



和睦家医疗
United Family Healthcare

Covid-19 Vaccines

Helen Zhang

Director of Pharmacy

Immunization Network Leader

United Family Healthcare

2021-2-9



和睦家医疗
United Family Healthcare

Part 1: Background about Covid 19 vaccines

Part 2: What we should expect

和睦家医疗

United Family Healthcare

VACCINE DEVELOPMENT at PANDEMIC speed

传统疫苗 - 3到8年
新冠疫苗 - 3-6个月



制备疫苗+动物实验

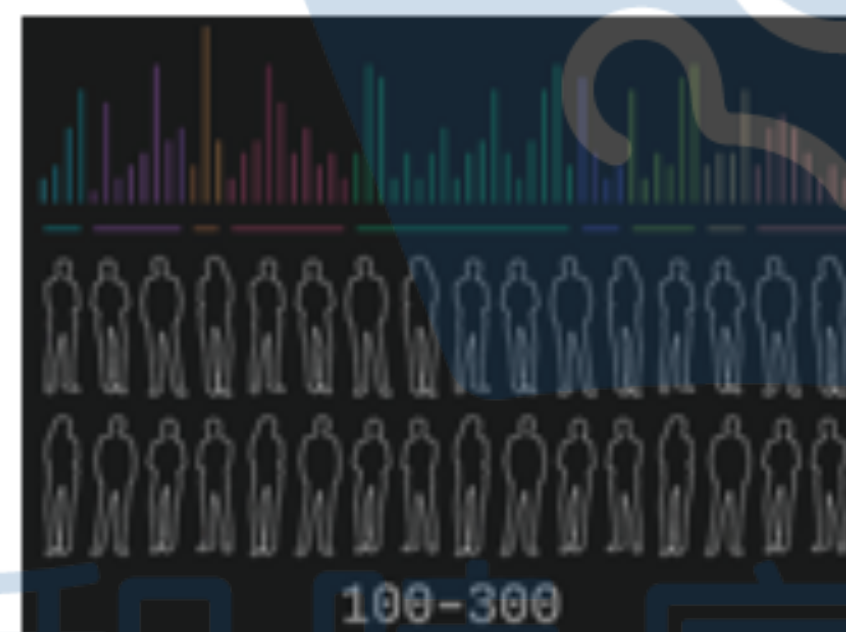
传统疫苗 - 1到2年
新冠疫苗 - 3个月



I期临床试验

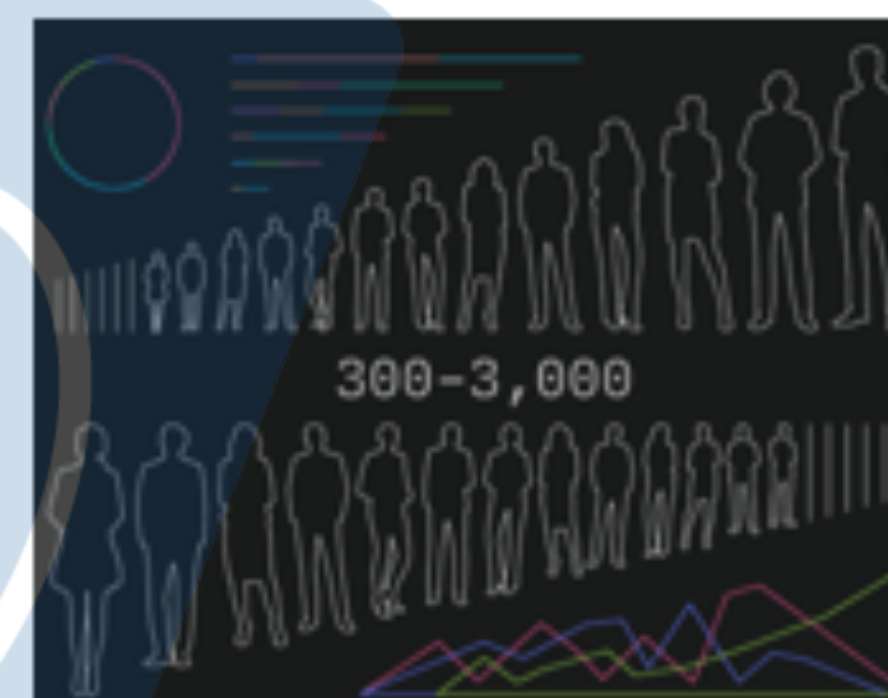
Pre-clinical

传统疫苗 - 2到3年
新冠疫苗 - 8个月



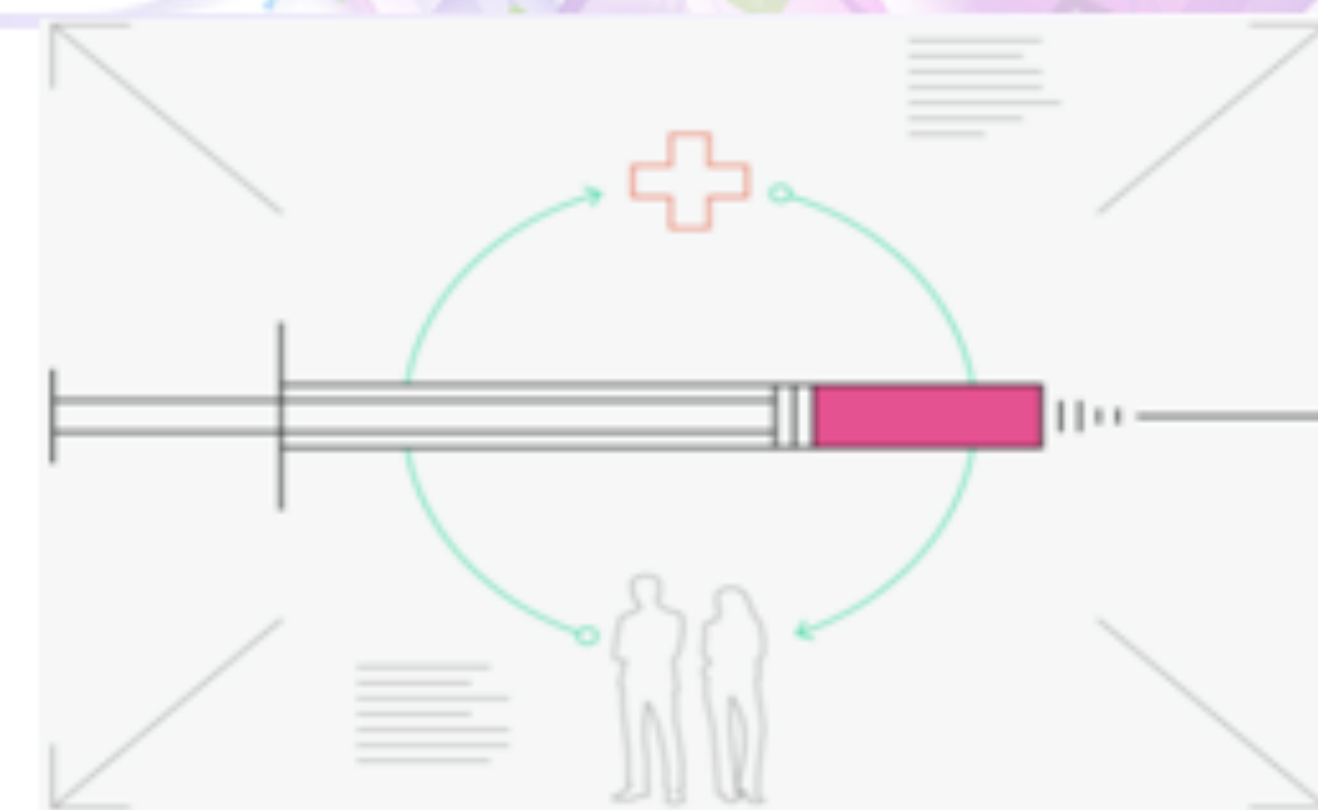
II期临床试验

传统疫苗 - 2到4年
新冠疫苗 - 可能与II期合并



III期临床试验

传统疫苗 - 1到2年
新冠疫苗 - 2个月



审核→生产→流通→接种

Regulatory- Manufacturing—
Transporting –Administering

1. Emergency Use Authorization
2. Conditional Approval
3. Post-Marketing Surveillance

WHO data as of Feb 5, 2021



和睦家医疗
United Family Healthcare

1. - Number of vaccines in clinical development

63

2. - Number of vaccines in pre-clinical development

177

3. - Candidates in clinical phase

Filter

All

Select phase of development (default is)

Platform		Candidate vaccines (no. and %)	
PS	Protein subunit	20	32%
VVnr	Viral Vector (non-replicating)	10	16%
DNA	DNA	8	13%
IV	Inactivated Virus	9	14%
RNA	RNA	7	11%
VVr	Viral Vector (replicating)	3	5%
VLP	Virus Like Particle	2	3%
VVr + APC	VVr + Antigen Presenting Cell	2	3%
LAV	Live Attenuated Virus	1	2%
VVnr + APC	VVnr + Antigen Presenting Cell	1	2%

63



World Health
Organization

Vaccines currently in phase 3 - China is leading



United Family
Healthcare

ID	Vaccine platform acronym	Vaccine platform description	Type of candidate vaccine	Number of doses	Dosing schedule	Route of administration	Developers	Phase
1	IV	Inactivated virus	SARS-CoV-2 vaccine (inactivated)	2	Day 0 + 14	IM	Sinovac Research and Development Co., Ltd	Phase 3
2	IV	Inactivated virus	Inactivated SARS-CoV-2 vaccine (Vero cell)	2	Day 0 + 21	IM	Sinopharm + China National Biotech Group Co + Wuhan Institute of Biological Products	Phase 3
3	IV	Inactivated virus	Inactivated SARS-CoV-2 vaccine (Vero cell)	2	Day 0 + 21	IM	Sinopharm + China National Biotech Group Co + Beijing Institute of Biological Products	Phase 3
4	VVnr	Viral vector (Non-replicating)	ChAdOx1-S - (AZD1222) (Covishield)	1-2	Day 0 + 28	IM	AstraZeneca + University of Oxford	Phase 3
5	VVnr	Viral vector (Non-replicating)	Recombinant novel coronavirus vaccine (Adenovirus type 5 vector)	1	Day 0	IM	CanSino Biological Inc./Beijing Institute of Biotechnology	Phase 3
6	VVnr	Viral vector (Non-replicating)	Gam-COVID-Vac Adeno-based (rAd26-S+rAd5-S)	2	Day 0 + 21	IM	Gamaleya Research Institute ; Health Ministry of the Russian Federation	Phase 3
7	VVnr	Viral vector (Non-replicating)	Ad26.COV2.S	1-2	Day 0 or Day 0 + 5	IM	Janssen Pharmaceutical	Phase 3
8	PS	Protein subunit	SARS-CoV-2 rS/Matrix M1-Adjuvant (Full length recombinant SARS CoV-2 glycoprotein nanoparticle vaccine	2	Day 0 + 21	IM	Novavax	Phase 3
9	RNA	RNA based vaccine	mRNA -1273	2	Day 0 + 28	IM	Moderna + National Institute of Allergy and Infectious Diseases (NIAID)	Phase 3
10	RNA	RNA based vaccine	BNT162 (3 LNP-mRNAs)	2	Day 0 + 21	IM	Pfizer/BioNTech + Fosun Pharma	Phase 3
11	PS	Protein subunit	Recombinant SARS-CoV-2 vaccine (CHO Cell)	2-3	Day 0 + 28 or Day 0 + 28 + 56	IM	Anhui Zhifei Longcom Biopharmaceutical + Institute of Microbiology, Chinese Academy	Phase 3
12	RNA	RNA based vaccine	CVnCoV Vaccine	2	Day 0 + 28	IM	CureVac AG	Phase 3
13	IV	Inactivated virus	SARS-CoV-2 vaccine (vero cells)	2	Day 0 + 28	IM	Institute of Medical Biology + Chinese Academy of Medical Sciences	Phase 3
14	IV	Inactivated virus	QazCovid-in® - COVID-19 inactivated vaccine	2	Day 0 + 21	IM	Research Institute for Biological Safety Problems, Rep of Kazakhstan	Phase 3
17	DNA	DNA based vaccine	nCov vaccine	3	Day 0 + 28 + 56	ID	Zydus Cadila	Phase 3
19	IV	Inactivated virus	Whole-Virion Inactivated SARS-CoV-2 vaccine (BBV152)	2	Day 0 + 14	IM	Bharat Biotech International Limited	Phase 3

Summary

Clinical

Pre-Clinical



Major Game Players – up till today



和睦家医疗
United Family Healthcare

Technology 技术	Manufacturer 厂家	Safety 安全性	Immunity 免疫源性	Production 产能	Status 现况*
Inactivated Virus 减毒疫苗	Sinopharm CNBG /Sinovac 国药北生研, 武汉所, 科兴	++ Depend on adjuvant 佐剂	++ Need booster 需加强	++ Need to cultivate in cells 体外细胞培养	Approved in China 在国内 附条件获批
mRNA 基因疫苗	Pfizer-BioNT Moderna 辉瑞, 莫德纳	++++ No viral particles 没有病毒成分	+++ Cell + humoral 体液和细胞免疫	+++ For variant	EUA 紧急使用 in USA
Viral vectored 病毒载体疫苗 腺病毒	AZ+Univ of Oxford Cansino, Janssen 阿斯利康+牛津大学, 康希诺, 强生	+++	+++ Strong immunity 强烈免疫反应	++	EUA 紧急使用 in EU/USA
Protein subunit 蛋白质亚单位	Novavax/Sanofi-GSK/Anhui 诺瓦瓦克斯、赛诺菲和葛兰素史克/ 安徽	+++	++	+++	Phase 3 三期

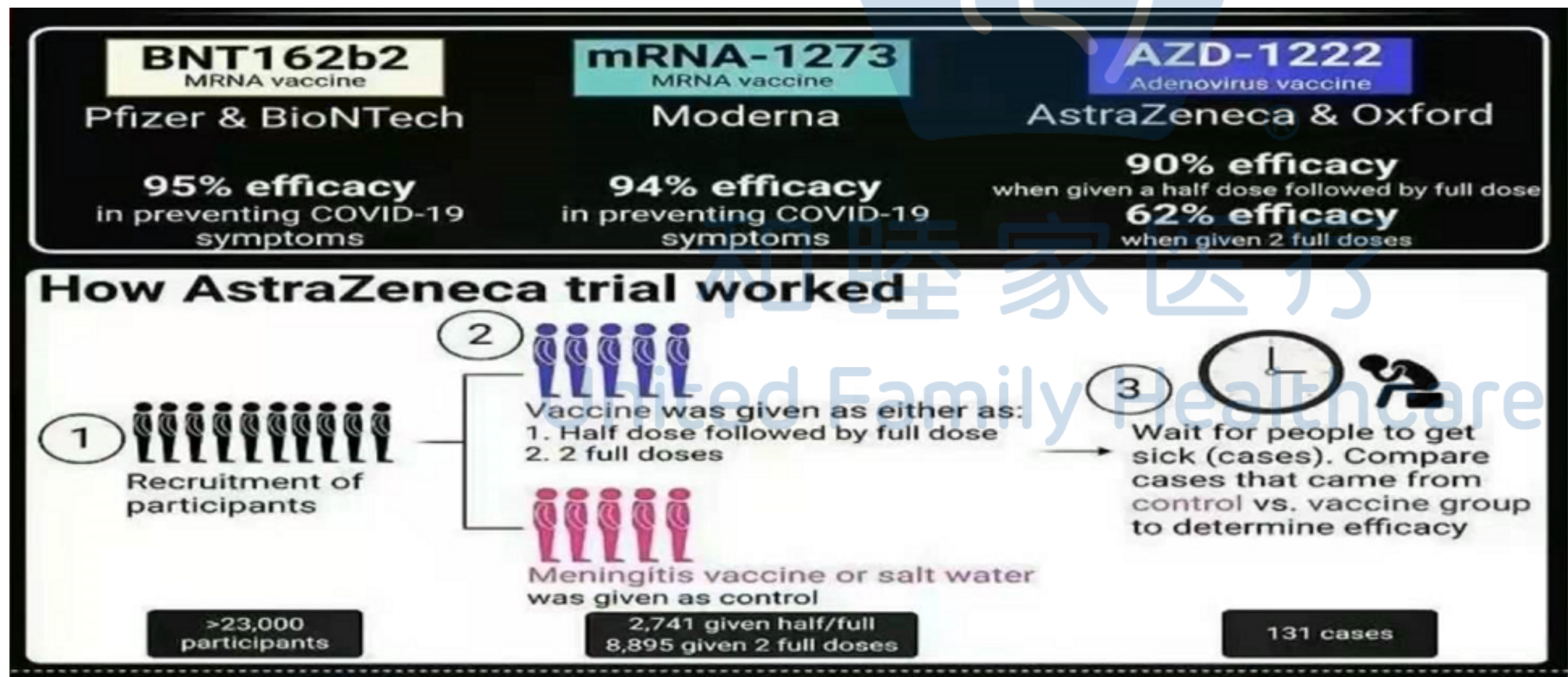
Janssen/Cansino: 1 dose needed:
Dosing Advantage

* As of Feb 8, 2021

How to measure Vaccine efficacy in real world: Phase 3 trial

% of reduction of disease =

Attack rate of non-vaccinated (placebo) – Attack rate of vaccinated
Attack rate of non-vaccinated (placebo)



*WHO target > 50%,
with lower bound of
95% CI at 30%

Currently, the two brands being approved
and widely used in China
Inactivated, Vero cell



克尔来福
CoronaVac™
新型冠状病毒灭活疫苗

SINO-VAC

CoronaVac
SARS-CoV-2 Vaccine (Vero Cell), Inactivated

[STRENGTH] Each prepackage contains 0.5 mL liquid. Single-dose of 0.5 mL contains 6000VU antigen of SARS-CoV-2.
[COMPOSITION AND DESCRIPTION] The vaccine contains inactivated SARS-CoV-2 virus antigen, aluminum hydroxide, sodium dihydrogen phosphate, disodium hydrogen phosphate, sodium chloride. No preservative in this product.
Description: The vaccine is the milky suspension.

0.5 mL/syringe

Wearing a Smile
without a Mask.

Being Close
without Distance.

北京科兴中维生物技术有限公司
SINO-VAC LIFE SCIENCES CO., LTD.

FOSUN PHARMA
复星医药

INNOVATION FOR GOOD HEALTH

持续创新 乐享健康

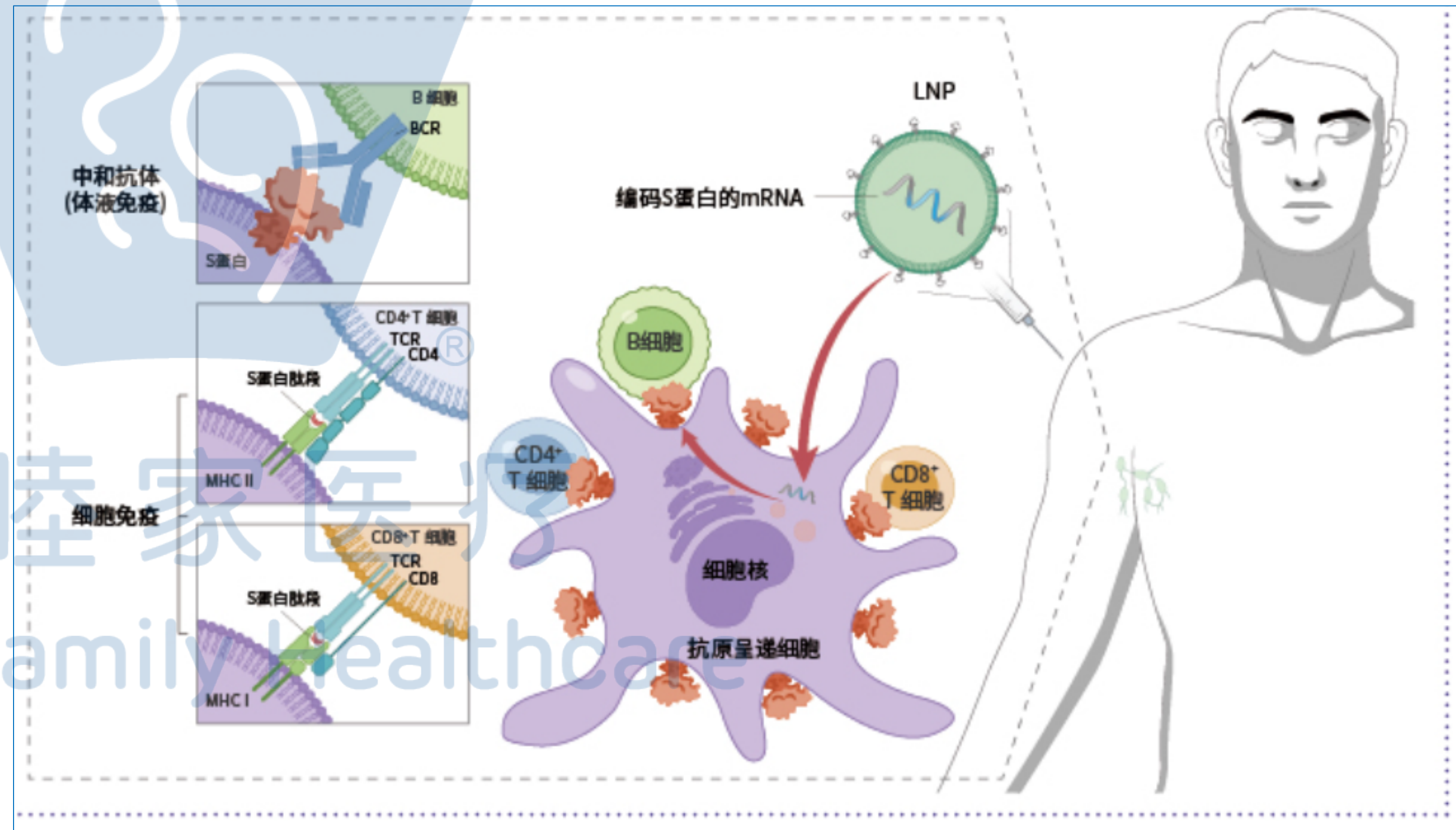
复星新冠疫苗

[复必泰]

FOSUN PHARMA | BIONTECH

与全球领先公司合作开发新冠疫苗

Fosun mRNA vaccine – will start in HK,
expect to gain CFDA conditional approval
soon in China





和睦家医疗
United Family Healthcare

Part 2

What we should expect

和睦家医疗

United Family Healthcare

Ideal vaccine	Current situation	Comments
Safe	Local/systemic reactions similar to flu vaccine	Over 40 million doses in China
Effective	Data promising phase 1/2 + overseas phase 3	
Easy dosing	Need 2 doses, 14-28d apart	
Long Lasting Immunity	Pending, expected > 6 mos	
Cost	Government paying	
Special population	Elderly, children, pregnancy excluded for now	18-59 yo healthy adults
Ease for administration	IM, regular cold chain	Fosun need superlow temp transport
Choose for brand	No choice for now, only Inactivated virus vaccine	Fosun submit application to CFDA, maybe in March 2021



和睦家医疗
United Family Healthcare

Need to know (FOR BEIJING market):

1. Vaccination for general public will start after CNY
2. 18-59 years old, Chinese citizens only for now
3. Delay for uncontrollable hypertension, diabetes and thyroid diseases,
4. Pregnant, breast feeding, fever: delay for now
5. Exclude: Cancer, Neurologic disease, severe allergies
6. 28 day between other vaccines (eg. Flu and HPV), and IVIG



Herd Immunity: enough people with protection to stop virus from Spreading out of control



和睦家医疗
United Family Healthcare



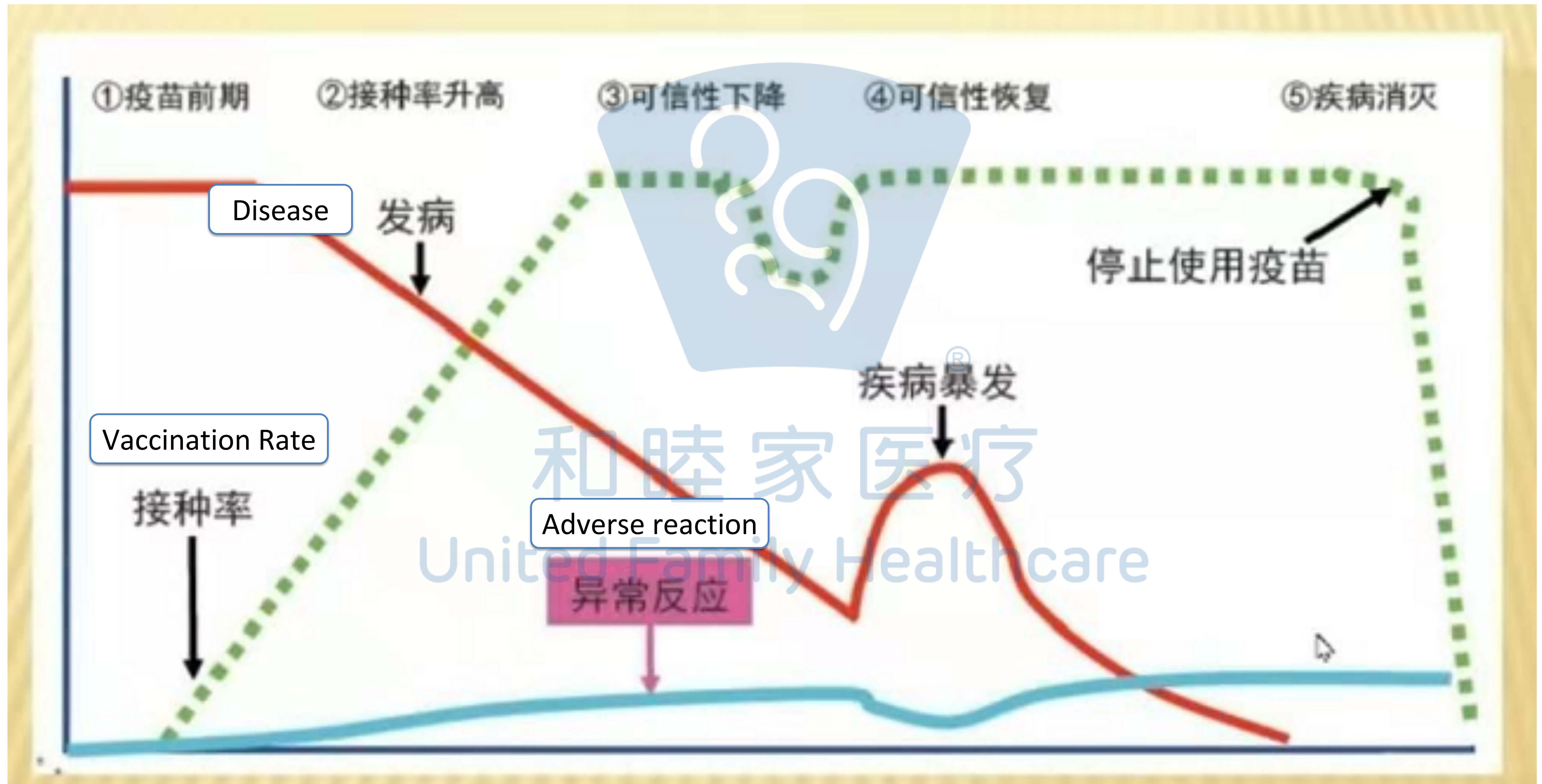
A vaccine protects an individual

Community vaccination protects the whole community, even those who can't vaccinate.

- In US, Public health officials estimate that 70 to 75 percent of the population needs to be vaccinated before people can start moving freely in society again

Vaccine Preventable Communicable Disease Cycle

1. Before vaccine 2. Increasing vaccination rate 3. Credibility decline 4. Credibility resume 5. Disease eliminated – stop vaccine



Ever changing data – Covid 19 vaccine – global pandemic speed



和睦家医疗
United Family Healthcare

Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine (CoronaVac) in healthy adults aged 60 years and older: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial [®]



Zhiwei Wu*, Yaling Hu*, Miao Xu*, Zhen Chen*, Wanqi Yang, Zhiwei Jiang, Minjie Li, Hui Jin, Guoliang Cui, Panpan Chen, Lei Wang, Guoqing Zhao, Yuzhu Ding, Yuliang Zhao†, Weidong Yin†

Summary

Background A vaccine against COVID-19 is urgently needed for older adults, in whom morbidity and mortality due to the disease are increased. We aimed to assess the safety, tolerability, and immunogenicity of a candidate COVID-19 vaccine, CoronaVac, containing inactivated SARS-CoV-2, in adults aged 60 years and older.

Lancet Infect Dis 2021

Published Online

February 3, 2021



和睦家医疗
United Family Healthcare

Thank you

Happy Chinese New Year

和睦家医疗

United Family Healthcare