



Viruses with Pandemic Potential

A Product of BryceTech Public Health Division

Potential pandemic pathogens are 1) likely highly transmissible and capable of wide, rapid spread in human populations and 2) highly virulent, making them likely to cause significant morbidity or mortality in humans. To ensure proactive progress to combat these potential and active threats, sufficient funding, subject matter expertise, and clear policy requirements are essential.

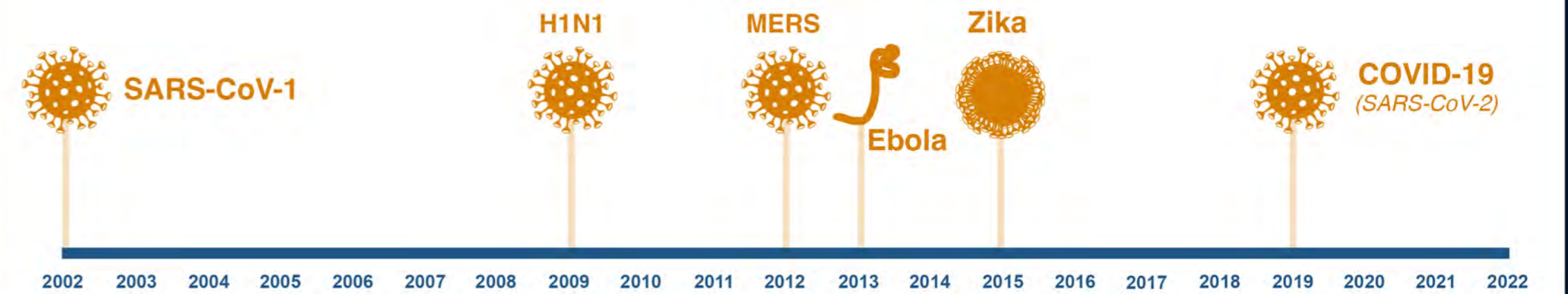
Viruses with Pandemic Potential

Virus	Vaccine	BSA Treatments		
		Approved	Trial	Pre-trial
COVID-19				
Crimean-Congo hemorrhagic fever				
Ebola and Marburg				
Marburg				
Lassa fever				
MERS-CoV and SARS				
Nipah and henipaviral diseases				
Rift Valley fever				
Zika				
Avian influenza A H5				
Avian influenza A H7				
Avian influenza A H9				
Swine influenza/variant influenza A				

Sources: WHO and CDC. Note: List is not exhaustive. List does not indicate the most likely causes of the next pandemic.

Start Year of Major Viral Outbreaks

2002-2022



NIH Funding for Antiviral Programs

FY2013-FY2022



From 2019 through 2022, NIH antiviral funding increased 128%

Sources:
<https://www.who.int>
<https://www.cdc.gov>
<https://www.usda.gov>
<https://drugvirus.info>
<https://www.ncbi.nlm.nih.gov>
<https://sph.unc.edu>

Acronyms:
 BSA - Broad Spectrum Antivirals
 MERS - Middle East Respiratory Syndrome
 NIH - National Institutes of Health
 SARS - Severe Acute Respiratory Syndrome
 WHO - World Health Organization



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Broad-Spectrum Antivirals (BSA)

Broad-spectrum antivirals are a class of molecules or compounds that inhibit replication of a broad range of viruses

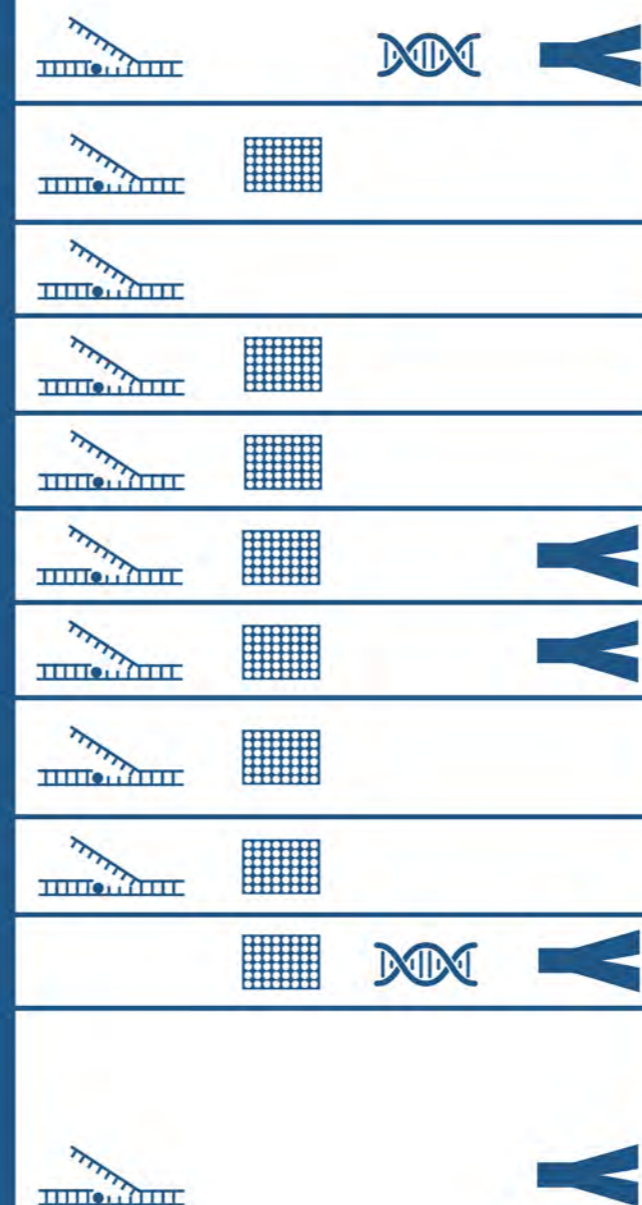
100+

Number of BSAs under consideration (published)

Diagnostic Tests

- PCR
- ELISA
- NAAT
- Other

Pathogens with Pandemic Potential	Approved BSA	Number In Trials	Number Pre-Trials
COVID-19	1	24	34
Crimean-Congo hemorrhagic fever (CCHF)	0	0	5
Ebola virus (Zaire)	1	10	24
Marburg virus	1	1	5
Lassa fever	0	1	13
MERS-CoV	1	4	31
SARS	0	0	42
Nipah and Henipaviral diseases	0	0	3
Rift Valley fever	0	0	0
Zika	0	0	47
Avian influenza	A H5 viruses	3	7
	A H7 viruses		
	A H9 viruses		
Swine influenza (H1N1)/variant influenza A viruses			41



Total Reported Deaths Worldwide



H1N1
363,550
Since 2009

Ebola
17,647
Since 1976

SARS
~800
Since 1969

MERS
~1,000
Since 2015

COVID-19
6,915,286

Since 2019, as of May 1, 2023

Under 700
Total Deaths
(each disease)

- Avian influenza H7N9
- Avian influenza H5N1
- Marburg virus
- Nipah virus
- Rift Valley fever
- Zika virus
- Avian influenza H9N2

Diagnostic tests: ELISA - Enzyme-linked Immunosorbent Assay, NAAT - Nucleic Acid Amplification Test, PCR - Polymerase Chain Reaction. Other tests include plaque reduction neutralization tests (PRNT), genetic sequencing tests, virus isolation tests and H/N subtyping tests, chicken pathogenicity tests, immunofluorescence assay, and virus culture.



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