



Project ECHO[®] (Extension for Community Health Outcomes)

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 @ProjectECHO

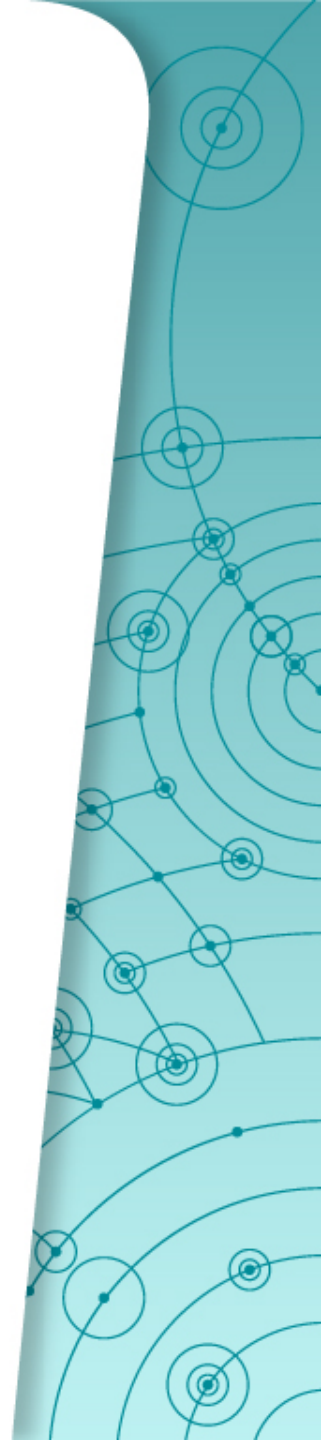
 UNMProjectECHO

At ECHO, our mission is to democratize medical knowledge and get best practice care to underserved people all over the world.

Our goal is to touch the lives of 1 billion people by 2025.

Project
ECHO®

**Moving Knowledge Instead of
Patients and Providers**



HCV

- 70 million in the world infected with HCV
- In New Mexico estimated number was greater than 28,000 in 2004. By 2017, 53,000 patients have tested positive for HCV antibody.
- In 2004 less than 5% of patients in NM had been treated.
 - 2,300 prisoners were HCV positive (~40% of those entering the corrections system), none were treated

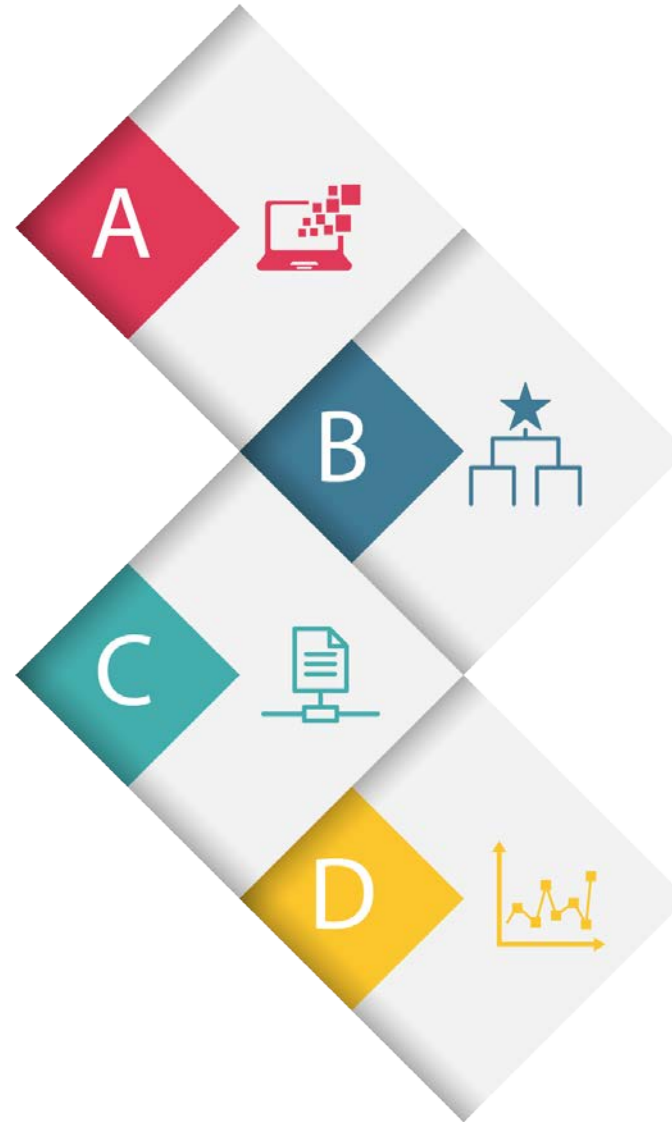
Goals of Project ECHO

Develop capacity to safely and effectively treat HCV in all areas of New Mexico and to monitor outcomes.

Develop a model to treat complex diseases in rural locations and developing countries.

The ECHO Model

Amplification – Use **T**echnology to leverage scarce resources



Share **B**est Practices to reduce disparity

Case Based Learning to master complexity

Web-based **D**atabase to **M**onitor **O**utcomes

Steps

- Train physicians, physician assistants, nurse practitioners, nurses, pharmacists, educators in HCV
- Train to use web-based software — **iECHO & ECHO Health®**
- Conduct teleECHO™ clinics — **“Knowledge Networks”**
- Initiate case-based guided practice — **“Learning Loops”**
- Collect data and monitor outcomes centrally
- Assess cost and effectiveness of programs

Benefits to Rural Clinicians

- No cost CMEs and Nursing CEUs
- Professional interaction with colleagues with similar interest
 - Less isolation with improved recruitment and retention
- A mix of work and learning
- Access to specialty consultation with GI, hepatology, psychiatry, infectious diseases, addiction specialist, pharmacist, patient educator





Clustering of Poor Prognostic Factors in Heavy Patients

	< 75.0 (1,140)	> 75.0 (1,281)**
Male, n (%)	462 (40.5)	1671 (129.5)**
Race, n (%)		
White	17 (1.5)	92 (7.2)
African American	21 (1.8)	103 (8.0)
Hispanic	13 (1.1)	75 (5.8)
Asian	193 (16.6)	103 (8.0)
Other	3 (0.3)	16 (1.2)
Log MELD score†	3.46 ± 0.37	4.48 ± 0.64**
MELD score, n (%)		
10-15	302 (26.5)	866 (66.8)**
16-20	343 (30.1)	999 (77.4)**
21-25	205 (18.0)	545 (42.5)**
> 25	205 (18.0)	545 (42.5)**

*MELD score was calculated using the following formula: MELD = 3.78 × ln (bilirubin) + 11.2 × ln (creatinine) + 9.74 × ln (INR) + 6.34. **p < .001. †p < .001.

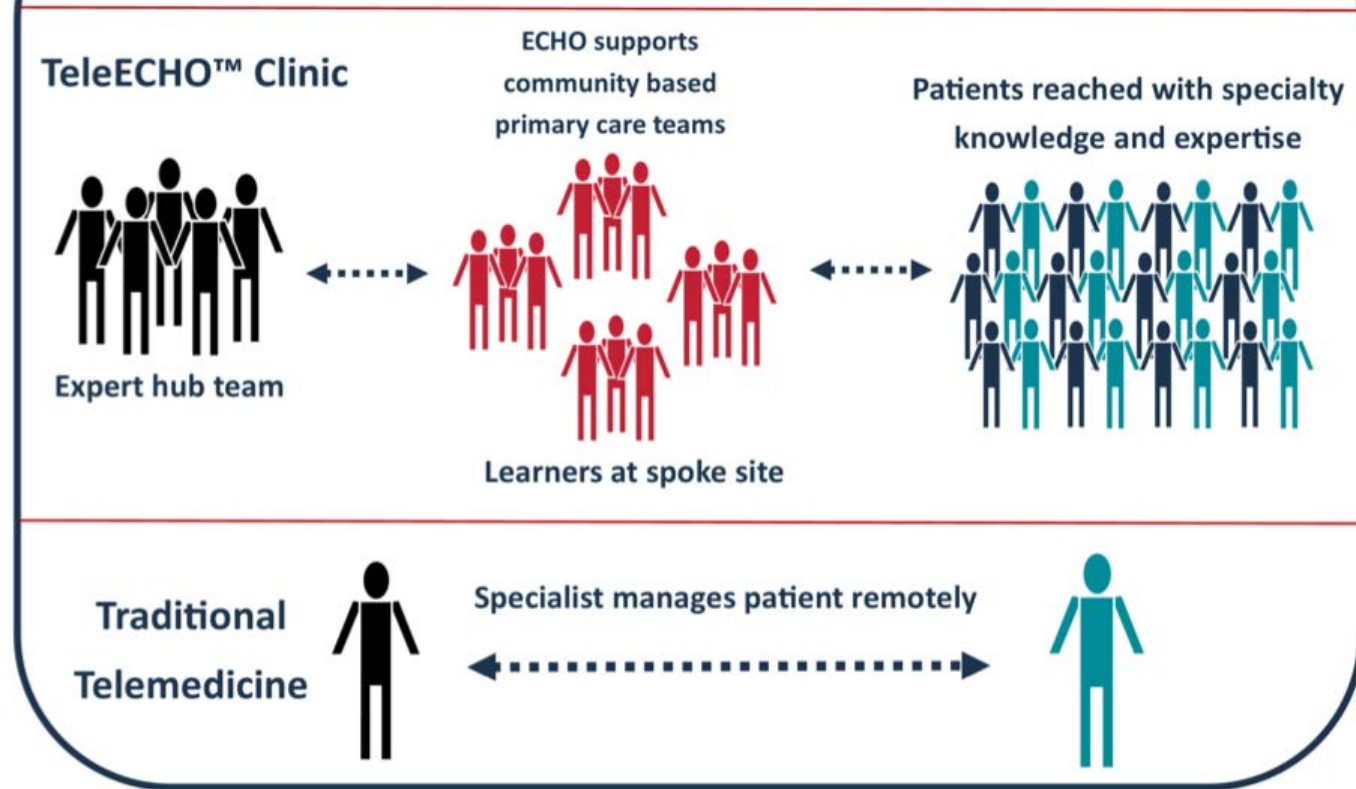
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DRUG INFORMATION HANDBOOK

Arora S., Kalishman S., Thornton K., et al. *Hepatology*. 2010;52(3):1124-33.

ECHO vs. Telemedicine



ECHO model is not ‘traditional telemedicine’.

Treating Physician retains responsibility for managing patient.

Technology

- Videoconferencing Hardware
- Videoconferencing Software
- Video Recording System
- You Tube-like Website/Archive
- **ECHO Health** – Electronic Clinical Management Tool
- **iECHO** – Electronic TeleECHO Clinic Management Solution

How well has model worked?

- 600 HCV teleECHO Clinics have been conducted
- >6,000 patients entered HCV disease management program

CME's/CE's issued:

- Total CME hours 79000 hours at no cost for HCV and 19 other disease areas

Project ECHO Clinicians

HCV Knowledge Skills and Abilities (Self-Efficacy)

scale: 1 = none or no skill at all 7= expert-can teach others

Community Clinicians N=25	<u>BEFORE</u> Participation MEAN (SD)	<u>TODAY</u> MEAN (SD)	Paired Difference (p-value) MEAN (SD)	<u>Effect Size</u> for the change
1. Ability to identify suitable candidates for treatment for HCV.	2.8 (1.2)	5.6 (0.8)	2.8 (1.2) (<0.0001)	2.4
2. Ability to assess severity of liver disease in patients with HCV.	3.2 (1.2)	5.5 (0.9)	2.3 (1.1) (< 0.0001)	2.1
3. Ability to treat HCV patients and manage side effects.	2.0 (1.1)	5.2 (0.8)	3.2 (1.2) (<0.0001)	2.6

(continued)

Project ECHO Clinicians

HCV Knowledge Skills and Abilities (Self-Efficacy)

Community Clinicians N=25	<u>BEFORE</u> Participation MEAN (SD)	<u>TODAY</u> MEAN (SD)	Paired Difference (p-value) MEAN (SD)	<u>Effect</u> <u>Size</u> for the change
4. Ability to assess and manage psychiatric co- morbidities in patients with hepatitis C.	2.6 (1.2)	5.1 (1.0)	2.4 (1.3) (<0.0001)	1.9
5. Serve as local consultant within my clinic and in my area for HCV questions and issues.	2.4 (1.2)	5.6 (0.9)	3.3 (1.2) (< 0.0001)	2.8
6. Ability to educate and motivate HCV patients.	3.0 (1.1)	5.7 (0.6)	2.7 (1.1) (<0.0001)	2.4

Project ECHO Clinicians

HCV Knowledge Skills and Abilities (Self-Efficacy)

Community Clinicians N=25	<u>BEFORE</u> Participation MEAN (SD)	<u>TODAY</u> MEAN (SD)	Paired Difference (p-value) MEAN (SD)	<u>Effect Size</u> for the change
Overall Competence (average of 9 items)	2.8* (0.9)	5.5* (0.6)	2.7 (0.9) (<0.0001)	2.9

Cronbach's alpha for the BEFORE ratings = 0.92 and Cronbach's alpha for the TODAY ratings = 0.86 indicating a high degree of consistency in the ratings on the 9 items.

Arora S., Kalishman S., Thornton K., et al. *Hepatol.* 2010;52(3):1124-33.

Clinician Benefits

(Data Source; 6 month Q-5/2008)

Benefits N=35	Not/Minor Benefits	Moderate/Major Benefits
Enhanced knowledge about management and treatment of HCV patients.	3% (1)	97% (34)
Being well-informed about symptoms of HCV patients in treatment.	6% (2)	94% (33)
Achieving competence in caring for HCV patients.	3% (1)	98% (34)

Project ECHO

Annual Meeting Survey

	Mean Score (Range 1-5)
Project ECHO® has diminished my professional isolation.	4.3
My participation in Project ECHO® has enhanced my professional satisfaction.	4.8
Collaboration among agencies in Project ECHO® is a benefit to my clinic.	4.9
Project ECHO® has expanded access to HCV treatment for patients in our community.	4.9
Access, <u>in general</u> , to specialist expertise and consultation is a major area of need for you and your clinic.	4.9
Access to <u>HCV specialist</u> expertise and consultation is a major area of need for you and your clinic.	4.9

Outcomes of Treatment for Hepatitis C Virus Infection by Primary Care Providers

Results of the HCV Outcomes Study

Treatment Outcomes

Outcome	ECHO	UNMH	p-value
	n = 261	n = 146	
Minority	68%	49%	p < 0.01
SVR* (Cure) Genotype 1	50%	46%	ns
SVR* (Cure) Genotype 2/3	70%	71%	ns

*SVR=sustained viral response

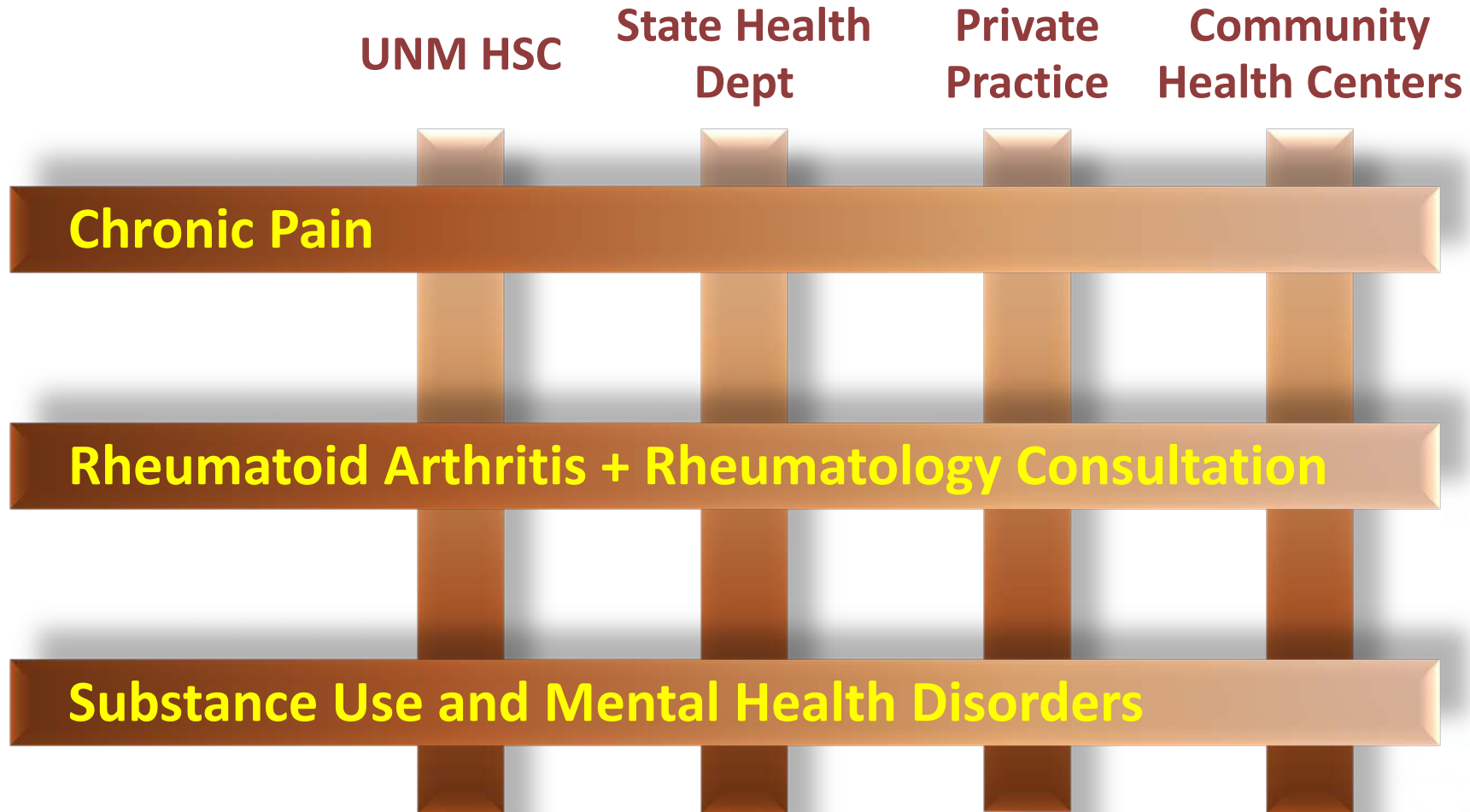
Arora S., Thornton K., Murata G., et al. *N Eng J Med.* 2011;364(23):2199-207.

Disease Selection

- **Common diseases**
- **Management is complex**
- **Evolving treatments and medicines**
- **High societal impact (health and economic)**
- **Serious outcomes of untreated disease**
- **Improved outcomes with disease management**

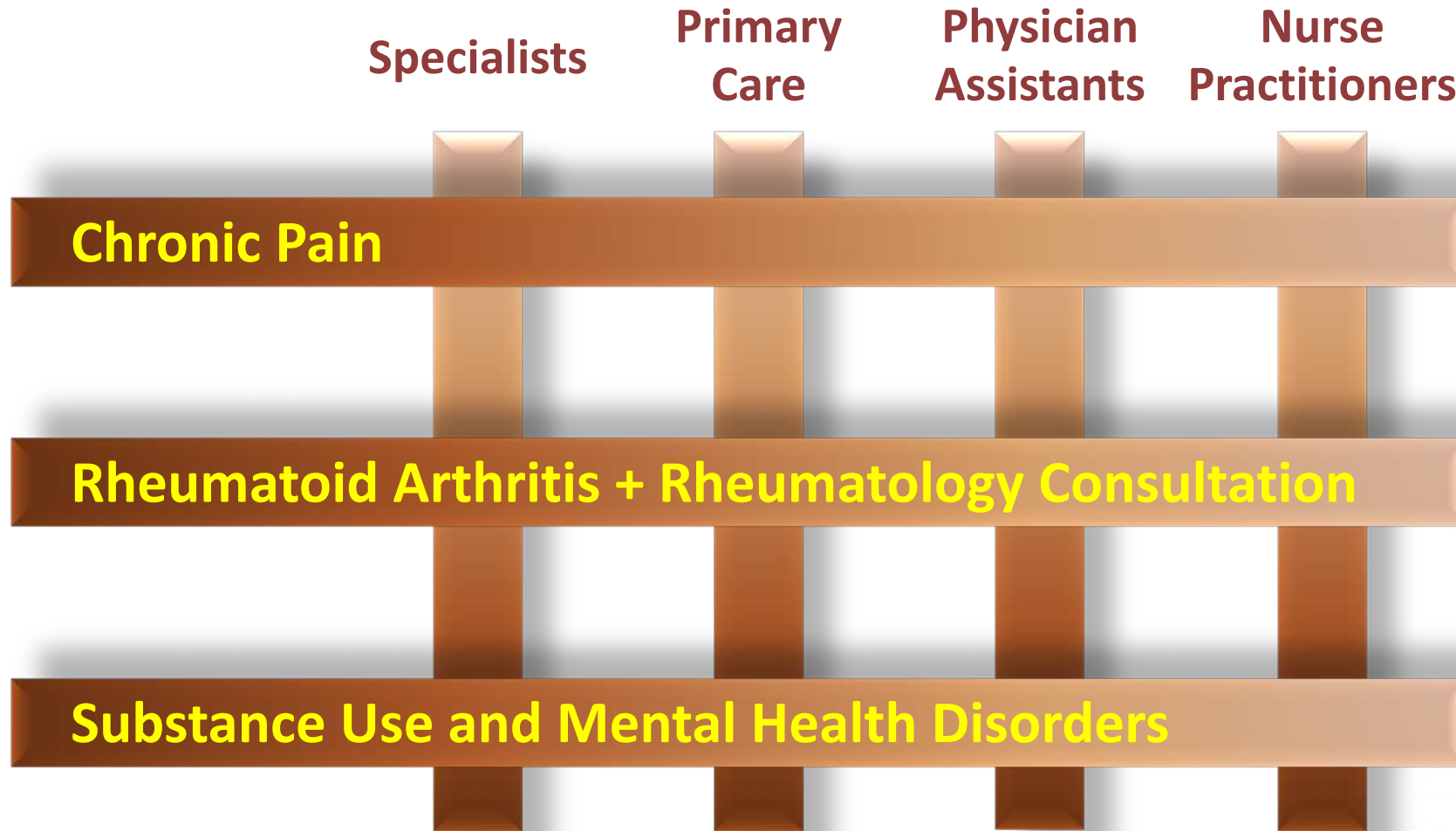
Bridge Building

Pareto's Principle



Force Multiplier

Use Existing Community Clinicians



Successful Expansion into Multiple Diseases

MON	TUE	WED	THURS	FRI
<u>Rheumatology</u> <ul style="list-style-type: none"> • Bankhurst 	<u>HBV</u> <ul style="list-style-type: none"> • Thornton 	<u>Community Health Workers</u> <ul style="list-style-type: none"> • CHW Team 	<u>CDC Good Health and Wellness in Indian Country</u> <ul style="list-style-type: none"> • Struminger 	<u>Opioid Addiction</u> <ul style="list-style-type: none"> • Komaromy
<u>Tuberculosis</u> <ul style="list-style-type: none"> • Burgos 	<u>Bone Health</u> <ul style="list-style-type: none"> • Lewiecki 	<u>Endocrinology & Diabetes</u> <ul style="list-style-type: none"> • <u>Bouchonville</u> 	<u>Chronic Pain and Opioid Management</u> <ul style="list-style-type: none"> • Comerci 	<u>Nurse Practitioner/ Certified Midwife Primary Care</u> <ul style="list-style-type: none"> • Van Roper
<u>Cardiology</u> <ul style="list-style-type: none"> • Achrekar, Anderson & Yatskowitz 	<u>Crisis Intervention for Community Policing Agencies</u> <ul style="list-style-type: none"> • Duhigg 	<u>Miners' Wellness</u> <ul style="list-style-type: none"> • Sood 	<u>Prison Peer Education Program</u> <ul style="list-style-type: none"> • Thornton 	<u>Integrated Addictions and Psychiatry (IAP)</u> <ul style="list-style-type: none"> • Komaromy
<u>Reproductive Health</u> <ul style="list-style-type: none"> • Singh 	<u>Seizures and Spells</u> <ul style="list-style-type: none"> • Imerman 	<u>Hepatitis C (HCV)</u> <ul style="list-style-type: none"> • Arora 	<u>HIV/ HCV Corrections</u> <ul style="list-style-type: none"> • Iandiorio & Thornton 	<u>Antimicrobial Stewardship</u> <ul style="list-style-type: none"> • Brett, Irizarry & Mercier

Project ECHO:

Views of Participating Providers, Health Workers, And Educators

1 = Strongly Disagree, 5 = Strongly Agree

Benefit	Mean
Through the Project ECHO telehealth clinics, I am learning best-practice care in chronic disease.	4.68
I am connected with peers in the ECHO telehealth clinic whose opinion I respect for professional advice and consultation.	4.55
I learn with guidance from Project ECHO academic specialists in chronic disease management whose knowledge and skills I respect.	4.73
I am connected to and respected by the academic specialists in the ECHO telehealth clinic in which I participate.	4.4
I am developing my clinical expertise through participation in Project ECHO.	4.48
After gaining expertise in the clinical diseases addressed in Project ECHO, I am comfortable teaching others what I have learned .	4.33

Arora S., Kalishman S., Dion D., et al. *Health Aff (Millwood)*. 2011;30(6):1176-84.

Patient Benefit	Mean
My participation in Project ECHO benefits patients under my care whom I co-manage with ECHO specialists.	4.45
The patients under my care whom I co-manage with ECHO specialists receive best-practice care .	4.43
My participation in Project ECHO benefits the patients under my care whom I do not co-manage with ECHO specialists .	4.19
I apply what I have learned about best practices through Project ECHO to all of my patients with similar chronic diseases .	4.45
I feel comfortable applying the principles I learned from Project ECHO to other patients in my practice with similar chronic disease, independently, without presenting them on the network.	4.23

ECHO-AGE

Beth Israel Deaconess Boston

- **2:1 Matched Cohort Study**
- **11 nursing homes received ECHO intervention. Matched with 22 controls**
- **Residents in ECHO Age facilities were 75% less likely to be physically restrained**
- **Residents were 17% less likely to be prescribed antipsychotics**

Gordon S.E., Dufour A.B., Monti S.M., et al. *J Am Med Dir Assoc.* 2016;17(6):553-6.

Geriatric Mental Health ECHO

University of Rochester NY

- **University of Rochester experts in geriatric psychiatry help train and mentor primary care clinicians in NY**
- **Since 2014, 500 clinicians have participated in their ECHO project funded by AHRQ**
- **There was a 20 % reduction in ED visits**
- **24 % reduction in overall costs**

<https://www.ahrq.gov/news/newsroom/case-studies/201703.html>

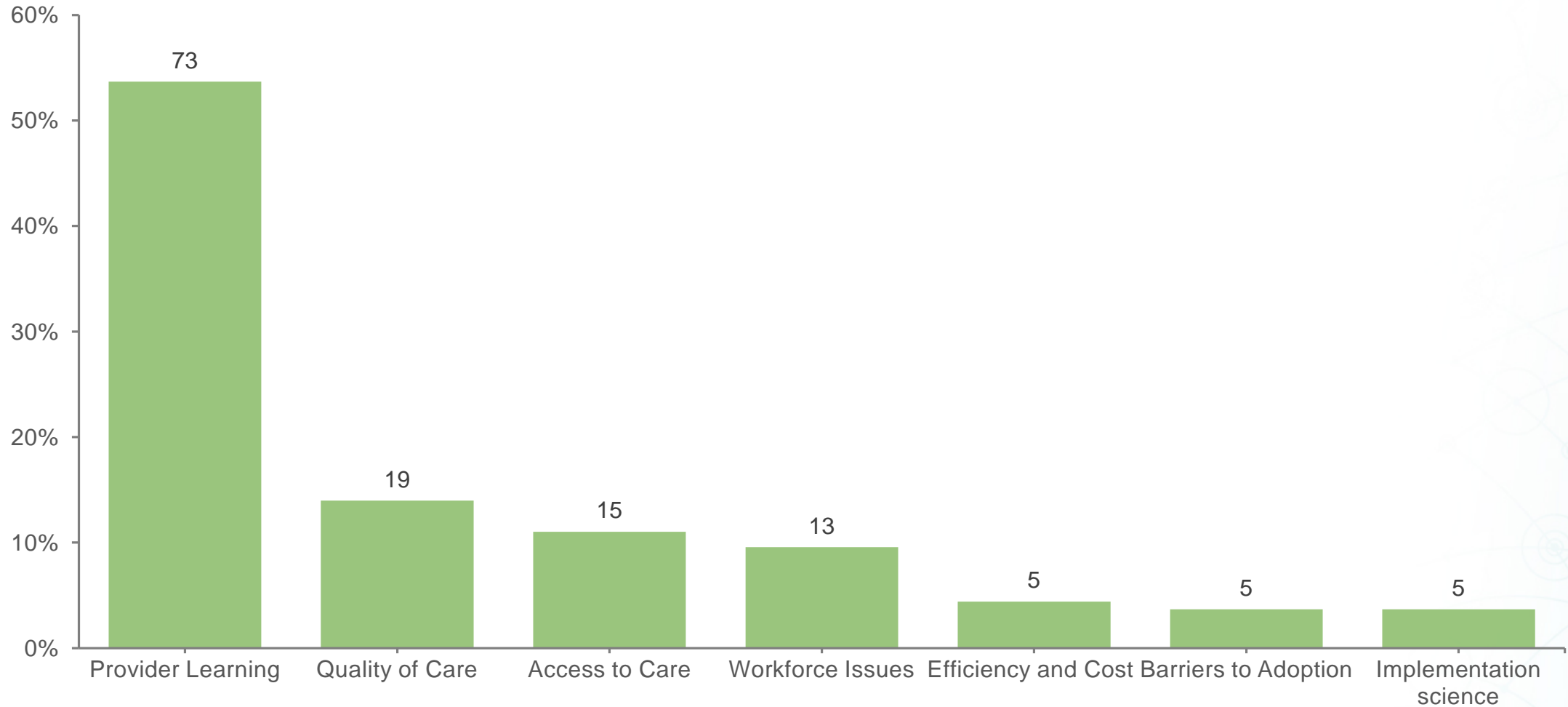
VA SCAN-ECHO for Liver Disease University of Michigan

513 patients who had a liver SCAN-ECHO visit were found within the cohort. Patients who had completed a virtual SCAN-ECHO visit were more likely younger, rural, with more significant liver disease, and evidence for cirrhosis. Propensity adjusted mortality rates using Cox Proportional Hazard Model showed that a SCAN-ECHO visit was associated with a hazard ratio of 0.54 (95% CI 0.36-0.81, $p = 0.003$) compared to no visit.

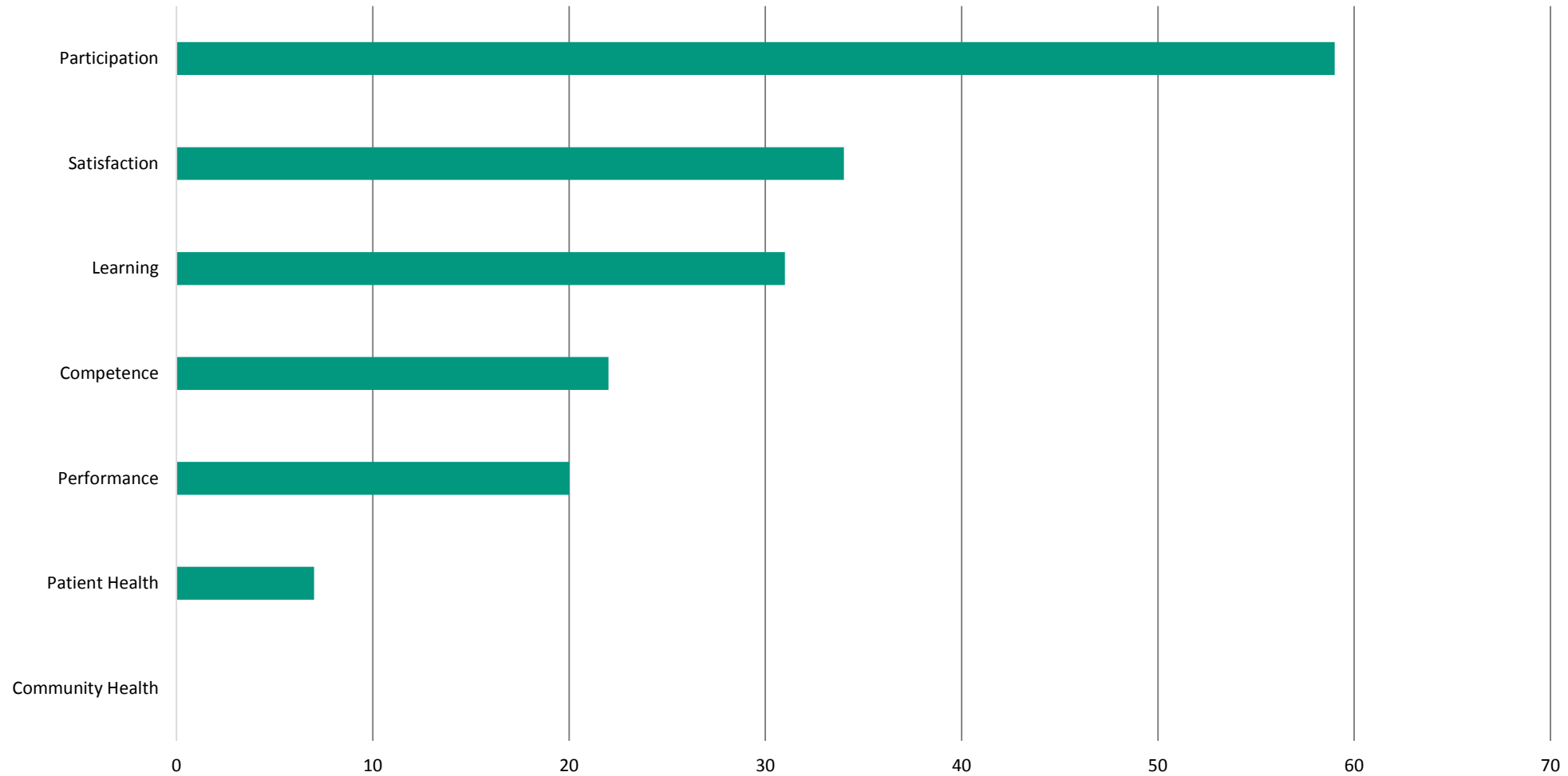
Virtual Consultations through the Veterans Administration SCAN-ECHO Project Improves Survival for Veterans with Liver Disease Su. GL, Glass L, et al; Hepatology . 2018 May 5. doi: 10.1002/hep.30074

Peer Reviewed Publications n=116

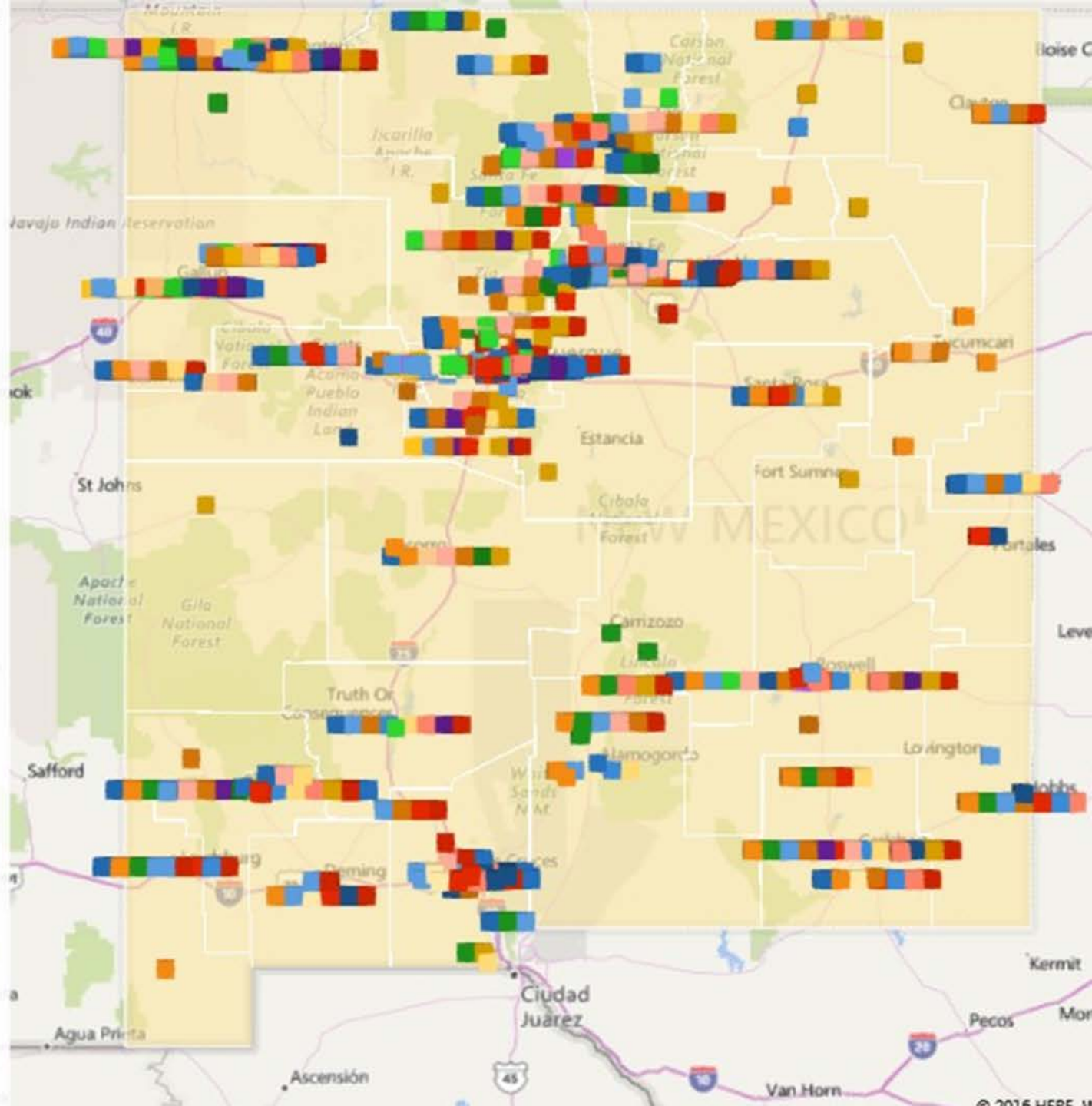
% of peer-reviewed publications (N=116)



ECHO Publications by Moore's Outcome Levels

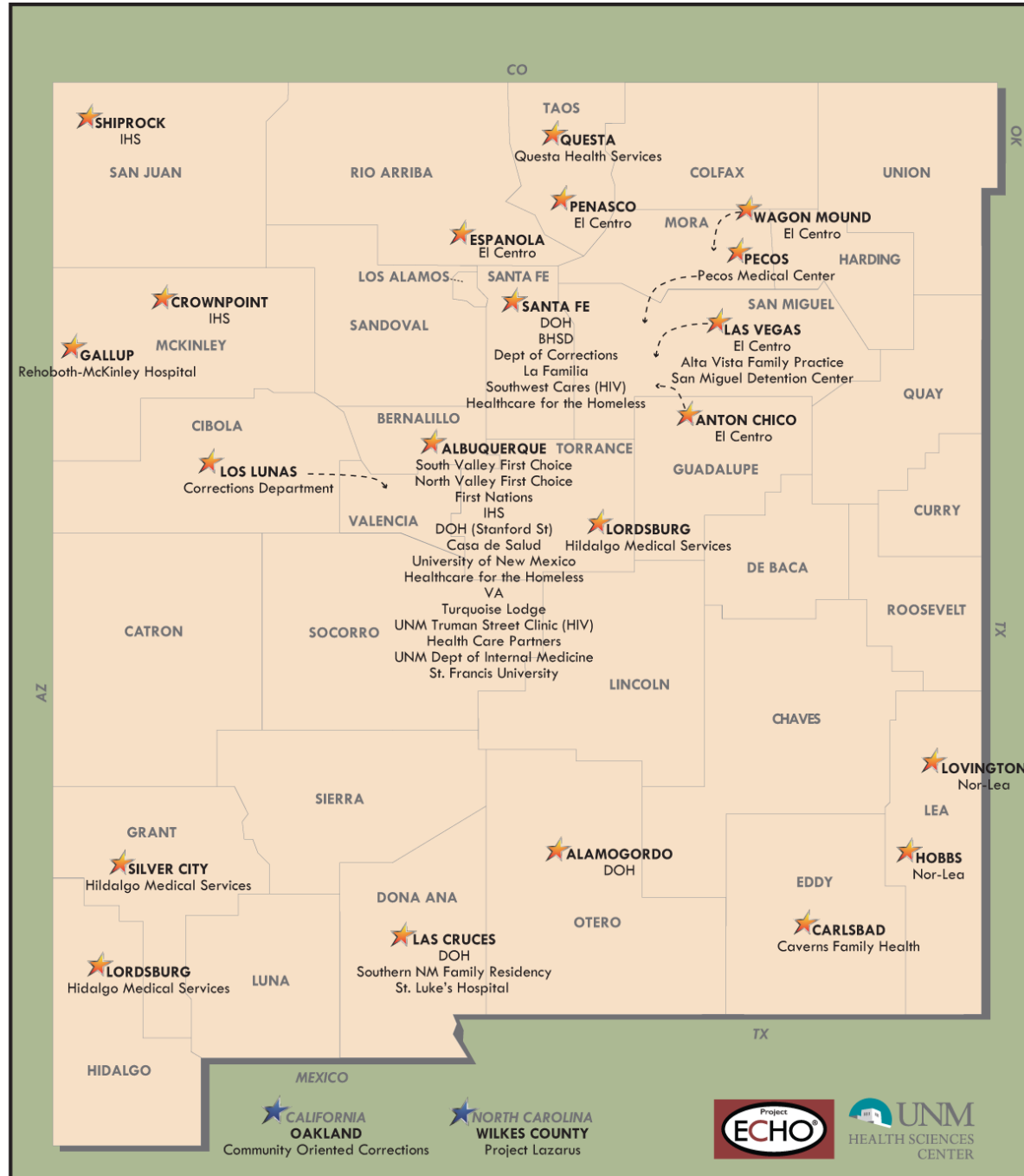


- Addiction/Psychiatry
- Asthma/Pulmonary
- Autism
- Child and Youth Epilepsy Clinic (CYE)
- Child Psychology
- Childhood Obesity
- Chronic Pain and Headache
- CHW Care Competency
- Community Addictions Recovery Specialist
- Complex Care Clinic
- Dementia Care Clinic
- Diabetes and Cardiovascular Care
- Disease Prevention Program
- Endocrinology TeleECHO
- HCV
- HCV-HIS
- Heart Failure
- Hepatitis C - Community
- Hepatitis C - Correctional
- Hepatitis C - IHS
- Hepatitis C -Community
- High-risk Pregnancy
- HIV / AIDS (IHS)
- HIV/AIDS
- Integrated Addiction / Psychiatry
- New Mexico Peer Education Program
- Palliative Care
- Pediatric Obesity
- Psychiatry
- Rheumatology
- Women's Health/Genomics

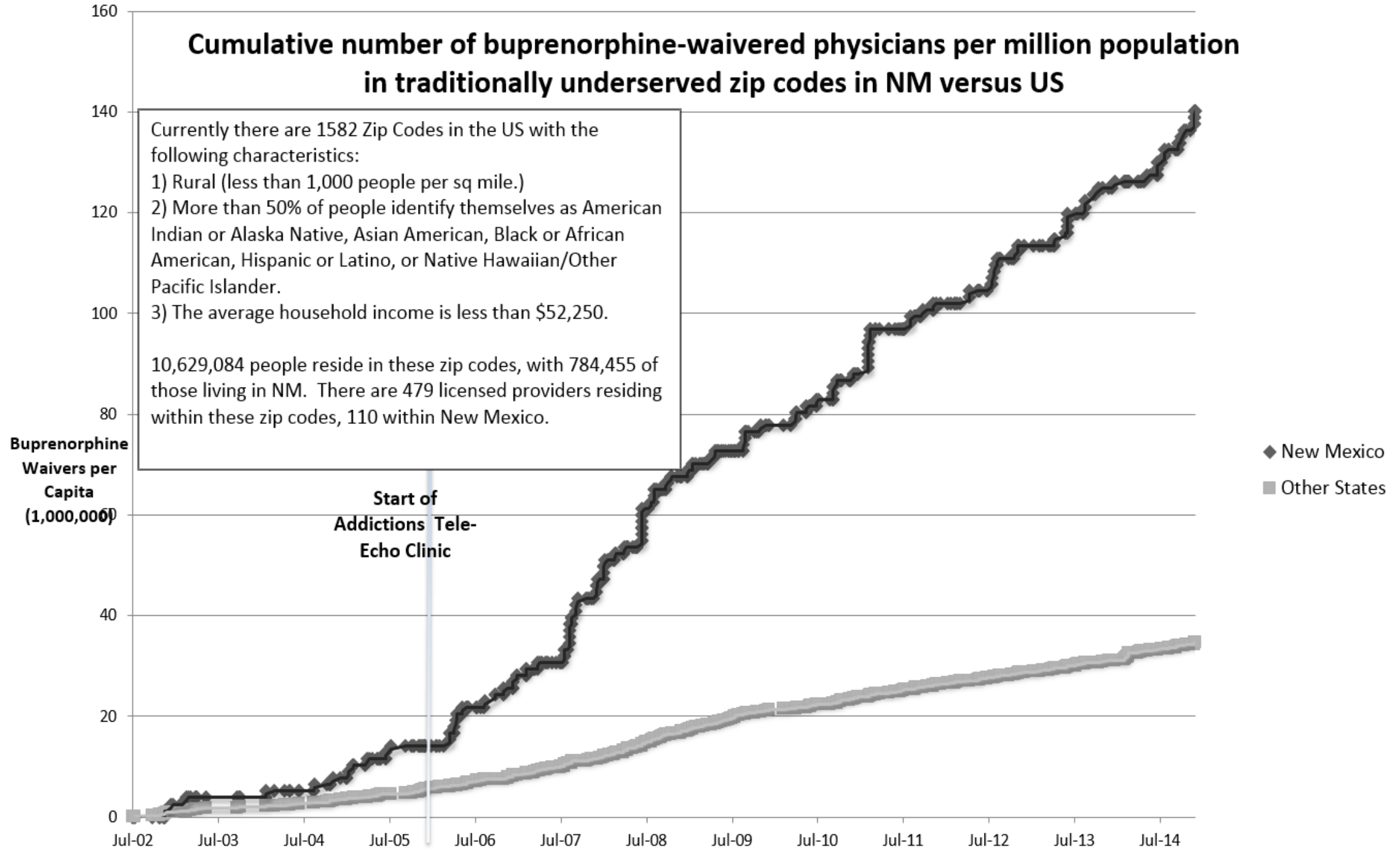


ECHO Hubs and Spokes: State of New Mexico

IAP CLINIC PARTICIPATION SITES



Cumulative number of buprenorphine-waivered physicians per million population in traditionally underserved zip codes in NM versus US



Currently there are 1582 Zip Codes in the US with the following characteristics:

- 1) Rural (less than 1,000 people per sq mile.)
- 2) More than 50% of people identify themselves as American Indian or Alaska Native, Asian American, Black or African American, Hispanic or Latino, or Native Hawaiian/Other Pacific Islander.
- 3) The average household income is less than \$52,250.

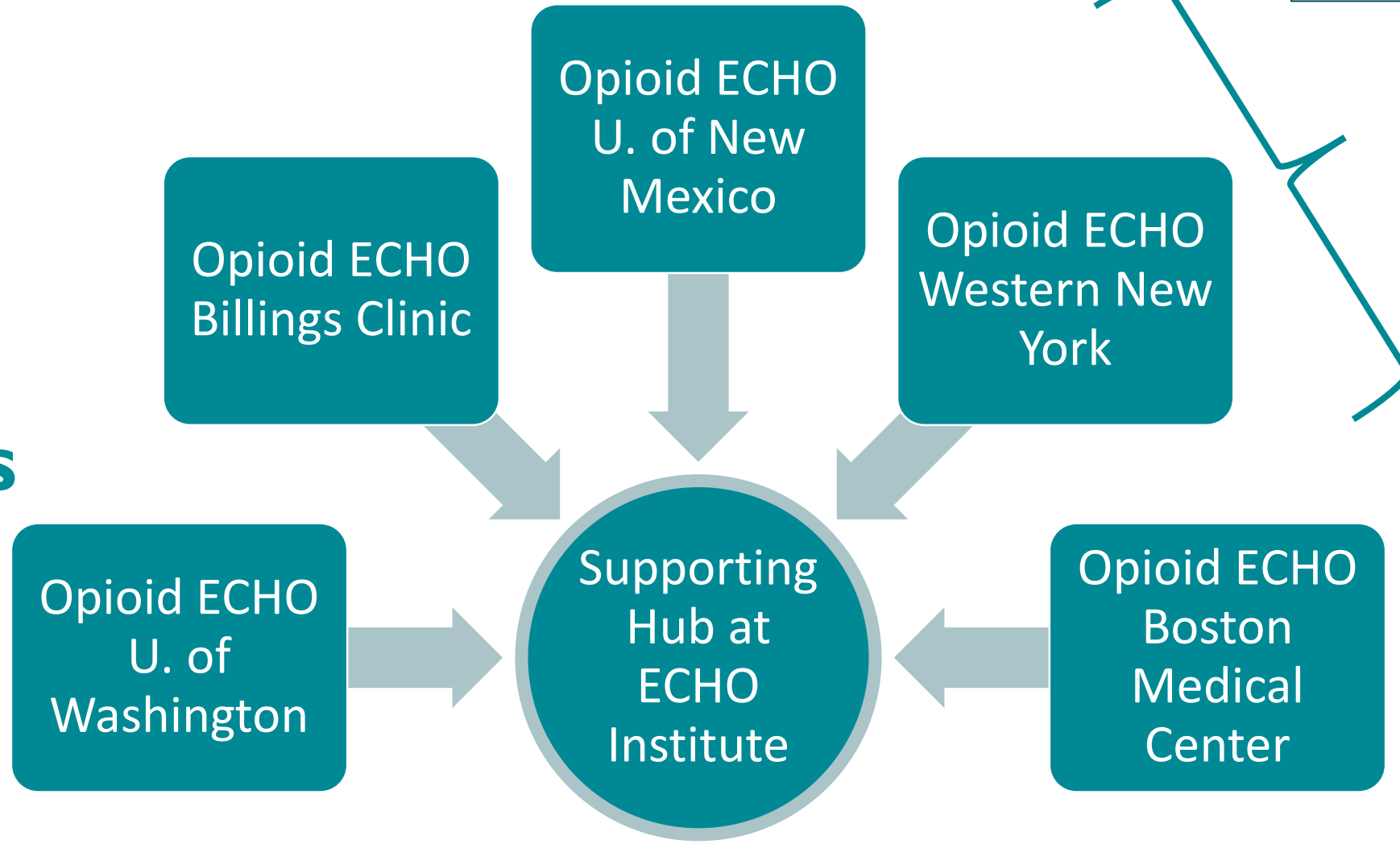
10,629,084 people reside in these zip codes, with 784,455 of those living in NM. There are 479 licensed providers residing within these zip codes, 110 within New Mexico.

Start of Addictions Tele-Echo Clinic



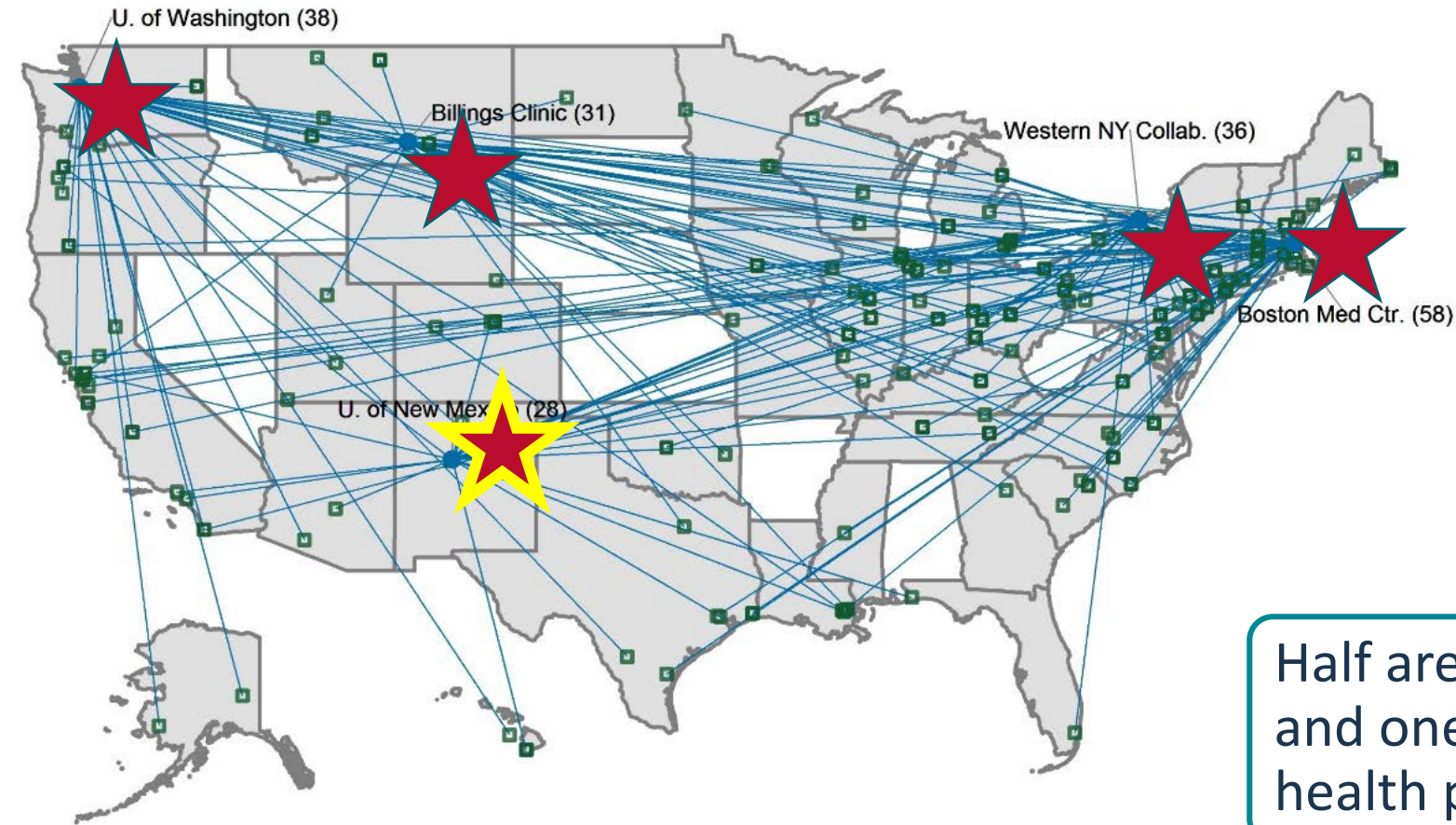
“Hub-lets” provide specialist teams

ECHO Shared Services Model



Supporting hub leads development of curriculum and provides IT, evaluation, and admin support, and participant recruitment for all hubs

HRSA-funded National Opioid ECHO Program



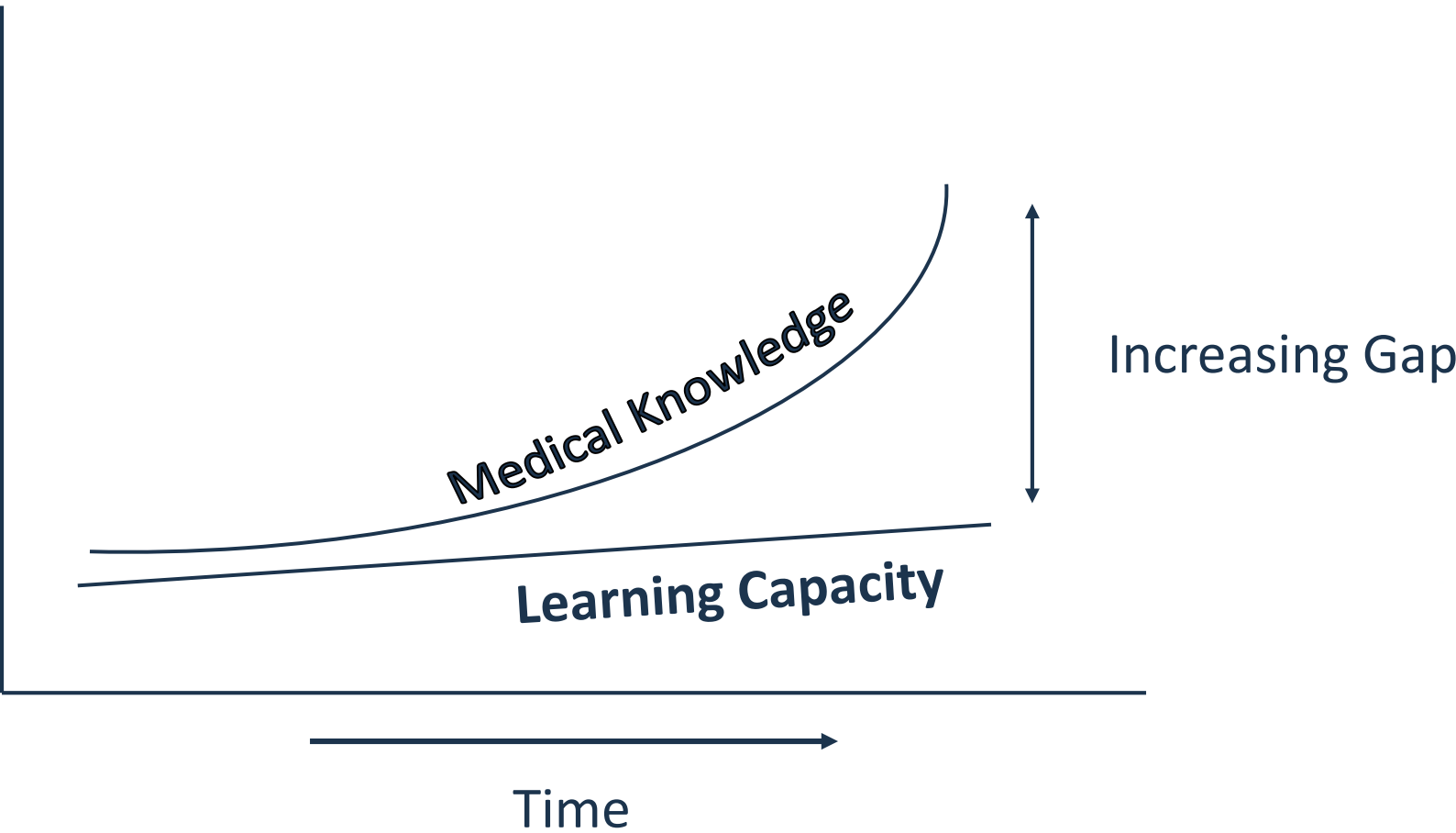
PARTICIPATION

Year one

- 355 participants from
- 147 HRSA-funded health centers

Half are medical providers,
and one third are behavioral
health providers

What The Mind Does Not Know The Eye Cannot See

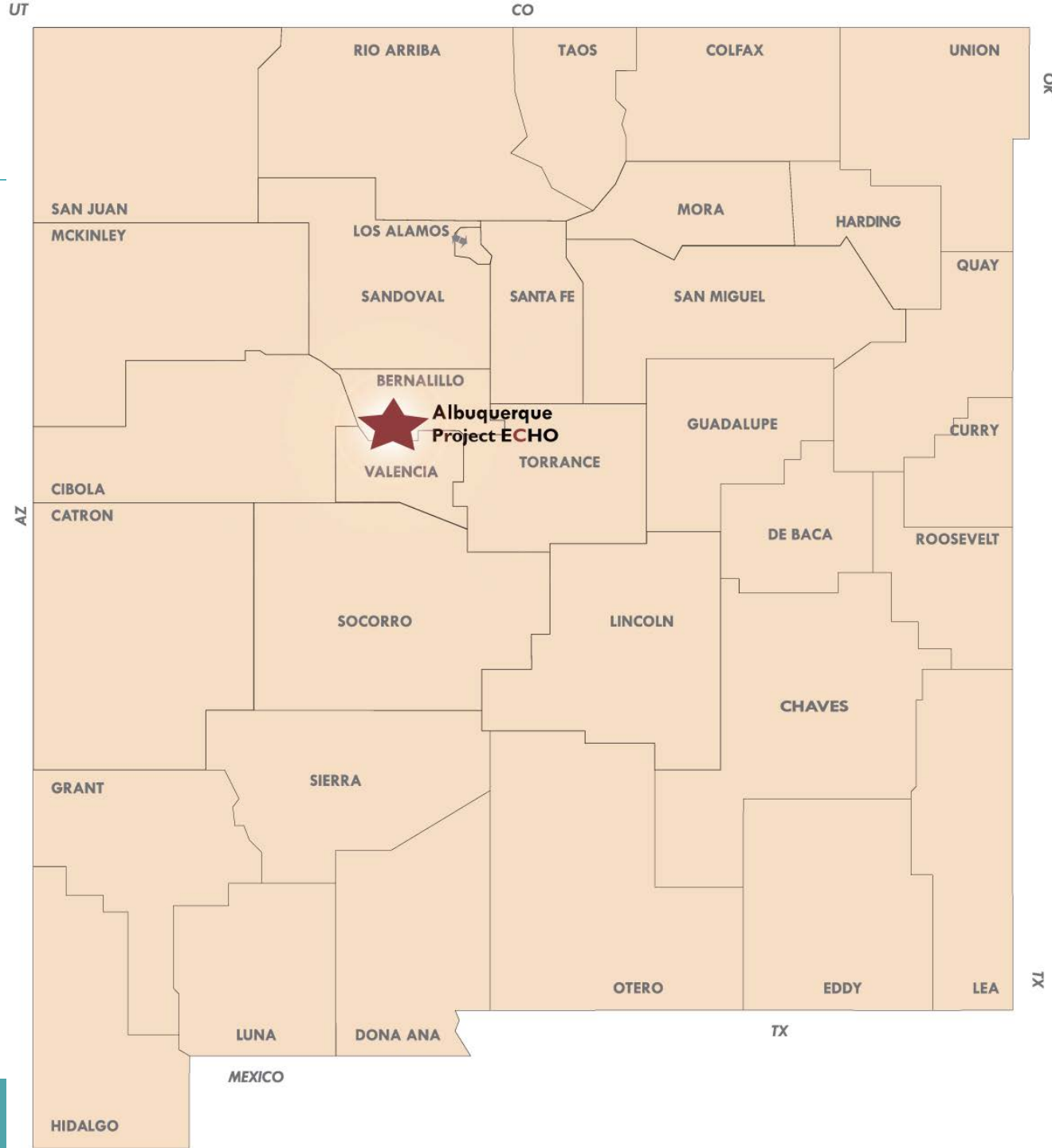


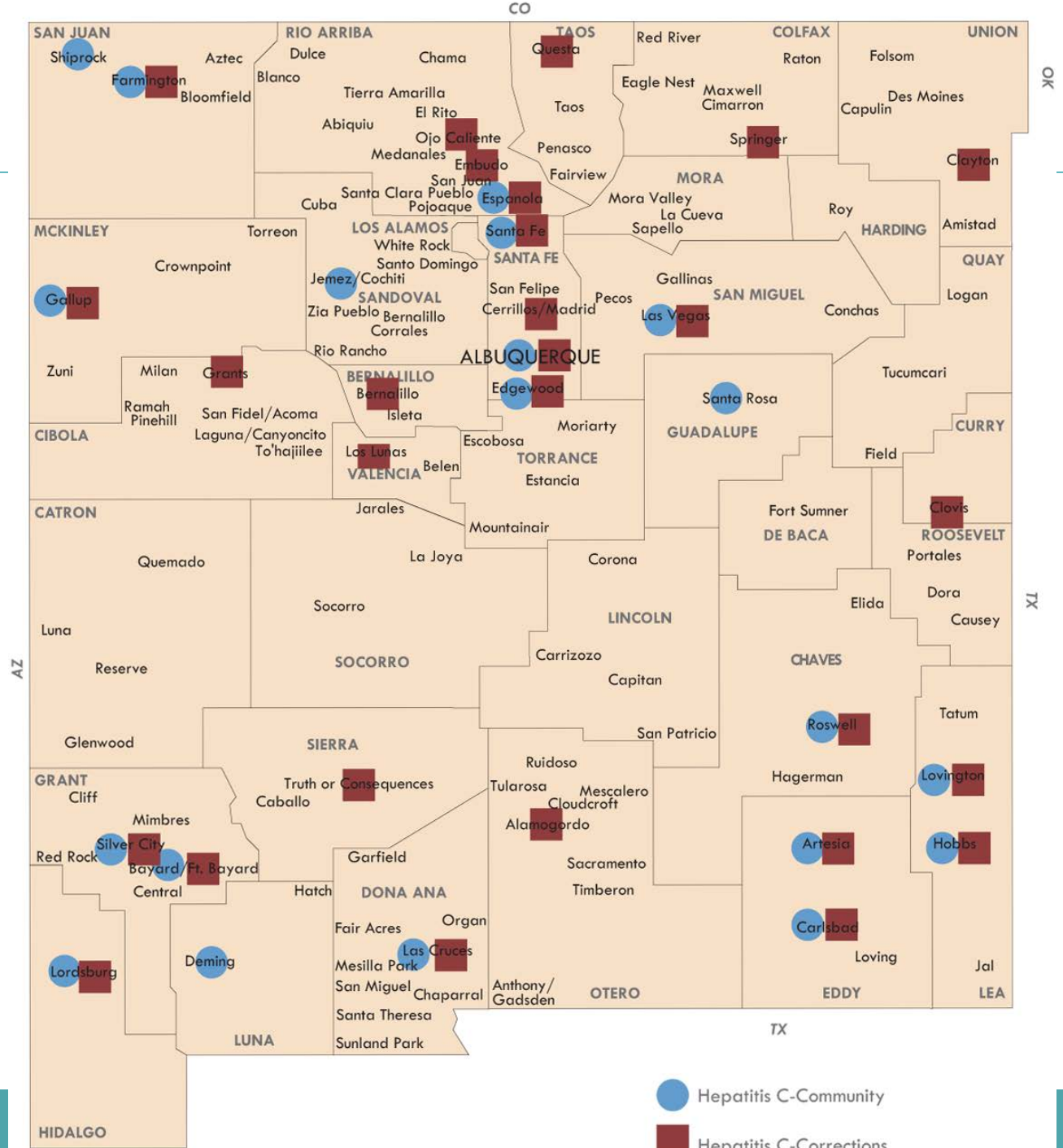
“Expanding the Definition of Underserved Population”

Potential Benefits of the ECHO Model

- Quality and Safety
- Rapid Learning and best-practice dissemination
- Reduce variations in care
- Access for Rural and Underserved Patients, reduced disparities
- Workforce Training and Force Multiplier
- Improving Professional Satisfaction/Retention
- Supporting the Medical Home Model
- Cost Effective Care- Avoid Excessive Testing and Travel
- Prevent Cost of Untreated Disease (e.g.: liver transplant or dialysis)
- Integration of Public Health into treatment paradigm

Democratize Knowledge

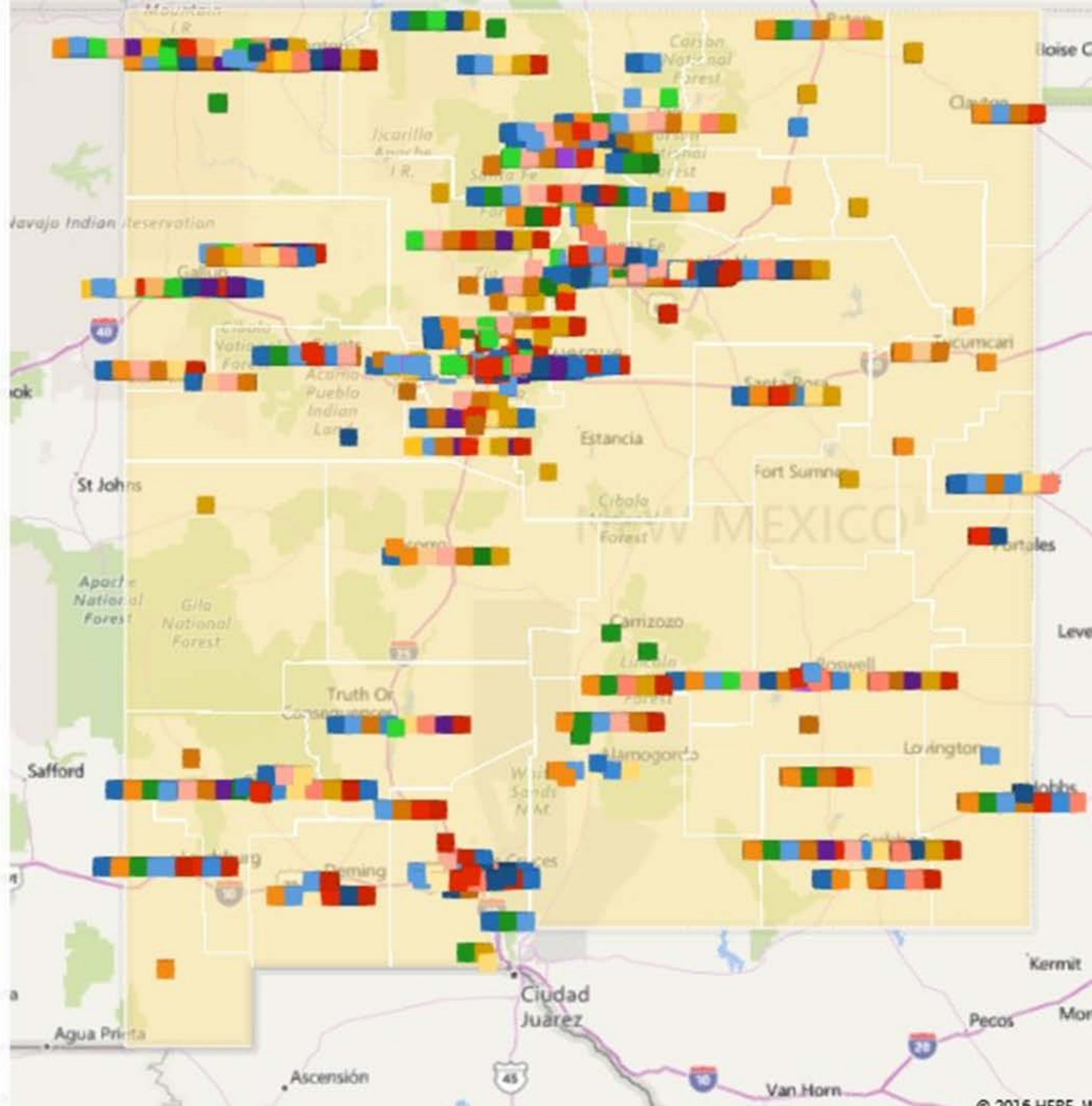




● Hepatitis C-Community
■ Hepatitis C-Corrections



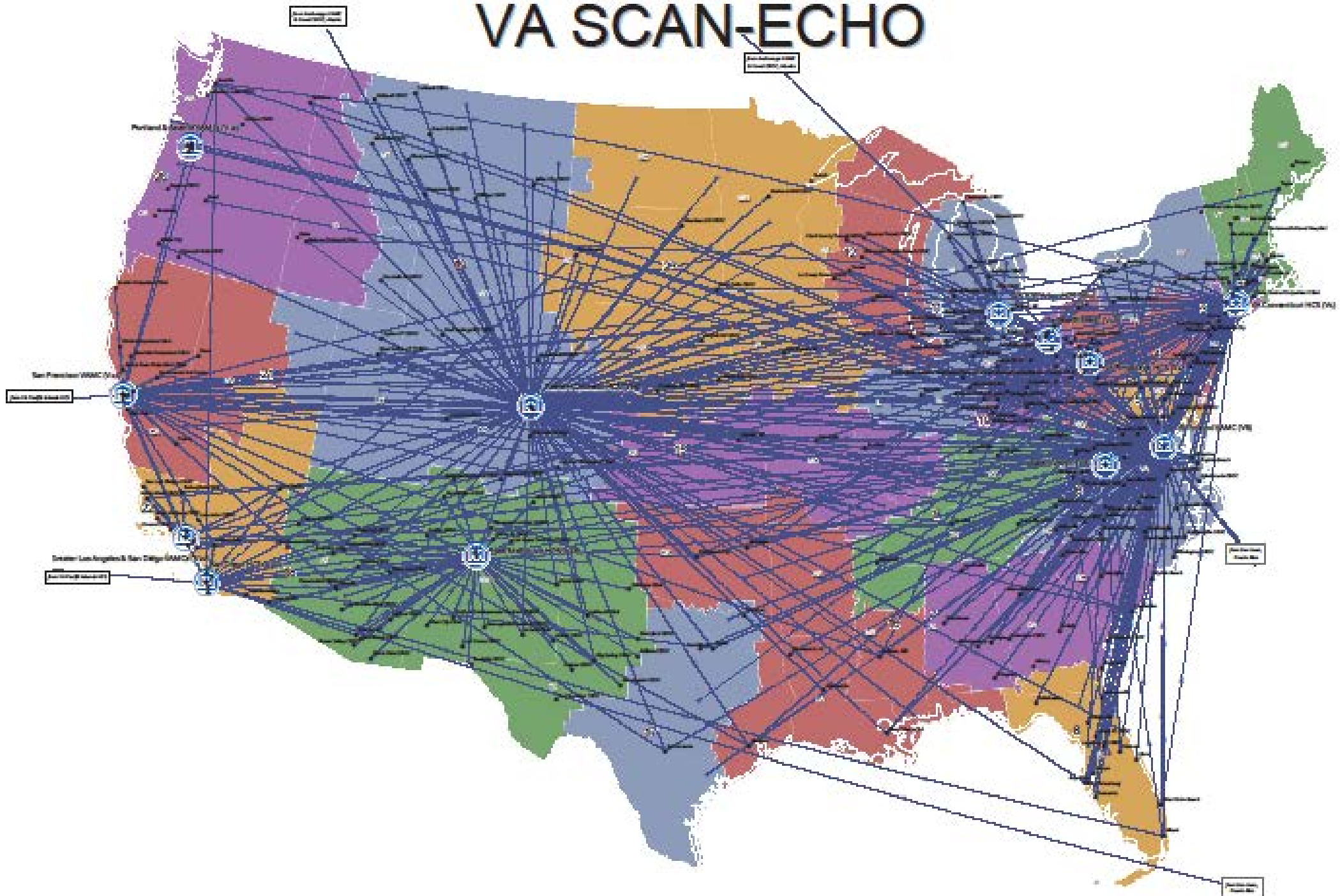
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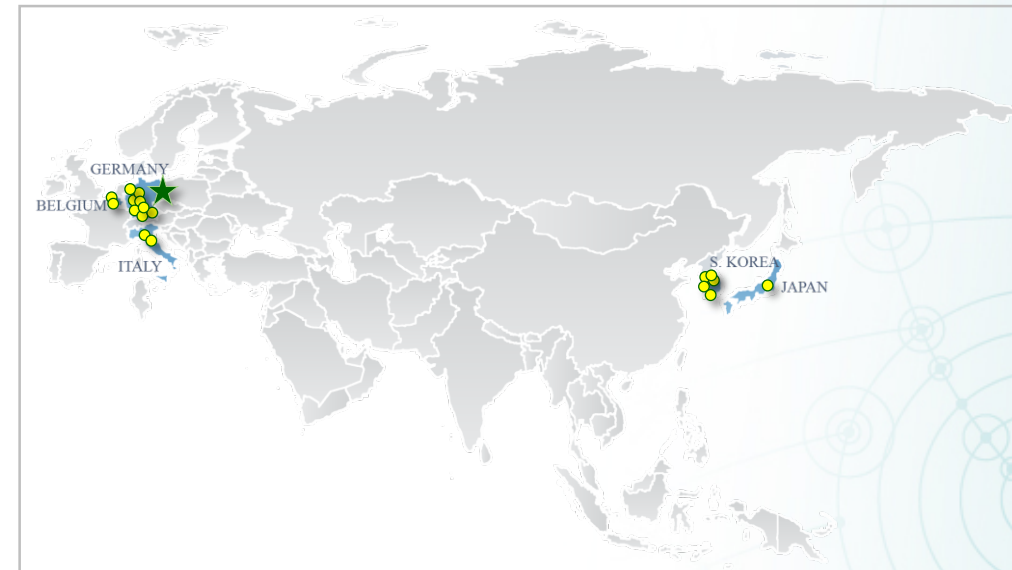
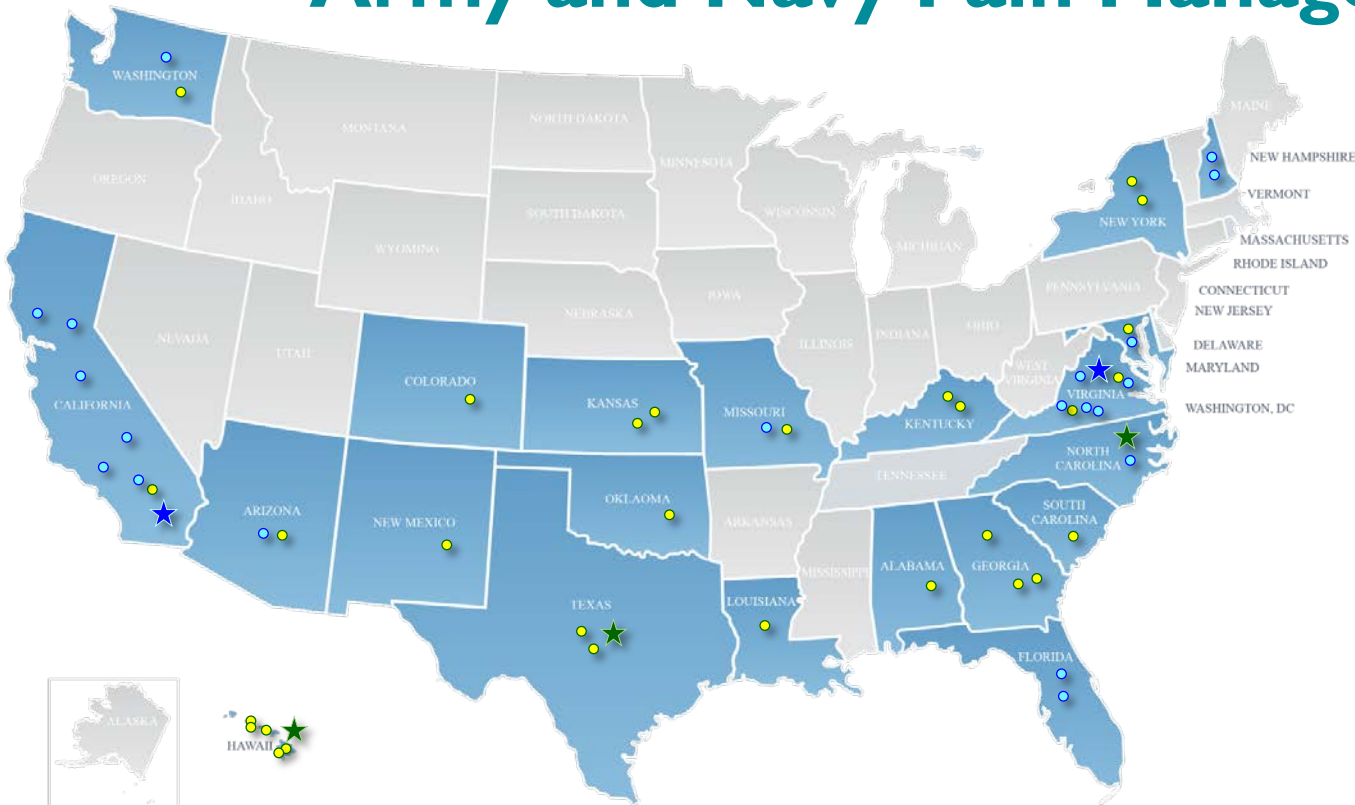
ECHO Hubs and Spokes: State of New Mexico



VA SCAN-ECHO



Army and Navy Pain Management ECHO Clinics



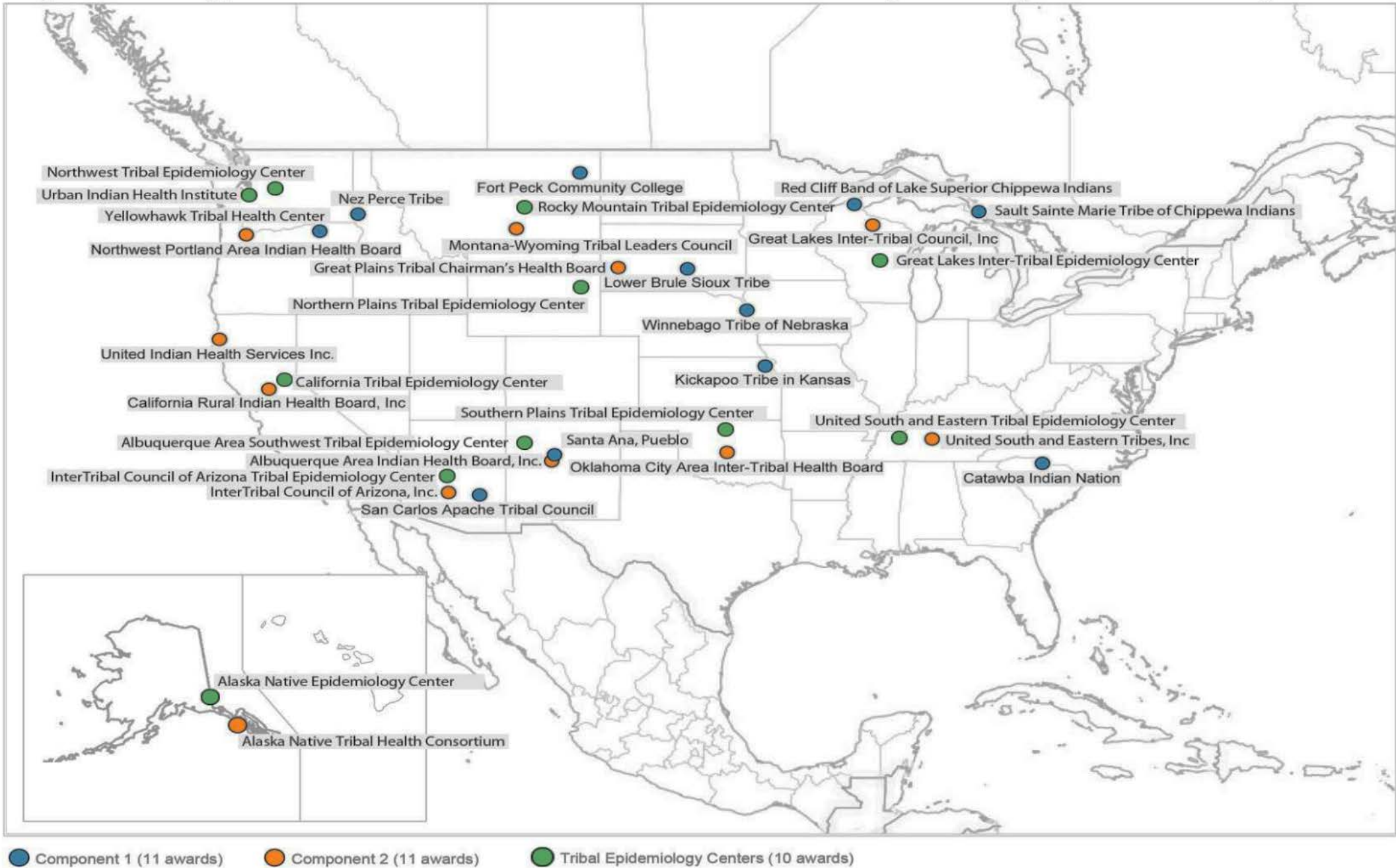
★ Army ECHO Hubs: Regional Health Command-Europe (RHC-E) – Landstuhl, Germany | Regional Health Command-Central (RHC-C)-Joint Base San Antonio-Brook Army Medical Center – TX | Regional Health Command-Pacific (RHC-P)-Tripler Army Medical Center – HI | Regional Health Command-Atlantic (RHC-A) – Ft. Bragg, NC

- **Belgium:**
 - Camp Casey
 - Supreme Headquarters Allied Powers Europe (SHAPE)
- **Germany:**
 - Grafenwoehr
 - Hohenfels
 - Katterbach
 - Landstuhl Regional Medical Center (LRMC)/FHC
 - LRMC/IMC
 - Stuttgart
 - Wiesbaden
 - Vilseck
- **Italy:**
 - Livorno
 - Vicenza
- **Japan:**
 - Camp Zama
- **South Korea:**
 - Camp Casey
 - Camp Humphreys
 - Camp Carroll
 - Camp Walker
 - Brian Allgood Army Community Hospital/ 121st Combat Support Hospital
- **Alabama:**
 - Redstone Arsenal
- **Arizona:**
 - Fort Huachuca
- **California:**
 - Fort Irwin
- **Colorado:**
 - Colorado Springs
- **Georgia:**
 - Fort Gordon
 - Fort Benning
 - Ft. Stewart
- **Hawaii:**
 - Schofield Barracks (Family Medicine and Troop Medical Clinic)
 - Adult Medicine Patient Centered Medical Home (PCMH) Tripler
 - Family Medicine PCMH Tripler
 - Warrior Ohana PCMH
 - VA Pain Clinic
- **Kansas:**
 - Fort Leavenworth
 - Fort Riley
- **Kentucky:**
 - Fort Knox
 - Fort Campbell
- **Louisiana:**
 - Fort Polk
- **Maryland:**
 - Fort Meade
- **Missouri:**
 - Fort Leonard Wood
- **New Mexico:**
 - White Sands Missile Range
- **New York:**
 - Fort Drum
 - West Point
- **Oklahoma:**
 - Fort Sill
- **South Carolina:**
 - Fort Jackson
- **Texas:**
 - Fort Bliss
 - Fort Hood
- **Virginia:**
 - Joint Base Langley-Eustis
 - Fort Lee
- **Washington:**
 - Madigan Army Medical Center

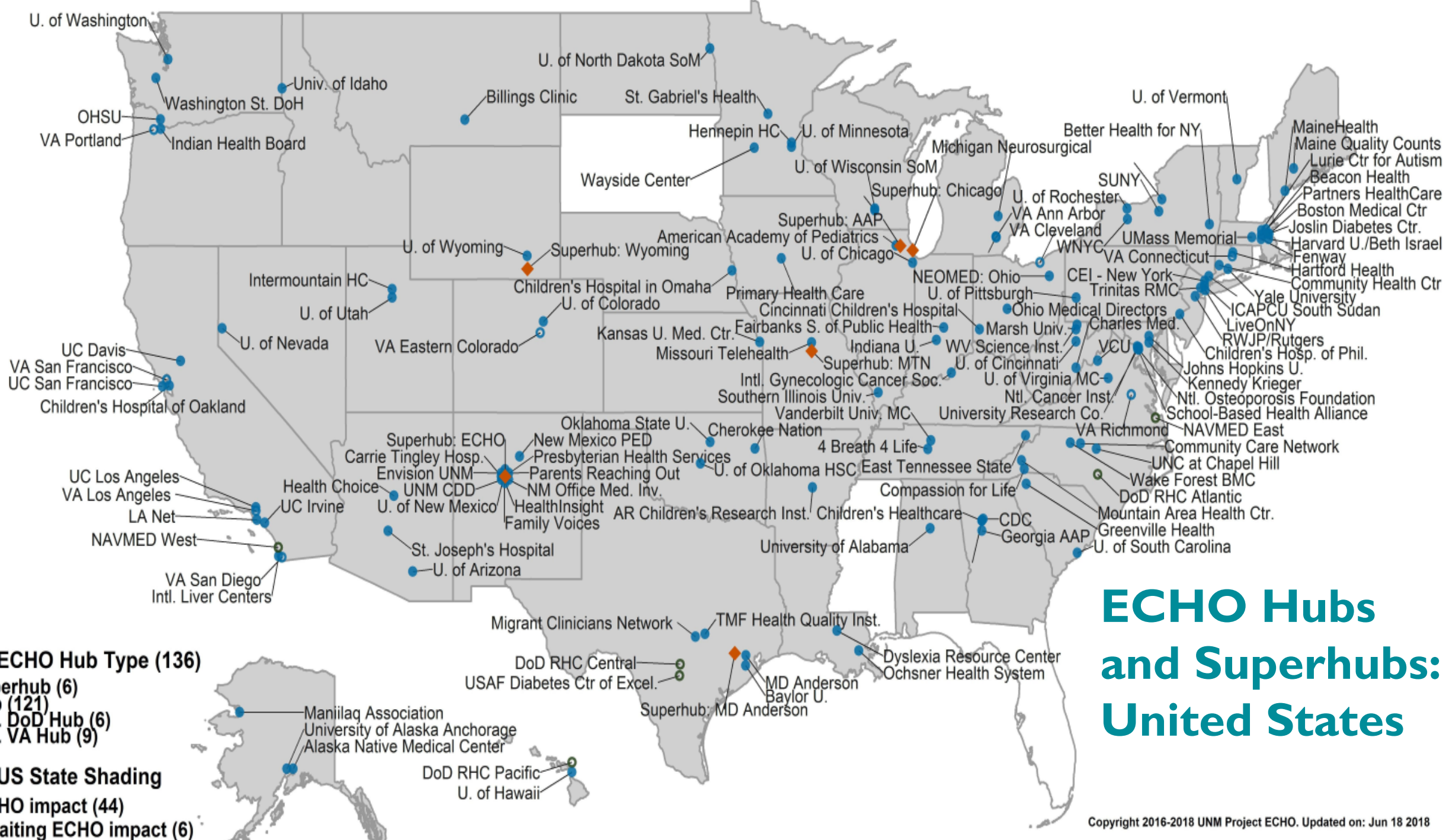
★ Navy ECHO Hubs: Navy Medicine East (NME)- Naval Medical Center (NMC) Portsmouth, VA | Navy Medicine West (NMW)- Naval Medical Center San Diego (NMCS), CA

- **Arizona:**
 - NH Yuma
- **California:**
 - NMCS Naval Training Center
 - NHLemoore
 - NH Twentynine Palms
 - NH Camp Pendleton
 - Naval Air Facility El Centro
 - Naval Air Station North Island
- **Florida:**
 - Naval Hospital (NH) Jacksonville
 - Naval Air Station Jacksonville
- **Maryland:**
 - NHC Pax River
- **Missouri:**
 - Behavioral Health Clinic (BHC) Boone
- **North Carolina:**
 - NH Camp LeJeune
- **New Hampshire:**
 - BHC Portsmouth NH
 - Navy Safe Harbor
- **Virginia:**
 - NMC Portsmouth (Case Management, Pain Clinic, Physiatry, Internal Medicine)
 - BHC Oceana
 - TriCare Prime Clinic (TPC) Chesapeake
 - TPC Virginia Beach
 - 633rd Medical Group-Langley

Comprehensive Approach to Good Health and Wellness in Indian Country Awards (DP14-1421PPHF14)**/22 awards



**These awards are financed solely by Prevention and Public Health Funds.



ECHO Hubs and Superhubs: United States

ECHO Consortium and Partners



Republic of Namibia Ministry of Health and Social Services



Centers for Disease Control and Prevention (CDC)

US Headquarters

CDC Namibia



Elizabeth Glaser Pediatric AIDS Foundation

EGPAF



International Training & Education Center for Health Namibia



The University of New Mexico

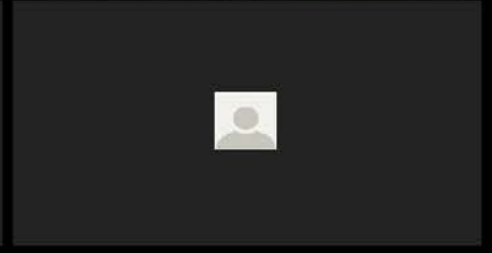
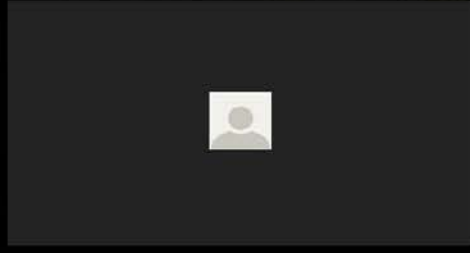


UNIVERSITY of WASHINGTON

University of Washington







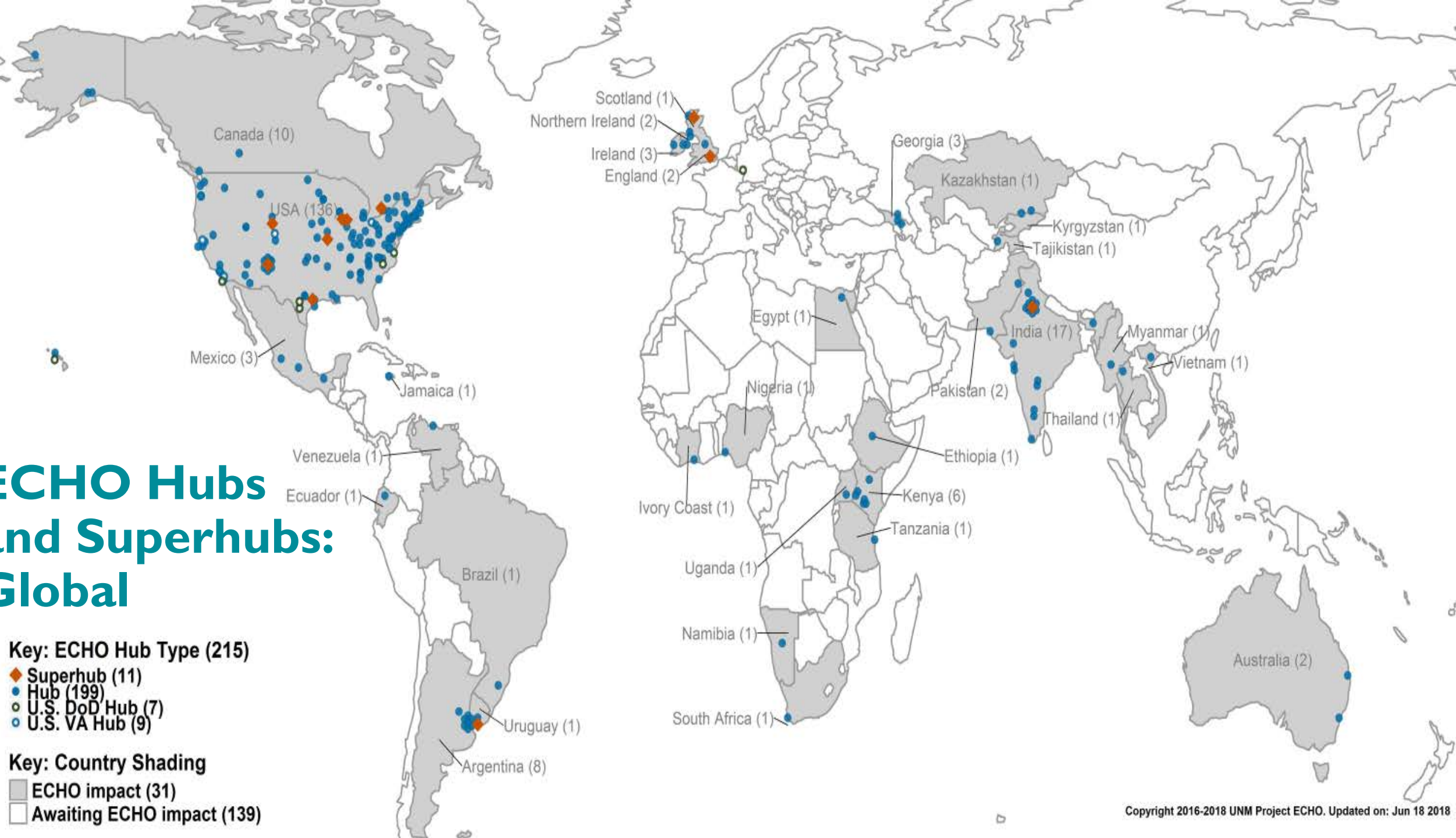
ECHO Hubs and Superhubs: Global

Key: ECHO Hub Type (215)

- ◆ Superhub (11)
- Hub (199)
- U.S. DoD Hub (7)
- U.S. VA Hub (9)

Key: Country Shading

- ECHO impact (31)
- Awaiting ECHO impact (139)



The “ECHO Act” (Expanding Capacity for Health Outcomes Act)

Passed House/Senate by unanimous vote, November-December 2016

Signed into law by President Barack Obama, December 2016

Asks the Secretary of Health and Human Services to study the impact of Project ECHO on:

Conditions Mental and substance use disorders, chronic diseases and conditions, prenatal and maternal health, pediatric care, pain management, and palliative care

Workforce Implementation of public health programs, including those related to disease prevention, infectious disease outbreaks, and public health surveillance

Public Health Health care workforce issues, such as specialty care shortages and primary care workforce recruitment, retention, and support for lifelong learning

Rural and Underserved Populations Delivery of health care services in rural areas, frontier areas, health professional shortage areas, and medically underserved areas, and to medically underserved populations and Native Americans



Utah

- Hatch(R)



Hawaii

- Schatz (D)

Co-sponsors



Texas

- Burgess(R)



California

- Matsui(D)



Louisiana

- Sen. Bill Cassidy (R)



New Mexico

- Sen. Martin Heinrich (D)
- Sen. Tom Udall (D)
- Rep. Michelle Lujan Grisham (D)



Massachusetts

- Sen. Elizabeth Warren (D)



Oklahoma

- Sen. James Inhofe (R)



Minnesota

- Sen. Al Franken (D)



Tennessee

- Sen. Lamar Alexander (R)



Mississippi

- Sen. Roger Wicker (R)



Texas

- Sen. John Cornyn (R)
- Rep. Kay Granger (R)



Washington

- Sen. Maria Cantwell (D)
- Sen. Patty Murray (D)



Montana

- Sen. Steve Daines (R)
- Sen. Jon Tester (D)



Virginia

- Sen. Mark Warner (D)



Wyoming

- Sen. John Barrasso (R)

The ECHO Team



What Makes ECHO Work?

