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HCW influenza immunization: Importance for Public Health

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HprolImmune EU Info Day, July 8th 2014

Agenda

- Clinical impact
  - Self-protection
  - Transmission
  - Cases averted
- How can we motivate HCWs to vaccinate?
- Economic impact
  - Economic burden
  - Is vaccination good value for money?
  - Socioeconomic factors

Value of vaccines for individual health protection

Every year, vaccines. . .

- prevent 3 million deaths[1]
- save 400 million life years[2]
- save 750,000 children from disability[1]

Vaccines are one of the greatest public health achievements, particularly in the industrialised world

1. Ehreth J. *Vaccine* 2003; 21: 4105–17
2. Ehreth J. *Vaccine* 2003; 21: 596–600

Healthcare workers (HCW) face a higher risk of influenza infection than other adults

Results from a meta-analysis of 29 studies with 58,000 subjects (1957-2009)

- **Unvaccinated HCW => 3.43 (1.2-5.6 95% CI) times as likely to experience an influenza infection as unvaccinated healthy adults**
- **Incidence rate among HCWs:**
  - **Vaccinated: 6.49% [4.63-9.09, 95%CI]**
  - **Unvaccinated: 18.69% [15.80-22.11, 95%CI]**
- **Rates of asymptomatic infections higher in HCWs**

Kuster, S. P.,et al. Incidence of influenza in healthy adults and healthcare workers: a systematic review and meta-analysis. *PLoS One* 2011*;* 6(10):e26239

General Medical Council

UK's Regulating Body for Doctors, Ensuring Good Medical Practice

Getting an annual influenza vaccination: a professional responsibility

Good medical practice

27 Whether or not you have vulnerable* adults or children and young people as patients, you should consider their needs and welfare and offer them help if you think their rights have been abused or denied.[13, 14]

Protect patients and colleagues from any risk posed by your health

28 If you know or suspect that you have a serious condition that you could pass on to patients, or if your judgement or performance could be affected by a condition or its treatment, you must consult a suitably qualified colleague. You must follow their advice about any changes to your practice they consider necessary. You must not rely on your own assessment of the risk to patients.

29 You should be immunised against common serious communicable diseases (unless otherwise contraindicated).

30 You should be registered with a general practitioner outside your family.

* Some patients are likely to be more vulnerable than others because of their illness, disability or frailty or because of their current circumstances, such as bereavement or redundancy. You should treat children and young people under 18 years as vulnerable.

Overall, 27 European Member States do recommend vaccination to health care professionals

http://www.gmc-uk.org/guidance/good_medical_practice.asp

Unvaccinated HCWs transmit influenza to vulnerable patients

In neonatal intensive care units[1,2,3]

- 19/54 infants were infected and one died[1]
- Only 15% of staff had been immunised

In organ transplant units[4]

- Influenza outbreak affected 33% of patients
- 11% HCWs on the ward also developed influenza
- None of the infected nurses had been vaccinated

Unvaccinated HCWs may be asymptomatic and still infect patients[5]

- 23% of 518 HCWs tested antibody positive to influenza
- 59% of them did not recall having had influenza

1. Cunney RJ, et al. Infect Control Hosp Epidemiol. 2000;21:449–51 2. Hall, C. Pediatrics. 1975.Vol 55(5), 673-77 3. Tsagris V, et al. J Hosp Infect 2012;81(1): 36-40 4. Malavaud S, et al. Transplantation. 2001;72:535–7 5. Elder G, et al. BMJ. 1996;33:1241–2

Impact of influenza vaccination in care homes

- **Influenza virus attack rate in care homes 20-40%[1-5] potentially reaching 60%[6] of residents**

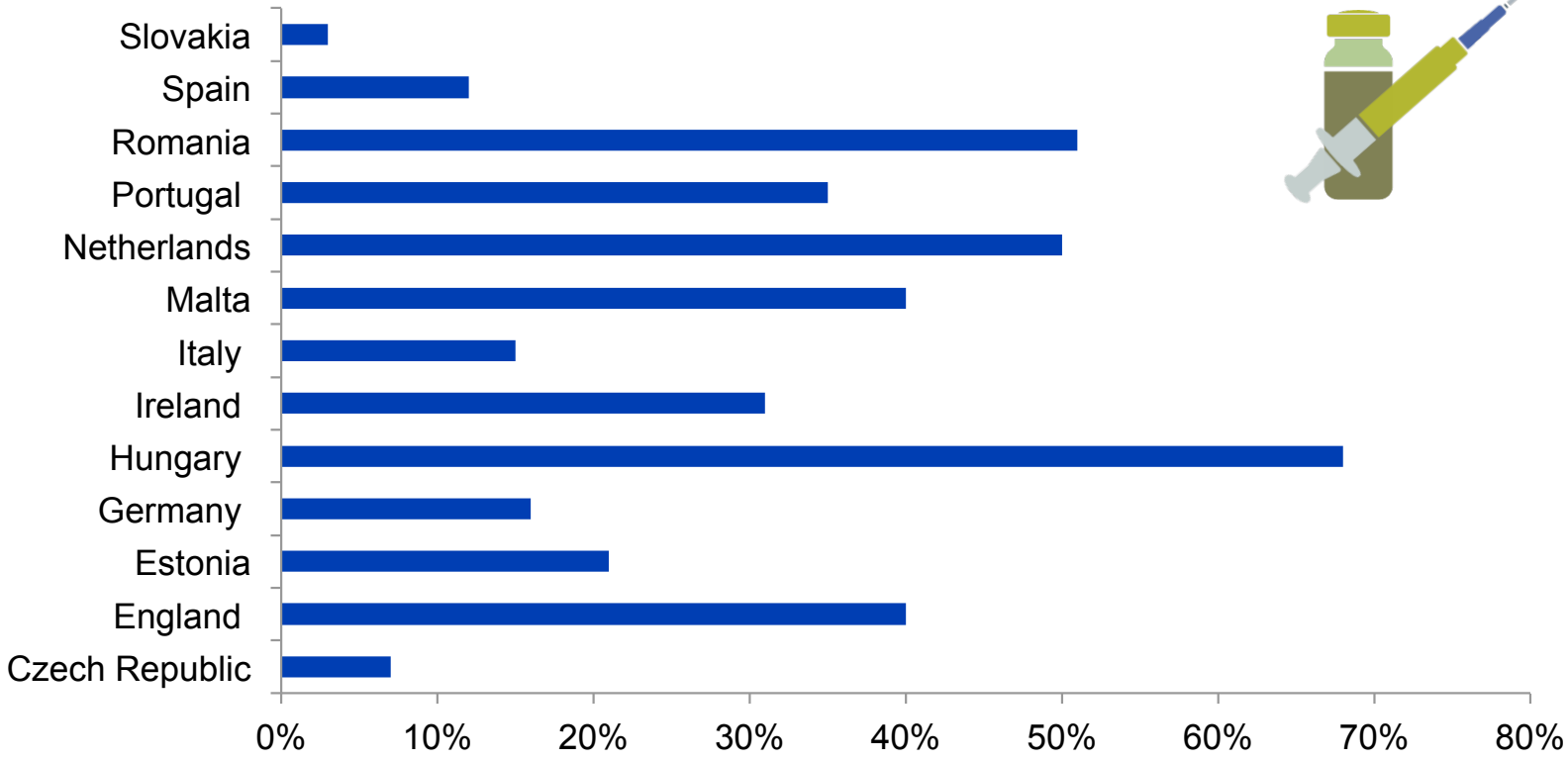
Numbers of care homes staff vaccinations needed to prevent (NNT)[6]:

- **one death = 8**
- **one case of ILI = 5**
- **one GP consultation for ILI = 6**
- **one admission to hospital = 20**

Vaccination of HCWs associated with a substantial decrease in influenza-like illness, hospitalisations and mortality among patients[6-8]

1. Moreus DM et al. Infect Control Hosp Epiremiol 1995;16:275-80 2. Staynor K et al. Can J Infect Control 1994;9:109-11. 3. Coles B et al. J Am Geriatr Soc 1992;10:589-92 4. Pariarca PA et al. JAMA 1985;253:1136-9 5. Anon Can Comm Dis Report 1995;21:61-4 6. Hayward A et al. BMJ, doi:10.1136/bmj.39010.581354 (1 December 2006) 7: Potter et al.. J. Infect. Dis 1997; 175(1)1-6. 8: Carman et al. Lancet. 2000;335(9198):93-7

HCWs - Voluntary influenza vaccination -> low VCRs (Aug 2010)



- **Traditional strategies of requesting & recommending HCWs to be vaccinated fail**
- **HCWs use alcohol gel to protect themselves and next patient**

Eurosurveillance, Volume 17, Issue 4, 26 January 2012

Drivers and barriers among HCWs working in a high risk environment* (VCR: 43.8%): similar fears than general population

Immediate side-effects	8 (11.8)	11 (26.2)	14 (18.2)	33
Long term side-effects	29 (42.6)	15 (35.7)	26 (33.8)	70
Needle phobia	1 (1.5)	1 (2.4)	3 (3.9)	5
Adequate immunity	2 (2.9)	1 (2.4)	9 (11.7)	12
Other	3 (4.4)	0 (0.0)	1 (1.3)	4
Total	68 (100.0)	42 (100.0)	77 (100.0)	187

Poor access to vaccine	5 (7.4)	1 (2.4)	2 (2.6)	8
Immediate side-effects	8 (11.8)	11 (26.2)	14 (18.2)	33
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*Invasive ventilation and airway management procedures

HM Parry, Journal of Hospital Infection 78 (2011) 302e307

Vaccination of HCWs impacts VCR among patients

- **Patients: 14% more likely to accept flu vaccination if their GP had the vaccine, than patients of reluctant GPs**
  - **Direct positive link between the choices of patients and those of their GPs**

- **When Doctors are convinced that the vaccine works**
  => patients get vaccinated
  - **But…many doctors are not convinced!**

- **How do you then increase vaccination rates ?**
  => Introduce incentives OR make it compulsory

1: CMAJ April 8, 2013, doi: 10.1503/CMAJ.121028

HCWs - Mandatory Influenza Vaccination

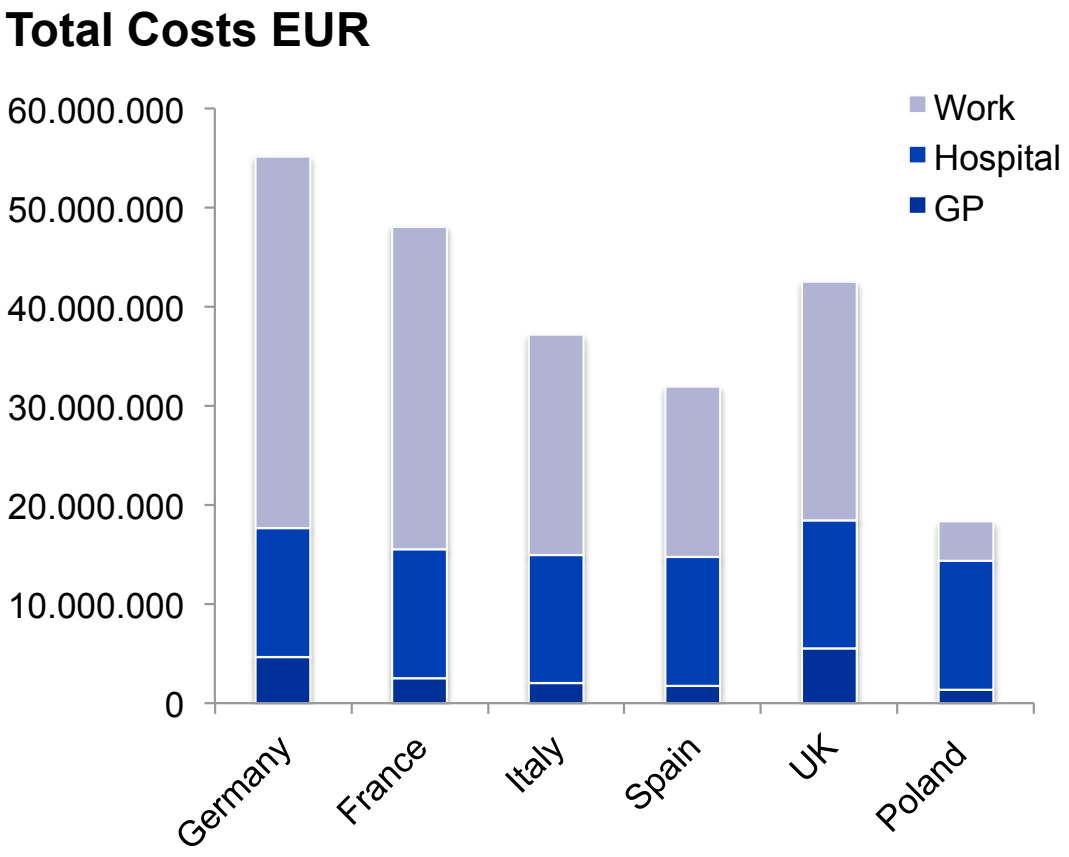
- **Vaccination rates in high 90s%**
- **Work environment – shield (herd immunity)**
- **Need to write it in every new employment contract of frontline HCW**

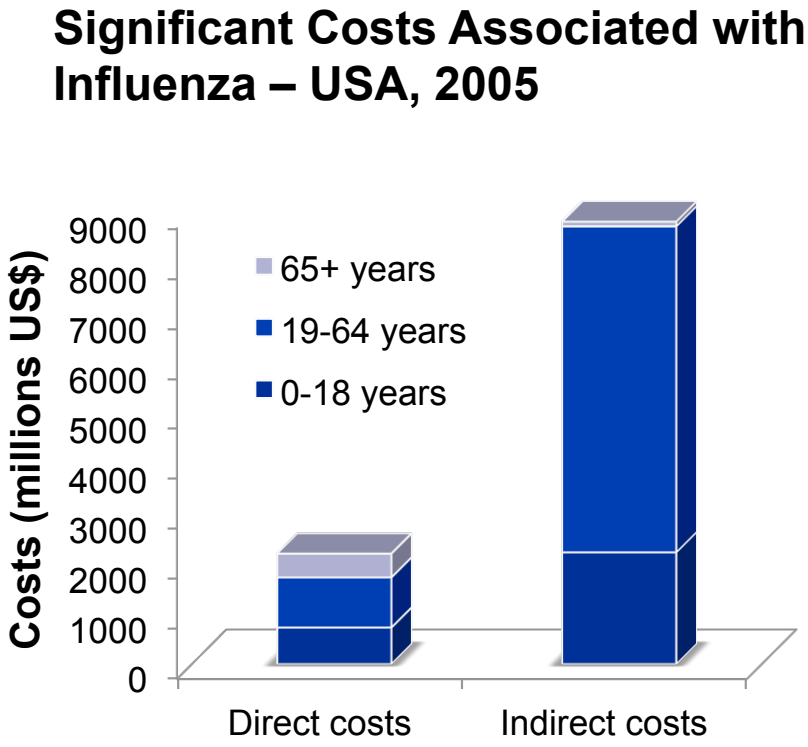
"the welfare of patients is best served by very high rates of staff immunity that can only be achieved through mandatory vaccination ……..under voluntary standards, institutional outbreaks occur[1]"

1: Stewart AM. N Engl J Med 2009; 361:2015-7

How about the costs?

The economic burden of influenza outbreaks is considerable





Indirect costs represent the majority of the total economic burden of influenza

World Health Organization. Wkly Epidemiol Rec 2005; 33: 279–287, Molinari NM. Vaccine 2007; 25: 5086–5096. Kressin BW, Hallauer JF. Deutsches Ärzteblatt 1999; 96: B275–B276; Levy E. Pharmacoeconomics 1996; 9: 62–66; Weycker D, et al. Vaccine 2005;23:1284–1293 OECD database

Estimated costs associated with improving influenza vaccination for health care personnel (HCP) in a multihospital health system

- **Interventions**
  1. education and publicity regarding influenza vaccination
  2. vaccine free of charge
  3. mobile vaccination carts and incentives
- **Costs per vaccinated employee** by type of intervention
  - The average costs per vaccinated employee
  - Vaccination rates increased significantly but remained below ideal levels

CONCLUSIONS

- **VCRs among non-physician HCP can be improved using various interventions at low cost**
- **The costs for interventions were modest compared with the costs typically associated with influenza-related absenteeism**

Intervention	Costs
incentives and carts	$24.55 to $30.43
incentives	$20.66 to $25.57
carts	$23.24 to $26.54
education and publicity	$18.03 to $20.60

Lin CJ et al. Jt Comm J Qual Patient Saf. 2012 Feb;38(2):67-72.

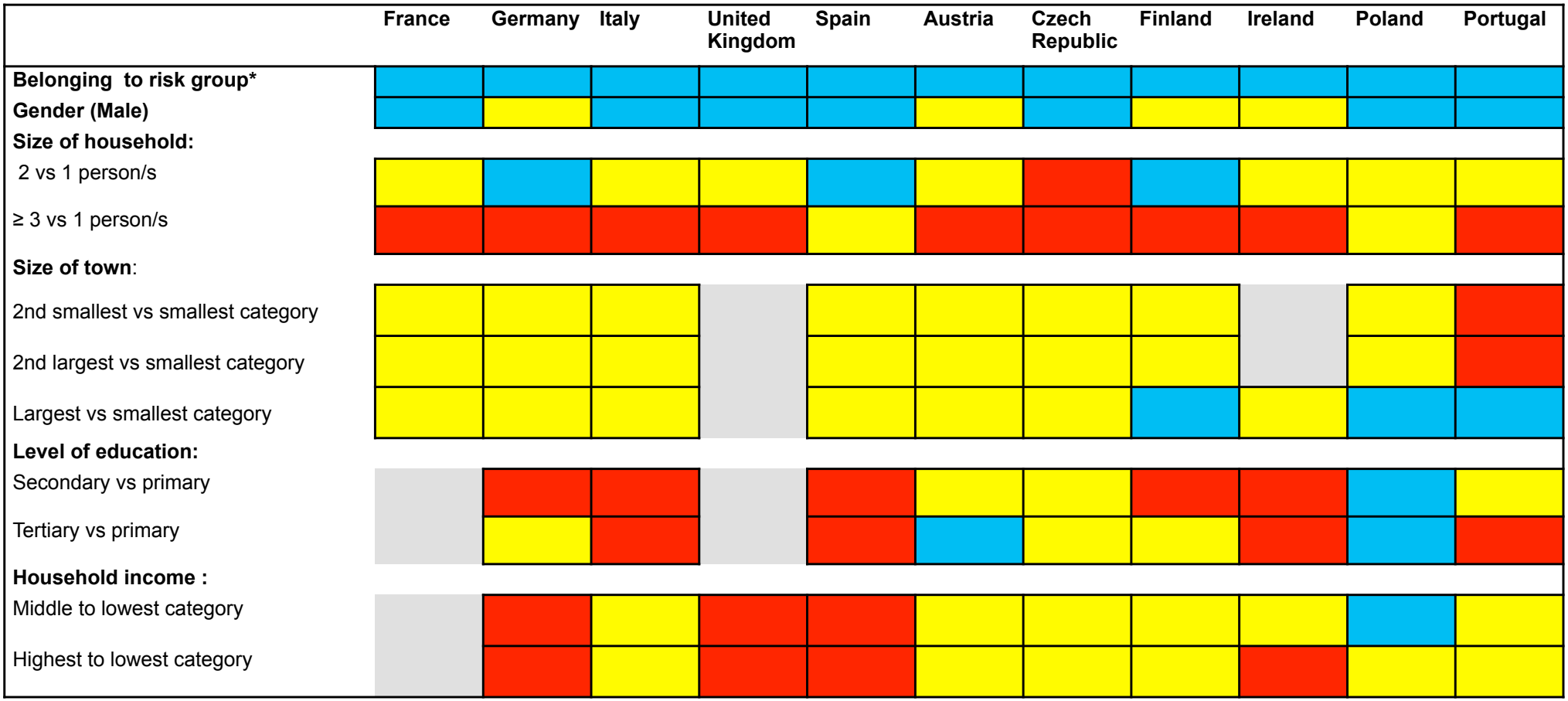
Protection of HCWs and (indirectly) high-risk patients: cost-effective/ cost saving

Parameter	Base case	No absenteeism	Pessimistic scenario
Cost of promotion per recipient (£)	0.70	0.70	2
Cost of vaccine per recipient (£)	6.59	6.59	10
Absenteeism reduced per person (h)	3	N/A	0
Life expectancy (years)	2.75	2.75	1.5
Mortality reduction (%)	8.8	8.8	4
Nurse time to vaccinate (min)	5	5	10
Staff uptake rate (%)	51	51	70
Discounting (%)	3.5	3.5	3.5
Additional cost	Saving of £28000	£18000	£35000
Life-years gained	350	350	86
Result	Cost saving (approximately £12/vaccinee)	£51/life-year gained	£405/life-year gained

A. Burls et al. Vaccine 24 (2006) 4212–4221

Soci(et)al marketing is essential

- **Socioeconomic factors associated with influenza vaccination analyzed by multivariate analyses**
- **Qualitative presentation of statistically significant odds ratios adjusted for all other listed factors per country**

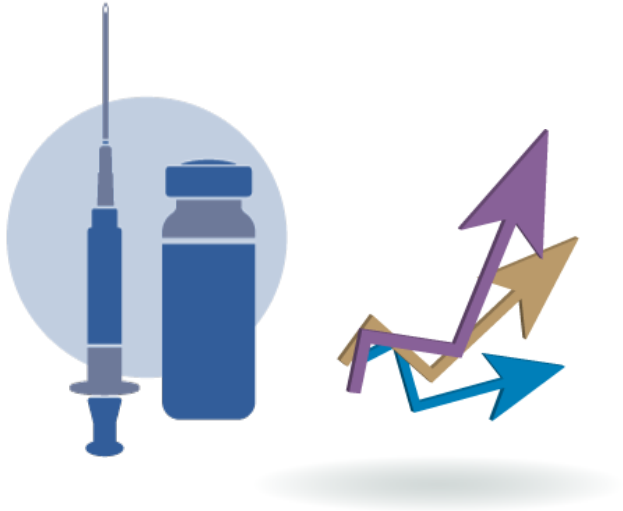


* Includes persons aged ≥ 65 years, or suffering of chronic illness, or working in medical field

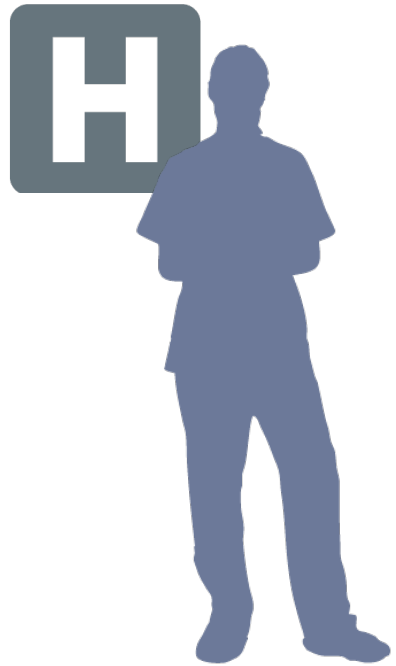
Positive predictor; Negative predictor; Factor with no significant odds ratio; Not applicable

Endrich MM et al, Vaccine. 2009 Jun 19;27(30):4018-24.

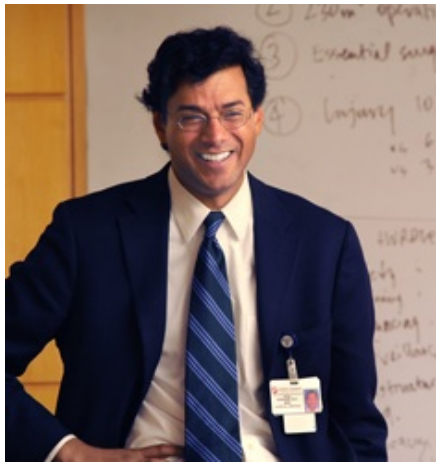
Conclusion: Vaccination of HCWs…



- The HCW is protected & protects their family too
- Protects other fellow HCWs
- Reduces absenteeism from work
- Protects vulnerable patients
- Could increase immunisation rates among patients
- Similar barriers and driving factors to vaccination as general population
- Vaccination and vaccine interventions show good value for money
- Socioeconomic factors

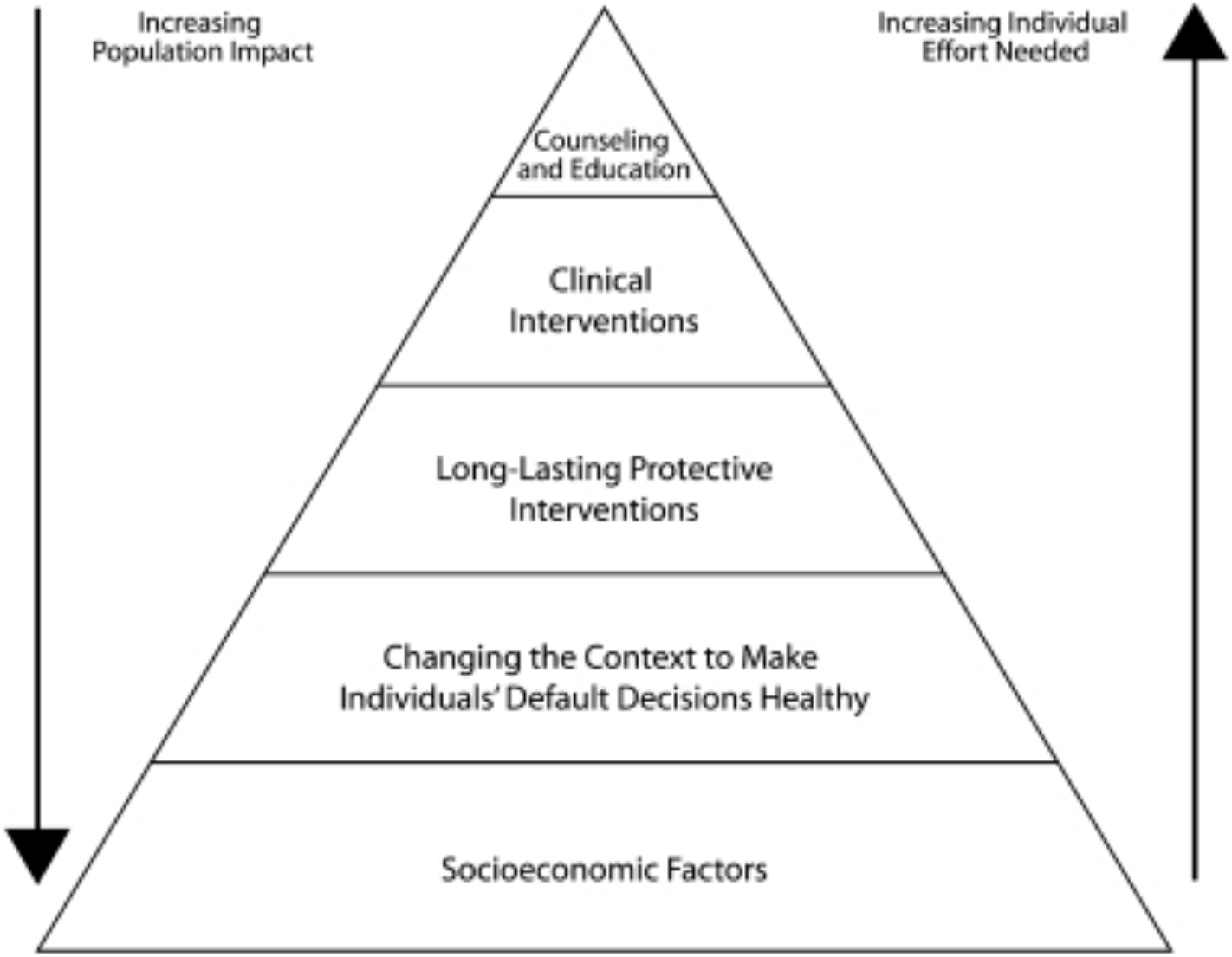


"We always hope for the easy fix: the one simple change that will erase a problem in a stroke. But few things in life work this way. Instead, success requires making a hundred small steps go right - one after the other, no slipups, no goofs, everyone pitching in."



Atul Gawande, Better: A Surgeon's Notes on Performance

Public health impact



Am J Public Health. 2010 April; 100(4): 590–595.

Vaccination of HCWs: Legal & Ethical Aspects

Mandatory Vaccination in Canada: National Advisory Committee on Immunization

– **"….in the absence of contraindications, refusal to be immunized against influenza by health care providers who have direct patient contact, implies failure in their duty of care to patients[1]"**

USA - National Vaccine Advisory Committee (NVAC) Recommendation[2]:

– **"NVAC recommends that Health Care Employees (HCEs) and facilities integrate influenza vaccination programs into their existing infection prevention programs or occupational health programs[2] "**

1: Public Health report /January-February 2013 / 2013
2: Vaccine Advisory Committee: Public Health Reports / January–February 2013 / Volume 128

Internation travel as catalyst

in 2008

Immigrants and VFR

February 28, 2009:
Flu spread by unvaccinated NHS frontline staff

- **Health workers have been blamed for putting vulnerable patients at risk and worsening the winter's flu outbreak by refusing to be vaccinated**
- **Fewer than one in 7 frontline NHS staff had a flu vaccine**
- **Of the hundreds of patients seriously affected by staff transmission of flu, some were infected while being treated in high-dependency wards...**

THE TIMES

http://www.thetimes.co.uk/tto/health/article1883305.ece