新型冠状病毒信息简报

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上海科技大学免疫化学研究所

生物医学大数据平台和高通量筛选平台领衔编译制作

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内容介绍

免责申明：

本简报仅作为科研参考之用，不构成医疗建议，如您怀疑自己感染新型冠状病毒，请去正规医院或者咨询医生。

1. 2021 年 4 月 1 日疫情

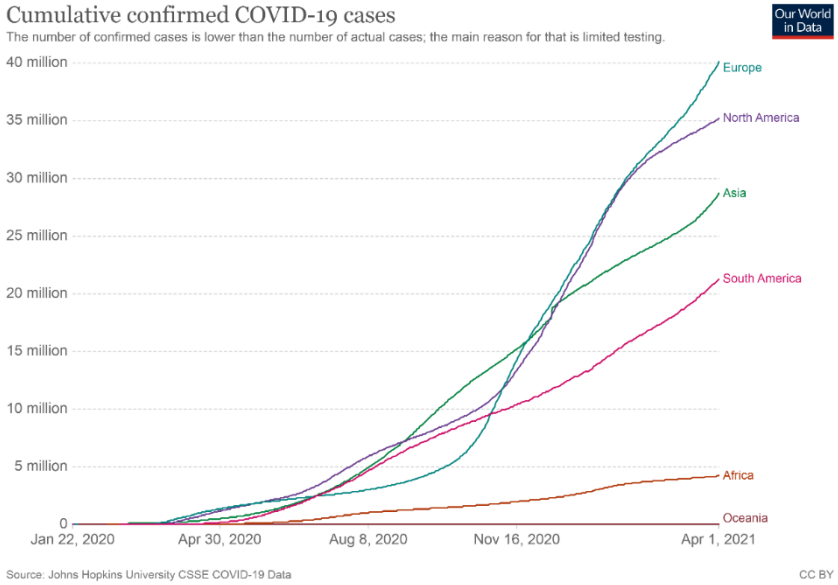
数据来源：WHO

发布时间：2021 年 4 月 1 日北京时间下午 4 点

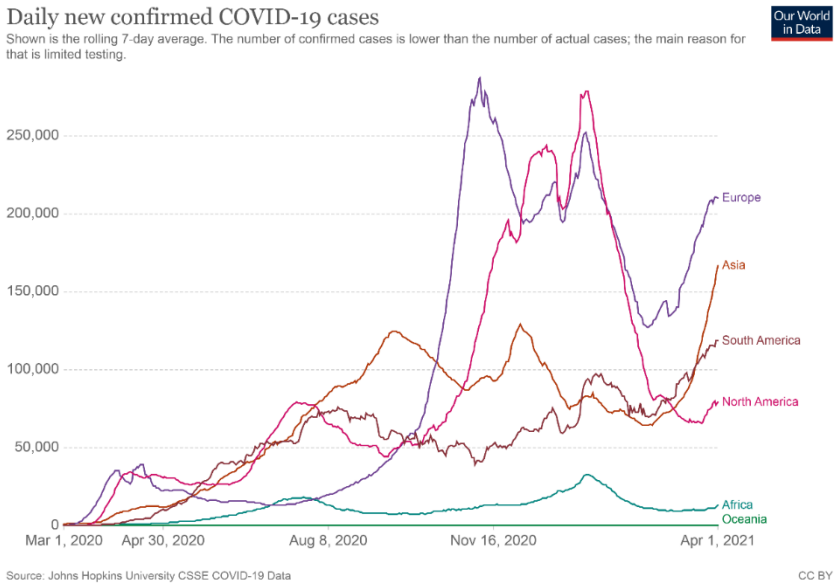
链接：https://covid19.who.int/

根据 WHO 提供的数据，2021 年 4 月 1 日全球累计确诊新型冠状病毒病人 128,540,982 例，当日新增确诊 650,765 例，累计死亡 2,808,308 例，当日新增死亡 11,608。

中国累计确诊 102,762 例，累计死亡 4,851 例，当日新增确诊 28 例，新增死亡 0 例。



重点国家确诊数量曲线（https://ourworldindata.org/covid-cases?country=~OWID_WRL#what-is-the-daily-number-of-confirmed-cases）



重点国家每日新增确诊数量曲线（https://ourworldindata.org/covid-cases?country=~OWID_WRL#what-is-the-daily-number-of-confirmed-cases）

全国新型冠状病毒肺炎新增确诊病例分布图（2021 年 4 月 1 日，来源：http://2019ncov.chinacdc.cn/2019-nCoV/）

2. 云南瑞丽：新增确诊病例 6 例、无症状感染者 23 例

来源：新华社

发布时间：2021-04-01

链接：https://mp.weixin.qq.com/s/Ywyylb05eGhb6886-SMVXA

编译者：宋张悦

中文摘要：

3 月 31 日 0 时至 24 时，我省新增确诊病例 6 例，新增无症状感染者 23 例，均在瑞丽市。

截至 3 月 30 日 24 时，我省现有确诊病例 15 例，无症状感染者 45 例，均在定点医疗机构隔离治疗和医学观察。

2021 年 3 月 31 日凌晨起，瑞丽市开展全员核酸检测，发现 29 人核酸检测结果阳性，用负压救护车转运至定点医疗机构。31 日结合流行病学史、临床表现和实验室检测结果，诊断为新冠肺炎确诊病例 6 例、新冠肺炎无症状感染者 23 例。全员核酸检测、流调等工作仍在紧张进行中。

3. 一项关于非洲 COVID-19 第一波和第二波大流行的横断面研究

The first and second waves of the COVID-19 pandemic in Africa: a cross-sectional study

来源：The Lancet

发布时间：2021-03-24

链接：https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00632-2/fulltext

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编译者：宋张悦
中文摘要：
背景 尽管第一波 COVID-19 大流行在非洲的进展比世界其他地区要慢，但到 2020 年 12 月，第二波似乎更具侵略性，出现了更多病例。迄今为止，尚未全面核查非洲联盟所有 55 个成员国的大流行病形势。我们的目的是评估报告的 COVID-19 流行病学数据，以更好地了解大流行在非洲的进展。

方法 我们利用非盟成员国报告的 COVID-19 流行病学、检测和缓解策略数据，在 2020 年 2 月 14 日至 12 月 31 日期间进行了横断面分析，以评估趋势，确定国家、区域和大洲各级的应对和缓解努力。我们对相关变量进行了描述性分析，包括累积和每周发病率、病死率(CFRs)、每例检测率、增长率以及公共卫生和社会措施。

发现 截至 2020 年 12 月 31 日，非洲国家报告了 2763421 例 COVID-19 病例，65602 例死亡，占全球报告的 823150 例病例的 3.4%，占 17994 例死亡的 3.6%。55 个国家中的 9 个国家占报告病例的 82.6%(2 283 613)以上。18 个国家报告的病死率高于全球病死率(2.2%)。17 个国家报告的每例检测次数低于建议的每例 10 至 30 次检测次数范围。在 2020 年 7 月非洲第一波疫情高峰时，日均新增病例数为 18273 例。截至 2020 年 12 月 31 日，40 个(73%)国家已经或正在经历第二波病例，非洲大陆在流行病学周第 53 周平均每天报告 23 790 例新病例。截至 2020 年 4 月 15 日，50 个会员国中有 48 个(96%)采取了 5 项或以上严格的公共卫生和社会措施，但截至 2020 年 12 月 31 日，这一数字已降至 36(72%)，尽管前一个月病例有所增加。

解释 我们的分析显示，非洲大陆的 COVID-19 大流行第二波比第一波更为严重，并强调了长期以来在区域和国家层面上检查多个流行病学变量的重要性。这些具体国家和区域的成果为执行全大陆的倡议提供了信息，并支持公平分配供应品和技术援助。随着时间的推移，监测和分析这些数据对于持续了解形势至关重要，特别是在非盟成员国试图在控制 COVID-19 传播与确保经济和生计稳定之间取得平衡之际。

Abstract:

Background Although the first wave of the COVID-19 pandemic progressed more slowly in Africa than the rest of the world, by December, 2020, the second wave appeared to be much more aggressive with many more cases. To date, the pandemic situation in all 55 African Union (AU) Member States has not been comprehensively reviewed. We aimed to evaluate reported COVID-19 epidemiology data to better understand the pandemic's progression in Africa.

Methods We did a cross-sectional analysis between Feb 14 and Dec 31, 2020, using COVID-19 epidemiological, testing, and mitigation strategy data reported by AU Member States to assess trends and identify the response and mitigation efforts at the country, regional, and continent levels. We did descriptive analyses on the variables of interest including cumulative and weekly incidence rates, case fatality ratios (CFRs), tests per case ratios, growth rates, and public health and social measures in place.

Findings As of Dec 31, 2020, African countries had reported 2 763 421 COVID-19 cases and 65 602 deaths, accounting for 3·4% of the 82 312 150 cases and 3·6% of the 1 798 994 deaths reported globally. Nine of the 55 countries accounted for more than 82·6% (2 283 613) of reported cases. 18 countries reported CFRs

greater than the global CFR (2·2%). 17 countries reported test per case ratios less than the recommended ten to 30 tests per case ratio range. At the peak of the first wave in Africa in July, 2020, the mean daily number of new cases was 18 273. As of Dec 31, 2020, 40 (73%) countries had experienced or were experiencing their second wave of cases with the continent reporting a mean of 23 790 daily new cases for epidemiological week 53. 48 (96%) of 50 Member States had five or more stringent public health and social measures in place by April 15, 2020, but this number had decreased to 36 (72%) as of Dec 31, 2020, despite an increase in cases in the preceding month.

Interpretation Our analysis showed that the African continent had a more severe second wave of the COVID-19 pandemic than the first, and highlights the importance of examining multiple epidemiological variables down to the regional and country levels over time. These country-specific and regional results informed the implementation of continent-wide initiatives and supported equitable distribution of supplies and technical assistance. Monitoring and analysis of these data over time are essential for continued situational awareness, especially as Member States attempt to balance controlling COVID-19 transmission with ensuring stable economies and livelihoods.

4. 世卫组织关于 COVID-19 溯源的报告倾向于野生动物的传播

WHO Report on COVID-19 Origin Focuses on Spread from Wild Animals

来源：BioSpace

发布时间：2021-03-29

链接：https://www.biospace.com/article/who-wild-animals-likely-source-of-covid-19-virus/

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中文摘要：

世界卫生组织（WHO）的一份报告草案指出，COVID-19 的源头很可能是野生动物，可能是蝙蝠。该报告主要基于世卫组织的一个国际专家小组于 1 月中旬至 2 月中旬对中国武汉进行的访问研究。该报告按可能性顺序列出了四种情况，有可能至非常有可能的（likely to very likely）是蝙蝠通过另一种动物传播。蝙蝠直接传播给人类被列为可能（possible）。通过冷链食品传播是可能的，但可能性不大（possible but not likely）。这四种情况还包括实验室可能发生的泄漏，该报告指出，这种情况极不可能发生（extremely unlikely）。

Abstract:

A draft report by the World Health Organization (WHO) indicates that the source of COVID-19 is most likely from wild animals, probably bats. The report was based primarily on a visit by a WHO team of international experts to Wuhan, China from mid-January to mid-February.

The report listed four scenarios in order of likelihood, with the top being from bats through another animal. The study suggested that was likely to very likely. The direct spread from bats to humans was listed as possible and spread through

“cold-chain” food product was possible, but not likely. The four scenarios also included the possible leak from a laboratory. The report found this to be “extremely unlikely.”

5. 巴西住院的 Covid-19 患者的年龄分布是否发生了变化？

Has the age distribution of hospitalized Covid-19 patients changed in Brazil?

来源：medRxiv

发布时间：2021-3-31

链接：https://www.medrxiv.org/content/10.1101/2021.03.30.21254650v1

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编译者：张鹏伟

中文摘要：

这项研究的目的是比较在巴西大行政区域在大流行第一年住院的 Covid-19 患者的年龄分布，以及按年龄组划分的医院死亡率和 ICU 的使用情况。我们使用了来自流感流行病学监测信息系统的数据，这些患者在 2020 年的第 8 周到 2021 年的第 7 周之间出现了该疾病的最初症状，分为三个时期。获得了由 Covid-19 住院的 779,257 名患者的记录。 在总数中，有 720,363（92.4%）涉及出院住院，这是在分析 ICU 使用和死亡时考虑的。 在 244,611 例有 ICU 使用迹象的住院治疗中，占 34.0%，其中 190,833 例允许计算在 ICU 中的时间。三个时期住院患者的年龄分布存在差异，但没有证据支持在最后一个时期，18 岁至 50 岁的成年人参与 Covid-19 治疗的比例增加的假设。北方年轻人死亡率的差异性增加表明 P1 变异在该人群中可能更严重。研究结果还表明，年轻人住院治疗和住院死亡的情况不容忽视，与接近或超过 10%的住院死亡率有关。巴西的 Covid-19 年轻化现象是基于巴西自身的社会人口和经济特点，可能是由于病毒变体的不断传播而加强的。重要的是要继续监测其进展和影响。

Abstract:

The aim of this study was to compare the age profile of hospitalized Covid-19 patients during the first year of the pandemic, as well as hospital mortality and use of ICUs, by age group, in large geographic regions of Brazil. We used data from the Influenza Epidemiological Surveillance Information System for patients who presented the first symptoms of the disease between the epidemiological weeks 8 of 2020 and 7 of 2021, which were divided into three periods. 779,257 records of patients hospitalized by Covid-19 were obtained. Of this total, 720,363 (92.4%) referred to discharged hospitalizations, considered in the analysis of ICU use and death. Among 244,611 hospitalizations (34.0%) with indication for use of ICU, 190,833 allowed the calculation of the time in ICU. There was variation in the age profile of hospitalized patients between the three periods, but there was no evidence in favor of the hypothesis of an increase, in the last period, in the participation of adults between 18 and 50 years old in hospitalizations by Covid-19. A differentiated increase in the mortality of young adults in the North suggests the possibility of greater severity of the P1 variant in this population. The results also show that the participation of young

adults in hospitalizations and hospital deaths was never negligible and is related to hospital mortality rates close to or above 10%. The Covid-19 youthening phenomenon in Brazil is based on the country's own sociodemographic and economic characteristics and may have been strengthened by the increasing circulation of viral variants. It is important to continue monitoring its progression and effects.

6. 通过唾液可以更好地检测南非 B.I.351 病毒变异株

Improved performance of saliva for the detection of the B.1.351 variant in South Africa

来源：medRxiv

发布时间：2021-03-31

链接：https://www.medrxiv.org/content/10.1101/2021.03.29.21254563v1

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中文摘要：

通过唾液来检测引起人们关注的 SARS-CoV-2 新变异株 B.I.351(501Y.V2)株系是一种性能尚不明确的方法，对这种方法进行评估是非常有必要的。在对由未突变的 SARS-CoV-2 病毒造成的感染进行分子检测的研究中，已经证明唾液是一种效果相同，创伤小，低成本的检测物，可以替代鼻咽拭子。在 2020 年 8 月 1 日至 2021 年 1 月 16 日期间，作者招募了 410 名到南非开普敦 Groote Schuur Hospital (GSH)门诊接受 SARS-CoV-2 检测的符合条件的参与者。这其中，有 300 人是在 B.I.351 变异首次被发现且取代野生型 SARS-CoV-2 之前被纳入研究，110 人是在此之后被纳入。除了标准的 HCW 采集的鼻咽拭子外，所有参与者都在监督下提供了一个自我收集的中鼻甲(MT)和唾液(SA)拭子。医务工作者采集的鼻咽拭子都在认证的诊断实验室通过 RT-PCR 进行检测。对变异前和变异后的病毒，唾液拭子与鼻咽拭子的阳性结果一致性比例分别为 51.5%和 72.5%，而中鼻甲拭子的一致性比例分别为 75.8%和 77.5%。在所有研究期间，全部拭子类型的阴性结果一致性比例为 98%。唾液拭子作为 B.I.351 病毒诊断样本，其性能显著改善的原因仍在研究中。

Abstract:

Assessment of the unknown performance of saliva for the detection of the novel SARS-CoV-2 variant of concern (VOC) B.1.351 (501Y.V2) lineage is essential as saliva has been shown to be an equivalent, less invasive and a less costly alternative to nasopharyngeal swabs for the molecular detection of SARS-CoV-2 infection in pre-variant studies. Between 1st August 2020 and 16th January 2021, we enrolled 410 eligible ambulatory participants who presented to Groote Schuur Hospital (GSH) in Cape Town, South Africa for SARS-CoV-2 testing. Of these, 300 were enrolled prior to, and 110 after, the initial detection and replacement of wild-type by the B.1.351 variant. All participants provided a supervised self-collected mid-turbinate (MT) and saliva (SA) swab, in addition to the standard HCW collected NP swab which were all tested by RT-PCR in an accredited diagnostic

laboratory. Positive percent agreement to NP swab for SA swabs pre- and post-variant were 51.5% and 72.5% respectively while these values for MT swabs were 75.8% and 77.5%. The negative percent agreement for all swab types during all periods was >98%. The basis for this marked improvement of SA swabs as a diagnostic sample for B.1.351 virus is still being investigated.

7. Tocilizumab 治疗后乙型肝炎病毒（HBV）和结核病（TB）再激活的风险及丙型肝炎病毒（HCV）并发症：COVID 时代风险评估的系统回顾

Risk of reactivation of hepatitis B virus (HBV) and tuberculosis (TB) and complications of hepatitis C virus (HCV) following Tocilizumab therapy: A systematic review to inform risk assessment in the COVID era

来源：medRxiv

发布时间：2021-03-26

链接：https://www.medrxiv.org/content/10.1101/2021.03.22.21254128v1

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中文摘要：

Tocilizumab（TCZ，托珠单抗）是一种 IL-6 受体拮抗剂，用于 COVID 的治疗。但是，这种药物有感染并发症的“黑匣子”警告，可能包括结核病（TB）或乙型肝炎病毒（HBV）的再激活，或丙型肝炎病毒（HCV）的恶化。由于 COVID 大流行期间临床研究的速度，这些风险的前瞻性评估是不可能的。该研究进行了一项系统性的回顾，得出 HBV 和 TB 再激活的平均累积发病率估计值为 3.3%和 4.3%。同时指出无法对丙型肝炎病毒的再激活进行评估。这些数据来源于不同的研究，这些研究是在病毒爆发之前进行的，使用了不同的流行病学和不同的筛查和预防方法。该研究强调在使用托珠单抗前，需要进行个体风险评，并提出了一个临床分类的算法。随着托珠单抗治疗在 COVID 中的应用，迫切需要对安全性数据进行整理。

关键点 在 COVID-19 中使用托珠单抗治疗可能有感染并发症的风险。该研究进行了系统的文献回顾，以评估乙肝病毒和结核病再激活的风险，得出平均估计发病率分别为 3.3%和 4.3%。

Abstract:

Tocilizumab (TCZ), an IL-6 receptor antagonist, is used in the treatment of COVID. However, this agent carries a ‘black box’ warning for infection complications, which may include reactivation of tuberculosis (TB) or hepatitis B virus (HBV), or worsening of hepatitis C virus (HCV). Due to the pace of clinical research during the COVID pandemic, prospective evaluation of these risks has not been possible. We undertook a systematic review, generating mean cumulative incidence estimates for reactivation of HBV and TB at 3.3% and 4.3%. We could not generate

estimates for HCV. These data derive from heterogeneous studies pre-dating the COVID outbreak, with differing epidemiology and varied approaches to screening and prophylaxis. We underline the need for careful individual risk assessment prior to TCZ prescription, and present an algorithm for clinical stratification. There is an urgent need for ongoing collation of safety data as TCZ therapy is used in COVID.

KEY POINTS Use of tocilizumab treatment in COVID-19 may risk infective complications. We have undertaken a systematic literature review to assess the risks of reactivation of HBV and TB, generating mean estimates of 3.3% and 4.3% incidence, respectively.

8. 与其他急性呼吸道病毒不同，非严重 SARS-CoV-2 感染的特征为 T 细胞的早期增殖不依赖于 1 型干扰素的应答

Non-severe SARS-CoV-2 infection is characterised by very early T cell proliferation independent of type 1 interferon responses and distinct from other acute respiratory viruses

来源：medRxiv

发布时间：2021-03-31

链接：https://www.medrxiv.org/content/10.1101/2021.03.30.21254540v1

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中文摘要：

在经历无症状感染或非严重疾病的大多数人中，SARS-CoV-2 的自然保护性免疫的相关性尚未完全确定，并且这一点随着新的变异的出现仍然很重要。该研究利用血液转录组学、多参数流式细胞术和 T 细胞受体（TCR）测序来解决这个问题。该研究鉴定了一种与其他急性呼吸道病毒共有的 1 型干扰素（IFN）反应，以及一种区分 SARS-CoV-2 与其他病毒的细胞增殖反应。这些反应在病毒第一次被检测到的时候达到顶峰，在某些情况下，病毒检测之前就出现了。细胞增殖在 CD8 T 细胞中最为明显，并与 SARS-CoV-2 反应性 TCR 的快速扩增有关。我们发现免疫球蛋白转录物同样快速增加，但循环病毒特异性抗体滞后 1-2 周。该研究的数据支持快速诱导 1 型 IFN 和 CD8 T 细胞应答 SARS-CoV-2 的保护作用。

Abstract:

The correlates of natural protective immunity to SARS-CoV-2 in the majority who experience asymptomatic infection or non-severe disease are not fully characterised, and remain important as new variants emerge. We addressed this question using blood transcriptomics, multiparameter flow cytometry and T cell receptor (TCR) sequencing spanning the time of incident infection. We identified a type 1 interferon (IFN) response common to other acute respiratory viruses, and a cell proliferation response that discriminated SARS-CoV-2 from other viruses. These responses peaked by the time the virus was first detected, and in some preceded virus detection. Cell proliferation was most evident in CD8 T cells

and associated with rapid expansion of SARS-CoV-2 reactive TCRs. We found an equally rapid increase in immunoglobulin transcripts, but circulating virus-specific antibodies lagged by 1-2 weeks. Our data support a protective role for rapid induction of type 1 IFN and CD8 T cell responses to SARS-CoV-2.

9. COVID-19 病情发展过程中患者肺部的病理学空间特征图景

The spatial landscape of lung pathology during COVID-19 progression

来源：Nature

发布时间：2021-03-29

链接：https://www.nature.com/articles/s41586-021-03475-6

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编译者：宋珂

中文摘要：

近期的研究使人们对 COVID-19 患者的病理特征和免疫响应有了深入的了解。然而，对位于感染部位的被感染细胞和免疫系统之间的相互作用，目前仍未见有详细的研究报道。本文中，作者利用质谱流式高参数成像技术对 36 种蛋白的表达进行了检测，在单细胞分辨率下，对包括由 SARS-CoV-2 感染导致的人类急性肺损伤的组织的细胞组成和空间结构进行了研究。此类空间解析的单细胞数据，揭示了发生感染和损伤的肺部的无序结构，以及大量出现的免疫浸润的分布情况。中性粒细胞浸润和巨噬细胞浸润分别是细菌性肺炎和 COVID-19 的特征。作者发现，SARS-CoV-2 病毒主要感染肺泡上皮细胞，并能诱导产生与肺部损伤相关的局部的超级炎症细胞状态。考查 COVID-19 患者相对于出现症状到发展为严重致命疾病的时间范围，作者发现随着病情的发展，患者的巨噬细胞外渗和间充质细胞增多，成纤维细胞的丰度上升，同时这些细胞类型之间的距离也随之增加。作者推测这可能是为了修复受损的肺部组织。利用这些空间解析的单细胞数据，使我们能够从结构、免疫学和临床的角度发展出一个具有生物学可解释性的肺部病理学图景。这种空间单细胞图景能够从宏观表现到单细胞水平展现出人类肺部的病理生理学特征，为理解 COVID-19 和一般性肺部病理提供了重要基础。

Abstract:

Recent studies have provided insights into the pathology and immune response to coronavirus disease 2019 (COVID-19). However, thorough interrogation of the interplay between infected cells and the immune system at sites of infection is lacking. We use high parameter imaging mass cytometry targeting the expression of 36 proteins, to investigate at single cell resolution, the cellular composition and spatial architecture of human acute lung injury including SARS-CoV-2. This spatially resolved, single-cell data unravels the disordered structure of the infected and injured lung alongside the distribution of

extensive immune infiltration. Neutrophil and macrophage infiltration are hallmarks of bacterial pneumonia and COVID-19, respectively. We provide evidence that SARS-CoV-2 infects predominantly alveolar epithelial cells and induces a localized hyper-inflammatory cell state associated with lung damage. By leveraging the temporal range of COVID-19 severe fatal disease in relation to the time of symptom onset, we observe increased macrophage extravasation, mesenchymal cells, and fibroblasts abundance concomitant with increased proximity between these cell types as the disease progresses, possibly as an attempt to repair the damaged lung tissue. This spatially resolved single-cell data allowed us to develop a biologically interpretable landscape of lung pathology from a structural, immunological and clinical standpoint. This spatial single-cell landscape enabled the pathophysiological characterization of the human lung from its macroscopic presentation to the single-cell, providing an important basis for the understanding of COVID-19, and lung pathology in general.

10. 对孕妇 SARS-CoV-2 感染的性别二态性胎盘反应

Sexually dimorphic placental responses to maternal SARS-CoV-2 infection

来源：bioRxiv

发布时间：2021-3-29

链接：https://www.biorxiv.org/content/10.1101/2021.03.29.437516v1

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编译者：张鹏伟

中文摘要：

男性在 COVID-19 的患病率和严重程度上都高于女性。解释这种性别差异的潜在机制仍不完全清楚。干扰素反应被认为是成人疾病的调节剂，在胎盘抗病毒反应中起着关键作用。此外，干扰素反应已被证明改变 Fc 受体的表达，因此可能影响胎盘抗体转移。在这里，我们检查了病毒诱导的胎盘干扰素反应、母胎抗体转移和胎儿性别的交叉点。对 68 例孕妇胎盘干扰素刺激基因（ISGs）、Fc 受体表达和 SARS-CoV-2 抗体转移进行了研究。在母体 SARS-CoV-2 感染后，观察到胎盘 ISGs、白细胞介素-10 和 Fc 受体的性二型表达，其中男性表达上调。在有男性胎儿的妊娠期，母亲 SARS-CoV-2 特异性抗体滴度降低，胎盘抗体转移受损。这些结果表明母体和胎盘对 SARS-CoV-2 的适应性和先天性免疫应答是胎儿性别特异性的。

Abstract:

There is a persistent male bias in the prevalence and severity of COVID-19 disease. Underlying mechanisms accounting for this sex difference remain incompletely understood. Interferon responses have been implicated as a modulator of disease in adults, and play a key role in the placental anti-viral response. Moreover, the interferon response has been shown to alter Fc-receptor expression, and therefore may impact placental antibody transfer. Here we examined the intersection of viral-induced placental interferon responses, maternal-fetal antibody transfer, and fetal sex. Placental interferon stimulated genes (ISGs),

Fc-receptor expression, and SARS-CoV-2 antibody transfer were interrogated in 68 pregnancies. Sexually dimorphic placental expression of ISGs, interleukin-10, and Fc receptors was observed following maternal SARS-CoV-2 infection, with upregulation in males. Reduced maternal SARS-CoV-2-specific antibody titers and impaired placental antibody transfer were noted in pregnancies with a male fetus. These results demonstrate fetal sex-specific maternal and placental adaptive and innate immune responses to SARS-CoV-2.

11.对接种辉瑞或阿斯利康疫苗的既往感染者中抗 SARS-CoV-2 S 蛋白抗体水平的定量检测

Quantitative SARS-CoV-2 anti-spike responses to Pfizer-BioNTech and Oxford-AstraZeneca vaccines by previous infection status

来源：medrxiv

发布时间：2021-03-21

链接：https://www.medrxiv.org/content/10.1101/2021.03.21.21254061v1

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DOI 或 PUBMED ID：preprint

编译者：孔娟

中文摘要：

目的：文中研究了接种一剂或两剂辉瑞或阿斯利康疫苗后，医护人员(HCWs)中抗 SARS-CoV-2 S 蛋白 IgG 应答的决定因素。

方法：对参与常规 SARS-CoV-2 核酸和抗体检测的医护人员在第一次和第二次接种疫苗前以及接种后 4 周进行血清学检测。使用雅培 SARS-CoV-2 IgG II Quant 分析法(检测阈值:≥50 AU/ml)测量接种后的抗 S 蛋白 IgG 抗体水平。研究者使用多变量逻辑回归确定血清阳性预测因子，并使用广义加性模型跟踪抗体应答随时间的变化。

结果：疫苗接种率为 80%，第二次接种疫苗前第一次接种疫苗后> 14 天，3570/3610(98.9%)呈血清反应阳性，辉瑞疫苗 2706/2720(99.5%)，阿斯利康疫苗 864/890(97.1%)。首次接种疫苗后,既往感染和较年轻的医护人员中血清反应阳性检出率较高,无明显性别和种族差异。第二次疫苗接种后> 14 天检测的 470 名医护人员均为血清阳性。接种辉瑞疫苗的既往感染者与无既往感染者相比 1028(564-1985) AU/ml 既往感染者具有较高的抗体应答 14，604(7644-22，291) AU/ml。阿斯利康疫苗接受者在首次接种后的抗体水平低于辉瑞，有和无既往感染抗体水平分别为 10，095(5354-17，096)和 435(203-962) AU/ml (均 $p<0.001$)，第二次疫苗接种后的抗体水平与既往感染者和第一次疫苗接种后的抗体水平无显著差异。

结论：接种疫苗使几乎所有医护人员均可检测到抗刺突蛋白抗体。反应差异是否影响疫苗疗效需要进一步研究。

Abstract：

Objectives：We investigate determinants of SARS-CoV-2 anti-spike IgG responses in healthcare workers (HCWs) following one or two doses of Pfizer-BioNTech or Oxford-AstraZeneca vaccines. Methods：HCWs participating in regular SARS-CoV-2 PCR and antibody testing were invited for serological testing prior to first and second vaccination, and 4 weeks post-vaccination if receiving a 12-week dosing interval. Quantitative post-vaccination anti-spike antibody responses were measured using the Abbott SARS-CoV-2 IgG II Quant assay (detection threshold:

≥50 AU/ml). We used multivariable logistic regression to identify predictors of seropositivity and generalised additive models to track antibody responses over time. Results: Vaccine uptake was 80%, but less in lower-paid roles and Black, south Asian and minority ethnic groups. 3570/3610(98.9%) HCWs were seropositive >14 days post-first vaccination and prior to second vaccination, 2706/2720(99.5%) after Pfizer-BioNTech and 864/890(97.1%) following Oxford AstraZeneca vaccines. Previously infected and younger HCWs were more likely to test seropositive post-first vaccination, with no evidence of differences by sex or ethnicity. All 470 HCWs tested >14 days after second vaccine were seropositive. Quantitative antibody responses were higher after previous infection: median(IQR) >21 days post-first Pfizer-BioNTech 14,604(7644-22,291) AU/ml vs. 1028(564-1985) AU/ml without prior infection（P<0.001. Oxford-AstraZeneca vaccine recipients had lower readings post-first dose compared to Pfizer-BioNTech, with and without previous infection, 10,095(5354-17,096) and 435(203-962) AU/ml respectively (both p<0.001 vs. Pfizer-BioNTech).Antibody responses post-second vaccination were similar to those after prior infection and one vaccine dose. Conclusions: Vaccination leads to detectable anti-spike antibodies in nearly all adult HCWs. Whether differences in response impact vaccine efficacy needs further study.

12. 脂质纳米粒 RBD-hFc mRNA 疫苗保护 hACE2 转基因小鼠抗致死性 SARS-CoV-2 的感染相关研究

A lipid nanoparticle RBD-hFc mRNA vaccine protects hACE2 transgenic mice against lethal SARS-CoV-2 infection

来源：biorxiv

发布时间：2021-03-29

链接：https://www.biorxiv.org/content/10.1101/2021.03.29.436639v1.full.pdf

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DOI 或 PUBMED ID：preprint

编译者：孔娟

中文摘要：

当前的全球新冠肺炎大流行导致人们做出前所未有的努力，开发针对新型冠状病毒的有效疫苗。mRNA 疫苗在过去一年中发展非常迅速，已经具有非常有前景的 3 期结果和显著的疗效数据。由于大多数动物模型对 SARS CoV-2 感染不敏感，因此临床前研究通常仅限于易感染的动物，如仓鼠和非人灵长类动物。在这些动物模型中，新型冠状病毒感染导致病毒复制和轻度疾病。因此，通常通过疫苗引发免疫应答、减少病毒复制和防止体重减轻的能力来评估疫苗在这些动物中的保护效力。研究中报告了一种通过脂质纳米粒(LNP)递送的新型冠状病毒人 Fc 偶联受体结合结构域(RBD-hFc) mRNA 疫苗的设计。研究结果表明，接种了 RBD-hFc mRNA 的 BALB/c 小鼠产生了稳健而特异的免疫应答。研究中采用 K18-HACE 2 小鼠模型评估了 RBD-hFc mRNA 疫苗的保护作用。结果显示 K18-hACE2 小鼠接受 RBD-hFc mRNA 疫苗给药

后，产生了由结合抗体和中和抗体组成的稳健体液应答。70%的接种小鼠（接受新型冠状病毒致死剂量感染）受到保护，而所有对照动物均死于感染。研究者表示这是首次报告 K18-hACE2 对致死性新型冠状病毒感染具有保护作用的非复制型 mRNA 疫苗研究。

Abstract

The current global COVID-19 pandemic led to an unprecedented effort to develop effective vaccines against SARS-CoV-2. mRNA vaccines were developed very rapidly during the last year, and became the leading immunization platform against the virus, with highly promising phase-3 results and remarkable efficacy data. Since most animal models are not susceptible to SARS CoV-2 infection, pre-clinical studies are often limited to infection-prone animals such as hamsters and non-human primates. In these animal models, SARS-CoV-2 infection results in viral replication and a mild disease disease. Therefore, the protective efficacy of the vaccine in these animals is commonly evaluated by its ability to elicit immunologic responses, diminish viral replication and prevent weight loss. Our lab recently reported the design of a SARS-CoV-2 human Fc-conjugated receptor-binding domain (RBD-hFc) mRNA vaccine delivered via lipid nanoparticles (LNPs). These experiments demonstrated the development of a robust and specific immunologic response in RBD-hFc mRNA- vaccinated BALB/c mice. In the current study, we evaluated the protective effect of this RBD-hFc mRNA vaccine by employing the K18-hACE2 mouse model. We report that administration of RBD-hFc mRNA vaccine to K18-hACE2 mice led to a robust humoral response comprised of both binding and neutralizing antibodies. In accordance with the recorded immunologic immune response, 70% of vaccinated mice were protected against a lethal dose (3000 plaque forming units) of SARS-CoV-2, while all control animals succumbed to infection. To the best of our knowledge, this is the first non-replicating mRNA vaccine study reporting protection of K18-hACE2 against a lethal SARS-CoV-2 infection.

13. 未接种疫苗的 SARS-CoV-2 感染风险与社区一级的疫苗接种率呈负相关

SARS-CoV-2 infection risk among unvaccinated is negatively associated with community-level vaccination rates

来源：medrxiv

发布时间：2021-03-29

链接：https://www.medrxiv.org/content/10.1101/2021.03.26.21254394v1

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DOI 或 PUBMED ID：https://doi.org/10.1101/2021.03.26.21254394

编译者：刘焕珍

中文摘要：

广泛使用的 BNT162b 疫苗不仅可以预防疾病，而且可以预防感染，因此具有很高的效力，这表明疫苗接种有可能产生群体效应，这对于根除疾病至关重要。在这里，分析了来自 223 个地理上界定的社区的大量人群的快速疫苗接种期间的疫苗接种记录和测试结果，我们发现，每个社区的接种率与 16 岁以下未接种疫苗的人群的感染率的下降高度相关。这些结果提供

了观察证据，表明疫苗接种不仅可以保护接种疫苗的个体，而且可以为社区中未接种疫苗的人提供交叉保护。

Abstract:
Mass vaccination has the potential to curb the current COVID-19 pandemic by protecting vaccinees from the disease and possibly lowering the chance of transmission to unvaccinated individuals. The high effectiveness of the widely-administered BNT162b vaccine in preventing not only the disease but also infection suggests a potential for a population-level effect, critical for disease eradication. However, this putative effect is difficult to observe, especially in light of highly fluctuating spatio-temporal epidemic dynamics. Here, analyzing vaccination records and test results collected during a rapid vaccine rollout for a large population from 223 geographically defined communities, we find that the rates of vaccination in each community are highly correlated with a later decline in infections among a cohort of under 16 years old which are unvaccinated. These results provide observational evidence that vaccination not only protects individual vaccinees but also provides cross-protection to unvaccinated individuals in the community.

14. 国务院联防联控机制举行新冠疫苗接种有关情况新闻发布会

来源：国务院新闻办公室网站

发布时间：2021-03-28

链接：

http://www.scio.gov.cn/xwfbh/gbwxwfbh/xwfbh/wsb/Document/1701169/1701169.htm

摘要：

3 月 28 日，国务院联防联控机制举行新闻发布会，请国家卫生健康委疾控局副局长吴良有、中国疾控中心免疫规划首席专家王华庆、国药集团中国生物副总裁张云涛、北京科兴中维生物技术公司总经理高强介绍新冠疫苗接种有关情况，并回答记者提问。

该新闻发布会提到

“去年中国生物在河南现场开展的 I/II 期临床研究的过程中就涵盖了 3-17 岁年龄段系统性、安全性、免疫原性的临床研究，目前这个年龄段的安全性数据已获得，达到了预期效果，免疫原性、中和抗体检测也已全部完成，近期将和药监局作沟通，相信在不远的将来，可以覆盖这部分人群”

15. 辉瑞和 BioNTech 证实他们的 COVID-19 疫苗在第二剂之后长达 6 个月高度有效、并且没有发生严重副作用

PFIZER AND BIONTECH CONFIRM HIGH EFFICACY AND NO SERIOUS SAFETY CONCERNS THROUGH UP TO SIX MONTHS FOLLOWING SECOND DOSE IN UPDATED TOPLINE ANALYSIS OF LANDMARK COVID-19 VACCINE STUDY

来源：pfizer 官网

发布时间：2021-04-03

链 接 ： https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-confirm-high-efficacy-and-no-serious

16. 辉瑞和 BioNTech 宣布他们的疫苗在 12-15 岁的青少年中取得阳性的临床试验结果

PFIZER-BIONTECH ANNOUNCE POSITIVE TOPLINE RESULTS OF PIVOTAL COVID-19 VACCINE STUDY IN ADOLESCENTS
来源：pfizer 官网
发布时间：2021-03-31
链 接 ： https://www.pfizer.com/news/press-release/press-release-detail/pfizer-biontech-announce-positive-topline-results-pivotal
摘要：
In participants aged 12-15 years old, BNT162b2 demonstrated 100% efficacy and robust antibody responses, exceeding those reported in trial of vaccinated 16-25 year old participants in an earlier analysis, and was well tolerated
The companies plan to submit these data to the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) as soon as possible to request expansion of the Emergency Use Authorization (EUA) and EU Conditional Marketing Authorization for BNT162b2
The companies also provided an update on the Phase 1/2/3 study of BNT162b2 in children aged 6 months to 11 years

17. 全球新冠疫苗接种计划会有哪些挑战
一份概述这些挑战的报告：从发挥新冠 mRNA 疫苗威力，到争取暂时取消其知识产权保护
What it will take to vaccinate the world against COVID-19
A special report outlines the challenges — from unleashing the power of mRNA vaccines, to the battle for temporary intellectual-property relief.
来源：nature
发布时间：2021-03-25
链接：https://www.nature.com/articles/d41586-021-00727-3
第一作者：Aisling Irwin
作者单位：Oxfordshire, UK
编译者：姜连连
中文摘要：
仅几个月内，疫苗公司已生产数亿剂新冠疫苗。但全球需要尽快提供更多疫苗。各公司表示可以在 2021 年底提供充足疫苗进行全球范围免疫接种。但并未考虑疫苗配送中的政治性延误，如国家进行疫苗出口管制，或者发达国家购买了绝大部分疫苗。这种现象正促使疫苗生产商考虑暂时放弃知识产权，支持发展中国家快速自主地生产新冠疫苗。
今年全球能生产多少剂新冠疫苗？
目前，全球可提供约 4.13 亿剂新冠疫苗。到 2021 年底，可提供 95 亿剂。但因印度和欧盟宣布限制疫苗出口，使该目标实现有可能要推迟至 2022 年底。疫苗生产需要超过 200 种材料，这些材料通常由不同的国家生产。包括玻璃瓶、过滤器、树脂、管子和方便袋。任何材料供应不足都会延缓疫苗生产流程。WTO 已提供全球近几百家可分装胰岛素、单抗和抗生素的企业清单备选。
公司间合作能否加速疫苗生产？
合作已经开始。之前是竞争关系的疫苗公司正在齐心协力，尤其是跨国公司间合作更是史无前例。此外还出现疫苗分装和包装的业务交易。例如，赛诺菲公司与 BioNTech 公司签订负责 BioNTech1.25 亿剂疫苗的后期生产业务。阿斯利康将 29 亿剂疫苗的生产业务承包给 15 个国家的 25 家疫苗生产商。印度血清研究所同意生产 10 亿剂阿斯利康疫苗，同时也接下来

生产 10 亿剂 Novavax 新冠疫苗业务。南非的阿斯彭制药公司将在生产强生的新冠疫苗。

为何全球无法生产更多的新冠疫苗？

新冠疫苗主要有痘病毒、全病毒和 mRNA 疫苗。mRNA 疫苗生产流程很简单，但难以扩大规模，是因为缺乏制备经验和专业人员。但生产 mRNA 新冠疫苗的关键瓶颈是全球原材料的短缺，尤其是核苷酸、酶和脂质。此外 mRNA 疫苗研发公司为其他公司发放疫苗生产许可证进展缓慢。虽然疫苗生产配件的制造商已扩大生产规模，但因新冠流行早期，只重视投资疫苗的研发而忽略了疫苗相关材料的生产。即使辉瑞和 Moderna 公司已考虑扩大生产，但对原材料没有主导权。

知识产权保护会多大程度阻碍新冠疫苗的生产速度？

假设每人接种两剂新冠疫苗，达到全球群体免疫水平则需要 110 亿剂疫苗。占全球人口 1/5 的发达国家购买了约 60 亿剂新冠疫苗；而占全球人口 4/5 的发展中国家只能分配到约 26 亿剂疫苗。印度和南非均发起请求疫苗公司暂时放弃新冠疫苗的相关知识产权运动，请求 WTO 在达到群体免疫前，暂时取消新冠疫苗某些相关的医疗器具和技术知识产权。这项提议已经得到了大约 100 个国家的支持。但是印度-南非的提议遭到了拥有欧盟、美国，英国和一些大的疫苗公司反对。

还有哪些技术转让可以加快疫苗生产？

WTO 正倡导“协调性技术转让”，即大学和疫苗生产商通过 WTO 全球协调机制向其他公司发放新冠疫苗生产许可证。另外，拥有 mRNA 疫苗相关知识产权的宾夕法尼亚大学正在帮助曼谷朱拉隆功大学开发疫苗生产设备。

Abstract:

Within just a few months, pharmaceutical firms have produced hundreds of millions of doses of COVID-19 vaccine. But the world needs billions — and as fast as possible. Companies say they could make enough vaccines to immunize most of the world’s population by the end of 2021. But this doesn’t take into account political delays in distribution, such as countries imposing export controls — or that the overwhelming majority of doses are going to wealthier countries. This situation is fuelling a campaign to temporarily waive intellectual-property rights so that manufacturers in poorer countries can make the vaccines more quickly themselves.

How many vaccines can the world make this year?

Some 413 million COVID-19 vaccine doses had been produced by the beginning of March. The company projects that this will rise to 9.5 billion doses by the end of 2021. However, these numbers are more likely to be reached by the end of 2022 with India and the European Union having announced restrictions on vaccine exports. Vaccine production can require more than 200 individual components, which are often manufactured in different countries. These include glass vials, filters, resin, tubing and disposable bags. Any critical item falls short can disrupt the entire process. WHO has drawn up a list of several hundred facilities worldwide that currently fill insulin, monoclonal antibodies or injectable antibiotics with filling vials.

Can’t companies work together to make vaccines faster?

They already are. Firms that would usually be competing are working together at pace. Such a degree of collaboration between multinational corporations is unprecedented. In addition, there are many fill-and-finish deals. For example,

Sanofi has a contract with BioNTech to do late-stage manufacturing of 125 million doses of the vaccine developed by BioNTech. But the biggest manufacturing deals have been negotiated by AstraZeneca for the vaccine. The company has contracted manufacturing capacity for 2.9 billion vaccine doses to 25 firms in 15 countries. Its largest partnership deal is with Serum Institute of India in Pune, which agreed to produce one billion doses of the AstraZeneca vaccine and also agreed to make at least one billion doses of a vaccine developed by Novavax. South Africa's Aspen Pharmaceuticals will formulate, as well as fill and finish, Johnson & Johnson's vaccine.

Why isn't the world making more vaccines?

There are three main types of COVID-19 vaccine: viral vector; whole virus; and messenger RNA (mRNA). Making mRNA vaccines has a simplicity about it, but scaling up is tricky because it's never been done before, the newness of the process means there's a shortage of trained personnel. But the key bottleneck in mRNA-vaccine manufacture is a worldwide shortage of essential components, especially nucleotides, enzymes and lipids. Moreover, these companies are proving slow to license their manufacturing so that others could do this. Manufacturers of component parts are now expanding their production. Early in the pandemic, there was swift investment in vaccine research and development, but scale-up of components was given less attention. Pfizer and Moderna were already thinking about how to make more, but they had no control on the raw materials.

To what extent is intellectual-property protection slowing access to COVID-19 vaccines?

Some 11 billion doses are required to vaccinate 70% of the world's population — assuming two doses are given per person. This is the proportion that might be needed to reach population-level, or herd, immunity.High- and upper-middle-income countries, representing one-fifth of the world's population, have bought around 6 billion doses; but low- and lower-middle-income countries, representing four-fifths of the population, have secured only around 2.6 billion. That's why India and South Africa are among the countries involved in a campaign to get COVID-19-related intellectual-property rights temporarily waived. They asked the WTO for certain intellectual-property rights on COVID-19 medical tools and technologies to be temporarily suspended until herd immunity has been reached. The proposal has been gathering support, and is now backed by around 100 countries. But the India–South Africa proposal is being opposed by the European Union, the United States, the United Kingdom and most of the larger pharma companies.

What other types of tech transfer could speed up vaccine production?

The WHO is advocating what it calls "coordinated technology transfer", in which universities and manufacturers license their vaccines to other companies through a global mechanism coordinated by the WHO. In another approach, the University of Pennsylvania, which owns sufficient intellectual-property rights relating to mRNA vaccines to strike out on its own, is helping Chulalongkorn University in Bangkok to develop a vaccine-making facility.

18. 全球免疫落差正在形成，中国如何应对？华裔学者提 5 大建议

来源：CC 情报局公众号

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通讯作者：张玉蛟

通讯作者单位:MD 安德森癌症中心

核心提示：

1、在后新冠疫情时代，由于不同国家疫苗接种率存在巨大差异，免疫落差正在形成。当英美发达国家达到群体免疫开放国门后，将会对世界带来极大的冲击。

2、从世界范围来看，实行免疫护照是大势所趋。中国要想有限开放国门，恢复社会经济发展，需要披露三期临床数据，获得 WHO 疫苗审批许可，不断优化疫苗研究方案，密切监控不良反应，做好风险预案，建立国际间互认的疫苗护照并引进其他国家 WHO 认证疫苗。

3、得益于严格的防控措施，疫情早期中国成为全球抗疫领跑者，但当前群体免疫仍较为滞后，疫苗接种率仅为 4%。目前中国每日疫苗接种量领跑全球，超 500 万剂。乐观估计 2022 年春节后，疫苗将覆盖中国总人口的 70%，实现群体免疫，而只有达到群体免疫中国才能完全放开国门。

19. “疫苗护照”认证-政策和道德考量

“Vaccine Passport” Certification — Policy and Ethical Considerations

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第一作者：Mark A. Hall

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中文摘要：

随着 Covid-19 大流行，人们渴望恢复正常状态以及推出有效的疫苗，使人们对“疫苗护照”的讨论更加激烈。尽管迄今为止，出行资格一直是主要重点，但似乎迫切需要使用护照来规范社交和娱乐聚会、工作场所或学校的出入口。但是，使用 Covid-19 疫苗护照来制定限制措施，基于几个重大问题引起了强烈的反对。首先，疫苗供应仍然有限。其次，少数民族和低收入人群的疫苗接种率似乎仍然会过低。第三，人们对疫苗接种的保护程度尚不十分了解。最后，我们缺乏准确验证疫苗接种的共识方法。公众似乎对豁免权的适当性存在严重分歧。意见不一，争执的范围广泛，这表明要采取一项要求广泛使用疫苗护照的官方政府政策，将是十分艰巨的。一个重要的出发点是将护照与授权区别开来。因此，我们着重于疫苗认证的政策用途。“护照”概念最明显地适用于旅行。在带头实施与疫苗接种有关的旅行政策时，政府可以从建立可靠的疫苗接种证明文件标准开始。政府的一个关键作用是确保认证规则的制定者能够随时获得有关疫苗有效性和局限性的最佳和最新科学信息。最后，灵活性是关键。随着疫苗可用性的增加，合理和合乎道德的疫苗认证政策可能会定期发生变化。确定疫苗可以使用多长时间以及它们对新变种的防护能力如何至关重要。当前的情况要求立即采取政策，为在保护公共卫生与恢复大流行前的生活之间取得平衡提供合理的余地。

Abstract:

As the Covid-19 pandemic enters its next phase, fervent desires to return to normalcy coupled with the rollout of efficacious vaccines have intensified discussions of “vaccine passports”. Although travel eligibility has been the

primary focus to date, some use of passports to regulate access to social and recreational gatherings, workplaces, or schools appears imminent.Using Covid-19 vaccine passports to tailor restrictions, however, has drawn staunch opposition based on several weighty concerns. First, while vaccine supply remains limited. Second, rates of vaccination among racial minorities and low-income populations seem likely to remain disproportionately low. Third, the extent of protection conferred by vaccination is not yet well understood. Finally, we lack a consensus approach to accurately certifying vaccination. The public appears to be deeply divided on the appropriateness of immunity privileges. The mixed views and range of competing arguments suggest that it would be precipitous to adopt an official government policy requiring widespread use of vaccine passports. An important starting point is distinguishing passports from mandates. Therefore, we focus here on policy uses of vaccine certification. The “passport” concept applies most obviously to travel. In taking the lead on vaccination-related travel policy, government can start by establishing standards for reliable documentation of vaccination. Government can help to mitigate inequities arising from private certification by boosting the supply and distribution of vaccines and redoubling efforts to reach underserved populations. Government guardrails are especially important when private policies affect employment opportunities. Federal law requires employers that mandate vaccination to reasonably accommodate workers who have sincerely held religious objections. Also, to avoid running afoul of disability discrimination laws, employers’ vaccination policies must be based on actual risk to workers’ or customers’ health. Another key role for government is to ensure that architects of certification rules have ready access to the best and most current scientific information on vaccine effectiveness and limitations. Finally, flexible adaptation is key. Rational and ethical vaccine certification policy is likely to shift regularly as vaccine availability increases, herd immunity nears, and scientific evidence of effectiveness or limitations grows. Determining how long vaccines work and how well they protect against new variants will be critical. But knowing that change is inevitable is not grounds for holding back guidance until circumstances become clear. Current circumstances demand immediate policies that offer reasonable leeway for balancing protection of public health with a return to prepandemic life.

20.疫苗证书：只要目的正当就可以不择手段吗?

Vaccine certificates: does the end justify the means?

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编译者：张怡

中文摘要：

随着COVID-19疫苗接种计划在许多国家开展，世界各国政府正在考虑颁发所谓的疫苗证书，

通过放宽对已接种过 SARS-CoV-2 疫苗的个人的一些限制，为其陷入困境的经济的重新开放提供便利。

使用 COVID-19 疫苗证书的前提假设是，接种疫苗不仅可以保护个人免受疾病侵袭，还可以降低他们被感染和传播病毒的风险。然而，疫苗接种对 SARS-CoV-2 传播的影响尚未得到可靠的阐明。来自以色列、英国和美国的初步报告表明，Moderna 和辉瑞生物技术疫苗可以通过降低疫苗接种后感染的病毒载量或通过预防无症状感染来减少 SARS-CoV-2 的传播。但是，在这些数据经过同行评审并证实其有效性之前，依赖疫苗证书重新开放经济的流行病学效用仍存在不确定性。疫苗诱导免疫的持续时间以及具有完全疫苗逃逸能力的新型 SARS-CoV-2 变种的风险尚不清楚，这对疫苗证书的有效期以及确保持有人对传播中的病毒株保持免疫存在疑问。

在国际层面上，鉴于目前 COVID-19 疫苗供应有限，且疫苗在全球分布不公平，为旅行发放疫苗证书将为高收入国家公民提供比低收入和中等收入国家公民更大的行动自由。

在评估是否颁发 COVID-19 疫苗证书时，公平、公正原则需要成为一个关键考虑因素。但至关重要的是，政府必须确保他们的决定基于可靠的科学证据，支持这一工具的流行病学效用，这可能具有重大的社会影响。

Abstract

As COVID-19 vaccination programmes proceed in many countries, governments worldwide are considering issuing so-called vaccine certificates to facilitate the re-opening of their stumped economies by easing some restrictions for individuals who have been vaccinated against SARS-CoV-2.

The assumption underlying the use of COVID-19 vaccine certificates is that vaccination not only protects individuals from disease, but also reduces their risk of becoming infected and spreading the virus.However, the effect of vaccination on the transmission of SARS-CoV-2 has not been reliably elucidated yet. Preliminary reports from Israel, the UK, and the USA suggest that the Moderna and Pfizer-BioNTech vaccines could reduce SARS-CoV-2 transmission either by lowering the viral load in post-vaccination infections or by preventing asymptomatic infections as well as disease. But until these data have been peer-reviewed and their validity confirmed, uncertainty will remain around the epidemiological utility of relying on vaccine certificates to re-open economies.Unknowns about the duration of vaccine-induced immunity and the risk of new SARS-CoV-2 variants with full vaccine-escape capabilities emerging raise questions about the validity period of vaccine certificates and the logistics of ensuring holders remain immune to circulating viral strains.

And at an international level, against the backdrop of the currently limited availability of COVID-19 vaccine doses and their inequitable global distribution, the deployment of vaccine certificates for travel will afford citizens of high-income countries greater freedom of movement than citizens of low-income and middle-income countries.

Principles of fairness and equity, will also need to be a key consideration in the assessment of whether to issue COVID-19 vaccine certificates. But crucially, governments must ensure they base their decision, which could have resounding societal implications, on reliable scientific evidence supporting the epidemiological utility of this tool.

21. 辉瑞启动针对 SARS-CoV-2 的新型口服抗病毒治疗剂的一期临床研究

Pfizer Initiates Phase 1 Study of Novel Oral Antiviral Therapeutic Agent Against SARS-CoV-2

来源：Pfizer

发布时间：2021-03-23

链接：https://www.pfizer.com/news/press-release/press-release-detail/pfizer-initiates-phase-1-study-novel-oral-antiviral

通讯作者：Pamela Eisele、Chuck Triano

通讯作者单位：Pfizer

编译者：张丽双

中文摘要：

辉瑞公司今天启动候选药物 PF-07321332 的一期临床试验，此前体外研究表明， PF-07321332 是一种有效的蛋白酶抑制剂，具有针对 SARS-CoV-2 的有效抗病毒活性。这是一项随机、双盲、发起人开放、安慰剂对照、单剂量和多剂量递增的健康成人研究，评估 PF-07321332 的安全性、耐受性和药代动力学，是首个在临床研究中评估的口服冠状病毒特异性研究性蛋白酶抑制剂，也是继辉瑞公司静脉内施用的研究性蛋白酶抑制剂之后的又一临床试验，后者目前正在 1b 期多剂量研究中对住院的 COVID-19 志愿者进行评估。

Abstract:

In-vitro studies conducted to date show that the clinical candidate PF-07321332 is a potent protease inhibitor with potent anti-viral activity against SARS-CoV-2

•This is the first orally administered coronavirus-specific investigational protease inhibitor to be evaluated in clinical studies, and follows Pfizer's intravenously administered investigational protease inhibitor, which is currently being evaluated in a Phase 1b multi-dose study in hospitalized clinical trial participants with COVID-19

NEW YORK--(BUSINESS WIRE)-- Pfizer Inc. (NYSE: PFE) announced today that it is progressing to multiple ascending doses after completing the dosing of single ascending doses in a Phase 1 study in healthy adults to evaluate the safety and tolerability of an investigational, novel oral antiviral therapeutic for SARS-CoV-2, the virus that causes COVID-19. This Phase 1 trial is being conducted in the United States. The oral antiviral clinical candidate PF-07321332, a SARS-CoV2-3CL protease inhibitor, has demonstrated potent in vitro anti-viral activity against SARS-CoV-2, as well as activity against other coronaviruses, suggesting potential for use in the treatment of COVID-19 as well as potential use to address future coronavirus threats.

22. SARS-CoV-2 变异 B.1.1.7 引起 HLA-A2+ CD8+ T 细胞表位突变，导致细胞免疫应答受损

SARS-CoV-2 variant B.1.1.7 caused HLA-A2+ CD8+ T cell epitope mutations for impaired cellular immune response

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doi: https://doi.org/10.1101/2021.03.28.437363
编译者：张怡
中文摘要：
由于 CD8+ T 细胞应答在 COVID-19 患者的疾病诊断和调节中发挥重要作用，因此有必要研究这些新出现的突变是否会导致免疫应答的改变。本研究评估了包括 B.1.1.7 突变的 HLA-A2 限制性 CD8+ T 细胞表位的免疫特性，综合分析了武汉株和 B.1.1.7 株 COVID-19 恢复期患者的 SARS-CoV-2 特异性 CD8+ T 细胞反应。首先，预测的 CD8+ T 细胞表位大多与 HLA-A2 具有良好的结合，而 B.1.1.7 的表位与原始菌株的结合能力较低。此外，这些多肽还能有效诱导 CD8+ T 细胞的活化和可能的免疫逃逸。研究结果进一步表明，B.1.1.7 中至少有两个位点突变导致了 CD8+ T 细胞激活的减少和可能的免疫逃避，即 ORF1ab1707-1716 中的 A1708D 突变和 ORF1ab2230-2238 中的 I2230T 突变。目前的分析为理解突变株感染引起的 SARS-CoV-2 特异性 CD8+ T 细胞反应提供了信息。
Abstract
Since CD8+ T cell responses play an important role in disease resolution and modulation in COVID-19 patients, it is essential to address whether these newly emerged mutations would result in altered immune responses. Here we evaluated the immune properties of the HLA-A2 restricted CD8+ T cell epitopes containing mutations from B.1.1.7, and furthermore performed a comprehensive analysis of the SARS-CoV-2 specific CD8+ T cell responses from COVID-19 convalescent patients recognizing the ancestral Wuhan strain compared to B.1.1.7. First, most of the predicted CD8+ T cell epitopes showed proper binding with HLA-A2, while epitopes from B.1.1.7 had lower binding capability than those from the ancestral strain. In addition, these peptides could effectively induced the activation and cytotoxicity of CD8+ T cells. Our results further showed that at least two site mutations in B.1.1.7 resulted in a decrease in CD8+ T cell activation and a possible immune evasion, namely A1708D mutation in ORF1ab1707-1716 and I2230T mutation in ORF1ab2230-2238. Our current analysis provides information that contributes to the understanding of SARS-CoV-2-specific CD8+ T cell responses elicited by infection of mutated strains.