

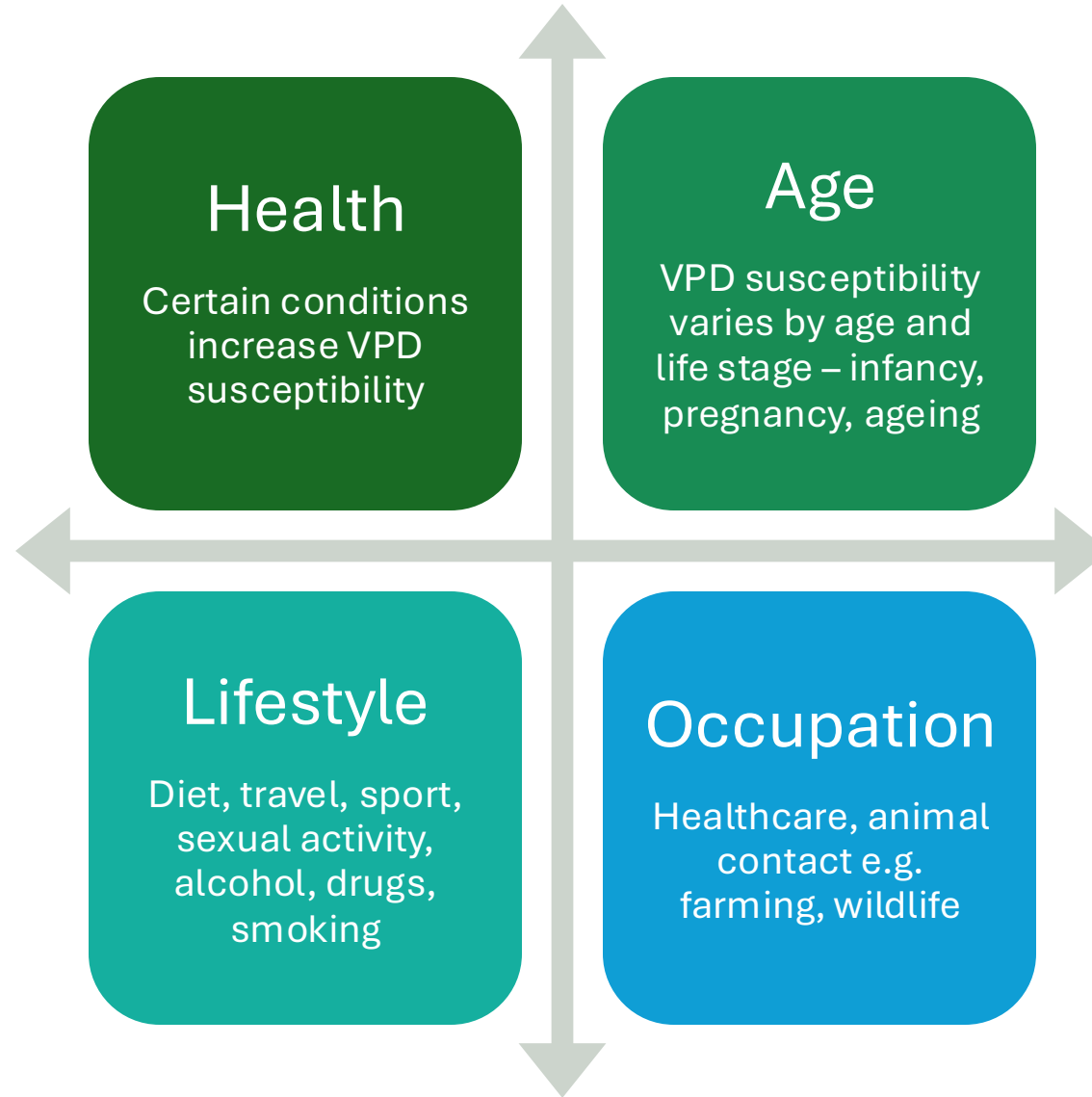


Vaccination in the Elderly

Prof Katie Flanagan

HALO Principal

Vaccination
susceptibility and
needs vary
according to these
factors



Other Factors:

- Sex
- Genetics
- Epigenetics
- Environment
 - urban vs rural
 - tropical vs temperate

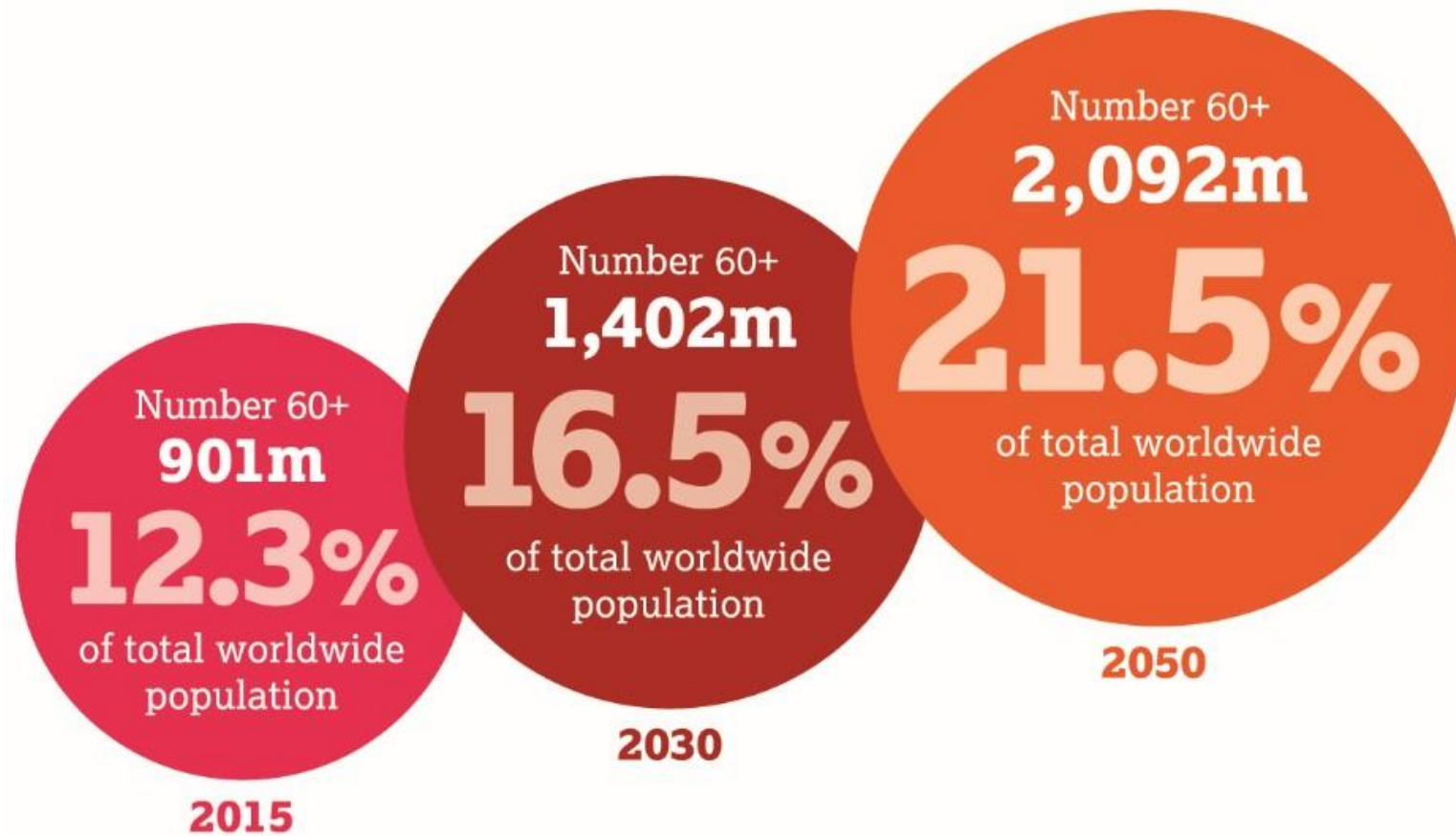
Why Focus on the Elderly?

- The aging population of the world is increasing (1 in 4 Australians are ≥ 65 years)
- Healthy elderly people make a significant contribution to the economy:
 - Care of grandchildren
 - Voluntary work
 - International travel
 - Spending their pensions



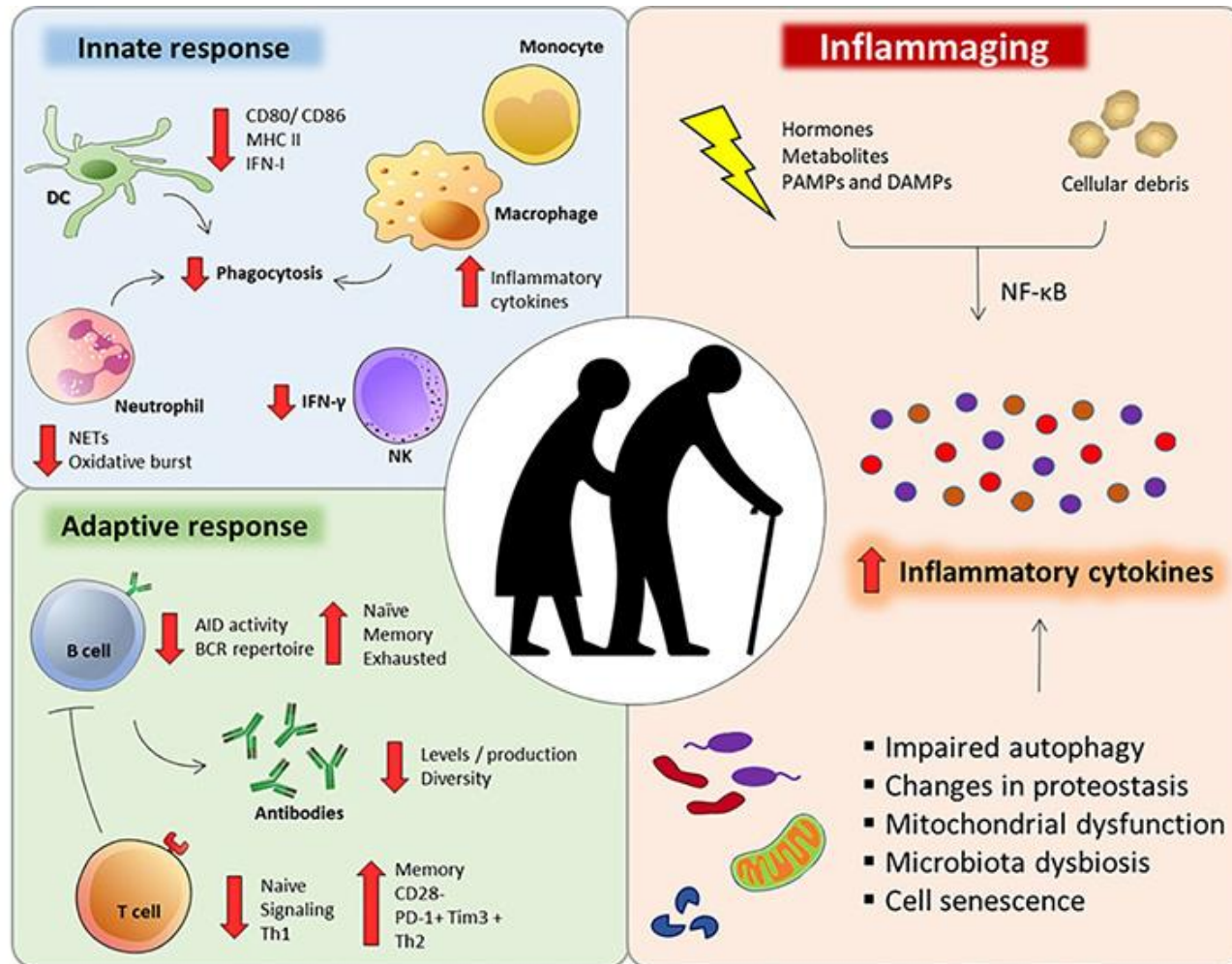
- Sick elderly people are a huge drain on resources
- Healthy aging is therefore a major public health priority





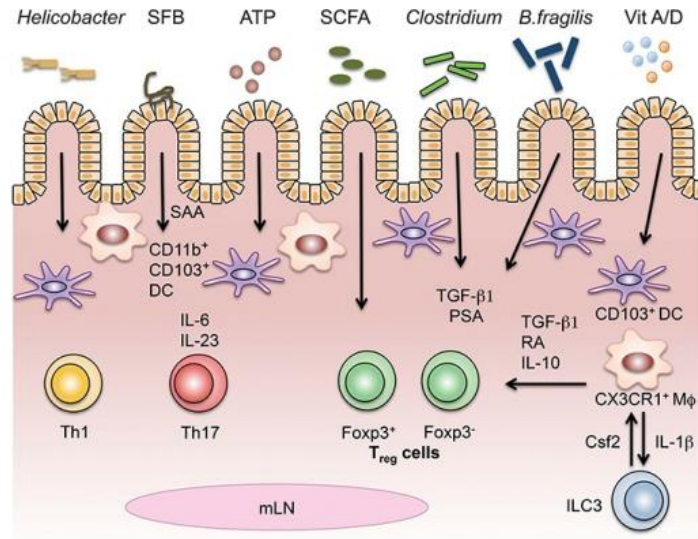
The number of people >60 years expected to double to >2 billion by 2050

Immunosenescence



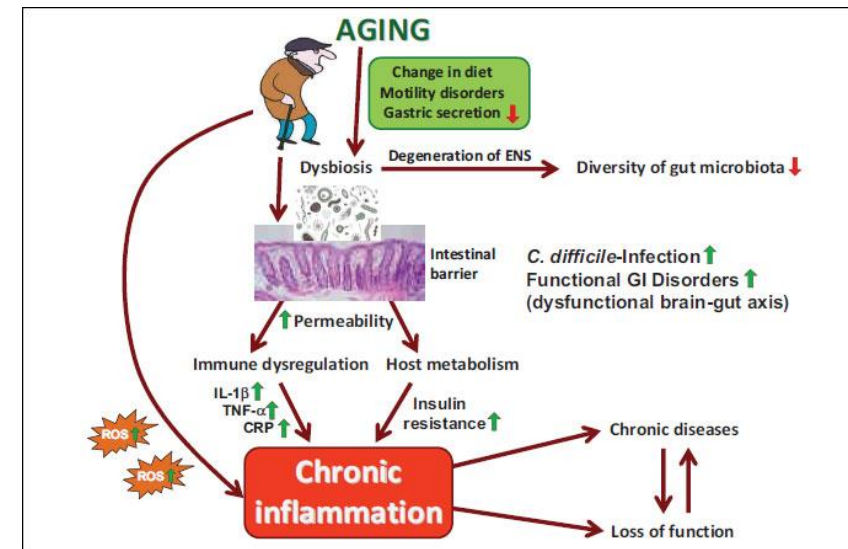
- Multiple arms of the immune system deteriorate with increasing age leading to suboptimal immune responses to infections and vaccination
- Inflammaging also occurs, characterised by enhanced immune activation, DNA damage, dysfunctional autophagy
- CMV infection probably contributes to inflammaging
- Inflammaging predicts frailty, cognitive impairment, mortality

The Role of the Gut Microbiota



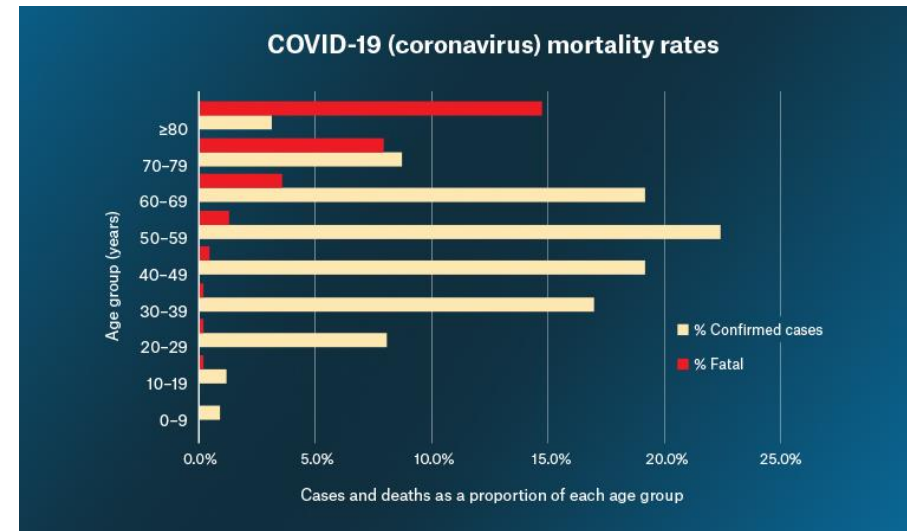
- Developing an abnormal microbiota is called **dysbiosis**
- Dysbiosis linked to systemic inflammation and many inflammatory diseases - IBD, autoimmune diseases, allergy, obesity, diabetes, anxiety, dementia
- Dysbiosis increases with age contributing to inflammaging

- The gut microbiota interact at multiple levels to influence both innate and adaptive immunity (locally and systemically)
- In particular there are high levels of regulatory factors to suppress inflammation

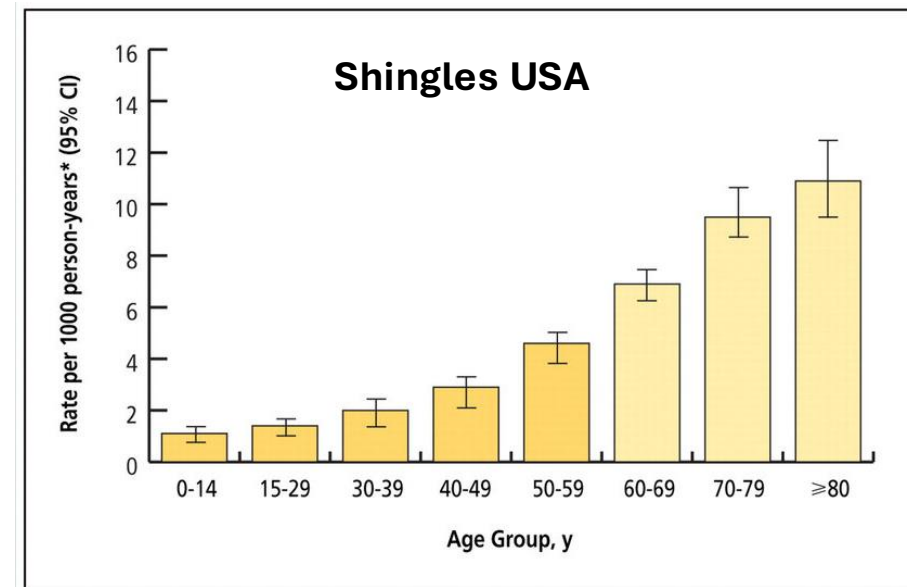


Impact of Immunosenescence

- Increased susceptibility to infections
- More severe, more complications, slower recovery from infections
- Prolonged hospital stay with infections
- Greater reactivation of latent / dormant infections (TB, shingles)
- Increased age-related diseases e.g. cardiovascular, neurodegenerative, metabolic
- Increased malignancies

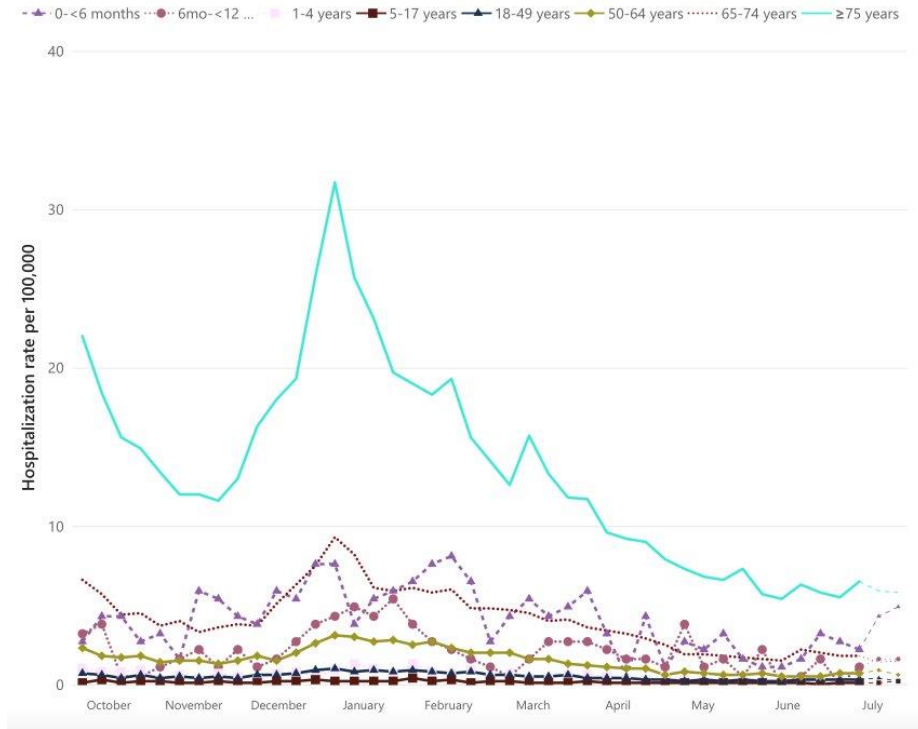


China CDC Weekly



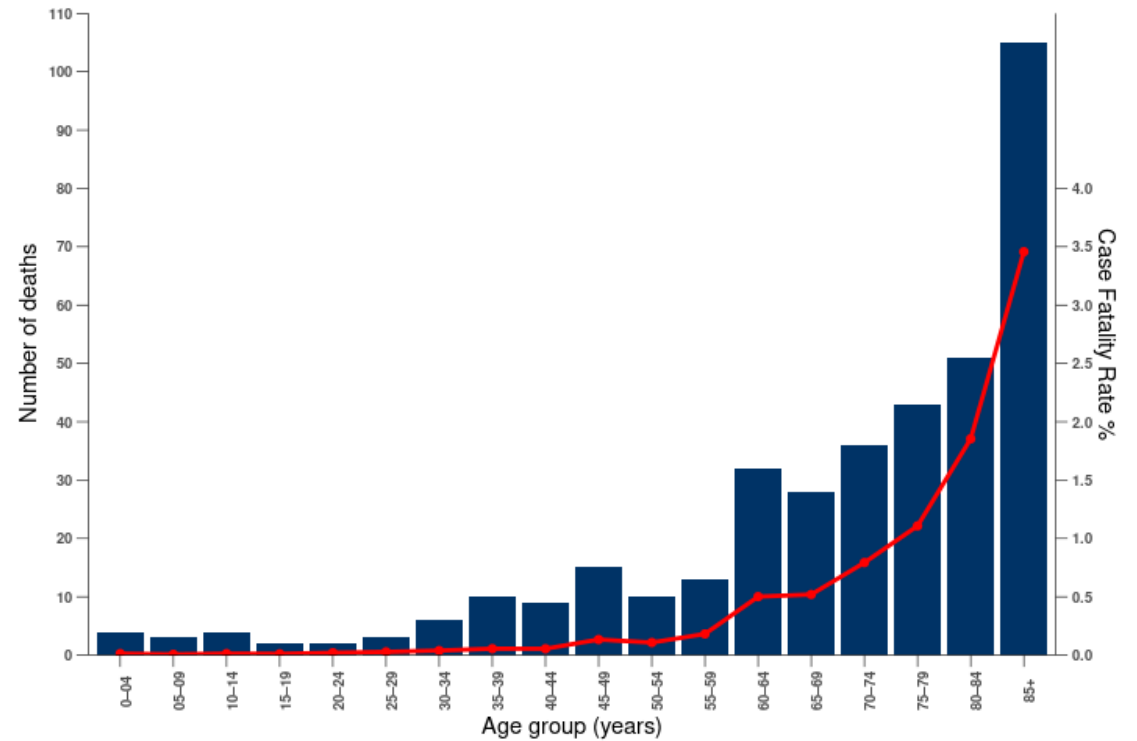
Weaver J Gen Intern Med 2009

COVID-19 Hospitalisation Rates (USA 2024-25)



COVID-NET Dashboard, CDC

Influenza-Associated Deaths by Age (Australia 2023)



NNDS 01 Jan to 15 Oct 2023

Vaccines Recommended for Older Adults

Australian Immunisation Guidelines

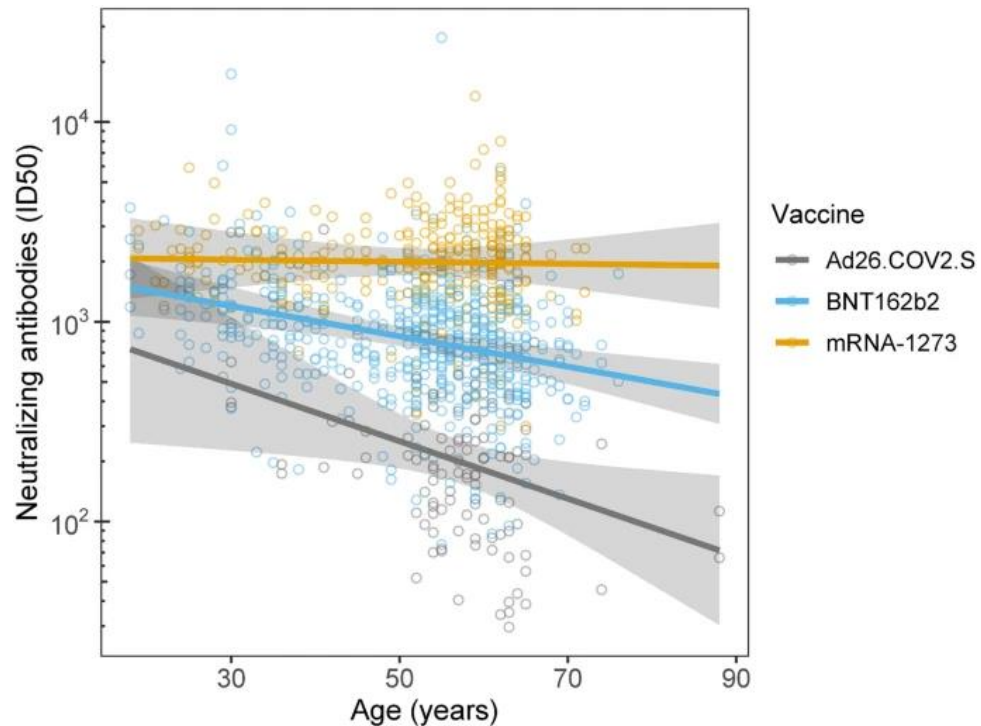
≥65 years	≥75 years
Influenza Vaccine * Annually	Pneumococcal Vaccine (PCV13) *
COVID-19 (every 12 months) #	COVID-19 (every 6 months) #
Varicella Zoster Vaccine (Shingrix) * 2 doses 2-6 months apart	
Tetanus/Pertussis (dT or dTpa) Booster every 10 years	

* Funded on the NIP, # Funded on the NCVP

NB Age recommendations differ for Aboriginal and Torres Strait Islanders

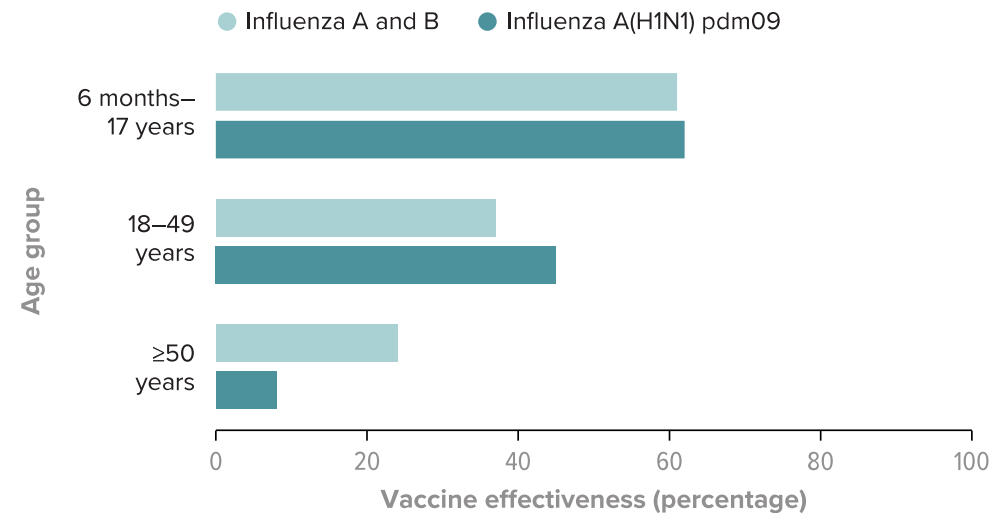
Vaccine Responses and Effectiveness Decline with Age

SARS-CoV-2 Responses



Prather et al. *Sci Reports* 2023; 13: 6505

Flu vaccine effectiveness varies by age group (2018–19 season)

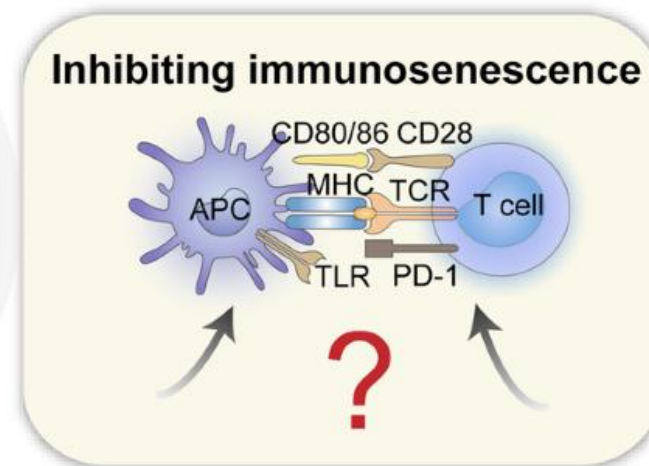
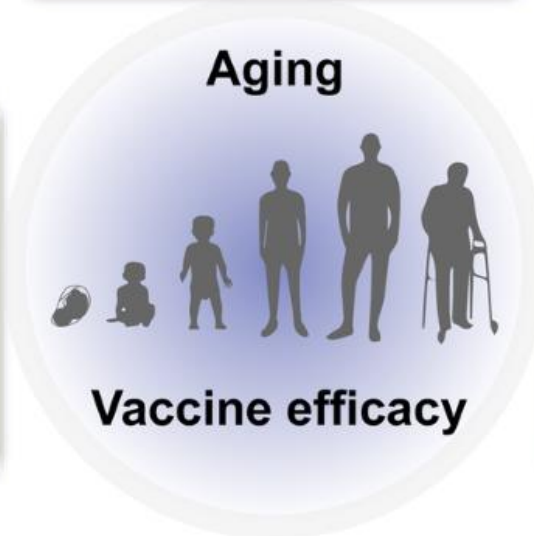
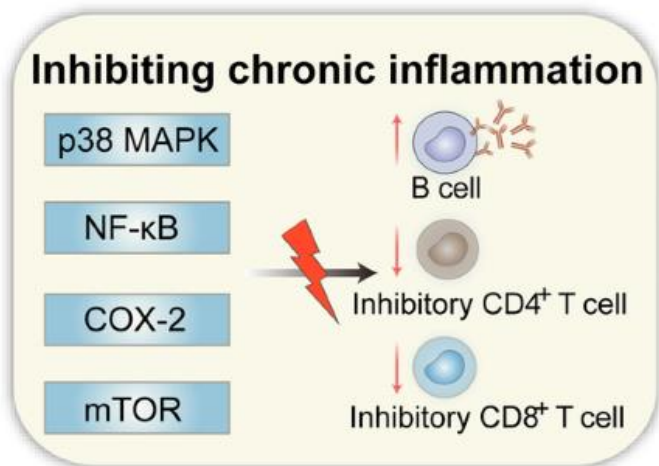
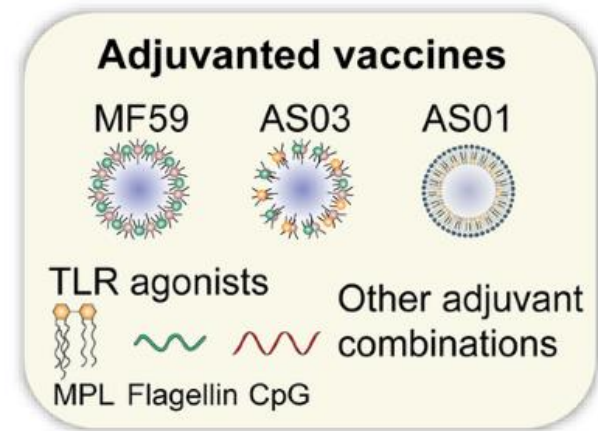
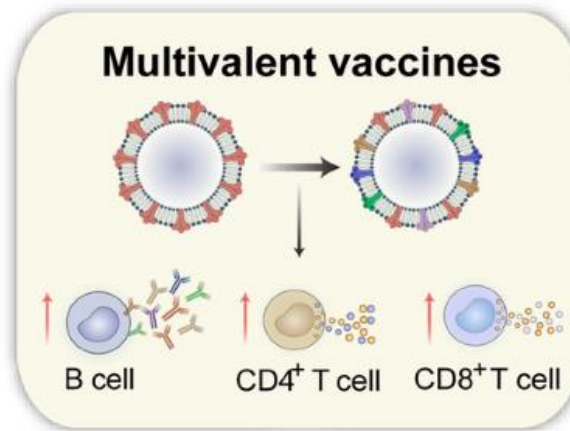
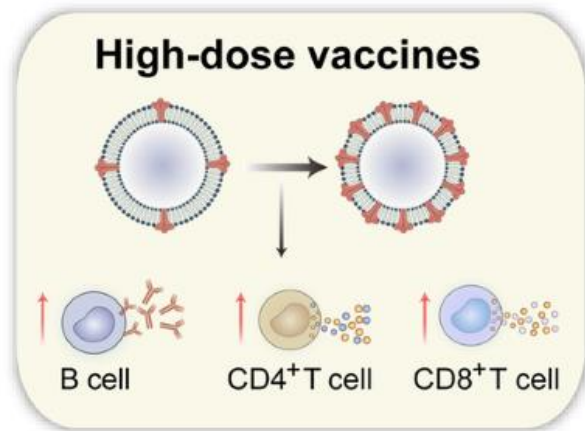


SOURCE: CDC.GOV

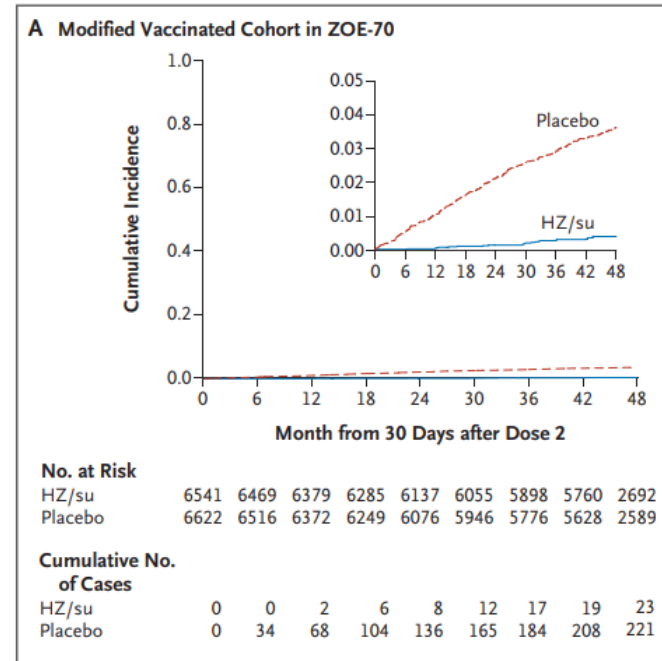
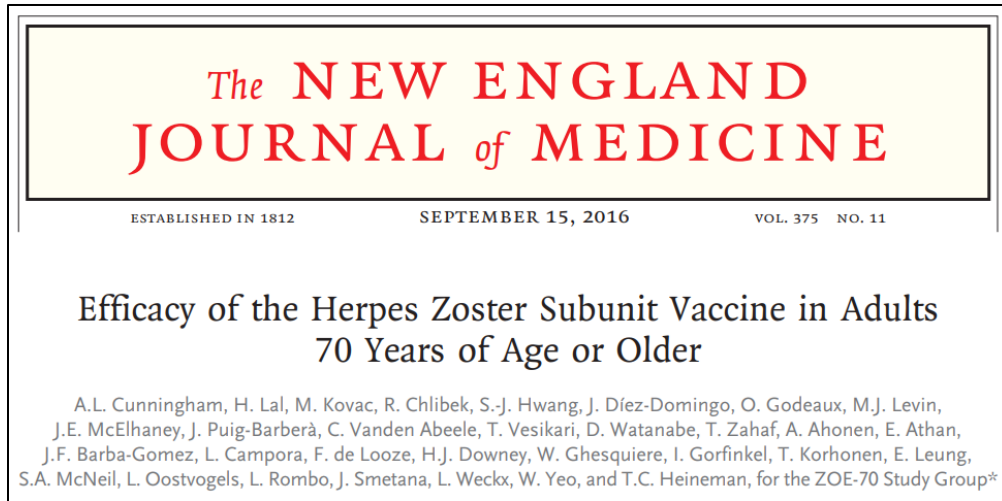
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Wosen 2020

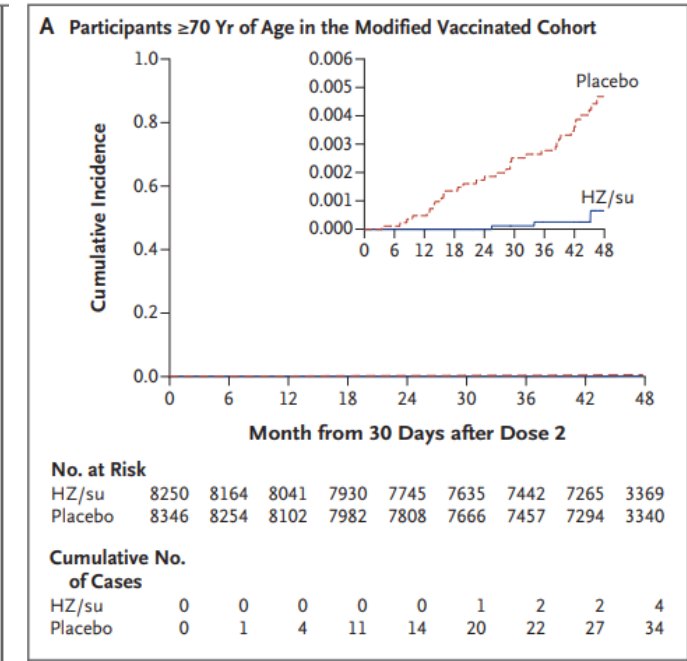
Overcoming Immunosenesescence



Efficacy of Shingrix at ≥ 70 years



HZV Infection



Post herpetic neuralgia

RCT in 18 countries of efficacy and safety in adults aged 50-59 yrs, 60-69 yrs and ≥ 70 yrs
 N = 15,411, 2 doses i.m. 2 months apart

Efficacy against HZV: 89.8% (95% CI 84.2-93.7)
 Efficacy against PHN: 88.8% (95% CI 68.7-97.1)

90% efficacy in 70-79 yrs and 89.1% in ≥ 80 yrs

ASO1 is a powerful adjuvant and likely contributes to the impressive protection in older individuals

Questions?

