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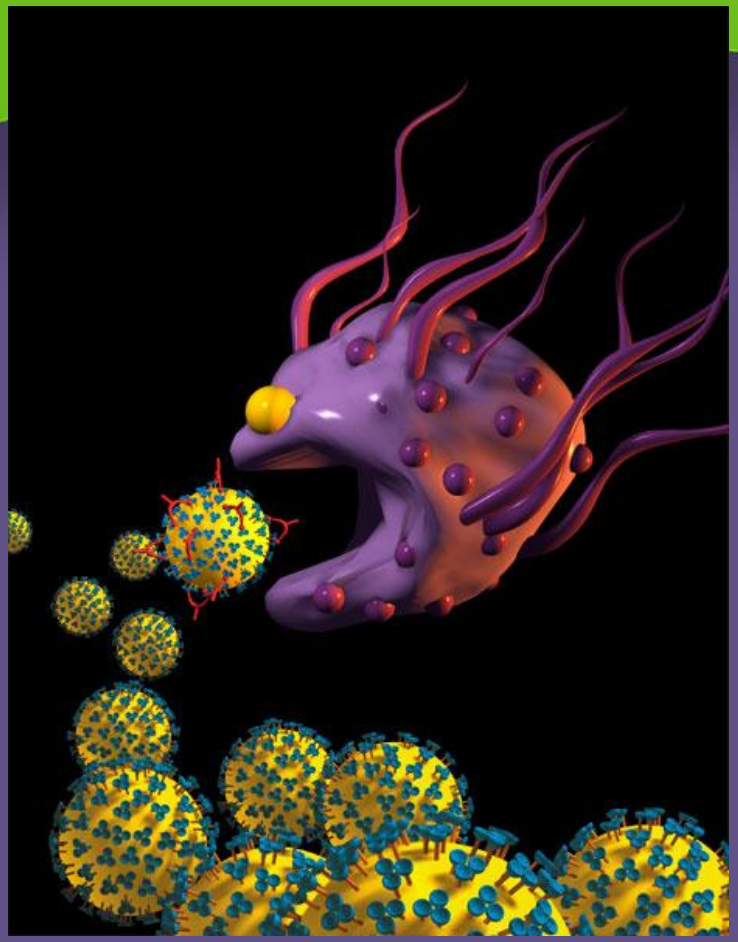
Hot Shots



Nikki Turner
University of Auckland
June 2011

All I need to know in 20 minutes....

- **Schedule change**
- **Private market vaccines**
- **Tricky stuff**
- **Interesting stuff**
- **Coverage**
- **Myth busting**
- **The future...**

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Only clean water and antibiotics have had an impact on childhood death and disease that is equal to that of vaccines

World Health Organization

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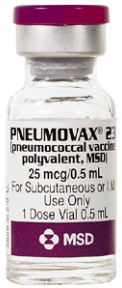
Immunisation Schedule change: 1 July 2011

Schedule changes: summary

***Synflorix*® (PCV10) replaces Prevenar® (PCV7) at 6 weeks, 3, 5 & 15 months**

High risk children only:

Prevenar 13® (PCV13) followed by Pneumovax® 23 (23PPV)



2011 NZ Immunisation Schedule

	DTaP-IPV-HepB/Hib	PCV	Hib	MMR	DTaP-IPV	dTap	HPV	Td	Influenza
6 weeks	*Infanrix hexa®*	*Synflorix®*							
3 months	*Infanrix hexa®*	*Synflorix®*							
5 months	*Infanrix hexa®*	*Synflorix®*							
15 months		*Synflorix®*	*Act-HIB™*	*MMR II®*					
4 years				*MMR II®*	*Infanrix® -IPV*				
11 years						*Boostrix®*			
12 years							*3 doses Gardasil®*		
45 years								*ADT-Booster™*	
65 years								*ADT - Booster®*	*Fluvax® or Fluarix®*

Pneumococcal Vaccines

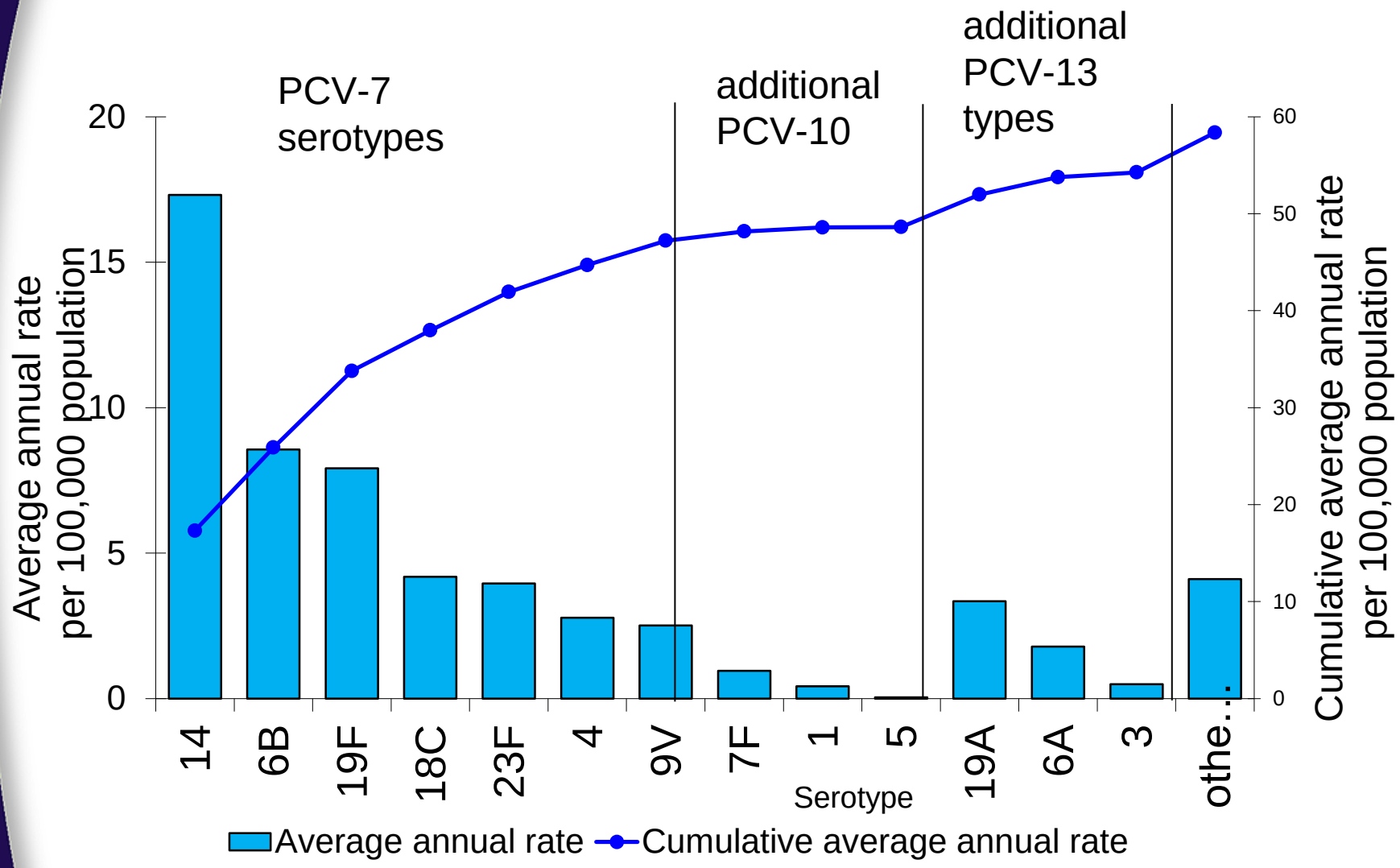
- **PCV10: Synflorix® - Routine childhood programme**
  - Contains the 7 types (4,6B,9V,14,18C,19F,23F) and extra types 1,5, 7F
  - conjugated to Protein D(non-typable H influenza)

- **PCV13: Prevenar 13® - High risk children**
  - Contains the 7 types (4,6b,9v,14,18c,19f,23f) and extra types 1, 3,5, 6A ,7F,**19A**
  - conjugated to CRM197 (non-toxin diphtheria)

- **23 PPV: Pneumovax®23 – high risk adults /children**
  - A polysaccharide vaccine
  - Less immunogenic, shorter duration of immunity
  - Poorly immunogenic in kids under 3 years

Incidence rates of invasive pneumococcal disease by serotype, in children aged less than five years, New Zealand, 1998 – 2007

(NB prior to introduction of PCV vaccine)



Pneumococcal high risk children: 0 -16 yrs

- **Offer PCV13 followed by 23PPV**
- **Up to 5 years of age: (59 months)**
  - On immunosuppressive therapy or radiation therapy
  - Primary immune deficiencies
  - HIV
  - Renal failure or nephrotic syndrome
  - Immune suppressed following organ transplantation
  - Cochlear implants, intracranial shunts
  - CSF leaks
  - On corticosteroids at least 2mg/kg/day prednisone (or 20mg a day) >2 weeks
  - Chronic pulmonary disease
  - IDDM
  - Down Syndrome
  - Pre or post-splenectomy or functional asplenia
  - Preterm infants born at under 28 weeks
- **6 – 16 years:**
  - Pre or post-splenectomy or functional asplenia

Summary cntd.

- MeNZB vaccine is no longer available.
- Change in BCG brand and eligibility criteria
- Act-HIB™ replaces Hiberix™
- The date the new vaccines are available will be later than 1 July while existing vaccine stocks are used up
- The Immunisation Handbook 2011 available online and hardcopies will be sent to practices in June
- Rubella antibody levels to indicate protection are now recommended to be ≥15IU/mL (previously it was ≥10 IU/mL)

Children/Adults high risk: pre or post splenectomy

- **The criteria remain unchanged**
- **No longer need the recommendation of a secondary care specialist to give in primary care**
- **Vaccines now being offered:**
  - Prevenar 13® (children up to 16 years only)
  - Act-HIB™
  - Pneumovax® 23
  - Menomune ACYW135

NB Prevenar 13® and Act-HIB™ are only licensed to 5 years of age, giving to older children and adults is currently outside of licensure. While there are not expected to be any safety concerns, it is important to give full informed consent

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Coverage

National Immunisation coverage

12 month reporting period ending March 2011

Milestone Age	Fully Immunised for age
6 month	70%
12 month	89%
18 month	78%
24 month	88%
5 years	74%

www.moh.govt.nz/moh.nsf/indexmh/immunisation-coverage-data

Why are we improving

- Commitment at all levels – national target
- Feedback loops – DHBs and PHOs
- General Practice engagement and confidence
  - More focus , higher priority
  - Less missed opportunities
- SYSTEMS
  - Early ENROLMENT! - and follow up
  - Precalls/recalls/audits
  - PMS/NIR
  - Providers to OIS : effective interface
- Confident health sector spills over to confident public
  - Less anti-science in the media

Areas to continue focus: Missed opportunities

True contraindication

- Anaphylaxis to any component of the vaccine
- Acutely unwell: high fever, toxic etc

Immunocompromised with a live vaccine (MMR)

Evolving neurological conditions with pertussis

Anaphylaxis to egg with flu vaccine

Typologies

- **Nuturers – children at low risk of disease**
- **Fearfuls – experience emotionally distressing**
- **Vulnerables – barriers to access**
- **Unwell - child poor health**
- **Rejectors - opposed**

Litmus: Immunisation Audience Research ,Feb 2011

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Private Market Vaccines

Remember….

- **Rotavirus**
- **Varicella**
- **Meningococcal C Conjugate Meningitec®)**
  (different from the polysaccharides: Menomune®, Mencevax®
- **HPV vaccine for men**
- **Adult pertussis protection: Boostrix**
- **Pneumococcal : PPV23 and PCV13**

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Tricky stuff

Practice Nurse Authorisation

CHECK

- If the PN has authorisation can autonomously given the schedule vaccines only
- Can have local programme authorisation eg Occ health flu, hep b
- All others are under the responsibility of the GP
  - Need a prescription or a standing order

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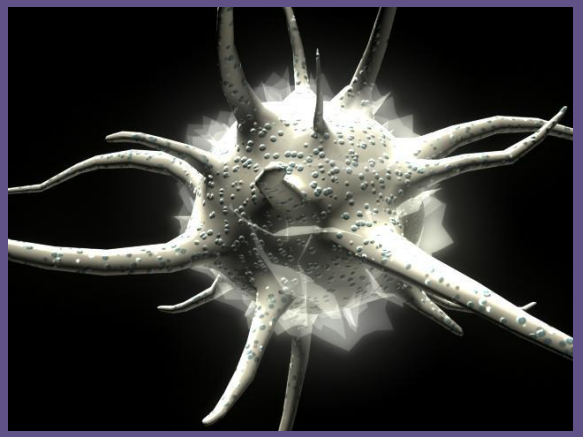
Interesting stuff



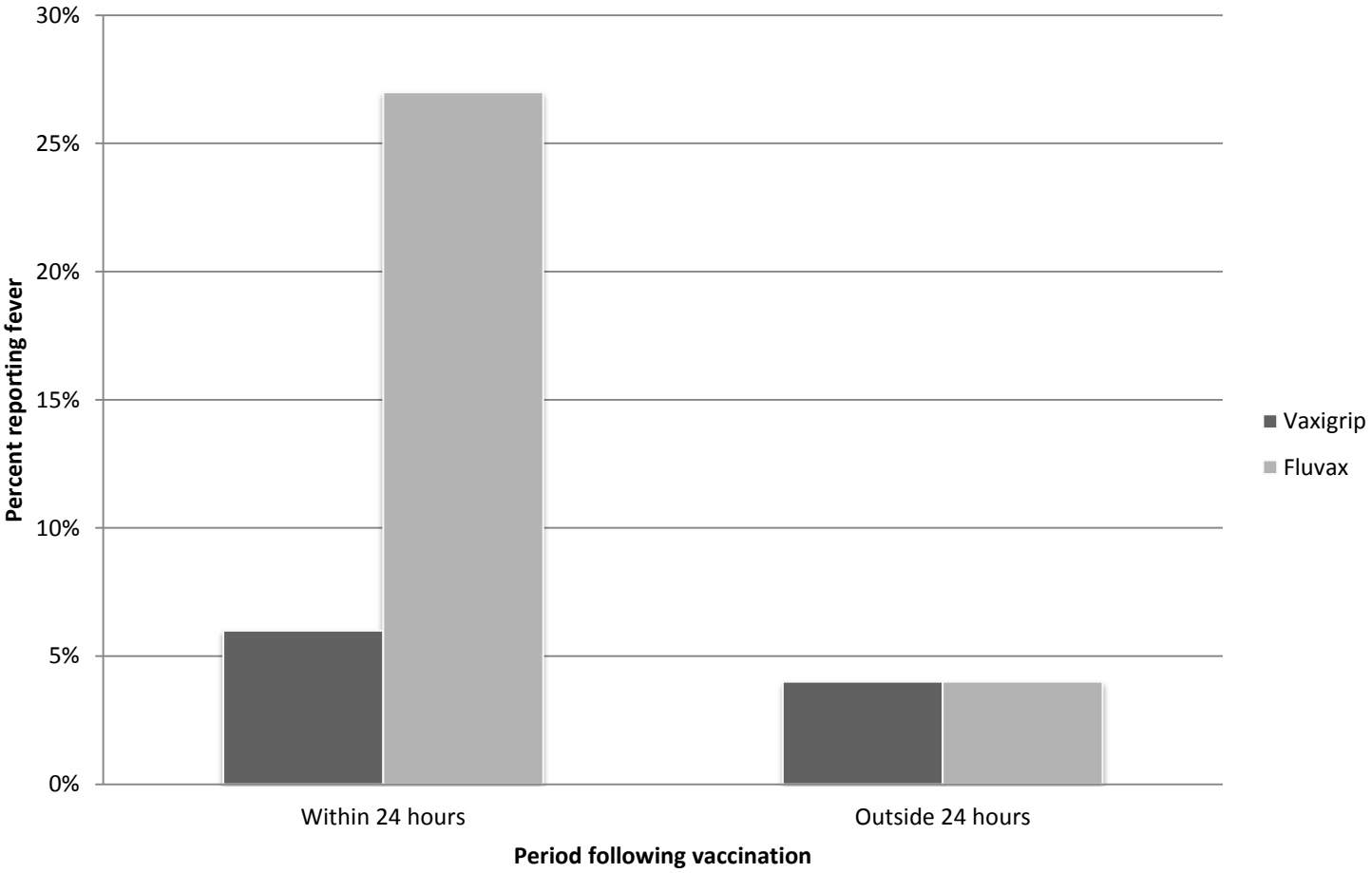
Maternal Flu vaccination

- Increased morbidity and mortality in pregnancy
  - 18x ↑ risk hospitalisation
  - Physiological changes, decreased pulmonary tidal volume and increased cardiac output
  - Suppressed type 1 helper T cell-mediated immunity

- Increased morbidity in Newborns
  - About 1% infants <6 months hospitalised (US data)
  - Much higher hospitalisation rates than older infants
  - Maternal immunisation in pregnancy: 85% effectiveness in preventing flu-hospitalisation in infants

For refs refer to summary article: Schlaudecker E P, Steinhoff M C *Helping mothers prevent influenza illness in their infants* Pediatrics 2010;126:1008-1011

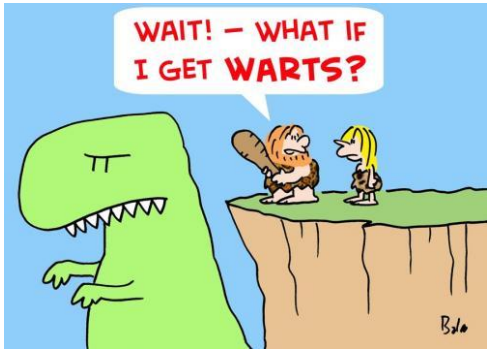
Fever attributable to 2010 influenza vaccine among 327 infants and children ≤ 5 years



Ref: In Press Petousis-Harris H, Poole T, Booy R, Turner N *Fever following administration of two inactivated influenza vaccines – A survey of parents of New Zealand infants and children 5 years of age and under* Vaccine(2011) ,doi:10.1016/j.vaccine.2011.02.012

HPV Vaccine: Reduction in Genital Warts

- Australian programme since 2007 women 12 – 26 yrs
  - 65.1% update by 2009
- National surveillance data
  - Decrease in women: - 59% ($p<0.0001$)
    - Effectiveness!!
  - No decrease in those over 26 yrs, or MSM
  - Decrease: - 28% in heterosexual men
    - Herd immunity!



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Myth busting


Jo.
We're concerned about overwhelming Johnny so he's getting his car seat and vaccines in staged installments.

Multiple vaccines

Year	Antigens	
– 1900	~200	(Smallpox vaccine)
– 1960	~3217	(included smallpox vaccine and wPertussis)
– 1980	~3041	(Included whole cell pertussis vaccine)
– 2000	~50	

– Infants receiving NZ scheduled vaccines receive around 50 different antigens at one time.

The importance of knowing background rates of disease in assessment of vaccine safety

If a cohort of 10 million individuals was vaccinated with a hypothetical vaccine, the medical events that would be expected to occur within 6 weeks post hypothetical vaccine dose:

21.5 cases of Guillain-Barré Syndrome

5.75 cases of sudden death

In a cohort of 1 million vaccinated pregnant women, within 1 day of hypothetical vaccination:

397 would be predicted to have a spontaneous abortion

Black S, Eskola J, Siegrist C-A, Halsey N, MacDonald N, Law B, et al.
The Lancet 2009 2010/1/1/;374(9707):2115-22.

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The Future....

Vaccines: What is next.....

- Always the possibility of future pandemics
- Next vaccines recommended for the schedule
  - Rotavirus
  - Varicella

- To consider after that
  - Conjugate Meningococcal C (infants) , quadravalent (adolescents)
  - Shingles vaccines (over 50 yrs)
  - Pertussis vaccines in older age groups

Slightly more distant horizon

- Better adjuvants
- Delivery mechanisms
  - Intranasal eg live influenza vaccine
  - Aerosol eg measles, rubella
  - Oral eg transgenic plants
  - Transcutaneous eg hepB, anthrax
  - More thermostable
- New targets…..

Table 5 New target groups for vaccination

Groups	Vaccine targets
Infants	**C**ombination vaccines
Adolescents	Tetanus, adult diphtheria dose, acellular pertussis, CMV, HPV, HSV-2
Adults	Zoster, HSV-2
Hospital patients	Staphylococcal, Candida
Pregnant women	Group B Streptococcus, RSV
Civil defense workers	New vaccinia, anthrax, plague, Ebola, etc.
Individuals with noninfectious diseases	Cancer, Alzheimer disease, dental caries, autoimmune disorders, drug addiction
Individuals with chronic infections (Therapeutic vaccines)	HIV, HPV

Paediatric Vaccines Research Review™

Making Education Easy

Issue 5 – 2011

In this issue:

Welcome

to the latest edition of Paediatric Vaccines Research Review, a quarterly New Zealand publication bringing you some of the most important paediatric vaccine research from around the world. The Review provides summaries of 10 recent studies, each accompanied by a comment from either Dr. Nikki Turner or Helen Petousis-Harris on why it is important and how it can potentially affect practice. The Review also provides website links to the abstract or fully published paper so you can make your own judgements.

Highlights this month include reassuring data of the safety of the influenza vaccine in pregnant women, impressive results from a study of the quadrivalent HPV vaccine in males, and exciting signs that intranasal PCV7 vaccine might suppress asthma.

If you have colleagues within New Zealand who would like to receive Paediatric Vaccines Research Review, please send us their contact email and we will include them next time. We hope you find this edition interesting and look forward to hearing your comments.

Kind regards,

Dr Chris Tofield
Medical Advisor, Research Review
christofield@researchreview.co.nz

Improving timely childhood immunizations through pay for performance in Medicaid-managed care

Authors: Chien AT et al

Summary: This study evaluated the impact of a pay-for-performance (P4P) programme designed to reward timely immunisation delivery to 2-year-olds. In 2003 the Hudson Health Plan (a not-for-profit Medicaid-focused managed care plan) introduced a scheme whereby it paid a bonus of $US200 for each fully immunised 2-year-old. Immunisation rates within Hudson Health Plan rose at a higher rate than those in comparison health plans. Supplementary analyses found that children with chronic conditions were more likely to be fully immunised during the study period as a result of the programme. In conclusion, a P4P programme can improve childhood immunisation rates.

Comment: Payment for performance (incentives) has been shown internationally to be effective in many contexts in healthcare. However in immunisation there is limited research published on effective strategies and designs. This study capitalised on a natural experiment in New York State, USA where one healthcare plan offered providers large financial remuneration and administrative support for timely immunisation rates, while others in the same region did not. These reimbursements amounted to 15–25% above base reimbursement for the care of 0- to 2-year-olds. It is no surprise that this was effective, however it was modest. Importantly it did not also exacerbate disparities. However the question for me would be whether this is the best use of a considerable amount of resources, and how effective interventions of this nature would be if they were of a lesser amount? NT

Reference: Health Services Research 2010;45 (6p2):1934-1947
http://dx.doi.org/10.1111/j.1475-6773.2010.01168.x.


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HPV Efficacy: the blokes

4065 men aged 16 – 26, 18 countries RCT

- **Efficacy against any external lesion regardless of type of HPV was around 60% and around 90% protection against the vaccine types.**

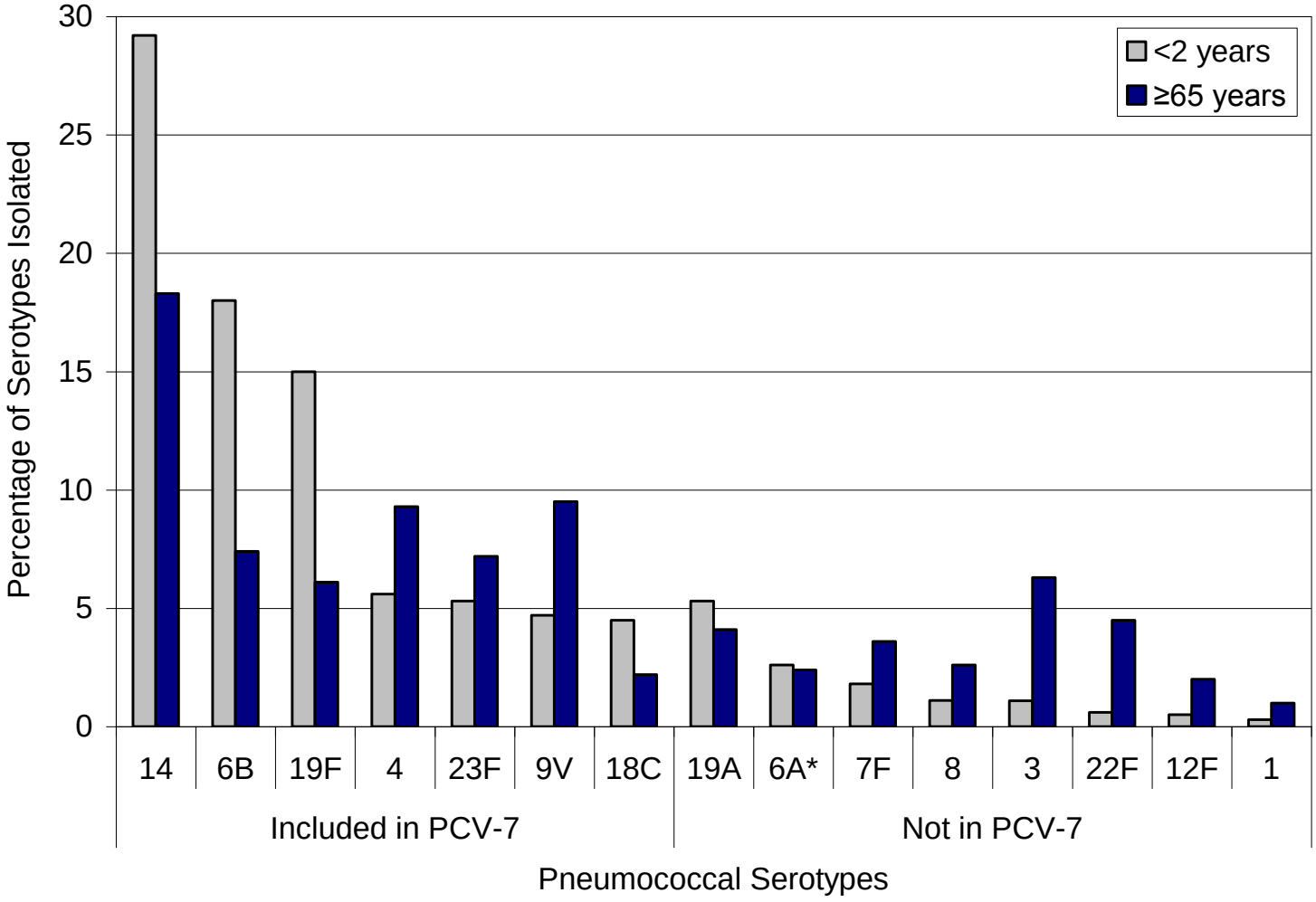
Guiliano A et al *Efficacy of quadrivalent HPV vaccine against HPV infection and disease in males* New England Journal of Medicine Feb 3 2011

Private purchase of non-funded vaccines

Price excludes GST and delivery

Vaccine	Protects against	Manufacturer	Price per dose[1]	Number of doses required
Rotarix®	rotavirus	GSK	$80.00	2 doses (before 24 weeks)
Varivax®	varicella (chickenpox)	MSD	$50.00	1 dose 12 months-12 years or 2 doses if given from 13 years
Varilrix™	varicella (chickenpox)	GSK	$50.00	1 dose 9 months-12 years or 2 doses if given from 13 years
Prevenar®	pneumococcal disease	Pfizer (Wyeth)	$112.00	1 dose if given after 2 years NB funded for children born after 1.1.08
Meningitec®	meningococcal disease group C	Pfizer (Wyeth)	$75.00	3 doses before 12 months or 1 dose if given after 12 months
Gardasil®	human papillomavirus 6,11,16 and 18	CSL	$128.50	3 doses for females 9-45 yrs and males 12-15 yrs NB funded for girls born after 1.1.90
Boostrix™	pertussis, tetanus and diphtheria	GSK	$25.00	1 dose as a booster[2,3] Can be offered to adults for pertussis protection
Adacel®	pertussis, tetanus and diphtheria	Sanofi-Pasteur	$25.00	1 dose as a booster Can be offered to adults for pertussis protection
IPOL®	polio	Sanofi-Pasteur	$35.32	1 dose as a booster
Adacel® Polio	pertussis, tetanus and diphtheria and polio	Sanofi-Pasteur	$54.00	1 dose as a booster Can be offered to adults for pertussis protection with polio
Mencevax™ ACWY	meningococcal A, C, W_{135} and Y	GSK	$30.00	1 dose. Do not use before 2 years
Menomune™ ACYW-135	meningococcal A, C, W_{135} and Y	Sanofi-Pasteur	$30.00	1 dose. Do not use before 2 years
Intanza®	Influenza	Sanofi-Pasteur	$150/10	Intradermal vaccine
Pneumovax®23	pneumococcal disease	MSD	$40.00	1 dose. Do not use before 2 years

Serotypes Causing IPD in Children <2 years and Adults ≥65 years - Laboratory Surveillance NZ 1998-2005



Ref:Serious Pneumococcal Disease in NZ , IMAC July 2007, University of Auckland