337,653	-292,200	-489,922	-315,576

** Assuming 50% of patients vaccinated by GPs do not require an additional GP consultation.*

Discussion

- The results are similar to those from previous research and demonstrate that vaccination by pharmacists improves health outcomes while being cost-saving
- However, it was not shown to be cost-saving in **Scenario 1b** where we considered a +3.5% increase in VCR associated with the intervention
- Our study presents some limitations:
  - assumptions on: vaccination ratios by GPs/Ns/Ps, distribution of HD/SD vaccine, and VCR increase due to vaccination by pharmacists
  - the study limited to the elderly population while vaccination by pharmacists applies to the whole population eligible to influenza vaccination
  - the hospitalization limited to confirmed influenza, even if there is evidence supporting that the protection from the vaccine also applies tohospitalizations for cardio-respiratory events consequent to influenza infection
- Pharmacists are major public health actors and key assets to supporting vaccination. They played a major role during the COVID-19 pandemic by supporting vaccination efforts and their assistance will be required again for the upcoming 2021/22 influenza vaccination campaign

Abbreviations: *AR, Attack Rate; HD QIV, High Dose Quadrivalent Influenza Vaccine; GP, General Practitioner; N, Nurse; P, Pharmacist; rVE, relative Vaccine Efficacy; SD QIV, Standard Dose Quadrivalent Influenza Vaccine; VCR, Vaccine Coverage Rate; VE, Vaccine Efficacy.*

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pierre.net@syneoshealth.com