The impact of ARVI and influences virus on hospital management

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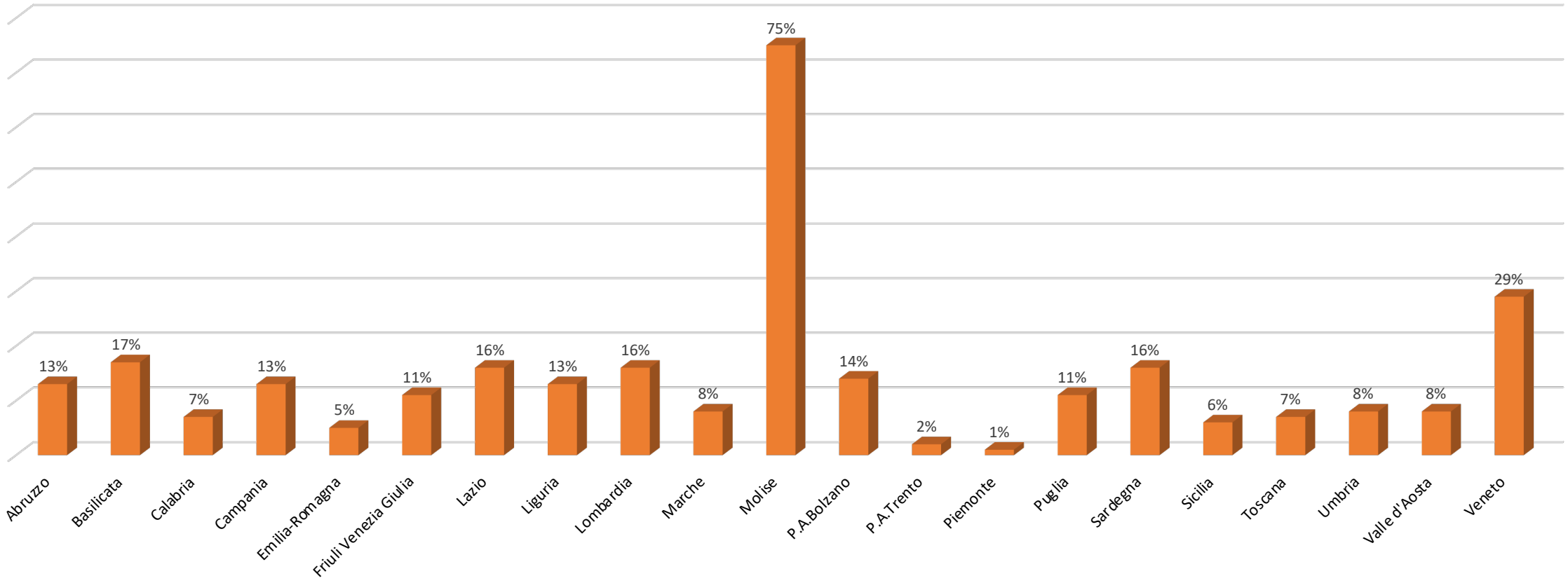
The burden of hospital management

- Healthcare systems can effectively deal with ARVI and seasonal flu by taking into consideration different perspectives, which involve different actors:
- From the institutional perspective:
  - It is necessary to sensibilize patient advocacy associations to increase the number of fragile patients and patients in chronic conditions to get vaccinated;
  - It is fundamental to involve GPs in an active vaccination campaigns aimed at covering the largest number of people;
- From an organizational perspective it is necessary:
  - To properly organize hospitals with guidelines, protocols and staffed beds necessary to receive the increasing number of patients, who probably are also the more fragile;
  - To be equipped with the right amount of healthcare personnel necessary to take care of patients;

The healthcare workforce challenge

- In 2021 5,000 healthcare workers left the I-NHS;
- The Italian Federation of Hospitals (FIASO) declared that in 2025 more than 54,000 physicians will retire;
- It will be hard to cover these exits because of the paucity of physicians in the labor market and a lack of appealing of the healthcare sector both for economic conditions and lack of career patterns;
- The Covid-19 pandemic has determined the great resignation;
- Moreover in 2020 the 56% of Italian physicians aged more than 55 years (higher than all the other EU Countries);
- On the other hand, more that 14 million people (patients) aged more than 65 years (24% of the population);

Health workforce strategies to deal with the pandemic



During the pandemic the healthcare workforce has been increased of 13.489 units (13% more units in comparison with the pre covid situation).

The medical specialization involved are Anestesiology and Resuscitation, Emergency medicine, Respiratory diseases, Infective diseases Microbilogy and virology, Public health.

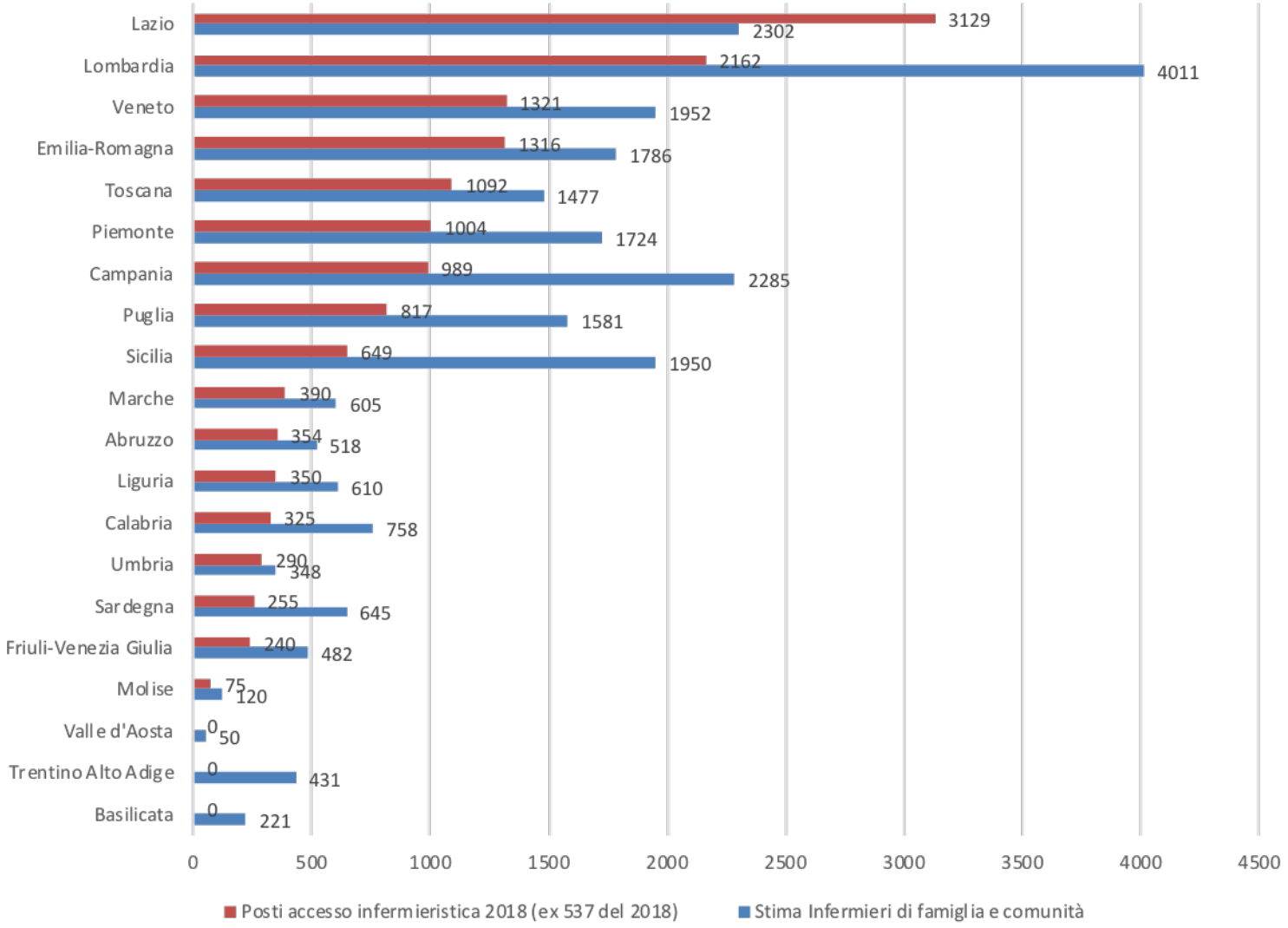
A regional focus

Regione	Personale 2018	Posti messi a disposizione 2020-2022	incremento %
Abruzzo	2.643	346	13%
Basilicata	1.169	199	**17%**
Calabria	3.755	280	7%
Campania	9.244	1.169	13%
Emilia-Romagna	8.505	420	5%
Friuli-Venezia Giulia	2.611	275	11%
Lazio	7.809	1.230	**16%**
Liguria	3.546	448	13%
Lombardia	14.697	2.359	**16%**
Marche	2.981	251	8%
Molise	462	347	**75%**
Piemonte	8.424	1.179	14%
P.A. Bolzano	954	20	2%
P.A. Trento	1.092	16	1%
Puglia	6.741	764	11%
Sardegna	4.110	639	**16%**
Sicilia	9.163	517	6%
Toscana	8.366	595	7%
Umbria	2.009	158	8%
Valle d'Aosta	310	24	8%
Veneto	7.884	2.253	**29%**
Italia	106.475	13.489	13%

In some Regions the possibility to hire new personnel as been used to recover the lack of personnel experienced before the pandemic.

Considering the average of 13% of new personnel hired, in 6 Regions this percentage is significantly higer.

A prevision about nurses



Commento

This is a comparison between the potential nurses that will achieve their degree in the next years and the number of nurses that will be necessary to make possible one of the main organizational model prevised by the recovery plan.. We still have problems in terms of personnel

The «at risk categories»

- The WHO divided vulnerable individuals who have a greater risk of contracting influenza, transmitting it, and developing complications, into five risk categories: children under 5 years of age, pregnant women, people over 65, chronic patients, and health care workers (HCWs);
- However, despite WHO recommendations, influenza vaccination policies are consolidated only in high-income countries and in a few low and middle-income countries, and in some risk categories, such as HCWs, suboptimal vaccination coverage is reported worldwide;
- Vaccination of HCWs is at the basis of a proper hospital management
- HCWs are at an increased risk of exposure to influenza, posing a potential threat to their health and to patient safety. They have a higher risk of symptomatic influenza infections (up to 2.5 times) compared to the population of healthy adults working in settings other than health care facilities;
- Flu vaccination is considered as a key preventive intervention of control activities for the prevention of healthcare-associated influenza transmission and to reduce patient morbidity and mortality, to increase patient safety, and to reduce work absenteeism among HCWs;
- Another problem is presenteeism associated with influenza like illness among HCWs: a large group of physicians (even >75%) admit to carrying out their work despite having flu-like symptoms;
- HCWs can promote influenza virus transmission, putting patients at risk;

vaccines

MDPI

Article

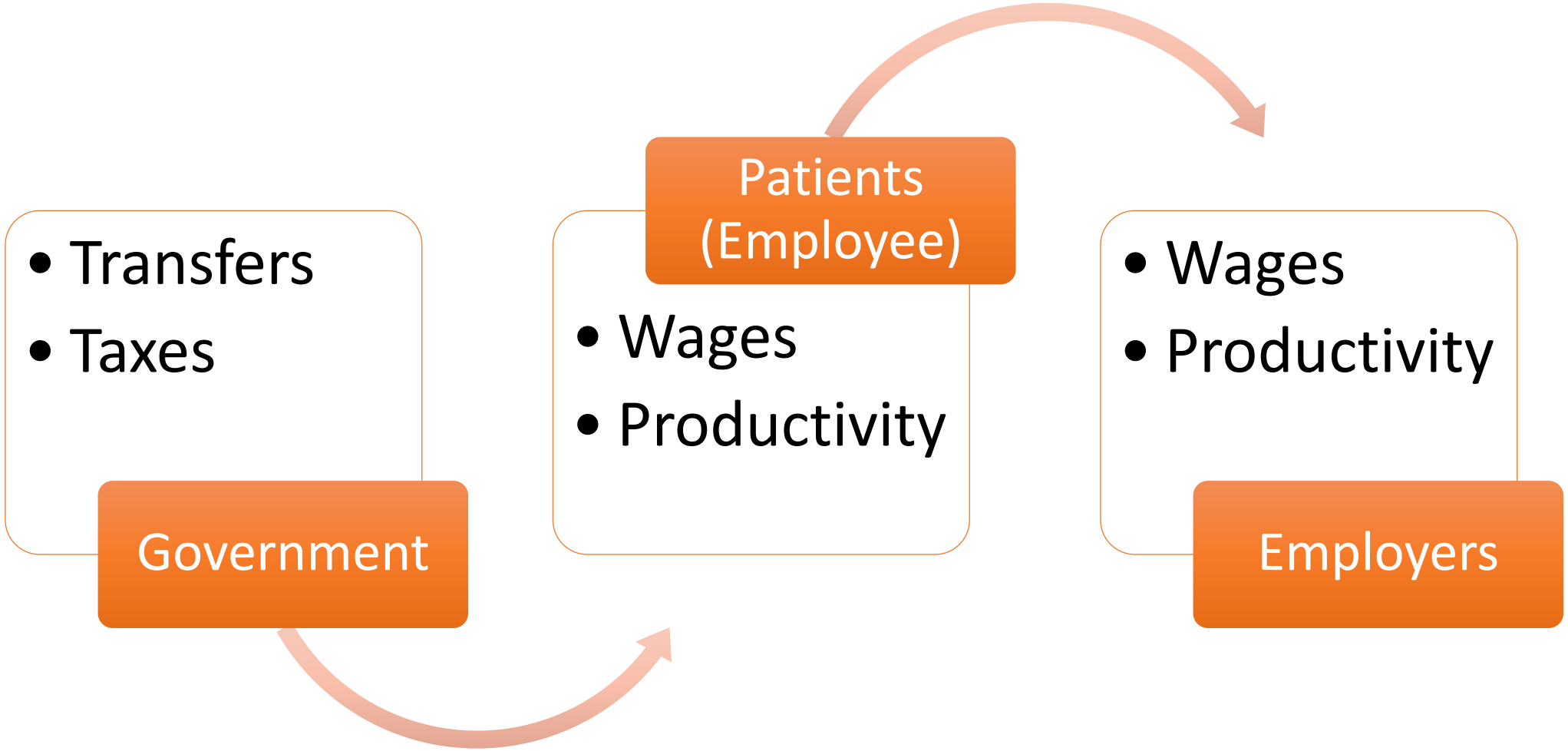
The Economic and Fiscal Impact of Influenza Vaccination for Health Care Workers in Italy

Giovanna Elisa Calabrò [1,2,*,†], Filippo Rumi [3,†], Elettra Fallani [4,5], Roberto Ricciardi [2] and Americo Cicchetti [3]

Why decide to vaccinate workers?

- Vaccine-preventable diseases (VPDs), such as influenza, have a significant impact not only on the health and social care system, but also on the production and economic systems;
- By decreasing the morbidity and mortality of VPDs, vaccinated workers are more likely to have improved productivity, work for more time, and remain active and prolific for longer in the job market than unvaccinated workers;
- Flu immunization is recommended during seasonal epidemics to ensure proper functionality of health services and prevent presenteeism and absenteeism;
- Vaccinations have also an economic impact which incorporate health and non-health benefits of vaccination in both vaccinated and unvaccinated populations;
- When assessing the economic value of vaccines, decision-makers should adopt a full societal perspective that also considers the fiscal impact of an infectious disease;
- The fiscal health model assumes that a higher productivity of HCWs translates into increased individual income, resulting in additional government tax revenues available to reinvest in health care services and the workforce;
- If an illness decreases the individual productivity, all the systems are negatively affected;

Fiscal Impact



A simulation

- Assuming an incremental increase in vaccination coverage among HCWs of 10% per year over a period of 5 years, total savings could be obtained in terms of a reduction in productivity losses equal to euros 4,475,497.16 and an increase in tax revenues of euros 327,158.84;
- This revenue could be used to finance interventions in the public health field, generating more health, which in turn could generate a population with less loss of productivity and consequently higher tax revenues;
- Therefore, an increase in vaccination coverage among HCWs leads to an increase in terms of tax revenues derived from the minor number of professionals affected by the influenza and at the same time involves a reduction in indirect costs (productivity losses) because HCWs lose fewer days of work on average.

The economic impact on Italian NHS of missing vaccinations

First and second doses

Date	Hospitalization costs (ordinary hospitaliz.)	Hospitalization Costs (ICU)	Full costs (ordinary + ICU)
2021-08-04	€ 15.891.471	€ 3.968.221	**€ 19.859.692**
2021-08-11	€ 22.252.747	€ 5.869.774	€ 28.122.521
2021-08-18	€ 30.123.709	€ 8.021.283	€ 38.144.992
2021-08-25	€ 38.800.416	€ 12.001.751	€ 50.802.167
2021-09-01	€ 45.215.922	€ 15.396.525	€ 60.612.447
2021-09-08	€ 49.896.694	€ 17.114.975	€ 67.011.669
2021-09-15	€ 52.090.101	€ 19.016.468	€ 71.106.569
2021-09-22	€ 51.618.876	€ 18.728.636	€ 70.347.513
2021-09-29	€ 46.912.932	€ 17.309.766	€ 64.222.698
2021-10-06	€ 39.810.247	€ 14.535.638	€ 54.345.885
2021-10-13	€ 32.366.437	€ 12.397.613	€ 44.764.050
2021-10-27	€ 21.380.166	€ 7.953.282	€ 29.333.448
2021-11-03	€ 20.059.556	€ 7.614.783	€ 27.674.340
2021-11-10	€ 21.493.332	€ 8.804.976	€ 30.298.308
2021-11-17	€ 23.798.270	€ 10.067.205	€ 33.865.475
2021-11-24	€ 27.427.581	€ 12.077.310	€ 39.504.891
2021-12-01	€ 27.397.886	€ 12.968.580	€ 40.366.466
2021-12-07	€ 32.422.540	€ 14.595.962	€ 47.018.502
2021-12-15	€ 37.331.257	€ 17.734.638	€ 55.065.895
2021-12-21	€ 43.448.434	€ 21.091.714	€ 64.540.148
2021-12-28	€ 50.987.804	€ 24.043.741	€ 75.031.545
2022-01-05	€ 60.237.897	€ 28.319.623	€ 88.557.520
2022-01-12	€ 69.452.459	€ 32.458.475	€ 101.910.934
2022-01-19	€ 82.450.755	€ 36.933.735	€ 119.384.490
2022-01-26	€ 96.546.490	€ 41.361.176	€ 137.907.666
2022-02-02	€ 98.988.801	€ 41.413.061	€ 140.401.862
2022-02-09	€ 99.019.683	€ 39.015.308	**€ 138.034.990**

Third dose

Date	Hospitalization costs (ordinary hospitaliz.)	Hospitalization Costs (ICU)	Full costs (ordinary + ICU)
2021-08-04	n.d.	n.d.	n.d.
2021-08-11	n.d.	n.d.	n.d.
2021-08-18	n.d.	n.d.	n.d.
2021-08-25	n.d.	n.d.	n.d.
2021-09-01	n.d.	n.d.	n.d.
2021-09-08	n.d.	n.d.	n.d.
2021-09-15	n.d.	n.d.	n.d.
2021-09-22	n.d.	n.d.	n.d.
2021-09-29	n.d.	n.d.	n.d.
2021-10-06	n.d.	n.d.	n.d.
2021-10-13	n.d.	n.d.	n.d.
2021-10-27	n.d.	n.d.	n.d.
2021-11-03	n.d.	n.d.	n.d.
2021-11-10	n.d.	n.d.	n.d.
2021-11-17	€ 4.986.697	€ 868.997	**€ 5.855.694**
2021-11-24	€ 7.422.765	€ 1.198.378	€ 8.621.143
2021-12-01	€ 14.090.678	€ 3.114.660	€ 17.205.339
2021-12-07	€ 17.940.615	€ 3.250.089	€ 21.190.704
2021-12-15	€ 22.697.115	€ 4.110.613	€ 26.807.729
2021-12-21	€ 26.953.413	€ 4.043.629	€ 30.997.041
2021-12-28	€ 38.896.047	€ 7.170.471	€ 46.066.517
2022-01-05	€ 45.013.758	€ 9.750.364	€ 54.764.122
2022-01-12	€ 49.807.217	€ 11.124.269	€ 60.931.486
2022-01-19	€ 57.859.454	€ 13.522.399	€ 71.381.854
2022-01-26	€ 69.245.130	€ 14.758.618	€ 84.003.749
2022-02-02	€ 77.281.819	€ 15.168.149	€ 92.449.968
2022-02-09	€ 83.638.548	€ 15.550.210	**€ 99.188.758**

We have estimated the economic impact on Italian NHS considering the number of avoidable hospitalizations (whether vaccinated), between August the 4th 2021 and February the 9th 2022, and the same we have done considering the third dose

Flu vaccination remarks

- Flu vaccination in children, adults, and elderly individuals results in a reduction in hospitalizations, ambulatory care visits, and medical interventions, which leads to substantial savings in health care costs each year in Europe and worldwide;
- Vaccination among HCWs is associated with a substantial decrease in mortality for elderly patients; therefore, the cost of not vaccinating HCWs can also be substantial in terms of missed benefits;
- Nevertheless, influenza vaccination is associated with a reduction in indirect costs in terms of lost productivity and days of work lost due to illness and reduces the potential fiscal impact caused by the disease;
- Therefore, flu vaccination represents an exceptional opportunity to keep people healthy and can contribute to the sustainability of health care systems by evading unnecessary use of financial and human resources and freeing resources for other health interventions.

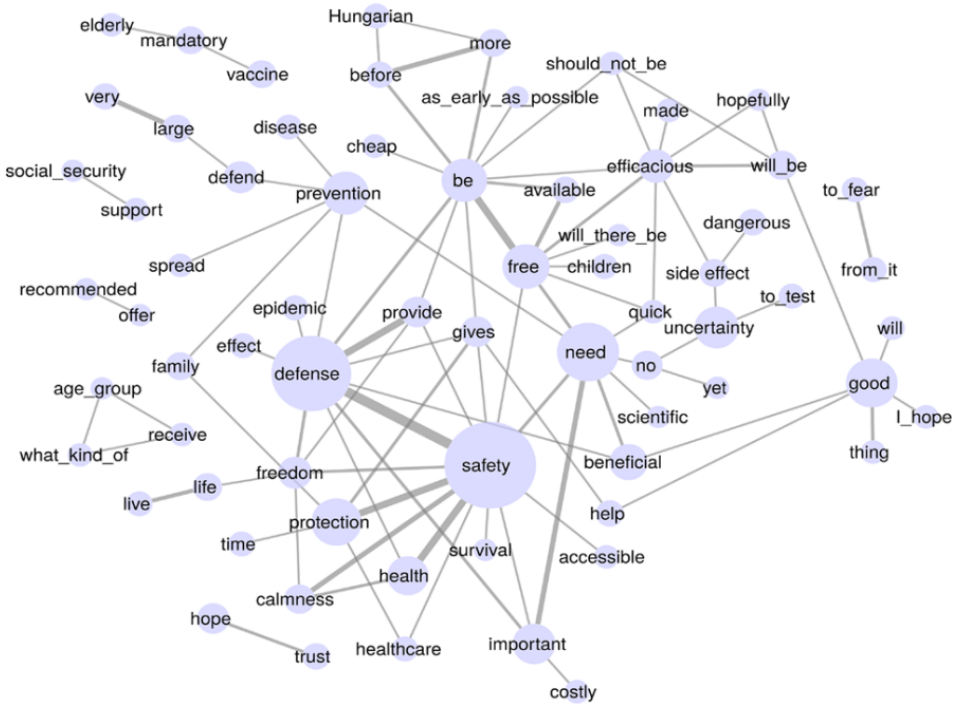
Limits to vaccination

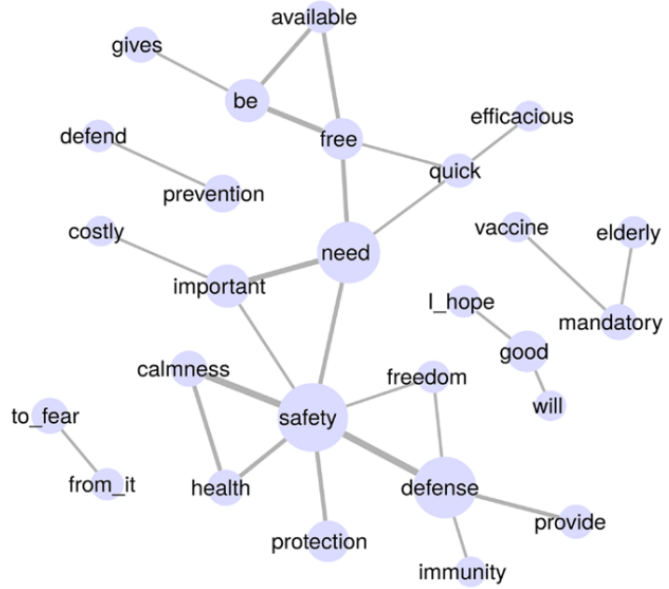
- Increasing vaccination coverage among HCWs is not always guaranteed and is often a difficult goal to achieve;
- It depends on: availability and delivery of the flu vaccine, the presence of adequate and expert human resources, health education, and the promotion of well-structured communication campaigns;
- About communication: several tools can be employed such as posting explanatory leaflets and posters in each hospital ward, distributing information material, creating promotional spaces—using social media and conveying correct communication through websites dedicated to vaccination, using innovative methods such as forum theatre;
- Other effective modalities were the organization of dedicated courses for HCWs, the active invitation to vaccination through e-mail, the on-site vaccination intervention, and the organization of dedicated units for the influenza vaccination of HCWs in the hospital setting;

COVID-19

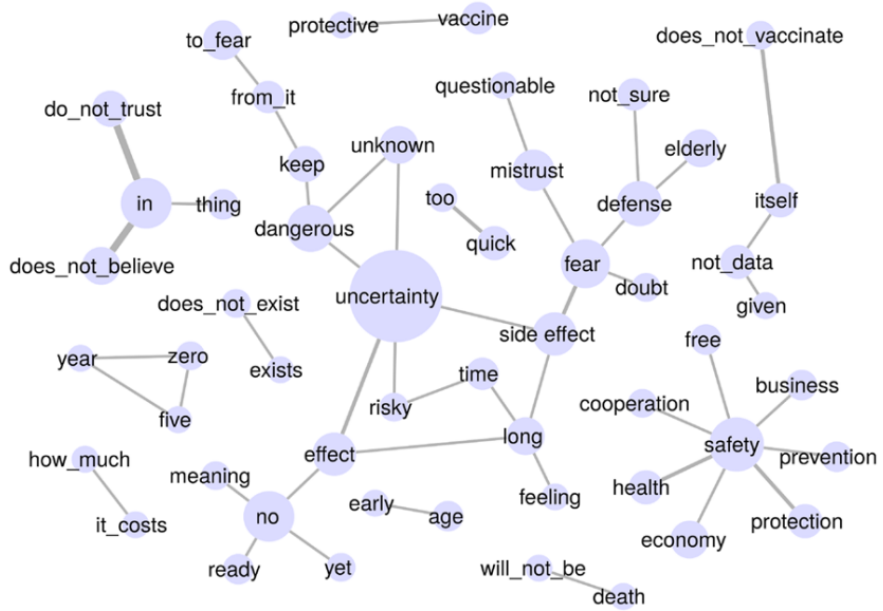
INFLUENZA

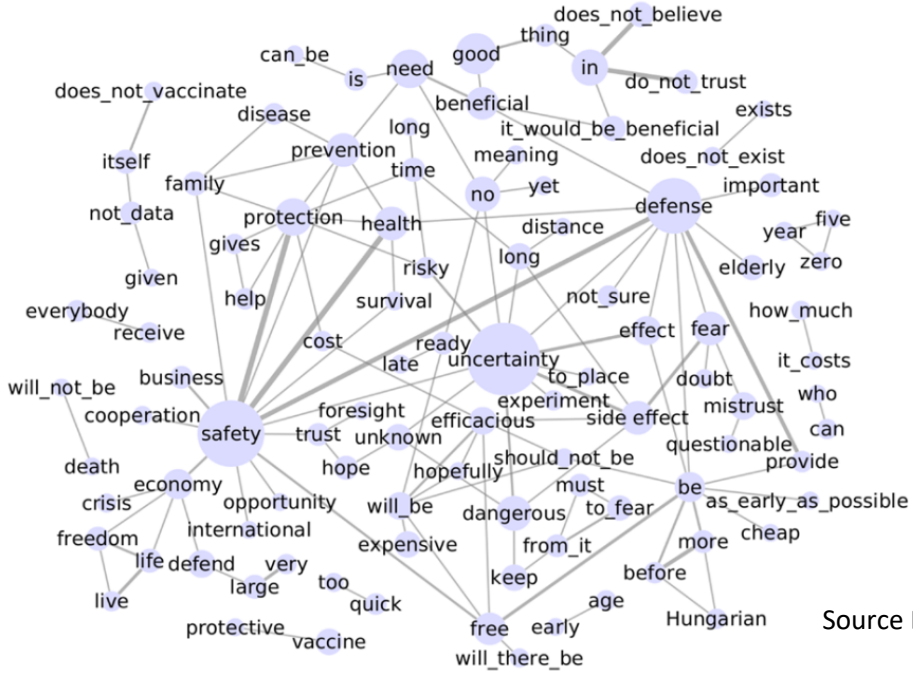
PRO-VACCINATION





ANTI-VACCINATION





Source Dombraidi et al., 2021

Final remarks

- Influenza hits not just patients but also healthcare workers;
- In order to properly manage healthcare organizations it is necessary to pay attention to HCW vaccination;
- This is not just an organizational need aimed at avoiding absence and presenteism but it also has a social impact;
- The increase of the vaccination coverage among HCW decreases loss of producitvity and increases tax wages;
- It is necessary to manage hesitancy and improve vaccination campaigns also among HCWs