



# Estimating the Economic Impact of Healthcare in Rural Communities

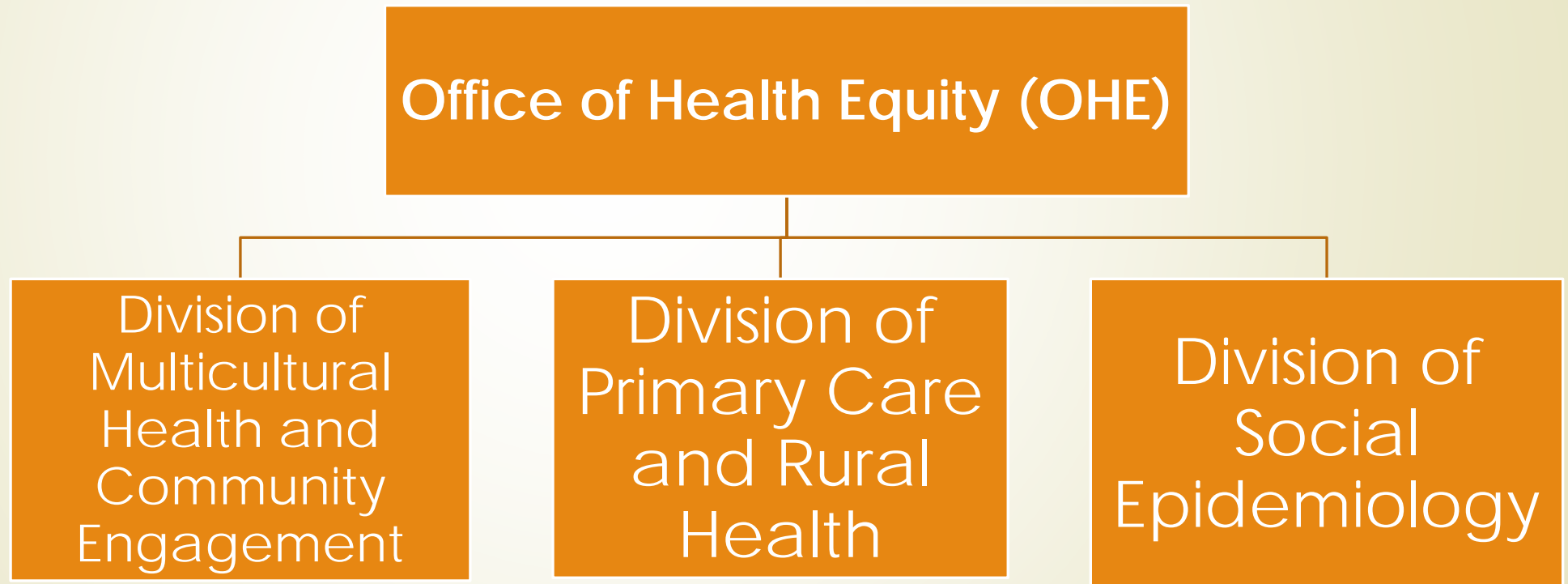
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# Overview

- ▶ Office Structure
- ▶ Economics and SORH
  - ▶ Tools and Outcomes
  - ▶ Value of Economic Analysis within VA SORH
- ▶ Two Case Studies (Economic Impact Analysis)
  - ▶ Case #1: Student Loan Repayment Program
  - ▶ Case #2: CAH Closure
- ▶ Lessons Learned, Next Steps, Future Research

# Virginia Department of Health Office of Health Equity



# Economic Analysis: Tools

- ▶ Summary Statistics and Trend Analysis
- ▶ Econometrics (Empirical Models, Forecasting)
- ▶ Simulation Models
- ▶ Cost-Benefit/ROI Analysis
- ▶ Market Dynamics/Cluster Analysis
- ▶ *Economic Impact Analysis (EIA)*
  - ▶ *Input-Output (I-O) → IMPLAN*
  - ▶ *I-O + Econometrics*
  - ▶ *Computable General Equilibrium (CGE) Models*

# Economic Analysis: Outcomes

## ▶ Regional Indicators

- ▶ *Industry Sales, Gross Regional Product, Gas Prices, Business Closures, Unemployment, LFP, Graduation Rates, Net Migration, GHG Emissions*

## ▶ Consumer Behavior Patterns

- ▶ *Holiday Travel Mode and Distance, Transportation Choices, Health Care Utilization, Tourism Spending, Willingness-to-Pay for Natural Resources, Time Use, Household Spending by Category, Program Enrollment*

## ▶ Individual Outcomes

- ▶ *Birth Weight, Income, Test Scores, Self-Reported Health, Alcohol Use and Smoking Behavior, Marital Status and Family Choice, Retirement Age, Health Insurance-Employment Decisions*

## Emphasizing the Role of the Health Care Industry in Rural Communities

- ▶ Health care facilities are critical to providing services, improving population health, and attracting businesses and residents in rural areas.
- ▶ Rural health care facilities face a unique set of challenges and resource constraints.
- ▶ Illustrating the impact of the health care industry beyond direct patient care has the potential to engage a wider audience.

# The Value of an Economist to a SORH

Familiar with using diverse data sets and formats (internal and external).

Adept at quantitative modeling and empirical analysis.

Capable of integrating data sources to adapt standardized models.

Use these skills to reframe rural health in a way that will appeal to a broad range of stakeholders (and funders/investors).

# Economic Analysis as a SORH Tool

- ▶ How **can** we adapt and modify traditional economic tools and models to represent rural communities?
- ▶ How **should** we use economic analysis to:
  - ▶ Illustrate the impact of VDH and VA-SORH policies and programs,
  - ▶ Understand and explain the **value** of health care and population health, and
  - ▶ Support rural communities and facilities by telling compelling data-driven stories to the “right” audiences?



# Case #1: Student Loan Repayment Program

Tool: EIA with IMPLAN (modified inputs)

Target Audience: General Assembly, VDH

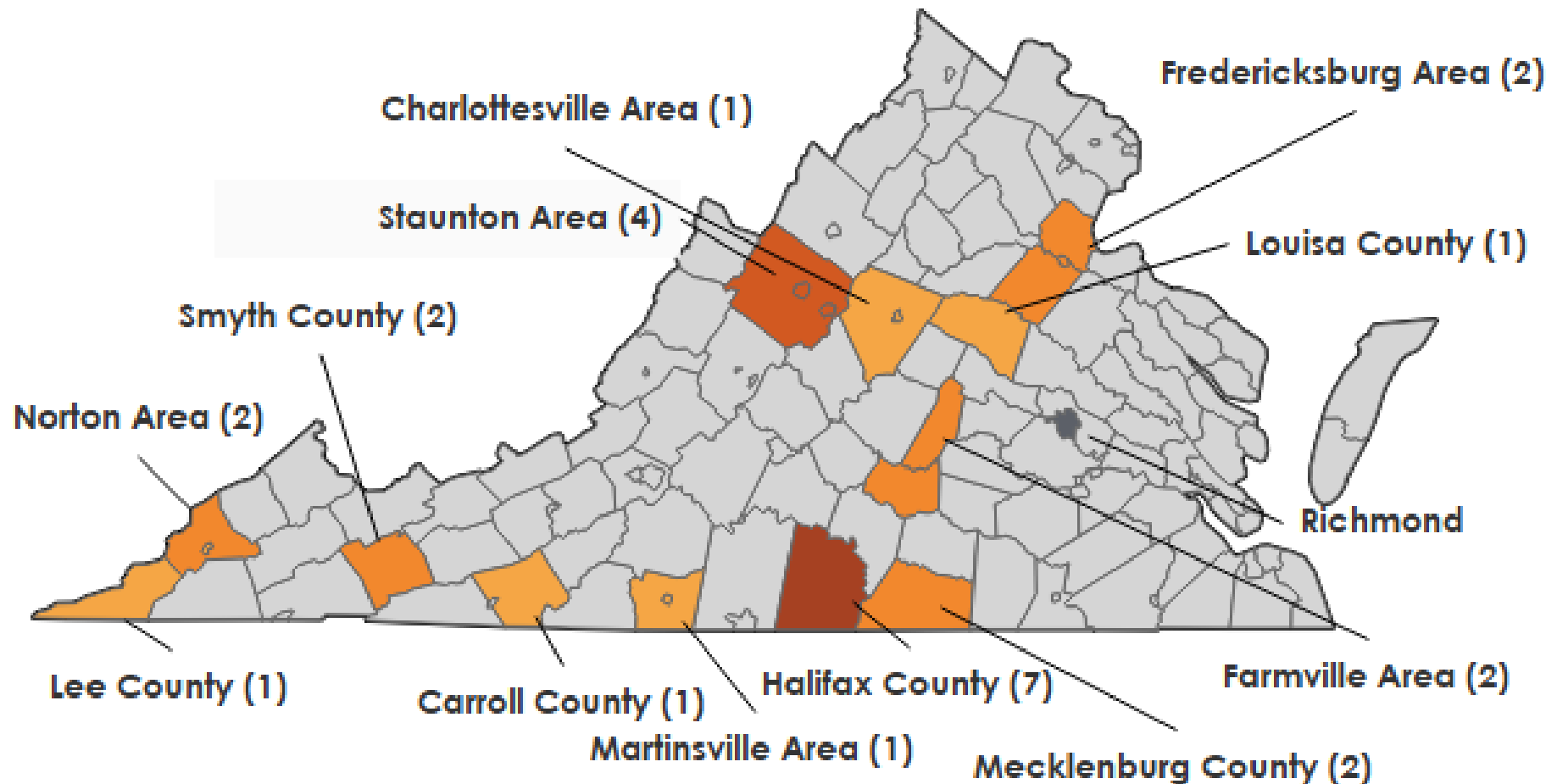
# Health Workforce Impact Case Study: Virginia Student Loan Repayment Program (VA-SLRP)

- ▶ **The VA-SLRP is a Federal health provider recruitment and retention program administered by VDH-OHE.**
  - ▶ Providers receive up to \$50k in student loan repayment in exchange for working at a qualifying facility in a Health Professional Shortage Area (HPSA).
  - ▶ Federal grants fund half; state and community match cover the rest. Facilities provide salary/compensation packages.
- ▶ **For the 2018 cycle, 26 providers in 12 high-need areas were awarded a total of \$1.012 million in VA-SLRP funds.**
  - ▶ Of this \$1.012 million, the VA General Assembly allocated \$300k in state/community matching funds.

# Health Workforce Impact Case Study: VA-SLRP Recipients by Study Area

<b>Locality (Study Area)</b>	<b>Providers Supported by VA-SLRP</b>
Carroll County	Family Medicine Physician
Charlottesville Area	Nurse Practitioner
Fredericksburg Area	Nurse Practitioners (2)
Halifax County	Nurse Practitioners (4), Family Medicine Physician, Registered Nurses (2)
Lee County	Nurse Practitioner
Louisa County	Dentist
Martinsville Area	Family Medicine Physician
Mecklenburg County	Nurse Practitioner, Family Medicine Physician
Norton Area	Nurse Midwife, Family Medicine Physician
Farmville Area	OB-GYN Physician, Nurse Practitioner
Smyth County	Psychiatrist, Nurse Practitioner
Staunton Area	Psychiatrists (4)
<b>Total VA-SLRP Recipients</b>	<b>26</b>
<b>Total Facility-Provided Employee Compensation</b>	<b>\$4.41 million</b>

# Health Workforce Impact Case Study: VA-SLRP Recipients by Study Area



## Health Workforce Impact Case Study: VA-SLRP Funding Loss Scenario

- ▶ VA-SLRP is not the sole driver of health care provider labor market decisions preference, but it is a powerful incentive.
- ▶ If the VA-SLRP disappeared due to lack of funding, practicing in a HPSA may be less desirable.
- ▶ Providers may leave high-need areas, impacting patient care.
- ▶ From an economic perspective, a provider leaving the area represents a change in industry supply.

# Economic Impact Analysis with IMPLAN

- ▶ **IMPLAN is an Input-Output (I-O) modeling and data system.**
  - ▶ I-O models use industry linkages, production functions, and employment patterns to characterize regional economies.
  - ▶ Data are available at varying levels of aggregation.
- ▶ **IMPLAN models are designed to measure shocks.**
  - ▶ IMPLAN estimates changes in existing industry “production,” not the contribution of business-as-usual operations.
- ▶ **The IMPLAN system calculates the total regional impact (of backward linkages only).**
  - ▶ A change in a single industry causes a ripple (multiplier) effect on other industries through supply purchases, employee spending, etc.

# Health Workforce Impact Case Study: VA-SLRP Funding Loss Scenario

- ▶ We estimate the economic impact on each region with current VA-SLRP providers if funding were to lapse and providers leave.
  - ▶ Each provider relocates out of a SLRP region; position goes unfilled (at least in the short-term).
- ▶ We use detailed information about each provider's specialty, salary, and practice location to derive inputs and model the regional "shock" of losing providers in these high-need areas.
  - ▶ Standard IMPLAN inputs are edited with additional information.
  - ▶ Student loan amounts are NOT included as inputs.

# Economic Impact Analysis with IMPLAN

**Direct Effect:**  
initial industry change

**Indirect Effect:**  
changes in industries within the region that supply the directly-affected industry

**Induced Effect:**  
changes in consumer spending due to labor impact in directly and indirectly-affected industries

**Total Regional Impact\***  
Measured by:

-Total Value Added (GRP)

-Employment (Average Annual Headcount)

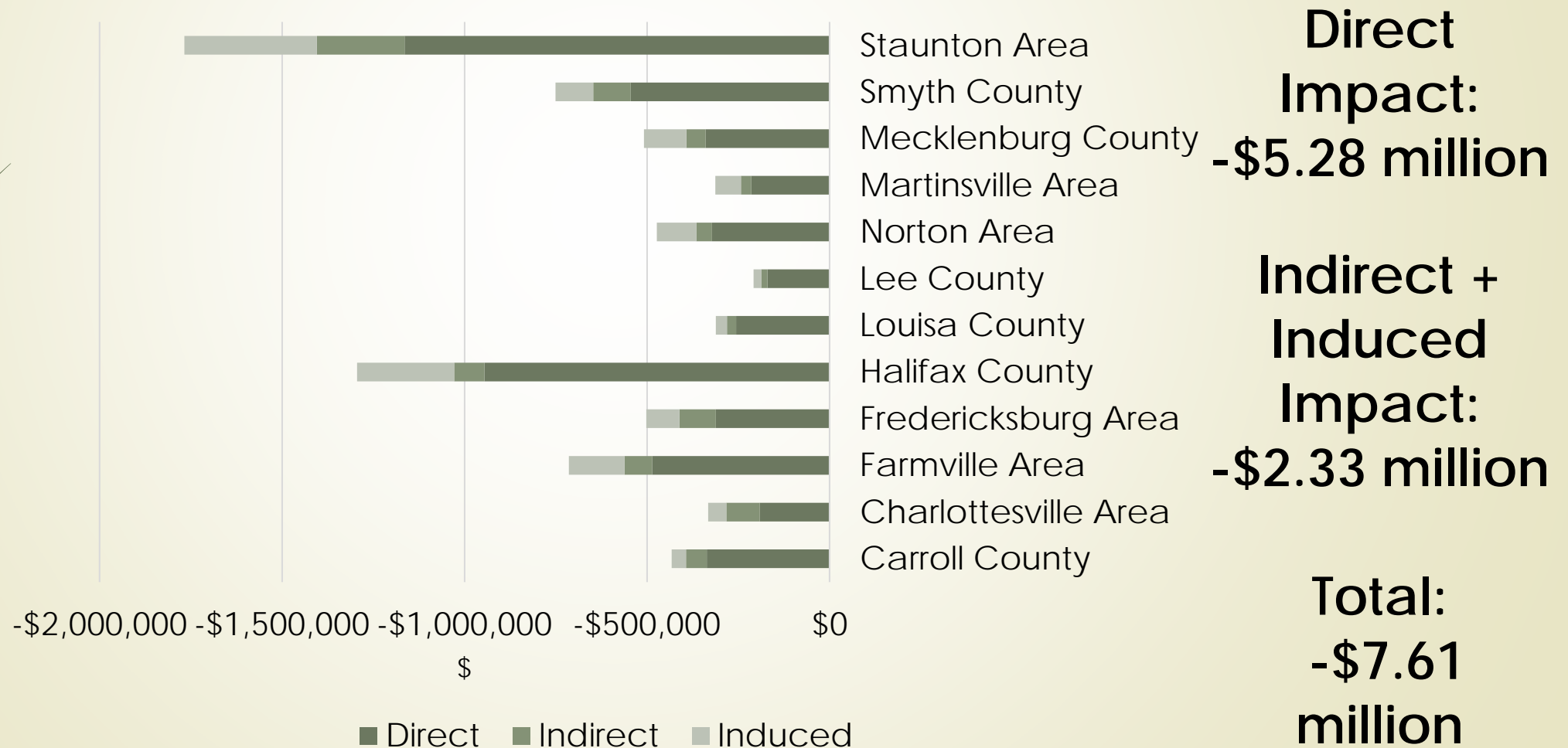
\*Less leakages



# Health Workforce Impact Case Study: The Ripple Effect of Eliminating VA-SLRP

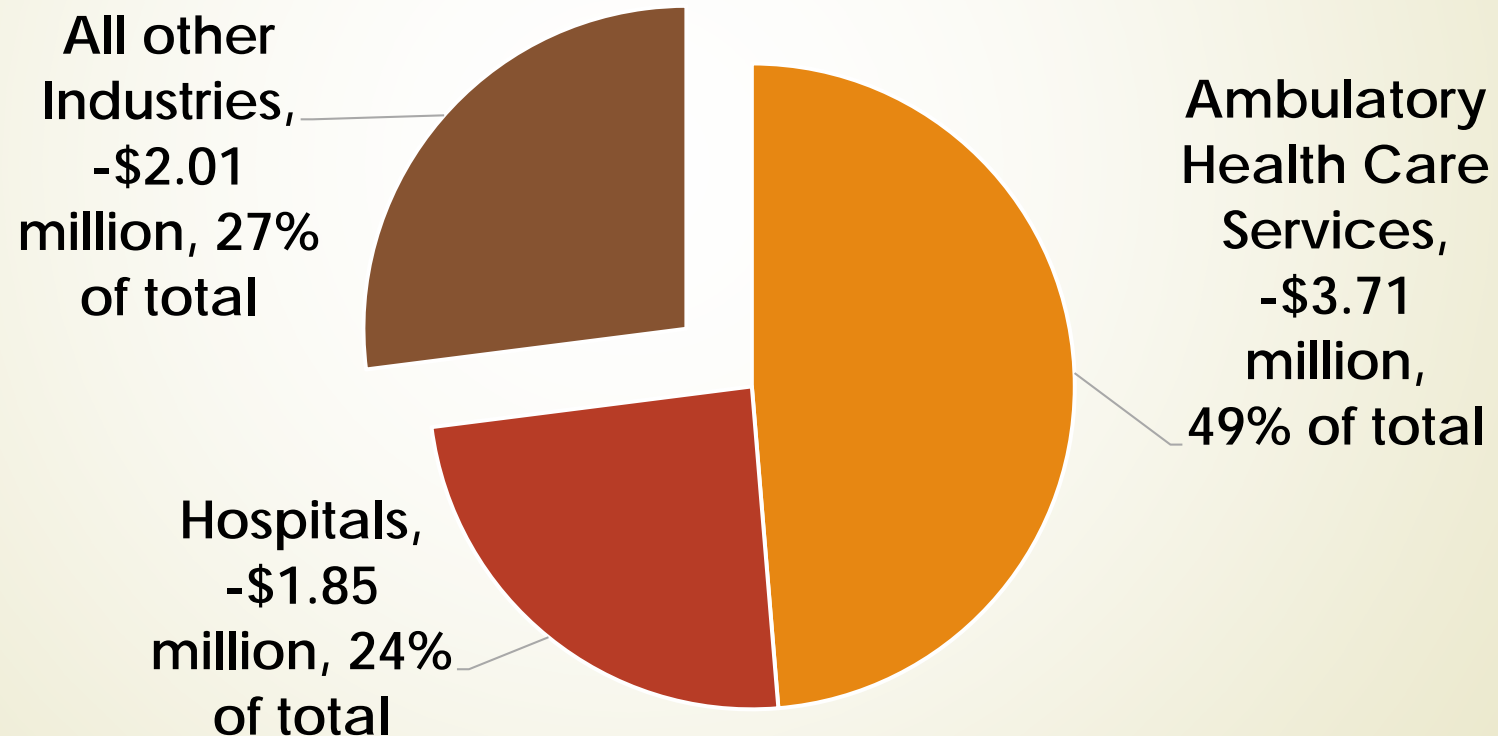
Impact	Mechanism	Example Industries Impacted in SLRP Region
Direct Effect	VA-SLRP recipient relocates (e.g., to Alexandria, North Carolina), reducing "production"/"sales" of health care services	Offices of physicians, (or hospitals, community health centers, dental offices)
Indirect Effect	Reduction in health care services → decrease in demand for inputs.	Services (administrative, maintenance, accounting, legal, medical assistant), medical and diagnostic labs
Induced Effect	Reduction in health care services + decrease in demand for inputs → reduction in labor demand and subsequent consumer spending.	Residential real estate services, restaurants, dry-cleaning, automotive repair

# Health Workforce Impact Case Study: SLRP 2018 Total Value Added Results

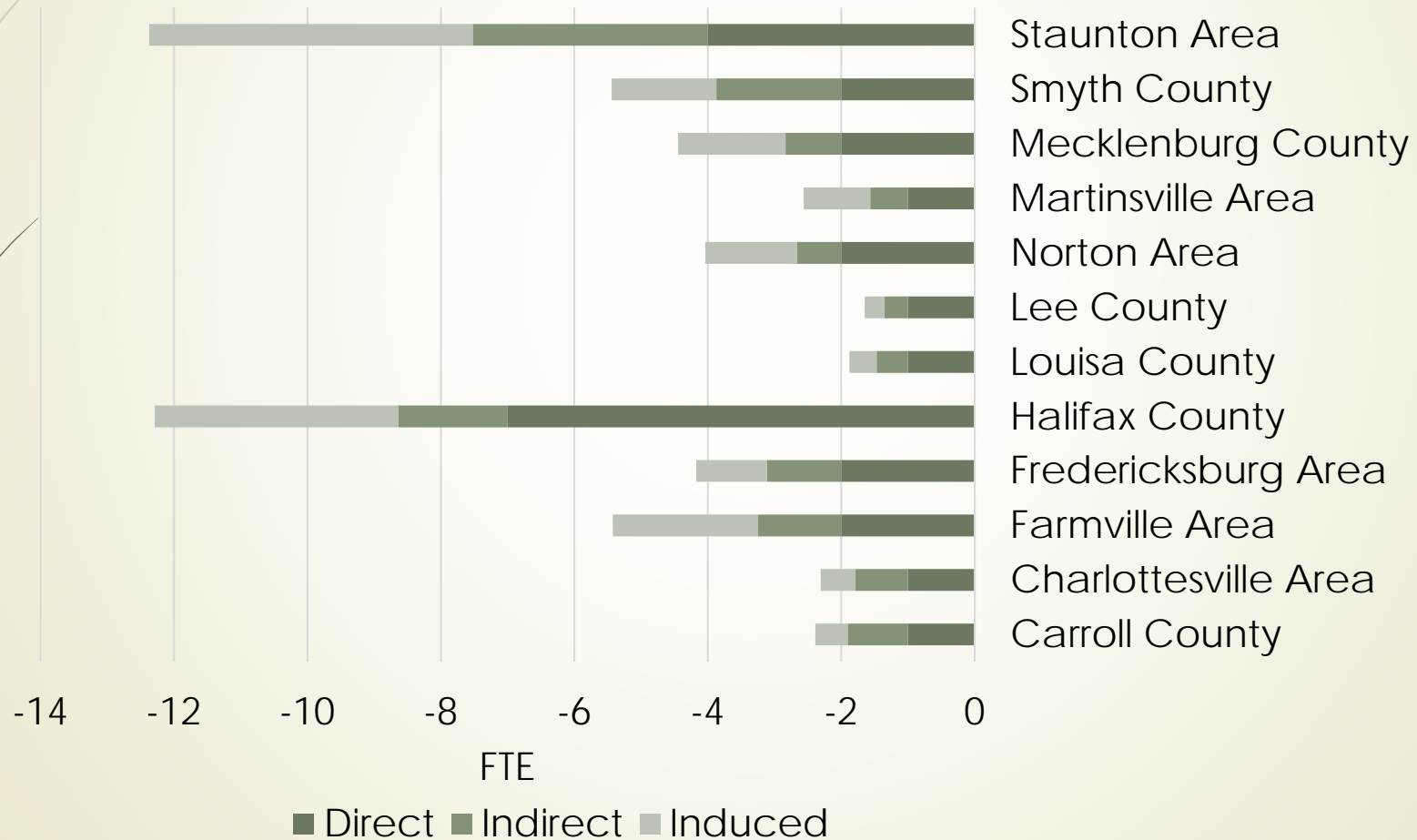


# Health Workforce Impact Case Study: SLRP 2018 Total Value Added Results

## Potential Economic Loss, Healthcare v. Non-Healthcare Sectors



# Health Workforce Impact Case Study: SLRP 2018 Employment Results



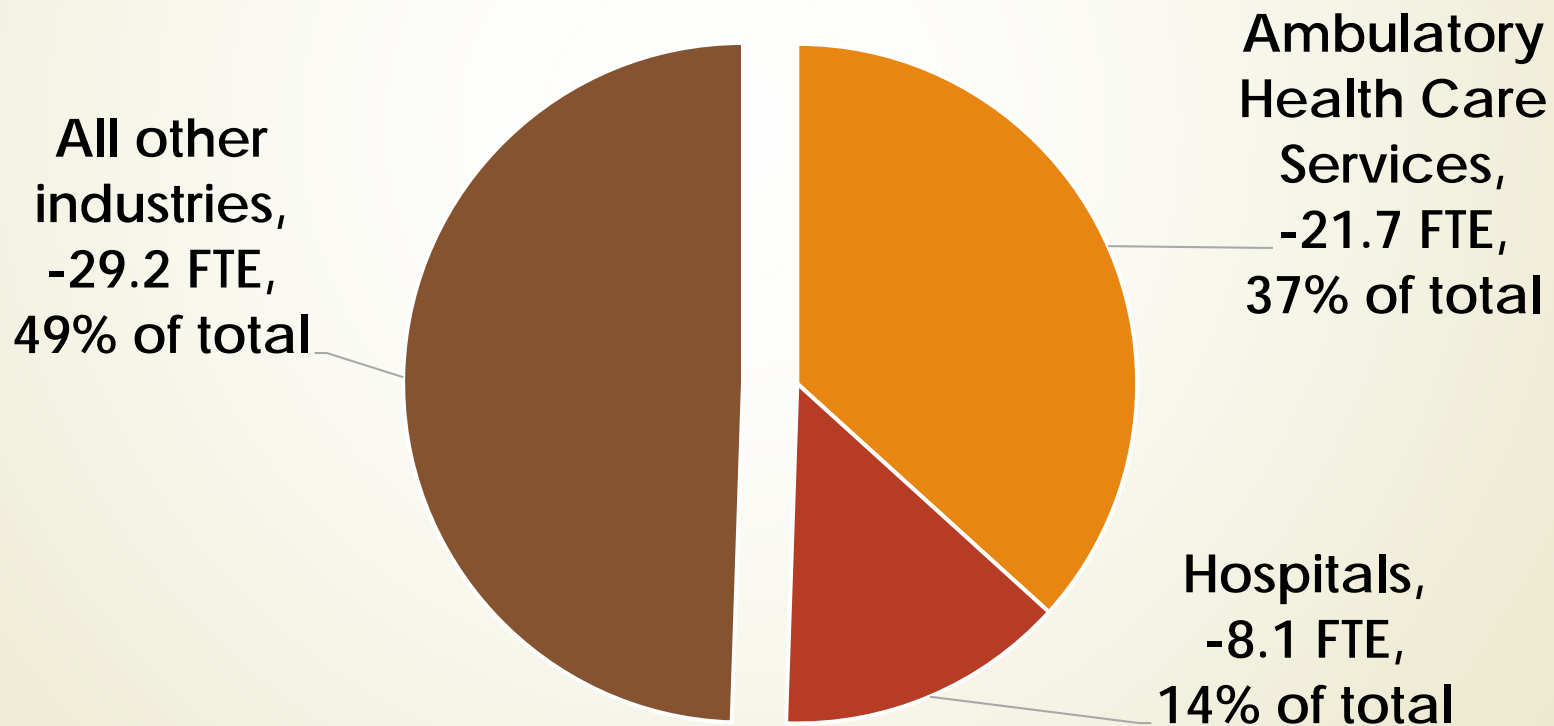
**Direct  
Impact:  
-26 FTE**

**Indirect +  
Induced  
Impact:  
-33 FTE**

**Total: -59 FTE**

# Health Workforce Impact Case Study: SLRP 2018 Employment Results

## Potential Employment Loss, Healthcare v. Non-Healthcare Sectors



# Health Workforce Impact Case Study: Impact v. GA Contribution

<b>Total VA-SLRP Loan Payments</b>
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<b>\$1.012 million</b>
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<b>General Assembly Contribution to VA-SLRP</b>
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<b>\$300,000</b>
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<b>Impact of VA-SLRP Elimination (12 Region Sum)</b>
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Total Value Added: <b>-\$7.61 million</b>
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Employment (FTE): <b>-59</b>
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State and Local Tax Revenues: <b>-\$443,000</b>
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# Limitations of Economic Impact Analyses

- ▶ **IMPLAN captures the within-region impact of a change in economic activity, but relies on assumptions.**
  - ▶ Output-per-worker and broad industry structure patterns drive the models.
  - ▶ Marginal effect of each worker is constant.
  - ▶ Study area may obscure the overall net effect.
- ▶ **Economic Impact Analysis in IMPLAN does not capture:**
  - ▶ Population health effects and lost productivity.
  - ▶ Forward linkages, long-term impacts, and market adaptations.
  - ▶ The complexity of health care as a “product.”

# Room for Improvement

- ▶ **There is room for improvement here; better inputs yield better outputs.**
  - ▶ Accurate data on practice locations, purchasing patterns, provider productivity, patient location.
  - ▶ Spousal effects?
  - ▶ Population health and long-term economic impacts.

Still, with adequate framing, this analysis sends the right value message to the target audience.



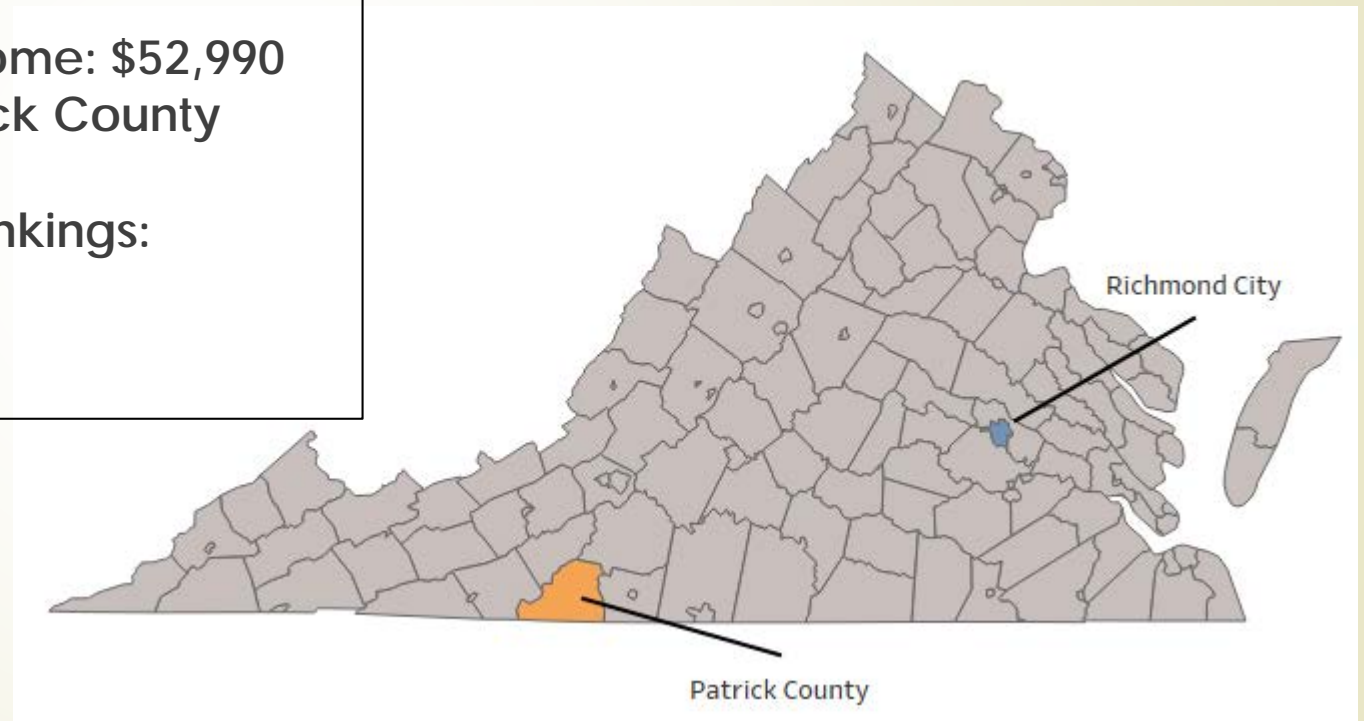
# Case #2: Critical Access Hospital Closure

Tool: Economic Impact Analysis, TBD

Audience: TBD

# Patrick County, Virginia

- ▶ Population ~18,000
  - ▶ Town of Stuart: ~1,400
- ▶ Median Age: 50
- ▶ Median Household Income: \$52,990
- ▶ Biggest Employer: Patrick County Schools
- ▶ RWJF County Health Rankings:
  - Health Factors: 100/133
  - Health Outcomes: 98/133



Sources: RWJF 2019 County Health Rankings, VEDP

## Pioneer Community Hospital of Patrick County, VA: A Very Abbreviated Timeline

- ▶ 2009: Pioneer Health Services (PHS) leased and opened Pioneer Community Hospital of Patrick
- ▶ 2016: PHS declares bankruptcy
- ▶ 2017: Hospital closes (September); building sold at auction (December)
- ▶ 2018: Numerous state and local attempts to build path towards reopening (licensure, purchase/lease offers, health system inquiries, etc.)
- ▶ **Currently: Hospital remains closed; building vacant; no indication of interested operator.**

## Hospital Closure: Standard Economic Impact Analysis with IMPLAN

<b>Patrick County, VA</b>	<b>Jobs (FTE)</b>	<b>Economic Impact</b>
<b>Direct Effect</b>	<b>-133</b>	<b>-\$6,089,666</b>
<b>Indirect Effect</b>	<b>-36</b>	<b>-\$1,647,684</b>
<b>Induced Effect</b>	<b>-17</b>	<b>-\$983,574</b>
<b>Total Effect</b>	<b>-186</b>	<b>-\$8,720,925</b>
<b>State and Local Tax Impact: -\$555,096</b>		

# Simple Economic Impact Analysis is NOT a Good Fit

- ▶ **Without additional detailed information specific to the hospital, the results are likely inaccurate.**
  - ▶ Data are from 2016, and may not represent hospital employment and operations at the closure.
  - ▶ Rural is different.
- ▶ **Even if correct, the standard IMPLAN-based analysis is incomplete.**
  - ▶ Net impacts are unclear (workforce relocation, patient care redistribution/loss).
  - ▶ Results mask the broader impacts of the closure (long-term, amenity effect, population health).

## Refining the Inputs

- ▶ Reviewed news coverage and available data to improve hospital operation/purchasing patterns.
  - ▶ Deep dive into IMPLAN data/balance sheets
  - ▶ Bankruptcy filings
  - ▶ VHI hospital industry data
  - ▶ Financial documents/Stroudwater report
- ▶ Pulled internal and external data sources to better assess net impacts.
  - ▶ Local economic and demographic data (e.g., CBP, Census, QCEW, Virginia LMI and VDEP)
  - ▶ Previous CHNA, internal data, CHR

## Reassessing: Telling the right story

- ▶ There has been significant research on the trend in rural hospital closures (causes and consequences).
- ▶ Each community has unique attributes, but without changes in the underlying causal factors, reopening a hospital may be a short-term fix.
- ▶ Given that the hospital has already closed, what analyses will tell the “right” story to appeal to the “right” audience?
  - ▶ Comprehensive economic impact is important, but how will that help the community now?

# Patrick County: Qualitative Research



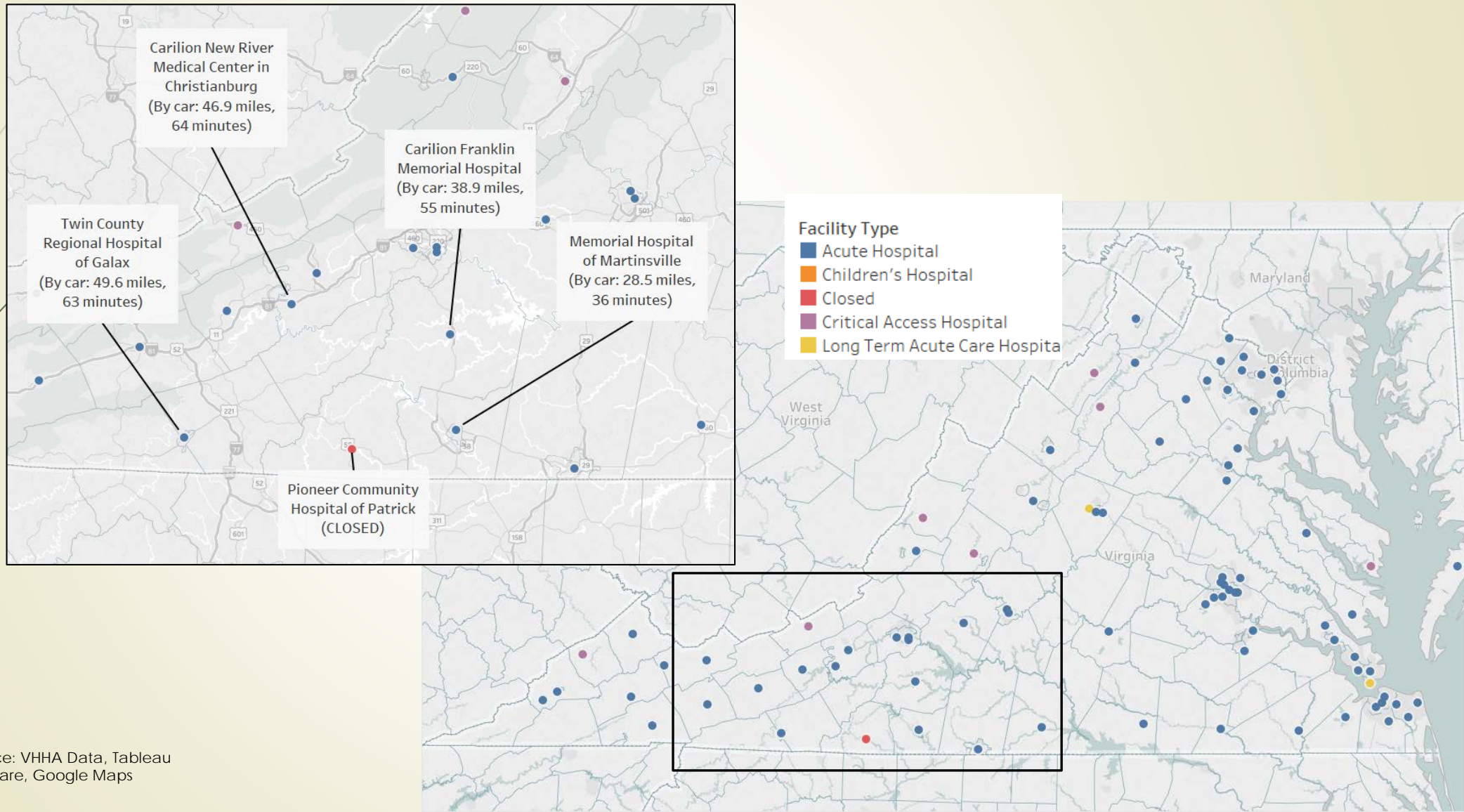
- Reached out to OHE contact in nearby city
- Introductory information-gathering visit (June 2019)
- Met with local stakeholders to understand the impact of the closure (and how we might help) in Stuart, VA



# Patrick County: Qualitative Research

- ▶ Economic and health consequences of the closure are already evident.
- ▶ EDA and county officials have exhausted options on reopening the hospital.
- ▶ EMS and local clinic have adapted to fill some of the gaps in care, but are under tremendous strain.
- ▶ **Preexisting and ongoing challenges have been exacerbated by hospital closure.**

# Patrick County: Surrounding Hospitals



## Patrick County: Value of Visit

- ▶ Developed appreciation for the geography of the area and the dedication of the community members.
- ▶ Started a genuine dialogue about community needs and VDH resources.
- ▶ Learned some surprising things about the population, workforce, and healthcare landscape.
- ▶ Gathered ideas for programs and potential entities with economic interests in the area.

# Patrick County: Next Steps

- ▶ Return to the data with new context, shifted focus, and ideas to generate meaningful economic analysis.
  - ▶ Emphasize population health impacts, along with economic costs, of the closure—in an actionable way.
  - ▶ Focus on targeted CBA/ROI of potential programs, grant opportunities, and private investments.
- ▶ Build sustainable relationships with local health district, EDA, health care workforce, and community members.
  - ▶ Talk to EMS director, free clinics, county officials.
  - ▶ Collect data to improve impact analysis.
- ▶ Evaluate state, agency, and local policies.

# Goals for Economic Analysis with SORH

- ▶ Enhance economic impact analysis by:
  - ▶ Improving data accuracy and model structure
  - ▶ Adding medium- and long-term population health and productivity impacts.
- ▶ Work with communities to focus on analyses that:
  - ▶ demonstrate the value of local initiatives,
  - ▶ leverage and highlight community strengths, and
  - ▶ target the right audience.
- ▶ Synthesize lessons learned from different communities to inform broader agency policies and programs.

# Summary

- ▶ Economic analyses can help tell the story of the health care industry in rural communities.
- ▶ Analyses should be guided by asking the right questions to understand the specific challenges and leverage the strengths of each community.
- ▶ Adapting models and analyses to represent and benefit rural communities requires direct outreach.

# Future Areas of Research

- Critical Access Hospitals/Impact of Closures
- ROI of Population Health Interventions (e.g., CHW)
- Social Impact Bond/Pay for Success Opportunities
- Health Care Worker Practice Location Decisions
- Hospital Mergers/System Consolidation Impacts
- Medicaid Expansion Effects
- Climate Change and Resiliency

# Thank you!

Questions?

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