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Health Service Executive

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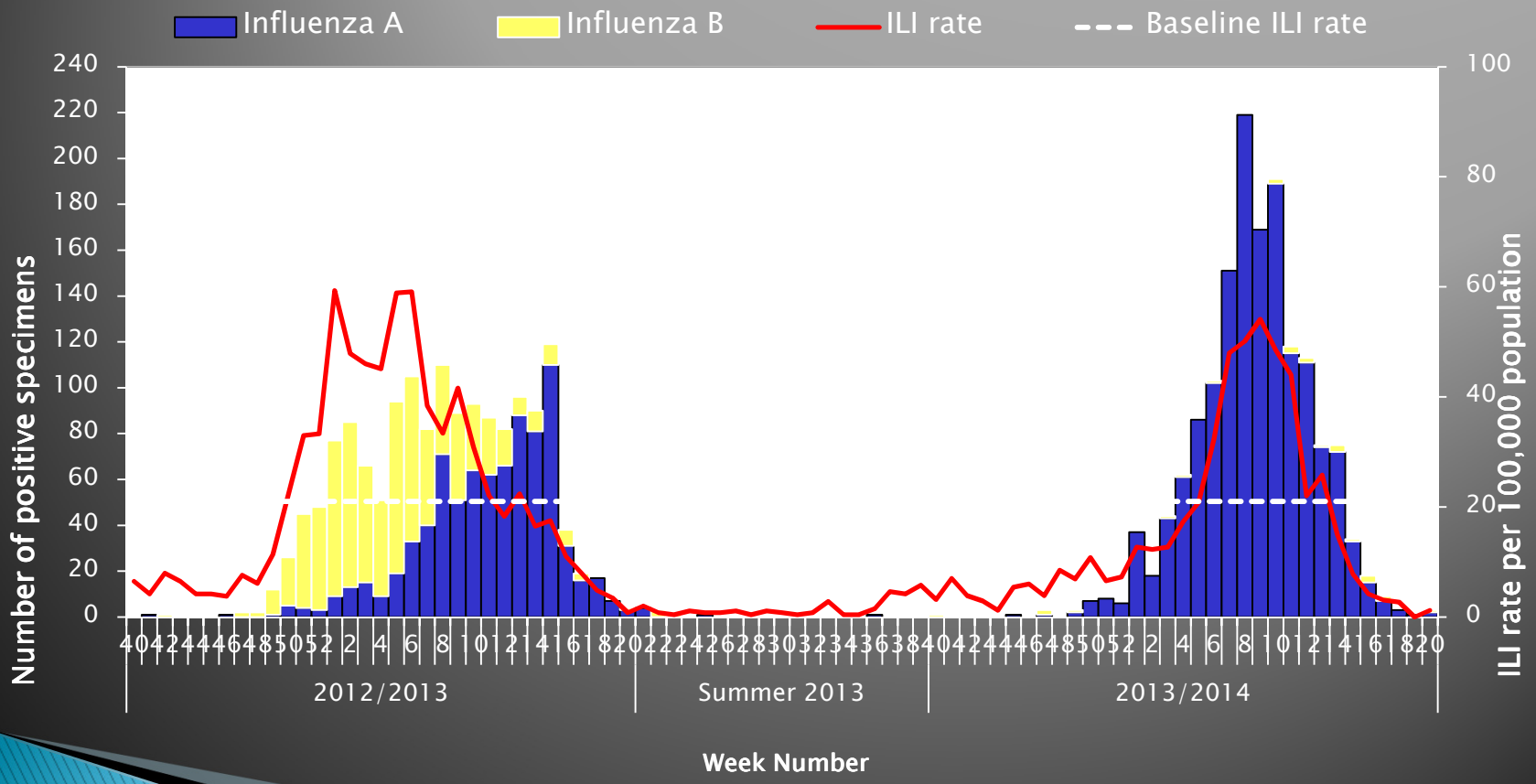
Seasonal Influenza Vaccination and Health Care Workers (HCWs)

Dr Rose Fitzgerald
Department of Public Health

Influenza (Flu)

- Viral infection
- Influenza A & B
- Seasonal
- Affects the lungs, throat, nose, and other parts of the body

ILI consultation rate, positive influenza A and B specimens (NVRL), by week and year (2012/13–2013/14*)



* Data for 2014-2015 not available at time of presentation 1/10/2015

How Does Flu Spread?

Courtesy: CDC/ Brian Judd

- Tiny droplets are sprayed into the air when a sick person coughs, sneezes, or even talks
- May land in nose, eyes, or mouth
- May touch a surface like a table or a doorknob that has the virus on it, then touching mouth or nose

Symptoms	Cold	Classic Flu
Fever	Rare , except in very young children	Usual (≥ 38°C 100.4° F) lasts 3-4 days, reduced in elderly
Headache	Rare	Prominent
General aches/ pains	Slight	Often severe
Fatigue/ Weakness	Mild	Sudden onset and can last up to 3 weeks
Extreme exhaustion	Never	Early and prominent
Stuffy nose	Common	Sometimes
Sneezing	Usual	Sometimes
Sore throat	Common	Sometimes
Cough, Chest discomfort	Mild to moderate	Common and can become severe

In healthy adults symptoms of flu can range from classic influenza to mild illness or *asymptomatic* infection

Complications

- Bacterial superinfection
  - pneumonia
  - croup

- Decompensation of chronic diseases
  - pulmonary disease
  - heart disease
  - renal insufficiency
  - metabolic disease

Who is most at risk of complications?

- Diseases
  - Chronic medical conditions e.g. Chronic respiratory, cardiac etc., Diabetes Mellitus, neurological disorders, immunosuppressed, morbid obesity-BMI $\geq$ 40
- Vulnerable age
  - Young children $<$ 5 years
    - hospitalisation rates comparable to those aged 50-64
    - those under 6 months have highest hospitalisation rate of any age
  - $\geq$ 65 years
    - Account for 90% deaths from seasonal flu
- Pregnancy

SAGE WHO background paper on Influenza vaccines and Immunization

Flu is Dangerous

- Most of these excess deaths are in the elderly/those with underlying illness
- Death 0.5-1/1000 cases (1/10,000 pop per year)
- Between 200 and 500 Irish people will die each year because of flu
- In a bad year this can be up to 1000 people (2008-2009)
- Of the 411 people admitted to ICU in Ireland with lab confirmed flu since 2009
  - 18% were healthy people with no underlying illness; most were < 65 years; median age of those admitted to ICU ranged from 18 – 66 years depending on year; Case fatality ratio varied, (range 18-36%)

Flu vaccine Recommended for

- From 6/12 age with chronic illness/immunosuppression
- Those > 50 years of age
- Morbid obesity
- Residents of Nursing Homes
- HCWs and carers
- Close, regular contact with pigs, poultry or water fowl
- Pregnant women – any stage

Children under 9 years of age and those who are immunosuppressed require two doses of vaccine separated by 4 weeks if receiving the vaccine for the first time

Inactivated vaccine

- Use from 6 months of age
- 6 months to <9 years – single injection of 0.5 ml IM
- Children aged 12-23 – separate from PCV13 by at least 1/52 to reduce risk of febrile convulsions
- Egg Allergy – can get seasonal influenza vaccine with ovalbumin <0.1µg per dose

Live attenuated vaccine

- Quadrivalent – antigens from 2 type A and 2 type B strains
- Cultured in eggs
- Administered intranasally (0.1 ml each nostril)
- Use from 24 months to less than 18 years
- Contra-indications
  - Concomitant use of aspirin
  - Significant immunosuppression
  - Severe asthma or active wheezing
  - Influenza antiviral medications within the previous 48 hours
  - Pregnancy
  - Egg allergy (due to insufficient data)
  - Persons who care for severely immunosuppressed

Influenza Vaccine for all HCWs

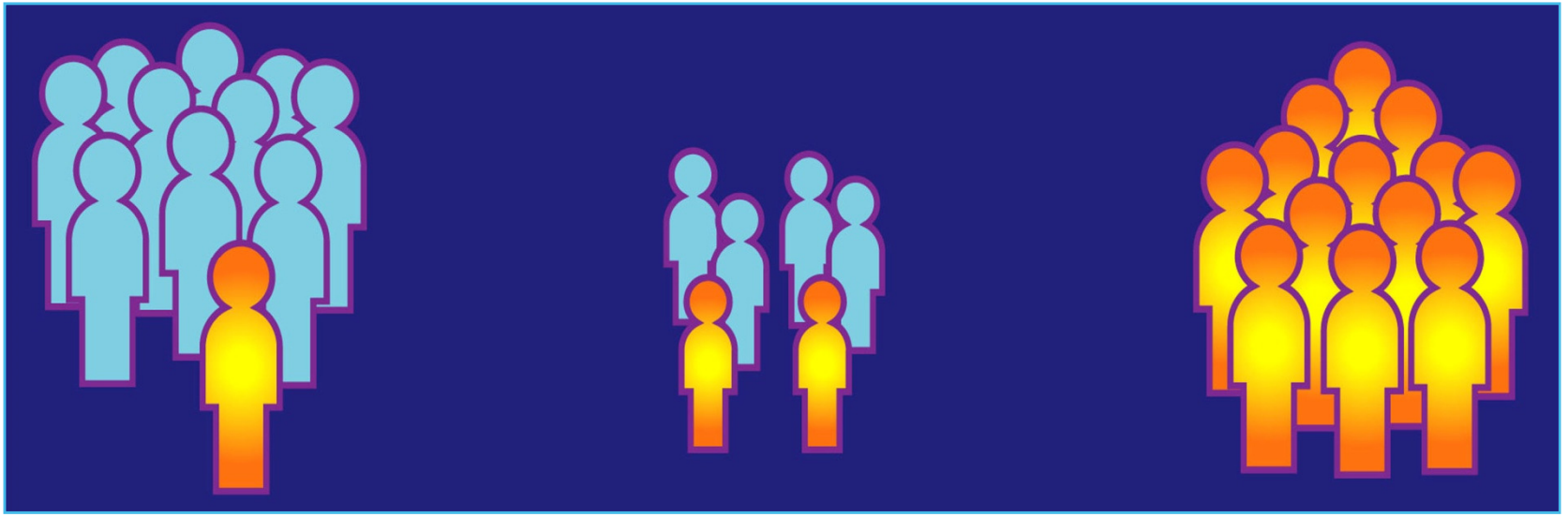
- Recommended annually since 1999*
  - Increased risk of exposure
    - Reduce staff illness and absenteeism
  - Known to spread from workers to patients
    - Vital to care of high risk patients
- Recent emphasis on influenza vaccine to ensure patient safety and as quality measure for organisations

*RCPI National Immunisation Guidelines for Ireland. (editions 1999/2202/2008/2013)

HCWs: all staff (including ancillary staff, such as cleaners, porters, kitchen staff) working in health care setting or health related activities in acute and non acute health care settings, including those working in health related activities in the community settings

Everyone is at risk

≈100 million people infected every year in Northern Hemisphere*



1:10 adults

1:3 children

10,000-40,000 deaths in the USA

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Characteristics of Influenza Hospitalisations in Ireland over 6 influenza seasons

	Hospitalised					
	Pandemic period	2010/11	2011/12	2012/13	2013/14	2014/15
Total cases	1059	968	147	469	693	978
Crude rate /100,000	23.1	21.1	3.2	10.2	15.1	21.3
Median age (years)	17	29	27	32	51	59
Females	50%	55%	56%	57%	57%	53%

*2014/2015 data provisional, further reported cases expected.

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Characteristics of Influenza ICU admissions, Ireland, over 6 influenza seasons

	Admitted to ICU					
	Pandemic period	2010/11	2011/12	2012/13	2013/14	2014/15
Total cases	100	121	15	39	83	53
Crude rate /100,000	2.2	2.6	0.3	0.8	1.8	1.2
Median age (years)	34	49	60	39	50	66
Females	50%	53%	80%	49%	41%	38%
Cases with risk factor	81	90	13	35	69	50
	82%	74%	93%	90%	85%	94%
% Vaccinated	NA	17%	-	-	32%	59%
ICU Median LOS - Adult	12	14	5	9	9	8
ICU Meduan LOS - Paediatric	8	7	3	5	8	8
Case fatality ratio	18%	29%	33%	28%	33%	36%

*2014/2015 data provisional, further reported cases expected.

Summary influenza/ILI general outbreaks by institution type; 2014/2015 influenza season

Location	No. of outbreaks	Total number ill	Total number hospitalised	Total Number dead	Total number lab confirmed
Comm. Hosp/Long-stay unit	26	355	39	2	80
Hospital	17	380	4	5	250
Residential institution	15	163	18	5	43
School	1	17	0	0	-
Total	59	915	61	12	373

Source: CIDR

Summary influenza/ILI general outbreaks in institutional settings (all) by HSE area; 2014/2015 flu season

HSE-area	No. of outbreaks	Total no. ill	Total no. hospitalised	Total no. dead	Total no. lab confirmed	Total no. lab investigated
East	17	407	1	6	240	64
Midlands	2	25	1	1	1	11
Midwest	6	69	24	3	27	25
Northeast	1	8				
Northwest	11	116	5	1	30	42
Southeast	6	52	2	0	15	21
South	13	201	20	0	37	36
West	3	37	8	1	23	24
Total	59	915	61	12	373	223

*Source CIDR data

But I don't get the flu…

Actually…

One serosurvey* showed 23% of HCW had serologic evidence of influenza virus infection during a single influenza season

…the majority had mild illness or subclinical infection

*Elder G, *et al. BMJ.* 1996;313:1241–2.

Kuster SP *et al 2011. PLoS ONE 6(10):e26239. doi:10.1371/journal.pone.0026239*

How can you help?

- People can still spread the flu even when they DON'T feel sick.
  - Up to 50% of infected people don't have symptoms when they are infected
  - People can spread flu germs before they feel sick.

1. Stay home from work when you have symptoms.

2. Wash your hands or use hand sanitisers, sneeze in your sleeve or a tissue

- The only protection is VACCINATION

Flu Vaccine

YOU can help protect your family, friends, patients, and yourself from the flu

Since I'm Not at High Risk, Do I Need to Get the Flu Vaccine?

YES

- When you get the flu it may be mild, but for those at high risk it could be fatal.
  - Patients.
  - Family Members and Friends.
- Getting the flu vaccine helps to protect the people you work so hard to keep healthy

HCW and vaccination

- HCWs frequently implicated as the source of influenza transmission in health care settings
  - Employees continue to work while sick with influenza
  - Unvaccinated workers who are not sick can still spread the virus
- Benefits of influenza vaccination of HCWs:
  - Decrease staff illness from influenza
  - Reduce rates of influenza among patients
  - Reduce risk of outbreaks in health care facilities

Transmission of Influenza by HCWs

- In a neonatal intensive care unit[1]
  - 15% of staff were vaccinated against influenza
  - 19/54 infants were infected and one died
  - Only 29% of staff who reported influenza-like illness took time off work
- In an organ transplant unit: attack rate 33%[2]
  - Each patient was in an individual room and 3/4 had no visitors to account for the spread
  - 3/27 (11%) HCWs on the ward had influenza; not vaccinated
- In long-term facility[3]
  - 65 residents developed influenza
  - Over half developed pneumonia, 19 hospitalized, 2 died
  - 10% of HCW were vaccinated

Influenza infection can be asymptomatic but infectious[4]

[1]Cunney et al. Infect Control Hosp Epidemiol. 2000;21:449–51
[2]Malavaud S, et al. Transplantation. 2001;72:535–7
[3]CDC. MMWR 1991;4:129-131
[4]Elder G, et al. BMJ. 1996;313:1241–2

The vaccine

- The 2014-2015 vaccine contains the 3 strains of flu viruses recommended by WHO as those most likely to be circulating :
  - Influenza A/California/7/2009 (H1N1)pdm09-like virus
  - Influenza A/Switzerland/9715293/2013 (H3N2)-like virus
  - Influenza B/Phuket/3073/2013-like virus
- Inactivated split virion vaccine
- Does not contain any adjuvant
- Does not contain thiomerosal

Most people can get flu vaccine
not recommended for those with:

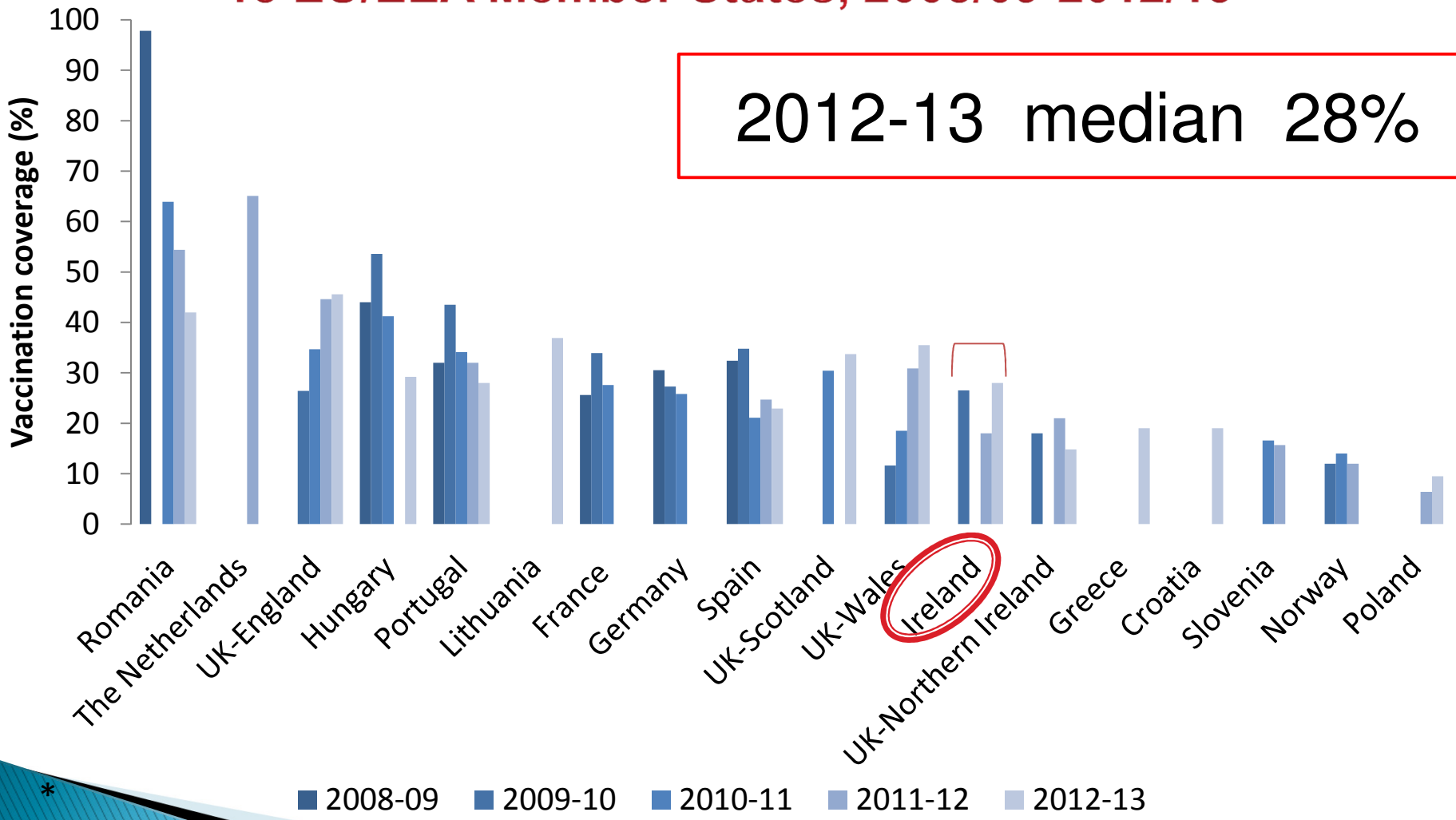
- a history of anaphylaxis following a previous dose of flu vaccine or any part of the vaccine

What about people with egg allergy?

- People with egg allergy can get seasonal flu vaccine (ovalbumin content <0.1 micrograms)

…Yet still HCW vaccination rates remain low

VENICE study
Seasonal influenza vaccination uptake among HCWs in 15 EU/EEA Member States, 2008/09-2012/13

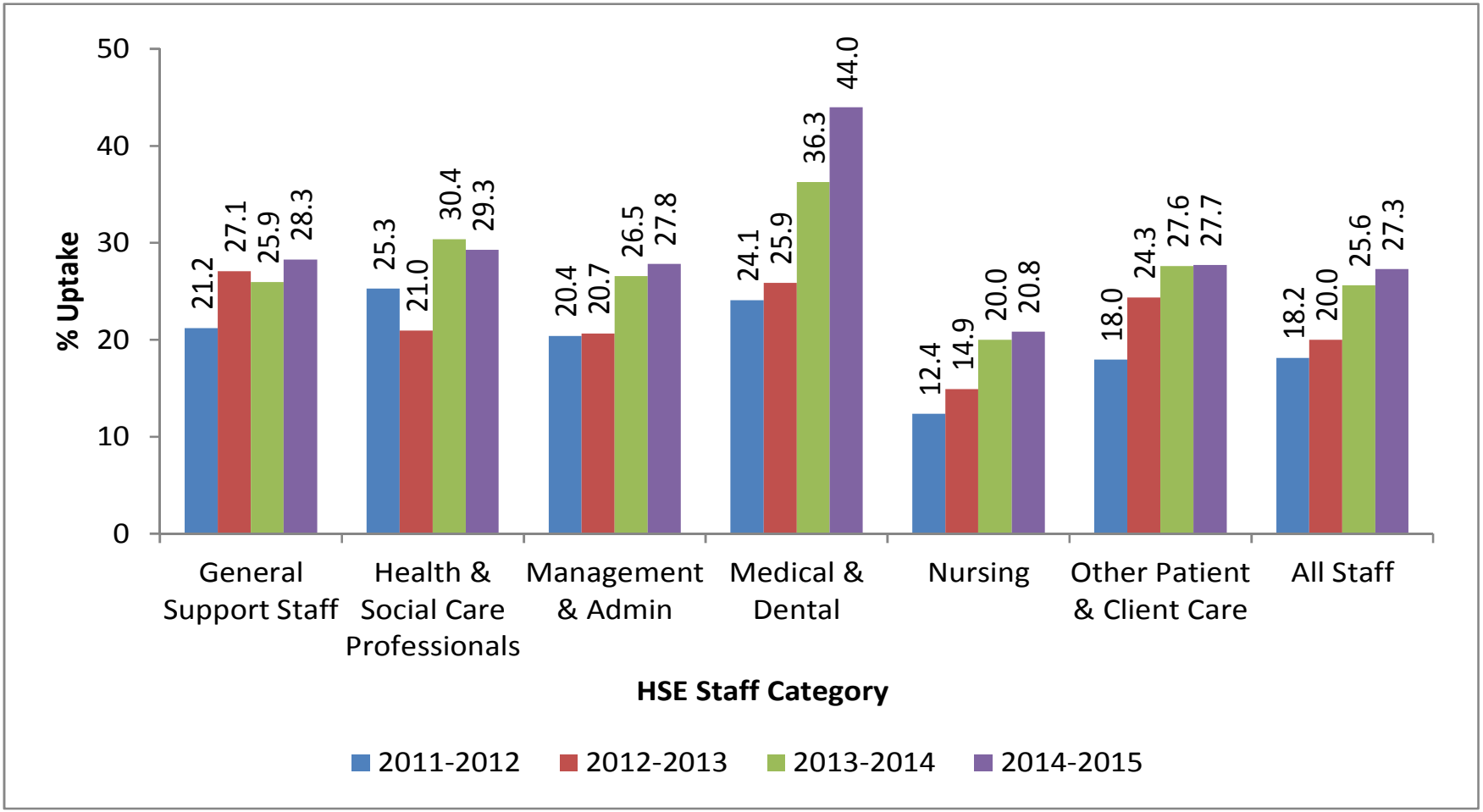


2012-13 median 28%

*

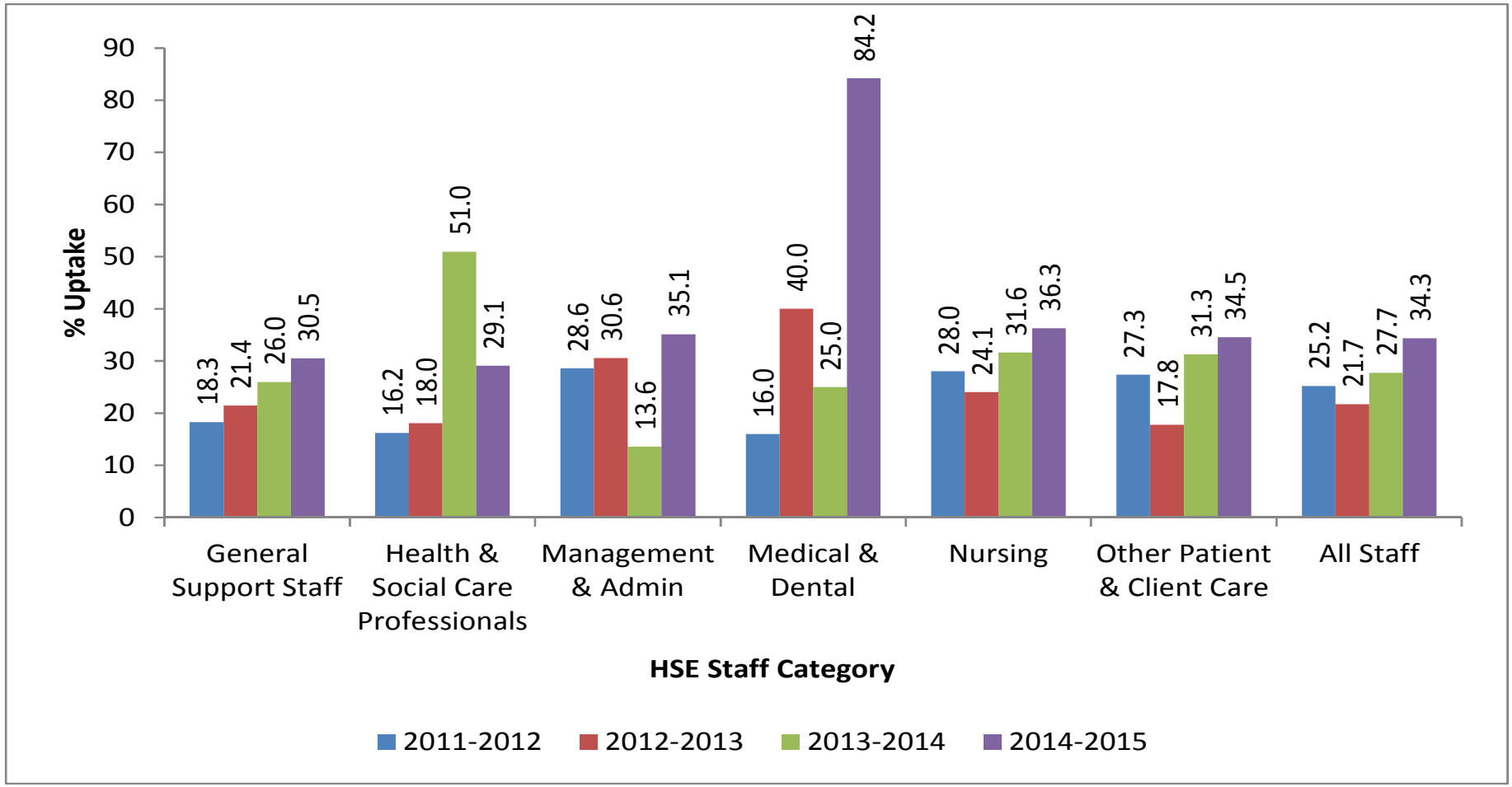
*Health care workers in GPs practice
Source VENICE survey ; http://venice.cineca.org/

Uptake by Hospital Staff Category by Season*



***Results based on complete returns consisting of eligible and vaccinated staff numbers by HSE grade in 21 hospitals that reported back in each survey over the past four seasons**

Uptake by LTCF Staff Category by Season**

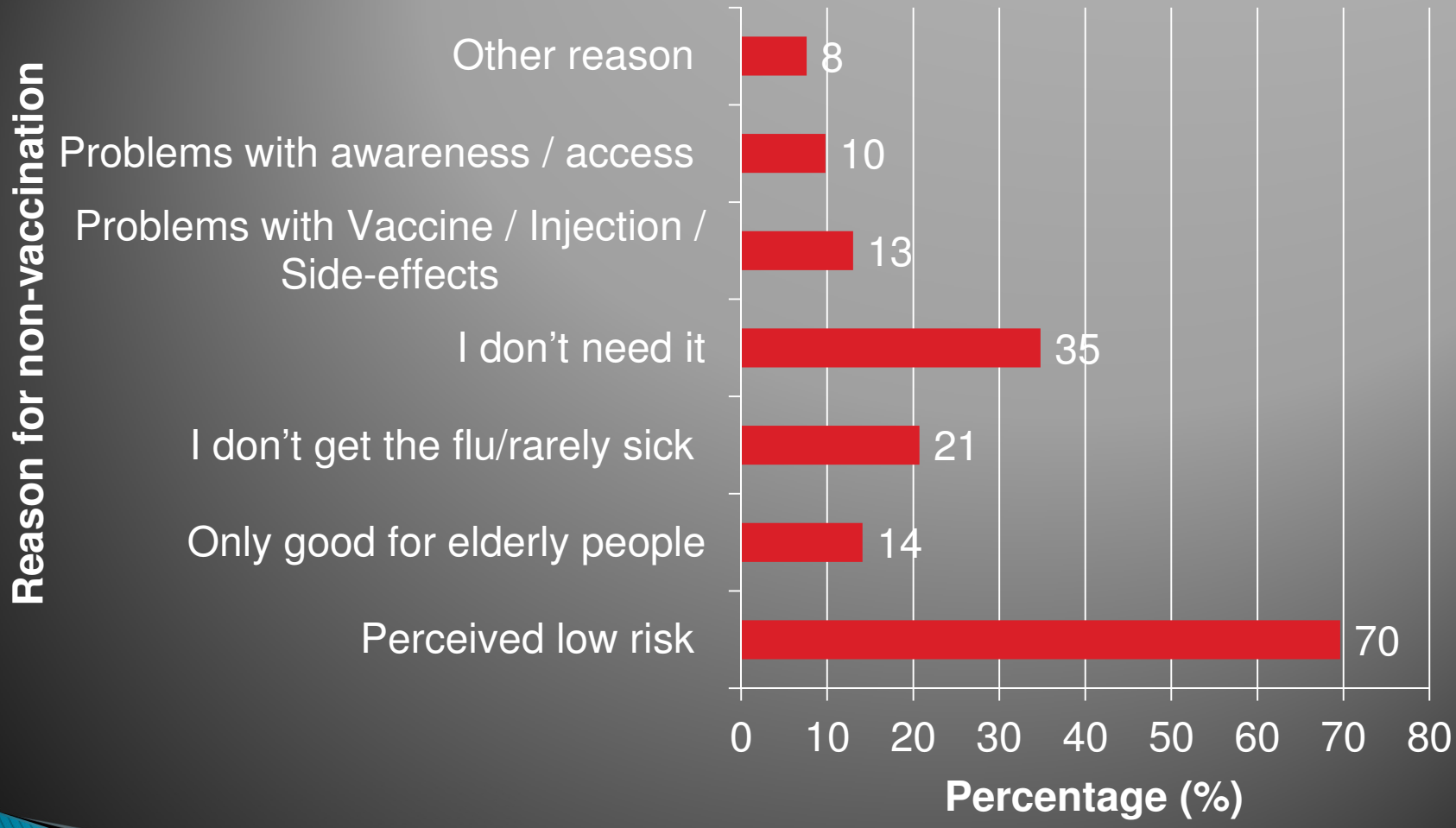


**Results based on complete returns consisting of eligible and vaccinated staff numbers by HSE grade in
21 LTCFs that reported back in each survey over the past four seasons

HCW and vaccination
Where are we in Ireland?

- Poor uptake of immunisation among Irish HCWs
  - Historically poor but improving
  - Inter-hospital/facility variation
- High risk of transmission in health care setting to vulnerable groups
- High risk of complications in risk groups
- Human and economic impact of influenza
  - employee absenteeism, disease among patients, burden on health services
- Poor knowledge
  - Low perception of self risk or risk to others among HCWs
  - Myths and inaccurate information common

Reasons for not getting influenza vaccine among Irish HCWs (n= 92), 2006*



Mereckiene J et al. Euro Surveill. 2007;12(12).

Does the Flu Vaccine Work?

YES!

Systematic reviews have shown that flu vaccine has reduced the flu incidence rate from 18.7 % in unvaccinated HCWs to 6.5% in vaccinated HCWs

Kuster SP *et al. Incidence of Influenza in Health adults and Health Care Workers: A systematic review and Meta -Analysis 2011 PLoS ONE 6(10):e26239. doi:10.1371/journal.pone.0026239*

Factors influencing vaccine efficacy

- Closeness of the match between the vaccine strain and the circulating virus
- Age of vaccinee:
  - older people do not respond as well
- Health of the vaccinee:
  - people with chronic illnesses and immune system disorders do not respond as well as healthy individuals
- Number of vaccinations:
  - in children under 9 two doses are required in the first year of use
- Type of vaccine used;
  - adjuvanted vaccines can give better immune response

Effectiveness of inactivated influenza vaccine in adults

- Effectiveness dependent on match with circulating virus
- Seasonal
  - Vaccine closely matched to circulating strain
    - 73% effective in healthy adults <65 years of age against influenza symptoms, whereas 44% when not well matched

      - Jefferson T et al Vaccines for preventing influenza in healthy adults Cochrane Database Syst Rev 2010:CD001269

- Pooled efficacy results of 59% in adults aged 18-65
  - Osterholm MT, Kelley NS, Sommer A, Belongia EA. Efficacy and effectiveness of influenza vaccines: a systematic review and meta-analysis. *Lancet Infect Dis. Jan 2012;12(1):36-44*.

Is Flu Vaccine Safe?

YES! The flu vaccine is very safe. The benefits far outweigh any possible side effects.

- Some people may have redness and soreness where they received the vaccine
- Serious side effects are rare

Does flu vaccine give you the flu?- NO

- It cannot cause flu
  - inactivated (killed)
  - cannot cause infection

*.

Vaccine side-effects

- Most common side effect of seasonal flu vaccine
  - soreness at injection site
- Rare symptoms
  - fever, muscle pain, and feelings of discomfort or weakness
  - begin soon after vaccination and last 1-2 days
- Frequency
  - local reactions — 15-20% recipients
  - Fever, malaise — not common, resolve
  - Allergic reactions — rare
  - Neurological reactions — very rare
  -

Debunking the Myths:

"I got sicker from the vaccine than when I actually got the flu"

N Engl J Med 2001;345:
1529-36.)

SYMPTOMS	VACCINE	PLACEBO
Rhinitis	44.8%	45%
Sore throat	28.3	28.7
Cough	46.1	45.7
Headache	39.6	37.8
Myalgia	25.1	20.8
Chills	12.2	11.1
Fever	5.1	5.0
Fatigue	27.9	28.6

What is Guillain-Barré Syndrome (GBS)?

- a rare neurological disease that causes temporary weakness or paralysis of the muscles
- Frequently preceded by a viral or bacterial illness (campylobacter)

- In the literature
  - 1976 influenza vaccine associated with increased risk – vaccine was discontinued
  - Since then no clear association between GBS and influenza vaccines
  - Risk of GBS after influenza infection is higher than the risk of GBS after influenza vaccination

Stowe J et al. *Am J Epidemiol* 2009;169:382-8

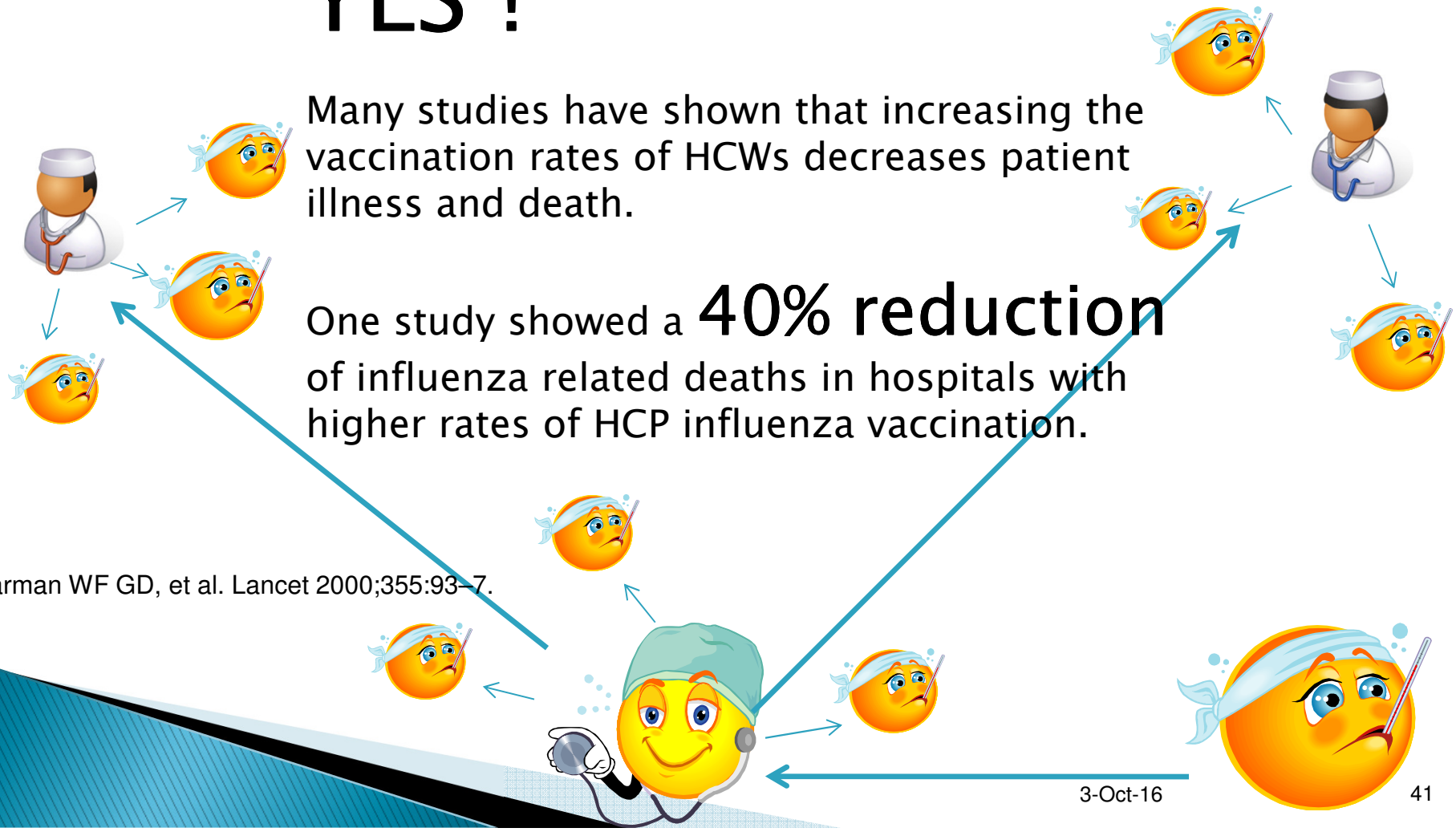
If I get vaccinated, will it really make a difference to my patients?

Does Vaccinating Health Care Workers (HCWs) Really Help?

YES !

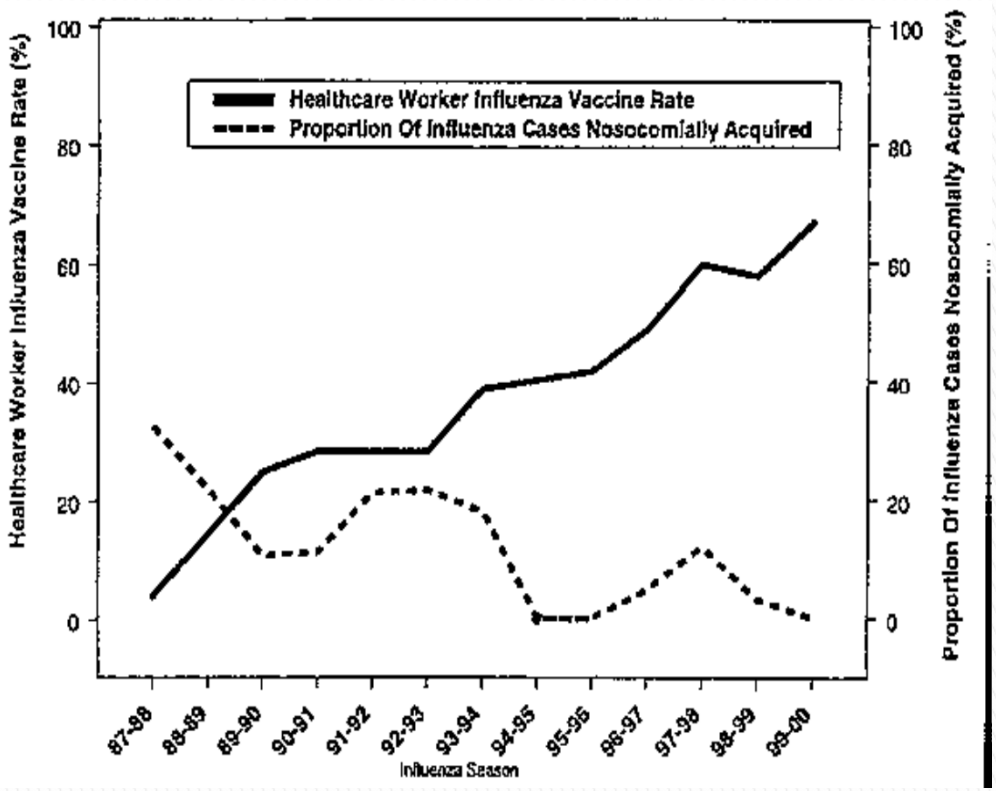
Many studies have shown that increasing the vaccination rates of HCWs decreases patient illness and death.

One study showed a **40% reduction** of influenza related deaths in hospitals with higher rates of HCP influenza vaccination.



Carman WF GD, et al. Lancet 2000;355:93–7.

Vaccination of HCW reduces nosocomial influenza cases

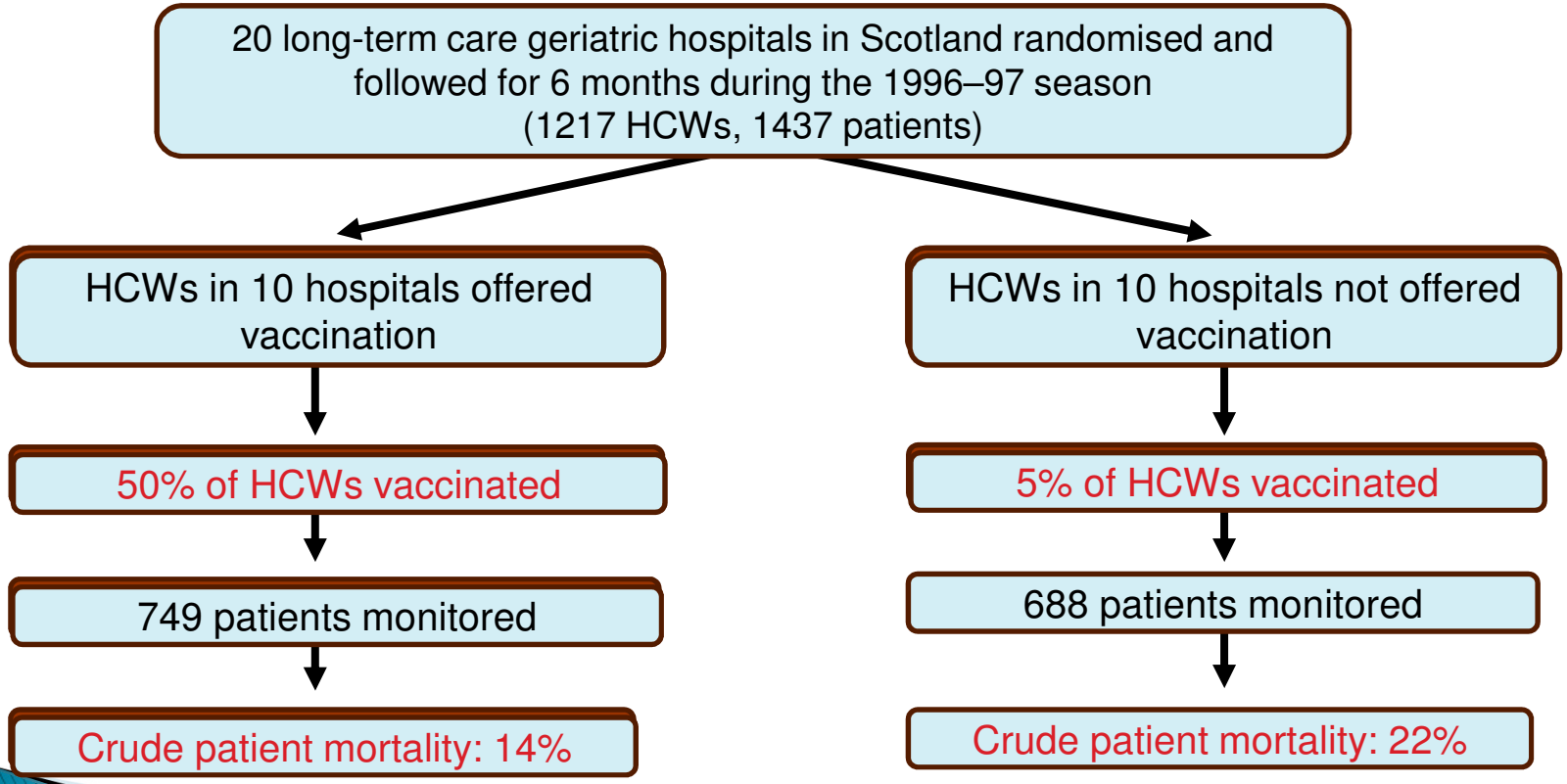


- Monitored for 12 years ('87–99)
- Coverage rate increased from 4% to 67%
- Lab confirmed cases–staff
  - Dropped from 42% (1990–93) to 9% (1997–2000)
- Nosocomial cases among hospitalized patients
  - Decreased 32% to 0 ($p<0.0001$)

Salgado et al. Infect Control Hosp Epidemiol 2004;25:923-928

Vaccinating HCWs and impact on patient mortality

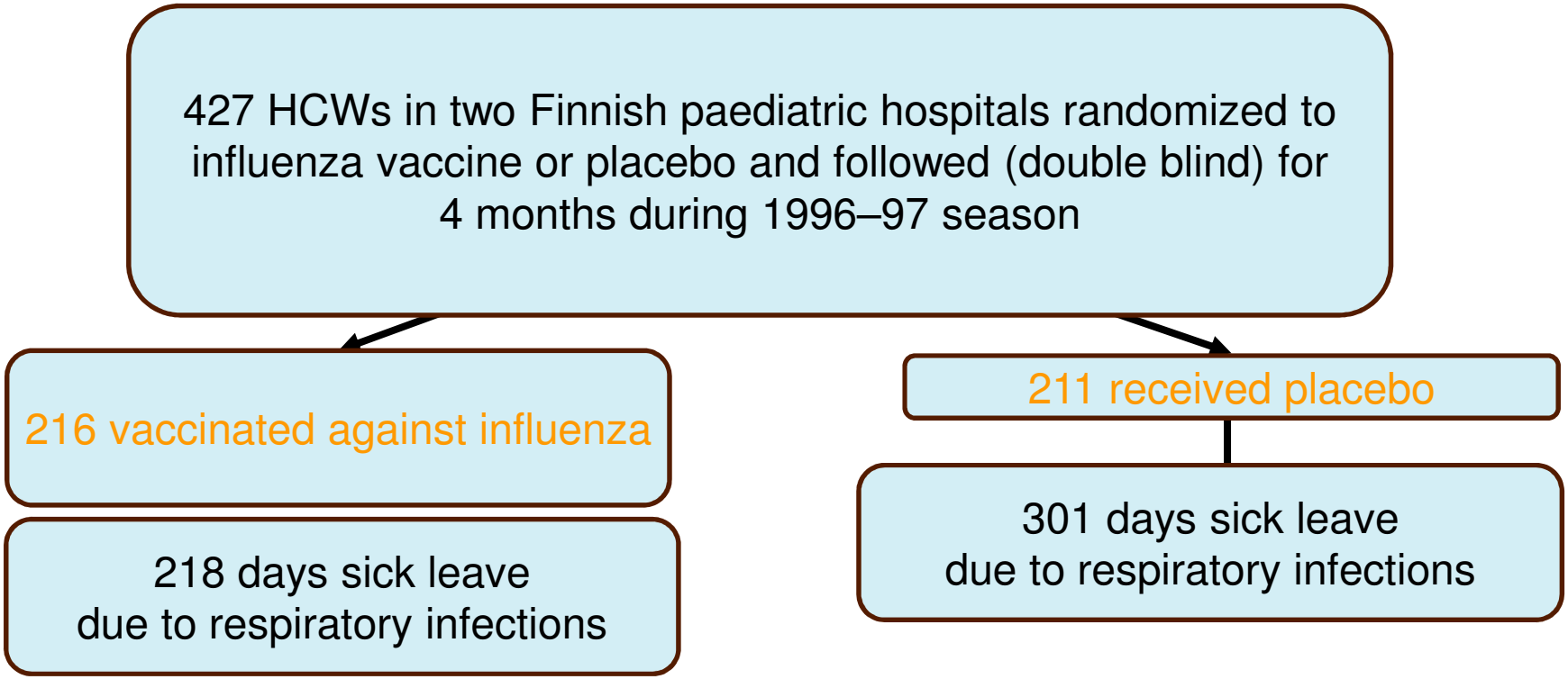
Increased vaccination rates of HCWs working in long-term care geriatric hospitals have been associated with a reduction in patient mortality



Carman WF, *et al. Lancet.* 2000;355:93–7.

Does getting vaccinated really keep the workforce more healthy?

Vaccination and reduction of HCW absenteeism



- Vaccination was associated with a 28% decrease ($p = 0.02$) in absenteeism related to respiratory infections
- No effect on the total number of days with respiratory infections (with or without sick leave) nor on antibiotic use

Saxen H, *et al. Pediatr Infect Dis J.* 1999;18:779–83.

What the vaccine does/does not do

- Does
  - protect against influenza from 2 weeks after vaccination up to a year later
  - Decreases risk of influenza disease and complications
    - Hospitalisation and severe illness incl. Guillain Barre after influenza-like illness

- Does not
  - Prevent “influenza-like” illnesses caused by other viruses
  - Increase risk of Guillain Barré syndrome after vaccination

Stowe J et al. Am J Epidemiol. 2009 Feb 1;169(3):382-8.

If You Don't Get the Flu:

- You're less likely to need to take time off from work because you are sick with the flu
  - HCWs who receive flu vaccine take about 50% fewer sick days

*Wilde JA, et al . Effectiveness of influenza vaccine in health care professionals: a randomized trial. JAMA 1999;281:908--13.

- You're less likely to have to pay for doctor visits and medication to treat the flu
  - Immunised HCWs have about 44% fewer doctor visits

Nichol KL, M, et al. The effectiveness of vaccination against influenza in healthy, working adults. N Engl J Med 1995;333:889–93..

- You're less likely to miss activities with friends and family because you are sick with the flu.
  - Immunized HCWs have a 59% reduction in illness during vacation time

Influenza Vaccination of Health-Care Personnel Recommendations of ACIP and HICPAC-MMWR 2006

Since I've been working for a long time, am I already protected against the flu?

No, this is not possible.

- Flu virus changes every year
- Your body cannot protect itself from new types of flu because your immune system does not recognise it
- A different vaccine is needed every year

Why Get Vaccinated Against the Flu?

- Protect yourself.
- Protect your patients.
- Protect your family and friends.
- Flu vaccination:
  - is FREE
  - is safe
  - is quick and easy
  - can save you time and money.

Vaccination is the BEST protection you have against the flu!

More information on influenza 2015-2016 season

- HPSC
- http://www.hpsc.ie/A-Z/Respiratory/Influenza/SeasonalInfluenza/
- National immunisation Office
- http://www.immunisation.ie/en/HotTopics/Text_17465_en.html

Protect your patients, yourself, colleagues, family and friends