“Responding to the Pandemic Together” Programme
Event 22: Key considerations for developing COVID-19 treatments: learning from the past and planning for the future
Delivered by the FIP Pharmacy Practice Research Special Interest Group
Victoria Garcia Cardenas

- Senior Lecturer, University of Technology Sydney
- Chair, FIP Pharmacy Practice Research SIG
- Associate Editor, Research in Social and Administrative Pharmacy

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@VGC_AF
I. Provide relevant information and interim guidelines for pharmacists and the pharmacy workforce on Coronavirus SARS-CoV-2/COVID-19 pandemic.

II. Share and discuss strategies adopted by pharmacy leaders and workers - including our Member Organisations – in response to the pandemic.

III. Describe sector or area-specific implications, innovations and approaches adopted across pharmaceutical science, practice and education.

IV. Engage frontline workers of the health and pharmacy workforce to know about the realities facing them around the world.

V. Discuss the implications of the pandemic on issues such as safety, supply, shortages that have been exacerbated by COVID-19, and health systems across our nations and regions.

VI. Consider the impact of this disease on patients across age groups and with concurrent conditions.

VII. Assess and discuss the evidence behind treatments and the process of developing therapies, vaccines and tests.

Welcome to the “Responding to the Pandemic Together” events
FIP’s Special Online Programme on COVID-19

These webinars aim to:

To share ideas on webinar topics we should feature, or if you’d like to share your story on dealing with the pandemic please email lina@fip.org
Important Links & Resources

FIP Covid-19 Information Hub
A comprehensive FIP webpage containing all of our resources and outputs relating to COVID-19, including recordings of previous webinars.
Link: https://www.fip.org/coronavirus

FIP Facebook Group: “COVID-19 & pharmacy”
Link: https://www.facebook.com/groups/covid19andpharmacy/
Announcements

FIP Digital Events House Rules

1. This webinar is being recorded and live streamed on Facebook
2. The recording will be freely available at www.fip.org/coronavirus and on our YouTube channel
3. You may ask questions by typing them into the Q&A box
4. Your feedback is welcome (webinars@fip.org)

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What is the current evidence on COVID-19 treatments?

What are the key clinical trials?

What are the Solidarity trial (WHO) and Recovery trial (UK) assessing?

Repurposed vs novel drugs?

What is the disease burden of COVID-19?

Cost effectiveness of antivirals for influenza-like illnesses?

What are the costs and economic implications from the health care system perspective?

Remdesivir vs dexamethasone?

Remdesivir stockpiling?
Learning Objectives

- To evaluate the current state of clinical research and the potential for developing curative treatments for COVID 19

- To summarise the key consideration when developing treatments for pandemics of respiratory illnesses

- To assess the potential clinical and economic value of COVID19 treatments
Speaker 1

Syed Shahzad Hasan, PhD

Senior Lecturer, Department of Pharmacy, University of Huddersfield, UK
& Senior Lecturer (Conjoint), School of Biomedical and Pharmacy, University of Newcastle, Australia

Email: s.hasan@hud.ac.uk  Shahzad_Tweets
COVID-19 Pandemic

Background


- No pharmaceutical products have yet been shown to be safe and effective for the treatment of COVID-19.

- Drugs for COVID-19 treatment
  - Repurposed drugs
  - Novel drugs?

- Drugs for the management of critical COVID-19 cases

- Vaccines for Prevention
## COVID-19 Pandemic

### Different Phases and Transmission

<table>
<thead>
<tr>
<th>Phases</th>
<th>Transmission</th>
<th>Treatment</th>
<th>Preventative measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>?</td>
<td>-</td>
<td>mask wearing + physical distancing</td>
</tr>
<tr>
<td>Pre-symptomatic</td>
<td>Possible</td>
<td>-</td>
<td>mask wearing + physical distancing</td>
</tr>
<tr>
<td>Mild</td>
<td>Possible</td>
<td>Symptomatic treatment</td>
<td>mask wearing + physical distancing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hospitalised?</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Standard care?</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Trial drugs?</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>Possible</td>
<td>Hospitalised</td>
<td>mask wearing + physical distancing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard care</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Trial drugs</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>Possible</td>
<td>Hospitalised</td>
<td>mask wearing + physical distancing</td>
</tr>
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<td></td>
<td></td>
<td>Standard care</td>
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<tr>
<td></td>
<td></td>
<td>Trial drugs</td>
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</table>
COVID-19 Pandemic

Key Clinical Trials

SOLIDARITY TRIAL (WHO)

- As of 3 June 2020, more than 3500 patients have been recruited in 35 countries, with over 400 hospitals actively recruiting patients.

- Remdesivir
- Lopinavir/Ritonavir and
- Lopinavir/Ritonavir with Interferon beta-1a
- Hydroxychloroquine (dropped)

RECOVERY TRIAL (UK)

- Over 11,000 patients have been randomised to the following treatment arms, or no additional treatment:

- Lopinavir-Ritonavir
- Low-dose Dexamethasone
- Hydroxychloroquine (dropped)
- Azithromycin Tocilizumab
- Convalescent plasma.
# COVID-19 Pandemic

## Repurposed drug/therapy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td>Antimalarials and disease-modifying antirheumatic drug for rheumatoid diseases.</td>
</tr>
<tr>
<td>Chloroquine (CQ) and</td>
<td>Investigated after the first SARS-CoV infection</td>
</tr>
<tr>
<td>hydroxychloroquine (HCQ)</td>
<td>Both drugs have demonstrated in vitro antiviral activity against SARS-CoV-2 (Liu et al., 2020;</td>
</tr>
<tr>
<td></td>
<td>Wang et al., 2020; Yao et al., 2020)</td>
</tr>
<tr>
<td><strong>Control/Comparator</strong></td>
<td>Clinical use of CLQ in the treatment of COVID-19 associated pneumonia in China (Gao et al., 2020)</td>
</tr>
<tr>
<td>Placebo</td>
<td>First trial on thirty-six COVID-19 patients with a mixed sample of asymptomatic or mild or</td>
</tr>
<tr>
<td>Usual care</td>
<td>moderate or severe cases (Gautret et al., 2020).</td>
</tr>
<tr>
<td>Lopinavir/ritonavir</td>
<td></td>
</tr>
</tbody>
</table>
## COVID-19 Pandemic

**Repurposed drug/therapy**

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<tr>
<td><strong>Treatment</strong></td>
<td>Eight trials on HCQ/CLQ: six on treatment and two on prophylaxis. Results are conflicting, lacked statistical significance and baseline disease severity or comorbidities in many cases, and recruited a fairly small patients group.</td>
</tr>
<tr>
<td>Chloroquine (CQ) and hydroxychloroquine (HCQ)</td>
<td></td>
</tr>
<tr>
<td><strong>Control/Comparator</strong></td>
<td>RECOVERY TRIAL No significant difference in the primary endpoint of 28-day mortality (25.7% HCQ vs. 23.5% usual care). There was also no evidence of beneficial effects on hospital stay duration or other outcomes.</td>
</tr>
<tr>
<td>Placebo</td>
<td></td>
</tr>
<tr>
<td>Usual care</td>
<td>SOLIDARITY TRIAL WHO Solidarity Trial dropped HCQ</td>
</tr>
<tr>
<td>Lopinavir/ritonavir</td>
<td></td>
</tr>
</tbody>
</table>
## COVID-19 Pandemic
### Repurposed drug/therapy

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<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td><strong>Evidence</strong></td>
</tr>
<tr>
<td>Lopinavir/Ritonavir</td>
<td>Lopinavir was identified as having in vitro inhibitory activity against SARS-CoV. (Chu et al, 2004; Chen et al, 2004; Wu et al, 2004)</td>
</tr>
<tr>
<td><strong>Control/ Comparator</strong></td>
<td><strong>Evidence</strong></td>
</tr>
<tr>
<td>Standard care</td>
<td>No significant difference between Lopinavir/Ritonavir and standard care or arbidol (umifenovir) in mild/moderate COVID-19 for incidence of viral negative conversion at D7 (Li et al, 2020).</td>
</tr>
<tr>
<td></td>
<td>No significant difference between Lopinavir/Ritonavir and standard care for incidence of viral negative conversion at D7 and incidence of clinical improvement at D7 (Cao B, 2020).</td>
</tr>
<tr>
<td></td>
<td>Osborne et al (2020) found no clear benefit for the use of lopinavir-ritonavir compared to standard of care in severe COVID-19.</td>
</tr>
</tbody>
</table>
**COVID-19 Pandemic**  
*Repurposed drug/therapy*

<table>
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<tr>
<th>Drug</th>
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<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td>RECOVERY TRIAL</td>
</tr>
<tr>
<td>Lopinavir/Ritonavir</td>
<td>A total of 1596 patients were randomised to lopinavir-ritonavir and compared with 3376 patients randomised to usual care alone.</td>
</tr>
<tr>
<td><strong>Control/ Comparator</strong></td>
<td>No significant difference in the primary endpoint of 28-day mortality (22.1% lopinavir-ritonavir vs. 21.3% usual care).</td>
</tr>
<tr>
<td>Standard care</td>
<td>No evidence of beneficial effects on the risk of progression to mechanical ventilation or length of hospital stay.</td>
</tr>
</tbody>
</table>
COVID-19 Pandemic

Repurposed drug/therapy

<table>
<thead>
<tr>
<th>Drug</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>Remdesivir is a broad-spectrum antiviral (Wang et al, 2020).</td>
</tr>
<tr>
<td>Remdesivir</td>
<td>Lower efficacy in comparison to monoclonal antibody therapies in Ebola virus disease (Mulangu et al)</td>
</tr>
<tr>
<td>Comparator</td>
<td>No significant difference for viral negative conversion, clinical improvement, clinical recovery and all-cause mortality at D7 and D14-D28 (Wang Y et al, 2020)</td>
</tr>
<tr>
<td>Placebo</td>
<td>No significant difference for time to death among moderate to critical cases but found significant difference for clinical recovery and for all-cause mortality at D14-D28 (Beigel et al, 2020)</td>
</tr>
<tr>
<td></td>
<td>Clinical use in severe cases of COVID-19 in a hospital setting or as emergency use in critically ill COVID-19 patients</td>
</tr>
</tbody>
</table>
## COVID-19 Pandemic

**Repurposed drug/therapy**

<table>
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<tr>
<th>Drug</th>
<th>Evidence</th>
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<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td><strong>Evidence</strong></td>
</tr>
<tr>
<td>Favipiravir (FPV)</td>
<td>FPV selectively inhibits RNA polymerase, which is necessary for viral replication</td>
</tr>
<tr>
<td><strong>Control Group</strong></td>
<td></td>
</tr>
<tr>
<td>Arbidol</td>
<td>Clinical recovery rate does not significantly differ between FPV group and Arbidol group (61% vs 52%) for total, moderate (71% vs 56%) and severe patients (6% vs 0%) (Chen et al)</td>
</tr>
<tr>
<td>Lopinavir/Ritonavir</td>
<td>No significant difference for clinical improvement among mild/moderate patients between FPV vs Lopinavir/Ritonavir + Arbidol + Interferon-α or Baloxavir for viral negative conversion or clinical improvement (Lou Y et al).</td>
</tr>
<tr>
<td>Darunavir/Cobicistat</td>
<td></td>
</tr>
<tr>
<td>Baloxavir</td>
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</tbody>
</table>

A significantly higher improvement rate in chest imaging and faster viral clearance in FPV arm plus interferon-α than LPV/RTV group plus IFN-α (Cai et al)
## COVID-19 Pandemic

### Novel Drugs and Targets

<table>
<thead>
<tr>
<th>Drug</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novel drugs</td>
<td>β-D-N4-hydroxycytidine (NHC, EIDD-1931) - broad-spectrum antiviral activity against various unrelated RNA viruses including influenza, Ebola, and CoV</td>
</tr>
<tr>
<td></td>
<td>Sheahan et al discovered that NHC</td>
</tr>
<tr>
<td></td>
<td>• potently inhibits coronavirus replication in cell lines</td>
</tr>
<tr>
<td></td>
<td>• is highly active against coronavirus in primary human airway epithelial cell cultures</td>
</tr>
<tr>
<td></td>
<td>• is effective against remdesivir (RDV)-resistant coronavirus</td>
</tr>
</tbody>
</table>
**COVID-19 Pandemic**

**Novel Drugs and Targets**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novel drugs</td>
<td>Add-on approach to dismantle the host cell machinery that enables the virus to infect the host cell and spread from one cell to another.</td>
</tr>
<tr>
<td></td>
<td>Host cell proteases as potential drug targets – Glycopeptide antibiotics (Teicoplanin), Factor Xa inhibitors (rivaroxaban, apixaban &amp; edoxaban), etc</td>
</tr>
<tr>
<td></td>
<td>• Dexamethasone inhibits protease activity (Crossland et al., 2010)</td>
</tr>
<tr>
<td></td>
<td>• HCQ/CLQ inhibits protease activity by increasing endosomal pH (Wang et al., 2020)</td>
</tr>
</tbody>
</table>
COVID-19 Pandemic

Novel Drugs and Targets

<table>
<thead>
<tr>
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<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novel drugs</td>
<td></td>
</tr>
<tr>
<td>Neutrophil Elastase Inhibitors (e.g sivelestat)</td>
<td>Mohamad et al (2020)</td>
</tr>
</tbody>
</table>

*Figure 1* Mechanism of action of neutrophil elastase inhibitors in COVID-19. Red indicates block. ARDS acute respiratory distress syndrome.
Speaker 2

Dalia Dawoud, PhD
Associate Editor, Pharmacoeconomics and Outcomes Research, Research in Social and Administrative Pharmacy (RSAP) Elsevier, UK &
Associate Professor, Faculty of Pharmacy, Cairo University, Egypt

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Disclaimer

- The views expressed in this presentation are my own and not those of my employer(s)

- No conflicts of interests to declare
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**The “infodemic”**

- Over 2400 clinical studies related to COVID-19 (ClinicalTrials.Gov)
- Over 28,400 publications using the keyword “COVID-19” (PubMed)

Credit: WHO/Sam Bradd
COVID-19 Pandemic
From trials to Market

- Regulatory approval
  - Randomised controlled trials (RCTs)

- Market access
  - Clinical effectiveness evidence
  - Cost effectiveness evidence
  - Budget impact

- Post-Marketing Surveillance
  - Observational studies

- Clinical Guidelines
  - Clinical effectiveness evidence
  - (Cost effectiveness evidence)
  - (Budget impact)
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Research and Development Costs and funding for ongoing trials

Cost of drug development

- The median cost of bringing a new drug to market was $985 million, and the average cost was $1.3 billion.
- Previous studies have placed the average cost of drug development as high as $2.8 billion.
- Public funding (NIH, NIHR, WHO) enabled R&D into COVID-19 treatments to be accelerated.

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*Speed vs Rigour*

**Speed is Not Always a Good Thing!**

- This is the time for global and national payers to revert to known and tested mechanisms such as health technology assessment (HTA) for assessing comparative clinical and cost effectiveness of medical technologies, placing their faith on evidence, value for money, and due process.

[Link to the article](https://www.cgdev.org/blog/healthcare-technologies-and-covid-19-speed-not-always-good-thing?fbclid=IwAR2j98zLShkATeNlmix-MpjXW7Dx7Gdmg9xKoab04gBN-mX6vO_LEvyCs)
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*Speed vs Rigour*

High-profile article retractions

- The Lancet and New England Journal of Medicine
- Hyderoxychloroquine for the treatment of COVID-19
- Confusion and knee-jerk reactions!

WHO halts hydroxychloroquine trial for coronavirus amid safety fears

Malaria drug taken by Trump could raise risk of death and heart problems, study shows

WHO to resume hydroxychloroquine trial after earlier halt over safety concerns

Questions raised over study claiming drug linked to higher rate of mortality and heart problems in Covid-19 patients
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The disease burden

- Over 10 million cases & 500,000 deaths worldwide
- Excess mortality and quality-adjustment
- Complications and long-term damage (VTE, pulmonary fibrosis, new onset diabetes, neurological and psychological impact)

https://coronavirus.jhu.edu/map.html
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The economic impact

From local to global level

The coronavirus outbreak could cost the global economy up to $2 trillion this year. (U.N.)
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The value of a death averted

- Average fiscal value per death of **Int$ 444,626***

- As of Saturday 4 July 2020, Total of Int$ 234,630,918,704

COVID-19 Pandemic

Cost effectiveness of antivirals- a review

• **Aim**: inform COVID-19 drug development efforts and identify key drivers of cost effectiveness

• **Methods**:
  - *Systematic review* of published *economic evaluations* of *antivirals* (as a class) for pandemics and outbreaks of influenza-like illnesses
  - *Search first run on 26 March 2020 (currently being updated) and limited to recent 10 years.*
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Cost effectiveness of antivirals- Findings

• Findings:

• 14 full economic evaluations from USA, Australia, UK, France, Netherlands, Canada and China

• Compared antiviral treatment to other pharmaceutical and non-pharmaceutical strategies including vaccination, antiviral prophylaxis, social distancing, school closures as well as combinations of these strategies

• All covering use in the H1N1 outbreak
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Cost effectiveness of antivirals- Findings

• Findings:
  • The most commonly-used regimen oseltamivir 75 mg given twice daily for 5 days.
  • In 3 studies, zanamivir was used in a sensitivity analysis. Other agents used included peramivir.

• Antiviral treatment was found to be either cost saving or cost effective at the study-specific willingness-to-pay thresholds.

• Empirical treatment or treatment based on clinical judgment emerging as the most likely to be cost effective compared to test-guided treatment.
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Cost effectiveness of antivirals - Key considerations

• **Antiviral treatment** assumed to start early (48 hours from start of symptoms)

• Main **drivers** of cost effectiveness:
  - *Antiviral effectiveness*
  - *Prevalence*
  - *Viral basic reproduction number (R0)*
  - *Case fatality rate (CFR)*
  - *Level of adherence to other non-pharmaceutical strategies (e.g. social distancing, hand washing)*
  - *Antiviral cost*
COVID-19 Pandemic
Timing is key!

<table>
<thead>
<tr>
<th>remdesivir</th>
<th>vs</th>
<th>dexamethasone</th>
</tr>
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<tbody>
<tr>
<td>Branded (Gilead Sciences)</td>
<td>Generic</td>
<td></td>
</tr>
<tr>
<td>200 mg day 1, 100 mg days 2–10 (IV)</td>
<td>6 mg, once daily for up to 10 days</td>
<td></td>
</tr>
<tr>
<td>Hospitalised patients with severe COVID-19 (Multinational, n=1063)</td>
<td>Hospitalised patients with severe COVID-19 (UK, n=6425)</td>
<td></td>
</tr>
</tbody>
</table>
COVID-19 Pandemic

Timing is key!

<table>
<thead>
<tr>
<th>Remdesivir</th>
<th>vs</th>
<th>Usual care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortality:</strong>&lt;br&gt; Hazard ratio: 0.70 (0.47–1.04) (NS)&lt;br&gt; <strong>Median recovery time:</strong>&lt;br&gt; – 4·0 day (NS)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Value-based price (VBP):</strong> $4,460 per course of treatment*&lt;br&gt; (assuming mortality benefit)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*ICER, May 2020

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**Alternative Pricing Models for Remdesivir and Other Potential Treatments for COVID-19**

Published May 1, 2020

[ICER logo]
COVID-19 Pandemic

**Timing is key!**

<table>
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<th>Remdesivir vs Dexamethasone</th>
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<td><strong>Mortality:</strong> Hazard ratio: 0.70 (0.47–1.04) (NS)</td>
</tr>
<tr>
<td>Median recovery time: – 4.0 day (NS)</td>
</tr>
<tr>
<td>VBP: $2,520 - $2,800 per course of treatment*</td>
</tr>
<tr>
<td>Assuming mortality benefit</td>
</tr>
<tr>
<td><strong>Mortality:</strong> reduced by ~20-33% depending on subgroup</td>
</tr>
<tr>
<td>Age-adjusted rate ratio: 0.83 (95% CI: 0.74-0.92)</td>
</tr>
<tr>
<td>$14.87 per course of treatment*</td>
</tr>
</tbody>
</table>

*ICER, June 2020
COVID-19 Pandemic

Choosing Wisely!

If not effective, it is not cost effective

- Hydroxychloroquine
- Lopinavir/ritonavir

In hospitalised patients with severe COVID-19

Better value in their original indications
COVID-19 Pandemic
Supply and demand

- **Repurposed** drugs and their use in **other indications**

- **Manufacturing capacity** is a rate limiting step

- **Stockpiling** and **export restrictions**

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US secures world stock of key Covid-19 drug remdesivir

No other country will be able to buy remdesivir, which can help recovery from Covid-19, for next three months at least

Australia secures stockpile of coronavirus drug remdesivir after US hoards supplies
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Remdesivir stockpiling - Should the rest of the world really care?

No:

• Likely overpriced given its efficacy data
  $2,340 for 5-day course  
  “Future studies of remdesivir, including earlier treatment in patients with COVID-19 and higher-dose regimens or in combination with other antivirals or SARS-CoV-2 neutralizing antibodies in those with severe COVID-19 are needed to better understand its potential effectiveness.” (Wang et al. 2020)

• Production cost-recovery price estimated to be $10 per 10-day treatment course  (Hill et al. 2020)
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Remdesivir stockpiling - Should the rest of the world really care?

Generic manufacturing

Voluntary Licensing Agreements for Remdesivir

Gilead has signed non-exclusive voluntary licensing agreements with generic pharmaceutical manufacturers based in Egypt, India and Pakistan to further expand supply of remdesivir. The agreements allow the companies – Cipla Ltd.; Dr. Reddy's Laboratories Ltd.; Eva Pharma; Ferozsons Laboratories; Hetero Labs Ltd.; Jubilant Lifesciences; Mylan; Syngene, a Biocon company; and Zydus Cadila Healthcare Ltd. – to manufacture remdesivir for distribution in 127 countries. The countries consist of nearly all low-income and lower-middle income countries, as well as several upper-middle- and high-income countries that face significant obstacles to healthcare access. The regulatory approval status of remdesivir varies by country, and the distribution of remdesivir within each country listed below is subject to local laws and regulations.

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Remdesivir stockpiling - Should the rest of the world really care?

But:

• As a **principle**, should not be acceptable

• Good to have an **alternative** for those who can’t have **dexamethasone**

“No-one is safe until everyone is safe”
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Be prepared, more to come!

Comparative effectiveness studies- Real-World Evidence

Project SCYLLA
SARS-Cov-2 Large-scale Longitudinal Analyses

Objective: The aim of this study is to assess the comparative safety and effectiveness of all emerging drug therapies used in COVID-19 treatments...
...administered during hospitalization and prior to intensive services.
...administered during hospitalization after initiating intensive services.
...administered after COVID-19 positive testing and prior to...

Post-marketing surveillance
COVID-19 Pandemic
Be prepared, more to come!

• Consider **effectiveness and safety results** alongside **costs**, and compare to all relevant **alternatives** not only “doing nothing”

• Collect data on **resource use and costs** alongside clinical outcomes

• “Living” cost effectiveness analyses
  • “Living” **economic models** that can be updated with new data as they emerge

https://icer-review.org/
COVID-19 Pandemic

Take-home messages

• Keep up to date with the “key” clinical trials (SOLIDARITY and RECOVERY). These are the ones that will shape the COVID-19 treatment landscape.

• Innovative pricing approaches need to be considered to guarantee access and affordability

• Consider trials for mild-moderate COVID-19
Thank You!
Question Time

Please use the chat board to log your questions & comments.
Thank you for participating!

Please provide your feedback through the 4-question survey that will appear to you at the end of the event.