

Potential future impacts of COVID-19

Singapore Actuarial Conference

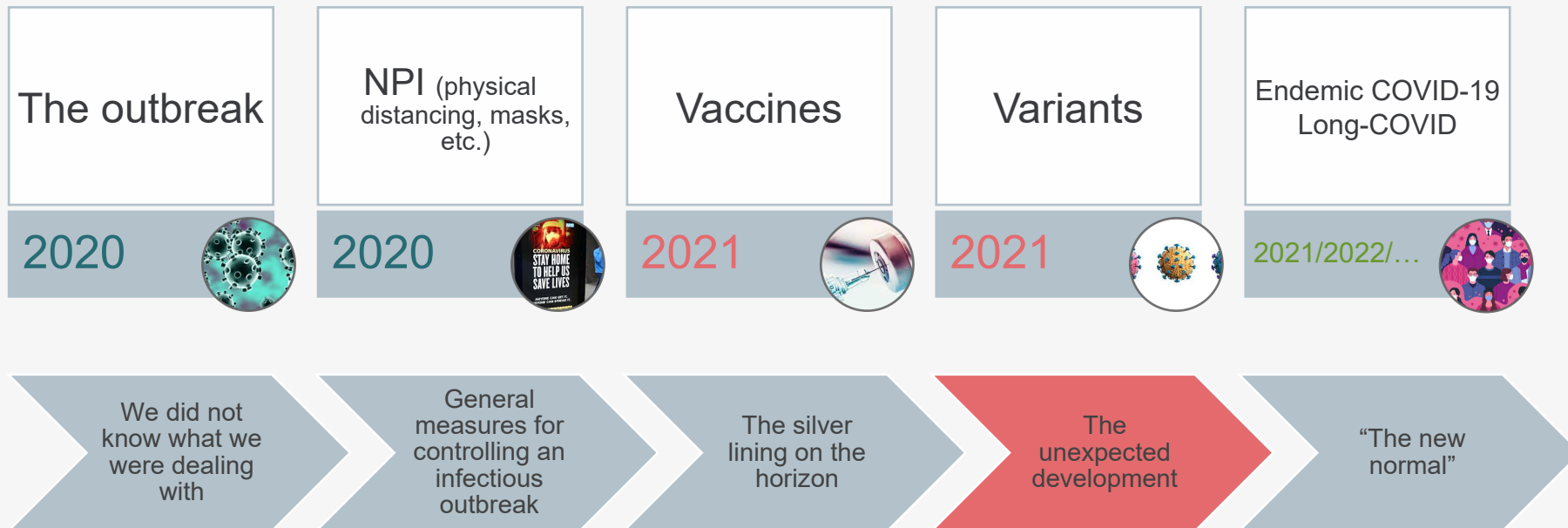
November 2021

Dr. Andreas Armuss

Chief Medical Officer
Asia Pacific, Middle East and Africa (Life and Health)

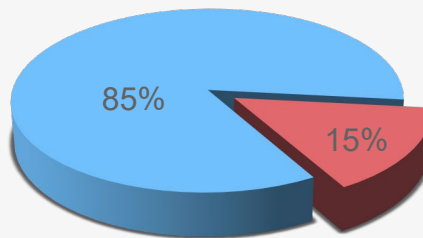


COVID-19: Timeline of events



Challenges since Delta has come into play

R_0 (basic reproductive rate) = 8



■ Vaccinated ■ Unvaccinated

Airborne transmission

Immune escape

Superspreading

Herd immunity is essentially impossible

Everyone will be infected at some point in time

Those without basic immunity (by vaccination or recovery) are still at increased risk of severe disease

Endemic COVID-19:

- Vaccination rates (+recovered) should be > 85%
- Natural (re)infection will occur for everyone at some point in time (“respiratory immune update”)
- Vaccine effectiveness monitoring is important

Vaccine effectiveness (UK and Singapore data)

PH England (week 46, 18th of Nov 21)

Outcome	Vaccine effectiveness*		
	Pfizer-BioNTech Comirnaty	AstraZeneca Vaxzevria	Moderna Spikevax
Infection	75-85%	60-70%	
Symptomatic disease	80-90%	65-75%	90-99%
Hospitalisation	95-99%	90-99%	95-99%
Mortality	90-99%	90-95%	

* Estimates of initial vaccine effectiveness in the general population after a 2 dose course. This typically applies for at least the first 3 to 4 months after vaccination.

For some outcomes there may be waning of effectiveness beyond 4-6 months after vaccination

Proportion (%) of cases who died in Singapore by age and vacc. status

Age	Unvaccinated	Partially Vaccinated	Fully Vaccinated
0-12	0.0	0.0	0.0
13-19	0.0	0.0	0.0
20-29	0.0	0.14	0.0
30-39	0.075	0.0	0.0
40-49	0.095	0.0	0.0044
50-59	0.67	0.85	0.034
60-69	3.4	1.6	0.20
70-79	7.8	6.3	0.57
80+	22	12	2.5
Total	1.3	1.6	0.12

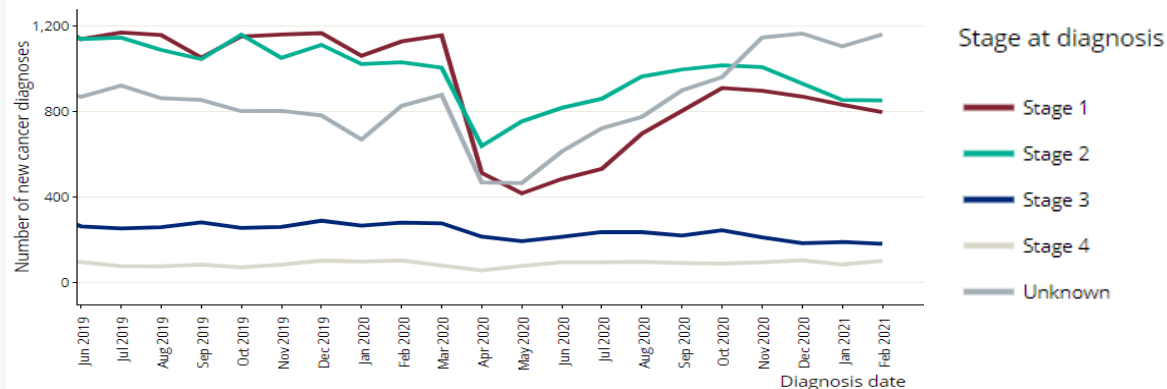
Vaccine effectiveness (mortality)

Group	Deaths	Person-Years	Deaths Per 10,000 Person-Years (95% CI)
Ages 18-64			
Fully Vaccinated	30	376,847	0.80 (0.54 – 1.14)
Unvaccinated	472	1,526,010	3.09 (2.82 – 3.39)
Ages 65-79			
Fully Vaccinated	88	211,189	4.17 (3.34 – 5.13)
Unvaccinated	1,015	156,728	64.76 (60.84 – 68.87)
Ages 80+			
Fully Vaccinated	118	84,343	13.99 (11.58 – 16.75)
Unvaccinated	1,597	38,013	420.12 (399.77 – 441.24)

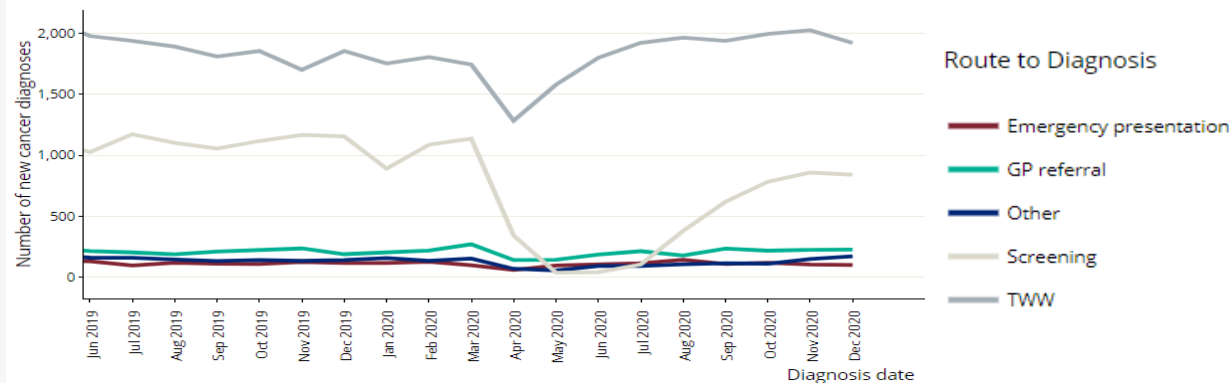
Death rates per 10,000 person-years for fully vaccinated and unvaccinated individuals in Scotland stratified by age group, December 29, 2020 to August 18, 2021

- Relevant parameters determining the impact of further waves:
 - Level of basic immunity (determined by vaccination + natural immunity)
 - Vaccination rates in insured population?
 - Waning immunity (against severe disease)
 - Less of a problem in younger and generally healthier individuals (insured population?)
 - Non-pharmaceutical interventions with low level of immunity
 - Future variants
 - Available new drugs

UK: COVID-19 rapid cancer registration and treatment data - Breast cancer-

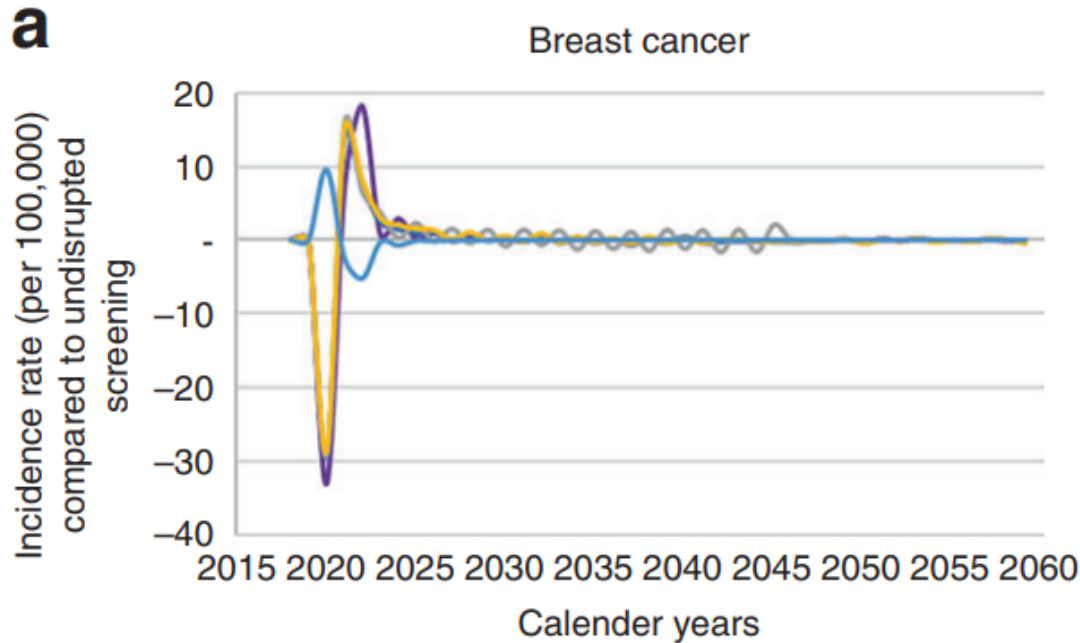


- Mainly early stage (Stage 1 and 2) breast cancers were missed
- Driven by reduced screening



Two-Week Wait (TWW) referral system introduced in 2000 (whereby patients being urgently referred for suspected cancer by their GP can expect to be seen by a specialist within 2 weeks)

Effects of cancer screening restart strategies after COVID-19 disruption



- Depending on restart strategy, an increase or a decrease of incidences can happen
- The resurgence did not exceed the amount of reduced incidence



- The (temporary) decrease in cancer diagnoses(incidence) is based mostly on reduced screening activity during containment measures
 - Therefore mainly earlier stage cancer incidences (temporarily) declined
- Modelling of impact of reduced screening shows that resurgence of cancer diagnoses will depend on the mode of screening restart
- The expected resurgence does not seem to exceed the reduced incidence during COVID-19 restrictions, but there will be an offset to missed incidence
- A complete offset of the decreased myocardial infarction incidence during COVID-19 restrictions over the next few years is unlikely

- Latest data from the UK indicates:
 - Decreasing trend in symptom prevalence over time (6 months)
 - When controlled with non-COVID patients, neuropsychologic symptoms (fatigue, brain fog, etc.) were lower than previously estimated
 - Vaccines seem to have a positive impact on the course of long-COVID, but difficult to quantify
- It is not clear yet how this relates to a possible impact on long-term DI:
 - Unknown medicalization impact
 - Even longer-term data (beyond 6-12 months) is not available yet

Thanks for your attention !!

Questions??