Therapeutic factbase

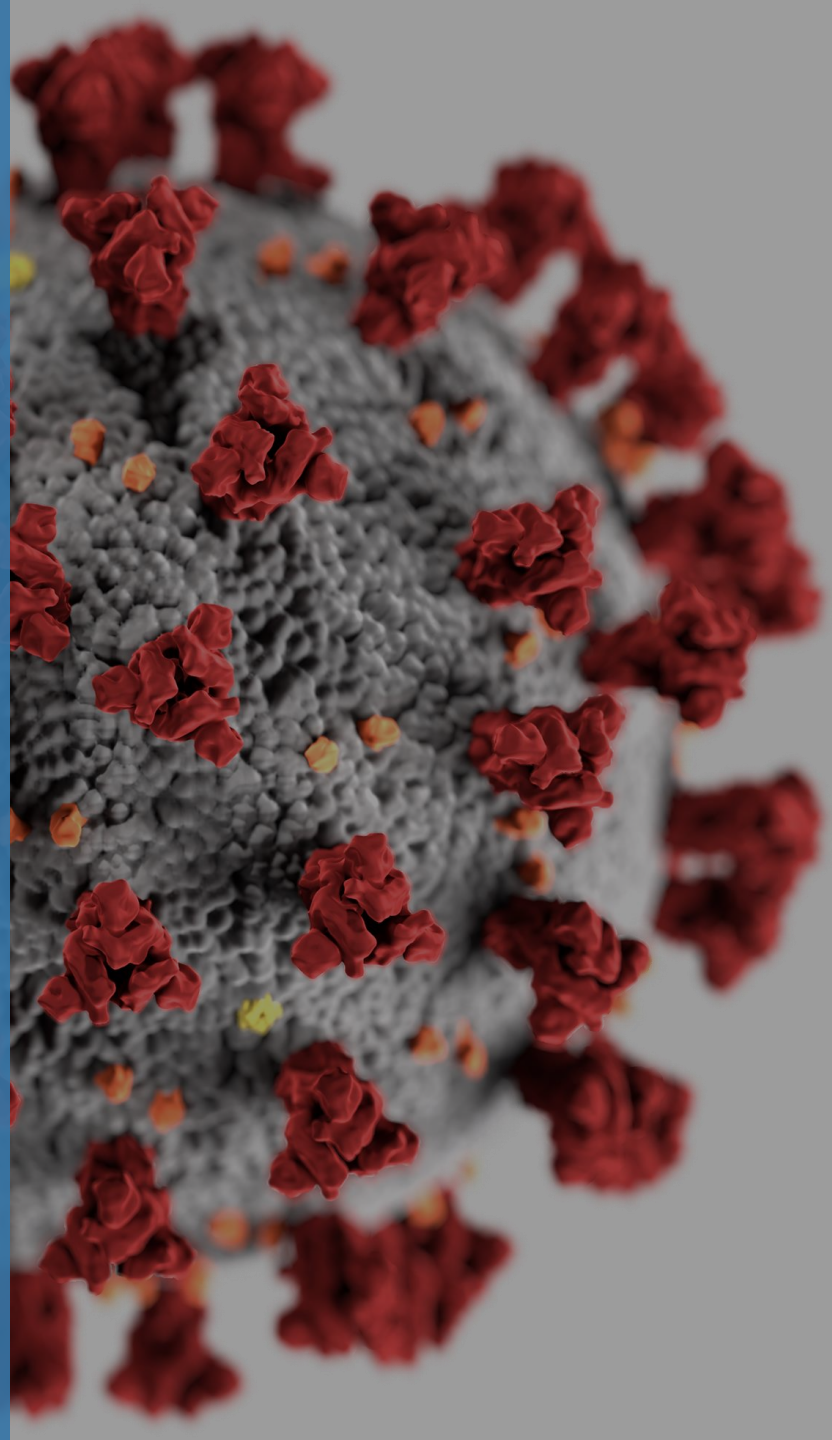
September 2020

The Mission of our COVID Response Program

Our mission is to **activate philanthropic and impact investing capital to fill critical gaps** in the COVID response between the public and private sector efforts. By **mobilizing an ecosystem of experts, public and private actors, and philanthropists**, we will **catalyze cutting edge technologies and partnerships** to address the evolving needs in diagnostics, therapeutics, PPE, health services and beyond.

Executive Summary

There are fundamental accessibility and affordability gaps in the therapeutic pipeline, impacting the nation's ability to effectively respond to COVID-19. Philanthropy is uniquely positioned to fill these gaps.



To comprehensively address COVID, we will need both therapeutics and vaccines

Therapeutics

Administered to mitigate the symptoms or shorten the duration of an active infection

Vaccines

Administered as a precautionary measure to avoid or lessen the severity of an infection

Early vaccines will not be a ‘sliver bullet’ for COVID-19; therapeutics are still needed

What we can expect from an early COVID-19 vaccine

- ✔ Meets tables stakes **safety requirements**
- ✔ Reduces, but does not eliminate, risk of **contracting COVID-19**
- ✔ Reduces, but does not eliminate, risk of **developing severe symptoms**

Where an early vaccine will likely still fall short

- ✖ Fails to induce **sterilizing immunity**, defined as immunity that prevents infection entirely
- ✖ Insufficient on its own; requires **booster shots** after first dose
- ✖ Lacks **public health infrastructure** to be administered equitably
- ✖ Likely not tested on racially or medically **diverse population**
- ✖ Likely met with **significant distrust**

Early COVID vaccines will confer imperfect immunity, functioning like a ‘Tamiflu’ rather than a polio vaccine. Therapeutics will be essential for infected individuals and for individuals who are not prioritized to receive the first round of vaccines.

Therapeutics support COVID-19 patients in hospitals, who are at risk of developing or currently experiencing severe symptoms

	% of Cases	Key Symptoms	Current treatment
Mild	~80%	• Dry cough • Low-grade fever • Fatigue	• Over-the-counter medication
Severe	~15%	• Shortness of breath • Low oxygen saturation	• Hospitalization with IV fluids and oxygen
Critical	~5%	• Respiratory failure • Septic shock • Multi-organ failure	• Hospitalization with IV fluids and ventilation

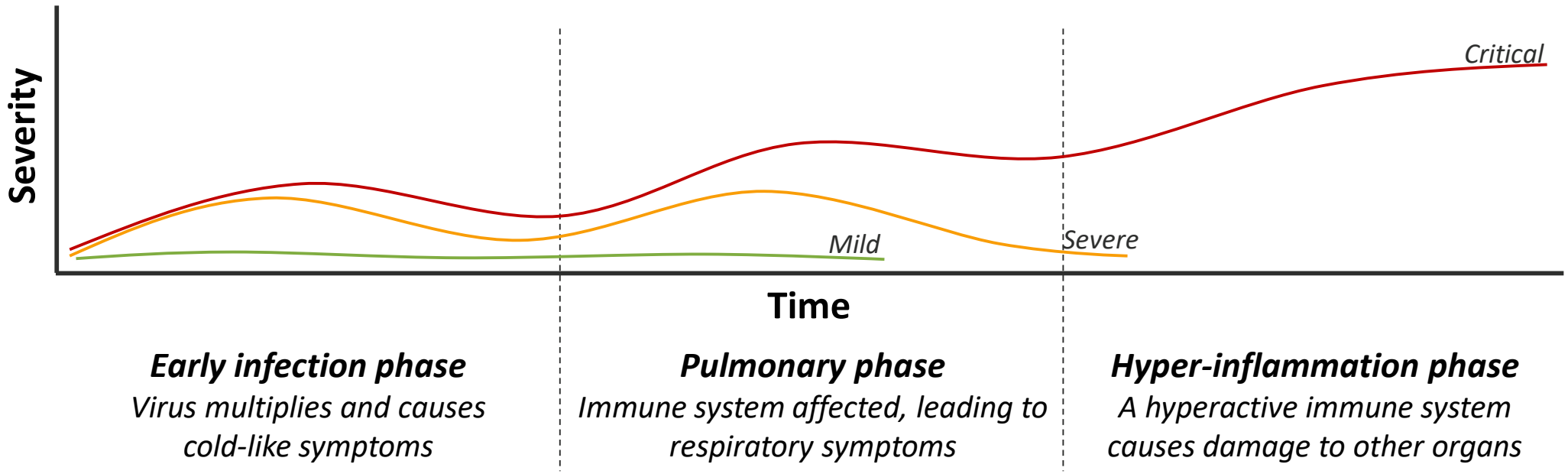
COVID-19 severity can be driven by risk factors including **age and comorbidities** like asthma, diabetes, obesity, or pulmonary disease

Therapeutics will either support patients with severe forms of COVID-19 or reduce a patient's risk of developing a severe form of COVID-19

Source: https://www.ncbi.nlm.nih.gov/books/NBK554776/

Different therapeutics are useful at different stages in the disease

Disease progression



Therapeutic

Help the body fight off infection

Reign in an overactive immune system and mitigate impact on other organs

Source: BioCentury

There are multiple approaches in development for COVID-19

~80% of therapeutics under investigation

	Antiviral	Immune booster	Anti-inflammatory	Other
Mechanism	• Interact with virus and disrupt its ability to replicate or enter cells	• Support the body in mounting an immune response to fight the virus	• Rein in the immune system's overreaction to the virus	• Address severe symptoms in various organ systems
Use case	• Reduce the duration or severity of symptoms	• Reduce the duration or severity of symptoms	• Limit the impact of an extreme inflammatory response	• Reduce the duration or severity of symptoms
Example	• Remdesivir • Favipiravir	• Convalescent plasma • Monoclonal antibodies	• Dexamethasone • Cytokine inhibitors	• Mucolytics • Anticoagulants • Vasodilators

Source: BioCentury, Bio.org

There are ~500 therapeutics under investigation globally

Development overview

520+ Unique therapeutic compounds in pre-clinical or clinical stage

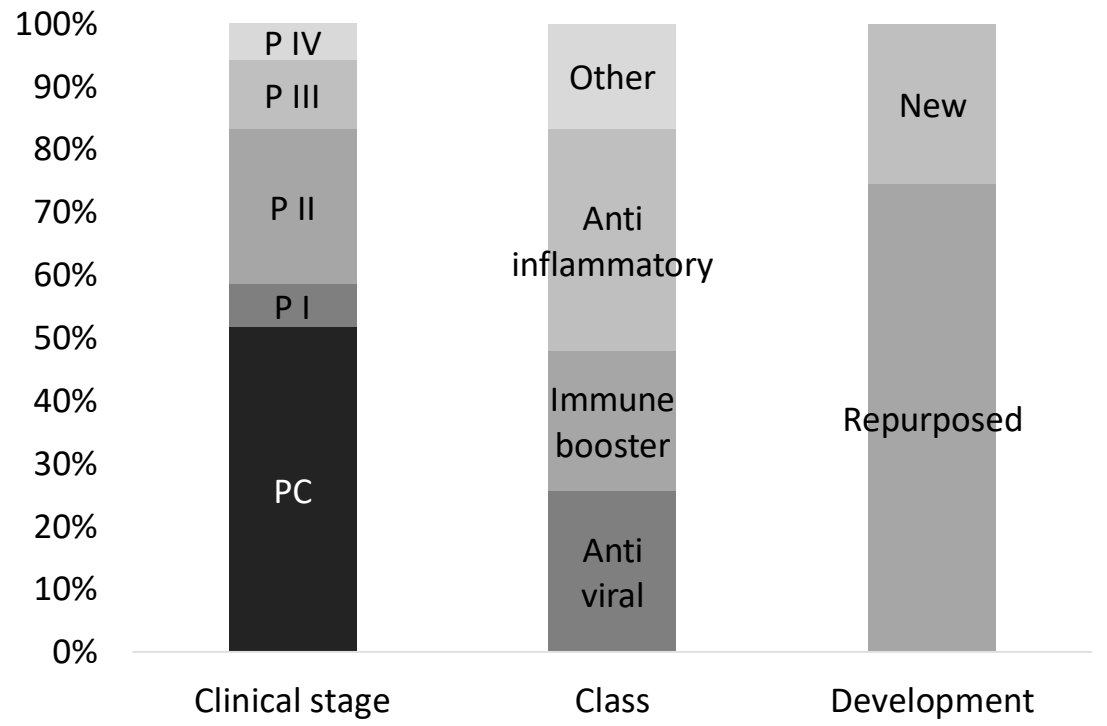
270+ Active clinical trials for therapeutic agents

80+ Active clinical trials with US federal funding

5 Therapeutic agents that have received fast-tracking or EUA:

- Hydroxychloroquine - *EUA revoked*
- Remdesivir (Gilead)
- Aviptadil (NeuroRx /Relief)
- RBT-9 (Renibus)
- Convalescent Plasma

Therapeutic profile



~70% of therapeutics are being developed in the U.S.

Note: as of 9/2020
Source: Bio.org, clinicaltrials.gov

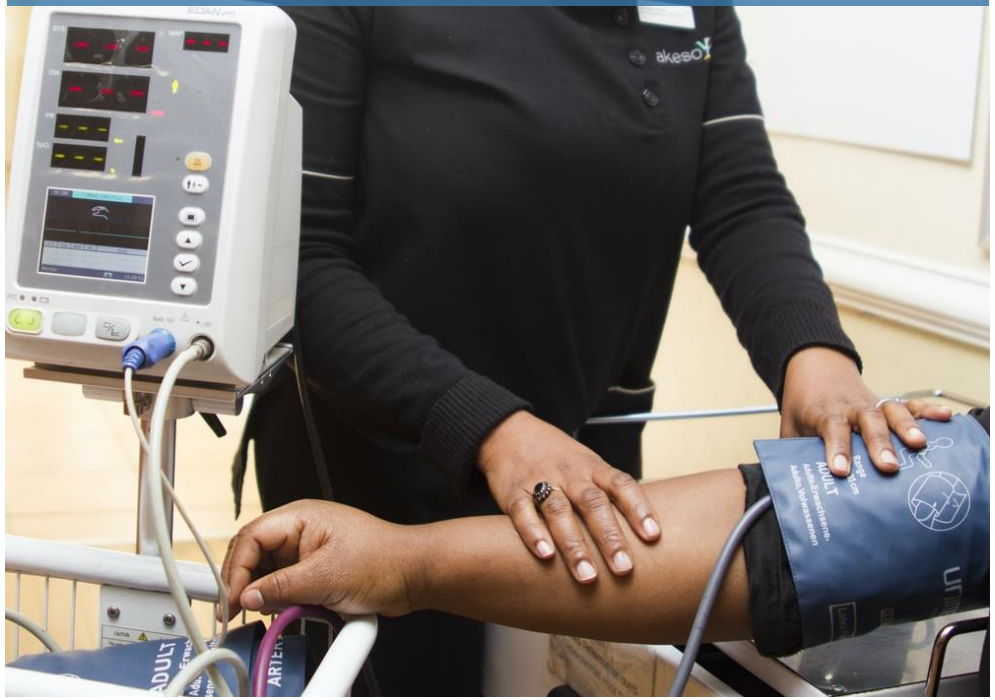
An effective therapeutic will drive benefits for both communities and health systems

Benefits for communities

- Reduce illness severity, mortality, and hospital stay duration
- Decrease time off from work and school

Benefits for health systems

- Lessen strain on healthcare workers and resources



Developers face several challenges today

CROWDED FIELD	• Many players are attempting to repurpose existing products and research. Most repurposed candidates will fail.
INSUFFICIENT KNOWLEDGE	• Without a clear understanding of the virus, it is challenging to know where to focus development efforts.
LACK OF FEDERAL FUNDS	• The administration has shifted resources away from therapeutics and is, instead, focused on rapidly manufacturing novel vaccines.
INEFFICIENT RESOURCE USE	• Major investments in expensive, hard-to-manufacture drugs are driving down supply of patients for clinical trials.

A successful therapeutic must solve for several factors

EARLY INTERVENTION

The most impactful therapeutics will lessen the duration and severity of the disease during the early infection phase, as opposed to treating symptoms that only emerge in the critically ill.

TIME TO MARKET

Given there is no widely available therapeutic, speed is essential; repurposed drugs with existing safety profiles will likely move through trials more rapidly.

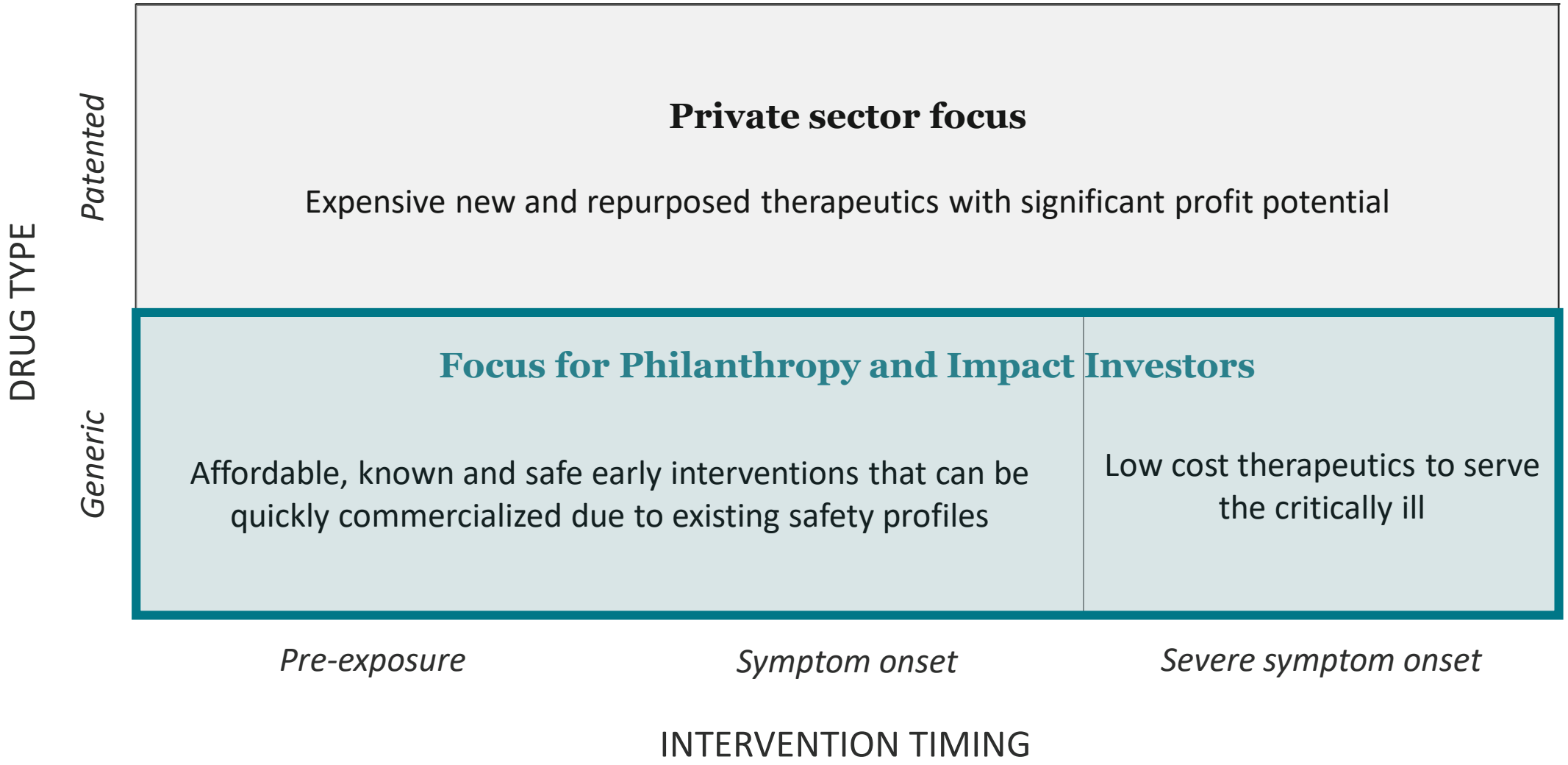
SCALABILITY

A therapeutic must be produced at massive scale, so easily sourced inputs and straightforward manufacturing processes are critical.

AFFORDABILITY

A therapeutic needs to be globally accessible and available, so cost is a critical component.

Generics are ideal therapeutics given they are off-patent, scalable, and have a known safety profile



Join the effort: 3 ways you can support our work

GRANT SUPPORT
FOR OUR CONTINUED OPERATIONS

Stop the Spread Programming

Seeking grants of $100k-1.5M to continue our COVID Response efforts through 2021

CUSTOM
IMPACT PORFOLIOS

Bespoke set of investments and grants designed around your desired areas of emphasis

CHARITABLE FUNDS
GRANTS & RECOVERABLE GRANTS

Stop the Spread: support those on the frontline fighting the pandemic

Preserve the Progress: support high-impact companies threatened by the economic downturn

Business and Community Resilience: support those with limited access to government aid

Our charitable funds are available to smaller donors who want to coinvest along side of our biggest clients which amplifies the impact of Custom Portfolios