Population-level Estimation #1: Safety of HIV/HepC protease inhibitors

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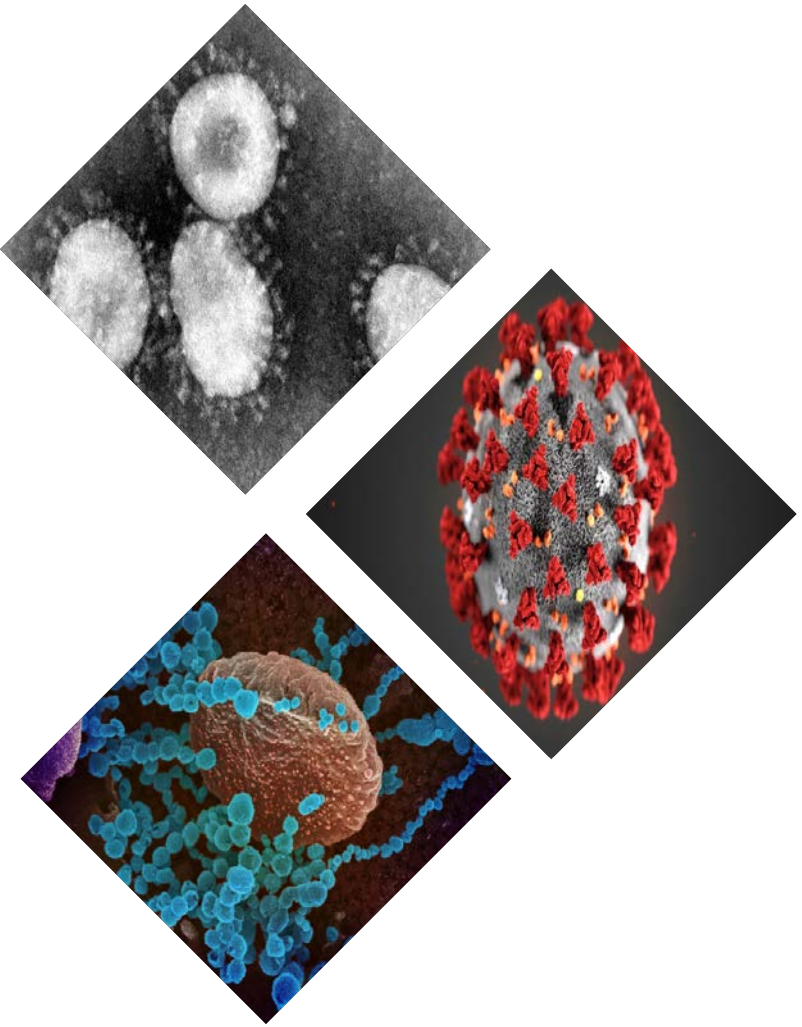
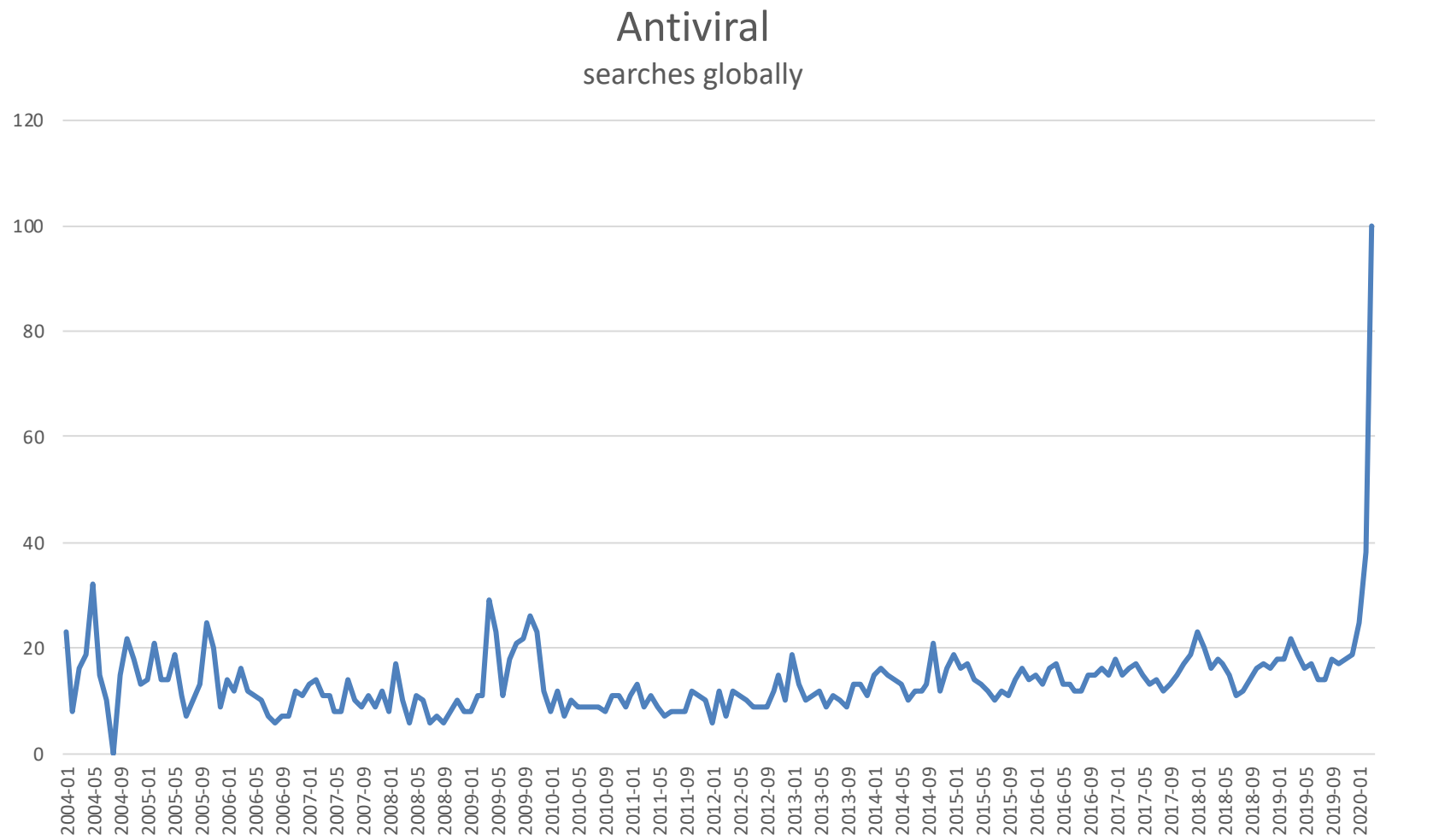
SARS-CoronaVirus-2

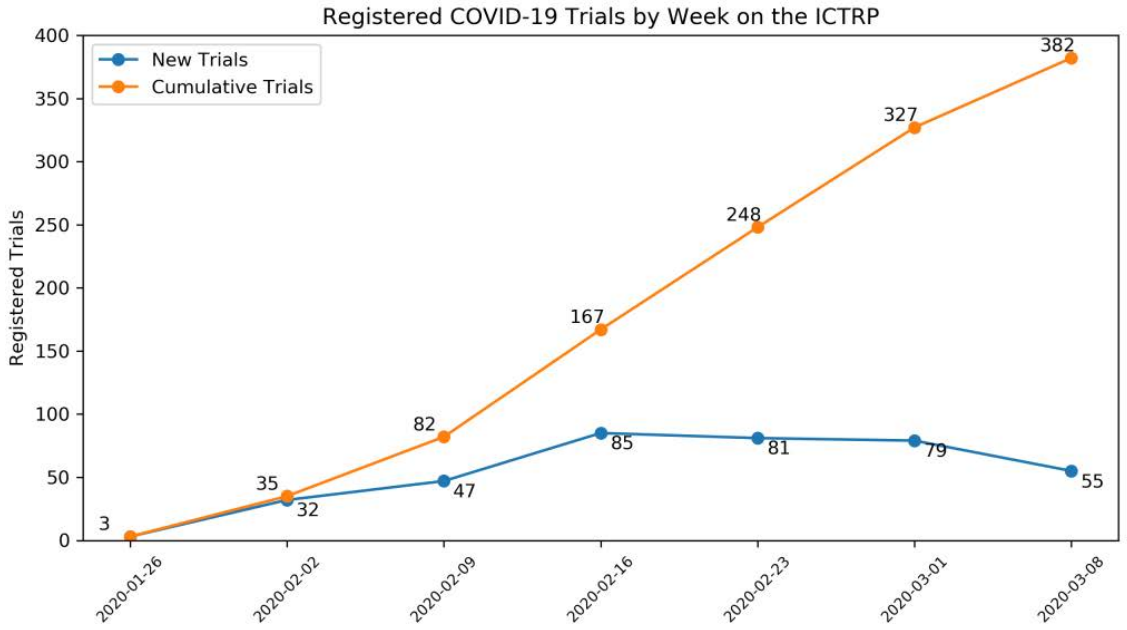
A little piece of enveloped RNA!





SARS-CoV-2 Antiviral Trials

COVID Treatments being tested!



Antiviral drugs, non-specific		
Interferons	Activate cytoplasmic enzymes affecting viral messenger RNA translation and protein synthesis; evidence of minor efficacy in MERS-CoV in combination with ribavirin	4
Antiviral drugs, antiretrovirals		
ASC09	**HIV** protease inhibitor; to be used in combination with ritonavir	4
Azvudine	Azidocytidine nucleoside analogue; **HIV** reverse transcriptase inhibitor	4
Danoprevir	**Hepatitis C** virus NS3 protease inhibitor; to be used in combination with ritonavir	1
Darunavir	**HIV** protease inhibitor; used in combination with cobicistat, a CYP3A inhibitor	2
Lopinavir + ritonavir	Both **HIV** reverse transcriptase inhibitors; ritonavir is mainly used to enhance the action of other drugs by inhibition of CYP3A4; in vitro and possible clinical efficacy in SARS-CoV	2
Remdesivir	Nucleotide analogue; inhibitor of RNA-dependent RNA polymerase; used to treat Ebola and Marburg viruses; effective in vitro against SARS-CoV-1 and MERS and blocks infection with 2019-nCoV in vitro	2

Adapted from: https://www.cebm.net/covid-19/registered-trials-and-analysis/ at 29-March

Antivirals Background

Effectiveness
Does it work?

Safety
Does it harm patients?

HIV antivirals

SARS

? COVID

Gastrointestinal events

Liver Injury

Pancreatitis

etc …

Hepatitis C antivirals

in-vitro

X SARS

? COVID

Arrythmia

Liver Injury

Hematologic

etc …

Safety
Does it harm patients?

HIV Antivirals Estimation

Ritonavir/lopinavir

All HIV protease inhibitors

vs

NNRTIs

Integrase inhibitors

SCCS

Cohort study

of HIV treatment naïve patients

(PS stratification)

Effectiveness
Does it work?

HIV Antivirals Estimation

Ritonavir/lopinavir

All HIV protease inhibitors

VS

Hydroxychloroquine

Cohort study

of SARS-CoV-2 Patients

(PS stratification)

Hospital treated

pneumonia

Poor outcomes

Safety
Does it harm patients?

Hep C Antivirals Estimation

Hepatitis C protease inhibitors

Peginterferon alfa-2b

Ribavirin

SCCS

Cohort study

Pairwise Comparisons

(PS stratification)

Hep C Antivirals Estimation

Hepatitis C protease inhibitors

Peginterferon alfa-2b

Ribavirin

Hydroxychloroquine

Cohort study pairwise comparisons

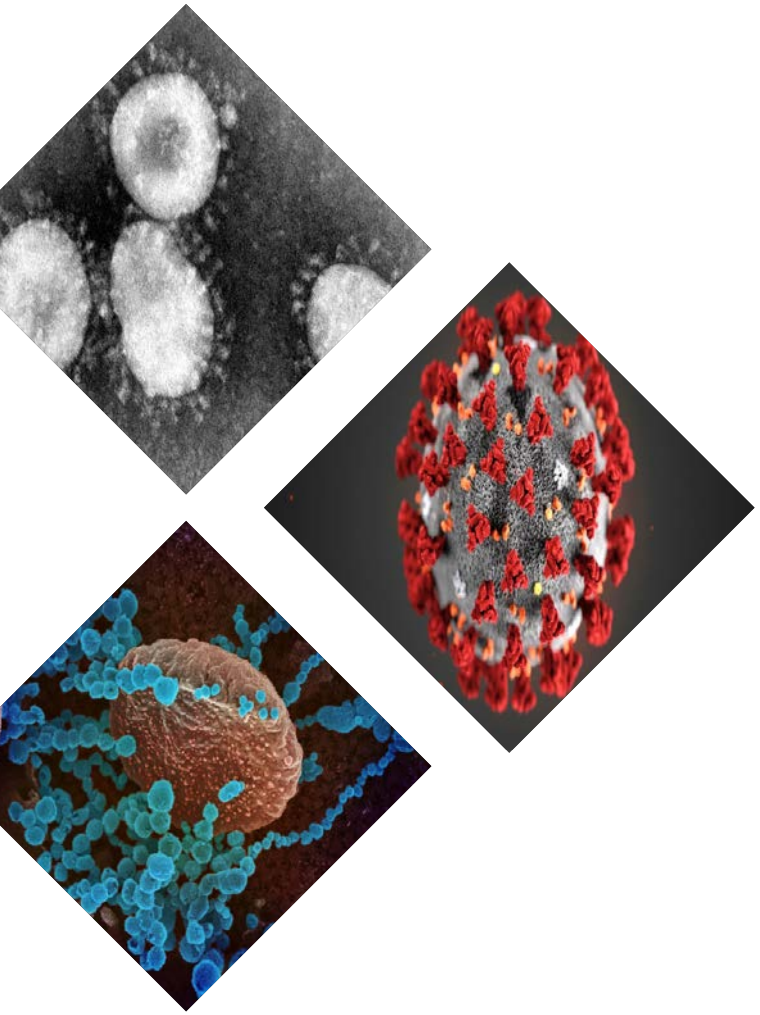
of SARS-CoV-2 Patients

(PS stratification)

Hospital treated pneumonia

Poor pneumonia outcomes

Progress



Protocol	Done!
Safety Analyses	SCCS Cohorts
Effectiveness Analyses	Cohorts
Paper writing	Background and methods