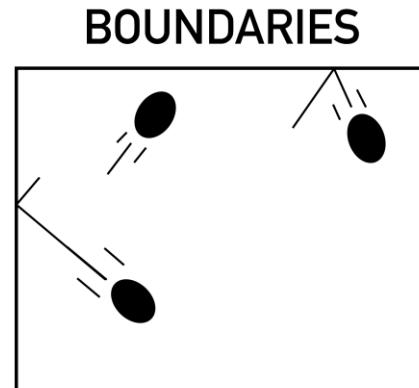


US COVID19 Pandemic Response

A systems perspective

Systems Thinking and Evaluation

Part 1



What is Systems Thinking?

*“Systems thinking is about **taking a vantage point** from where you can see the whole, a **web of relationships**, rather than focusing on the detail of any one particular piece of the whole. This means that **events are understood in the larger context** of a **pattern that is unfolding over time.**”*



How do we know when to use a systems thinking approach?

- Look for key terms that signal interrelationships:
 - Coordination
 - Collaboration/Collaboratives
 - Coalitions
 - Alliances
 - Partnerships



COVID-19: The Emergency Management Context

- **EM goal in all hazards:** save lives
- **EM goal in pandemic:** stop the spread of disease, which then saves lives
- To meet goal requires **collaboration** and **coordination** of multiple agencies

Emergency Management

Definition, Vision, Mission, Principles

Definition

Emergency management is the managerial function charged with creating the framework within which communities reduce vulnerability to hazards and cope with disasters.

Vision

Emergency management seeks to promote safer, less vulnerable communities with the capacity to cope with hazards and disasters.

Mission

Emergency Management protects communities by coordinating and integrating all activities necessary to build, sustain, and improve the capability to mitigate against, prepare for, respond to, and recover from threatened or actual natural disasters, acts of terrorism, or other man-made disasters.

Principles

Emergency Management must be:

1. **Comprehensive** — emergency managers consider and take into account all hazards, all phases, all stakeholders and all impacts relevant to disasters.
2. **Progressive** — emergency managers anticipate future disasters and take preventive and preparatory measures to build disaster-resistant and disaster-resilient communities.
3. **Risk-Driven** — emergency managers use sound risk management principles (hazard identification, risk analysis, and impact analysis) in assigning priorities and resources.
4. **Integrated** — emergency managers ensure unity of effort among all levels of government and all elements of a community.
5. **Collaborative** — emergency managers create and sustain broad and sincere relationships among individuals and organizations to encourage trust, advocate a team atmosphere, build consensus, and facilitate communication.
6. **Coordinated** — emergency managers synchronize the activities of all relevant stakeholders to achieve a common purpose.
7. **Flexible** — emergency managers use creative and innovative approaches in solving disaster challenges.
8. **Professional** — emergency managers value a science and knowledge-based approach based on education, training, experience, ethical practice, public stewardship and continuous improvement.

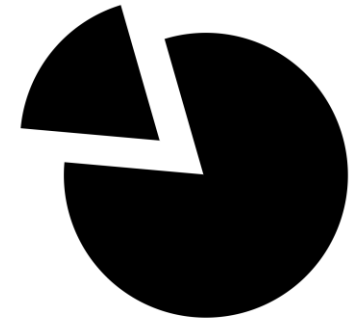


FEMA



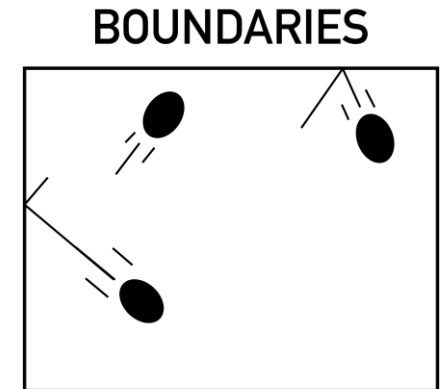
Agencies needing to collaborate and coordinate in a pandemic.

- **Public Health:** epidemiology surveillance, testing, contract tracing.
- **Private and State Laboratories:** process tests.
- **ICS:**
 - **Logistics:** acquiring and moving things from point A to Point B (e.g., tests).
 - **Operations:** coordinating people on the ground.
- **Groups overseeing vulnerable populations:** long-term care facilities, prisoners, first responders (LE, Fire, EMS), grocery clerks, homeless, etc.
- **Volunteer groups:** Rec Cross, Medical Reserve Corps, etc. Help with workforce shortage due to pandemic.
- **PPE providers:** face shields, gowns, masks, etc.



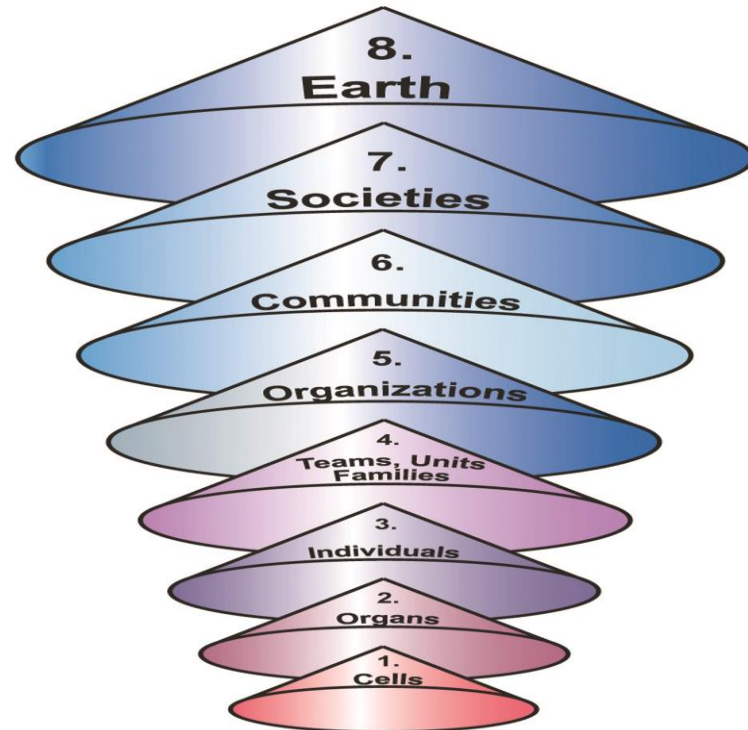
So systems thinking is a good fit for the EM context: now what?

- Start **applying** systems thinking concepts to analyze collaboration and coordination.
- Focus today is on boundaries.
- If there is interest we will continue the series by showing how other system thinking concepts are being applied.
- Lewe will define what we mean by boundaries; then Ralph will show you how it applies in the COVID-19 response.



The boundary question: “What entity/system or ‘collision of systems are we dealing with?”

EIGHT LEVELS OF LIVING AND OPEN SYSTEMS

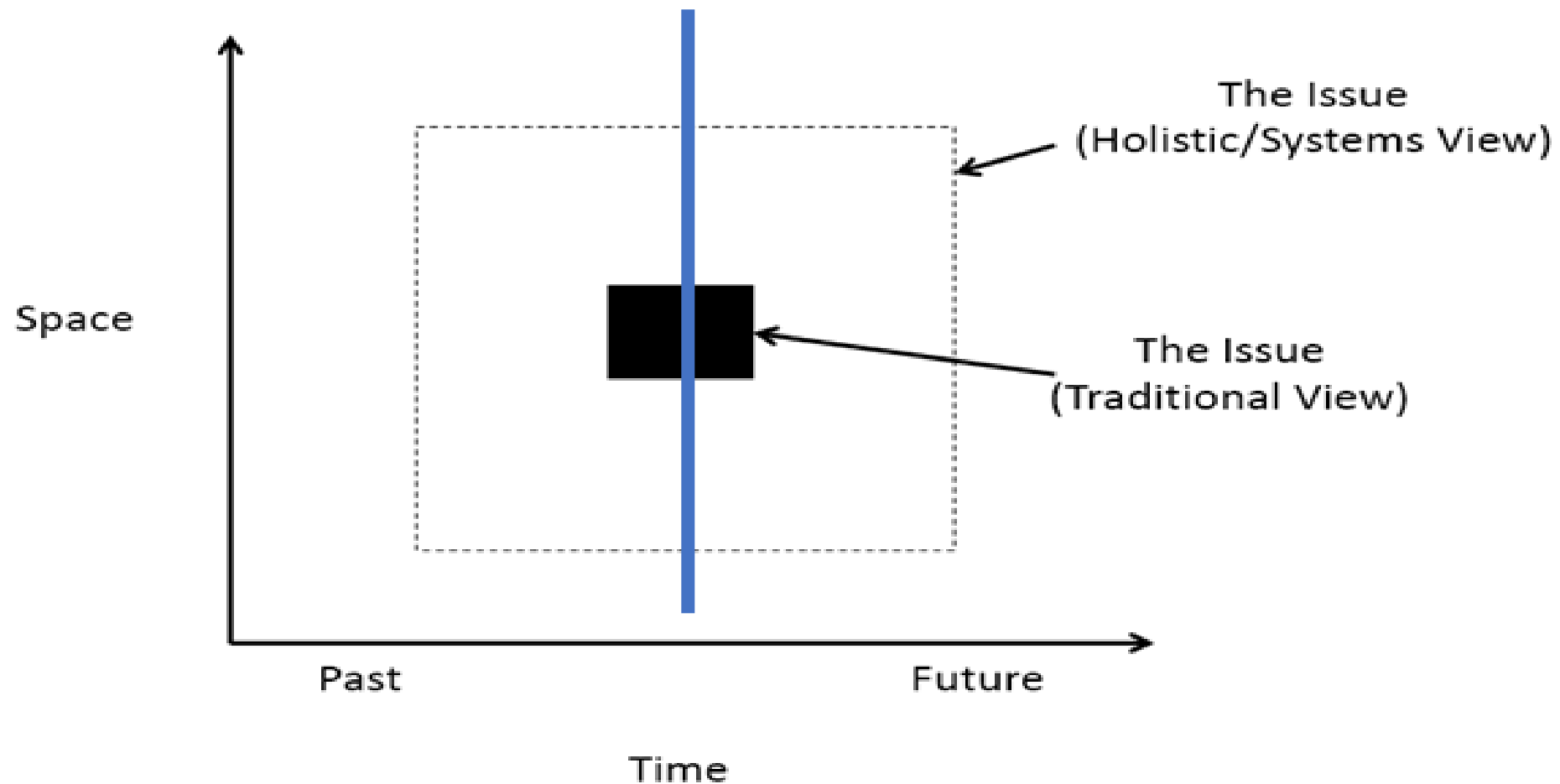


Source: James Grier Miller, *Living Systems* (1978)

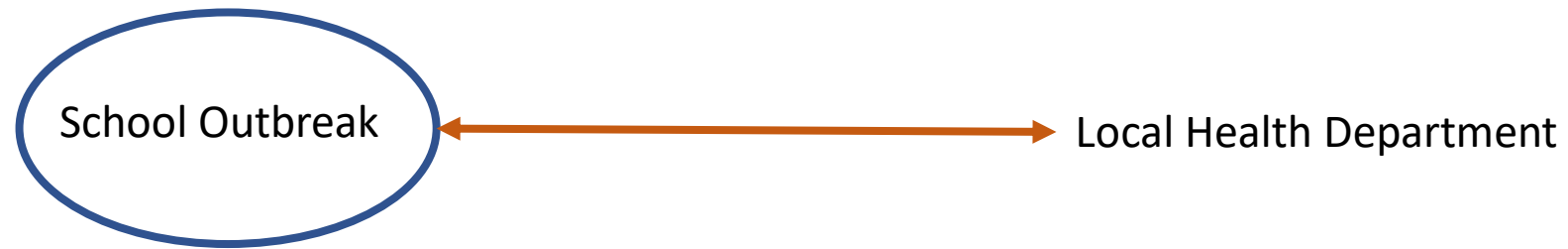


Boundaries in both space & time

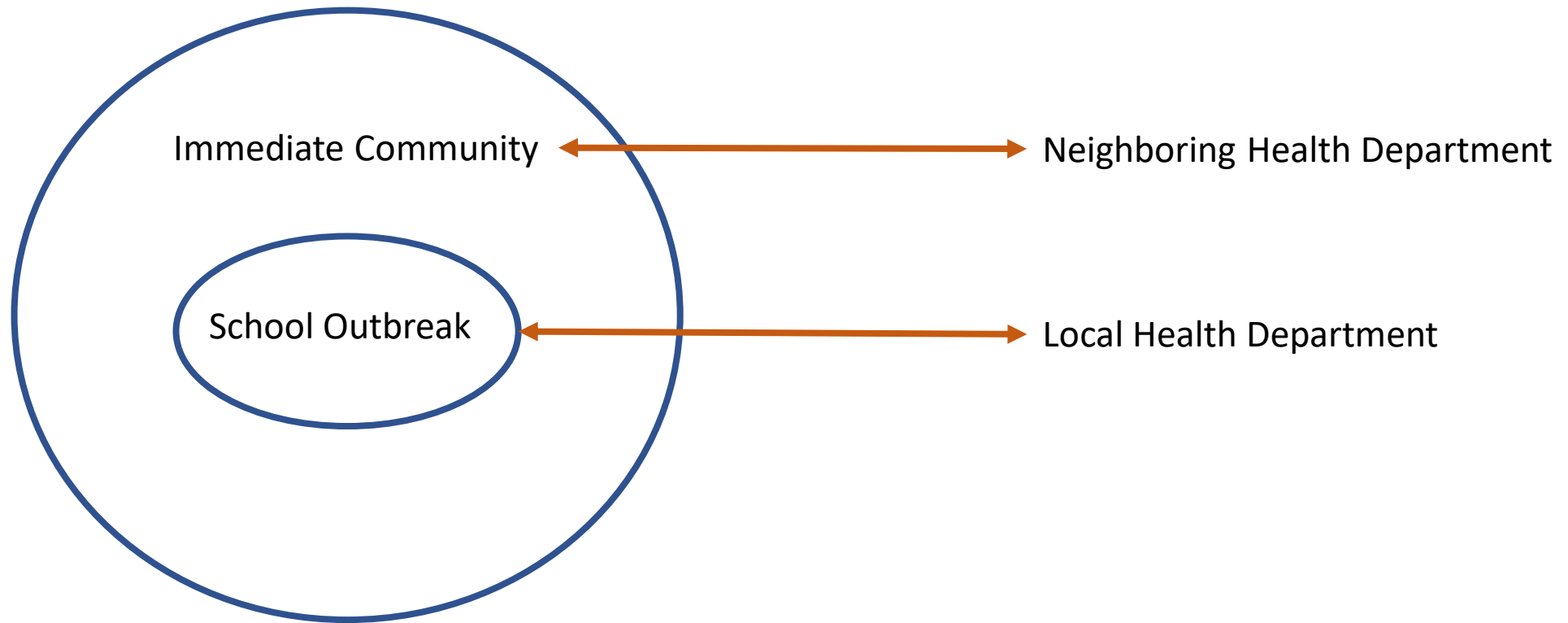
*“boundaries define the difference between **outside and inside** between the **past and the present and the future**”*



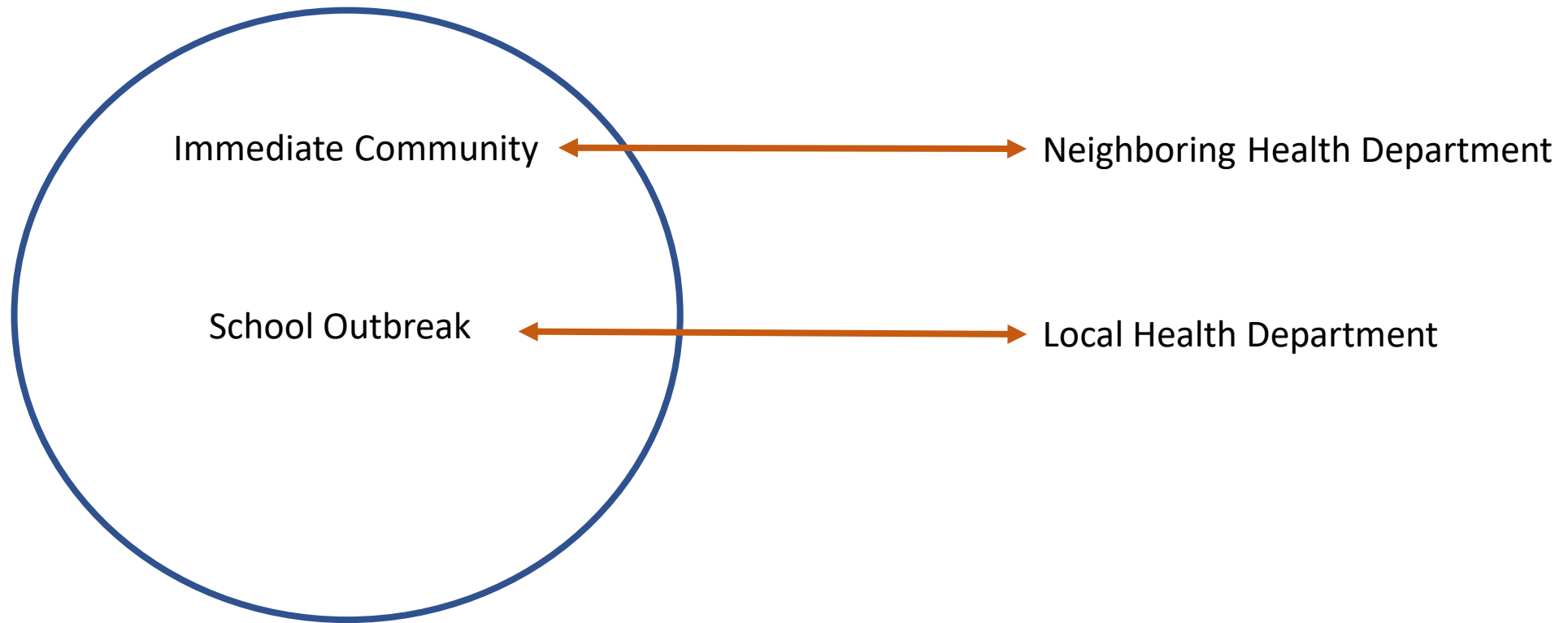
Boundaries: the EM mutual aid model



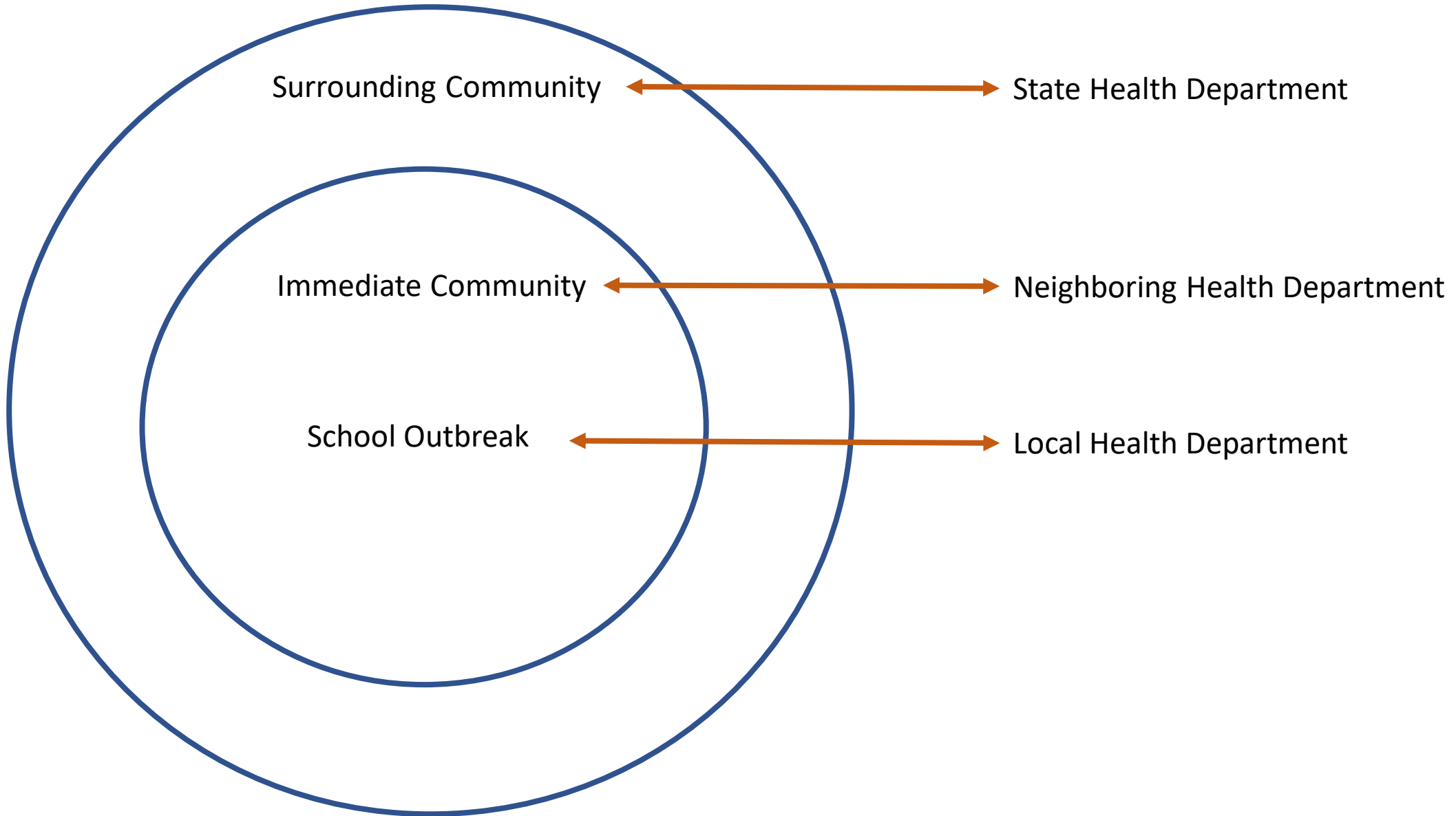
Boundaries: the EM mutual aid model



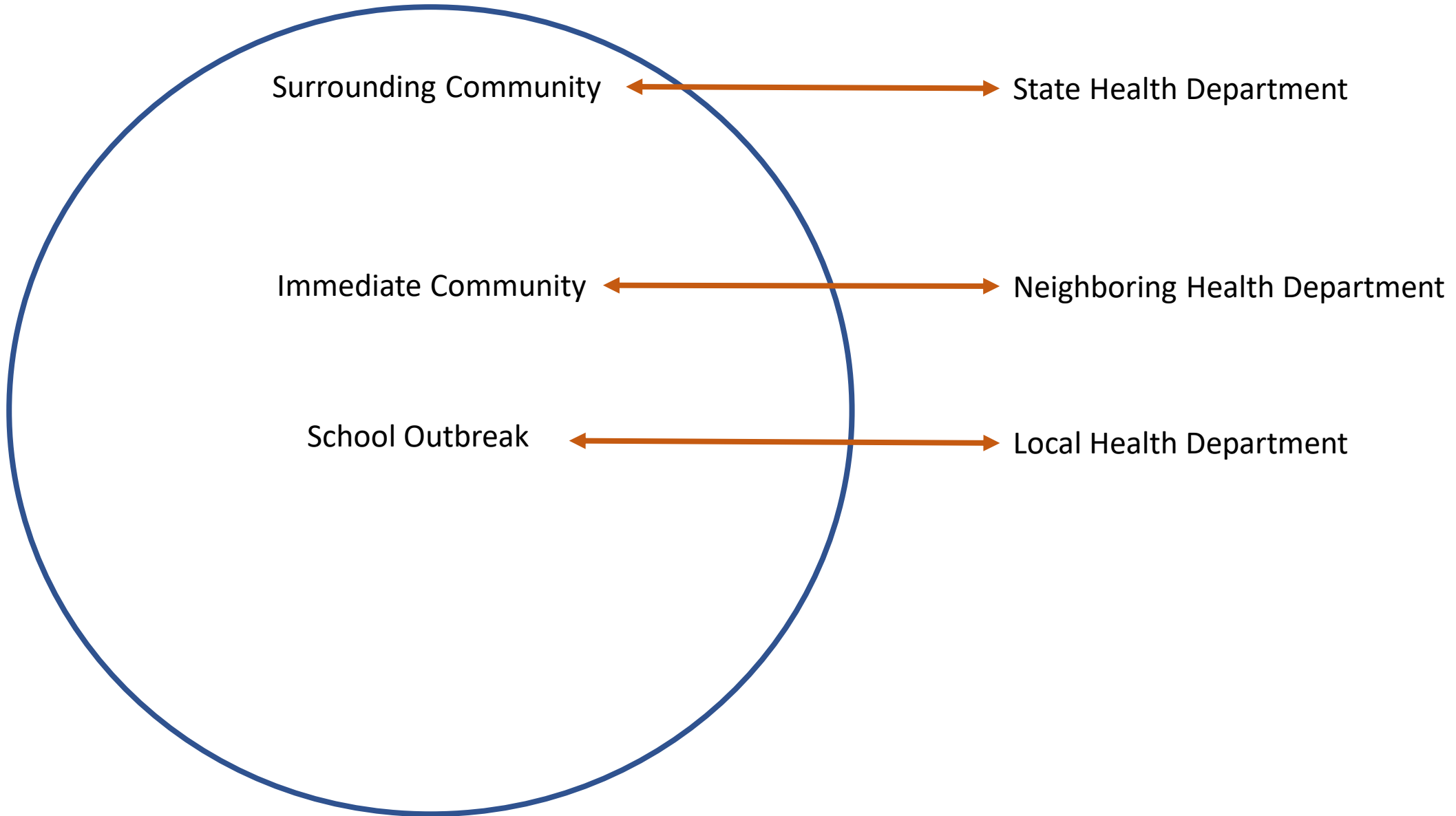
Boundaries: the EM mutual aid model

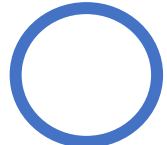


Boundaries: the EM mutual aid model



Boundaries: the EM mutual aid model





EM boundary



COVID-19 boundary

Time



Federal Health Department
Resources

Washington State
Health Department

New York State
Health Department

nth State Health
Department

Arizona Health
Department

Neighboring County
Health Department

Neighboring County
Health Department

nth County Health
Department

Neighboring County
Health Department

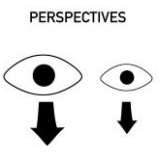


Washington
Local Health
Department

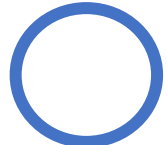
New York
Local Health
Department

nth Local Health
Department

My
Local Health
Department



PERSPECTIVES



EM boundary



COVID-19 boundary

Time



Federal Health Department
Resources

Washington State
Health Department

New York State
Health Department

nth State Health
Department

Arizona Health
Department

Neighboring County
Health Department

Neighboring County
Health Department

nth County Health
Department

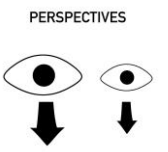
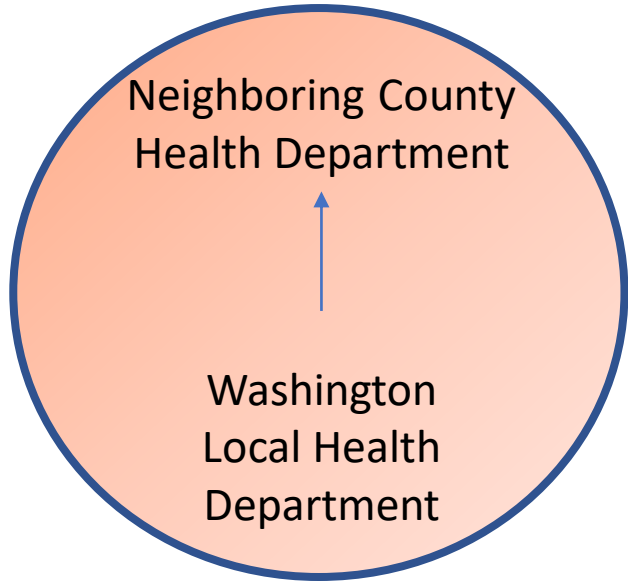
Neighboring County
Health Department

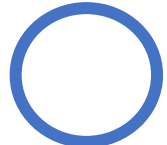
Washington
Local Health
Department

New York
Local Health
Department

nth Local Health
Department

My
Local Health
Department





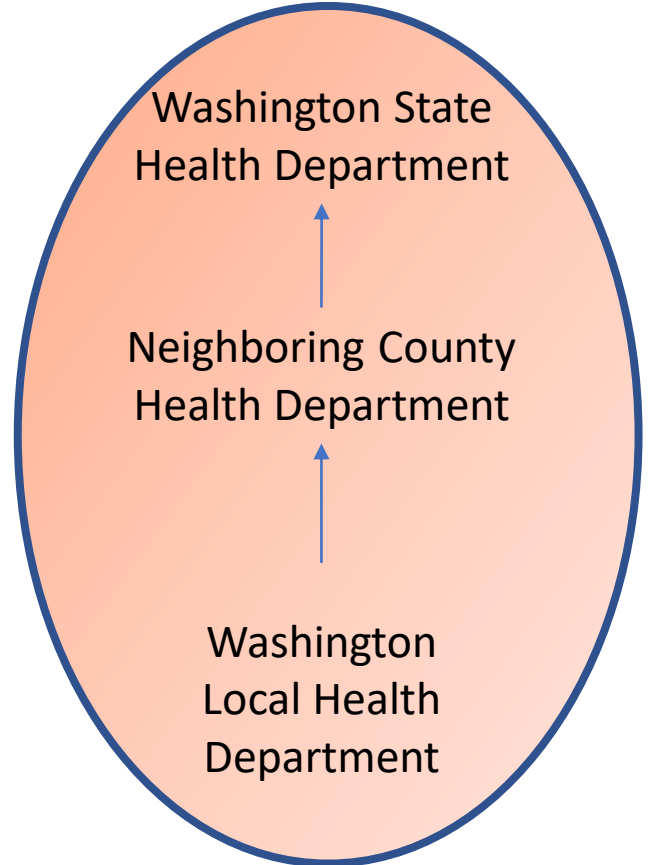
EM boundary



COVID-19 boundary

Time

Federal Health Department
Resources



New York State Health Department

Neighboring County Health Department

New York Local Health Department

nth State Health Department

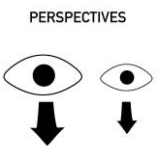
nth County Health Department

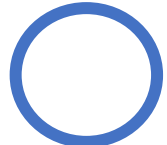
nth Local Health Department

Arizona Health Department

Neighboring County Health Department

My Local Health Department



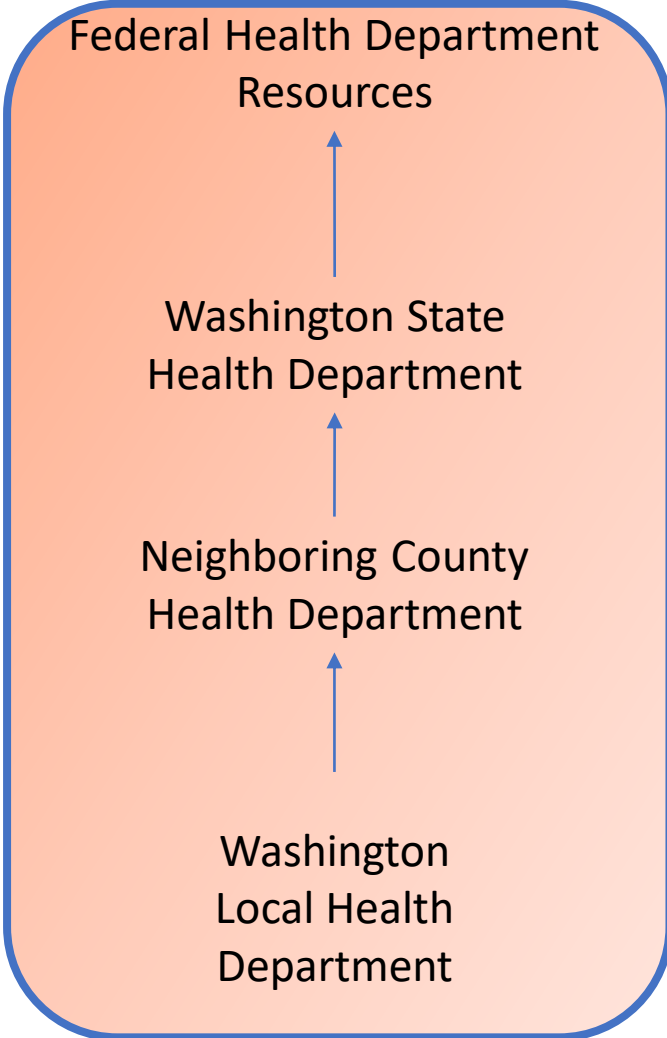


EM boundary



COVID-19 boundary

Time



New York State Health Department

nth State Health Department

Arizona Health Department

Neighboring County Health Department

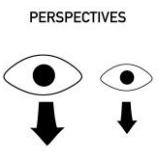
nth County Health Department

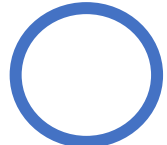
Neighboring County Health Department

New York Local Health Department

nth Local Health Department

My Local Health Department



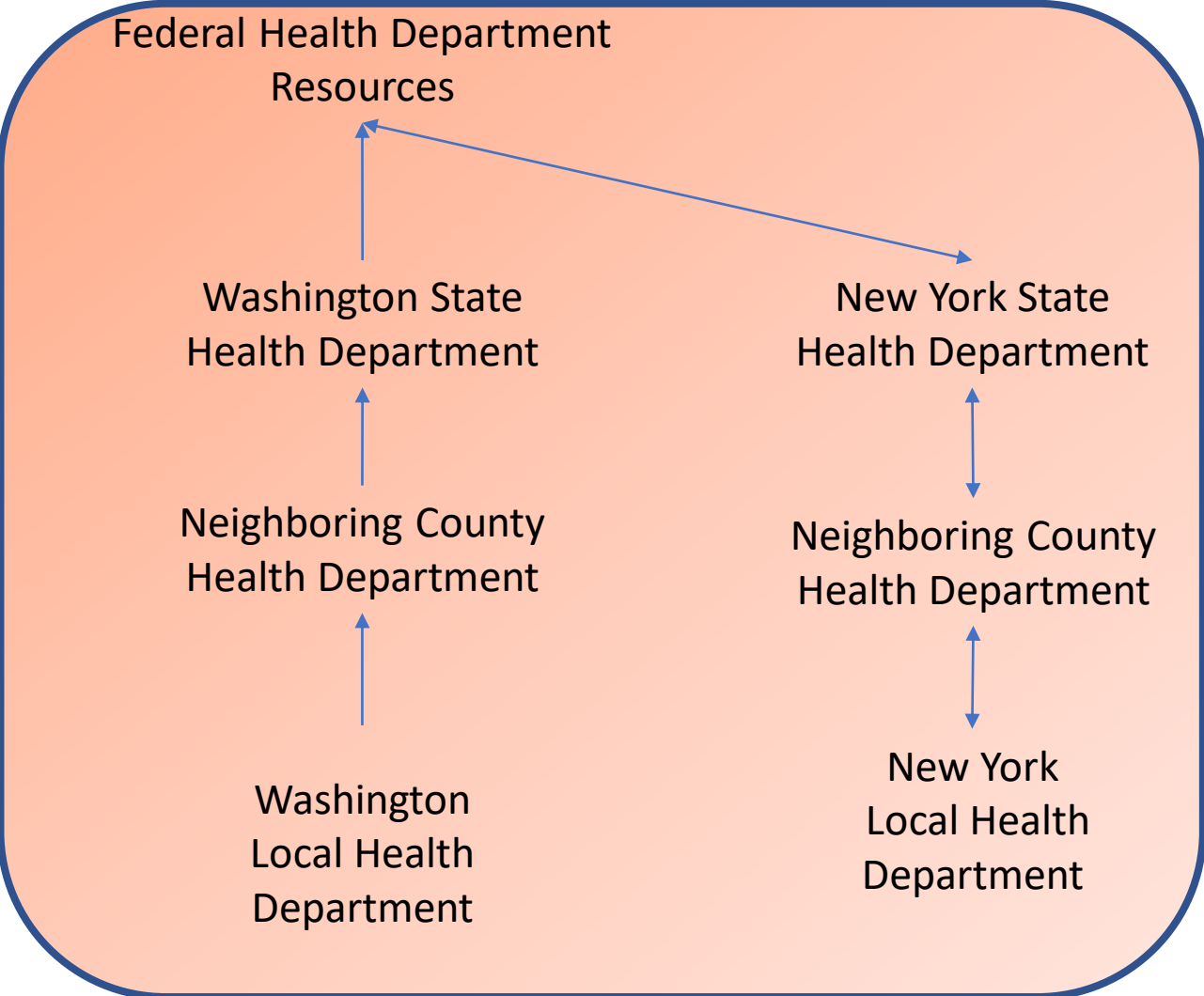


EM boundary



COVID-19 boundary

Time



nth State Health Department

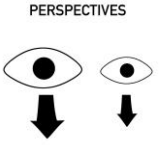
Arizona Health Department

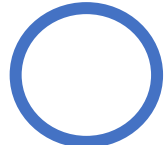
nth County Health Department

Neighboring County Health Department

nth Local Health Department

My Local Health Department



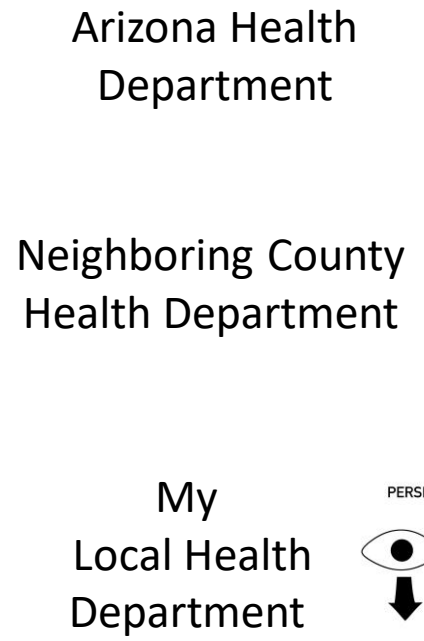
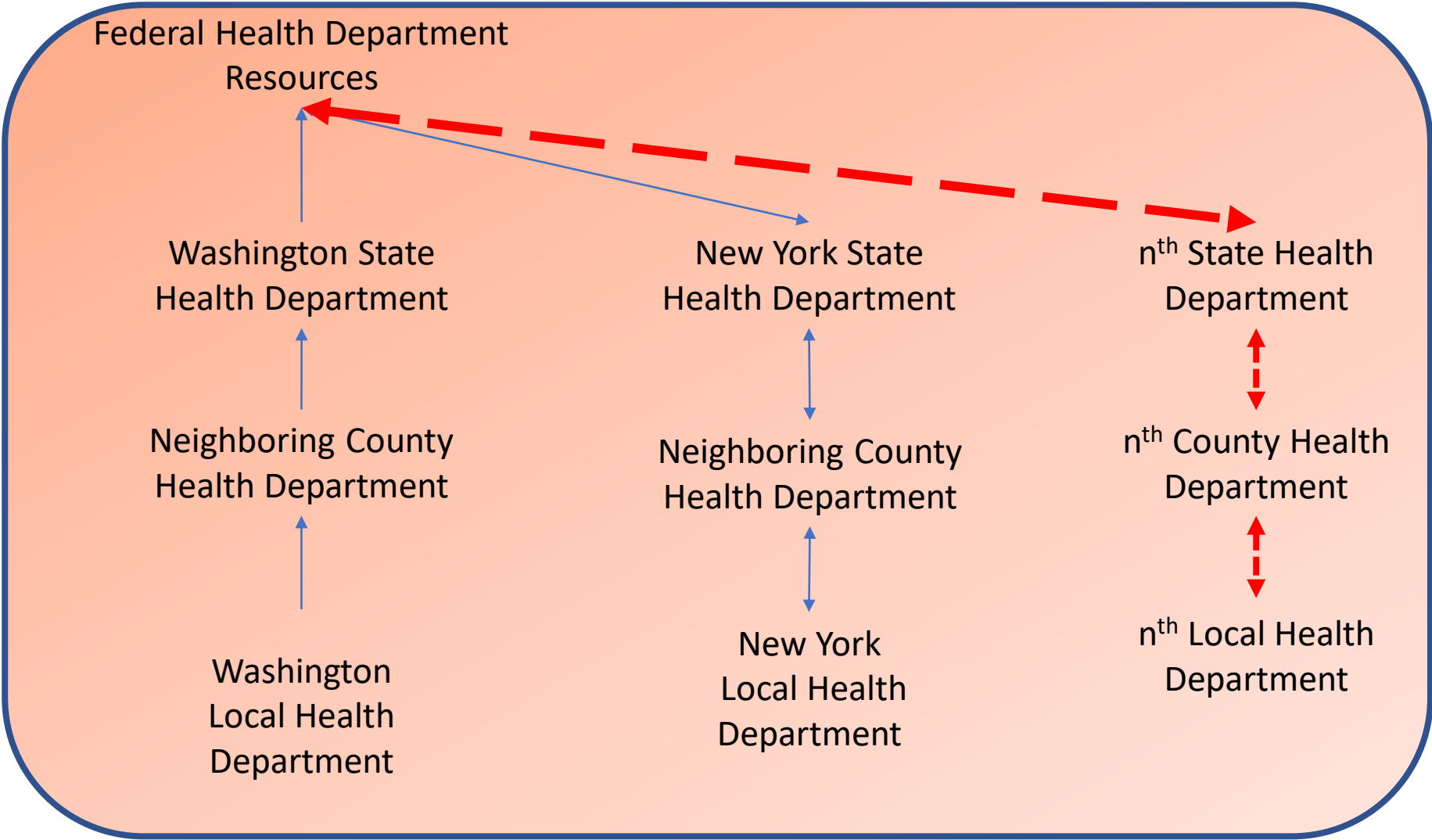


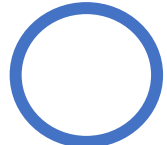
EM boundary



COVID-19 boundary

Time



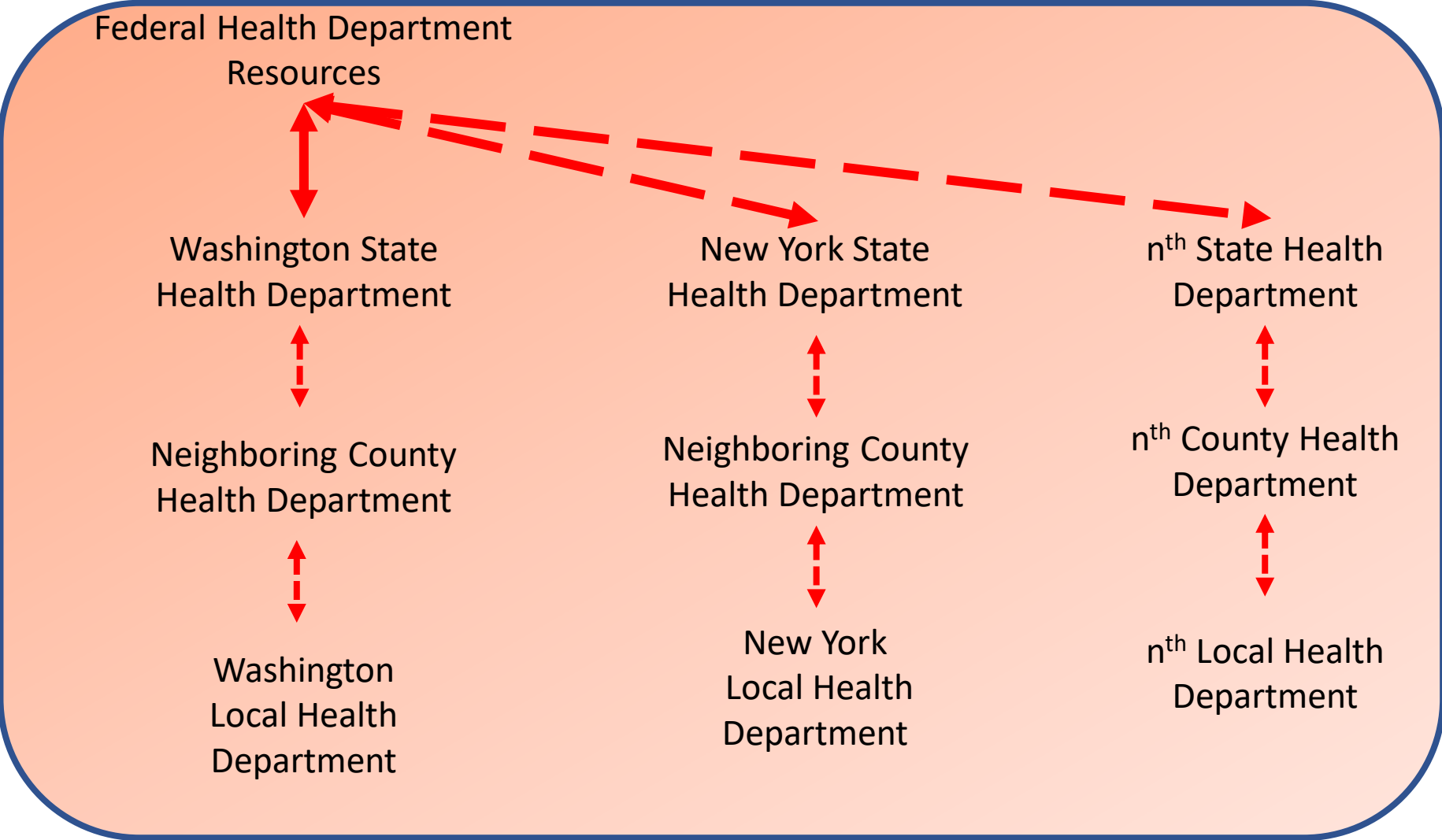


EM boundary



COVID-19 boundary

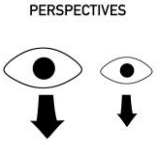
Time

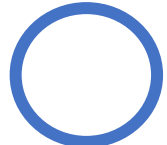


Arizona Health Department

Neighboring County Health Department

My Local Health Department



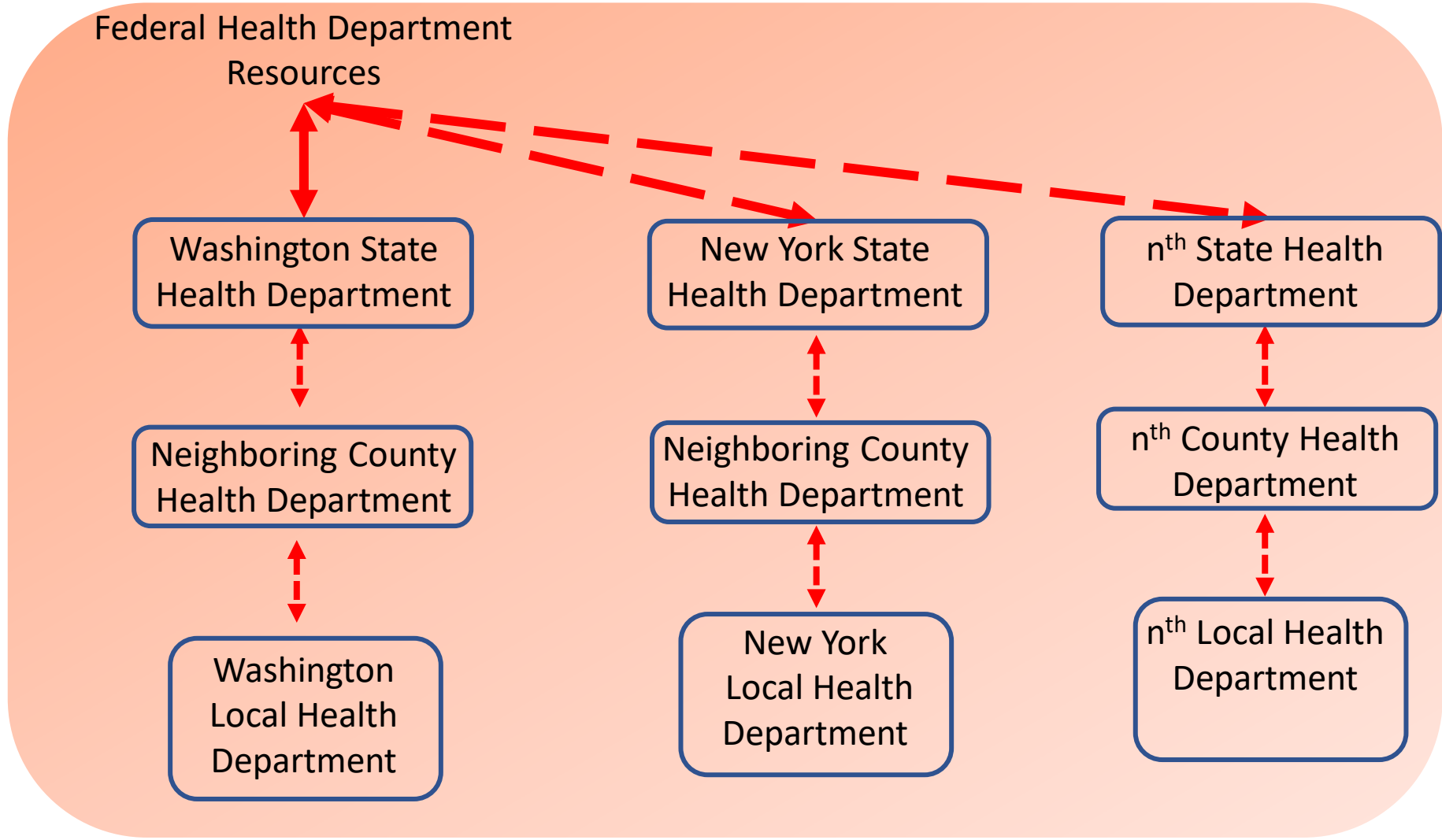


EM boundary



COVID-19 boundary

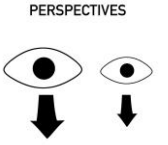
Time

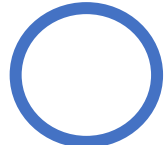


Arizona Health Department

Neighboring County Health Department

My Local Health Department



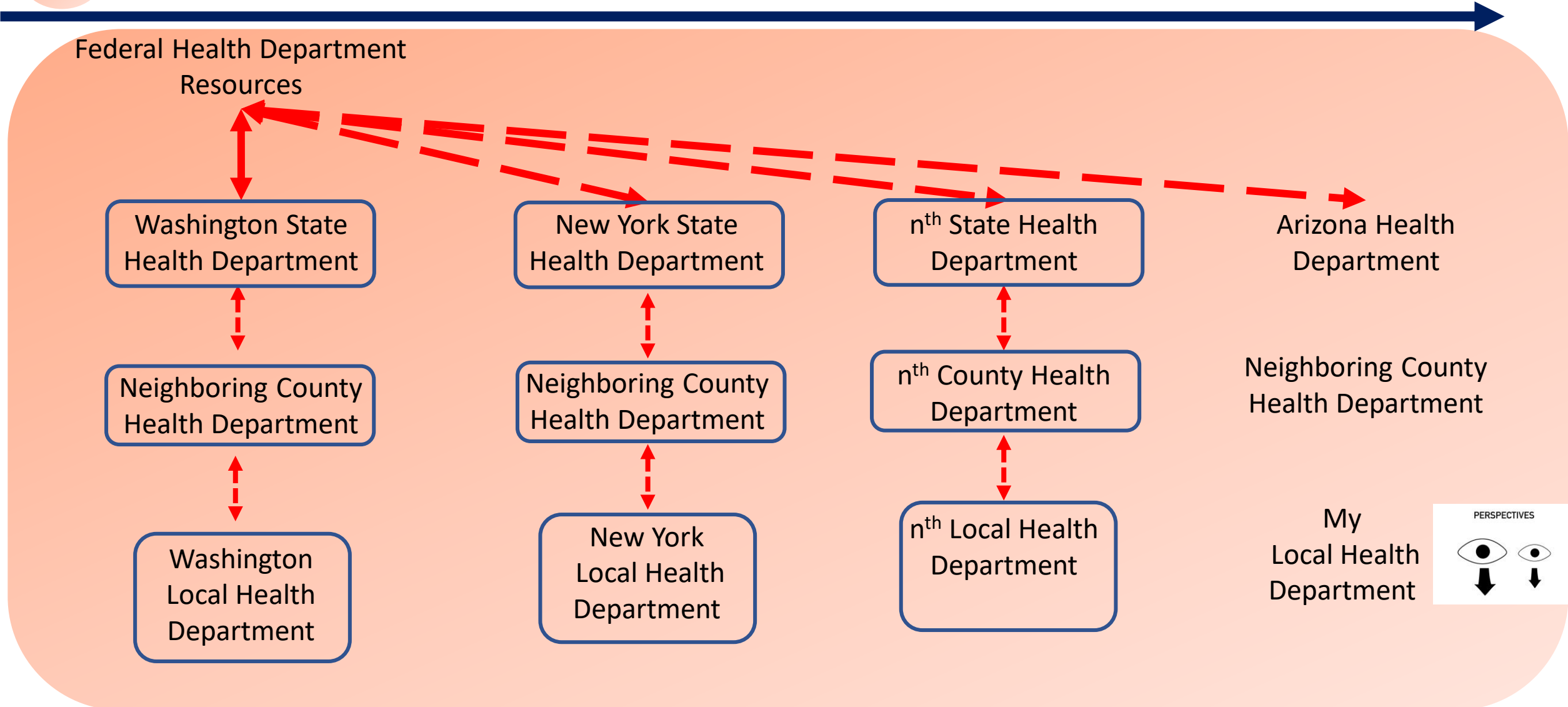


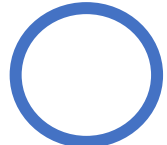
EM boundary



COVID-19 boundary

Time



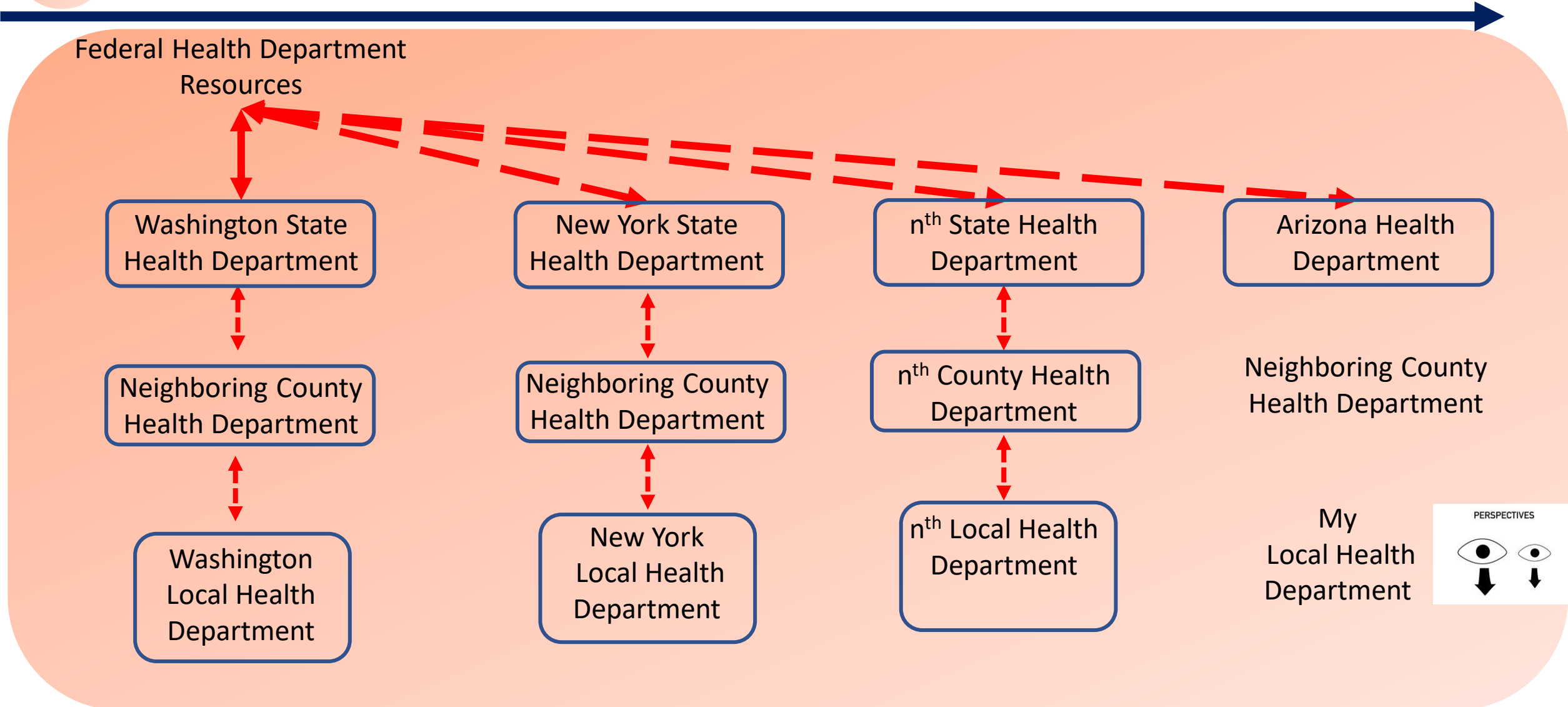


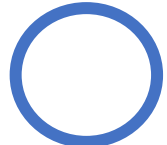
EM boundary



COVID-19 boundary

Time



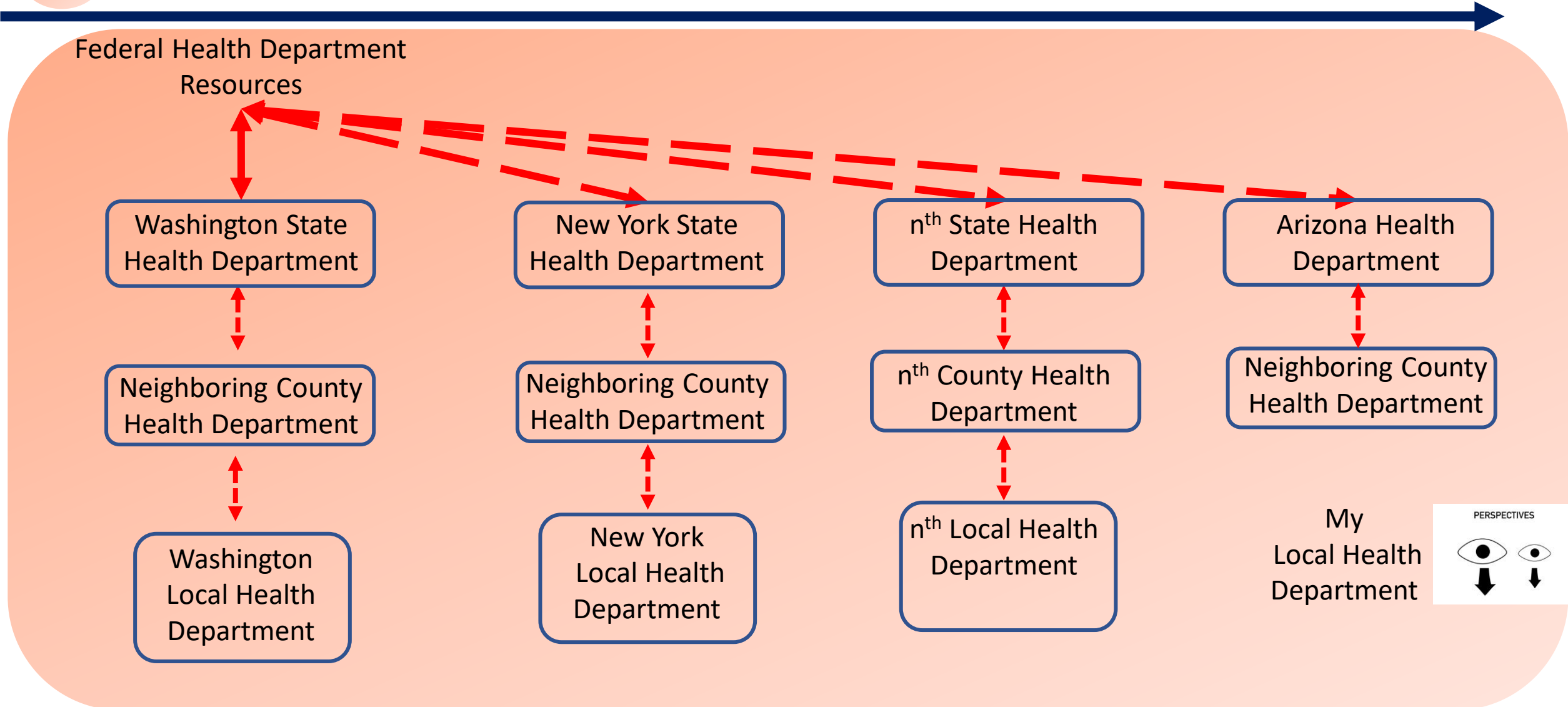


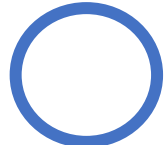
EM boundary



COVID-19 boundary

Time



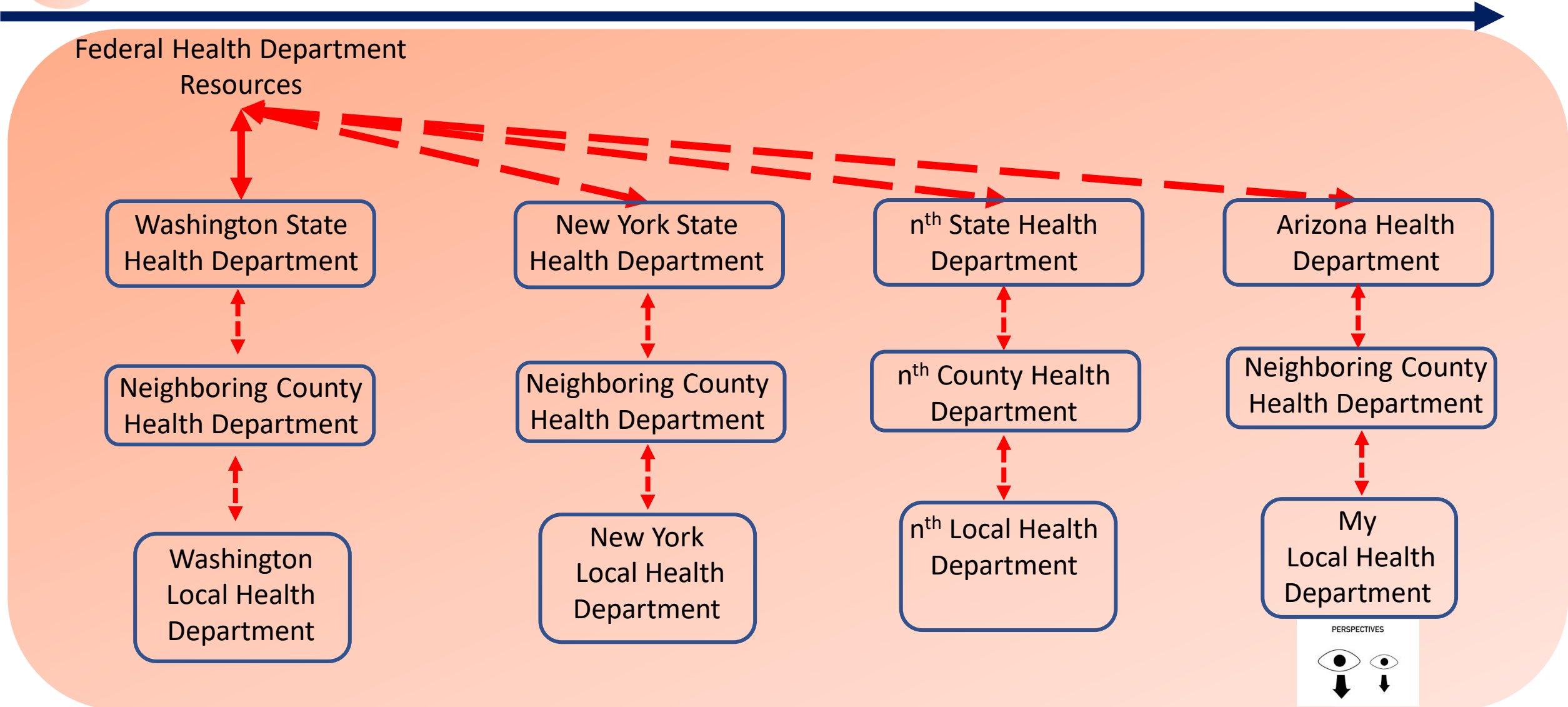


EM boundary



COVID-19 boundary

Time



Steady state & open/closed systems



Closed system boundaries create chaos

Healthy “open systems” are in dynamic equilibrium – they perform best when they are operating IN steady state with the *chaos on the edge of the system boundary*



Closed systems are **NOT IN steady state** exchange materials, energy, information, feedback and will reach maximum entropy: death & decay leading to system-wide chaos



What does chaos look like in COVID-19?

- States competing with other for same PPE; prices driven up
- People stealing food from trucks
- Hospitals within county withholding PPE counts (hoarding)

A systems thinking local health department could have been:

- Assessing local inputs two months earlier.
- Looking for system inputs locally:
 - Medical and Non-medical Volunteers
 - PPE
 - Food security (National Guard)
- Looking system inputs internationally:
 - Germany
 - South Korea

“Nobody could have predicted how the events of COVID-19 unfolded”



Thank-you

- Contact information
- Email: ralph@justevaluation.com
- Web: justevaluation.com