

Medical Facility Design and Planning for “What If”

Michigan Society of Professional Engineers
Webinar
5.6.2021



**This isn't forever.
It's just right now.**

YOUR Speaker



Sam Reed, PE

Principal | Chairman Emeritus
| Compliance Officer



Learning

BSA

**Creating Inspired
Solutions that
Improve Lives.**



Discovery



Healing

Focused Expertise



OBJECTIVES

01

Epidemiology Primer

02

History of Epidemics & Pandemics

03

Medical Facilities' Engineering Systems

04

Real World Realities Limiting Preparedness

05

Healthcare Facility Design & Planning
Improvements

Epidemiology Primer

Epidemiology **Primer**



Speaking at a briefing on Wednesday, May 13, 2020, WHO Executive Director, Health Emergencies Program, Dr. Michael Ryan.

Epidemiology **Primer**



Epidemiology **Primer**

Sporadic

Endemic

Epidemic

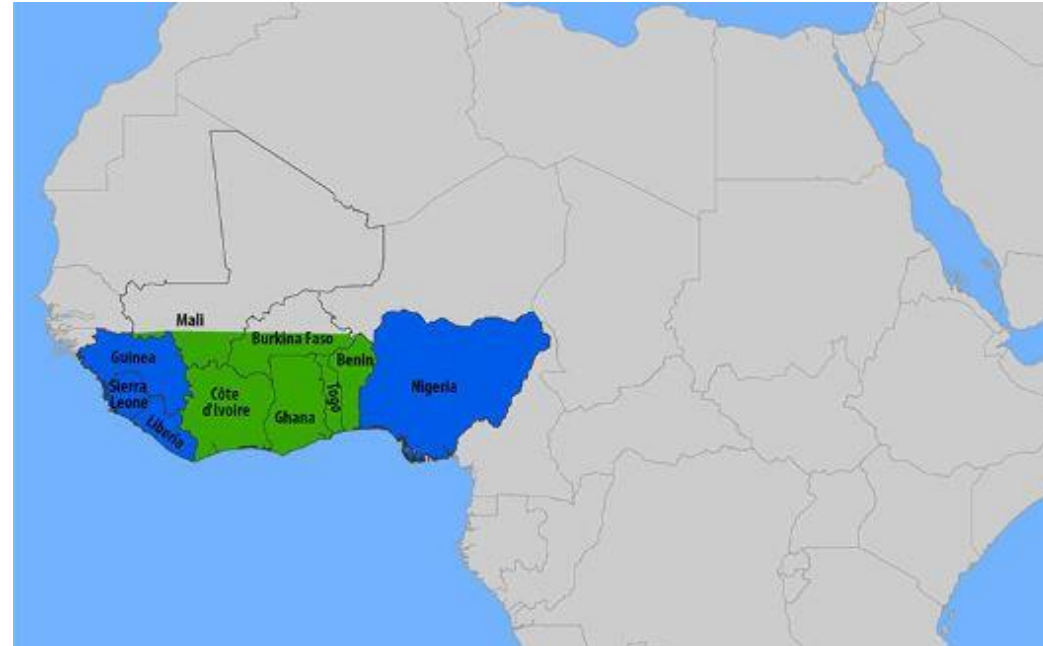
Pandemic

Epidemiology **Primer**

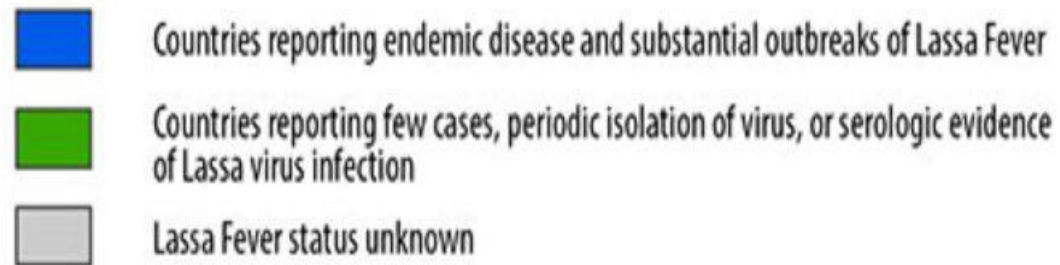


Sporadic

Epidemiology Primer



LASSA FEVER DISTRIBUTION MAP



Endemic

Epidemiology Primer



Epidemic

Epidemiology **Primer**



Pandemic

Epidemiology **Primer**



Epidemiology **Primer**



History of Epidemics and Pandemics

History of Epidemics and Pandemics



Prehistoric Epidemic Circa 3000 BC

History of Epidemics and Pandemics



Antonine Plague AD 165-180

History of Epidemics and Pandemics



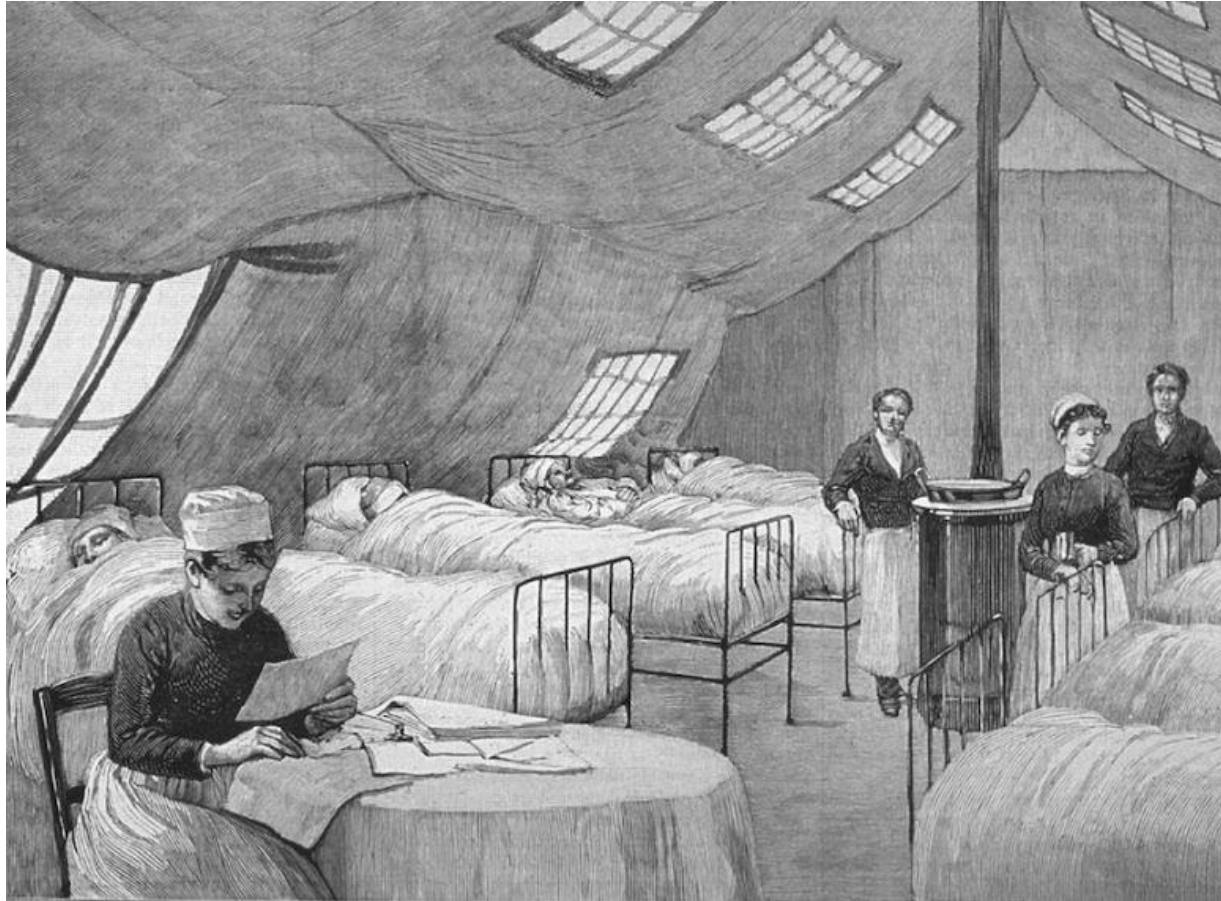
American Plagues 16th Century

History of Epidemics and Pandemics



Great Plague of Marseille 1720-1723

History of Epidemics and Pandemics



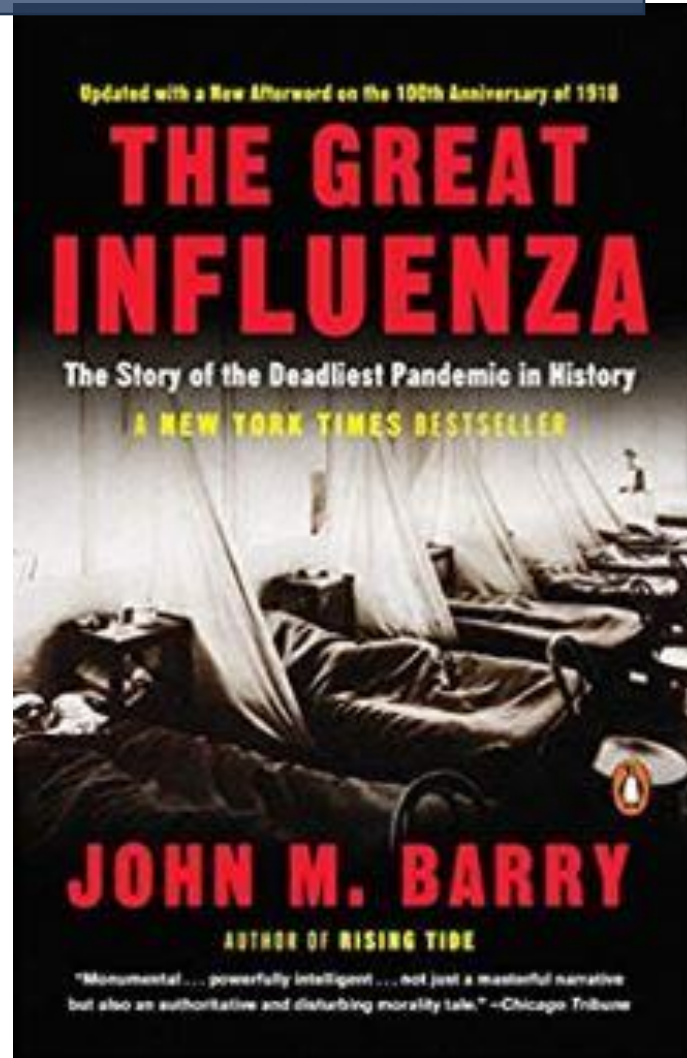
Flu Pandemic 1889-1890

History of Epidemics and Pandemics



Spanish Flu 1918-1920

History of Epidemics and Pandemics



History of Epidemics and Pandemics



Asian Flu 1957-1958

History of Epidemics and Pandemics



AIDS Pandemic and Epidemic 1981-Present Day

History of Epidemics and Pandemics



H1N1 Swine Flu Pandemic 2009-2010

History of Epidemics and Pandemics



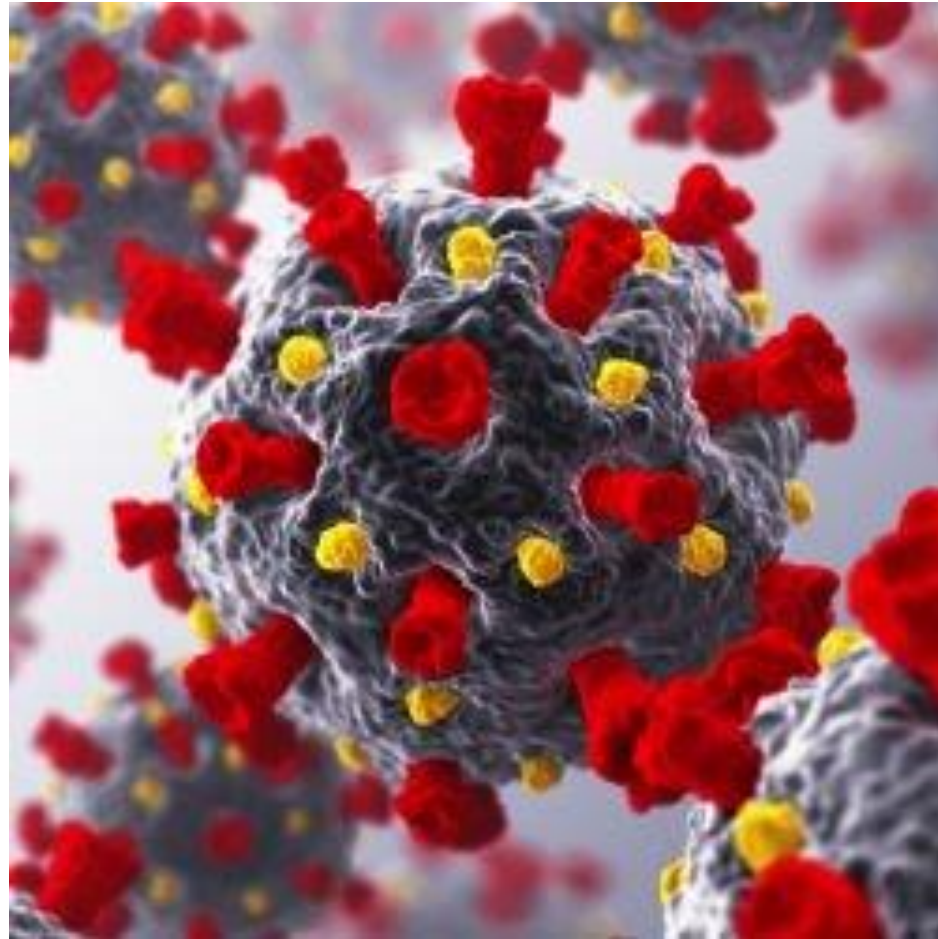
West African Ebola Epidemic 2014-2016

History of Epidemics and Pandemics



Zika Virus Epidemic 2015-Present Day

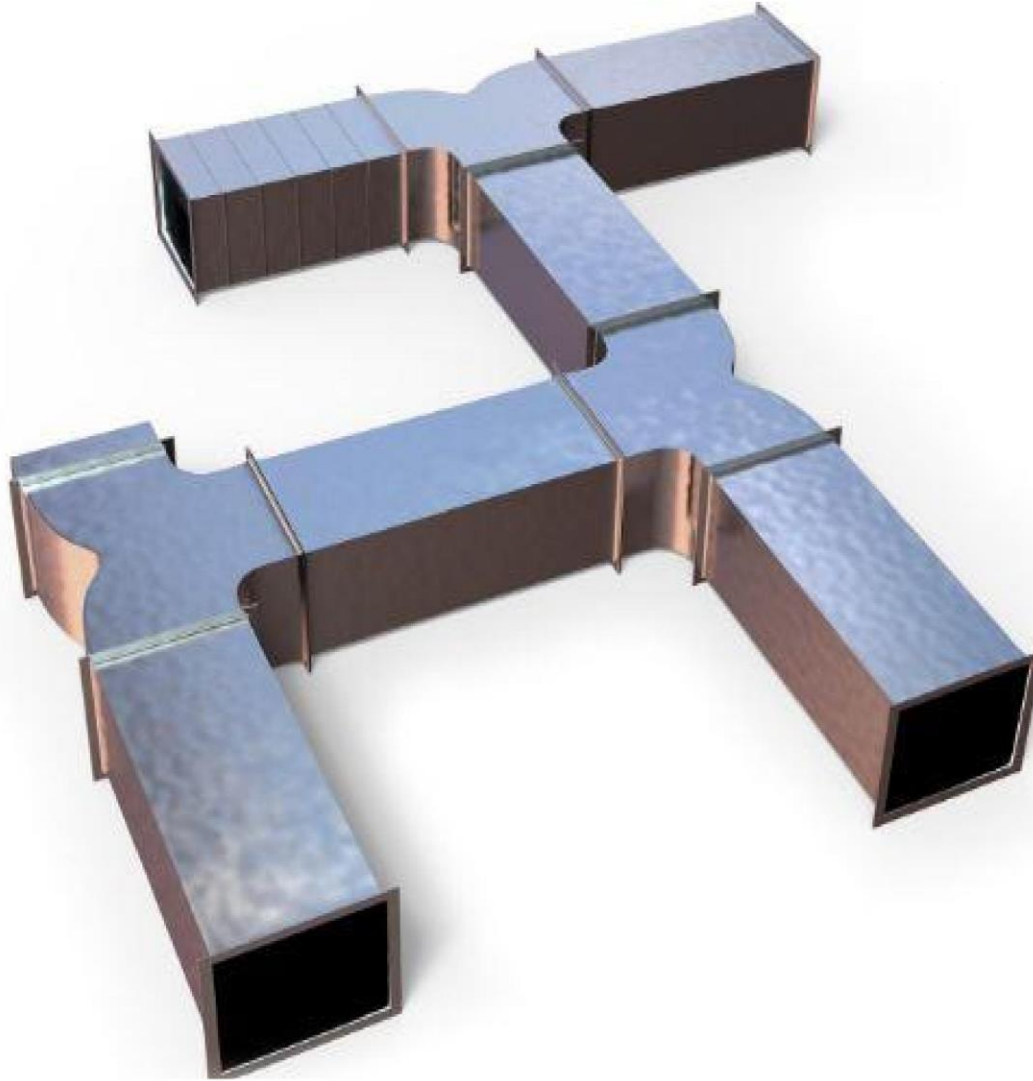
History of Epidemics and Pandemics



COVID-19 2020 – Present Day

Medical Facility's Engineering Systems

Medical Facility's **Engineering Systems**



Medical Facility's **Engineering Systems**



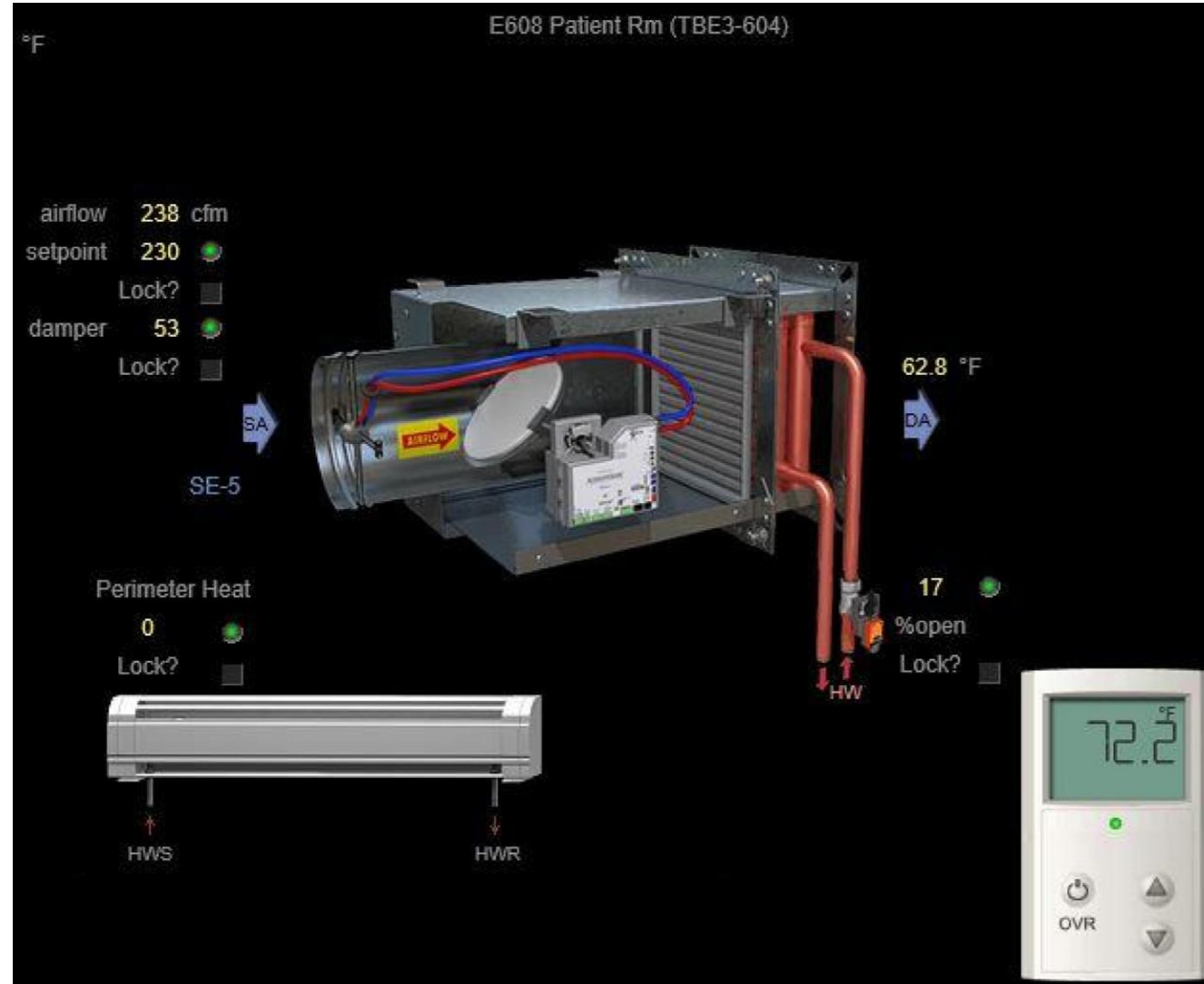
Medical Facility's **Engineering Systems**



Medical Facility's **Engineering Systems**



Medical Facility's Engineering Systems



Medical Facility's **Engineering Systems**



Medical Facility's **Engineering Systems**



Medical Facility's **Engineering Systems**



Real World Realities Limiting Preparedness

Real World Realities Limiting Preparedness



Centers for Disease
Control and Prevention

Influenza (Flu)

National Pandemic Strategy

Real World Realities Limiting Preparedness



Public Health Guidance for Community-Level Preparedness and Response to Severe Acute Respiratory Syndrome (SARS) Version 2

Supplement A: Command and Control

Appendix A1

State And Local Health Official Epidemic SARS Checklist



STATE AND LOCAL HEALTH OFFICIAL EPIDEMIC SARS CHECKLIST

Are You and Your Jurisdiction Ready for Epidemic Severe Acute Respiratory Syndrome (SARS)?

This checklist, developed in collaboration with the Centers for Disease Control and Prevention, has been modeled on a previous Association of State and Territorial Health Officials (ASTHO) checklist for pandemic influenza preparedness (*Preparedness Planning for State Health Officials: Nature's Terrorist Attack - Pandemic Influenza* www.astho.org/pubs/PandemicInfluenza.pdf). Preparations made to respond to other public health emergencies, including bioterror events, will generally be applicable to epidemic SARS planning.

The items on this checklist are intended for use by health officers at all levels – state, regional, district and local. The division of responsibilities between state and local levels varies among states, and often within states, according to the size of the population served by local health agencies. The items on this checklist should be interpreted in the context of the responsibilities of your public health agency and the division of responsibilities within your community, regardless of level of government. For some local public health agencies, for example, the capabilities needed for certain items may be available from a state health department but are not present locally.

Every locality should plan for the possibility of a local public health crisis such as widespread SARS-CoV transmission, in which help from other public health agencies is not available because they are facing similar crises. At the same time, there are advantages to coordinating response plans on a regional and statewide basis, partly so that isolation and quarantine procedures are applied uniformly and equitably.

SARS would be considered to be widespread in the United States if and when cases occur throughout the nation, in multiple locations, in persons without known epidemiologic links to places with community transmission of SARS-CoV or to known SARS cases. Local, district, or state public health agencies should be prepared to address all of the following items when the disease is present elsewhere in the world and to implement those preparations when widespread disease occurs in the United States.

January 8, 2004

January 8, 2004

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Real World Realities Limiting Preparedness

NATIONAL STRATEGY FOR
PANDEMIC
INFLUENZA



HOMELAND SECURITY COUNCIL

NOVEMBER 2005

Real World Realities Limiting Preparedness

NATIONAL STRATEGY FOR PANDEMIC INFLUENZA

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Real World Realities Limiting Preparedness

NATIONAL STRATEGY FOR
**PANDEMIC
INFLUENZA**

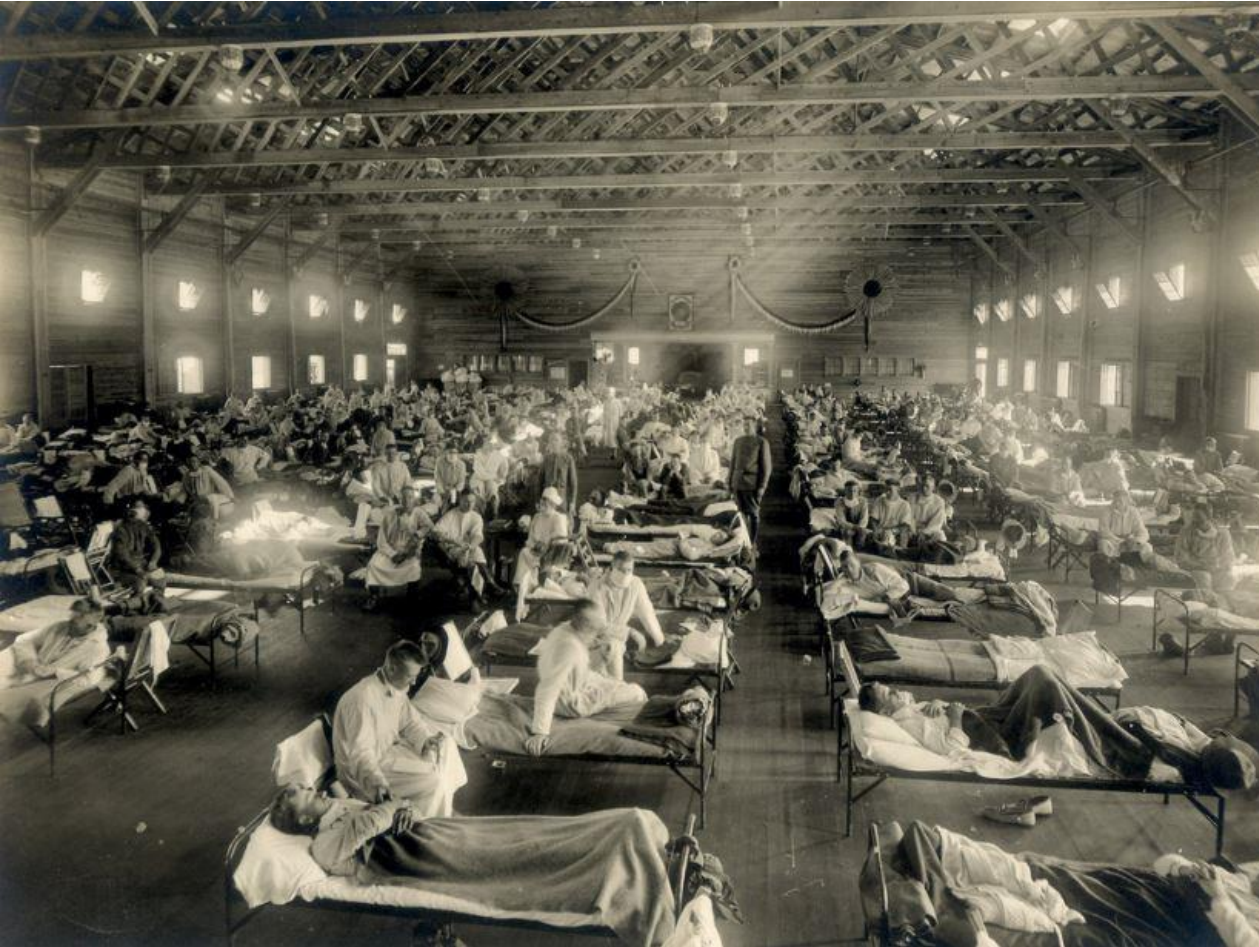
IMPLEMENTATION PLAN



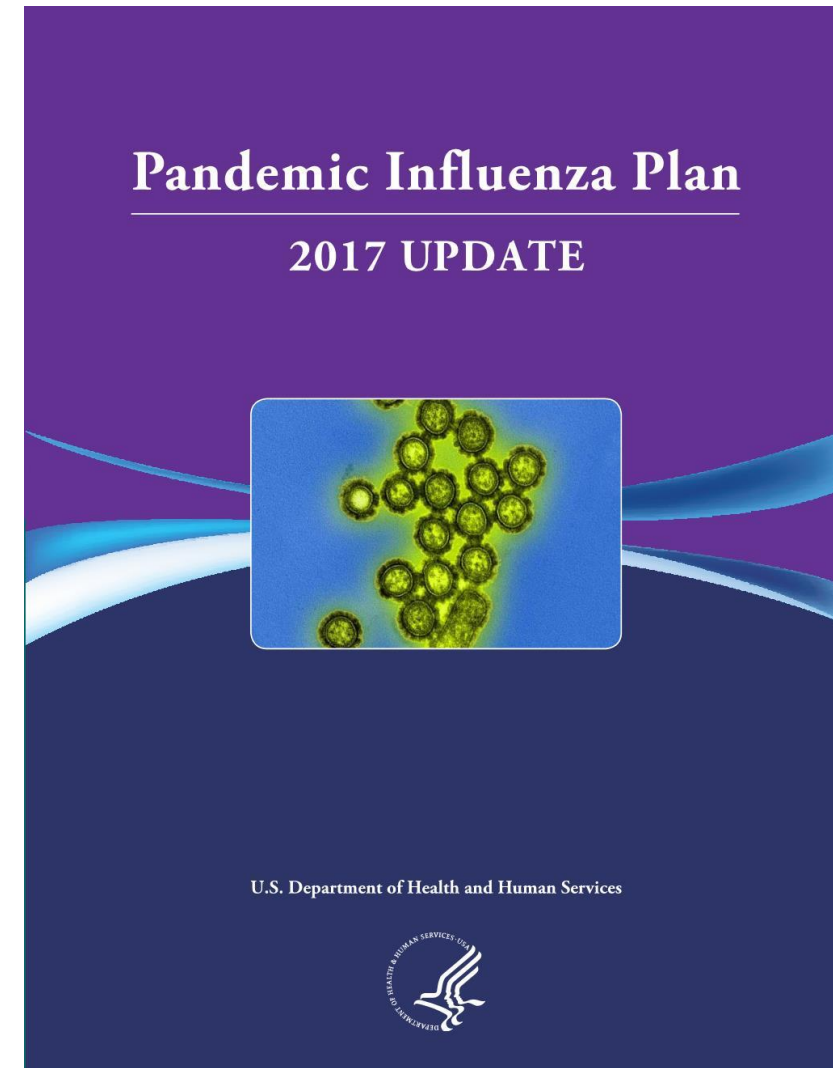
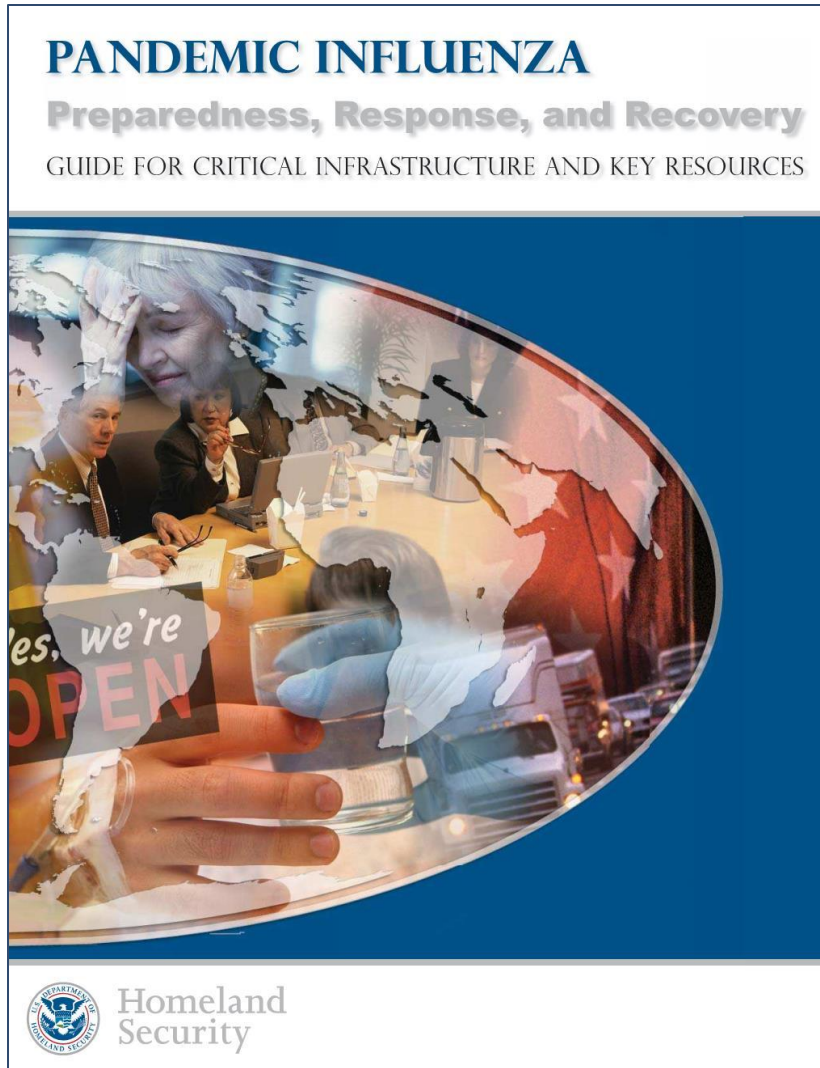
HOMELAND SECURITY COUNCIL

MAY 2006

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Real World Realities Limiting Preparedness



Real World Realities Limiting Preparedness

Centers for Disease Control and Prevention
MMWR

Recommendations and Reports / Vol. 66 / No. 1

Morbidity and Mortality Weekly Report

April 21, 2017

Community Mitigation Guidelines to Prevent Pandemic Influenza — United States, 2017



Continuing Education Examination available at <http://www.cdc.gov/mmwr/cme/conted.html>.



U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



U.S. Department of Health and Human Services

2017-2018 Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) Strategy and Implementation Plan



Real World Realities Limiting Preparedness

Table 3c: FY 2016 Strategic National Stockpile (SNS) Procurement / Replenishment Contracts ⁶³

Threat / Portfolio Area	Actual FY 2016 (\$ million)
Anthrax	\$184.6
Botulism	\$0
Burkholderia	\$5.9
Chemical	\$3.1
Influenza	\$7.0
Plague	\$0
Radiological/Nuclear	\$13.6
Smallpox	\$42.7
Tularemia	\$0
Federal Medical Station (FMS)	\$0.2
Medical Supplies and Ancillary Items (MS&AI) and non-MS&AI ⁶⁴	\$67.4
Total	\$324.5

Healthcare Facility Design & Planning Improvements

Healthcare Facility Design & Planning Improvements



Healthcare Facility Design & Planning Improvements

Federal Medical Stations Minimum Requirements

One FMS requires approximately 40,000 square feet of enclosed, climate-controlled space with the following features:

- Loading dock/ramps, forklifts, pallet jacks, and parking
- Sufficient existing communications/IT support and power supply with back-up
- Availability of support services including, food and water, waste disposal, medical oxygen, laundry, and mortuary services
- Refrigeration and locked storage
- Bathroom and shower capability



Centers for Disease Control and Prevention

Office of Public Health Preparedness and Response

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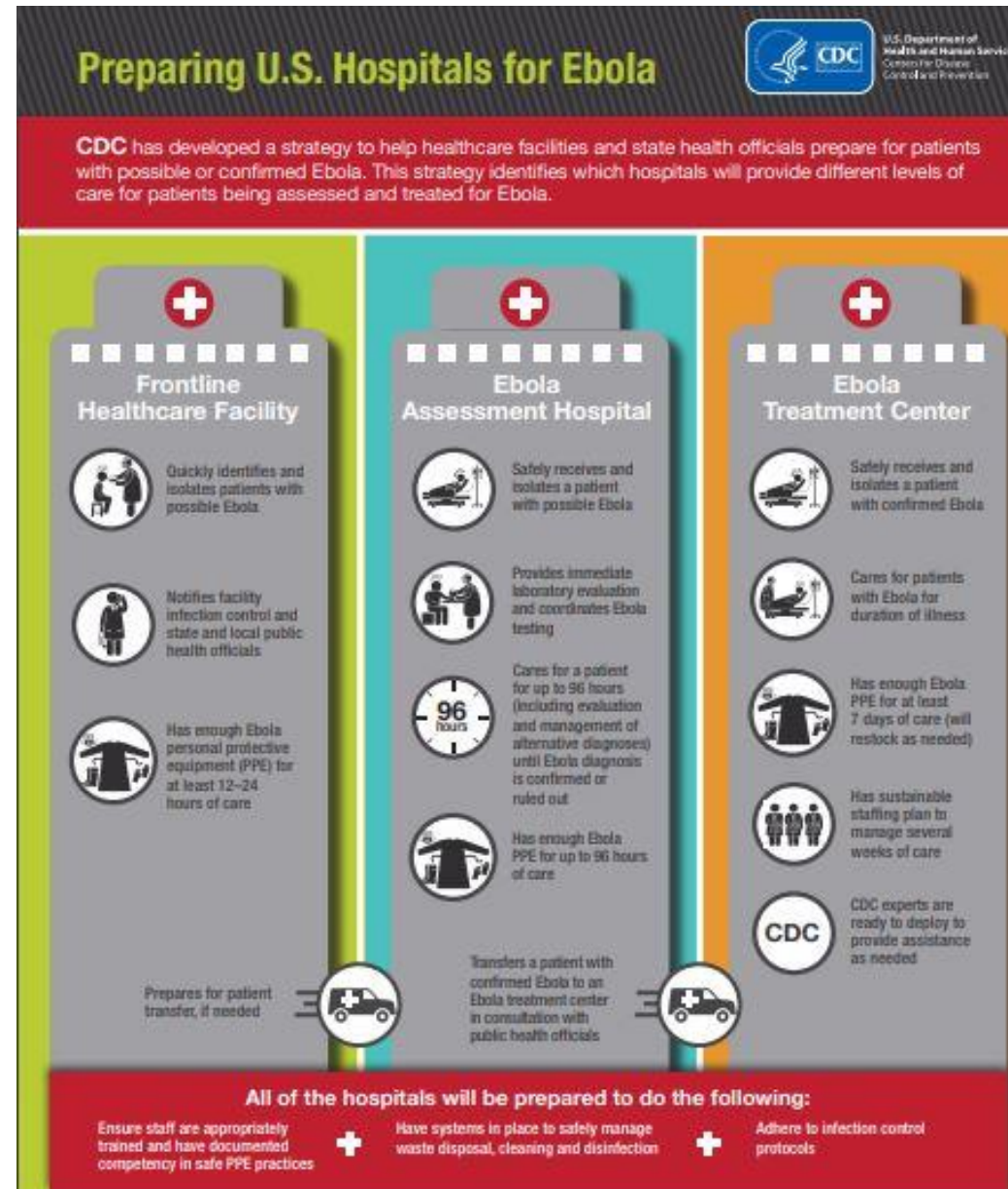
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what if?



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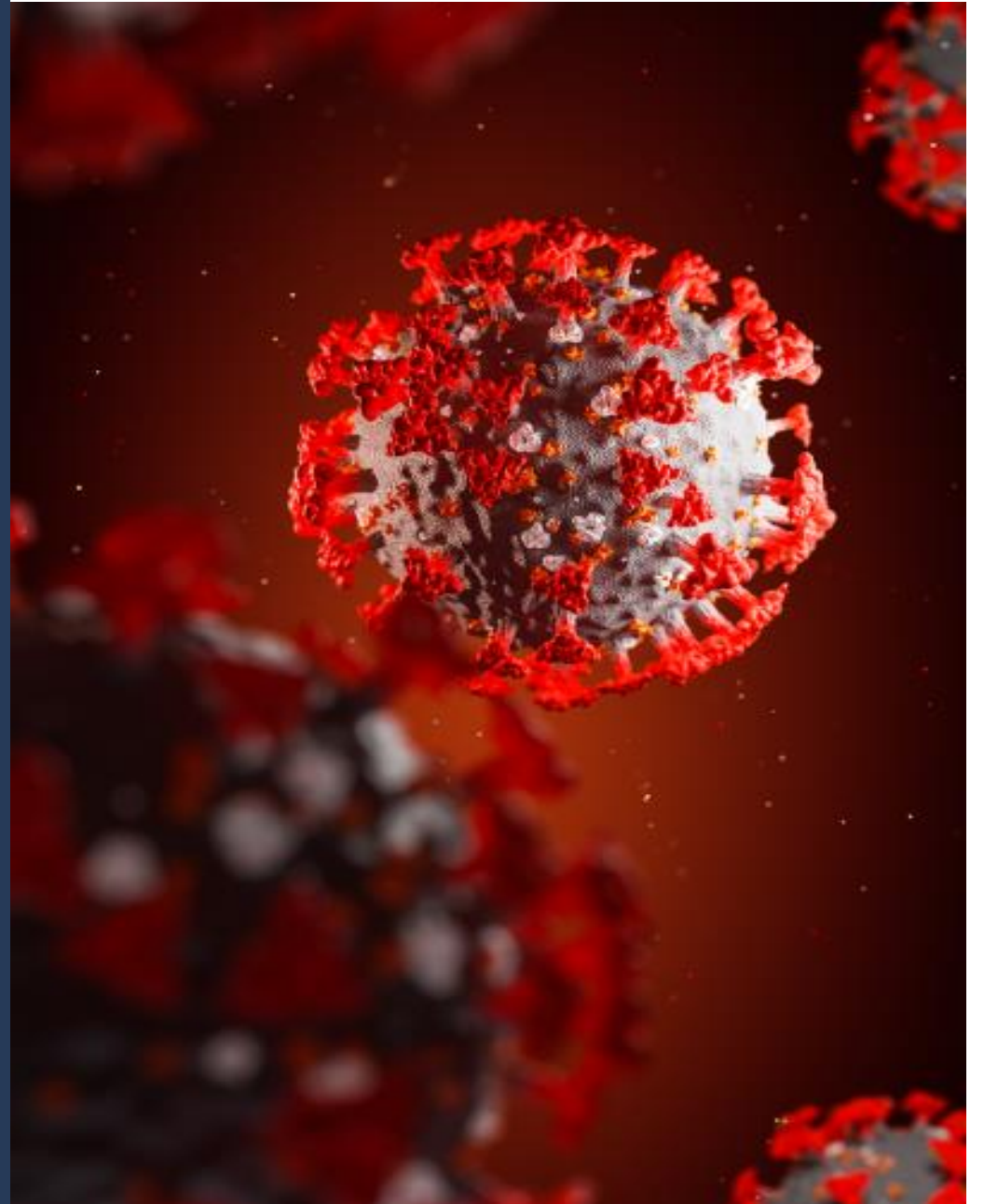
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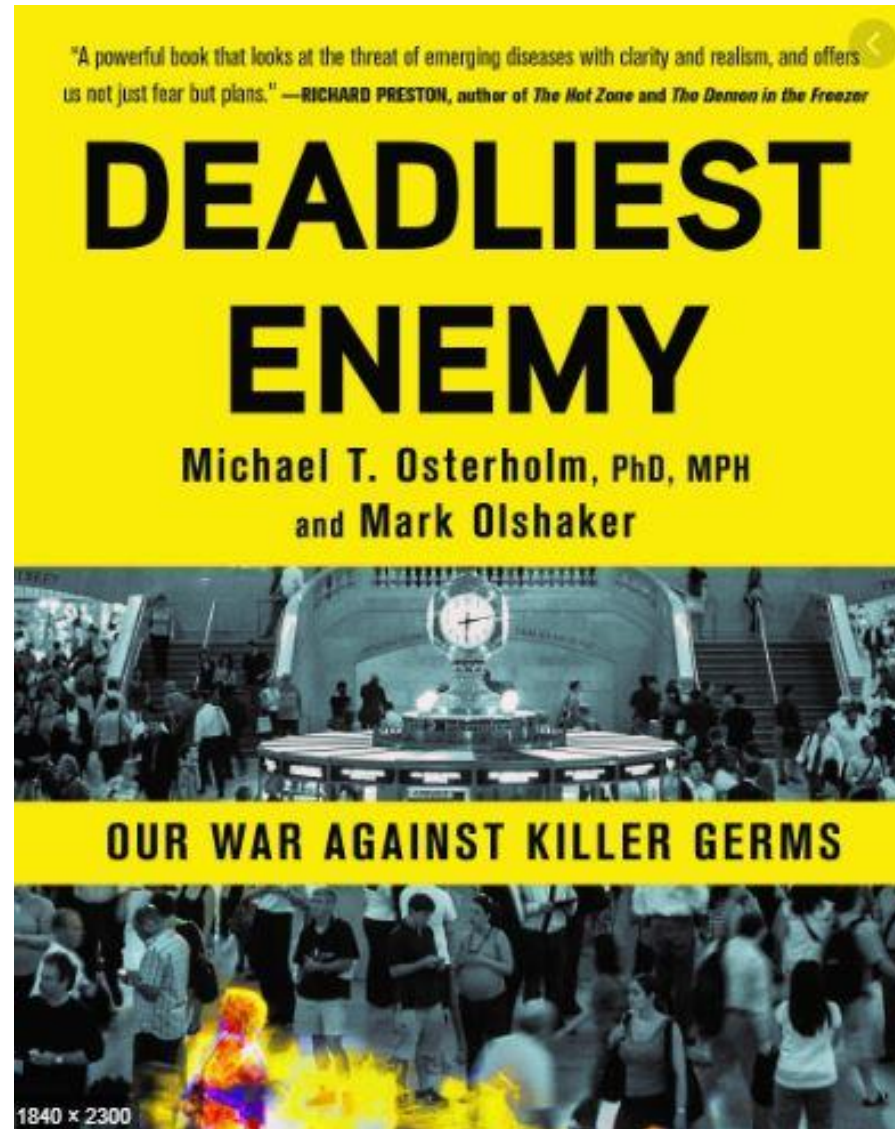
Questions?

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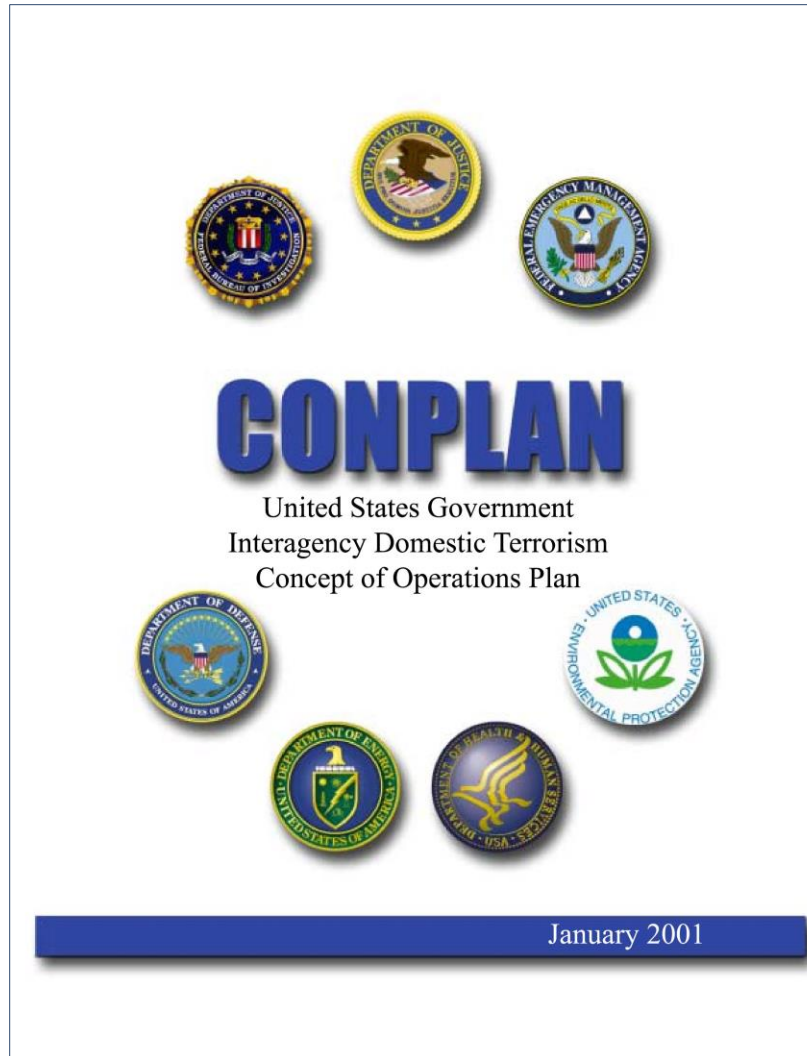
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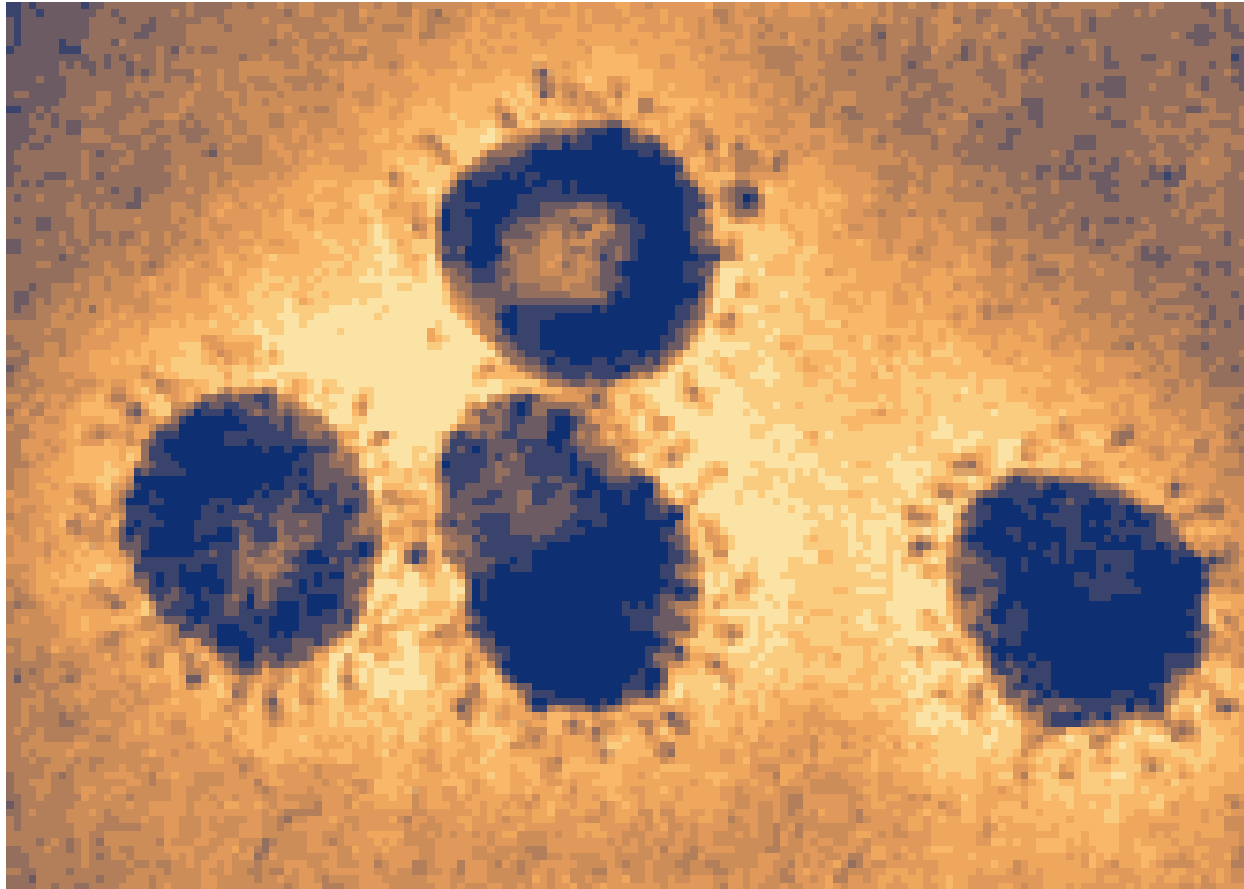
Healthcare Facility Design & Planning Improvements



Real World Realities Limiting Preparedness



History of Epidemics and Pandemics



SARS-CoV

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