
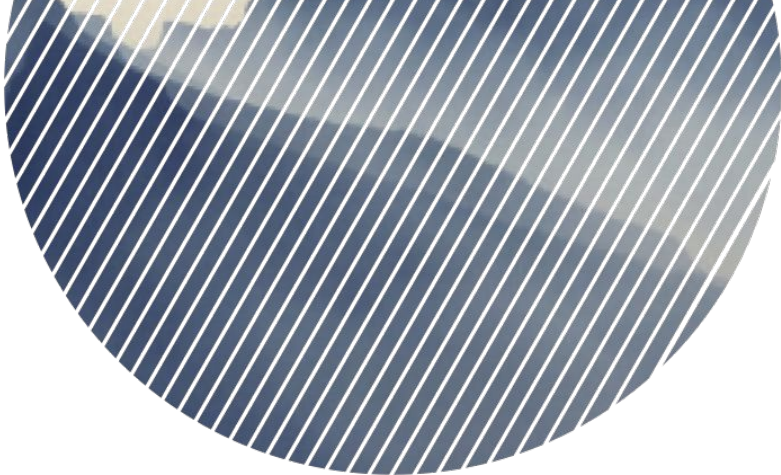
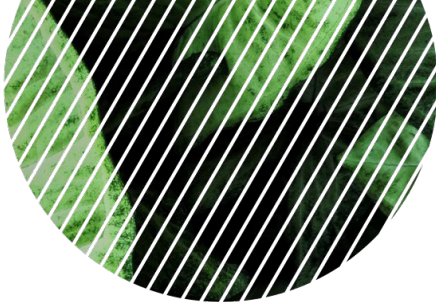




# *scientifica*

*presenta le LEZIONI DI SCIENZA*  
*gli eventi di approfondimento sulle materie scientifiche*

 **MONDADORI**  
EDUCATION



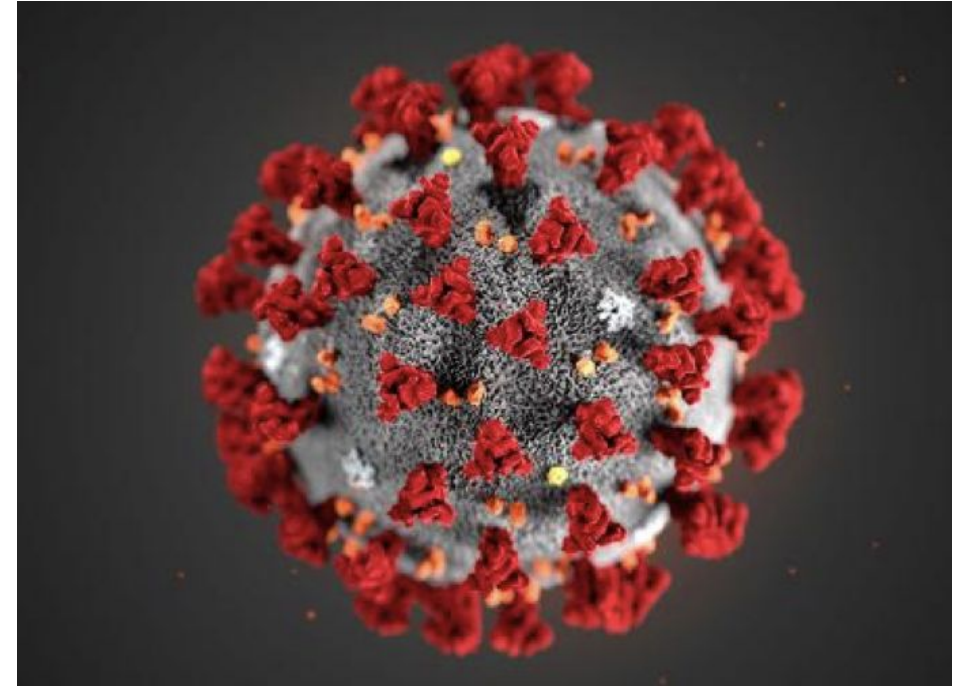
# Covid-19: passato, presente e futuro della pandemia

Daniele Banfi

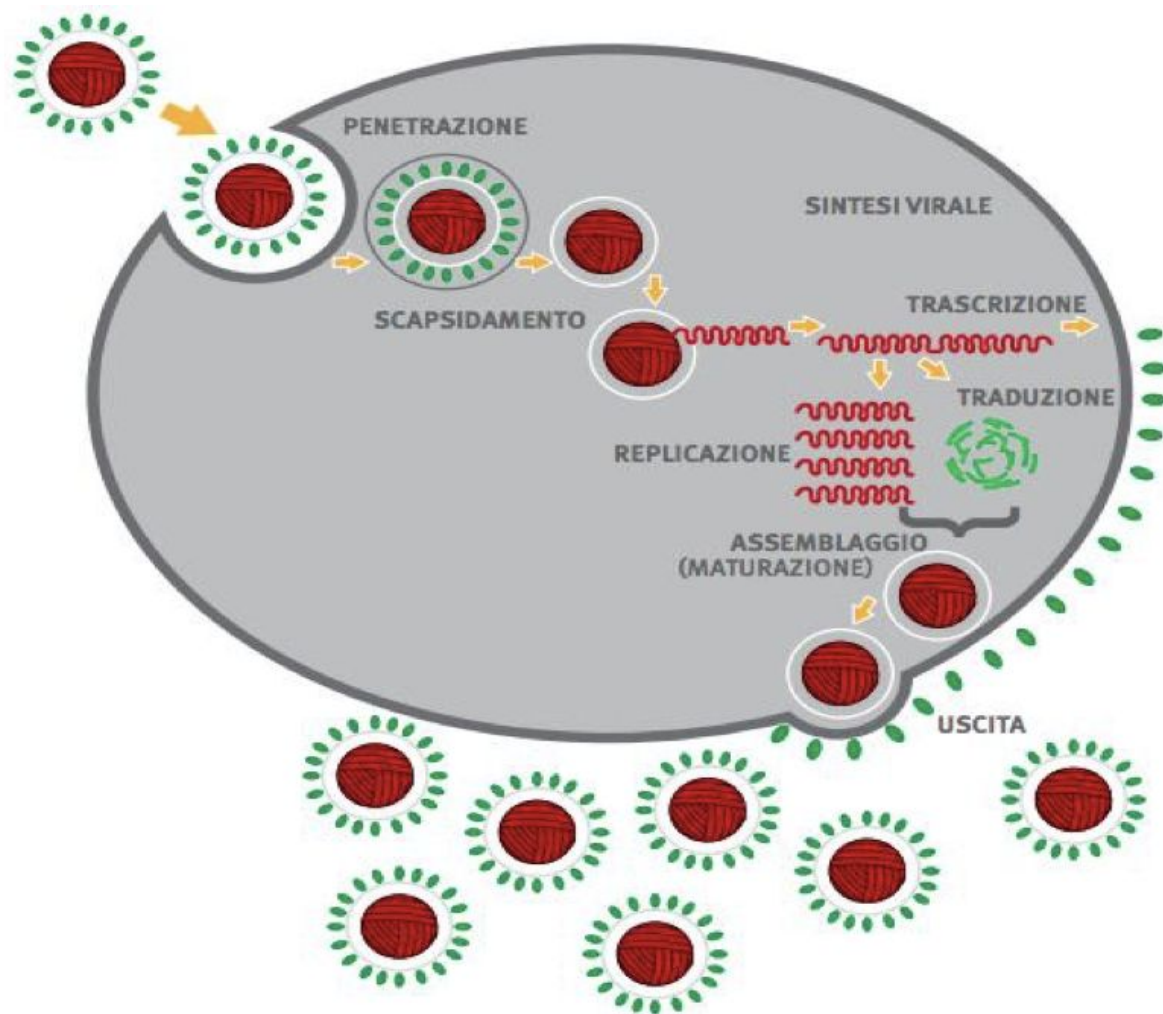


# Argomenti trattati

- **Le origini della pandemia**
- **Le ragioni dell'emergenza**
- **L'evoluzione del virus**
- **Terapie attuali e future**
- **Vaccini**
- **I prossimi mesi**



# I virus



**Parassiti per natura**

**Causa di malattie quali:**

**Morbillo  
Parotite  
Rosolia  
Vaiolo  
Poliomielite  
Influenza  
Epatite  
AIDS  
Covid-19**

# Salto di specie

## nature medicine

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[nature](#) > [nature medicine](#) > [correspondence](#) > [article](#)

[Correspondence](#) | [Published: 17 March 2020](#)

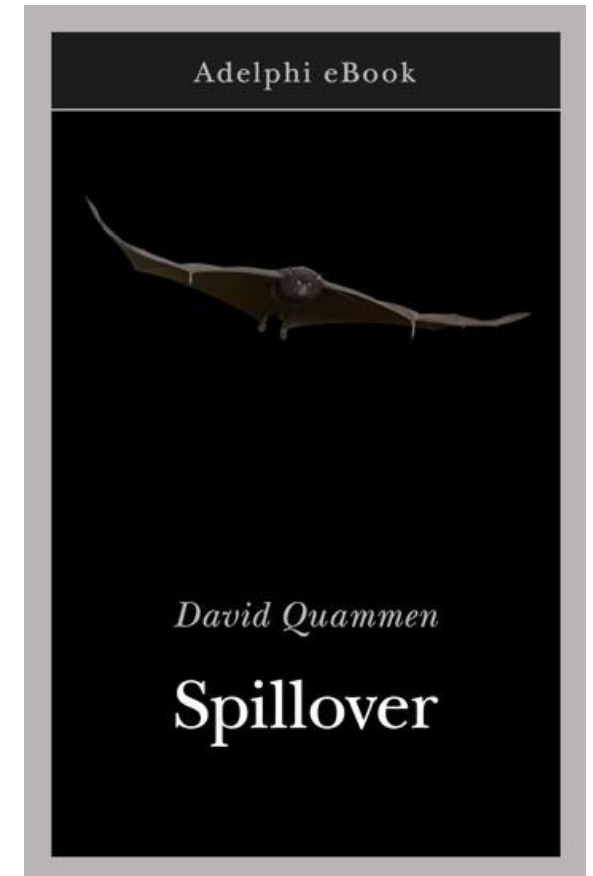
### The proximal origin of SARS-CoV-2

Kristian G. Andersen [✉](#), Andrew Rambaut, W. Ian Lipkin, Edward C. Holmes & Robert F. Garry

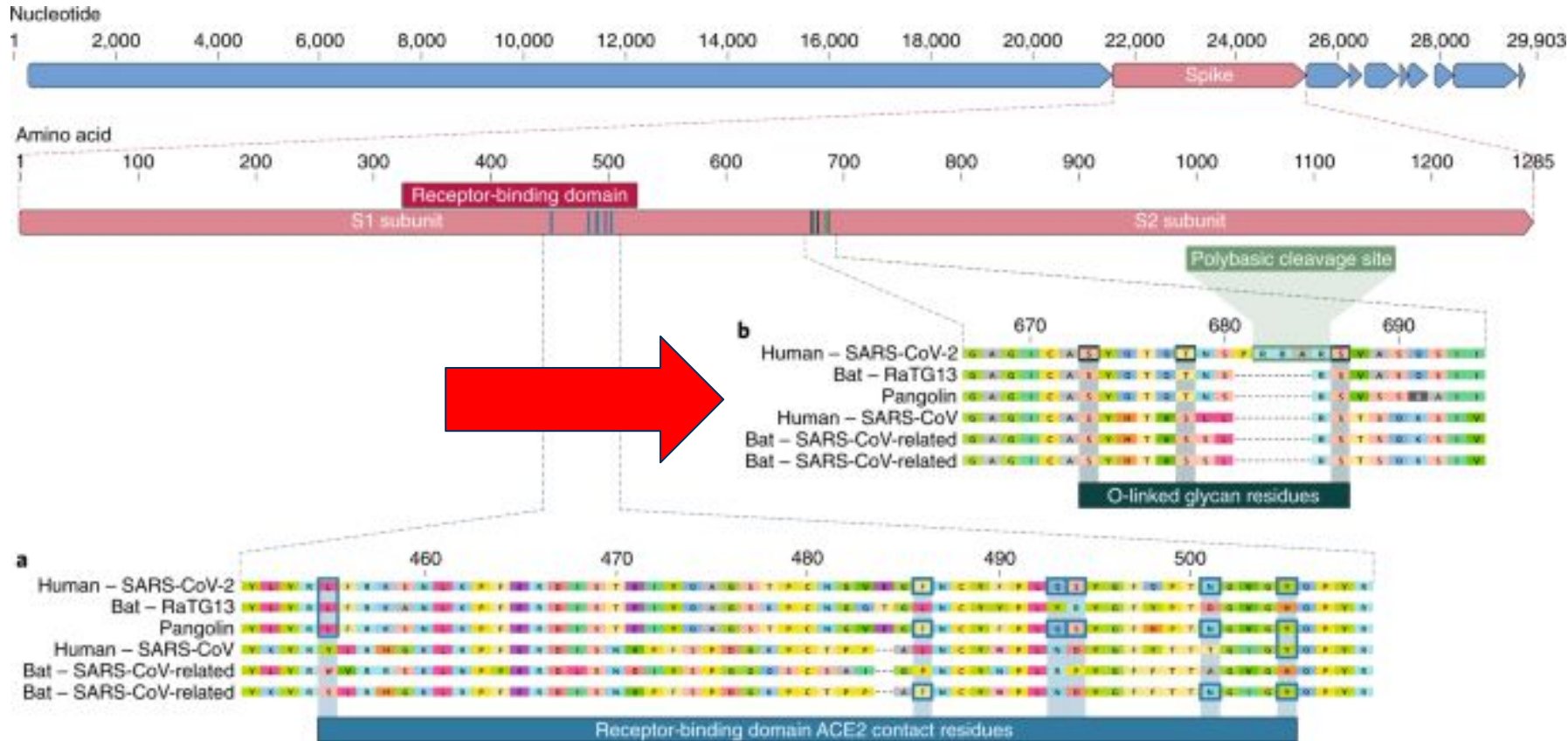
*Nature Medicine* **26**, 450–452(2020) | [Cite this article](#)

**5.07m** Accesses | **786** Citations | **34881** Altmetric | [Metrics](#)

**To the Editor** – Since the first reports of novel pneumonia (COVID-19) in Wuhan, Hubei province, China<sup>1,2</sup>, there has been considerable discussion on the origin of the causative virus, SARS-CoV-2<sup>3</sup> (also referred to as HCoV-19)<sup>4</sup>. Infections with SARS-CoV-2 are now widespread, and as of 11 March 2020, 121,564 cases have been confirmed in more than 110 countries, with 4,373 deaths<sup>5</sup>.

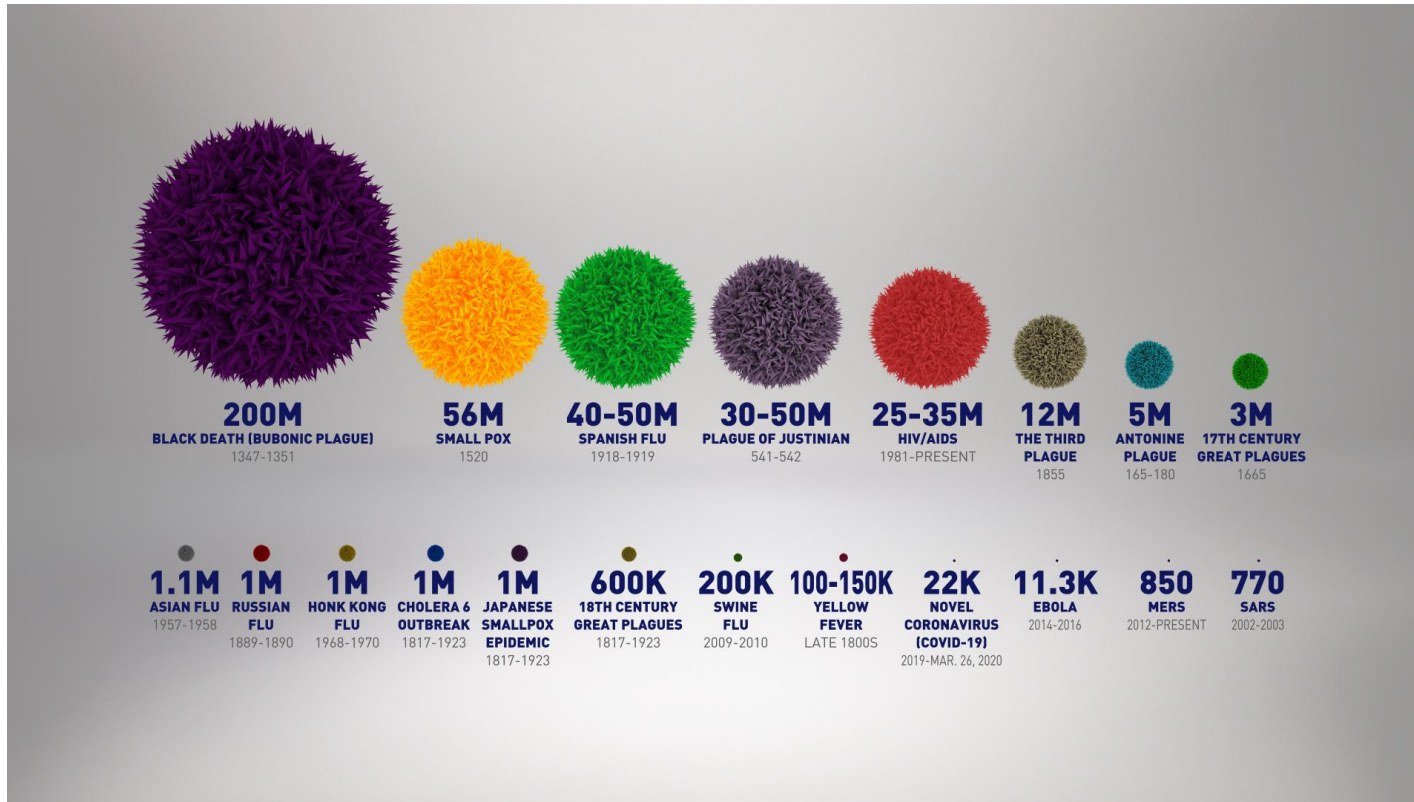


# Salto di specie



Sequenze compatibili

# Salto di specie



Morbillo e tubercolosi dal bestiame

Pertosse dal maiale

Influenza dalle anatre

Negli ultimi anni:

HIV, Ebola, Marburg, Nipah, Sars, H5N1, H1N1, Mers e Zika

# Salto di specie

Fondazione  
Umberto Veronesi  
— per il progresso  
delle scienze

*magazine*  
IL PORTALE DI CHI CREDE NELLA RICERCA

ONCOLOGIA FUMO ALIMENTAZIONE CARDIOLOGIA NEUROSCIENZE PEDIATRIA GINECOLOGIA

DONA ORA 

SEI IN : MAGAZINE > L'ESPERTO RISPONDE > COVID-19: PREVENIRE NUOVI VIRUS È UNA QUESTIONE ECOLOGICA

L'ESPERTO RISPONDE

## Covid-19: prevenire nuovi virus è una questione ecologica

Daniele Banfi

PUBBLICATO IL 08-05-2020



TAG:

CORONAVIRUS

BIODIVERSITÀ

Una pandemia ampiamente prevista e procurata dal comportamento dell'uomo. Per prevenire le successive occorrerà rimettere al centro la questione ecologica. L'intervista a Carlo Alberto Redi



GLOSSARI

POLMONITE  
CORONAVIRUS  
TAMPONE MOLECOLARE  
(COVID-19)  
TEST SIEROLOGICI (COV  
ID-19)

## Devastazione degli ecosistemi Vicinanza specie incompatibili





# Le ragioni dell'emergenza

 Tweet fissato



**Daniele Banfi**  
@danielebanfi83

...

Non sappiamo più come spiegarlo. La stragrande maggioranza dei positivi a [#COVID19](#) supera bene l'infezione. Quando però si verificano tanti casi in poco tempo, quella piccola percentuale che richiede assistenza ospedaliera diventa numericamente insostenibile. Questo è il punto!!!

11:02 PM · 26 ott 2020 · Twitter Web App

 Visualizza interazioni Tweet

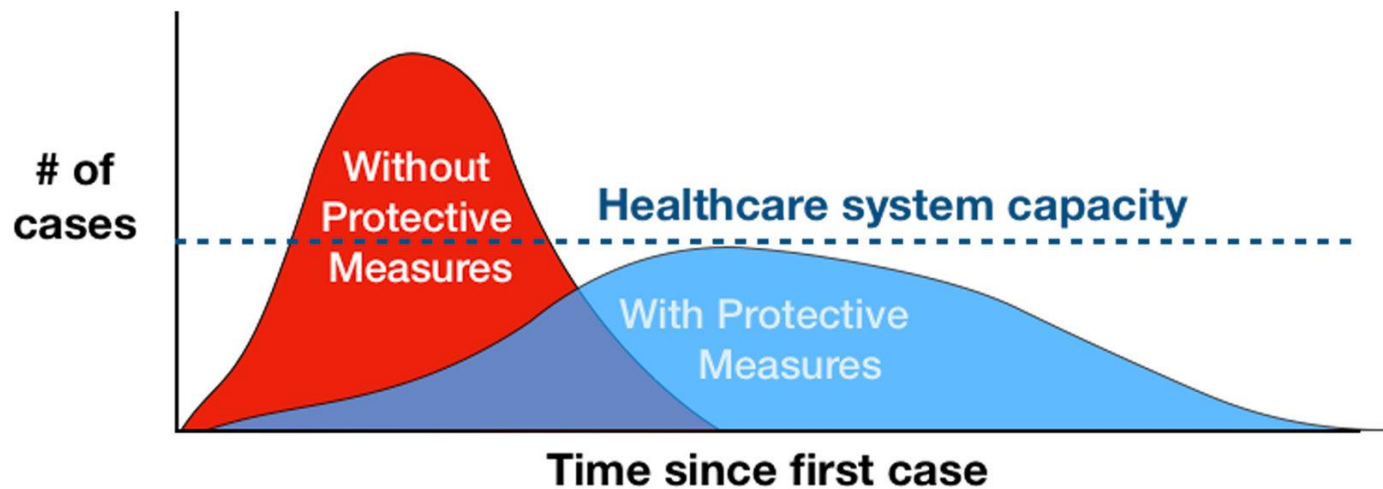
**221** Retweet **36** Tweet di citazione **773** Mi piace

**Tanti casi in poco tempo**

**Poco meno del 10% richiede ricovero**

**Sistema sanitario in tilt**

# Le ragioni dell'emergenza



*Adapted from CDC / The Economist*

**Ridurre i casi**  
**Spalmarli nel tempo**  
**Migliorare la capacità**

# L'evoluzione del virus

Zangrillo, San Raffaele: “Il coronavirus clinicamente è sparito, torniamo alla vita normale”. Locatelli (Iss): “Sconcertato”

L'ESPERTO

**«Coronavirus clinicamente morto». E il Veneto torna a zero contagi**

Navalesi, direttore della Scuola di specializzazione in Anestesia: spero di non vederlo più. Pronto un database con la storia clinica dei 650 degenti di Terapia intensiva

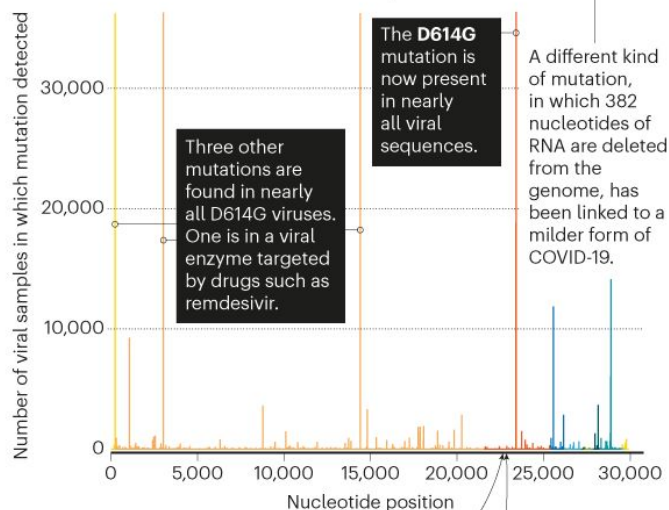
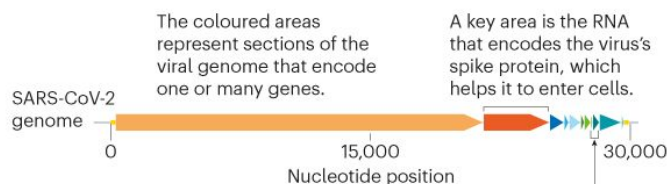
## Virus indebolito?

## Casi non più gravi?

# L'evoluzione del virus

## A CATALOGUE OF CORONAVIRUS MUTATIONS

Various mutations have been detected in SARS-CoV-2 genomes, including the most prevalent one, D614G. The virus's genetic code has just under 30,000 nucleotides of RNA, or letters, that spell out at least 29 genes. The most common mutations are single-nucleotide changes.



Lab experiments have flagged a mutation in the receptor binding domain (RBD) of the spike protein. This change boosts protein expression and is found in some virus samples.

Another mutation in the spike RBD allows the virus to escape recognition by some neutralizing antibodies. It was common in sequences from Scotland, UK, but hasn't been detected for months.

©nature

## Tante mutazioni Nessuna correla con malattia blanda

nature

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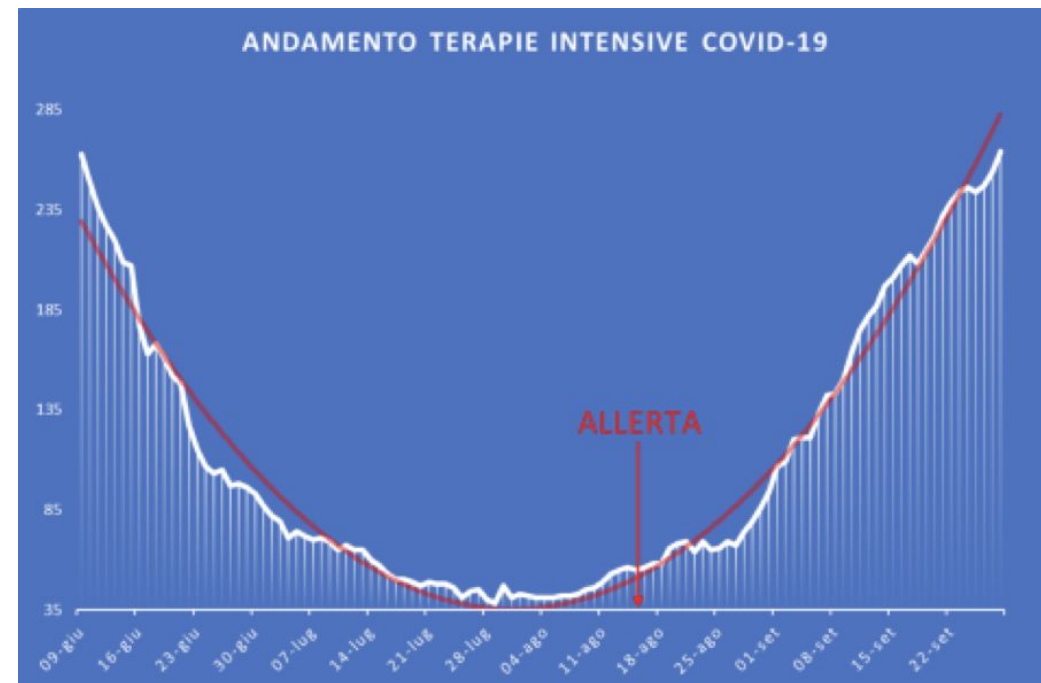
NEWS FEATURE · 08 SEPTEMBER 2020 · CORRECTION 16 SEPTEMBER 2020

## The coronavirus is mutating – does it matter?

Different SARS-CoV-2 strains haven't yet had a major impact on the course of the pandemic, but they might in future.

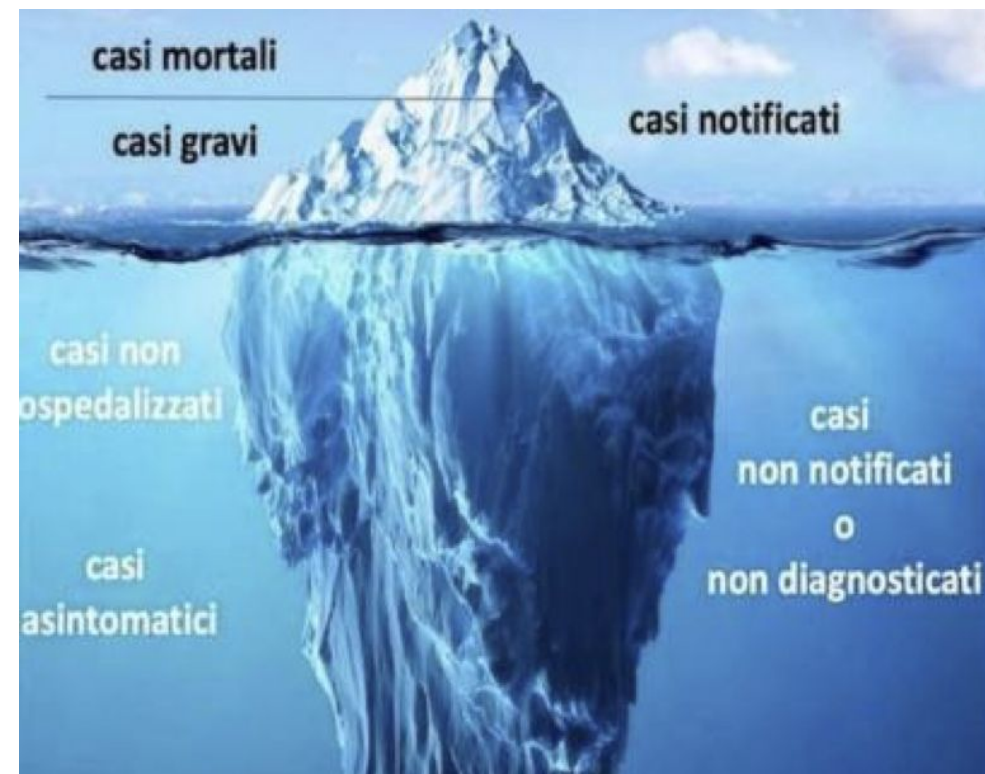
[Ewen Callaway](#)

# L'evoluzione del virus



**Pochi casi, pochi ricoveri, pochi posti occupati in TI...**

# L'evoluzione del virus




A marzo 6-10x numero di casi

# Terapie

## Remdesivir

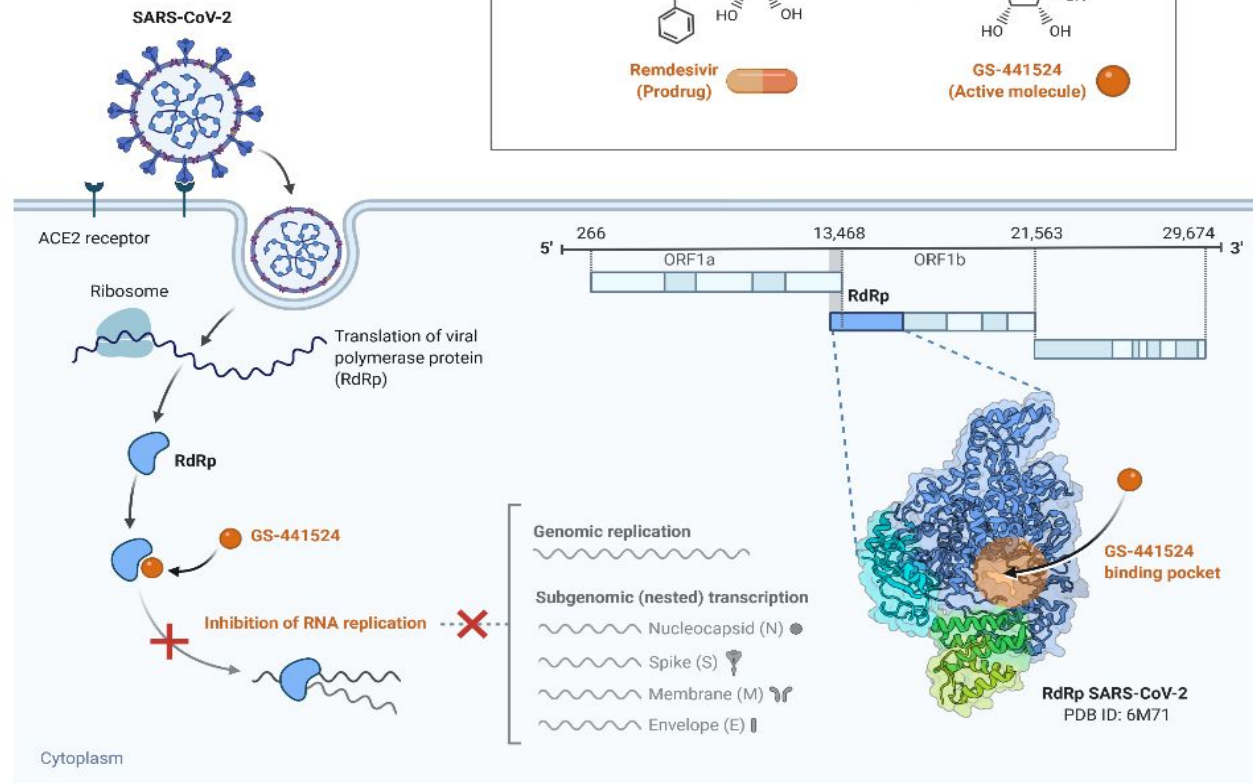
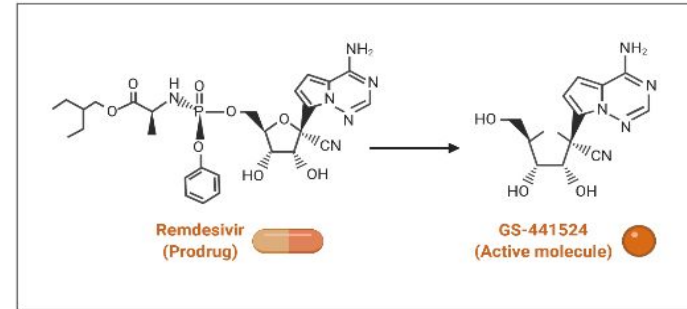
- Characteristics
- Mechanism of action
- Uses
- COVID-19 and Remdesivir



The  Biology Notes

### Remdesivir

Potential repurposed drug candidate for COVID-19



# Terapie

ORIGINAL ARTICLE

## Remdesivir for the Treatment of Covid-19 — Final Report

John H. Beigel, M.D., Kay M. Tomashek, M.D., M.P.H., Lori E. Dodd, Ph.D., Aneesh K. Mehta, M.D., Barry S. Zingman, M.D., Andre C. Kalil, M.D., M.P.H., Elizabeth Hohmann, M.D., Helen Y. Chu, M.D., M.P.H., Annie Luetkemeyer, M.D., Susan Kline, M.D., M.P.H., Diego Lopez de Castilla, M.D., M.P.H., Robert W. Finberg, M.D., et al., for the ACTT-1 Study Group Members\*

FDA NEWS RELEASE

## FDA Approves First Treatment for COVID-19

[f Share](#) [t Tweet](#) [in LinkedIn](#) [✉ Email](#) [🖨 Print](#)

For Immediate Release: October 22, 2020

**Non incide sulla mortalità  
Riduce i tempi di ricovero**



# Terapie



**Plasma iperimmune:**

**Occorrono malati**

**30% idoneo**

**Terapia non standardizzabile**

# Terapie

## Editorials

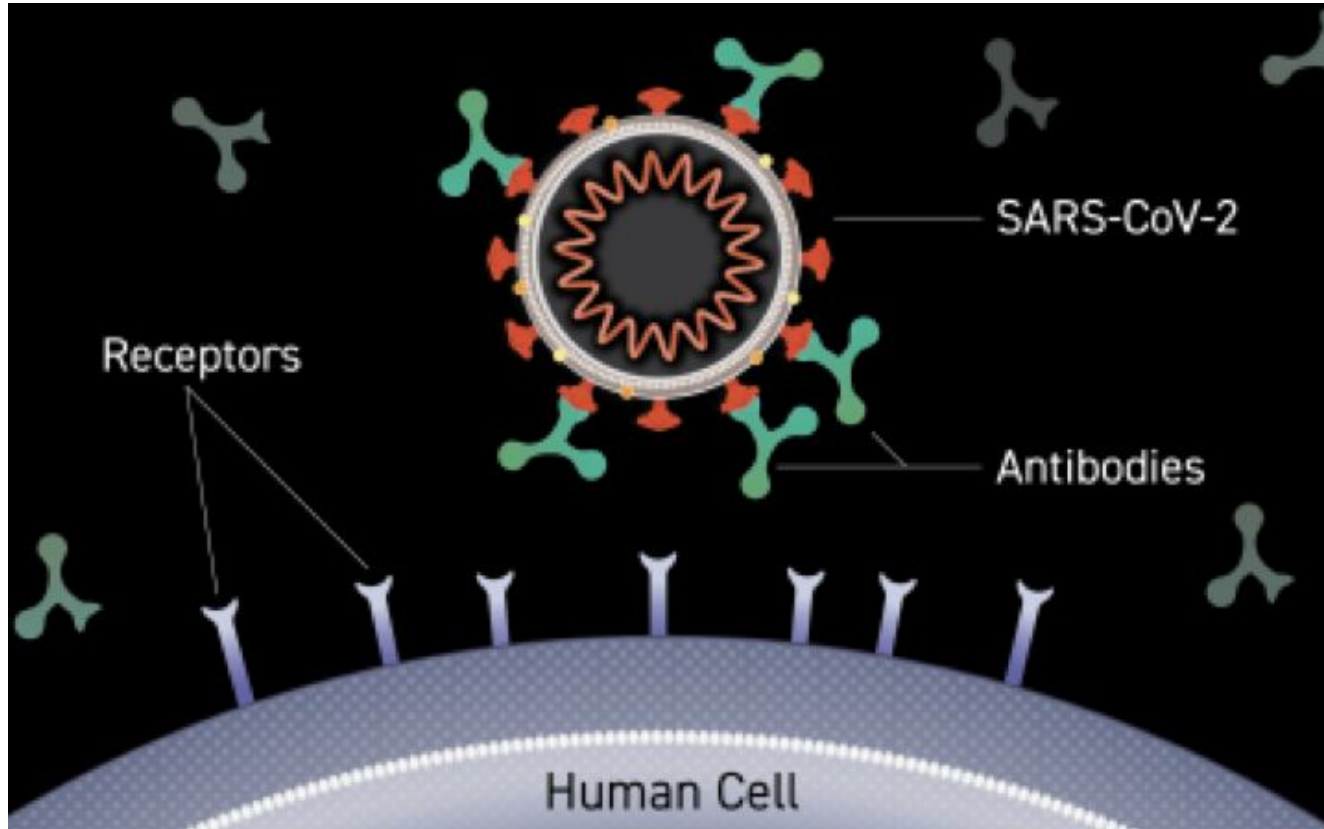
### Convalescent plasma is ineffective for covid-19

*BMJ* 2020 ; 371 doi: <https://doi.org/10.1136/bmj.m4072> (Published 22 October 2020)

Cite this as: *BMJ* 2020;371:m4072

**Tutto inutile? ...NO!**

# Terapie



**Miglior concentrato**

**Replicabile su scala industriale**

**Plasma iperimmune 2.0**

# Terapie

Fondazione  
Umberto Veronesi  
—per il progresso  
delle scienze

*magazine*

IL PORTALE DI CHI CREDE NELLA RICERCA

ONCOLOGIA FUMO ALIMENTAZIONE CARDIOLOGIA NEUROSCIENZE PEDIATRIA GINECOLOGIA

DONA ORA 

SEI IN : MAGAZINE > DA NON PERDERE > COVID-19: CON BAMLANIVIMAB INIZIA L'ERA DEGLI ANTICORPI MONOCLONALI

DA NON PERDERE

Daniele Banfi

## Covid-19: con bamlanivimab inizia l'era degli anticorpi monoclonali

PUBBLICATO IL 11-11-2020



TAG:

SPECIALE CORONAVIRUS

RICERCA CORONAVIRUS

Approvato all'uso in emergenza, l'anticorpo monoclonale si è dimostrato utile nel ridurre i sintomi e le probabilità di ricovero



a

GLOSSARI

TAMPONE MOLECOLARE  
(COVID-19)  
TEST SIEROLOGICI (COV  
ID-19)

## bamlanivimab

## ...altri in sperimentazione!

# Terapie

ORIGINAL ARTICLE

## Dexamethasone in Hospitalized Patients with Covid-19 — Preliminary Report

The RECOVERY Collaborative Group\*

Article [Figures/Media](#)

[Metrics](#)

July 17, 2020

DOI: 10.1056/NEJMoa2021436

[39 References](#) [277 Citing Articles](#)

**Ridurre l'infiammazione  
Ruolo anticoagulanti**

**Original Investigation** | Caring for the Critically Ill Patient

September 2, 2020

## Association Between Administration of Systemic Corticosteroids and Mortality Among Critically Ill Patients With COVID-19

### A Meta-analysis

The WHO Rapid Evidence Appraisal for COVID-19 Therapies (REACT) Working Group

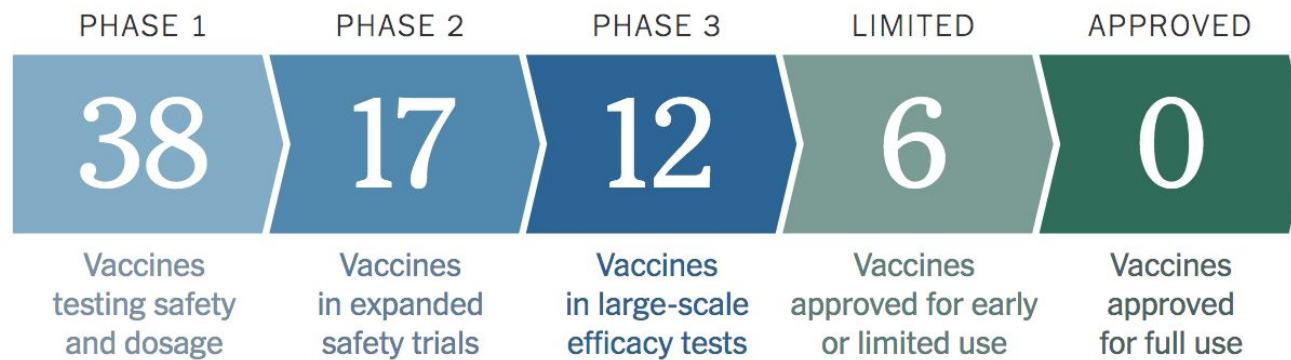
Article Information

JAMA. 2020;324(13):1330-1341. doi:10.1001/jama.2020.17023

# Vaccini

## Coronavirus Vaccine Tracker

By Jonathan Corum, Sui-Lee Wee and Carl Zimmer Updated November 17, 2020








**10 mesi dalla conoscenza della sequenza...**

Vaccines typically require years of research and testing before reaching the clinic, but scientists are racing to produce a safe and effective coronavirus vaccine by next year. Researchers are testing **54 vaccines** in clinical trials on humans, and at least 87 preclinical vaccines are under active investigation in animals.

# Vaccini

## Types of coronavirus vaccine approaches

Scientists are casting a wide net to see what works best against the novel coronavirus.

Types of vaccines	DNA and RNA	Live attenuated	Inactivated	Subunit	Viral vector
					
<b>How it works</b>	This vaccine uses DNA or RNA molecules to teach the immune system to target key viral proteins.	This is a weakened version of the actual virus.	An inactivated vaccine uses the whole virus after it has been killed with heat or chemicals.	This vaccine uses a piece of a virus' surface to focus your immune system on a single target.	This approach takes a harmless virus and uses it to deliver viral genes to build immunity.
<b>Advantages</b>	Easy and quick to design.	Stimulates a robust immune response without causing serious disease.	Safe because the virus is already dead and is easy to make.	Focuses the immune response on the most important part of the virus for protection and cannot cause infection.	Live viruses tend to elicit stronger immune responses than dead viruses or subunit vaccines.
<b>Disadvantages</b>	Never been done before. There are no licensed DNA or RNA vaccines currently in use.	May not be safe for those with compromised immune systems.	Not as effective as a live virus. Some previous inactivated vaccines have made the disease worse; safety for the novel coronavirus needs to be shown in clinical trials.	May not stimulate a strong response, other chemicals may need to be added to boost long-term immunity.	Important to pick a viral vector that is truly safe. An immune response to the viral vector could make the vaccine less effective.
<b>Existing examples</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• Measles, Mumps and Rubella</li> <li>• Chickenpox</li> </ul>	<ul style="list-style-type: none"> <li>• Polio</li> </ul>	<ul style="list-style-type: none"> <li>• Pertussis</li> <li>• Hepatitis B</li> <li>• Human papillomavirus (HPV)</li> </ul>	<ul style="list-style-type: none"> <li>• Ebola</li> <li>• Veterinary medicine</li> </ul>
<b>Group testing this approach for COVID-19</b>	<ul style="list-style-type: none"> <li>• Moderna (RNA)</li> <li>• Inovio (DNA)</li> </ul>	<ul style="list-style-type: none"> <li>• Codagenix</li> <li>• Indian Immunologicals Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>• Sinovac</li> <li>• Sinopharm</li> </ul>	<ul style="list-style-type: none"> <li>• Novavax</li> <li>• AdaptVac</li> </ul>	<ul style="list-style-type: none"> <li>• University of Oxford &amp; AstraZeneca</li> <li>• CanSino Biologics</li> <li>• Johnson &amp; Johnson</li> </ul>

Sources: CDC; NIAID; FDA

MICHELLE GUERRERO and JONATHAN WOSEN U-T

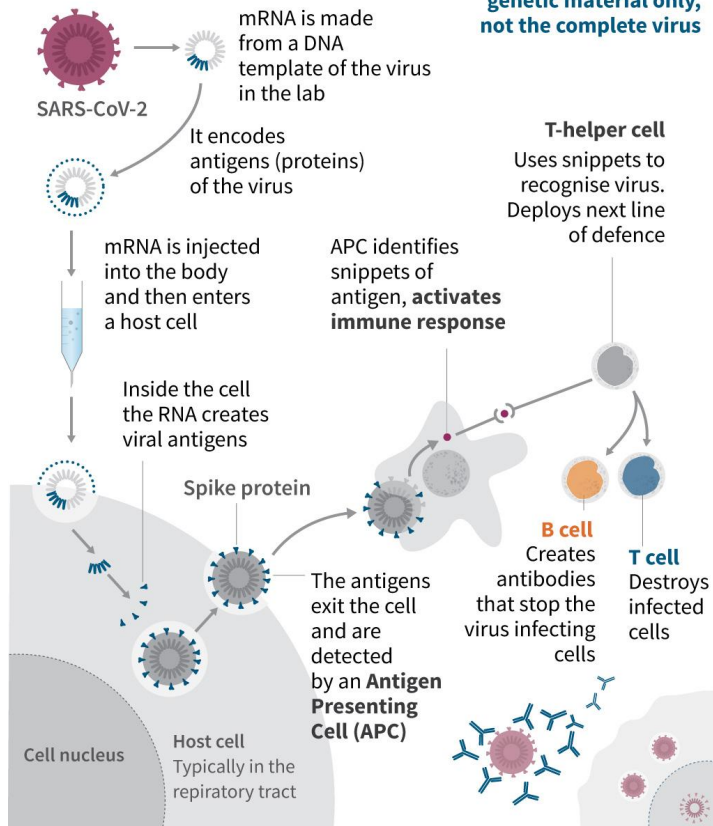
# Vaccini

## Triggering immunity from genetic code

The Pfizer Covid-19 vaccine is a **nucleic-acid\* vaccine**. It uses a lab-made SARS-CoV-2 messenger RNA (mRNA) to trigger the body's natural defences

### How a nucleic-acid vaccine works

**RNA- and DNA-based vaccines involve making genetic material only, not the complete virus**



\*The cell's main information-carrying molecules, which direct protein production

Source: Vaccine pipeline/Nature journal/pfizer.co.uk

AFP

## Siamo noi la fabbrica del vaccino

## Modulabile a seconda delle esigenze



# Vaccini

Fondazione Umberto Veronesi - per il progresso delle scienze

*magazine*

IL PORTALE DI CHI CREDE NELLA RICERCA

ONCOLOGIA FUMO ALIMENTAZIONE CARDIOLOGIA NEUROSCIENZE PEDIATRIA GINECOLOGIA

INserisci parole chiave...

DONNA ORA

SEI IN : MAGAZINE > DA NON PERDERE > COVID-19: IL PUNTO DELLA SITUAZIONE SUL VACCINO PFIZER

## DA NON PERDERE Covid-19: il punto della situazione sul vaccino Pfizer

Daniele Banfi

PUBBLICATO IL 09-11-2020



TAG:

SPECIALE CORONAVIRUS

RICERCA CORONAVIRUS

Il vaccino BNT162b2 sembrerebbe efficace nel 90% dei casi. Funzionamento, risultati e sfide future nella lotta a Covid-19



GLOSSARI

TAMPONE MOLECOLARE (COVID-19)  
TEST SIEROLOGICI (COVID-19)

I TOOL DELLA SALUTE

The New York Times

## Early Data Show Moderna's Coronavirus Vaccine Is 94.5% Effective

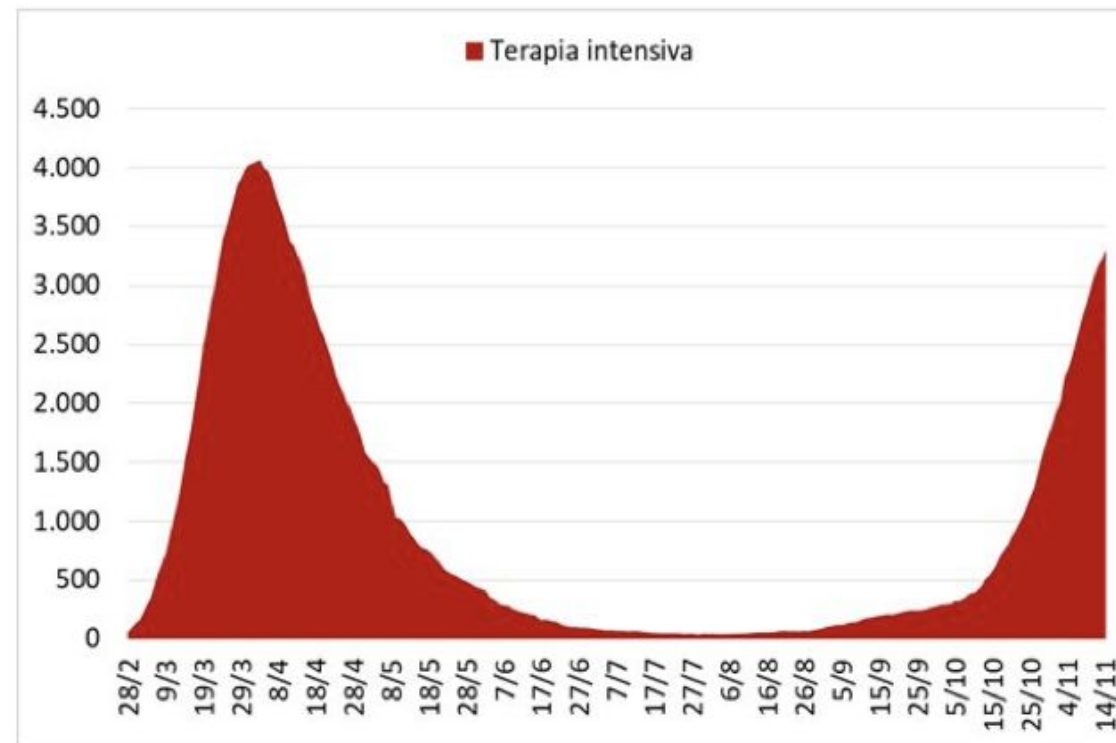
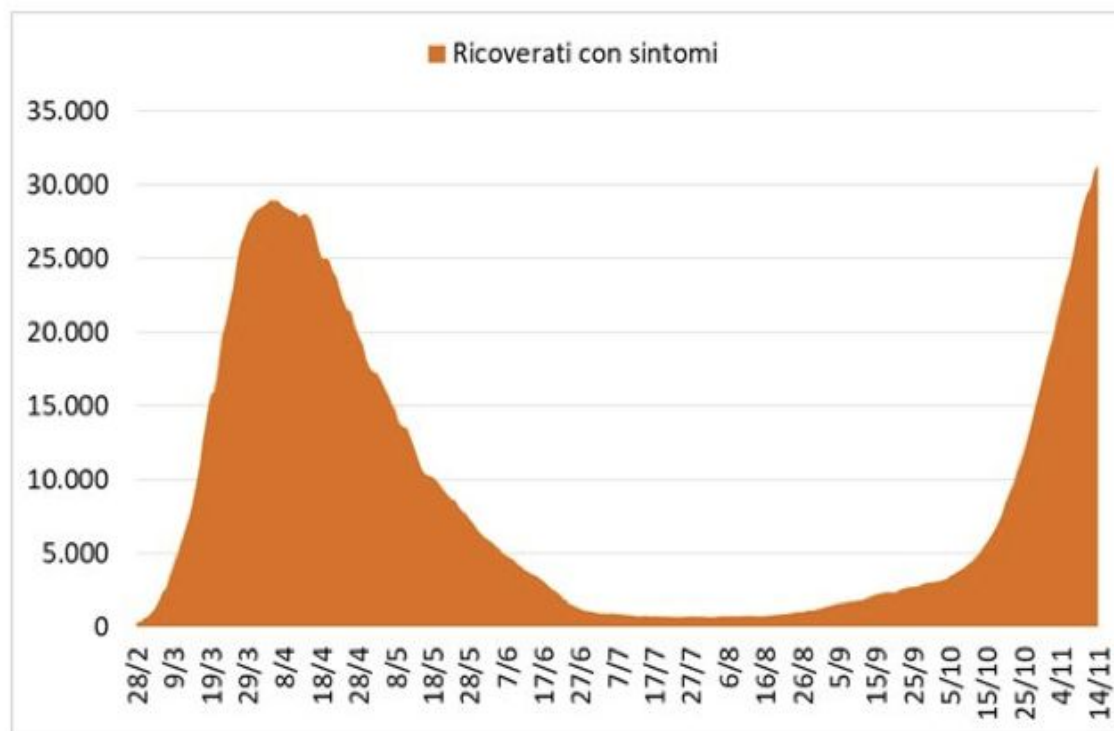
Moderna is the second company to report preliminary results from a large trial testing a vaccine. But there are still months to go before it will be widely available to the public.



Moderna Therapeutics in Cambridge, Mass. Tony Luong for The New York Times

Produzione, distribuzione... sfida logistica

# I prossimi mesi

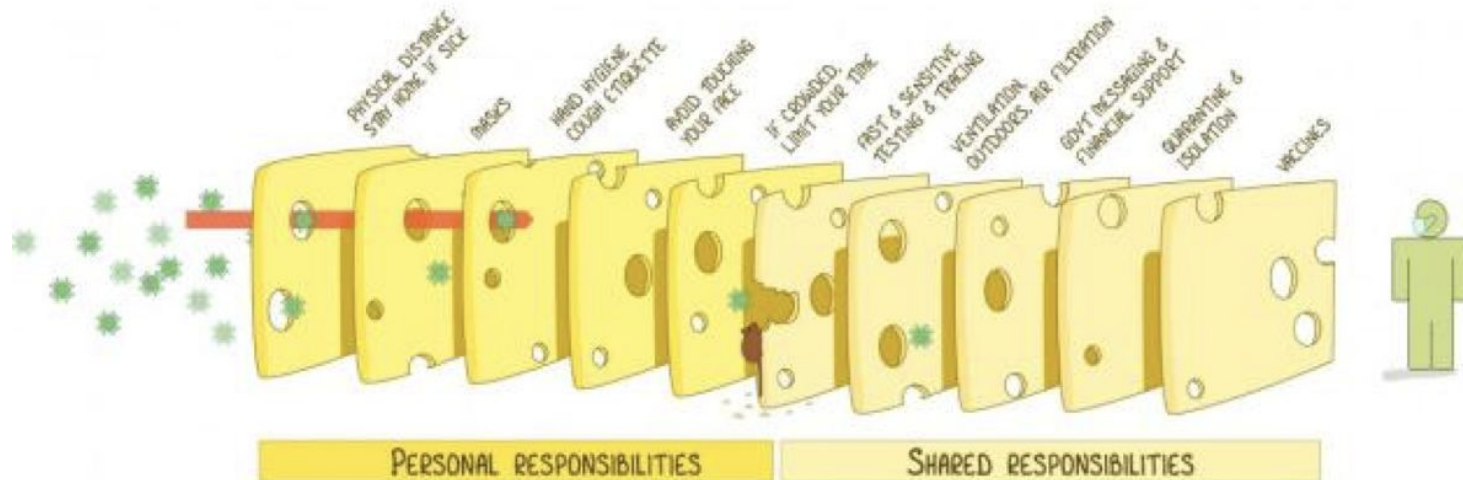


**Situazione peggiore? Sì...  
Spalmata in tutta Italia**

# I prossimi mesi

## THE SWISS CHEESE RESPIRATORY VIRUS PANDEMIC DEFENCE

RECOGNISING THAT NO SINGLE INTERVENTION IS PERFECT AT PREVENTING SPREAD

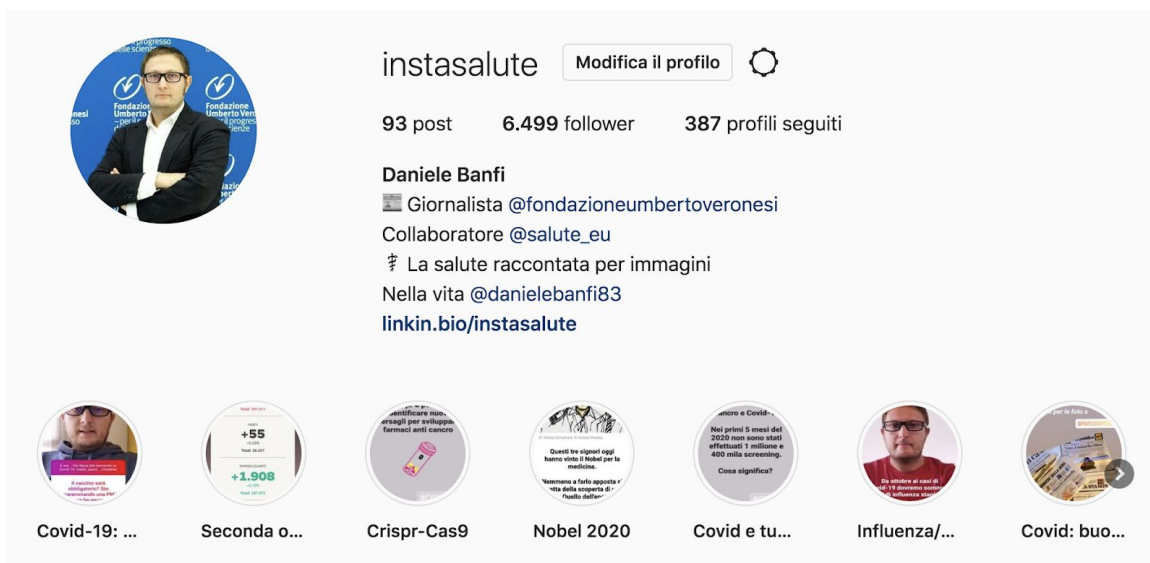


EACH INTERVENTION (LAYER) HAS IMPERFECTIONS (HOLES).  
MULTIPLE LAYERS IMPROVE SUCCESS.

Jim H. Thacker  
VIRUS@YOHANUNDELOD.COM  
WITH THANKS TO JOEY LABRO, EXTREME ACHER & THE LAW OF OLD  
BASED ON THE SWISS CHEESE MODEL OF ACCIDENT CAUSATION BY JAMES T. BEASLEY, 1990  
VERSION 3.0  
UPDATED: 24OCT2020

**Tutti siamo protagonisti  
Comportamenti, migliori terapie, 3T,  
vaccini**

# Per maggiori informazioni



The screenshot shows the Instagram profile for 'instasalute'. The profile picture is a circular image of a man in a suit. The bio includes the name 'Daniele Banfi', his role as a journalist for 'Fondazione Umberto Veronesi', and his contact information: '@salute\_eu', '@danielebanfi83', and 'linkin.bio/instasalute'. The profile statistics show 93 posts, 6,499 followers, and 387 profiles followed. Below the bio are seven featured posts with circular thumbnails and captions: 'Covid-19: ...', 'Seconda o...', 'Crispr-Cas9', 'Nobel 2020', 'Covid e tu...', 'Influenza/...', and 'Covid: buo...'. Each post thumbnail contains text related to the topic.

[daniele.banfi@fondazioneveronesi.it](mailto:daniele.banfi@fondazioneveronesi.it)

Instagram: @instasalute

Twitter: @danielebanfi83



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*presenta le LEZIONI DI SCIENZA*  
*gli eventi di approfondimento sulle materie scientifiche*

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