IMMUNISATION COALITION

7TH ADULT IMMUNISATION FORUM NEWSLETTER

Hybrid Event: Pan Pacific Perth Hotel, Perth

THURSDAY 22 JUNE 2023

Message from the CEO

For the first time, this event was presented as a hybrid meeting which attracted 750 attendees (a new record). It was also held in Perth for the very first time which meant we could draw on the outstanding talent Western Australia has to offer in the science and healthcare sector.

My sincere thanks goes to all of the wonderful speakers, the sponsors who have enabled it to take place, and to the IC team who made the delivery of the event seem effortless (which of course it was not).

I look forward to seeing everyone at the 2024 Adult Immunisation Forum.

Sincerely,

Kim Sampson
Chief Executive Officer

Contents

Click the title to read the summary

A/PROF KATIE ATTWELL

Impact of COVID-19 Vaccine Mandates

Vaccine mandates can successfully increase vaccine uptake. They can convince some refusers to vaccinate, but they also enhance feelings of negativity about vaccinations and about government. These feelings may be lasting and have impacts on future vaccinations and relationships with government.

A/Prof Katie Attwell presented on the issue of COVID-19 vaccine mandates. Drawing on qualitative interviews from the "Coronavax: Preparing Community and Government" project, her talk focused on the polarising impact of mandates and the attitudes of vaccine-hesitant individuals. A/Prof Attwell and her co-authors (lead author Amy Morris and interviewer Leah Roberts) aimed to understand the reasons behind vaccine refusal in the unique context of Western Australia, where mandates were implemented to increase coverage rates for border reopening amidst minimal community transmission.

Drivers of non-compliance with COVID-19 vaccination were influenced by several factors. Concerns over government legitimacy played a significant role, as vaccine refusing individuals believed the vaccines to be unsafe, unnecessary, and ineffective. The government's promotion of these perceived problematic products diminished participants' trust and the perception of its legitimacy, even within a voluntary vaccination setting.

Social pressures were another factor. These existed before mandates were introduced, but were exacerbated afterwards. Some individuals faced judgement and derogatory comments from others, such as being labelled as "stupid". However, others had mixed networks that had a more relaxed attitude to people's personal vaccination decisions. It was found that public space mandates had limited impact on behaviour, as individuals found ways to circumvent them more easily. However, a significant driver for vaccination was vaccine mandates for employment.

Dr Attwell noted how the level of distrust towards the government was profound, with some individuals expressing extreme views such as mentioning concentration camps and the harvesting of organs. This widespread distrust eroded confidence in the government, despite many individuals having previously never refused vaccines.

The presentation concluded that mandates had successfully changed the behaviour of 5 out of 17 people interviewed who had previously refused to get vaccinated against COVID-19. However, compliance was not sustained overall in Western Australia, as evidenced by lower coverage rates for the fourth vaccine dose under the voluntary program. A/Prof Attwell believes that losing trust through mandates could lead to long-term resistance to vaccination and engagement with other health initiatives. It was emphasised that rebuilding trust, promoting social cohesion, and regaining confidence in all vaccines would be a challenging and essential task.

COVID-19 vaccination status	Reason/s					
Acceptor	No concerns about vaccine safety; and	No concerns about vaccine efficacy; and	No concerns about access; and	Accepted the vaccine that was offered, when it was offered		
Cautious Acceptor	May have some concerns about vaccine safety; or	May have some concerns about vaccine efficacy; or	May have some concerns about access; or	May have *preferred* other vaccine brand, but	Accepted what was offered.	
Coerced/Hostile Acceptor	Concerns about vaccine safety; and/or	Concerns about efficacy; and	Did not want to vaccinate, but was prompted to by mandates			
Wait Awhile	For more data on general vaccine safety; or	For more data on general vaccine efficacy; or	For easier access; or	For other vaccine brand perceived as safer or more effective	To feel at risk from COVID-19 disease	For the vaccines to be mandatory
Refuser	Concerns about vaccine safety; and	Concerns about efficacy; and	No concerns about access (as no intention to vaccinate)			

Updated Vax Intentions and Status Model, taken from:

Roberts, L.; Deml, M.J.; Attwell, K. 'COVID Is Coming, and I'm Bloody Scared': How Adults with Co-Morbidities' Threat Perceptions of COVID-19 Shape Their Vaccination Decisions. Int. J. Environ. Res. Public Health 2023, 20, 2953.

www.mdpi.com/1660-4601/20/4/2953

You can access A/Prof Attwell's presentation video and slides in the AIF Program here

AIF CHAIR

DR RODNEY PEARCE AM

What Has General Practice Learnt From COVID-19?

Government will improve pandemic response if there is an existing recognition of the importance of primary care that can be utilised.

Planning starts now and the delivery of routine Immunisation programs can be used to refine, streamline and practice for the next pandemic.

Dr Rodney Pearce discussed primary care handling of the COVID-19 pandemic, what worked well, what did not, and the lessons learnt. The COVID-19 pandemic has taught us quite a few things. On the upside, it has been shown that General Practice is adaptable and remains the cornerstone of immunisation and mass vaccination roll out programs.

An important "first step", is to establish **reliable** information sources, that the public trusts. Government and social media sources are confusing, unreliable and unpredictable. GPs were left to digest and simplify the information (for themselves and their patients) and had to source their own equipment to protect themselves, staff and patients. Whilst these were eventually provided, it left clinics scrambling for supply which exposed staff and patients to unnecessary risk.

Dr Pearce talked about the importance of telehealth. With the restrictions posed upon travel and high workload during clinic vaccination, this online video service played an important part in patient consultations. But there are limits on the effectiveness of non-F2F consultations namely that there is a price to pay for fewer physical examinations and fewer non-verbal cues. The impact of this is currently unknown but could include a reduction in quality of care.

During the pandemic, advancing telehealth services to support chronic disease management, self-managed support and consideration of a new funding model reform should have been a focus. This would have been a simple and efficient platform to better improve patient services for COVID-19 and non-COVID-19 consultations.

COVID-19 had a complex impact on primary care. It taught us that there needs to be more consultation and support with Government departments. Communication, training, timely relevant information and product supply needed to be better planned and executed to help balance available resources and public opinion, and to maximise vaccination coverage. Internationally, particularly in the UK, this was managed better and whilst COVID-19 vaccination coverage caught up State by State, the delay could have been avoided.

Dr Pearce concluded by saying that the COVID-19 pandemic had a complex impact on primary care, with upsides and downsides. The lessons learnt will help future infectious disease pandemics and that primary care still remains the cornerstone of pandemic response and has shown itself to be highly adaptable in meeting the unique demands of a pandemic. To better cope with the next pandemic, government needs to consult more with general practice and act quicker.

This will ultimately improve public opinion and awareness, improve medical advice, have fewer emergency visits and hospital admissions (particularly for older patients) and potentially lower the death rate.

You can access Dr Pearce's presentation video and slides in the AIF Program here

DR LAUREN BLOOMFIELD

Vaccine Safety and Vaccine Effectiveness

Adverse events following immunisation (AEFI) require reporting through state or federal agencies, and passive systems rely on the clinician and patient to report these as they occur.

Data linkage can help to strengthen and support existing adverse event reporting systems by routinely linking vaccines and hospital contact, complementing existing systems. Data linkage is also being used to assess the effectiveness of vaccines.

Dr Lauren Bloomfield delivered a presentation on Vaccine Safety and Vaccine Effectiveness. The presentation covered vaccine safety monitoring systems for adult vaccines in Western Australia (WA) and the evaluation process for vaccine effectiveness.

Dr Bloomfield explained that adverse events following immunisation (AEFI) can occur due to various factors, including individual responses to vaccines, mishandling or administration errors, or coincidental events unrelated to vaccination. Noteworthy AEFI should be reported, along with any vaccination errors. Medical and nurse practitioners, as well as other immunisation providers, parents/guardians, and vaccinated individuals, have a statutory obligation to report AEFI to the Chief Health Officer through the Western Australian Vaccine Safety Surveillance (WAVSS) system.

Data linkage was emphasised as a crucial tool for vaccine safety monitoring in WA (figure 1). This process connects relevant information belonging to the same individual, primarily analysing aggregate population/cohort data. Data linkage is not reliant on self-reporting or clinician reports and covers serious events resulting in emergency department presentations or hospital admissions. It draws from existing data collections, covers almost the entire state, and enables timely analysis.

The presentation also discussed the use of data linkage for case finding and rapid cycle analysis (RCA) in monitoring vaccine safety. RCA involves comparing observed vs. expected events for newly introduced vaccines, aiming to identify safety signals. Prospective linking of COVID vaccines using specific codes of interest and proportional emergency department presentations were highlighted as methods to detect safety signals.

Regarding vaccine effectiveness (VE), Dr Bloomfield differentiated between vaccine efficacy under ideal and controlled circumstances, and VE in the real world. VE assessment requires large sample sizes with known exposure and outcome statuses. In WA, COVID-19 vaccination data has been linked to pathology results, hospitalisation data, and mortality data to assess VE in a COVID-naïve population. The analysis showed waning effectiveness against breakthrough infections over time but demonstrated effectiveness of over 80% against severe disease following a third dose.

The presentation concluded by highlighting the importance of incorporating safety signals and data linkage into routine practices, as well as continuing case finding and RCA for new vaccines such as seasonal flu, RSV, and Shingrix. For VE assessment of seasonal influenza, three methods were proposed for comparison: retrospective cohort studies, test-negative design (PathWest only), and Test-ORV+ (Flu, COVID, RSV).

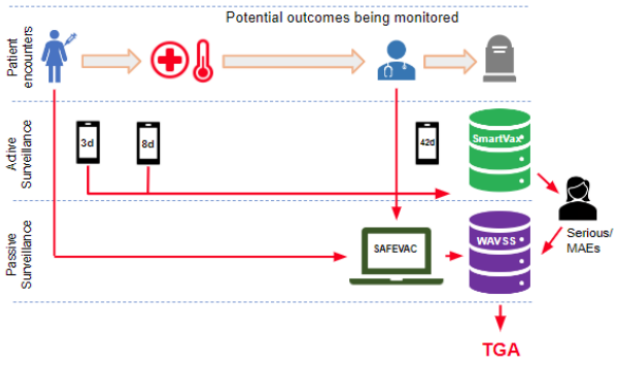

Fig. 1. Vaccine safety monitoring in WA

You can access Dr Bloomfield's presentation video and slides in the AIF Program here

DR DAVID MULLER

High Density Microarray Patch For Vaccine Delivery

When delivered via the HD-MAP the hexapro spike produces broadly reactive antibody responses that are able to neutralise every SARS-CoV-2 test (alpha, beta, delta, kappa, lambda, omicron).

Preliminary interim results from the clinical trial found the Hexapro patch produced on average an 8 fold increase in antibody titres.

Dr David Muller provided a detailed evaluation of a novel medical device in development for delivery of a SARS-CoV-2 spike vaccine via a polymer high density microarray patch (HD MAP) patch (figure 1). The concept behind this is to offer patients a needle free single dose dermal delivery of a vaccine and be stable at room temperature. It is hoped that this novel system would help improve vaccination rates globally.

The microarray is coated with a dried vaccine formulation that is depressed onto skin for sub-dermal delivery (figure 2). In mice studies, the vaccine coated microarray has been shown to enhance the immune response by targeting Antigen Presenting Cells.

Dr Muller also pointed out that the HD MAP patch has many advantages over traditional syringe/needle system by reducing the need for cold chain storage and transportation (stable for 30 days @25 degrees C, 7 days @40 degrees C), minimising needle phobia, application time and the potential for self-administration.

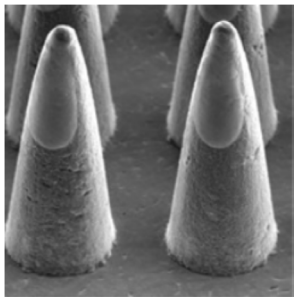

Figure 1. The Vaxxas microarray coated with dried SARS-CoV-2.

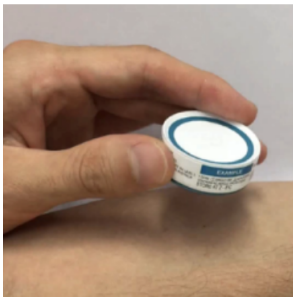

Figure 2. Application of the polymer high density microarray patch

Dr Muller showed the results of a mouse immunogenicity study. Mice received 2 doses of SARS-CoV-2 Spike protein vaccine 3 weeks apart vs control. Blood and Bronchial alveolar lavage fluid from the lungs were collected on days 1, 20 and 42. The results showed an immunological spike response by raising IgG levels and were statistically above baseline. The results determined in a mice model, that the HD-MAP spike induced protection from SARS-CoV-2 infection using the HD-MAP coated with the dried SARS-CoV-2 vaccine.

The HexaPro HD-MAPs induce neutralising antibodies after 1 dose, boosted after 2 doses and that the response was faster and more potent than typical injection methods.

In an ongoing study with healthy volunteers, clinical data supported pre-clinical mice models. The HD-MAP delivered HexaProSpike protein can act as a booster dose. In this study, three groups of participants received a single dose of 15ug or 45ug vaccine and a non-vaccine control arm received a non-vaccine containing HD-MAP. Blood and saliva was collected at days 0, 7, 28, 56 and 90 and analysed for immunogenicity. Serum IgG, virus neutralisation and saliva IgA were all statistically significant over time vs baseline and control samples

Studies are ongoing and soon to be published.

This vaccine delivery system offers several advances over traditional syringe/needle methods. We look forward to reading more on this technology as there are many vaccine applications this could be used for.

Dr Muller concluded that if the technology were to be available at the start of the SARS-CoV-2 pandemic, in theory, there may have been over 16 million fewer cases, 200,000 fewer deaths and a significant cost reduction on the healthcare system globally.

You can access Dr Muller's presentation video and slides in the AIF Program here

KEN GRIFFIN

APNA Workforce Survey: Vaccination By Primary Health Care Nurses

The role of primary health care nurses in vaccination across Australia.

Nurses administer most vaccines but this role is not captured, impairing informed policy decision-making.

Ken Griffin presented findings from a survey conducted by the Australian Primary Health Care Nurses Association (APNA), which focused on the role of Primary Health Care Nurses vaccination across Australia.

Ken provided an overview of the Primary Healthcare (PHC) nursing workforce, indicating that most nurses work in residential health care facilities and community health care services. The survey, conducted between October and December 2022, included approximately 3,700 PHC nurse respondents.

Key activities of PHC nurses include infection control, administering medication, and cold chain management. Notably, 59% of PHC nurses administer adult vaccines daily, and 52% administer paediatric vaccines daily. However, the survey revealed a decreasing trend in daily immunisation and cold chain management activities between 2019 and 2022.

Ken stressed the significant implications of these findings for policy-making. The data suggests that nurses administer most of the vaccines in Australia but this is not captured in data collection (figure 1), thus impairing informed policy decision-making.

As pandemic vaccination activity reduces, regular immunisers are vaccinating less, and new immunisers are returning to previous clinical activities. This could reflect workforce burnout or present an opportunity for increased utilisation of this large and experienced workforce. It was also noted that 13% of PHC nurses express a desire to do more immunisation work, which policy-makers could leverage.

Ken emphasised that PHC nurses play a critical role in administering vaccines in Australia and are highly motivated to vaccinate. However, the decreasing vaccination activity by nurses and a lack of data acknowledging their role obscures their contribution. This data gap impedes the creation of effective and efficient immunisation policy and potentially hampers Australia's immunisation program objectives.

National Audit Office COVID19 Vaccine Roll-out Audit

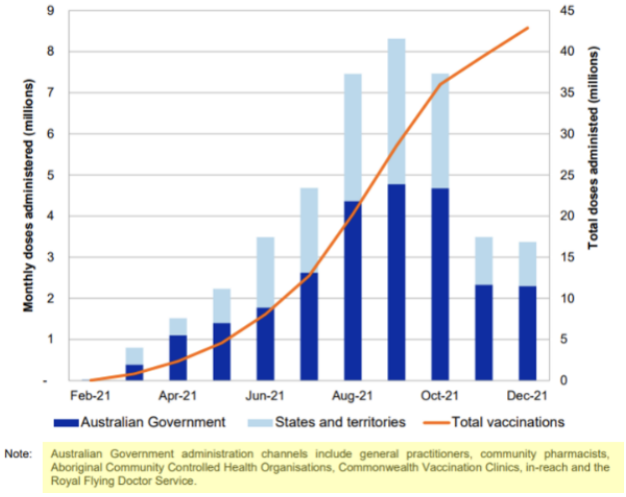

Fig. 1. Vaccination data collected with no acknowledgment of nurses

You can access Ken Griffin's presentation video and slides in the AIF Program here

DR ANNALEISE HOWARD–JONES

Japanese Encephalitis Virus and Murray Valley Encephalitis Virus

The Australian flavivirus landscape is in evolution and highly subject to environmental influences including climate change.

Vaccination and education of at-risk populations is critical to the mitigation of emergent / re-emergent flavivirus outbreaks.

Dr Howard-Jones provided an overview of arthropod-borne flaviviruses, detailing the different types and global geographic distribution. Annaleise then focused on the recent emergent and re-emergent mosquito-borne flavivirus outbreaks in Australia over 2022 and 2023 - Japanese encephalitis virus and Murray Valley encephalitis virus - and how these viruses develop and spread from animals to humans.

The lifecycle and transmission of JEV involves mosquito vectors, water birds (as definitive hosts) and domestic and feral pigs (as amplifying hosts). Humans and other animal species are incidental hosts. Infection is often asymptomatic or presents as a mild febrile illness, with encephalitis representing only 1 per 250 cases. Encephalitic disease, though rare, carries high morbidity & mortality with a case fatality rate of 5-50%.

The diagnosis of JEV requires a detailed clinical history including symptoms and risk factors for exposure (residence, regional / international travel, timing of contact, recreational activities & occupational risk), followed by a physical examination. Suitable samples for laboratory analysis were also described.

Dr Howard-Jones then provided data on the number of recent cases of JEV in NSW. In early 2022, 12 cases were confirmed within the first 3 months of the JEV outbreak. More recently, National JEV notifications to February 2023 totalled 35 cases, which resulted in 7 fatalities.

Annaleise outlined the available JEV vaccines in Australia. They are JEspect (inactivated vaccine) and Imojev (live chimeric attenuated vaccine). In 2022, at least 85,930 people completed a course of a JEV vaccine and importantly, each State and Territory health department were responsible for A) defining eligibility criteria for people in high-risk settings, and B) distribution of vaccines.

Finally, some information was presented on the recent re-emergence of human Murray Valley Encephalitis Virus (MVEV) in 2023. The first two cases were diagnosed in January 2023 with additional case detections over subsequent months. These cases were concentrated in the Murray River Region (NSW/VIC) and across WA & NT with fewer cases in SA and QLD. Nationally, 21 cases of MVEV were diagnosed as of 4 June 2023 with a 27-60% case mortality (amongst those with encephalitic disease).

In summary, the diagnosis of JEV and MVEV is complex. Accurate diagnosis requires integration of clinical presentation, local epidemiology, the patient's travel, exposure and vaccination history and detailed laboratory testing. Inter-laboratory collaboration is important.

In Australia, the flavivirus landscape is in evolution and subject to environmental influences. In outbreak areas, necessary steps must be prioritised at State and National level to vaccinate and educate at-risk populations.

You can access Dr Howard–Jones' presentation video and slides in the AIF Program here

PROF PETER RICHMOND

RSV Vaccination and Pregnancy

GlaxoSmithkline (n=24,966)		Pfizer (n=34,283)		Moderna[1] (n=37,500)		Janssen[2] (n=5782)	
Outcome	Efficacy	Outcome	Efficacy	Outcome	Efficacy	Outcome	Efficacy
RSV Acute RTI	71.7%	RSV ARTI	62.1%	RSV ARTI	N/A	RSV ARTI	N/A
RSV Acute LRT disease with ≥2 LRT Sx/signs inc 1 LR sign or 2 LR signs or 3 LR Sx	82.6%	RSV LRTI with ≥2 Sx/signs	66.7%	RSV LRTI with ≥2 Sx/signs	83.7% (CI: 66%, 92%)	RSV LRTI with ≥2 Sx/signs	75% (CI: 50-88%)
		RSV LRTI with ≥3 Sx / signs	85.7%	RSV LRTI with ≥3 Sx / signs	82.4% (CI: 35%, 95%)	RSV LRTI with ≥3 Sx / signs	80% (CI: 52-93%),
RSV LRTI with ≥2 lower resp. signs or assessed as severe by PI	94.1%					RSV LRTI with ≥2 Sx or ≥1 LRTI Sx with ≥1 systemic Sx	70% (CI: 44-85%)

Fig. 1. RSV vaccine summary efficacy data by Manufacturer

Professor Peter Richmond presented on RSV burden and epidemiology in Australia, the development of the long-awaited RSV vaccines including monoclonal antibodies, and the outlook on maternal RSV vaccination.

RSV infection is a seasonal winter virus and is widespread amongst children. Approx. 95% are infected by 2 years of age, thus representing the majority of infections across the different age groups. About 25% of RSV infected infants have lower respiratory tract infection which a proportion will present at hospital. Globally, the annual RSV infection rate is approx. 34 million episodes, with a high death rate in low-income countries.

In Australia, it is estimated that 15,000 children are admitted to hospital each year. The AIHW hospitalisation data underestimates RSV burden by at least ~30% and when compared to influenza, RSV is associated with higher rates of ED visits, hospitalizations and carer resource use. Until an RSV vaccine becomes available, there is little healthcare physicians can do when RSV is suspected and/or diagnosed other than treat the symptoms and monitor the patient for decline.

Several RSV vaccines are in development and will hopefully be available before the 2024 winter season.

Professor Richmond provided a RSV vaccine and mAb snapshot looking closely at phase II and phase III trials. He summarised the different vaccine technologies/vaccine types for children, pregnant mums, adults and the older population.

In a recent article published in the NEJM, several maternal RSV vaccine safety and efficacy studies reported the following (figure 1):

- There were no safety concerns and well tolerated in pregnant women
- Is immunogenic with passive antibody transfer to the infant
- Is likely to be effective in the first 180 days
- Prevents both lower and upper respiratory infections
- Timing of vaccination during pregnancy and related to season is important
- There is no evidence of disease enhancement in the subsequent year

Regarding RSV vaccines for older adults, Professor Richmond pointed out the following:

- New technologies are delivering effective prevention strategies
- RSV vaccines for older adults appear highly effective against mild-moderate
- No evidence of disease enhancement disease

You can access Prof Richmonmd's presentation video and slides in the AIF Program here

PROF CHRIS BLYTH

Protecting the Future – What's New In Antenatal Vaccination

Antenatal vaccination against diphtheria, tetanus, pertussis, influenza and COVID-19 is strongly recommended for all women based on both its efficacy and safety, yet many pregnant women and their infants do not receive this protection – we need to understand the barriers to delivery and acceptance to inform development of new programs to ensure vaccination.

A number of new vaccines are on the horizon including vaccines against RSV, Group B Streptococcus and CMV – all of these are likely to significantly shape diseases in Australian infants.

Professor Chris Blyth's presentation highlighted the importance of antenatal vaccination for protecting both mothers and babies, with a focus on Influenza, COVID-19, Pertussis, RSV, GBS, and CMV. He emphasised the significance of vaccination for Aboriginal people and the challenges of achieving high coverage and equity.

Professor Blyth began by stressing the impact of influenza vaccination on pregnant women, noting that pregnant women were many times more likely to be admitted to ICU compared with non-pregnant women the same age. Having the influenza vaccine has been shown to be effective in preventing disease in mothers and newborns, with similar vaccine effectiveness against maternal infection, stillbirth and infant infection.

Regarding Pertussis, Professor Blyth discussed the importance of vaccinating pregnant women to protect both mothers and infants. A single dose provided 60-70% protection, while two doses increased protection to 80%. Interestingly, coverage for Pertussis is better than for influenza, but variable due to factors like seasonal programs and differential risk perception. Chris advocated that a multifaceted strategy targeting barriers to maternal vaccine uptake was needed to increase vaccination rates.

It was also emphasised the poor outcomes associated with COVID-19 in pregnant women. It is recommended to get a booster COVID-19 vaccine to reduce complications, noting that severe COVID-19 is rare in fully vaccinated pregnant women. The importance of RSV prevention was highlighted, particularly for young babies and the elderly, and the need to involve social scientists in vaccine development for readiness and acceptance.

We look forward to new RSV vaccines as they become available in Australia in the near future.

Regarding future prospects, Professor Blyth highlighted potential vaccines for Group B streptococcus (GBS) and CMV currently in phase 2 trials, showing promising results in immunogenicity, safety, and efficacy. These vaccines aim to prevent GBS and CMV-related diseases in infants.

In summary, Professor Chris Blyth's presentation provided insights into the importance of antenatal vaccination, challenges of achieving coverage and equity, and promising developments in vaccines and their availability in the near future.

You can access Prof Blyth's presentation video and slides in the AIF Program here

PROF TONY CUNNINGHAM

Herpes Zoster – Vaccines in the Ageing

Shingrix is more effective and has a longer duration of action than Zostavax against Herpes Zoster and PHN.

In immunocompetent people ›50 years, Shingrix is preferred over Zostavax for the prevention of Herpes Zoster and its complications.

In all immunocompromised people, use Shingrix as it is most effective. Zostavax is contraindicated in moderately and severely immune-compromised patients.

Professor Cunningham started out by saying that one in three people will develop Herpes Zoster (HZ) (shingles) as they get older. This is largely caused by immune decline in the elderly and contributes to the marked increase in HZ for people over 50.

99.5% of adults over 50 years of age have been infected with the varicella zoster (chicken pox) virus (VZV) and are at risk for Shingles. The VZV remains dormant in the dorsal root ganglion and can be reactivated later in life to cause shingles. Vaccination against the HZ is the only way to avoid the risk of Shingles.

When infected, in the acute phase, HZ causes a nasty maculopapular rash and excruciating pain which rates higher than labour pain on the debilitating pain scale (figure 1).

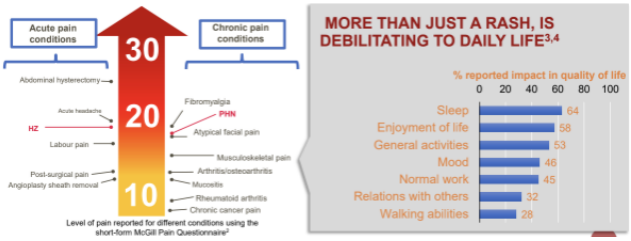

Fig. 1. Shingles causes burning, stabbing and deep aching pain

Complications include Post Herpetic Neuralgia (PHN) which manifests as stabbing or burning pain from damaged nerves. PHN affects 30% of patients with shingles. Ophthalmic zoster affects 25% with 1% experiencing vision loss. Other complications include cardiovascular and cerebrovascular events, hearing loss, scarring and cranial involvement.

Vaccination against HZ
There are two vaccine options.

Zostavax
This is a first generation, Live attenuated vaccine. Zostavax has a 51% overall vaccine efficacy in people over 60 against HZ with the efficacy declining to 38% in people ≥ 70 years of age. Zostavax protects two thirds of people against PHN. Vaccine protection wanes over 8 years.

Shingrix
This is a second generation, Recombinant Zoster Vaccine. Shingrix has an adjuvant, ASO1 which increases peak immune response to the vaccine and its durability. Shingrix has a 97% overall vaccine efficacy in people over 50 against HZ with the efficacy for people over 70 still over 90%. Shingrix protects 88.8% of people over 70 against PHN, they are protected due to the high efficacy against HZ. Shingrix has an 89% vaccine efficacy, up to 10 -year post vaccination. Shingrix has increased reactogenicity causing a sore arm and systemic side effects (fatigue, GI side effects, headache, myalgia, shivering and fever). These side effects generally last 2-3 days.

Key vaccination messages:

- Shingrix is more effective and has a longer duration of action than Zostavax against Herpes Zoster and PHN.
- Two doses (2-6 months apart) of Shingrix are more effective than one dose.
- In immunocompetent people ≥50 years, Shingrix is preferred over Zostavax for the prevention of Herpes Zoster and its complications.
- In all immunocompromised people, use Shingrix as it is most effective.
- Zostavax is contraindicated in moderately and severely immune-compromised patients
- In immunocompetent people ≥50 yrs. if Shingrix is unavailable or not affordable, use Zostavax.
- Zostavax is NIP funded for all immunocompetent people aged 70 years old with a five-year catch-up program for people aged 71–79 years old until 31 October 2023

What's next for Shingrix?

- Duration of efficacy, longer term trials in progress for immunocompetent and immunocompromised people
- Long term marketing surveillance for risk of autoimmunity
- NIP listing is imminent (Q4 2023); PBAC recommendations for non-indigenous people of 70 yrs, Indigenous and Torres Strait Islander individuals ≥50 yrs, ≥18 years with haemopoietic stem cell transplant, solid organ transplant, haematological malignancy, or advanced or untreated HIV
- See NIP schedule for details and conditions of use.

You can access Prof Cunningham's presentation video and slides in the AIF Program here

DR LAURENS MANNING

Adult Strep A Disease and the Potential Impact of a Vaccine

Dr Laurens Manning presented on the potential impact of a vaccine for adult Strep A disease, which is the fifth most lethal pathogen but often neglected. Strep A infections can lead to various illnesses, including strep throat, scarlet fever, and invasive diseases such as cellulitis and necrotizing fasciitis. Dr Manning highlighted that currently, there is no commercially available Strep A vaccine specifically targeted for adults. While a vaccine for Strep A exists for children, developing one for adults poses challenges due to the complex nature of Strep A's virulence factors and its highly variable M protein on the surface, which hampers the development of a universally effective vaccine.

His presentation highlighted the increasing incidence of invasive Strep A and Group C/G Streptococcocci in Australia and also touched upon the potential cross protection of a Strep A vaccine against Group C/G Streptococci (SDSE) (figure 1).

The level of cross protection would depend on factors such as the specific antigens targeted by the vaccine and the similarity or cross reactivity between different strains.

Regarding preventing cellulitis, Dr Manning mentioned that current strategies mainly involve maintaining good skin hygiene. However, a Strep A vaccine for cellulitis could be considered as a primary prevention strategy for older adults with risk factors. Given the high rates of cellulitis recurrence, targeting it as a vaccine-preventable disease would be ideal for late-phase trials.

While the Strep A vaccine pipeline is gaining momentum for childhood pharyngitis and prevention of acute rheumatic fever, trials for older adults to prevent invasive disease or target cellulitis are not considered priorities. However, many of the proposed multivalent Strep A vaccine candidates have the potential to impact SDSE populations, providing some degree of cross protection.

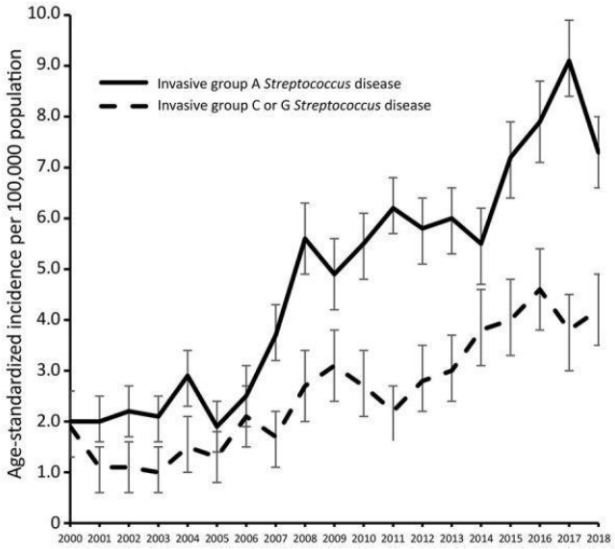

Fig. 1. Increasing incidence of invasive Strep A (and C/G) in Australia

You can access Dr Manning's presentation video and slides in the AIF Program here

A/PROF DEBORAH STRICKLAND

Immunomodulatory Therapies

Certain microbial exposures, including through vaccination and environment, can induce long-term changes in innate immune cell functions which potentially provides non-specific protection against infection.

Immunomodulatory agents may offer novel opportunities to protect pregnant women and neonates against infection, and may be a useful tool for improving vaccines.

Associate Professor Deborah Strickland presented an informative overview of the emerging immunomodulatory strategies for the prevention of infection with relevance to vaccines. A/Prof Strickland guided us through how the immune system maintains homeostasis and how disease develops. Consisting of two parts; the innate and the adaptive arms of immunity, vaccines have previously been considered to target adaptive immunity as the means to generate protective memory functions (Figure 1).

Immune System Function: Innate and Adaptive

Microorganism recognition through germ line encoded expression of various Pathogen Recognition Receptors (PRR)

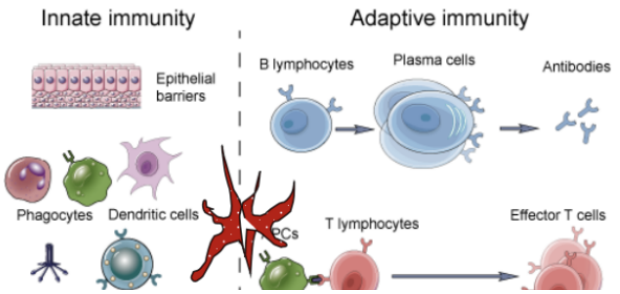

Fig. 1. Innate and Adaptive immunity

A/Prof Strickland highlighted the non-specific effects of vaccines. BCG, the most well studied vaccine, protects non-specifically against unrelated infection and mortality. Following an initial response to a primary challenge from BCG modifications can be induced in innate immune cells, generating a non-specific memory that leads to an enhanced response to a secondary challenge.

This improves the host's defence to pathogens. This long-term reprogramming of the pathways and function of innate immune cells, which leads to an altered response to a secondary challenge, is termed Trained Immunity.

Some interesting evidence on how nature can prevent disease was shown. Traditional farming in Europe and the US provided exposure to microbial compounds. Respiratory microbes (from barn dust) and gastrointestinal microbes (from unpasteurized milk) led to profound protection in children against allergic asthma, early infections and allergic rhinitis. It was also shown that exposure to traditional farm environments in pregnant women, led to activation of innate and regulatory pathways to equip the infant with the capacity to appropriately shape and calibrate downstream immune responses and prevent infection.

A/Prof Strickland presented data where microbial based therapeutics were used to boost the immune system function, to prevent infections. The most publicised were polybacterial lysates (OM-85; an oral polybacterial lysate vaccine). In the OMPAC study, OM-85 was used in the primary prevention of respiratory viral infections in infants at high risk for asthma development. It was shown that OM-85 treatment boosted immunity against severe respiratory infection. Preclinical studies using OM-85 in pregnancy has been shown to reduce maternal disease severity to infection and maintain gestational tissue homeostasis which supports foetal growth and development.

You can access A/Prof Strickland's presentation video and slides in the AIF Program here

PROF PAUL VAN BUYNDER

New Vaccine Conjugates To Protect Against IPD

Pneumococcal disease remains a significant cause of morbidity and mortality despite vaccines against this, particularly in the elderly and those with chronic diseases,

New conjugated vaccines provide hope of improved protection against circulating serotypes.

There are more than 95 known pneumococcal serotypes however, most confirmed pneumococcal infections leading to IDP, pneumococcal pneumonia and bacterial meningitis, are caused by a relatively small number of serotypes.

Professor Paul Van Buynder presented on the burden on invasive pneumococcal disease, currently funded vaccine options (PCV13, PPSV23), newly TGA approved polyvalent conjugate vaccines (PCV15, PCV20) and the possible future direction of vaccine usage for both adults and children. Both funded vaccines are listed on the National Immunisation Program with the two new conjugated vaccines are under review by ATAGI.

Professor Van Buynder provided a snapshot of the cost burden associated with pneumococcal pneumonia presentations to GP and Hospital. The annual incidence was approximately 450/100,000 and 270/100,000 population at a cost of $1.6M and $56M per year respectively. IPD was significantly lower.

The answer to reducing pneumococcal infections lay with better vaccine coverage and the introduction of new conjugated vaccines which have more serotypes in the formulation and more effectiveness against serotypes poorly protected against by current vaccines.(figure 1). These two new vaccines offer additional serotype protection.

Enhanced protection is particularly important in the elderly population and those that have 3 or more chronic medical conditions (asthma, chronic lung disease, chronic heart disease, diabetes or chronic liver disease). The risk of a poor outcome increases significantly in those with chronic co-morbidities.

Serotype 3 infections are characterised as having the most severe clinical manifestations. This includes empyema, bacteremia, cardiotoxicity, and meningitis, with a fatality rate of 30%–47%. This serotype is enhanced by its thick polysaccharide capsule making it particularly difficult to immunise against. Serotype 3 resists antibody-mediated clearance despite its inclusion in the current NIP listed vaccine formulations.

Dr Van Buynder also highlighted that serotype 3, 19F and 22F infections are still prominent and the main serotype infection in children and adults >70yrs. There is also a disturbing gradual increase of non-PCV serotype infections.

It is hoped that with the introduction of new conjugated vaccines, improved protection will lead to a reduction in the overall number of pneumococcal disease infections.

To summarise, the new PCV15 and PCV20 conjugated vaccines will offer greater protection against pneumococcal disease. In line with improved effectiveness, there needs to be a renewed emphasis on vaccinating key risk groups particularly older persons and those with chronic diseases.

Previously/currently registered pneumococcal vaccines																							
PCV7*	4	6B	9V	14	18C	19F	23F																
PCV13	4	6B	9V	14	18C	19F	23F	1	3	5	6A	7F	19A										
PPV23	4	6B	9V	14	18C	19F	23F	1	3	5		7F	19A	22F	33F	2	8	9N	10A	11A	12F	15B	17F	20
V114 PCV15	4	6B	9V	14	18C	19F	23F	1	3	5	6A	7F	19A	22F	33F									
PCV20	4	6B	9V	14	18C	19F	23F	1	3	5	6A	7F	19A	22F	33F		8		10A	11A	12F	15B		

Fig. 1. Pneumococcal disease serotype by vaccine

*Prevenar 7 is no longer available Australia

You can access Prof Van Buynder's presentation video and slides in the AIF Program here

ANGELA NEWBOUND

PneumoSmart Vaccination Tool Update

If there is no written evidence that the individual has received pneumococcal vaccine, then proceed as if they have not been vaccinated and administer the recommended pneumococcal vaccines.

We cannot 'over vaccinate' with pneumococcal vaccines, but an individual could be at risk of pneumococcal disease if they are under vaccinated.

Angela Newbound presented an informative update on the PneumoSmart Vaccination Tool, an innovative tool developed to help healthcare providers navigate the complex pneumococcal disease vaccination recommendations in Australia.

The 10th Edition Australian Immunisation Handbook in 2013 introduced new pneumococcal vaccination recommendations, which classified medical conditions into Category A and Category B (figure 1).

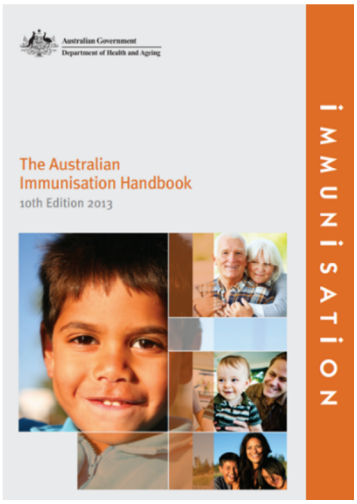

Fig. 1. The Australian Immunisation Handbook

These new recommendations had heightened the complexity of the pneumococcal chapter, which led to confusion among providers.

Recognising the need for a simplified tool to aid healthcare providers, Angela and her team embarked on the development of a paper-based tool.

However, the complexity of vaccination schedules and categories necessitated a more sophisticated approach, an online digital version was needed. Thus the PneumoSmart Vaccination Tool, a web-based application, was created :

PneumoSmart Vaccination Tool
immunisationcoalition.org.au/pvt

It was designed to guide clinicians consulting with patients over 5 years of age, with medical conditions and thus categorising them in the 'highest risk' group for contracting pneumococcal disease.

The tool has undergone several updates to reflect changes in vaccination recommendations. It was significantly updated in 2020 due to changes designed to simplify the recommendations and protect those at the most risk of invasive pneumococcal disease (IPD). Further updates were done recently to include higher valency vaccines, specifically the 15-valent and 20-valent pneumococcal conjugate vaccines. Angela assured the audience that the tool would continue to be updated if the Handbook recommendations change or if new vaccines are added to the National Immunisation Program (NIP).

The presentation also included practical demonstrations of the tool using various scenarios. The purpose of the tool is to be easily accessible, quick to use, and ensures patients are appropriately vaccinated. All clinicians are encouraged to use the tool to ensure that patients receive the correct vaccine, the correct number of doses, at the correct intervals, and at the correct time to reduce the likelihood of pneumococcal disease burden.

You can access Angela Newbound's presentation video and slides in the AIF Program here

PROF ROBERT BOOY

Meningococcal Disease

Meningococcal disease can occur at any age, including infancy, teenagers, and older teenagers. However, it is most prevalent in infants and older teenagers.

Vaccination is the most effective method of prevention. Additionally, implementing social distancing measures, like those observed during COVID-19, can also have a significant impact on preventing the spread of the disease.

Professor Robert Booy presented an insightful update on the changing epidemiology and prevention of Invasive Meningococcal Disease (IMD). Men B is currently the predominant strain in Australia, causing 44 of the 58 IMD cases reported between January–June 2023.

Professor Booy provided historic findings from a Landmark paper published in 1918, which observed six predisposing factors for IMD; 1. season, 2. severe weather, 3. antecedent epidemics of influenza, 4. temporarily lowered resistance, 5. overcrowding and 6. high carriage rates.

Robert highlighted how IMD has evolved over the past 30 years. Men A became rare due to improved social economic status and less crowding. However, in the early 2000s, there was a surge in Men B and Men C. Then when a Men C vaccination was implemented in 2003, there was a dramatic decrease in Men C. Thirteen years on, there has been a 99% reduction in Men C.

In 2017, there was a surge in four meningococcal serogroups (B, C, W, Y) due to a surge in influenza which predisposed the population to a secondary surge in IMD. It is believed that influenza caused damage to the throat mucosa which facilitated the invasion of meningococcal. From this, the approach is now to target meningococcal and influenza vaccine rates simultaneously. The impact of social distancing during COVID has also coincided with the lowest rates of IMD and influenza since national records were kept.

In the fight against COVID-19, broad scale public education strategies aimed at disrupting transmission dynamics, including restricting travel, improved hand hygiene practices, physical distancing, improving ventilation of indoor space and mask wearing have all directly or indirectly influenced IMD case numbers.

Robert reinforced that changing social behaviours might further reduce rates of IMD and is consistent with historic findings from controlled defence settings. It also demonstrates that we can achieve reductions in case numbers in a broader social context and on a far greater scale.

You can access Prof Booy's presentation video and slides in the AIF Program here

BRUCE LANGOULANT

(Chair & Co-founder) Meningitis Centre Australia

The parent /patient voice is like the propeller for driving change when combined with health professionals and key influencers when lobbying. Without it, the momentum is far less urgent and impactful. It is a well proven fact in The Change Equation.

Meningitis Centre Australia runs a nationwide support group ' Mending Hearts' with over 150 survivor / parent members.

Mr Langoulant has been advocating for free vaccinations against meningitis for children since the early 1990's. His perseverance and persistence were rewarded first when the pneumococcal vaccine was made available, free of charge, to children in 2005 (figure 1).

Abbott signs off on $178m vaccine plan

Fig 1. Government signs off on free pneumococcal disease vaccine for children

Bruce talked about the many challenges of advocating for free vaccinations. As a father and carer whose daughter Ashleigh contracted pneumococcal meningitis in 1989 with devastating consequences, Bruce co - founded The Meningitis Centre (figure 2) which today continues to advocate for free vaccination against harmful infectious diseases in children. Under the banner of "The power of working together and adding the parent/patient voice", Mr Langoulant was able to work with others to convince government officials to fund the pneumococcal vaccine and make it available to children free of charge.

Mr Langoulant's goal, together with the help and support of parent patient advocates and expert health professionals, was to instill change through:

- Increasing awareness of meningitis and open minds to the disease through logic and emotion
- Government lobbying and timing of events and activities in line with elections
- Getting government to acknowledge and recognise the impact invasive pneumococcal disease can have on children and families
- Building relationships with people that cared and were in position to support change
- Being persistent and focused, particularly with HCPs and government officials
- Obtaining media support
- Creating public interest and community support
- And the final hurdle – maintaining the pressure!

Mr Langoulant stressed that these were important steps for gaining support and advocating for change. The success of The Meningitis Centre for winning government and community support was based on working together and being heard as one strong passionate voice.

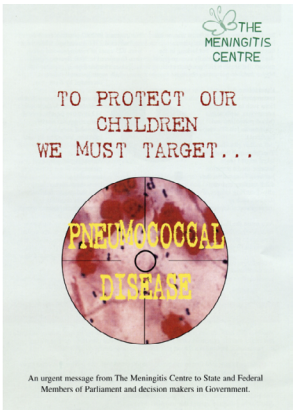

Fig. 2. The Meningitis Centre advocating change for free pneumococcal disease vaccination in children 2001-2004.

Bruce highlighted that we all take for granted vaccines listed on the NIP – 'but none of these got there on their own!'. There are still vaccines that are non-funded or have limited funding based on age and risk factors.

The work of Meningitis Centre Australia continues with the successful funding for the Meningococcal ACWY vaccine in 2016 for teens and 2017 for toddlers (in WA) which subsequently were funded soon after nationally.

What's next for Mr Langoulant and the Meningitis Centre Australia? *'We are working on Meningococcal B free vaccination for children and young adults. Watch this space!'*

For more information on the Meningitis Centre Australia, please visit www.meningitis.com.au
You can access Mr Langoulant's presentation video and slides in the AIF Program here

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