



# Impacts of Porcine Epidemic Virus in the U.S. Swine Herd

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# PED Initial Events

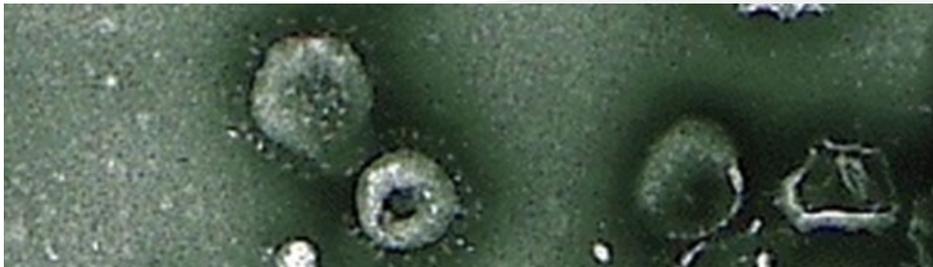
- PED was confirmed in the US on May 17<sup>th</sup>, 2013 by diagnostic tests at the USDA National Veterinary Services Laboratory (NVSL)
- PED is new to the Western Hemisphere, but not new to Asian countries (S. Korea; China; Thailand) and Europe
- Now reported in Mexico, Peru and Canada
- Strain initially found in the US is 99.4% similar to a Chinese isolate from 2012

# PED Initial Events

- Following the diagnosis of PED, there was an immediate coordinated effort by all key stakeholders to understand where PED was/is occurring and how to best manage it:
  - United States Department of Agriculture (multiple divisions)
  - National Pork Board
  - National Pork Producers Council
  - American Association of Swine Veterinarians

# PED – what is it?

- PED is a diarrheal disease of pigs that is similar to the TGE virus (Transmissible Gastroenteritis virus)
- Considered to be a production disease
- PED is **NOT** a threat to human health and pork is safe to eat



# PED – how does it move?

- PED is transmitted through contaminated manure, so anything in contact with manure can be a potential source of infection
- Biosecurity focus has been stepped up for the entire industry!
  - Focus on preventing the spread of this virus
  - Control areas you can control

# What does PED do to pigs?

Up to 100% mortality of baby pigs < 4wks of age

- Total loss of production in farrowing for 6-8 weeks

Diarrhea and vomiting in older animals

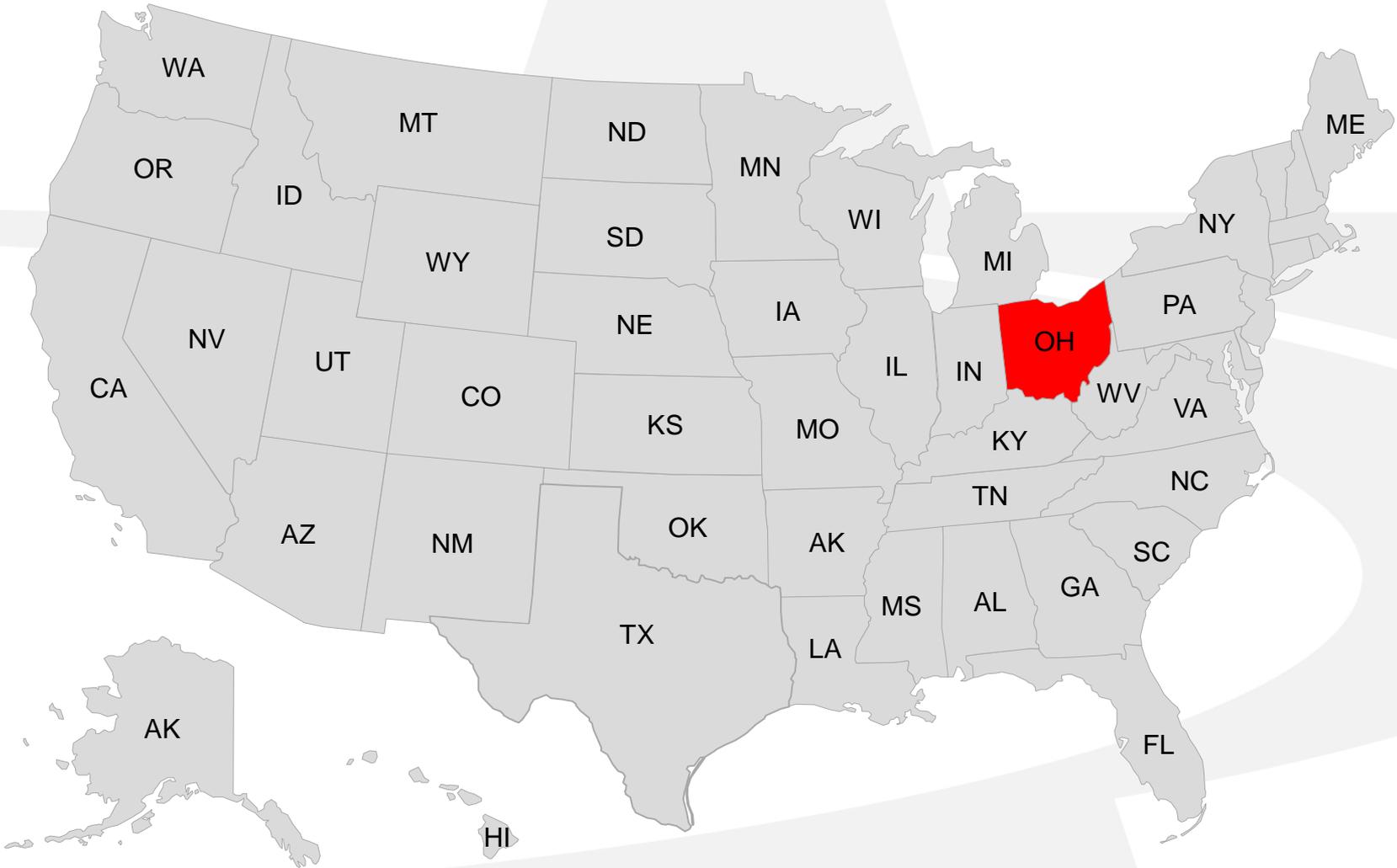
- Loss of growth & reduced reproduction

# Why is PED so different?

- U. S. pig population has no immunity (naïve population) against this virus
- Entire pig population is at risk
- Currently do not have a commercially licensed vaccine
- Virus can spread easily

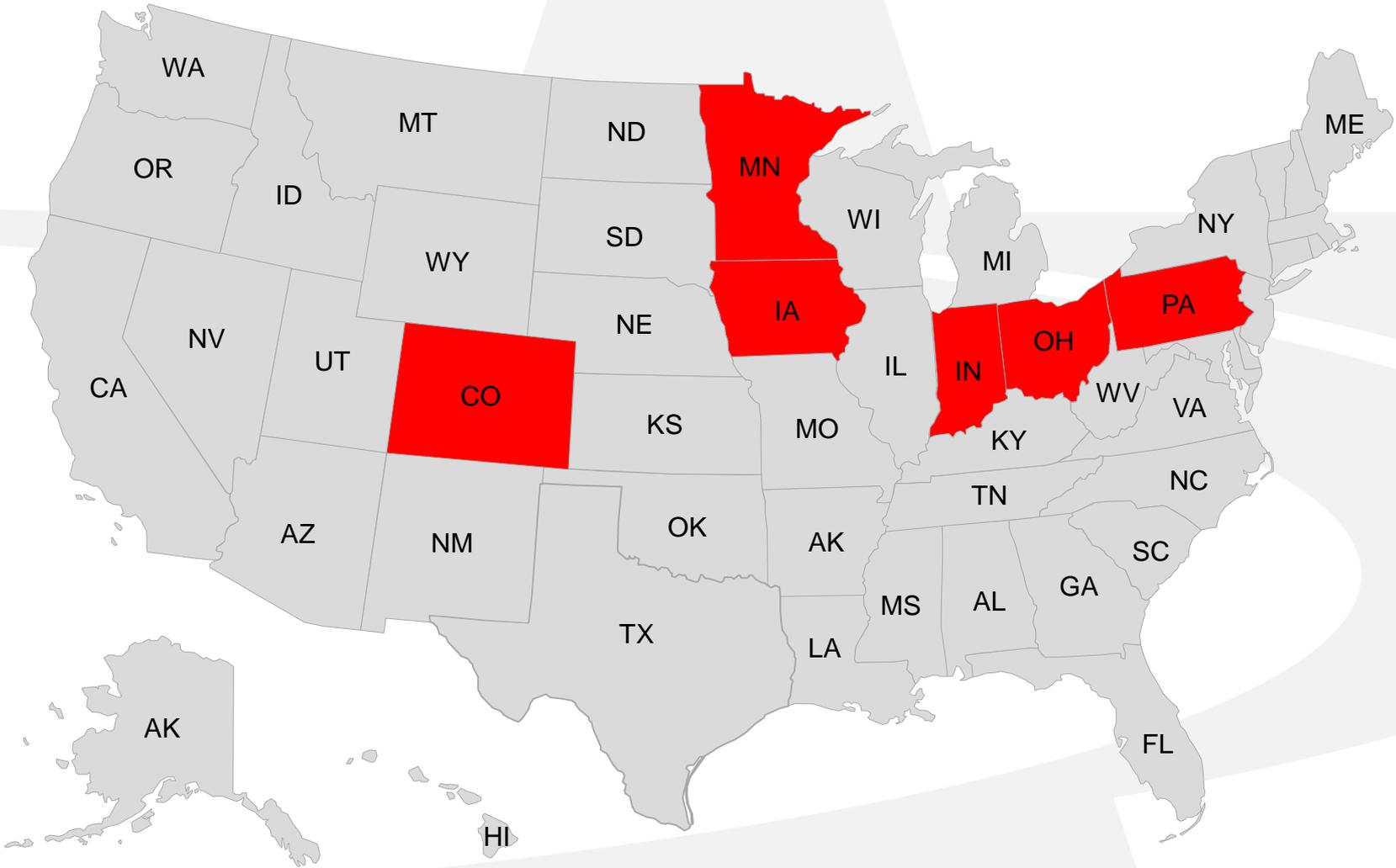
# PED Ongoing Events

- Has spread to 25 states
- Second strain has been reported
  - Lower virulence
  - Whole genome sequencing will help determine if new virus
- Delta coronavirus causing similar illness
- National Animal Health Laboratory Network (NAHLN) Laboratories have made a significant contribution



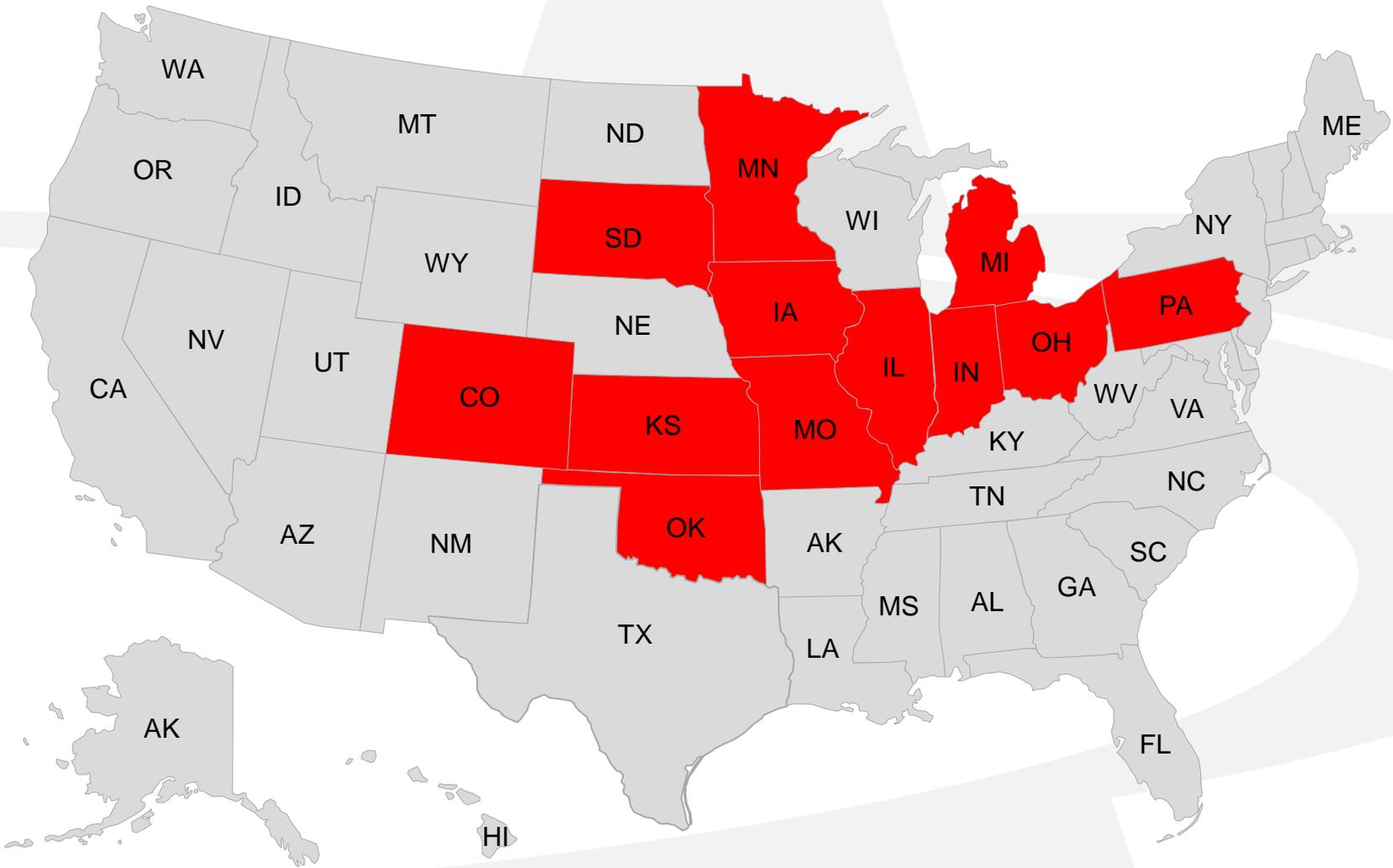
Week of 4/15/2013: 1 state





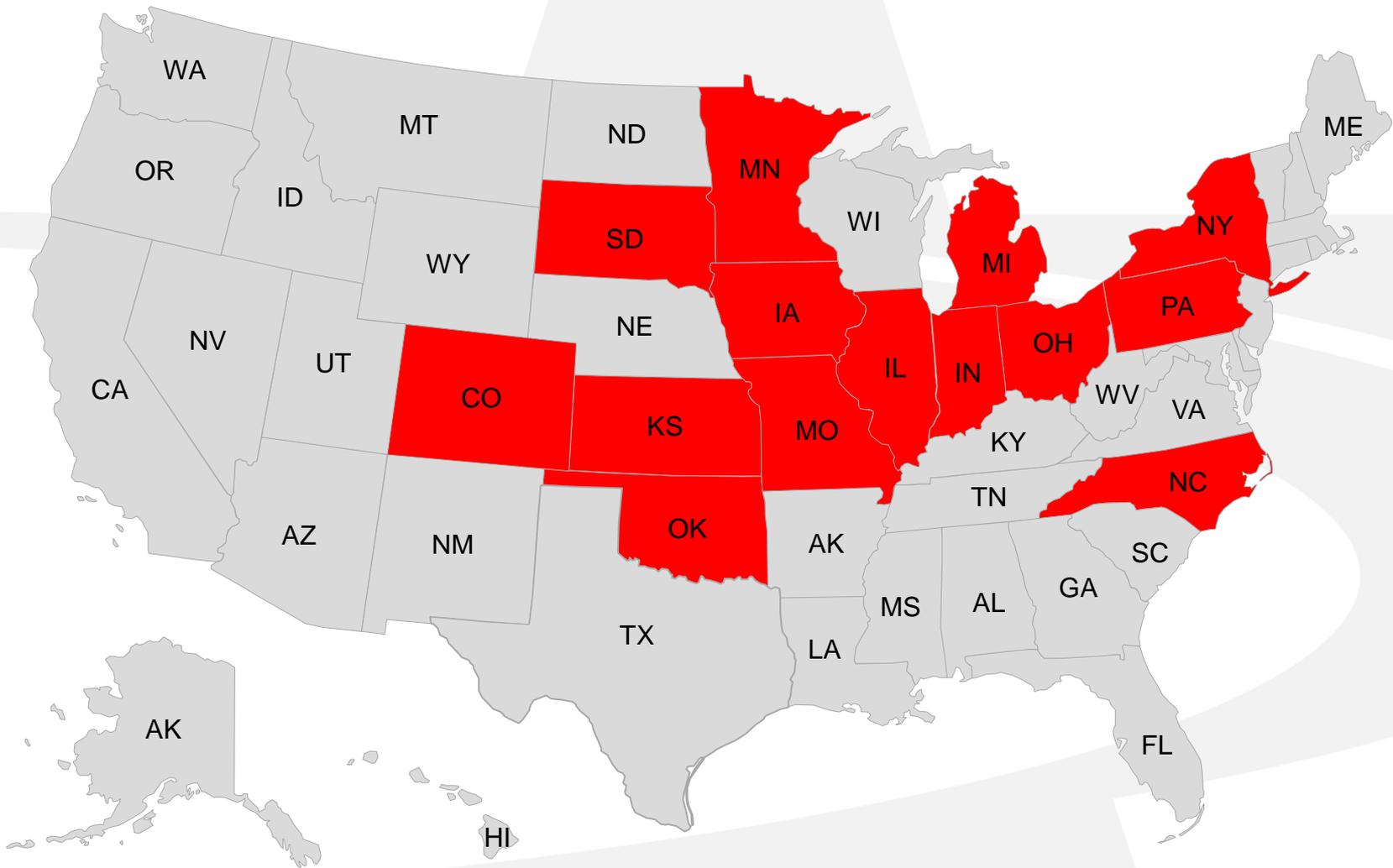
Week of 5/6/2013: 6 states





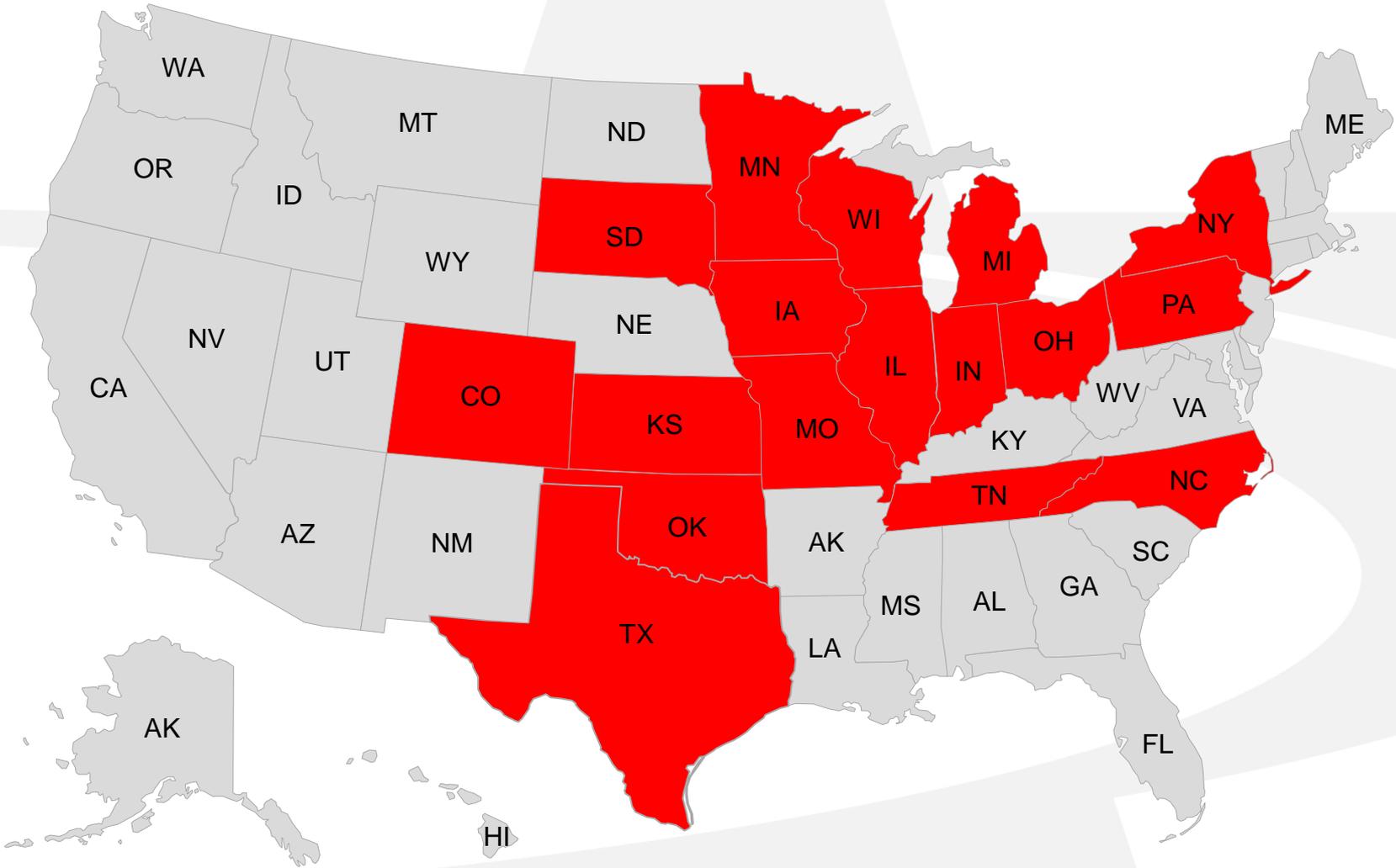
Week of 6/3/2013: 12 states





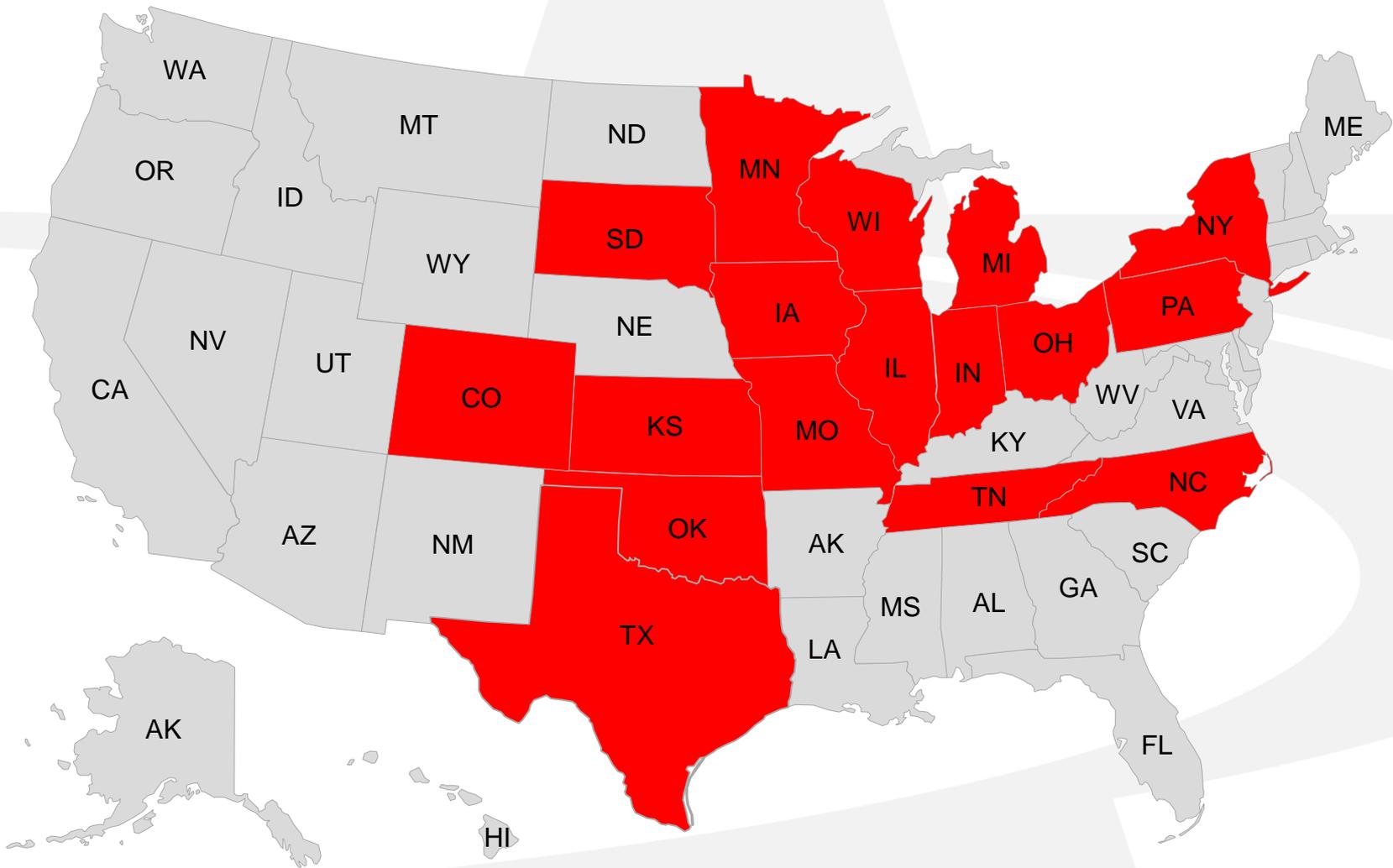
Week of 7/7/2013: 14 states





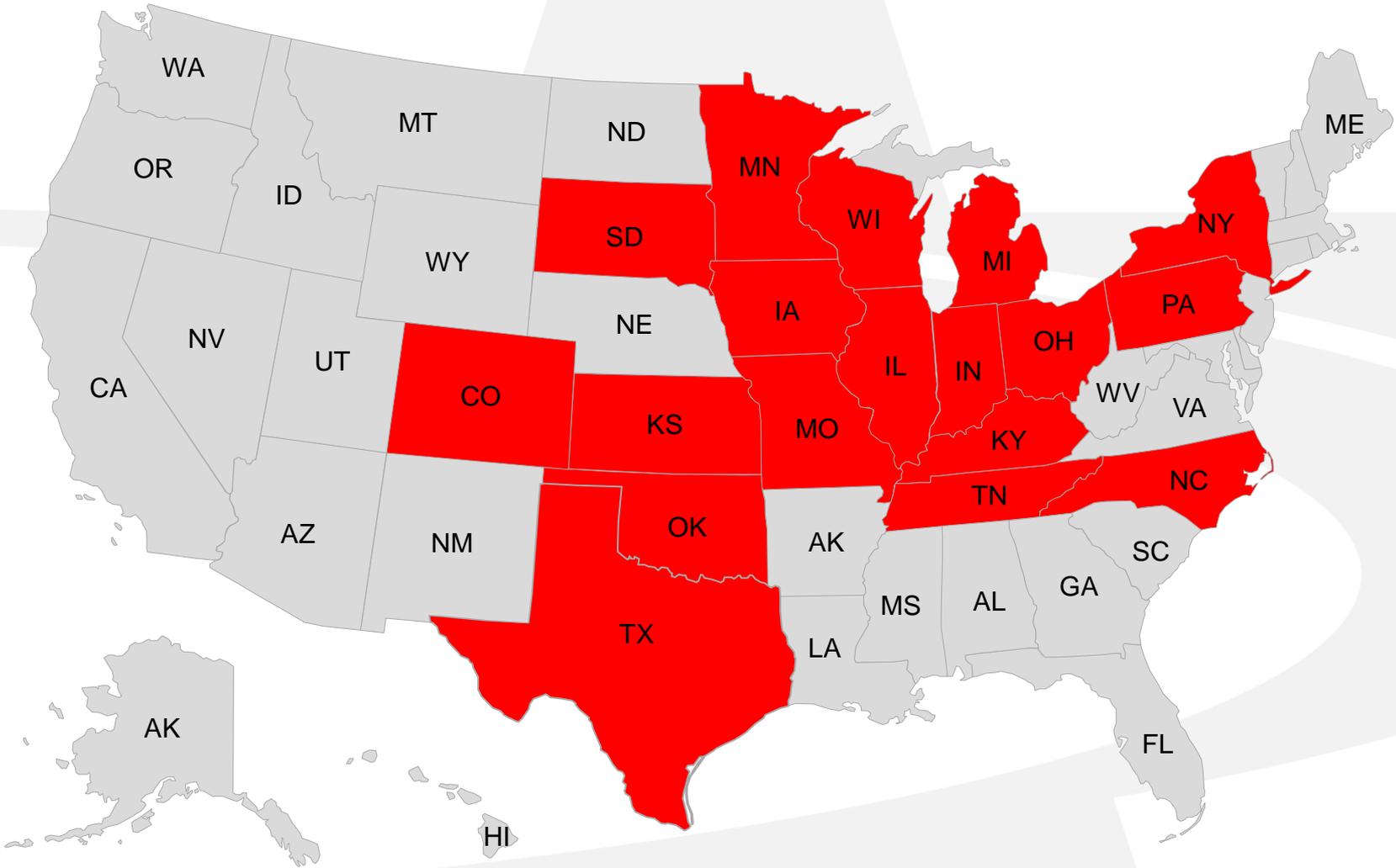
Week of 8/4/2013: 17 states





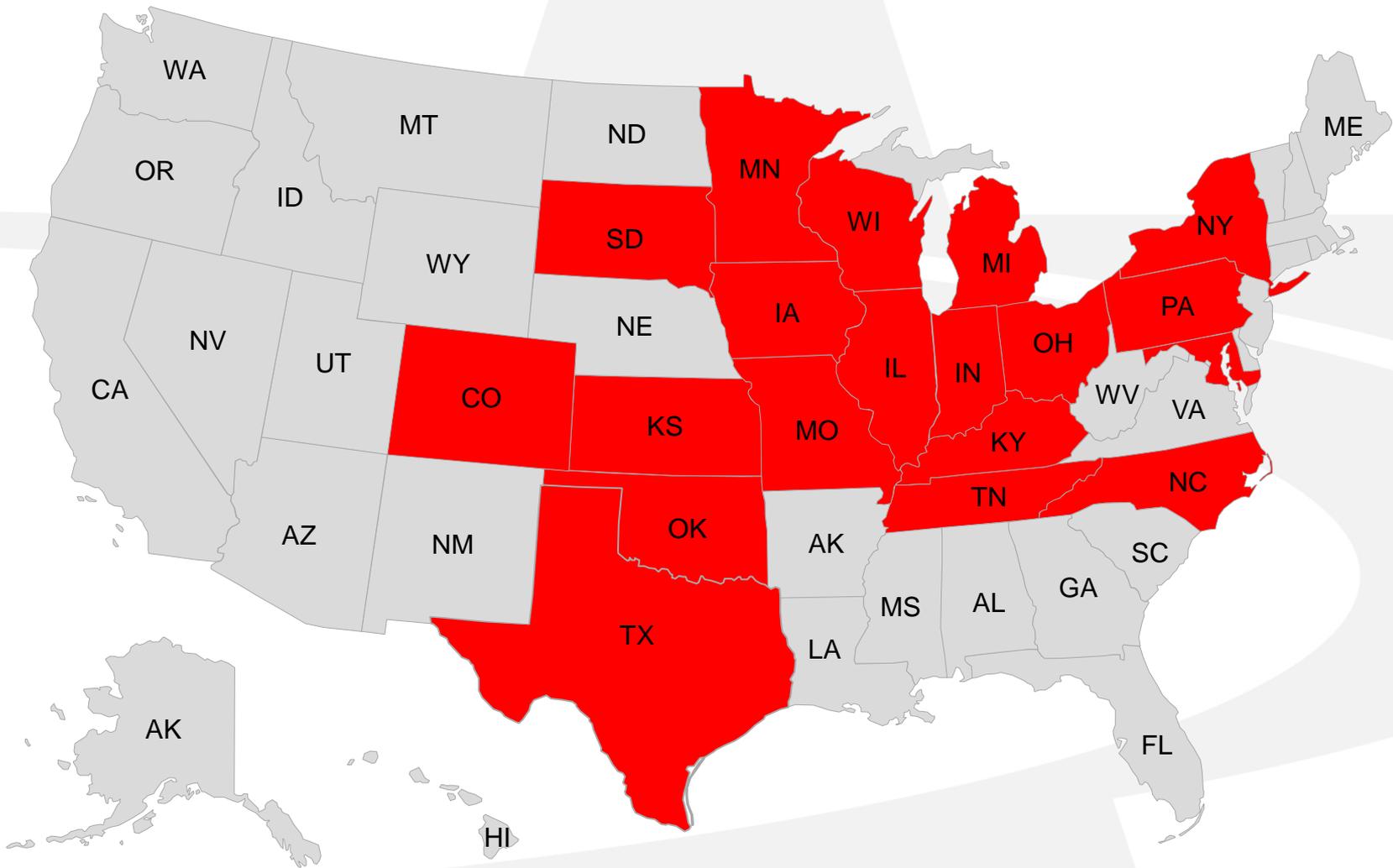
Week of 9/1/2013: 17 states





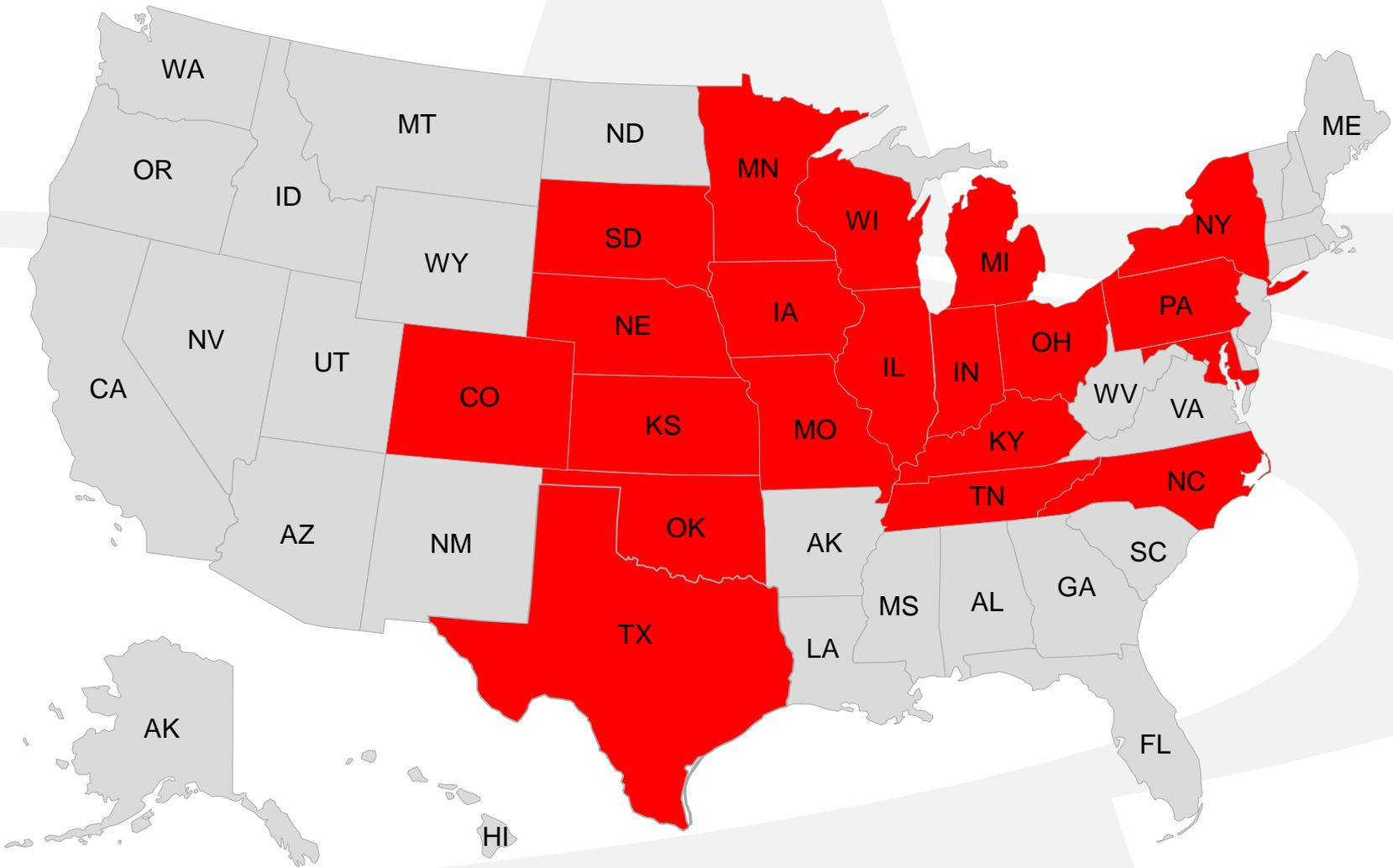
Week of 10/6/2013: 18 states





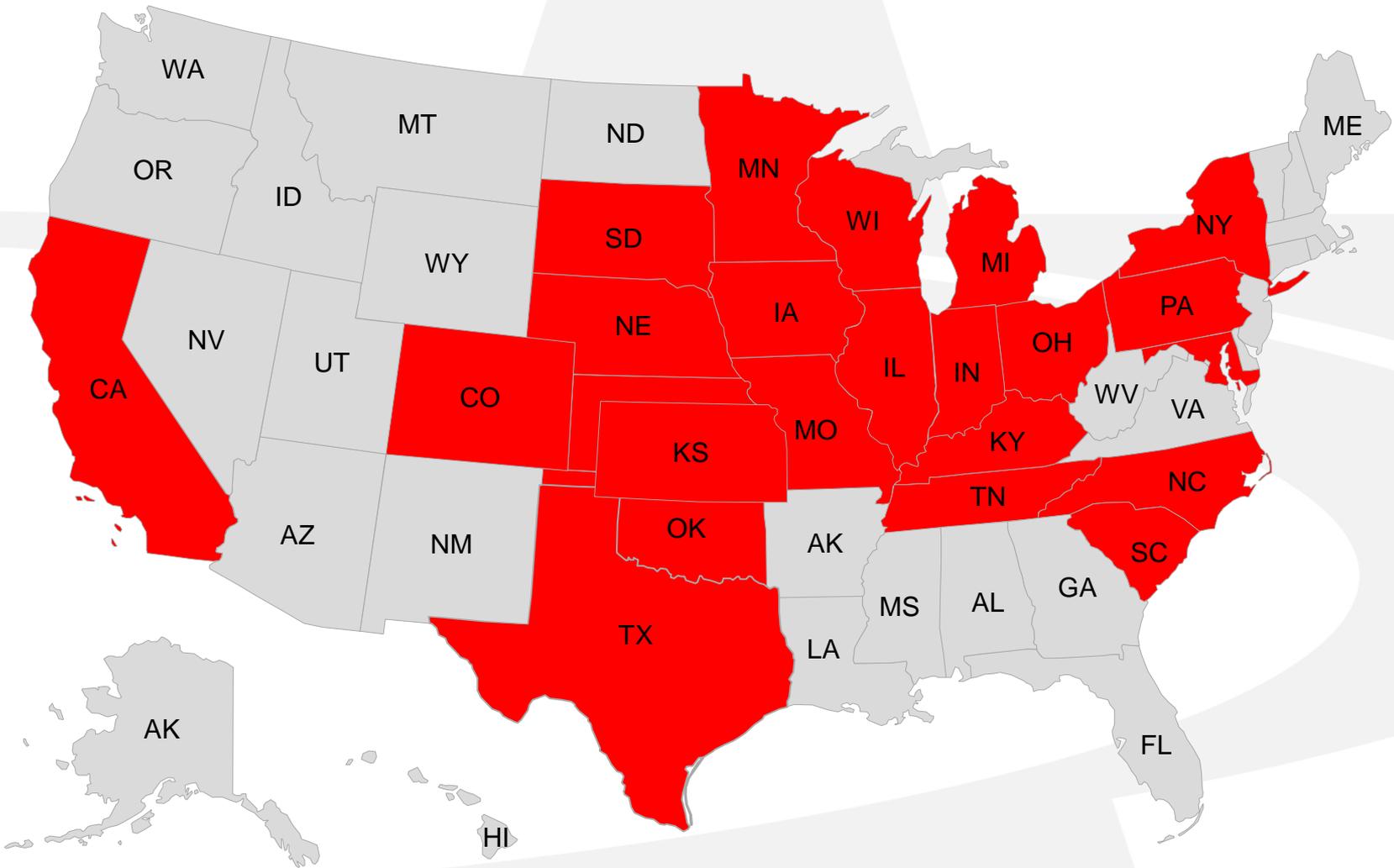
Week of 11/3/2013: 19 states





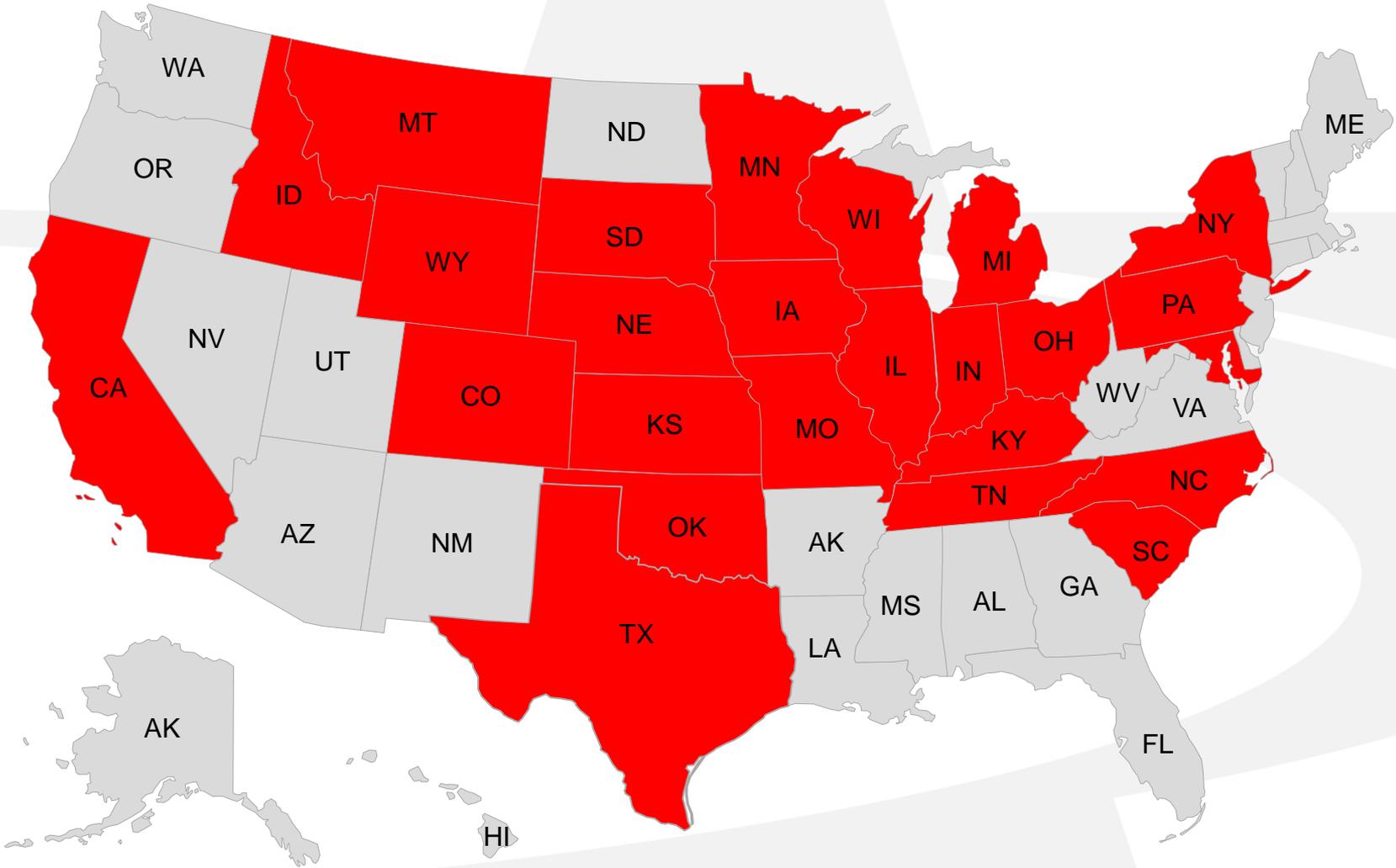
Week of 12/1/2013: 20 states





Week of 1/5/2014: 22 states

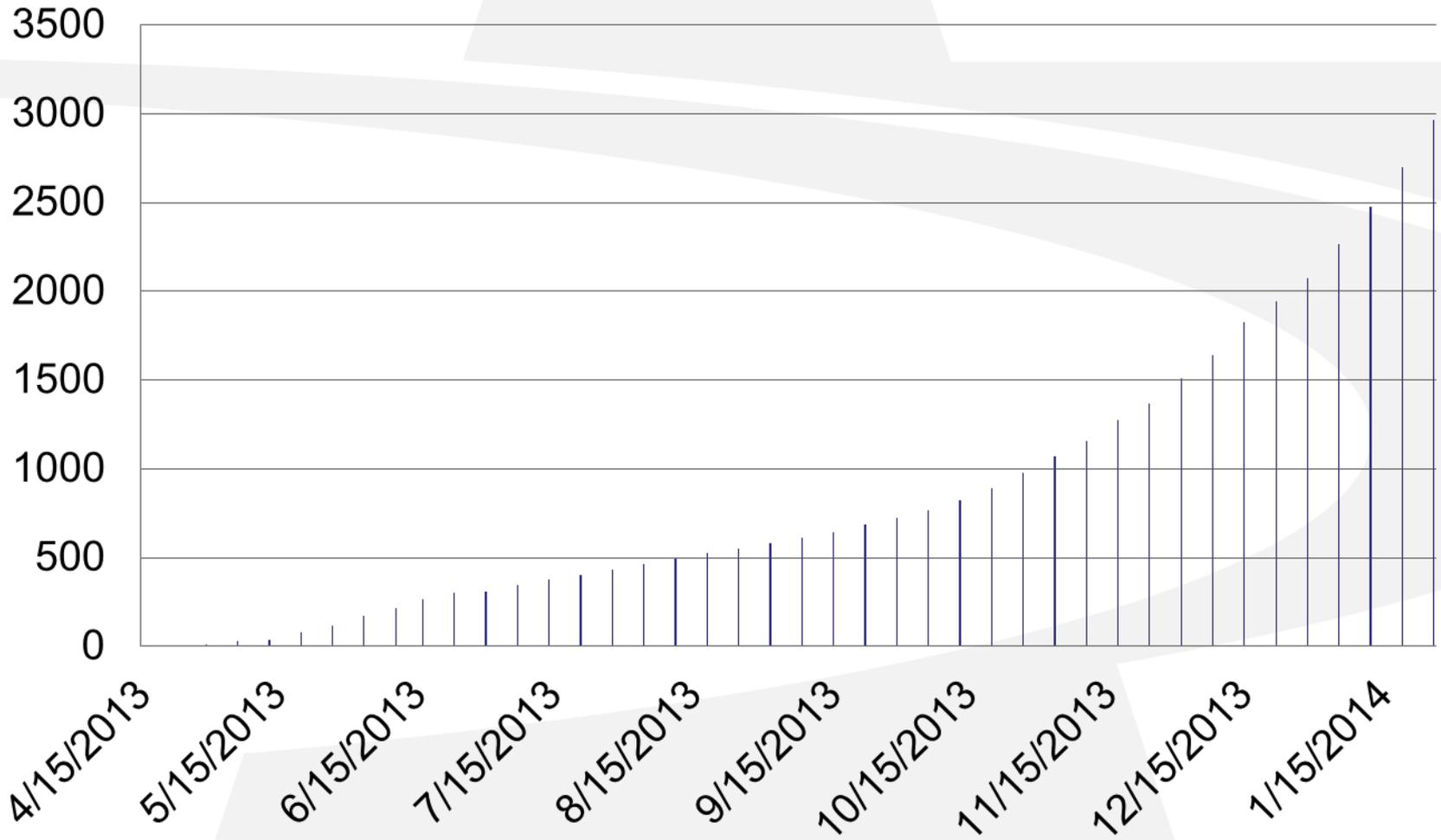




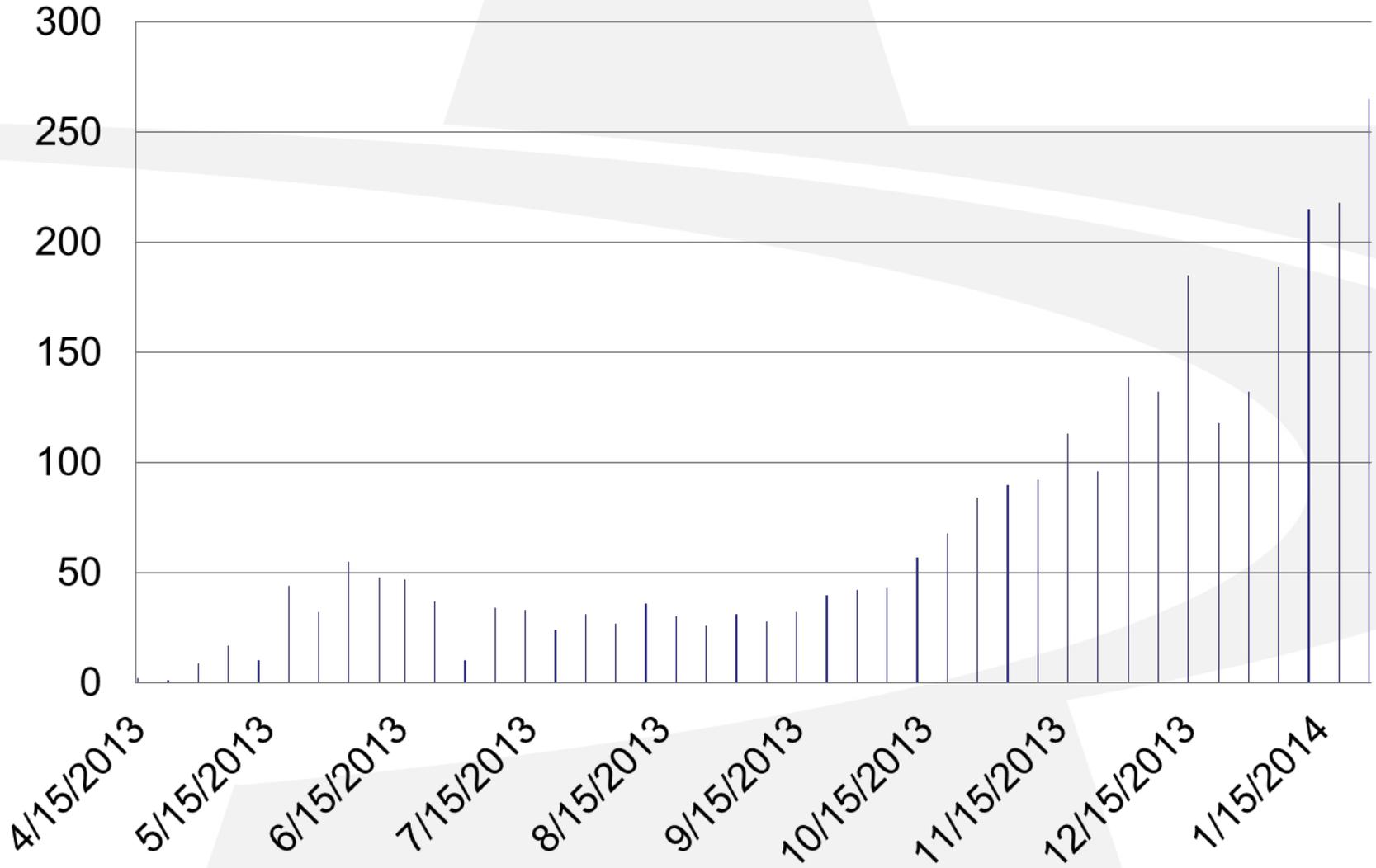
Week of 2/17/14: 25 states



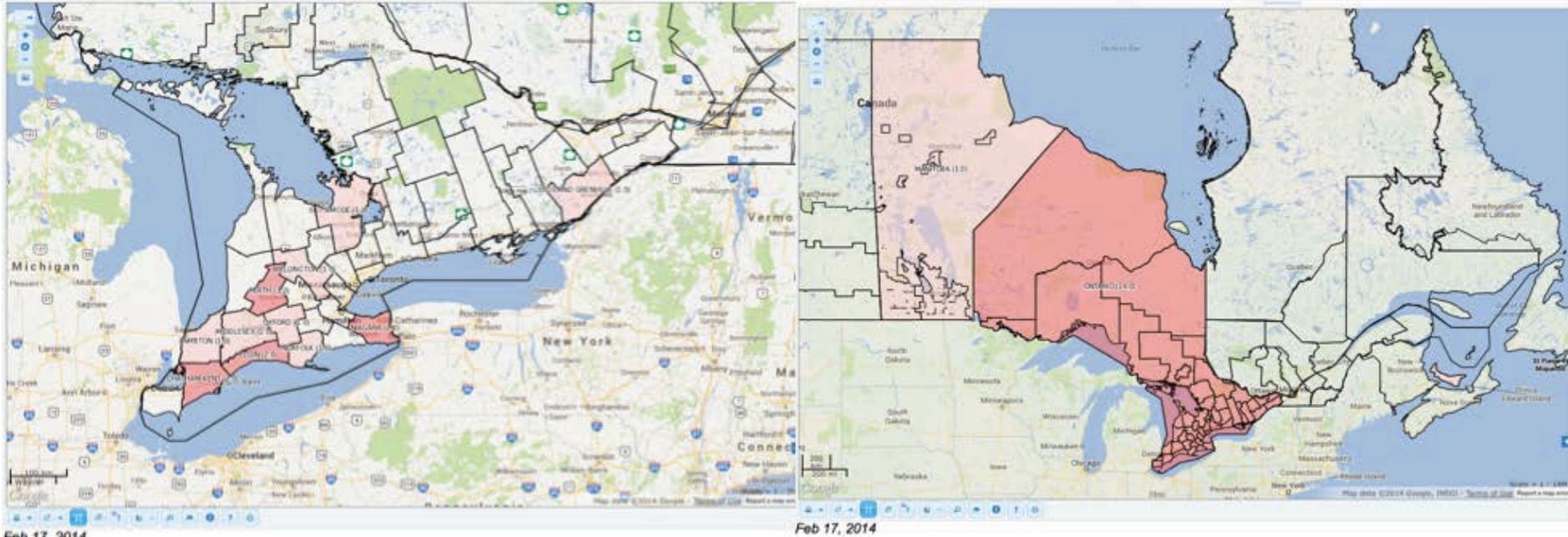
# Total Number of Diagnostic Case Submissions Testing Positive for PEDv



# New Case Submissions Per Week



# Canadian Situation



# Development of Producer Resources

- Formation of Working Groups to focus on key areas of need
  - **Biocontainment** (if you have it, how to not spread it)
  - **Biosecurity/Transportation** (how to keep it out)
  - **Packing Plant Biosecurity Working Group** (how can you control multiple sources of pigs and minimize spread)
    - Market hog
    - Buying stations

# Biosecurity is critical for PED control

- Focus on what can be done to minimize or prevent the spread of PED
- How can we do this? Examples...
  - Understand areas of risk (commingling points, chutes, trailers)
  - Set up a Line of Separation
  - Use of additional clothing/footwear to prevent contamination (cover-up and contain)

# Guidelines for Diagnosis of PED Virus

- Lab diagnosis needed for determining site status
- Managing biosecurity or biocontainment
- Specifics of specimen collection
  - Feces
  - Oral fluids

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**Swine Health Producer Guide**

## Guidelines for Diagnosis of PED Virus

**Key Points**

The recent introduction of the Porcine Epidemic Diarrhea (PED) virus into the United States has greatly increased the risk of spreading disease for pig producers.

- When sow farms are first infected, all ages of pigs develop diarrhea and suckling pigs will die.
- The severity of piglet diarrhea will usually decrease over time in infected sow farms.
- After weaning, diarrhea from PED virus can be either severe or mild like other diseases.

Accurate diagnosis through proper testing is **essential** to know a herd's infection status.

- PED virus cannot be contained without knowing where the virus is present.
- Knowing the infection status of herds or sites will help all of us manage our biosecurity practices and control protocols.

**Contact your herd veterinarian if you suspect PED.**

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**Guidelines for sow herds**

**Do piglets or sows have diarrhea?**  
YES → PED virus is a differential  
Sow herd: collect feces from piglets or sows acutely affected with diarrhea

**Minimum: PCR on 3 pools of feces:** Each fecal pool composed of feces from 5 diarrheic pigs from different litters or locations.

**Optional:** Submit live pigs or pig tissues, along with pools of feces to a laboratory

NO or not much looseness → PED virus may be harder to detect  
Sow herd: collect feces from any pigs with diarrhea and older piglets with soft feces

**Minimum: 3 pools of feces:** Each fecal pool composed of feces from the 5 loosest pigs from different litters in farrowing rooms

**Optional: Serum from at least 10 dams** (highly recommended) and/or submit live pigs or pig tissues, along with pools of feces and serum



**Guidelines for weaned (nursery, grower, finisher) pigs**

**Do pigs have diarrhea?**  
YES → PED virus is a differential  
Nursery / Grower / Finisher

**Oral fluids and feces:** At least 2 oral fluid samples AND 3 pools of 5 loose/diarrheic feces each

**Optional:** Submit representative pigs or pig tissues to a diagnostic laboratory

NO or not much → PED virus may be endemic/chronic or harder to detect  
Nursery / Grower / Finisher

**Oral fluids and feces:** At least 2 oral fluid samples AND 3 pools of 5 feces from five of the loosest pigs in the barn

**Optional: Serum from 10-15 pigs** for serology (highly recommended)

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# PED Biosecurity Guidelines

Swine Health Producer Guide

## Biosecure Manure Pumping Protocols for PED Control: Recommendations for Pork Producers

**Key Points**

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

**COMMUNICATE with the Manure Hauler:**

- When scheduling with the manure hauler:
  - Find out when the manure hauling crew has been coming to the farm and require to be notified when they arrive.
  - Ask where the manure hauling crew will be prior to coming to your site.
  - Ask what biosecurity procedures the manure hauling crew uses between customers to understand disease risks to your herd.
  - Share contact information between the manure hauling crew and farm personnel.
- Discuss your biosecurity expectations for the manure hauling crew.
  - Plan entrance and exit to the site with minimal cross-over with the path for the manure hauling crew and the rest of farm traffic or areas used by farm staff.
  - Explain the routes that will be used to transport manure to fields.
  - Discuss how any manure spills are to be handled.

Explain why the set-up is important.
 

- This manure hauling crew has been to a site with PED virus.
- Discuss how any manure spills are to be handled.

Inform the manure hauler of the biosecurity requirements discussed with the producer.

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Swine Health Producer Guide

## Biosecure Manure Pumping Protocols for PED Control: Recommendations for Commercial Manure Haulers

**Key Points**

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

**Prior to the time of going to a site to pump COMMUNICATE with the producer:**

- Contact the producer to discuss the upcoming pumping season and the biosecurity plan.
- Communicate on when you will be going to the farm.
- Share the contact information between the manure pumping crew and farm personnel.
- Be prepared to share the history of sites where the pumping crew has been.
- Plan entrance and exit to the site with minimal cross-over with other farm traffic or areas used by farm personnel. Ask the routes that will be used to transport manure to fields.
- Ask where the "Line of Separation" is between the set-up, hauling equipment and farm site. This defines the area that is to be used by the manure haulers and the area to be used by daily farm traffic and personnel. Don't cross over the line.
- Discuss how any manure spills will be handled.
- Inform all your employees of the biosecurity requirements discussed with the producer.

**At the time of pumping with the producer:**

- Manure haulers at areas or walk over should never come in contact with the manure.
- Avoid any direct contact with the manure.
- Use always clean equipment.
- IF personnel must separate the manure from the site:
  - Cover-up (gloves).
  - Dispose of manure.
  - Clean and disinfect equipment.
  - Next site.

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Swine Health Producer Guide

## Biosecure Manure Pumping Protocols for PED Control: Recommendations for Land Owners

**Key Points**

The recent introduction of the Porcine Epidemic Diarrhea Virus (PED) into the United States presents a new challenge for manure pumping. Infection with PED can create tremendous financial losses to a producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs.

**Producers and Manure Haulers face some challenges in order to control the risks of spreading PED virus when pumping:**

- The steps necessary to prevent PED from being moved from farm to farm during manure pumping and hauling take planning and may impact the timing of getting your fields applied.
- Increased time between sites may be required for washing and cleaning of equipment.
- Previously known positive sites for PED virus are strongly suggested to be last in the sequence of sites for a producer or system.
- Communicate and find out when the manure haulers will be going to pump manure and ask when you can expect your fields to have manure application.

**At the time of pumping and spreading manure:**

- Farm land personnel and your farm equipment need to avoid any direct contact with manure, manure hauling personnel or the manure hauling equipment because disease can be spread to other farms through accidental transfer from manure contamination of people or your vehicles and equipment.

**PED virus infection at the sow farm can create near 100% mortality of piglets. Cleaning, disinfecting and drying all equipment is mandatory if moving to a sow site.**

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# PED Biosecurity Guidelines

## Swine Health Producer Guide

### Feed Delivery Biosecurity for Control of PED

The recent introduction of the Porcine Epidemic Diarrhea (PED) virus into the United States presents a new challenge for the industry. PED virus transfers via feces and survives in manure for extended periods of time. Contamination of trucks, equipment, and clothing with footwear with feces can spread the virus. Infection with PED virus can create tremendous financial losses to the producer. It is important that everyone do their part to prevent spread of this disease.

1. Transport drivers arrive at work wearing clean clothes and footwear which hasn't been worn around livestock.

2. Carry cover-ups (clean, disinfected rubber boots or disposable boots) in a clean container in the truck cab. As exiting the truck, put on the cover-ups.

3. Stay as close to the truck as possible to minimize the areas you access.

4. To keep you on your side of the Line of Separation between you or your equipment and the production facilities. Whenever possible, communicate with the farm staff and ask them to open and close the bin lids.

5. Remove cover-ups when climbing back into the truck and contain and dispose of soiled items in a separate bin.

6. Apply hand sanitizer to clean cab surfaces.

7. Do not separate production and processing areas.



## Swine Health Producer Guide

### Transportation Biosecurity Protocols for PEDV Control

#### Key Point

Infection with Porcine Epidemic Diarrhea (PED) virus can create tremendous financial losses to a pork producer. PED virus transfers via feces and survives in manure for extended periods of time. Contamination with pig manure can be a source of infection for pigs. Live haul is an essential part of the pork industry and plays a key role in the control of disease. Live haul drivers should be educated on PED virus and its control. Live haul drivers should be educated on PED virus and its control.

#### Ensure you are Prepared for Swine Transportation

1. The market truck should be prepared for hauling market hogs.

- a. The cab of the truck, including floor-boards, pedals, steering wheel, gear shift handle, door handles, etc. should be cleaned and disinfected between loads.
- b. The trailer should be
  - Washed clean and free of any viable manure or shavings.
  - Disinfected with an appropriate disinfectant, at the correct rate, for the proper contact time, and applied so that all surfaces are covered, and allowed to dry completely (Thermal assisted drying truck bakers speed this process greatly).
- c. All equipment, including sort-boards, rattle-paddles, electric prods, etc. need to be thoroughly cleaned, disinfected, and dried.
- d. Clean boots, coveralls, gloves, knee pads, etc. should be used for each load and stored in a designated clean area. A separate area for storage should be used for these articles after they are used and until they can be cleaned and disinfected for future use.

2. The Production Site should be ready for animal movement

- a. All load out equipment should be clean and in

good working order

b. The load out area

ready to market

c. Communicate

located. This

production

from truck

production

• As

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## Swine Health Producer Guide

### Biosecure Truck Wash Protocols for PED Control: Recommendations for Truck Wash Facilities

#### Key Point

Infection with Porcine Epidemic Diarrhea (PED) virus can create tremendous financial losses to a pork producer. PED virus transfers via feces and survives in manure for extended periods of time. Any object that is contaminated with pig manure can be a source of infection for pigs. Truck wash facilities are an essential part of the pork industry and play a key role in the control of disease. All truck wash personnel should be educated about the risks PED virus is to the pork industry.

#### Basic Guidelines for Sanitation, Disinfection, Drying and Downtime

- Proper cleaning prior to disinfection is a critical step for preventing disease spread. The truck and trailer must be thoroughly cleaned, washed, disinfected and completely dry.
- This involves 5 steps
  1. Removal of all manure and bedding
  2. Soaking with soap and/or degreaser
  3. Pressure washing with hot water
  4. Disinfecting by foaming with an appropriate disinfectant
  5. Drying
- The trailer and all equipment must be free of visible manure, shavings or dirt prior to disinfection. The use of wash soap or degreasers can decrease cleaning time versus just using water alone.
- Disinfectants should be used on trucks and trailers only after they have been cleaned because manure and dirt will inactivate and reduce the effectiveness of most disinfectants.
- Check on the disinfectant's label to ensure it mixes safely with any cleaning product or wash soap that is being used.
- Follow label directions when using disinfectants to ensure the disinfectant is being used at the proper concentration and temperature.
- Follow label directions for adequate contact time to ensure effectiveness.
- If any

**Drying helps inactivate pathogens that cause disease and maximizes the benefit of disinfectants.**

- Heat delivered to a trailer for the appropriate temperature and time can assist in disinfection.
- If heat isn't available, fans or enough drive time to allow complete drying will help.

**All manure and shavings for bedding cleaned from a trailer may contain pathogens that could cause disease.**

- Dispose of these in a way that will prevent their spread to other trailers or locations.

**Be aware of the source of water used for cleaning.**

- Recycled wash water may still contain pathogens that could cause disease so disinfecting and adequate drying are especially important.

**Pork producers will expect clean trailers are free of PED and other diseases. On the other side of this document are key elements of a biosecure cleaning process.**

...continued on page 2

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# Pork Industry Research Funding

- Pork Checkoff funding exceeds \$1 million
- Research project updates posted every 2 weeks at [www.pork.org](http://www.pork.org)

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#### PEDV Research

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#### PEDV Update

Click on this button for the PEDV Update Newsletter archive.



# Moving Forward

- Public Private efforts for surveillance and control of disease
- Coordinated strategy to protect animal health
  - USDA
  - Pork Industry
  - Veterinary Associations
  - Academia

# DISCUSSION

