Stroke Systems of Care (SSOC) Policy Projects Update

AREB COFFEE BREAKS 2021

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Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division for Heart Disease and Stroke Prevention

MODERATOR:
Welcome to today's Coffee Break presented by the Applied Research and Translation Team in the Division for Heart Disease and Stroke Prevention at the Centers for Disease Control and Prevention.

We are fortunate to have Siobhan Gilchrist and Nina Omeaku as today's presenters. Siobhan and Nina both work as Public Health Policy Analysts for ASRT Inc., with the team. My name is Allison White, and I will be acting as today's moderator. I am an ORISE Policy Research and Health Communications Fellow within the Applied Research and Evaluation Branch, with this team.

MODERATOR:
Before we begin, there are some housekeeping items. All participants have been muted; however, to improve audio quality, please mute your phones and microphones throughout the webinar until prompted. If you are having issues with audio or seeing the presentation, please message us using the chat box or send us an email at AREBheartinfo@cdc.gov. If you have questions during the presentation, please enter it into the Q/A box located at the bottom of your screen. Please hold your questions until we reach the end of the presentation until prompted. Since this is a training series on applied research and evaluation, we hope you will complete the poll at the end of the presentation and provide us with your feedback
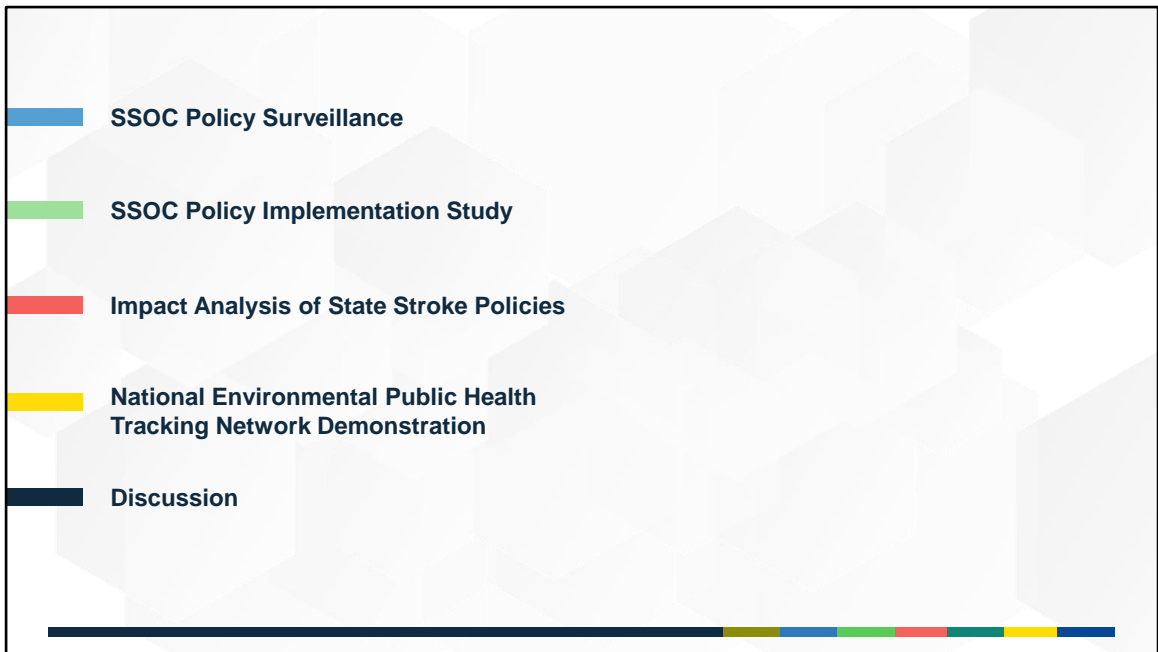
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The information presented here is for training purposes and reflects the views of the presenters. It does not necessarily represent the official position of the Centers for Disease Control and Prevention. This presentation is not intended to promote any particular legislative, regulatory, or other action.

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So, without further delay. Let's get started. Siobhan the floor is yours.

SSOC Policy Surveillance

SSOC Policy Implementation Study

Impact Analysis of State Stroke Policies

National Environmental Public Health Tracking Network Demonstration

Discussion

Thank you, Allison. Today, Nina and I will provide an update on our projects focused on stroke systems of care (SSOC) policy along our policy research continuum. I'll start with a description of our longitudinal stroke policy surveillance dataset which is the basis for our other studies. Next, I will give a status update on our case study examining the implementation of evidence informed laws for prehospital stroke care in six states. I will provide an overview of our mixed methods impact analysis of state stroke systems of care policies on health and economic outcomes. As an example of how we are disseminating this work, Nina will provide a demonstration of how to access our stroke policy surveillance data through the National Environmental Public Health Tracking Network.

SSOC Policy Surveillance
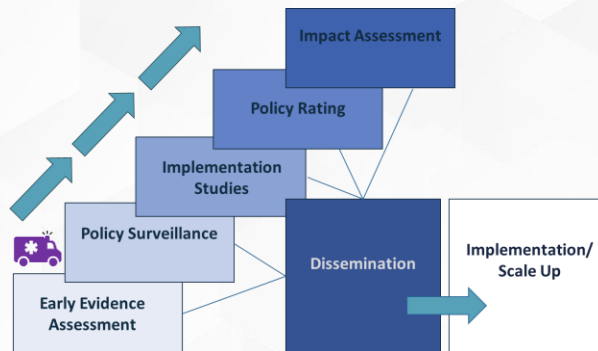
Our SSOC work spans the policy research continuum. We conduct stroke systems of care policy surveillance to monitor trends in the uptake of evidence-informed laws across the United States and over time, and to conduct studies examining the relationship between the laws and stroke outcomes.
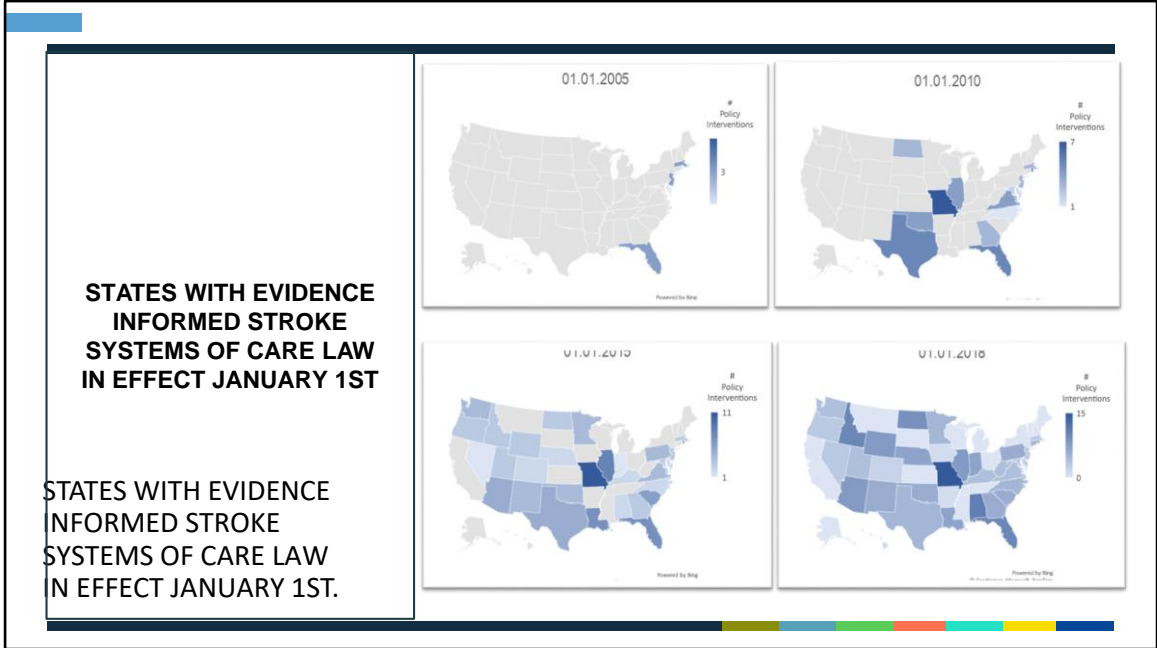
Stroke policy interventions
- 15 evidence-informed stroke policy interventions

Data collection & analysis
- WestLawNext and state websites
- 50 states and District of Columbia
- Law in effect January 1, 2002-2018
  - Statutes, Agency Regulations, Legislation
  - Prescriptive/permissive

To date, our stroke policy research focuses on the EMS prehospital and the acute/care and in-hospital aspects of the stroke continuum of care. We aligned the strength of the evidence for a set of 15 policy interventions that states had adopted through legislation or rule-making (figure) and conducted a retrospective analysis of laws using a detailed coding protocol. Two legal analysts used the legal search engine, WestLawNext, to retrieve statutes, regulations, session laws and legislation in effect on January 1st, of each year going back to 2002 for the 50 states and the District of Columbia. We also reviewed state websites to ensure we captured the most current law. The analysts code the laws independently and reconcile the results. We coded the law based on the level of authorization or prescriptiveness – for example if an action was required, required in some circumstances, or authorized. We are currently updating the legal dataset through 2021 with some new variables to include thrombectomy capable stroke center designations, and stroke severity assessment protocols.

STATES WITH EVIDENCE INFORMED STROKE SYSTEMS OF CARE LAW IN EFFECT JANUARY 1ST

Here is an example of our policy surveillance data with some of the temporal and geographic trends in the uptake of stroke systems of care laws. This series of maps shows the number of evidence informed policy interventions we identified in state law that were in effect on January 1st, 2005, 2010, 2015, and 2018. Please note that the scales used in each map differ slightly. In 2005, there were 3 states with 3 policy interventions in effect. Over time, the number of states with any policies increased and the number of policies in effect per state had also increased.
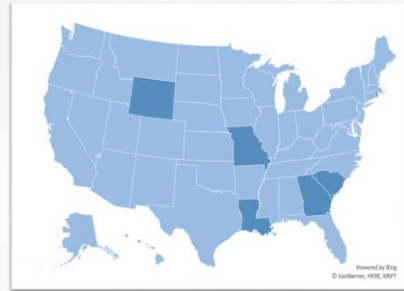
SSOC Policy Implementation Study
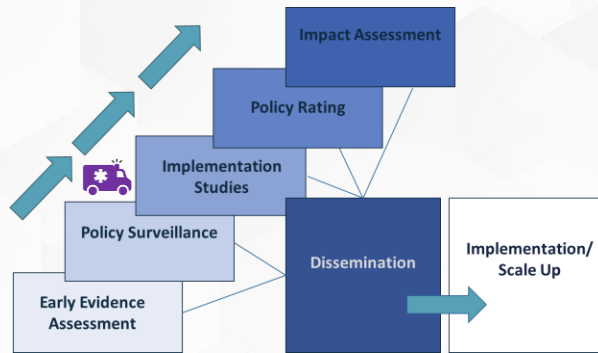
Next, I will give an update on the SSOC policy implementation case study.

SSOC Policy Case Study

- States' experiences developing and implementing prehospital SSOC laws

- 6 states: Georgia, Louisiana, Missouri, Rhode Island, South Carolina, Wyoming

- 36 key informants

The purpose of this study was to understand the types of challenges, facilitators and lessons learned from state agencies and organizations involved in the development and/or implementation of the prehospital aspect of the stroke care continuum. This study was commissioned by DHDSP and conducted by the Association for State and Territorial Health Officials (ASTHO) in 2019. The final report was submitted to CDC in 2020.

The six states selected were Georgia, Louisiana, Missouri, S. Carolina, Rhode Island and Wyoming. Each of these states had enacted legislation and/or adopted regulations allowing for the creation of a tiered statewide or regional stroke system of care with 3 or more levels of stroke center certification as well as other prehospital policy interventions. The criteria for state selection also included whether there was a state stroke task force; if the state EMS system was regional or centralized, the use of a stroke registry and EMS data reporting; local autonomy through home-rule; and the urban/rural mix.

The 36 key informants interviewed represented state, regional, and local EMS agencies, public health departments, hospitals, stroke task forces, and other organizations that had been involved with different stages of developing and/or

implementing aspects of the prehospital system of care.

Study Questions

- Prehospital policy developers & implementers
- EMS systems and stroke center infrastructure & collaboration
- Rollout of prehospital policy changes
- Facilitators and challenges developing new processes
- Implementation facilitators and challenges
- Performance measurement and CQI
- Unique state experiences

The questionnaire was developed with subject matter input and was designed to understand how the prehospital policies were developed and how the policies were implemented. The questions asked about the EMS system and stroke center infrastructure within each state and how stroke centers and EMS coordinated care, communication, resources, education and training.

Interviewees were asked how changes to their prehospital policies and protocols were rolled out statewide and what types of obstacles they faced, how they over came them and what made it easier to implement new policies.

The interviewees were also asked focused questions on the process of implementing prehospital policy changes, the types of facilitators and challenges they experienced, in particular in relation to addressing rural/urban and racial and ethnic disparities in access to care.

Questions also focused on the role of performance measures, continuous quality improvement, issues with data collection, reporting and sharing, and whether there were improvements in stroke outcomes. Finally, interviewees were asked about unique experiences for their state as well as lessons others could take from their

experiences.

Preliminary Findings

- Stroke task forces for statewide & regional collaboration
- State medical directors' role in the dissemination of pre-hospital stroke protocols
- Quality improvement, data collection, and communication
- Training, education, communication and outreach to EMS and stroke centers

Translation Products

- Translation Fact Sheet
- Abstract
- Manuscript

We are currently working on a translation fact sheet that will describe key findings and will be published on our website.

On a very high level, across the states there was consensus on the role of stroke task forces as a means for enhancing collaboration statewide and within regions in the development and implementation of changes to prehospital stroke policies. There was also acknowledgement of the role of state medical directors in the development and enforcement of prehospital stroke protocols.

Quality improvement, data collection, and communication were considered strengths, although many challenges exist. And EMS agency and stroke center outreach, training, education,

and communication were important channels for disseminating information about new policies and protocols, particularly to reach populations with limited access to care.

ART staff are currently conducting an in-depth thematic analysis of the interview transcripts and are submitting an abstract to the Academy Health Annual Conference on the Science of Dissemination and Implementation in Health, and a journal manuscript this fall.

SSOC Policy Impact Assessment
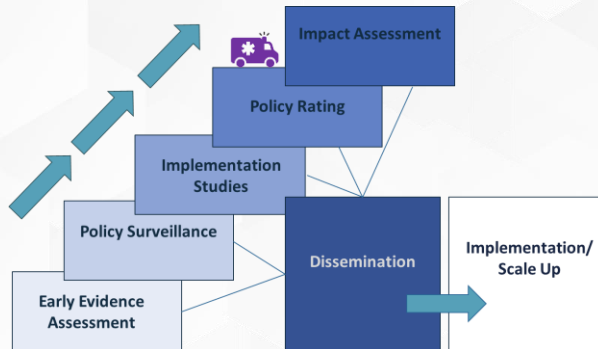
We kicked off the SSOC policy impact study in January 2020 through a contract with ICF International Inc. This mixed methods study builds on all the earlier work across the policy research continuum and aims to determine the impact of the stroke policies in our retrospective policy surveillance analysis on enhancing stroke care and health outcomes.

Evaluation Questions

1. Do states with SSOC laws demonstrate more improved outcomes over time than before they passed laws and compared to states without laws?

2. Do states with more comprehensive SSOC laws show stronger outcomes over time than states with less comprehensive laws?

3. Do states with more prescriptive laws show stronger outcomes than states with less prescriptive laws?

4. What are the observed pathways from specific SSOC policy interventions to changes in outcomes of interest?

5. How do state contextual factors affect the outcomes of interest over time?

Outcomes of Interest:

State stroke systems of care

Healthcare services quality and efficiency

Health outcomes

Economic costs associated with stroke care

ubject matter expert (SME) input from representatives of stroke EMS and clinical academic institutions; State Departments of Public Health with and without Coverdell programs; the American Heart Association and the Brain Attack Coalition; CDC's Coverdell program, & CDC experts in health systems research. In addition, the team developed a conceptual model (not shown here) that informed the development of the study and the types of data outcomes to analyze. We used the conceptual model to formulate these evaluation questions.

- Do states with SSOC laws demonstrate more improved outcomes over time than before they passed laws and compared to states without laws?
- Do states with more comprehensive SSOC laws show stronger outcomes over time than states with less comprehensive SSOC laws?
- Do states with more prescriptive laws show stronger outcomes than states with less prescriptive laws?
- How do state contextual factors affect the outcomes of interest over time?

The outcomes of interest include the impact to each state's stroke health care

delivery system from a cost, quality and efficiency perspective, as well as the impact on stroke health outcomes.

Stroke Policy Impact Assessment

PART I: QUANTITATIVE ANALYSIS

- Is there a gap between the observed and predicted outcomes after policies go into effect?
- What contributed to the gap?
- Confidence in results?

PART II: QUALITATIVE ANALYSIS

- 3 states with positive trends across indicators
- Policy interventions in effect
- Improved outcome measures
- Reduced racial and rural/urban outcome disparities

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To answer the evaluation questions, there were two parts to this study:

1). The first part is the quantitative analysis that links the 51-state retrospective policy surveillance dataset to national health and economic datasets using a natural experimental design. This analysis predicts the outcomes that would have occurred if no policy had been enacted compared to the

observed outcomes after the policy interventions took effect in each state. Through a multistep process, it also examines which specific policy interventions or combinations of policy interventions contributed most to improved outcomes and whether more prescriptive policies were associated with positive outcomes. Finally, it includes a sensitivity analysis to determine how confident we can be in the results.

2). The second part of the study involved qualitative interviews of experts in stroke care in three states that performed well in part I of the study. The qualitative analysis asked what factors contributed to the positive trends in health outcomes and played a role in reducing the gap in stroke rural/urban and racial disparities.

Impact Study Translation Products

- Evaluation brief
- Translation document
- Policy rating
- Journal manuscript

ICF is producing an evaluation brief with high level findings and a more detailed translation document that will be disseminated and available on our website.

We are also drafting a journal manuscript to be completed this year and are identifying journals for submission.

We will use the information to develop a policy

rating approach for our policy surveillance data going forward.

Now I will hand it over to Nina to show you a demonstration of the stroke policy surveillance data that is accessible through the [National Environmental Public Health Tracking Network Query Tool (cdc.gov)](cdc.gov).
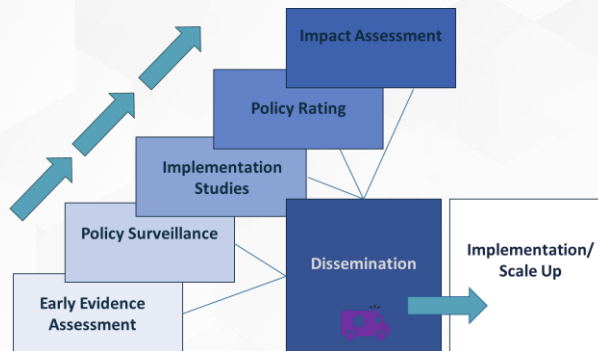
To provide context to what I will be talking about, the creation of this portal falls under the dissemination stage of the policy research continuum. In terms of dissemination, we use the continuum to think carefully about how we can create products to aid implementation and scale up effective policies.

Pre-Hospital Emergency medical services (EMS) Interventions

- Stroke pre-notification of receiving facility
- Stroke assessment protocols
- Standardized stroke assessment
- Transport protocols to stroke facility
- Air medical transport protocol to stroke facility
- Interfacility transfer agreements to stroke facility
- Provider education in stroke assessment
- EMS stroke continuous quality improvement (CQI) data system

In-Hospital Interventions

- Stroke center tiered approach
- Nationally certified primary stroke centers (PSCs)
- State standards for PSCs
- Nationally certified comprehensive stroke centers (CSCs)
- State standards for CSCs
- Nationally recognized acute stroke-ready hospitals (ASRHs)
- State standards for ASRHs
- Acute stroke care through telemedicine
- Statewide stroke CQI data system
- Stroke centers report CQI stroke data

Shown here is a list of the prehospital/EMS policy interventions we looked for and a list of the acute care/in-hospital policy interventions we searched for in state law.

Utilizing the data collected – which included 15 types of stroke pre-hospital and in-hospital policy interventions; 4 policy interventions addressing legal authorities and infrastructures, we aimed to create an analytical data set based on our legal data set to determine temporal and geographic trends in uptake of policy interventions and legal authorities.

Working alongside NCEH – we created an interactive webpage to house our stroke legal data. We aim for the portal to enhance dissemination of this data and create access for those who are in need or interested in utilizing our data. I will now do a basic walk through of the portal using screenshots for clarity.

National Environmental Public Health Tracking Network Demo

1 https://ephtracking.cdc.gov/DataExplorer/
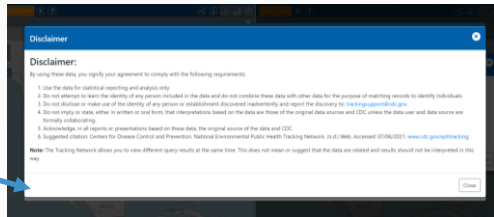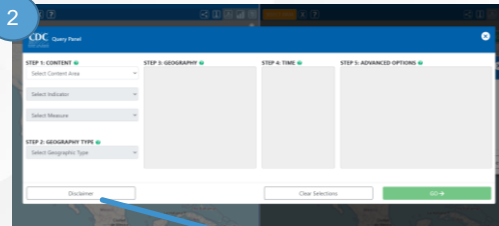
- Step 1 shows the actual link to the portal. Click the following link to view: National Environmental Public Health Tracking Network Query Tool (cdc.gov)

- Step 2 demonstrates a general disclaimer for the portal and the data contained within.
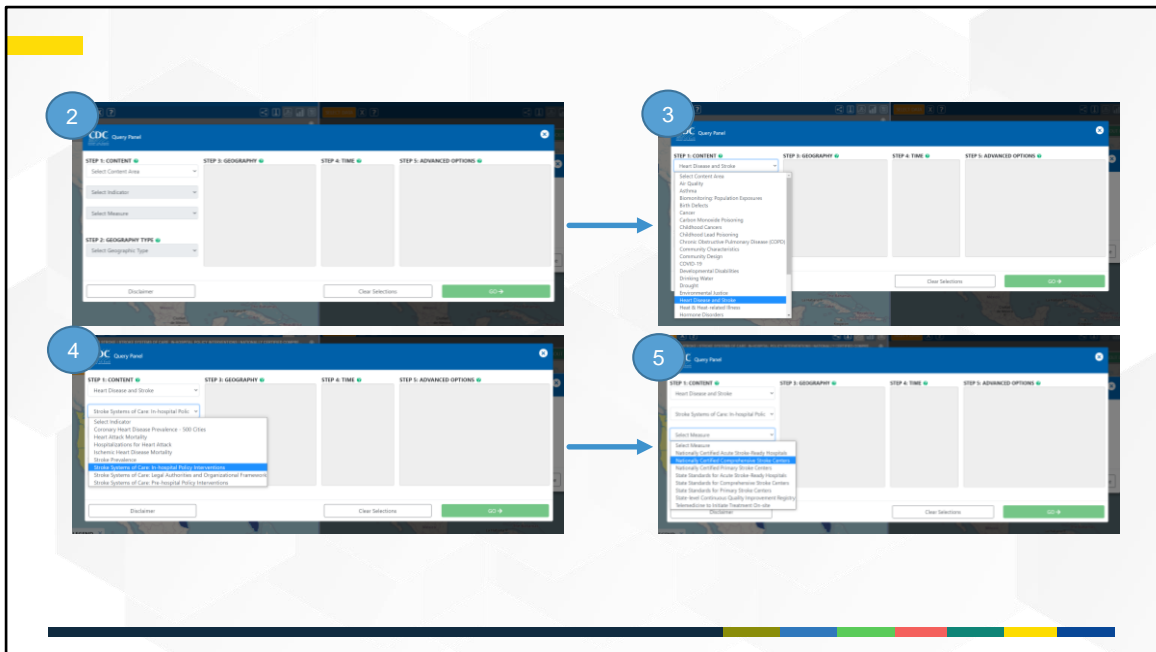
- Screenshot #2: Upon entering the portal, you will be prompted to specify the content and geography type you would like displayed on the interactive map.

- Screenshot #3: For our purposes, you would select Heart Disease and Stroke under Content Area.

- Screenshots #4-5: And for the purposes of this demo, I selected Stroke Systems of Care In-Hospital Policy Interventions as my Indicator of Interest and Nationally Certified Comprehensive Stroke Centers as my Measure of interest.
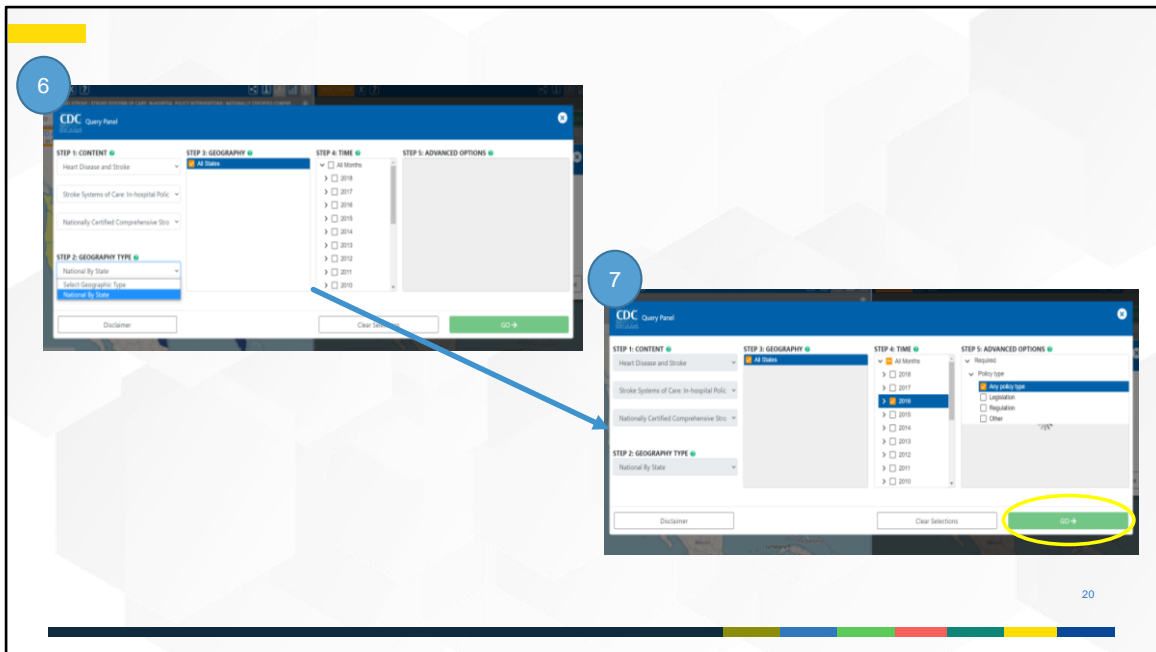
- Screenshot #6. Geography type for this data is by state. After selecting content and geography type. You would select the desired time you would like to examine and lastly select any advanced options.

- Screenshot #7. For the purposes of this demo, I have selected 2016 and we will examine all policy types. You would then click go to load the data into the map.
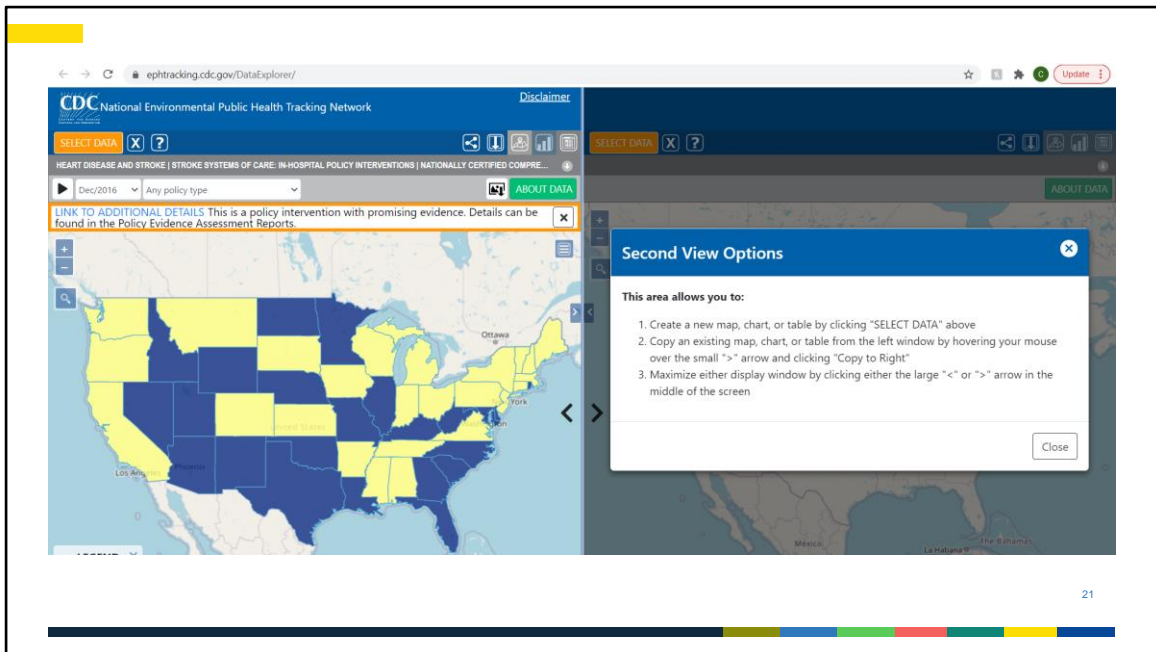
Once our selections have been loaded into the map, you should see this screen. The screen is divided into two maps. One side has what you have selected. The other side is available to load data for comparison purposes or if you would like to have the data mirrored on the other side. There is a link to additional details which will take you to where the Policy Evidence Assessment Reports used and cited in this portal are housed.
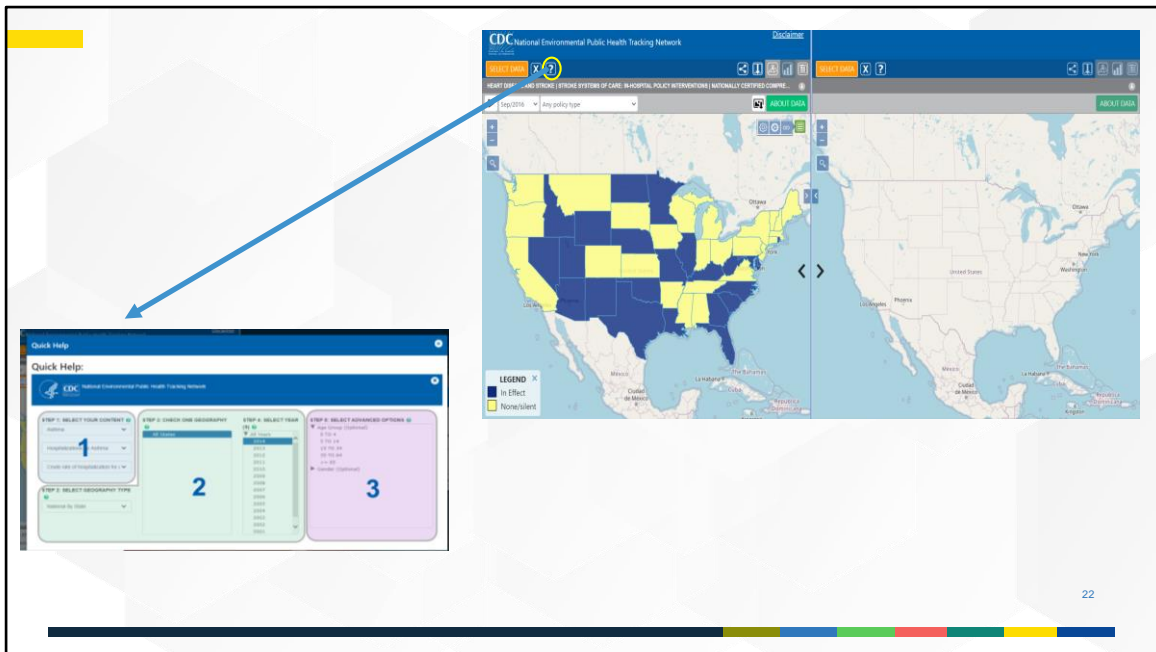
Selecting the large orange "Select Data" button will take us to the page we began with – if we choose to edit or change our data specifications. The x right next to the select data button will clear the data from the page and have it mirror the lack of data you can see on the second view screen. The question mark adjacent to the x is the "help" button". If selected, this window will pop up and provide detail for to assist in optimally utilizing the portal.
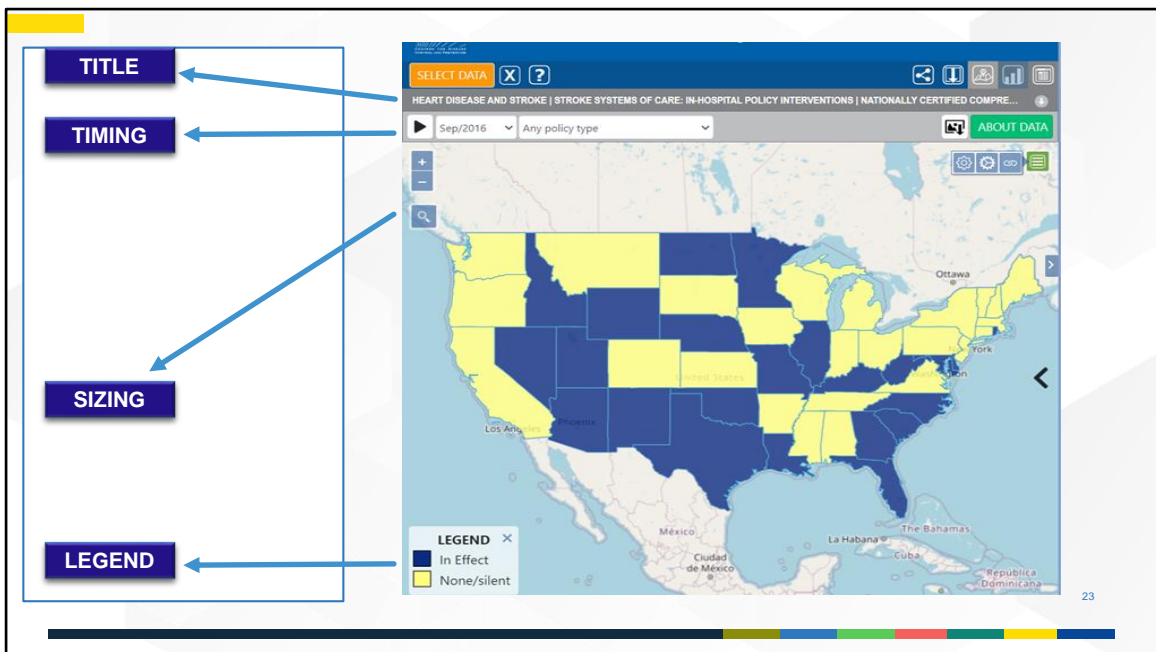
The title for the graph is displayed in the gray section with white writing. To look at the full title, you would hover your mouse over the downward facing arrow.

Underneath the gray box are buttons that address the time frame for the data. When you select to see data for 1 or more years as we did in the very beginning, you can click the play button, or the large sideways triangle and the map will move accordingly like a short movie going from month to month showing the change in policies in real time.

Regarding sizing, you can increase or decrease the overall size of the map with the magnifying glass icon shown.

And the legend is on the bottom left, clarifying which colors are for in effect for non-existent or silent policies.
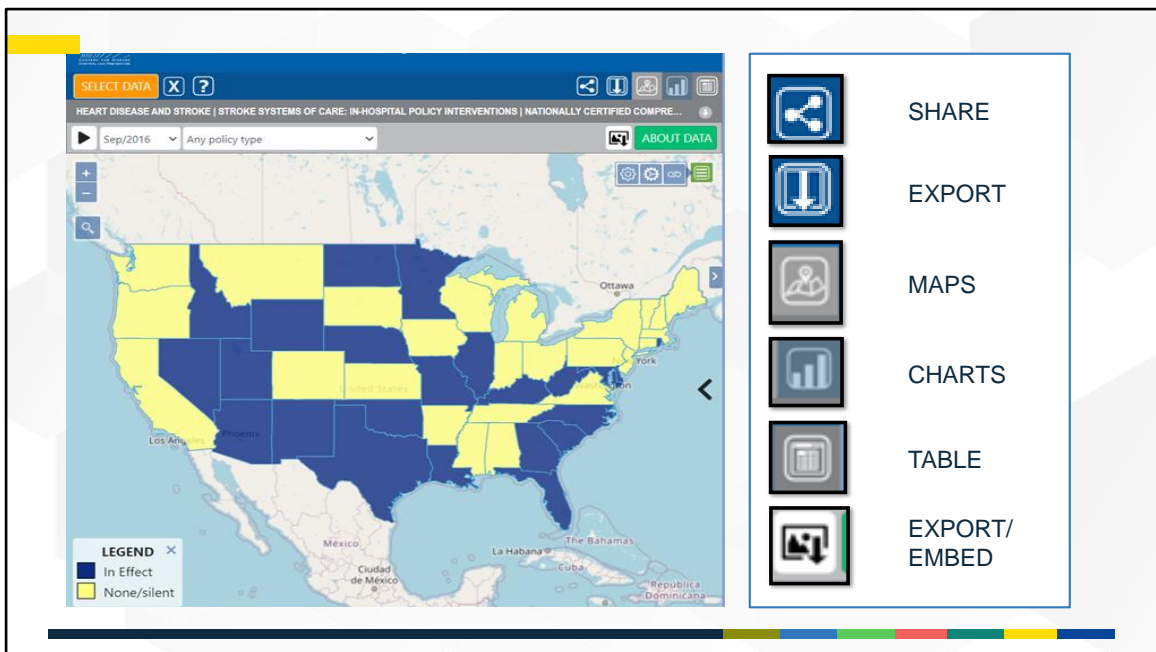
I have highlighted several icons and I will discuss their functionality for your understanding. On the top right of the screen are the share, export, maps, chart and table icons.

The Share icon allows you to share the data via a provided link.

The Export icon produces a Zip file. The ZIP file is comprised of 3 documents – an excel doc, a map, and document shown on a webpage explaining the data.

The Maps icon allows you navigate back to the page shown on the screen where the data is shown in the format of the US Map.

The Charts icon allows for the creation of charts based on the data.

The Table icon displays the data shown in the map (in effect vs. non-existent or silent policies) in table – similar to an Excel document.

The Export/Embed allows you to download the data provided in a JPG, PNG, Animation gif, or an embedded data visualization. The Animation gif give you a copy

of the real time changes shown when you press the play button I described earlier.
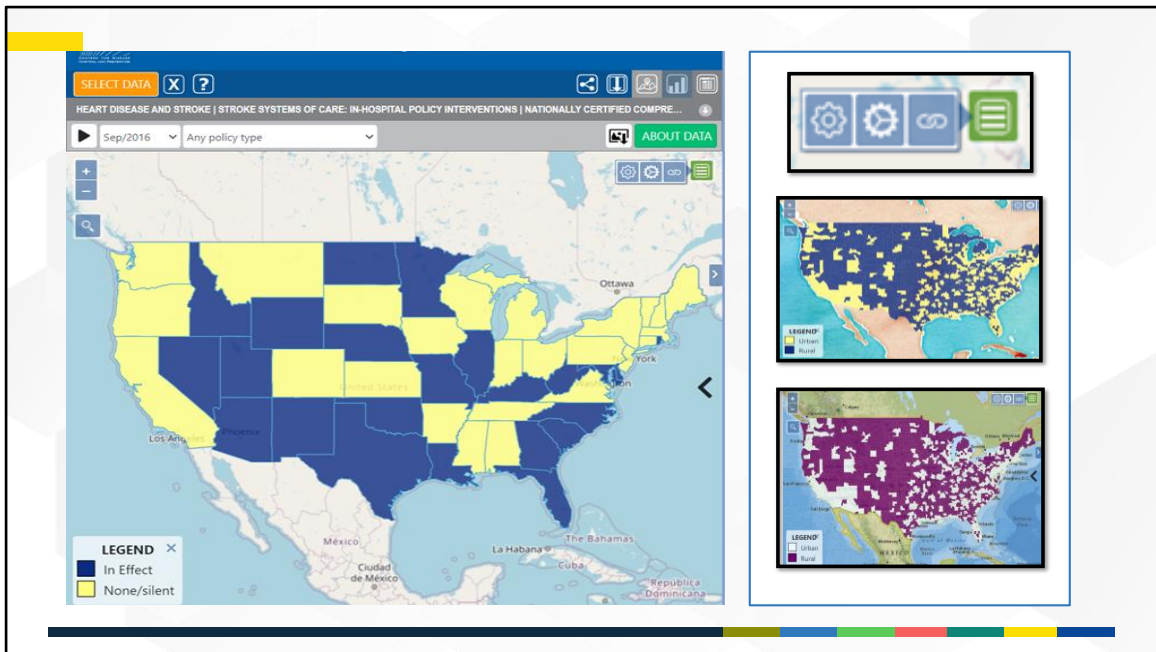
Below the ABOUT DATA button is a green icon with white lines. When you click on that icon, it will expand to show the 3 light blue icons shown. The gear symbol or the first light blue icon in the row allows you to change transparency of colors shown in the map, change the background layer (such as watercolor as shown and topographic display) which are both shown in this slide, and points of interest, or change things related to the overlay.

To the right of that is a gear symbol with peace sign. There you can change the color scheme – an example of a changed color scheme is also displayed in this slide.

Lastly, the paperclip on the end allows you to link the map on the right with your primary map on the left.

Questions?

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Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion

Division for Hear Disease and Stroke Prevention

MODERATOR

This concludes today's Coffee Break presentation. At this time, we will take questions from the audience, please enter your question into the Q/A feature at the bottom of your screen. As we wait for questions from the audience, I'll ask our presenters a question to help start the discussion.

Question: A participant in the audience might have the following question: "My state hasn't passed legislation to create a stroke system of care, but we do have a statewide stroke program. What are the implications of the studies you described for states such as mine?"

Siobhan's Answer: When the findings of our studies

are released publicly, you will be able to see the impact in states that had enacted and put into effect their statutes and/or regulations some or all of the policy interventions we studied. Your state might consider adopting the policies that had the strongest associations with reduced stroke mortality or improved in hospital performance measures to have more of an impact on stroke outcomes. We hope that the information forthcoming can help you best decide the appropriate mix of legislative or regulatory and programmatic approaches to reduce the time to appropriate treatment for stroke patients.