HEALTHCARE WORKER VACCINATION:
nice to have or non-negotiable?

UPdate 2016

Angela Dramowski
Paediatric Infectious Diseases, Stellenbosch University
dramowski@sun.ac.za

Outline

Why vaccinate?

Recommendations for HCW vaccination

Mandatory vaccination: the big debate

Influenza, Hepatitis B, Pertussis, MMR, Varicella

Local data

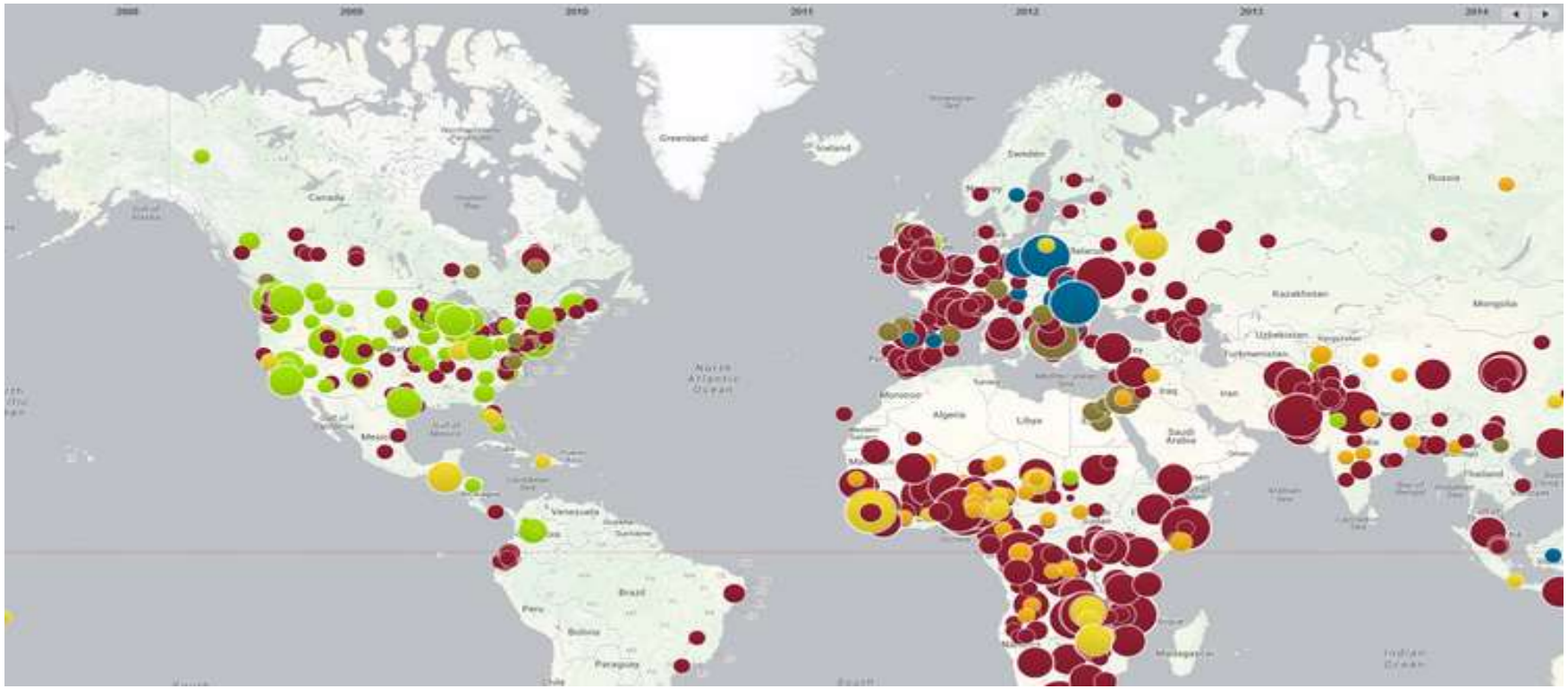
Increasing uptake of HCW vaccination in SA

Why vaccinate?

2 million deaths; 750 000 disabilities averted

30 diseases prevented or reduced

1.3 billion USD saved by smallpox eradication alone



http://www.cfr.org/interactives/GH_Vaccine_Map/#map

Vaccine target populations

Children	Pregnant women	Adolescents	The elderly	Healthcare workers
				
SA-EPI expanded to add: Rota PCV13	Tetanus Pertussis Influenza	Human papilloma virus	*S. pneumoniae* Herpes zoster	?

Vaccine target populations

Children	Pregnant women	Adolescents	The elderly	Healthcare workers
				
SA-EPI expanded to add: Rota PCV13	Tetanus Pertussis Influenza	Human papilloma virus	*S. pneumoniae* Herpes zoster	**Hepatitis B**

Recommended vaccines for HCW (CDC)

Healthcare Personnel Vaccination Recommendations[1]

Vaccine	Recommendations in brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1–2 months after dose #3.
Influenza	Give 1 dose of influenza vaccine annually. Give inactivated injectable vaccine intramuscularly or live attenuated influenza vaccine (LAIV) intranasally.
MMR	For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give SC.
Varicella (chickenpox)	For HCP who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus, diphtheria, pertussis	Give a dose of Tdap as soon as feasible to all HCP who have not received Tdap previously and to pregnant HCP with each pregnancy (see below). Give Td boosters every 10 years thereafter. Give IM.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of *N. meningitidis* and boost every 5 years if risk continues. Give MCV4 IM; if necessary to use MPSV4, give SC.

http://www.cdc.gov/vaccines/adults/rec-vac/hcw.html

Advisory Committee on Immunization Practices (ACIP)

Recommended vaccines for HCW (WHO)

Table 4: Summary of WHO Position Papers – Immunization of Health Care Workers[A]

The information below is provided to assist countries to develop national policies for the vaccination of health care workers (HCWs). It is expected that HCWs are fully vaccinated per the national vaccination schedule in use in their country.

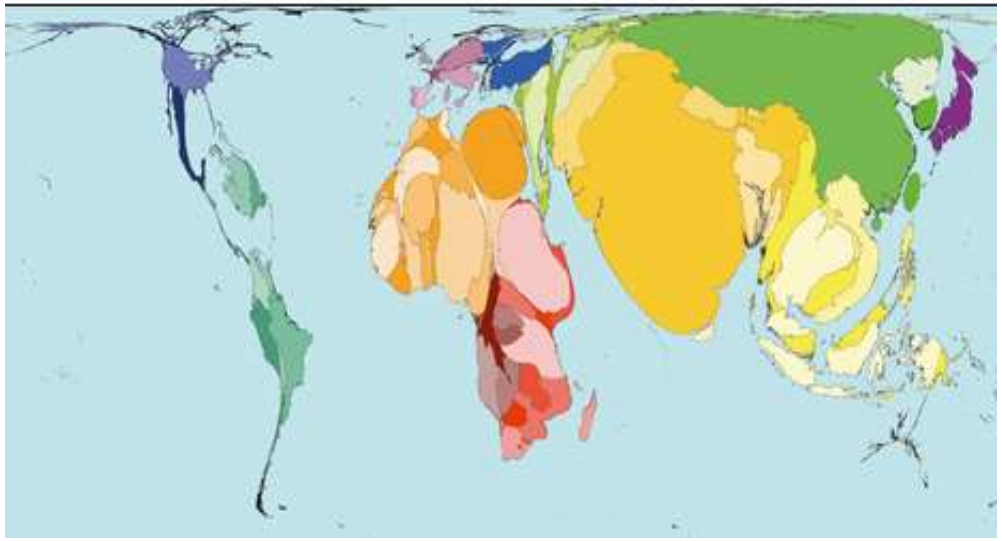
Antigen	Vaccination of Health Care Workers Recommended
Hepatitis B[1]	Immunization is suggested for groups at risk of acquiring infection who have not been vaccinated previously (for example HCWs who may be exposed to blood and blood products at work).
Polio[2]	All HCWs should have completed a full course of primary vaccination against polio.
Diphtheria[3]	Particular attention should be given to revaccination of HCWs with diphtheria boosters every 10 years. Special attention should be paid to immunizing HCWs who may have occupational exposure to C. diphtheria.
Measles[4]	All HCWs should be immune to measles and proof/documentation of immunity or immunization should be required as a condition of enrollment into training and employment.
Rubella[4]	If rubella vaccine has been introduced into the national programme, all HCWs should be immune to rubella and proof/documentation of immunity or immunization should be required as a condition of enrollment into training and employment.
Meningococcal[5]	One booster dose 3-5 years after the primary dose may be given to persons considered to be at continued risk of exposure, including HCWs.
Influenza[6]	HCWs are an important group for influenza vaccination. Annual immunization with a single dose is recommended.

- **Currently no recommendation for pertussis and varicella**

Hepatitis B

Very prevalent in SA (HBsAg + 8%)[1]

100 x more infectious than HIV; HCW at high risk[2]



Worldmapper
www.worldmapper.org

1) Lukhwareni J Med Virol 2009
2) De Villiers SA Fam Prac J 2007
3) Burnett JHI 2013

EPI only introduced in 1995; most HC students non-immune

SA DoH strongly recommends Hep B immunization BUT

variable implementation at facilities and teaching institutions[3]

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevierhealth.com/journals/jhin

Need for a comprehensive, consistently applied national hepatitis B vaccination policy for healthcare workers in higher educational institutions: a case study from South Africa

L. Fernandes [a,*], R.J. Burnett [a], G. François [b], M.J. Mphahlele [c], M. Van Sprundel [b], A. De Schryver [b]

[a] *Department of Public Health, University of Limpopo, Medunsa Campus, Pretoria, South Africa*
[b] *Department of Epidemiology and Social Medicine, University of Antwerpen, Antwerp, Belgium*
[c] *HIV and Hepatitis Research Unit, Department of Virology, University of Limpopo/National Health Laboratory Service, Medunsa Campus, Pretoria, South Africa*

Review

An update after 16 years of hepatitis B vaccination in South Africa

Rosemary J. Burnett[a,*], Anna Kramvis[b], Carine Dochez[c], André Meheus[c]

[a] *Department of Public Health, University of Limpopo, Medunsa Campus, Pretoria, South Africa*
[b] *Hepatitis Virus Diversity Research Programme, Department of Internal Medicine, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa*
[c] *Department of Epidemiology and Social Medicine, University of Antwerpen, Belgium*

Although the SADoH recommends HB vaccination for HCWs, it has not been made mandatory [20,29,68]. An earlier study from Gauteng, South Africa found that the majority of HCWs at high risk for HBV are not vaccinated, with only 21.2% remembering ever being vaccinated [68]. While current research has shown that the situation has vastly improved, with HB vaccination being widely available and 67.9% of Gauteng HCWs having received at least one dose, only 19.9% had received all 3 doses [29]. Clearly, there is a need for a national policy for the prevention and control of HBV in HCWs to be developed and implemented in South Africa.

Hepatitis B immunization in SA

In healthy adults, 1 ml is given intramuscularly into the deltoid muscle at the following intervals:

- Heberbiovac-HB® and Euvax B®: 0, 1 and 2 months
- Engerix B®: 0, 1 and 6 months or 0, 1 and 2 months with a fourth dose at 12 months.

> 90% have protective immunity after primary course

HBsAB level > 10mIU/ml is protective

Levels wane over time, but good memory response

Some recommend 5 yearly boosters

Tygerberg Hospital staff (2007-11): with needlestick injuries

25% HCW were non-immune or needed a booster dose

Management of Hepatitis B vaccine non-responders

It is suggested that people who do not respond should receive a second series of hepatitis B vaccines. Anti-HBs levels should then be rechecked 1-2 months after completion of the second hepatitis B vaccine series. Fewer than 5% of individuals do not respond to six doses of hepatitis B vaccines. Individuals who still do not obtain protective anti-HBs levels may already be infected with HBV, or are considered to be primary non-responders. Primary non-responders should be aware of their susceptibility to infection and should they be exposed in the future, will need to receive hepatitis B immunoglobulin.

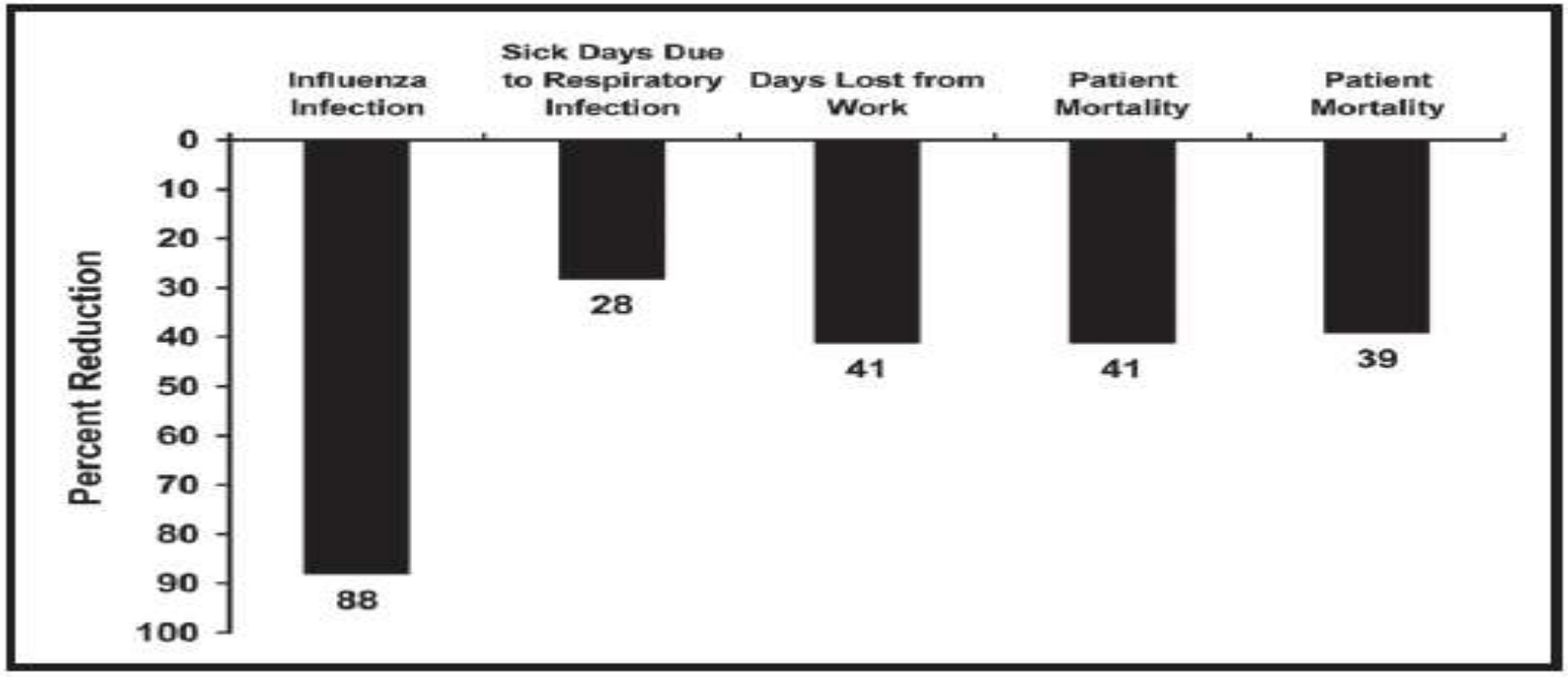
Chronic HBV infection must be excluded in non-responders

Rossouw SAMJ 2014

Influenza vaccination: why bother?

Patients: Reduce nosocomial flu, mortality, costs, length of stay

Staff: fewer sick days, more stable workforce



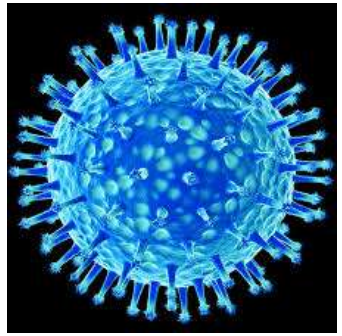
Bhat NEJM 2005
Vayalumkal ICHE 2009
Talbot ICHE 2005

Challenges with influenza prevention

Virus transmitted by large respiratory droplets

Minimal benefit from hand hygiene

Virus shed 24 hrs before symptom onset



Many adults have asymptomatic infections

20-50% of infected HCW asymptomatic

Some patients too young to receive vaccine

Some can’t mount protective immune response

Mandatory vaccination: the big debate

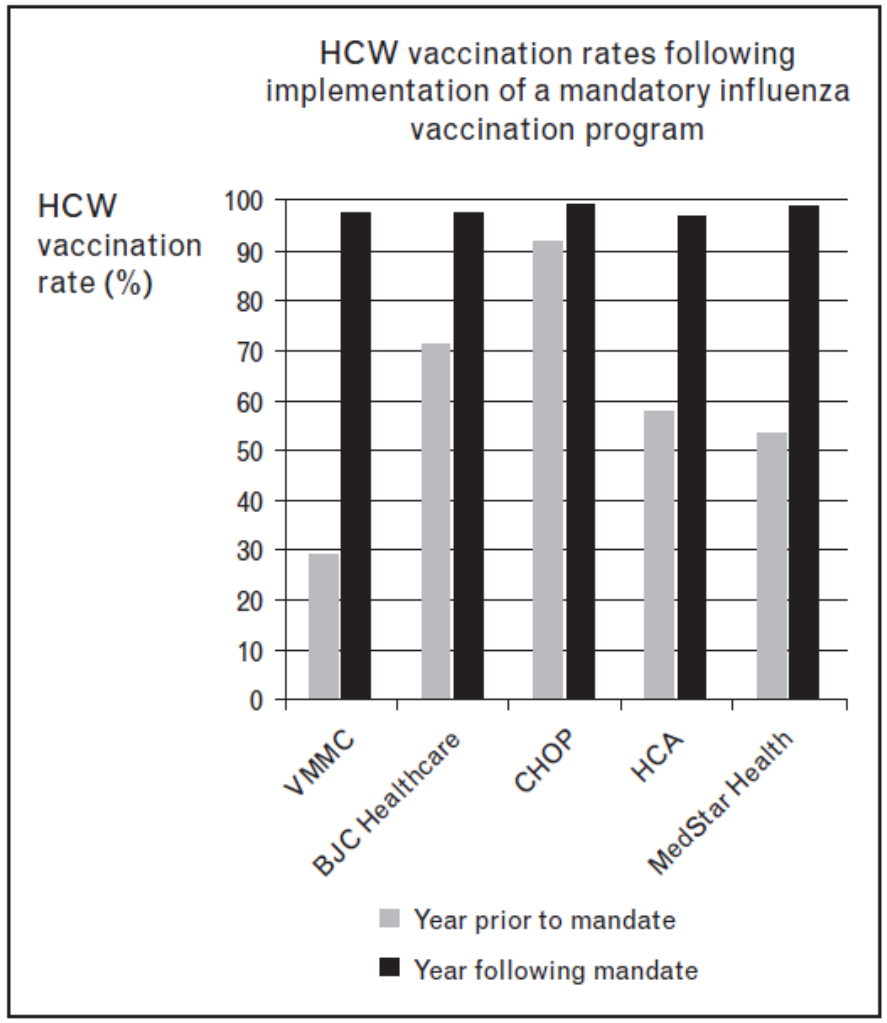
CBSNews.com / CBS Evening News / CBS This Morning / 48 Hours / 60 Minutes / Sunday Morning / Face T

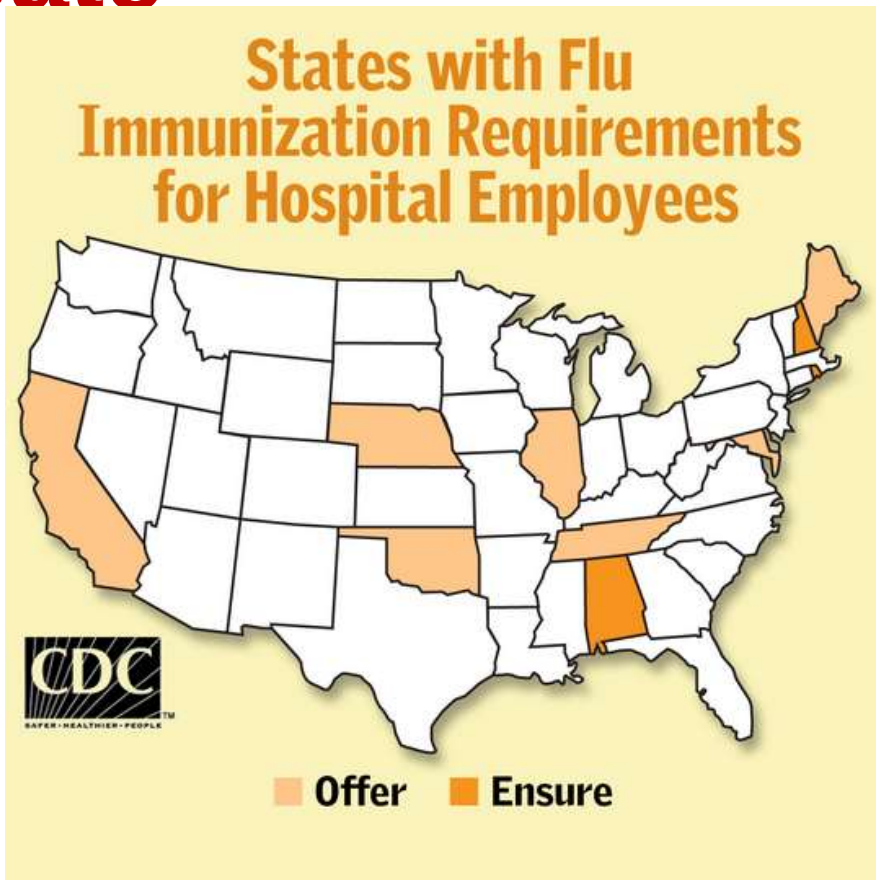
CBSNEWS Video | US | World | Politics | Entertainment | Health | MoneyW

CBS/AP / *January 12, 2013, 8:45 PM*

Hospitals crack down on staff refusing flu shots

Mandatory vaccination: the big debate





Johnson, COID 2011

www.healthleadersmedia.com

Implementing mandatory vaccination

Season	% Vaccinated	Program Changes
2004-2005	57	First formalized program; collaboration with IPC
2005-2006	69	Unit flu captains; reports by unit; voluntary declination forms
2006-2007	73	Increased leadership involvement; multi-disciplinary approach
2007-2008	90	Part of institutional strategic safety plan ; early planning, public relations; logo ,T-shirts, posters; Mandatory participation – vaccine or declination
2008-2009	92	Consequence for non-participation (performance eval) Physician leadership involvement
2009-2010	99.6	Mandatory vaccine supported by Patient Safety Committee

Prof S Coffin, CHOP, USA

Strategies that work…

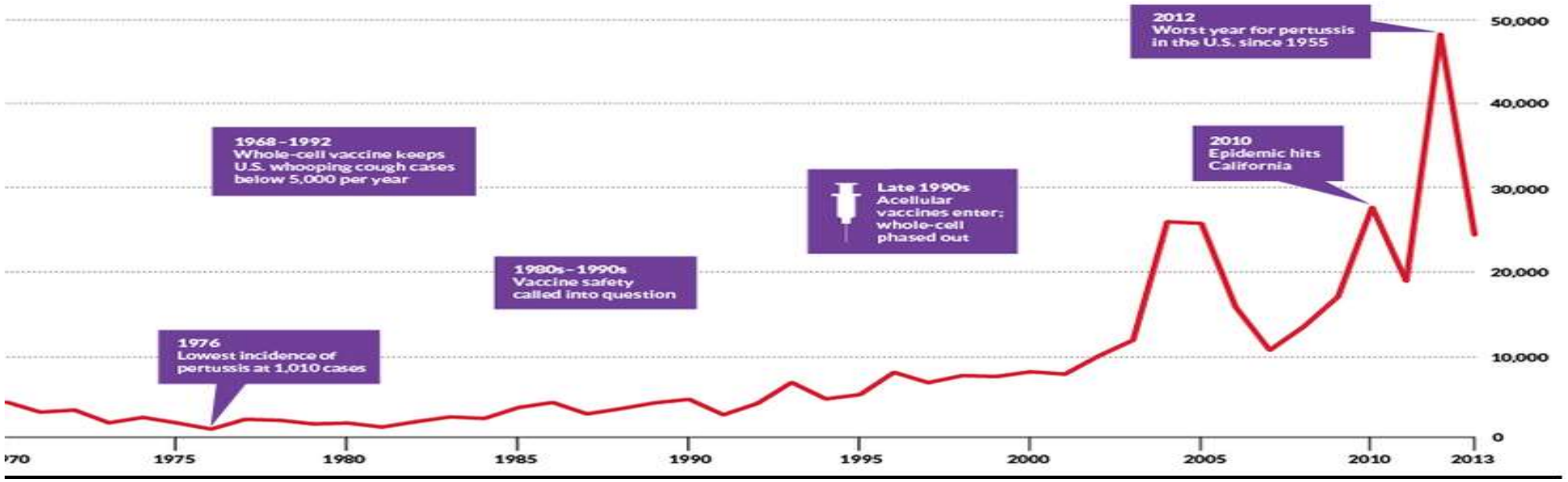
Education	- Risks of disease[1,2] - Vaccine safety and efficacy[2]
Improving access to vaccine	- Mobile carts[1,2] - Walk-in, after-hours clinics[2]
Expanding responsibility	- Vaccine deputies[1] - Nurses as educators[2]
Declination form	- doubling of vaccine uptake[3]

"I realize I am eligible for the flu shot and that my refusal of it may put patients, visitors, and family with whom I have contact, at risk should I contract the flu. Regardless . . ."

Slide courtesy Prof S Coffin, CHOP, USA

1. Bryant ICHE 2004
2. Tapiainen ICHE 2005
3. Spillman National Immunization Conf. 2006

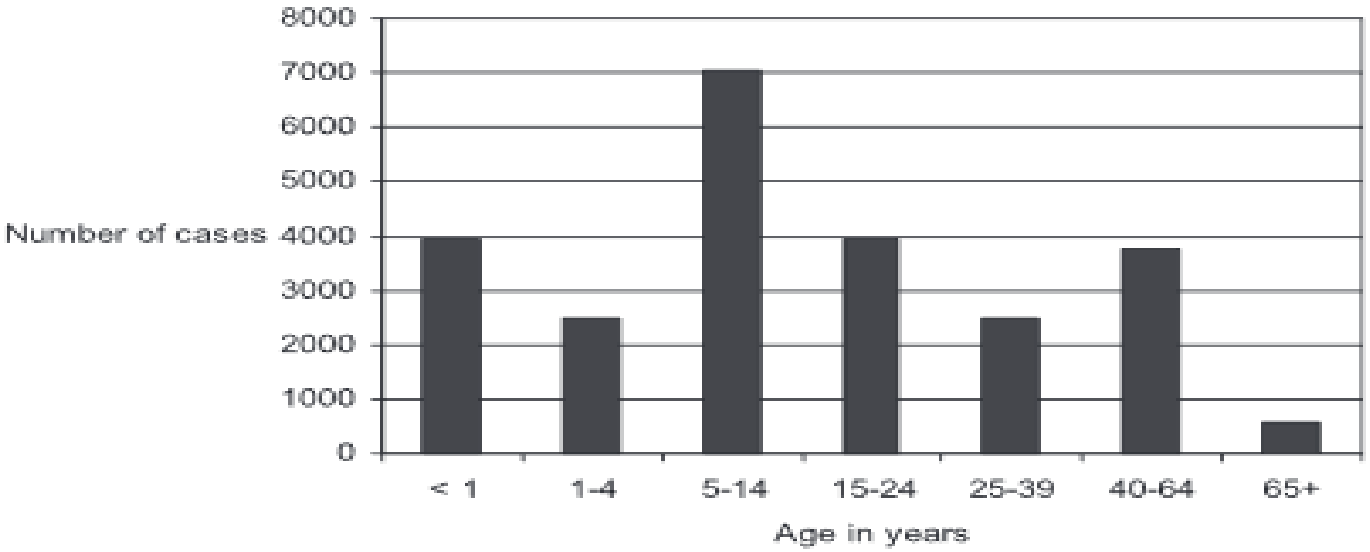
Tetanus, Diptheria, Pertussis (Tdap)



Reasons for increasing pertussis cases:

- Awareness + new diagnostics
- Reduced vaccination uptake
- Acellular vaccine less effective
- New virulent strains

Tetanus, Diptheria, Pertussis (Tdap)



Infected adults cause 50% of child cases; transmission rate >80%

Average time to pertussis diagnosis 21 days
Average annual pertussis rate in HCW 33%

Waning HCW immunity + frequent exposures = outbreaks
HCW Tdap saves $2.5 for each dollar invested

Sandora Clin Micro Rev 2008

Measles, Mumps, Rubella

http://www.cfr.org/interactives/GH_Vaccine_Map/#map

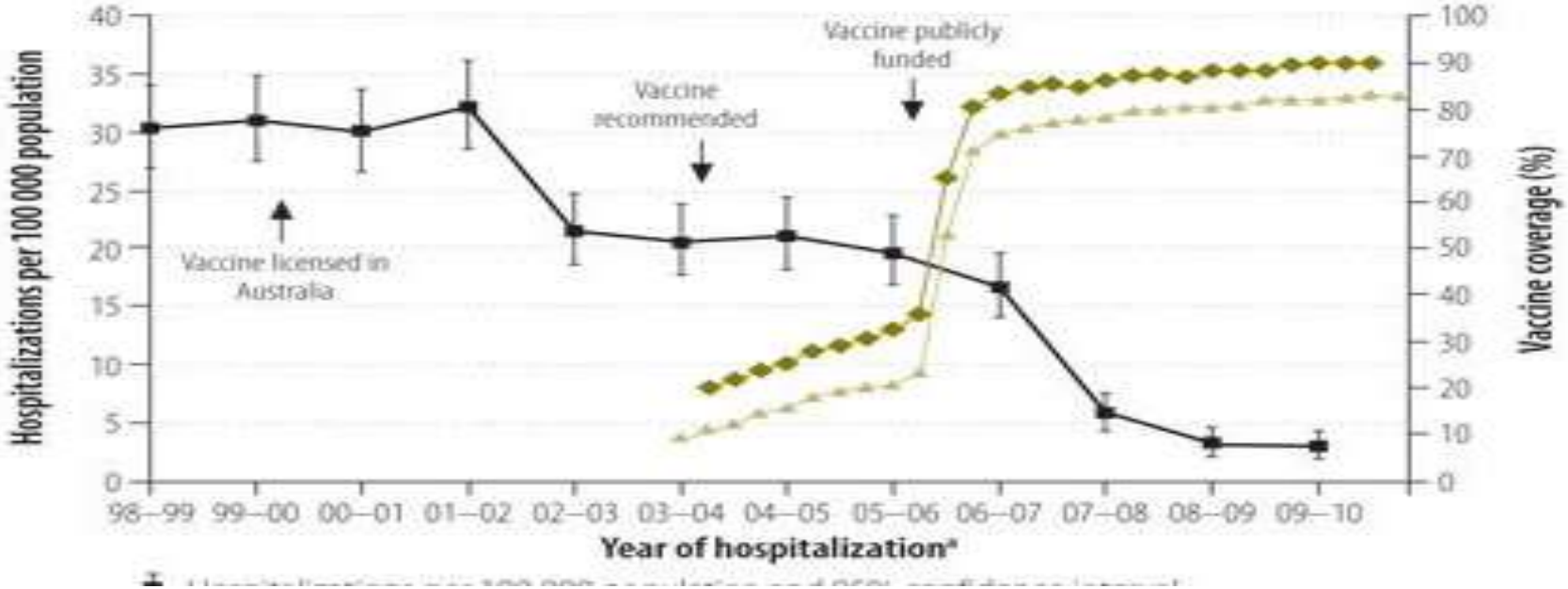
HCW who should receive MMR:

- Born after 1957
- Without history of disease
- No laboratory confirmation of immunity

Schedule: 2 doses of MMR, 4 weeks apart
or a measles booster during outbreaks

Varicella

Impact of varicella vaccination in Australia



Highly contagious airborne virus with a 90% attack rate

High morbidity/mortality in: - immunocompromised,
- pregnant women,
- premature infants

Two doses for HCW - without history of natural disease
- without proof of immunity

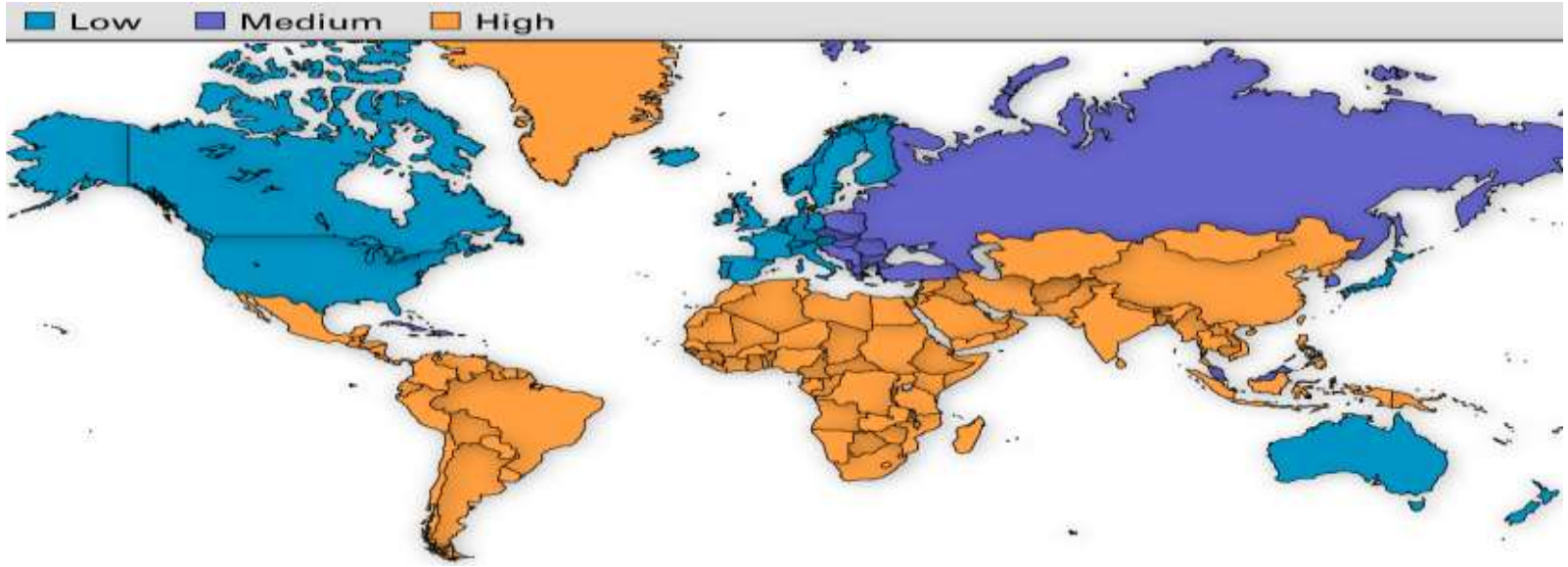
Hepatitis A

Not routinely recommended for HCW but strongly consider in:

- institutions for mentally handicapped
- laboratory workers
- paediatric staff

Greater morbidity and mortality in adults

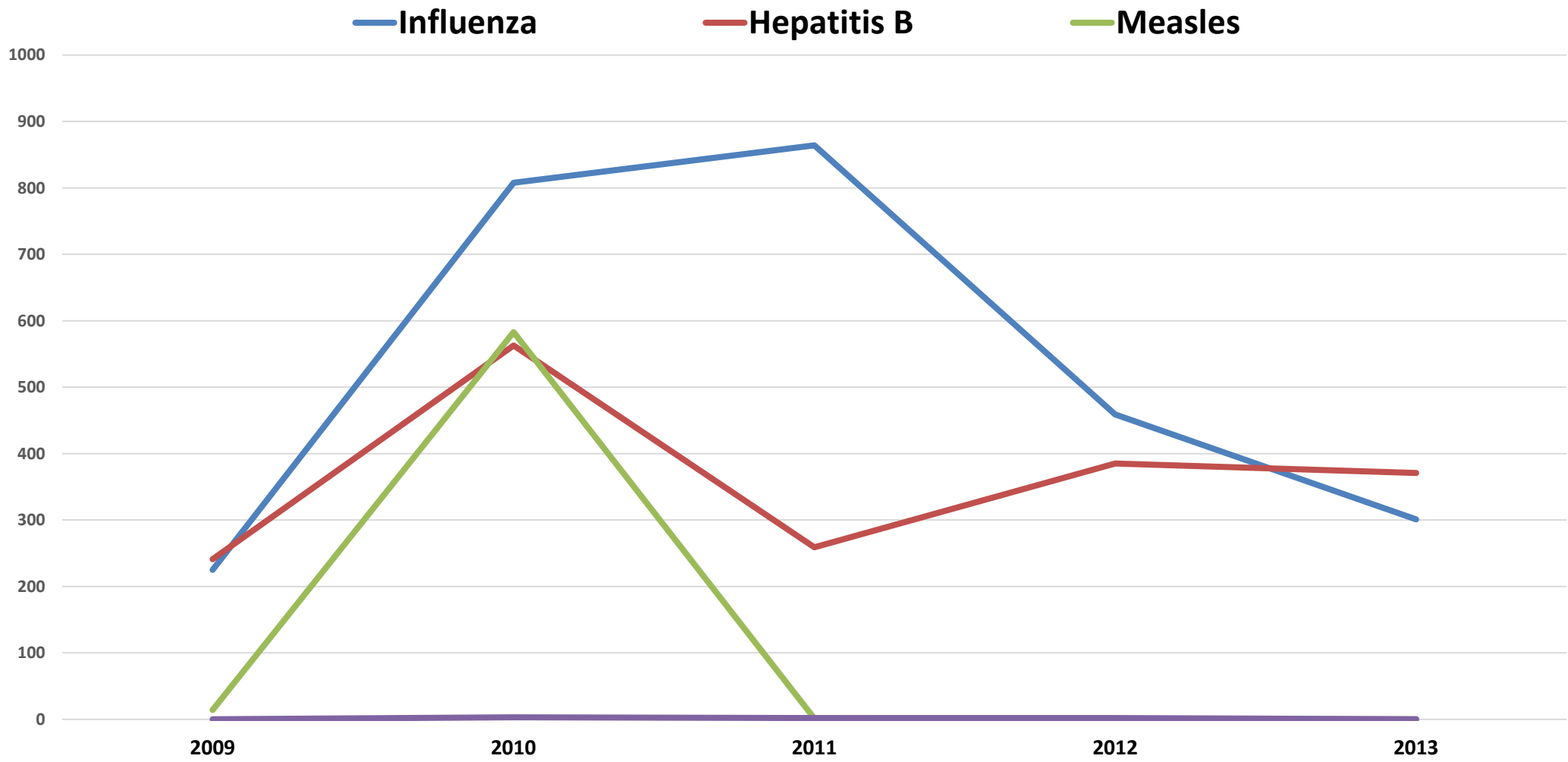
Schedule: 2 doses given 6 months apart



http://depts.washington.edu/hepstudy/hepA/prevention/havpre/discussion.html

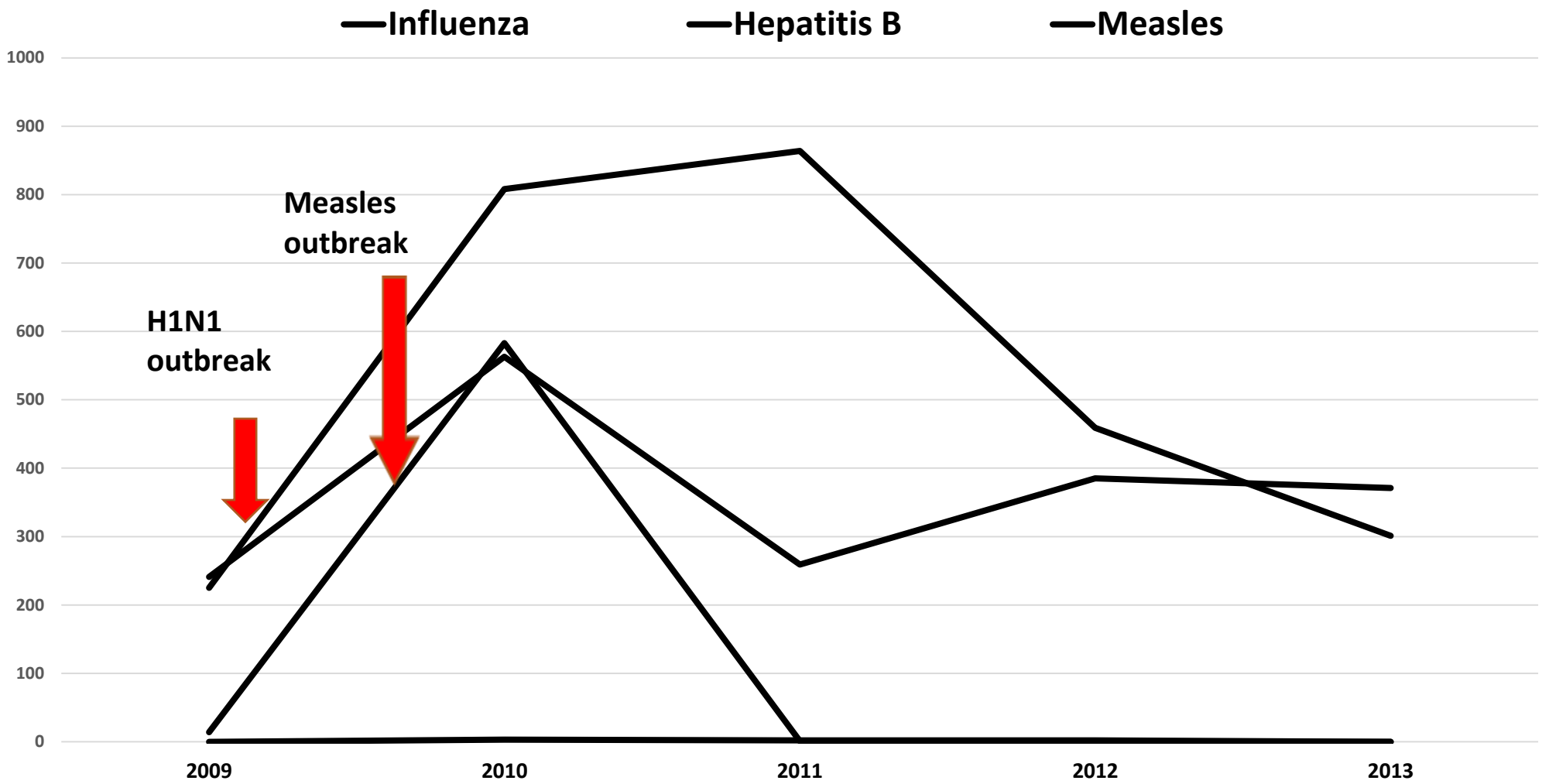
What's happening at Tygerberg hospital?

HCW vaccination uptake at TBH Occupational Health Clinic



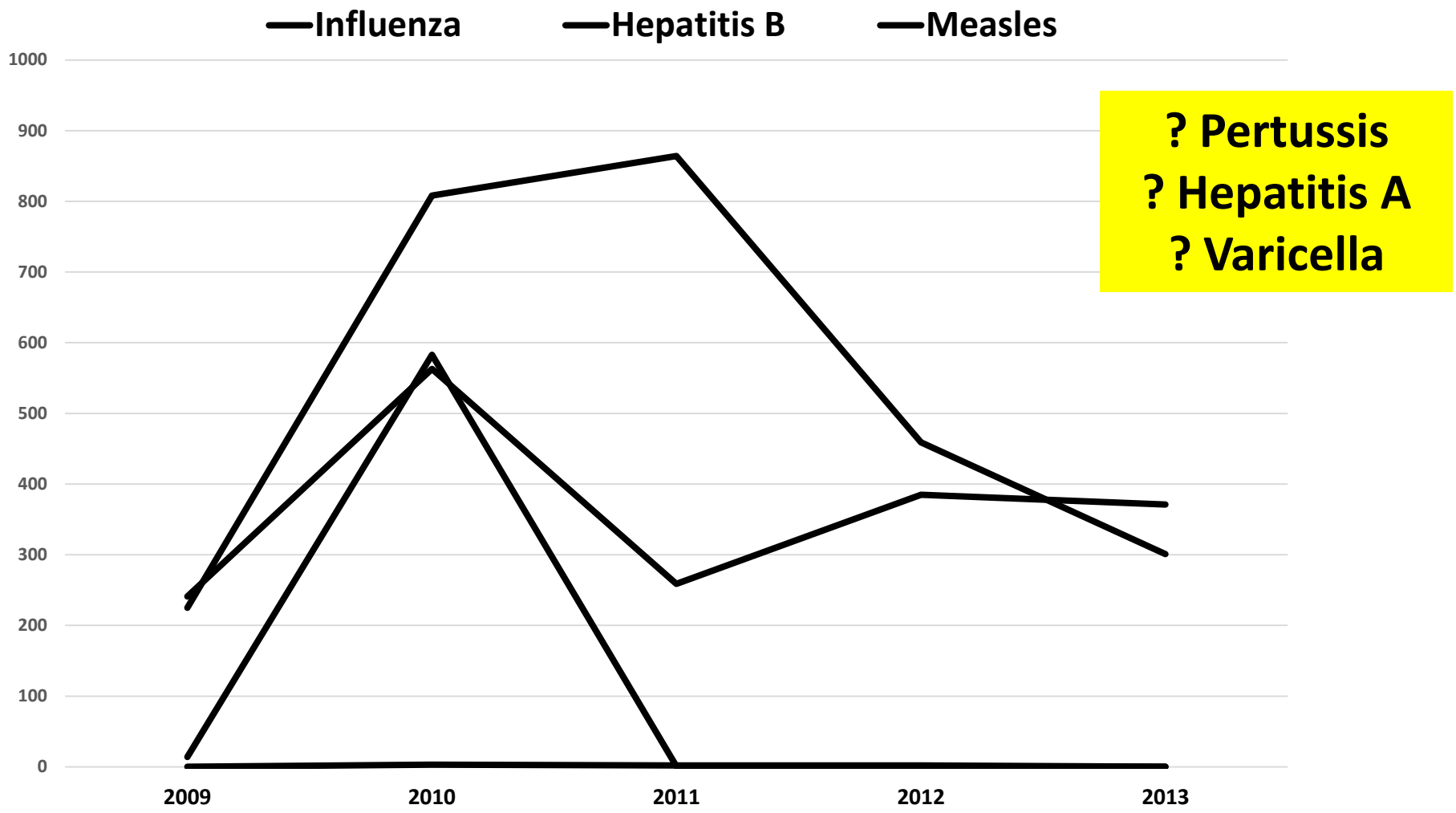
What's happening at Tygerberg hospital?

HCW vaccination uptake at TBH Occupational Health Clinic



What's happening at Tygerberg hospital?

HCW vaccination uptake at TBH Occupational Health Clinic



? Pertussis
? Hepatitis A
? Varicella

What would it cost to ensure comprehensive vaccination for health science students & HCW?

Vaccine name	Number of doses	Unit cost	Total cost
Hepatitis B	3	R110	R330
HBsAB test	1 test	R200	R200
MMR	1	R150	R150
Varicella	1	R310	R310
Hepatitis A	2	R220	R440
TDap	1	R270	R270
Influenza	Annual (4-6) over degree	R65 (assume x 6)	R390
This total cost could be split over the first 2 years of the degree programme			R2090

Which vaccinations are indicated for SA healthcare students?

SEROPREVALENCE OF MEASLES, RUBELLA, VARICELLA-ZOSTER, HEPATITIS A AND HEPATITIS B VIRUS ANTIBODIES IN FIRST YEAR MEDICAL STUDENTS IN THE WESTERN CAPE, SOUTH AFRICA

M.L. Sikhosana[1], A. Dramowski[2], H. Finlayson[2], W. Preiser[1]

1) Division of Medical Virology, NHLS Tygerberg / Stellenbosch University
2) Paediatric Infectious Diseases, Department of Paediatrics and Child Health, Stellenbosch University

? Hep A antibody levels from different provinces

? Hep A in students from different socio-economic status

? Are HBsAB adequate post primary EPI series ? booster only

What is needed to increase HCW vaccine uptake in SA?

Greater **education & awareness** of vaccination benefits

Understand **local barriers** to vaccine uptake

National policy and plan for HCW vaccination

Pre-employment/pre-enrolment **screening**

Resources to implement HCW vaccination (vaccines, OHS)

Free provision of vaccine and use of incentives for HCW

Personal record of vaccinations (RTHC for HCW!)

KEEP
CALM
AND
GET
VACCINATED