

# Project ECHO<sup>®</sup> (Extension for Community Health Outcomes)

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 **UNMProjectECHO**

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

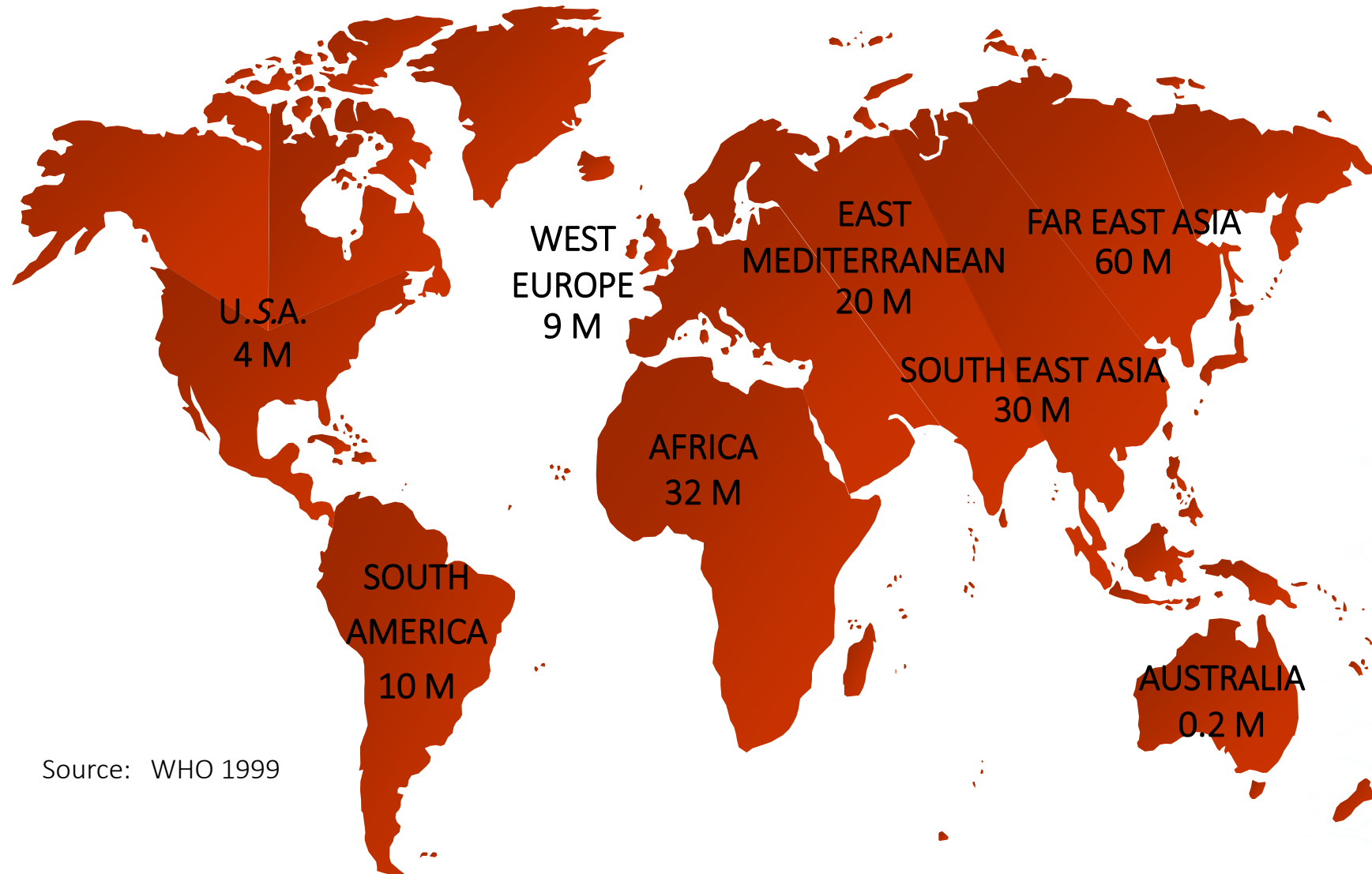
**Our goal is to touch the lives of 1 billion people by 2025.**



***Moving Knowledge Instead of Patients***

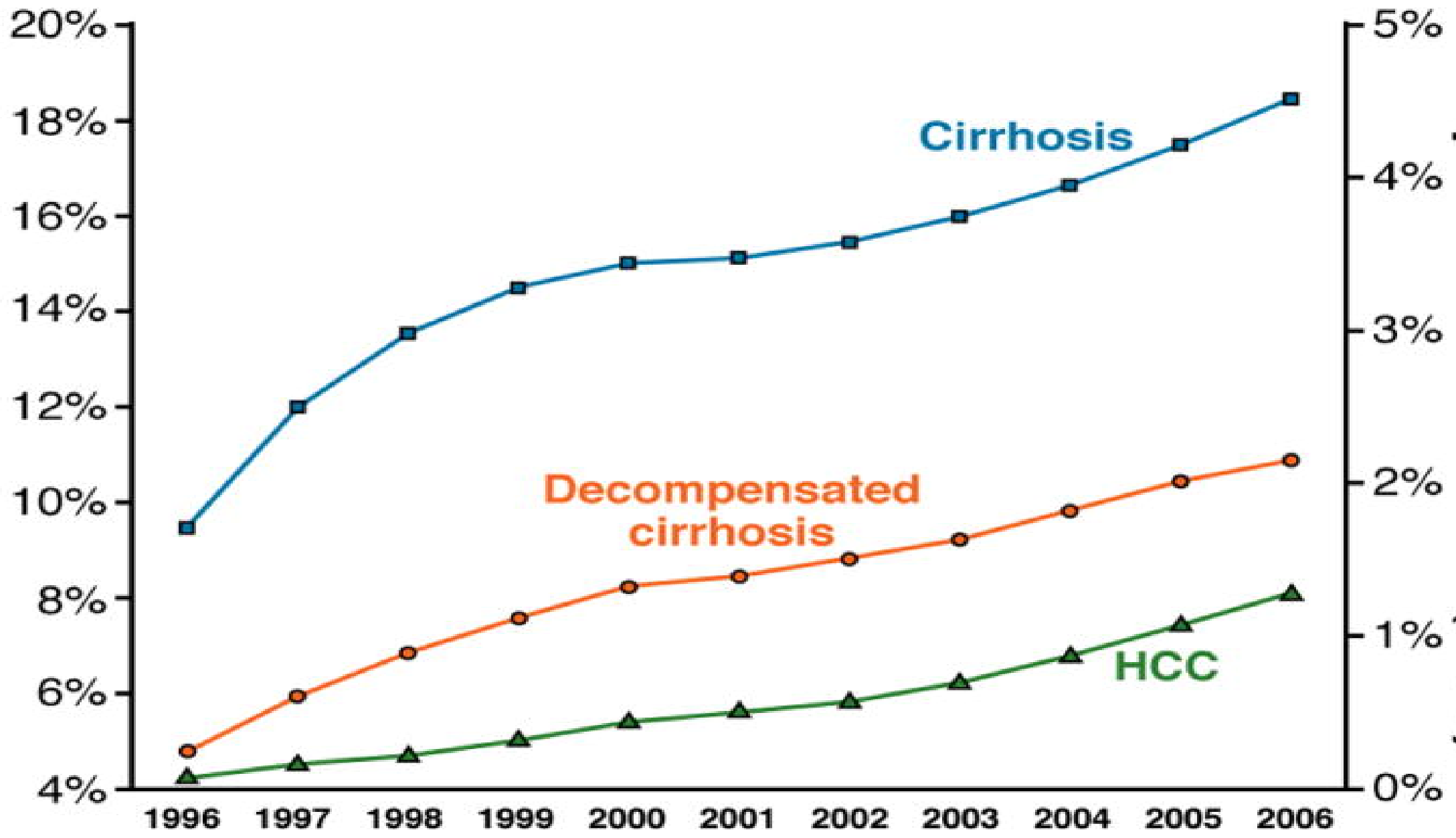
# A Global Health Problem

Over 170 Million Carriers Worldwide, 3-4 Million new cases/year

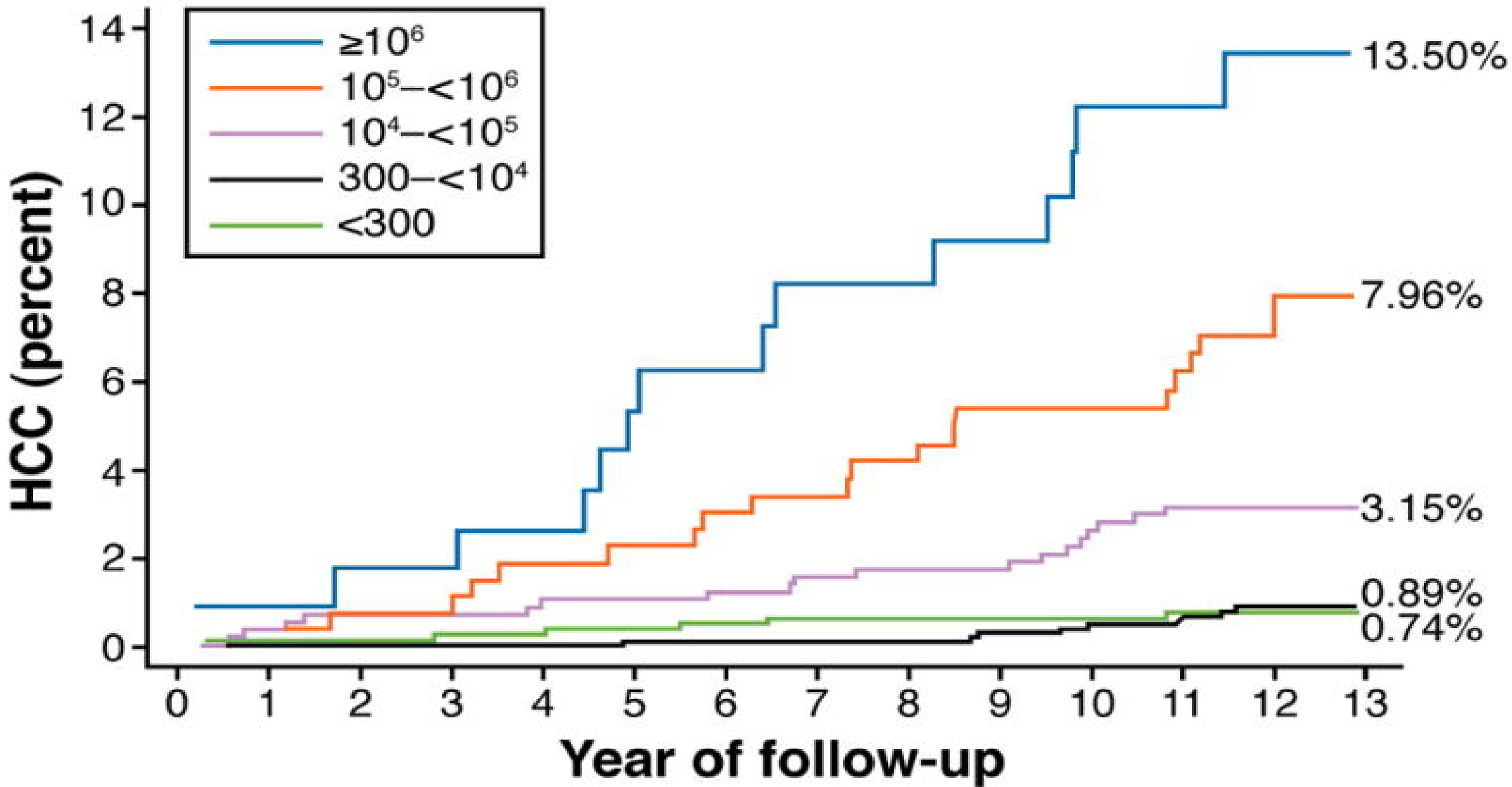


Source: WHO 1999

# Cirrhosis and decompensated cirrhosis



# Hepatocellular cancer (HCC)



# HCV in New Mexico

- Estimated number was greater than 28,000
- In 2004 less than 5% had been treated
  - 2,300 prisoners were HCV positive (~40% of those entering the corrections system), none were treated

# HCV Treatment 2004

## Good news...

- Curable in 70% of cases

## Bad news...

- Severe side effects:
  - anemia (100%)
  - neutropenia >35%
  - depression >25%
  - No Primary Care Physicians treating HCV



# 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.

# Partners

- University of New Mexico School of Medicine, Department of Medicine, Telemedicine and CME
- NM Department of Corrections
- NM Department of Health
- Indian Health Service
- FQHCs and Community Clinics
- Primary Care Association

# Methods

- **Use Technology** to leverage scarce resources
- **Sharing “best practices”** to reduce disparities
- **Case based learning** to master complexity
- **Web-based database to monitor outcomes**

Arora S, Geppert CM, Kalishman S, et al: Acad Med. 2007 Feb;82(2): 154-60.

# 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 for program assessment

# 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



ECHO Whale



PCA Espanola



Baton Rouge



Pecos Valley MC



DOH Las Cruces



SBRT-First Choice South Va



Memorial HDX7000



LAS VEGAS ECFH



**Clustering of Poor Prognostic Factors in Heavy Patients**

	< 75.0 (1,140)	> 75.0 (1,281)**
Male, n (%)	592 (51.8)	1071 (83.5)**
Race, n (%)		
White	17 (1.5)	98 (7.6)
African American	21 (1.8)	103 (8.0)
Hispanic	11 (1.0)	75 (5.8)
Asian	19 (1.7)	103 (8.0)
Other	14 (1.2)	82 (6.4)
Age, n (%)		
18-24	19 (1.7)	103 (8.0)
25-34	19 (1.7)	103 (8.0)
35-44	19 (1.7)	103 (8.0)
45-54	19 (1.7)	103 (8.0)
55-64	19 (1.7)	103 (8.0)
65-74	19 (1.7)	103 (8.0)
75+	19 (1.7)	103 (8.0)
Missing	19 (1.7)	103 (8.0)
Total	19 (1.7)	103 (8.0)

\*p < .05, \*\*p < .001

**Clustering of Poor Prognostic Factors in Heavy Patients**

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# Technology

- Videoconferencing Hardware
- Videoconferencing Software
- Video Recording System
- You Tube-like Website/Archive
- **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
<b>Overall Competence (average of 9 items)</b>	<b>2.8* (0.9)</b>	<b>5.5* (0.6)</b>	<b>2.7 (0.9) (<math>&lt;0.0001</math>)</b>	<b>2.9</b>

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, Dion D et al: Hepatology. 2010 Sept;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

Arora S, Thornton K, et al. N Engl J Med. 2011 Jun; 364:2199-207.

# Objectives

- To train primary care clinicians in rural areas and prisons to deliver Hepatitis C treatment to rural populations of New Mexico
- To show that such care is as safe and effective as that give in a university clinic
- To show that **Project ECHO** improves access to Hepatitis C care for minorities



# Participants

- Study sites
  - Intervention (ECHO)
    - Community-based clinics: 16
    - New Mexico Department of Corrections: 5
  - Control: University of New Mexico (UNM) Liver Clinic

# Principle Endpoint

Sustained Viral Response (SVR):  
no detectable virus 6 months  
after completion of treatment

# 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

NEJM : 364: 23, June 9-2011, Arora S, Thornton K, Murata G

# Conclusions

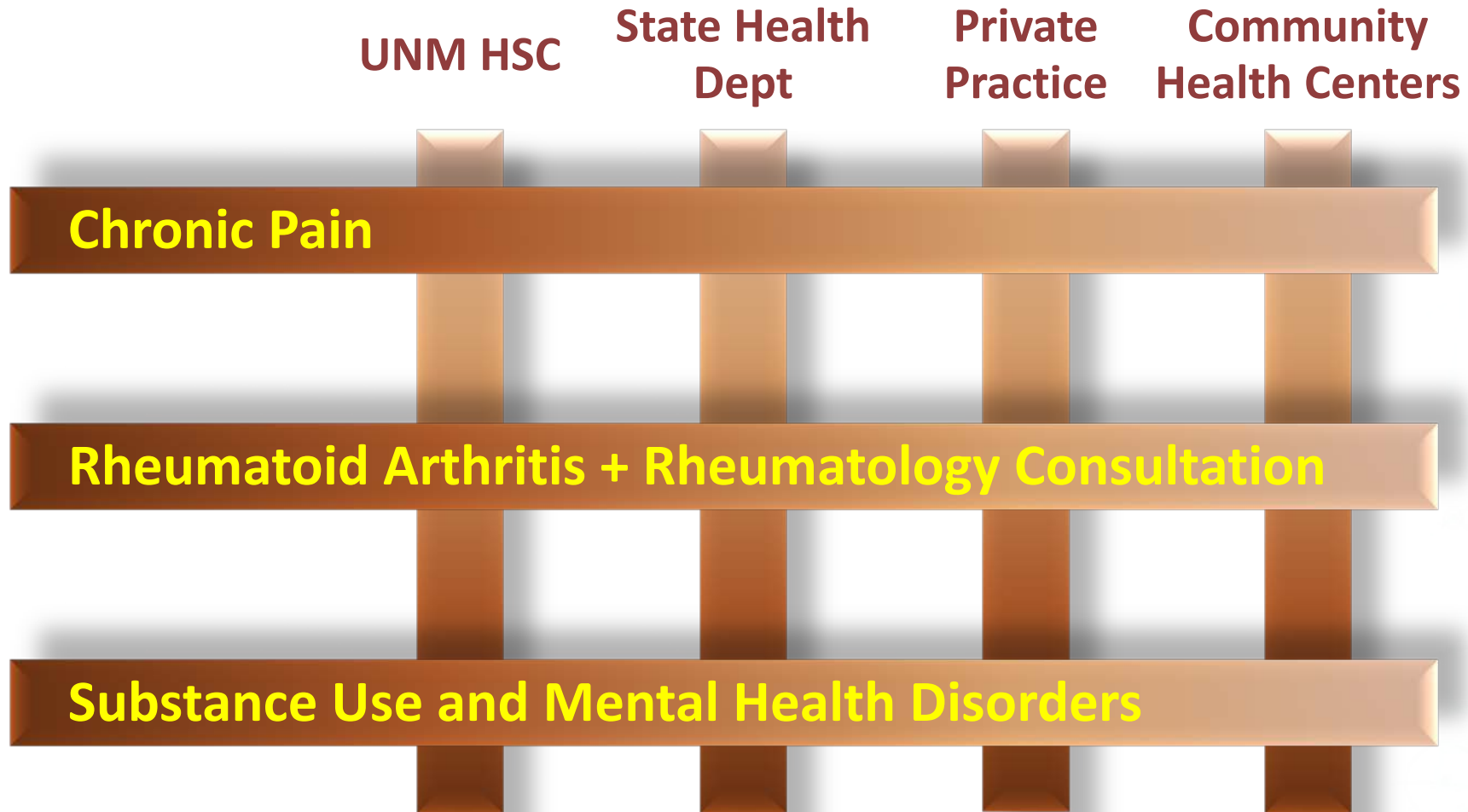
- Rural primary care Clinicians deliver Hepatitis C care under the aegis of Project ECHO that is as safe and effective as that given in a University clinic.
- Project ECHO improves access to hepatitis C care for New Mexico minorities.

# 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

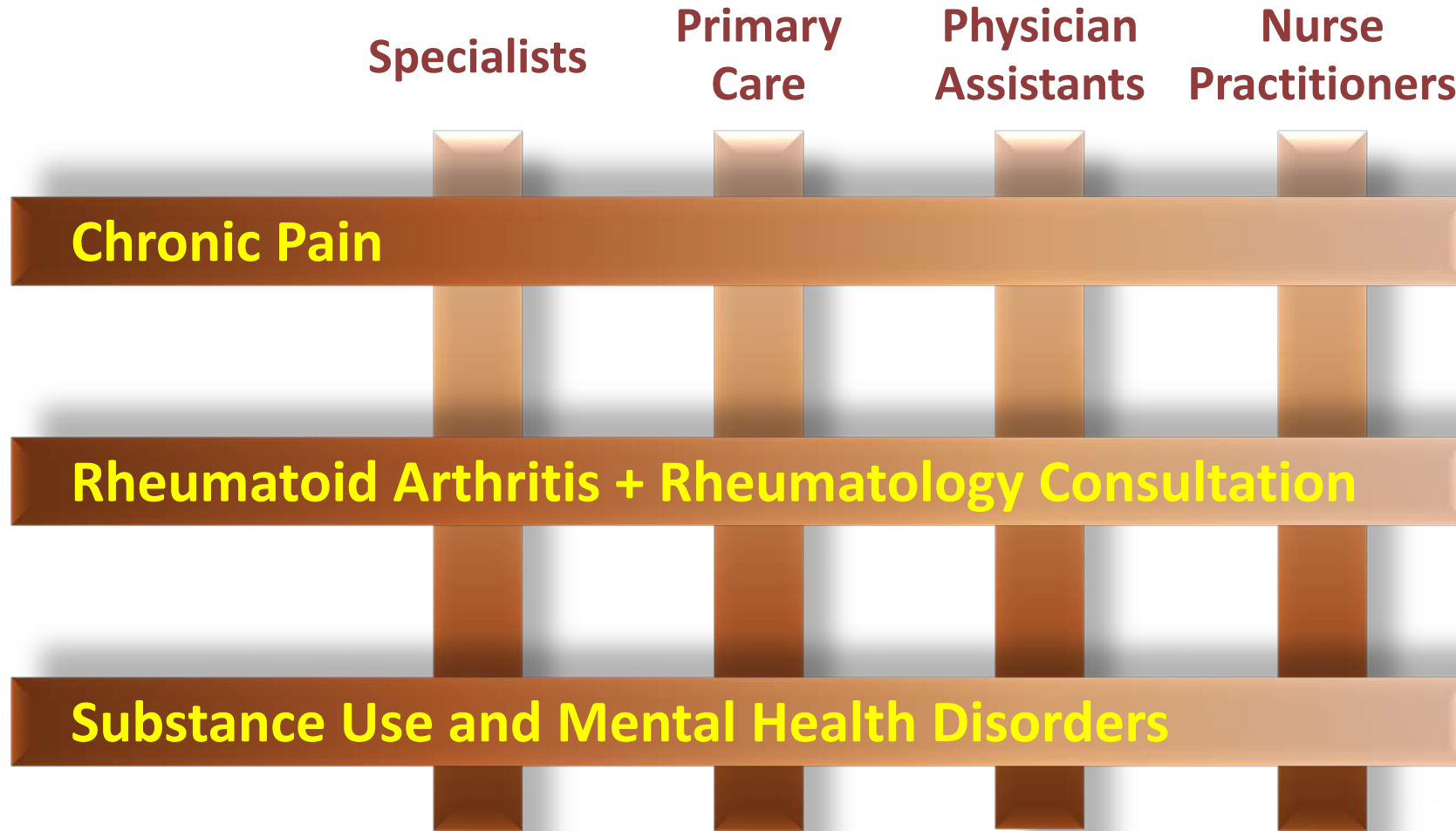
# Bridge Building

## Pareto's Principle



# Force Multiplier

## Use Existing Community Clinicians



# Successful Expansion into Multiple Diseases

Mon	Tue	Wed	Thurs	Fri
<u>Hepatitis C</u> <ul style="list-style-type: none"> <li>• Arora</li> <li>• Thornton</li> </ul>	<u>Namibia HIV</u> <ul style="list-style-type: none"> <li>• Struminger</li> </ul>	<u>IHS Navajo HIV</u> <ul style="list-style-type: none"> <li>• Iandiorio</li> </ul>	<u>Hepatitis C in Prisons</u> <ul style="list-style-type: none"> <li>• Thornton</li> </ul>	<u>Nurse Practitioners</u> <ul style="list-style-type: none"> <li>• Van Roper</li> </ul>
<u>Rheumatology</u> <ul style="list-style-type: none"> <li>• Bankhurst</li> </ul>	<u>Partners in Good Health and Wellness</u> <ul style="list-style-type: none"> <li>• Struminger</li> </ul>	<u>Endocrinology &amp; Diabetes</u> <ul style="list-style-type: none"> <li>• Bouchonville</li> </ul>	<u>Chronic Pain and Headache</u> <ul style="list-style-type: none"> <li>• Shelley</li> </ul>	<u>Integrated Addictions and Psychiatry</u> <ul style="list-style-type: none"> <li>• Komaromy</li> </ul>
<u>HIV</u> <ul style="list-style-type: none"> <li>• Iandiorio</li> </ul>	<u>Bone Health</u> <ul style="list-style-type: none"> <li>• Liewicki</li> </ul>	<u>Crisis Intervention for Community Policing Agencies</u> <ul style="list-style-type: none"> <li>• Duhigg</li> </ul>	<u>Improving Clinical Flow</u> <ul style="list-style-type: none"> <li>• IHI</li> <li>• Clewett</li> </ul>	<u>Tuberculosis</u> <ul style="list-style-type: none"> <li>• Struminger</li> </ul>
<u>Complex Care</u> <ul style="list-style-type: none"> <li>• Komaromy</li> </ul>	<u>Prison Peer Educator Training</u> <ul style="list-style-type: none"> <li>• Thornton</li> </ul>	<u>Epilepsy</u> <ul style="list-style-type: none"> <li>• Immerman</li> </ul>		



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

Source: "Partnering Urban Academic Medical Centers and Rural Primary Care Clinicians to Provide Complex Chronic Disease Care," Arora, et al., Health Affairs 2011

# Project ECHO

## Participants' Views of Patient Benefits

1 = Strongly Disagree, 5 = Strongly Agree

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

Source: "Partnering Urban Academic Medical Centers and Rural Primary Care Clinicians to Provide Complex Chronic Disease Care," Arora, et al., Health Affairs 2011

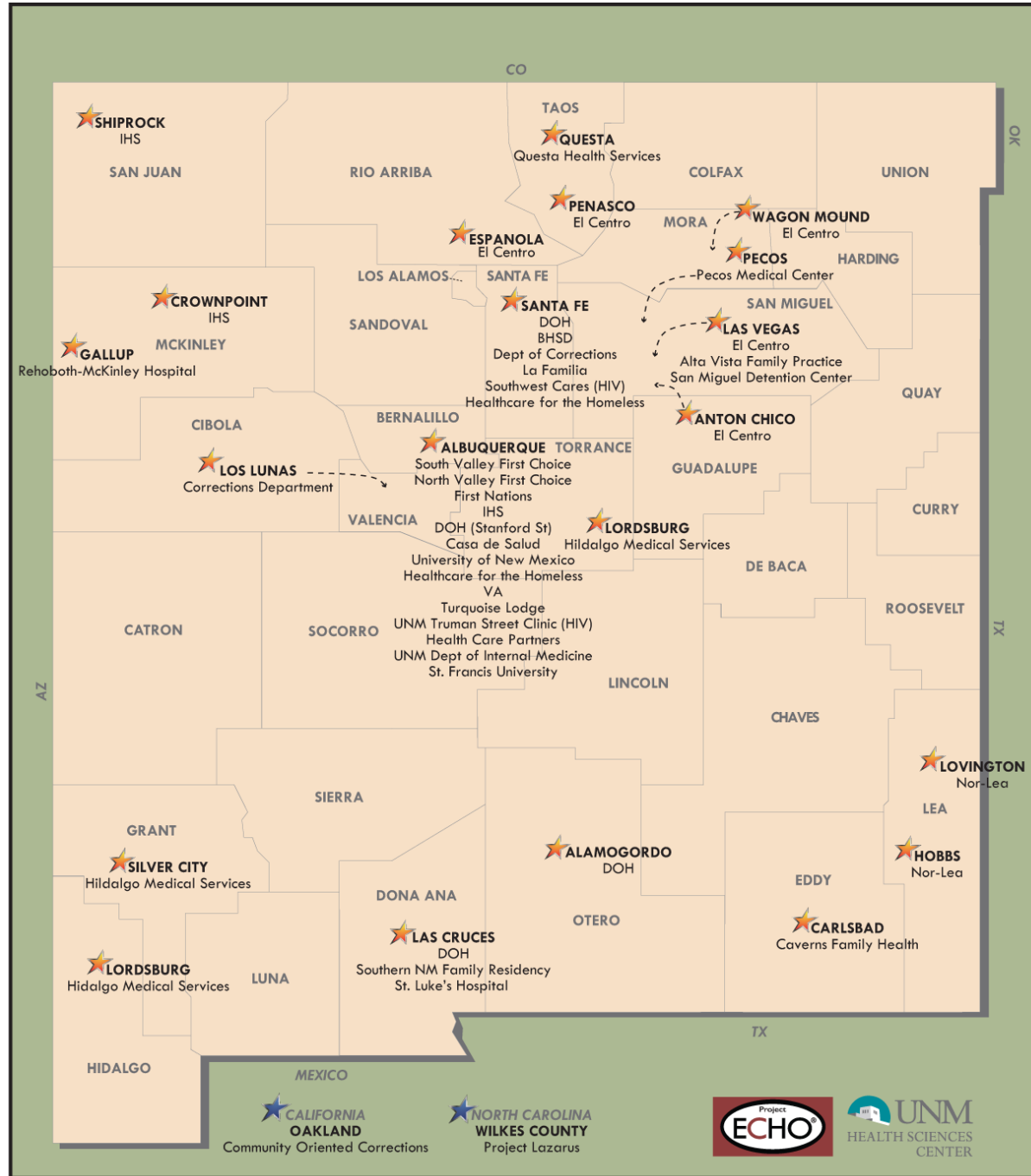
# ECHO Age Beth Israel Deaconess Boston

- 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

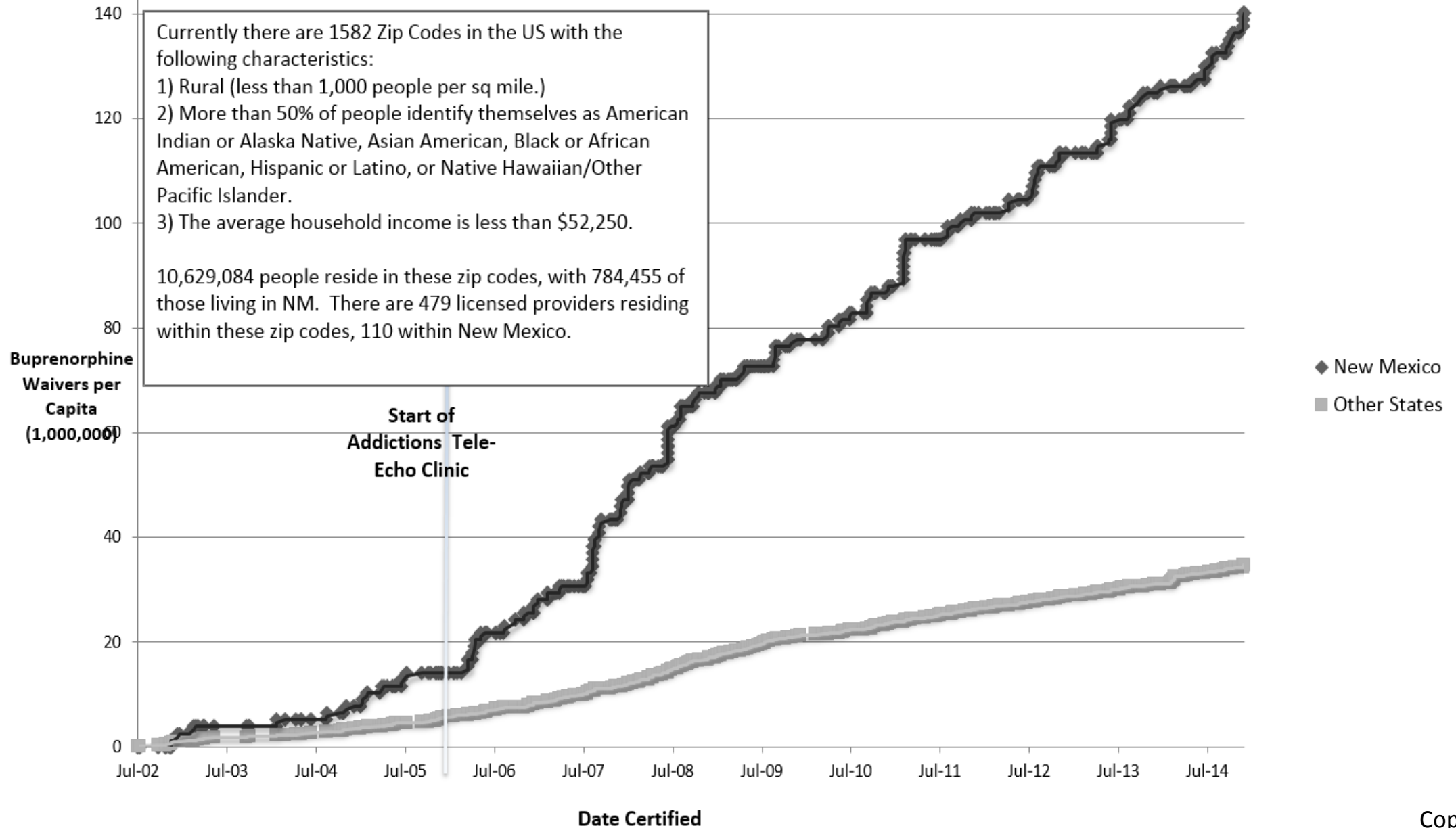
Stephon E. Gordon et al: 2015: Vol. 16, Issue 3, B27–B28



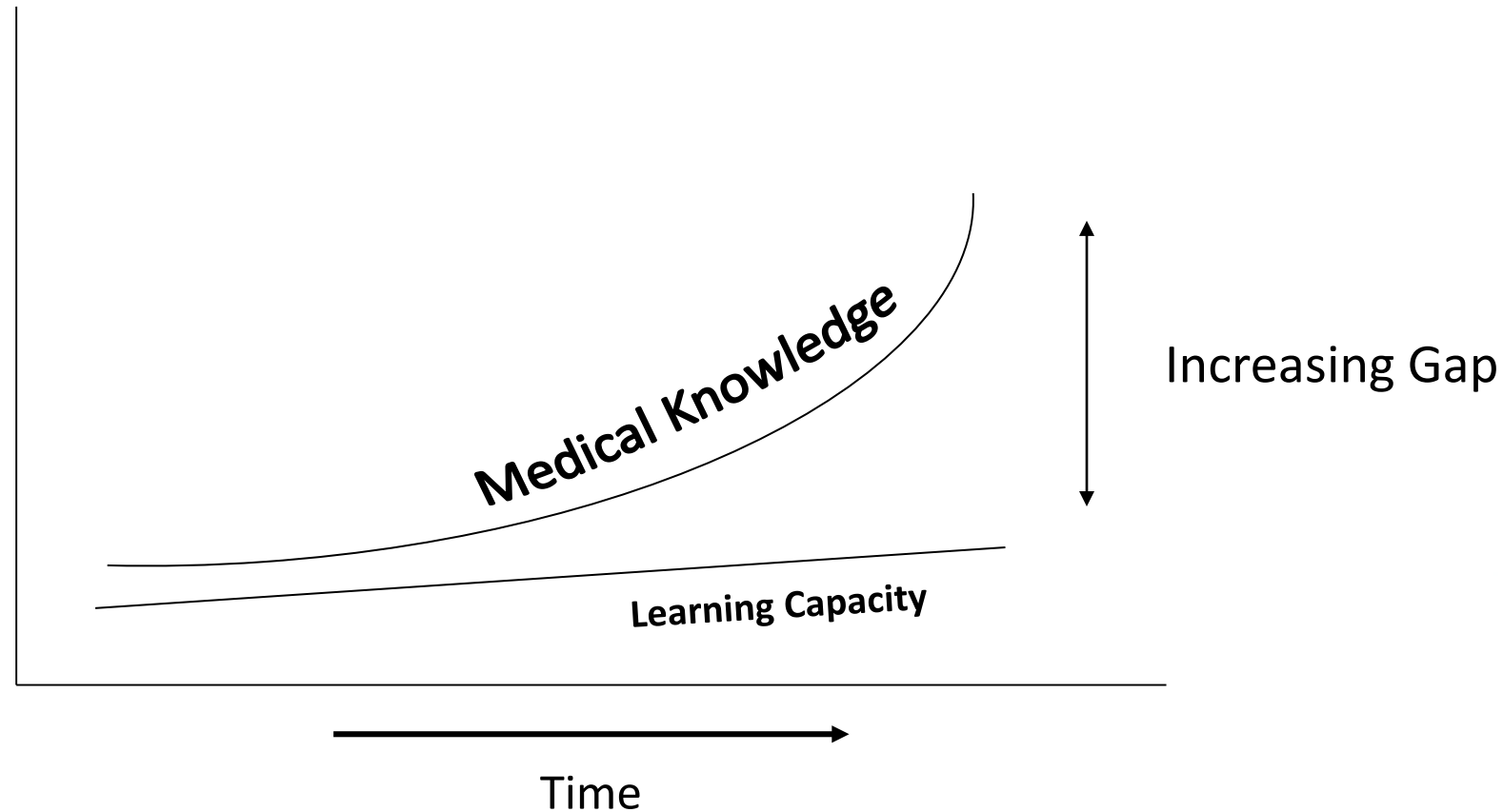
# IAP CLINIC PARTICIPATION SITES



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



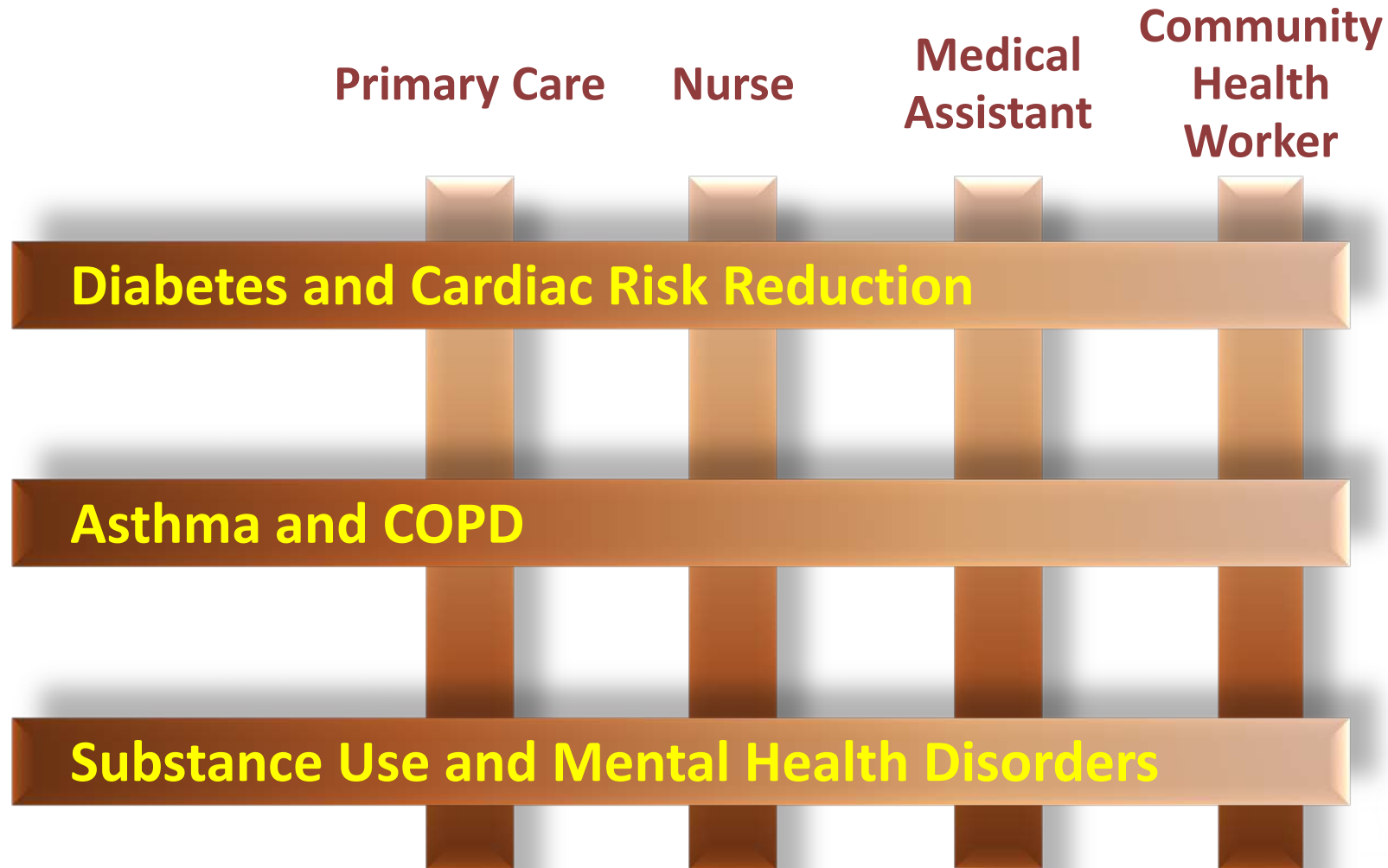
# What The Mind Does Not Know The Eye Cannot See



“Expanding the Definition of Underserved Population”

# Force Multiplier

## Chronic Disease Management is a Team Sport





# ECHO CHW Training

## Multiple Tracks

- CHW Specialist Training
  - **CREW:** Diabetes, Obesity, Hypertension, Cholesterol, Smoking Cessation, Exercise Physiology
  - **CARS:** Substance Use Disorders
  - **ECHO Care™:** Complex Multiple Diagnoses
  - **Obesity Prevention:** Diet, Exercise, Motivational Interviewing
- Prison Peer Educator Training

# Diabetes Specialty CHW Program

- Narrow Focus — Deep Knowledge
- Standardized Curriculum
  - 3 Day Onsite
  - Webcam/Weekly Video Based Clinics
    - Diet
    - Exercise
    - Smoking Cessation
    - Motivational Interviewing
    - Gentle Nudges
    - Finger Stick
    - Foot Exam
  - Ongoing support via knowledge networks
  - Part of Disease Management Team

# Community Health Workers in Prison

## The New Mexico Peer Education Program

Pilot training cohort, CNMCF Level II, July 27-30, 2009



First day of peer educator training  
Photo consents on file with Project ECHO® and CNMCF

# Graduation Ceremony of First Cohort

## The New Mexico Peer Education Program

Pilot training cohort, CNMCF Level II, July 27-30, 2009



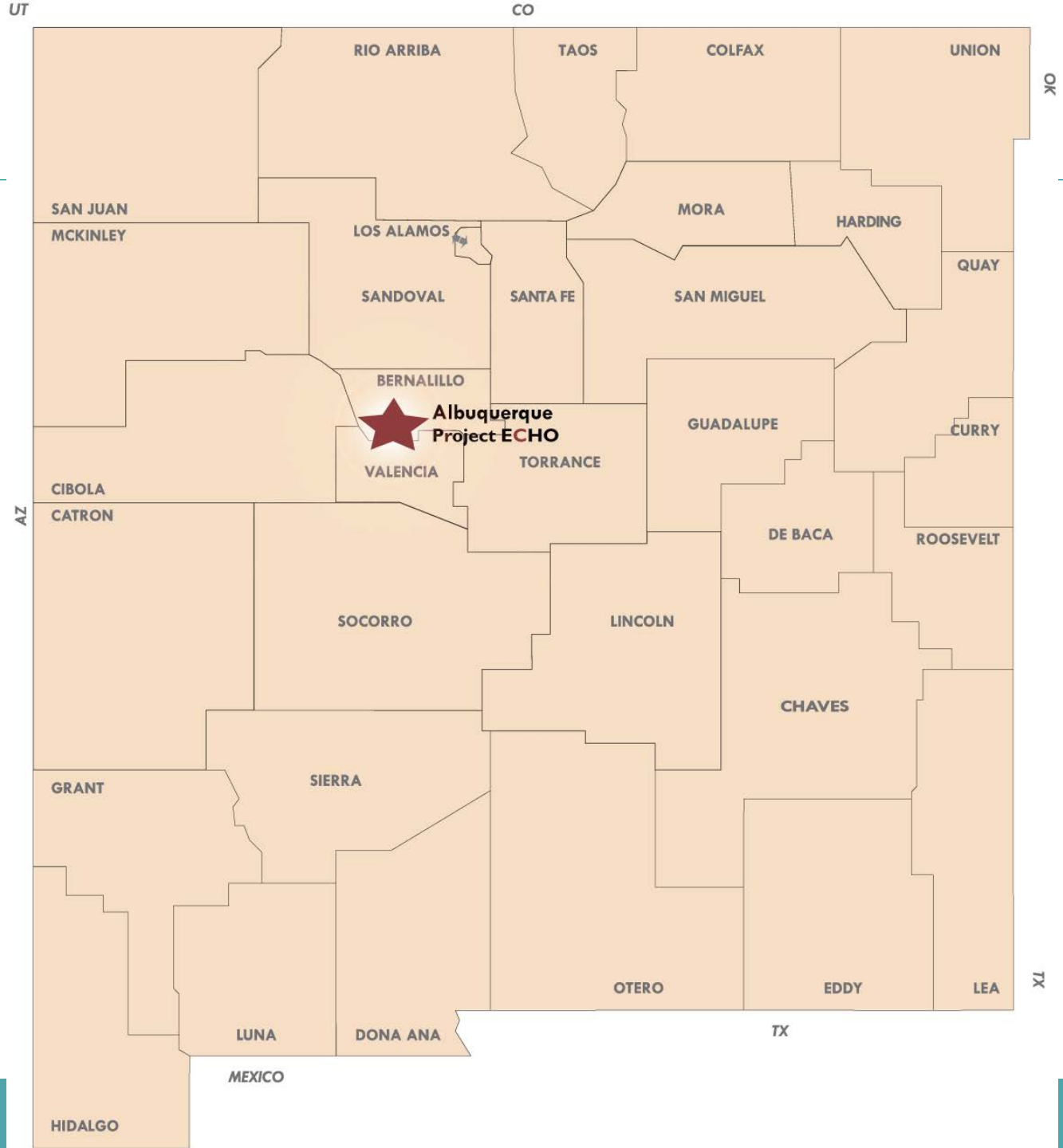
Graduation as Peer Educators

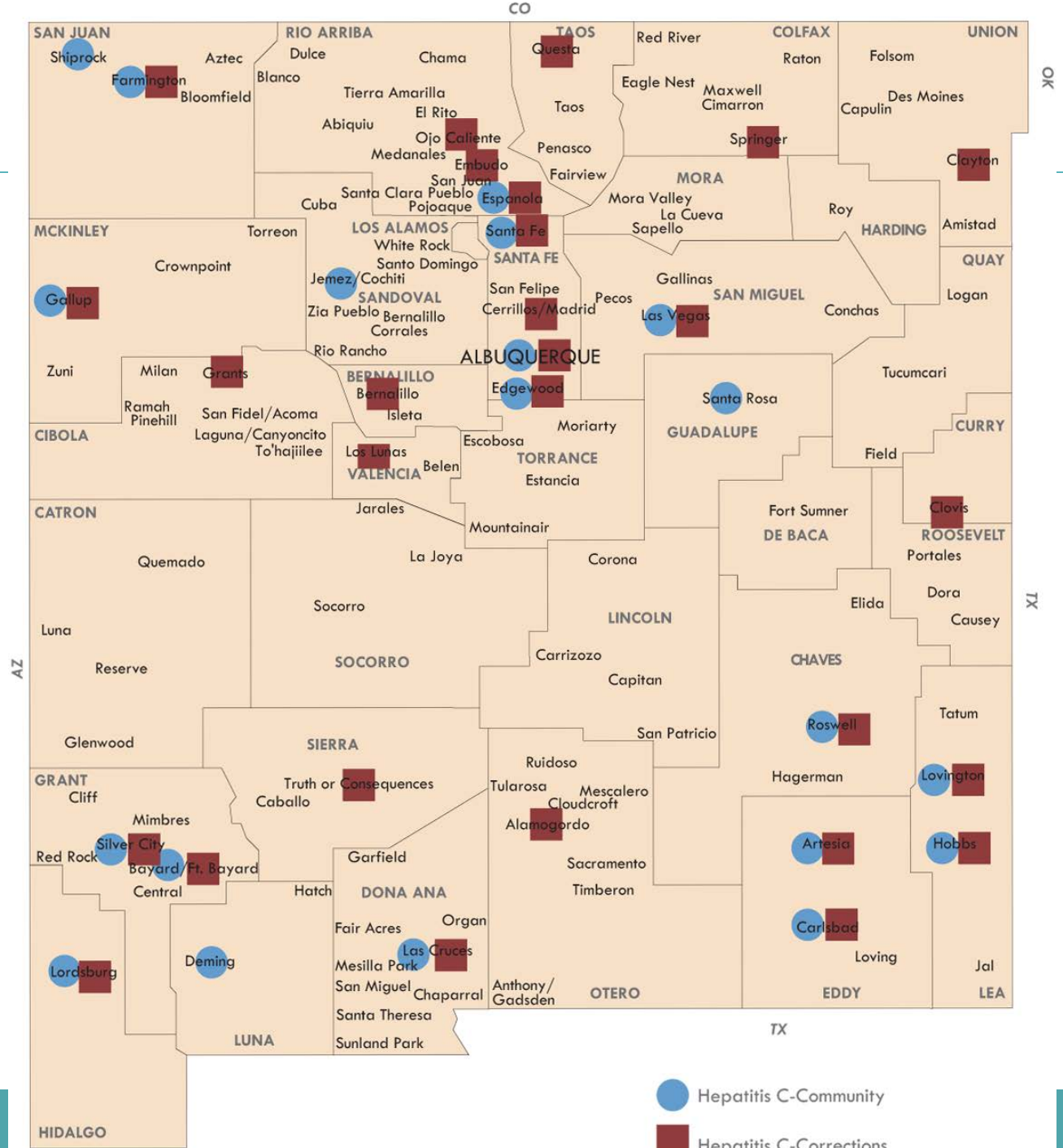
Photo consents on file with Project ECHO® and CNMCF

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# Potential Benefits of ECHO Model to Health System

- 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
- **Democratize Knowledge**
- 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



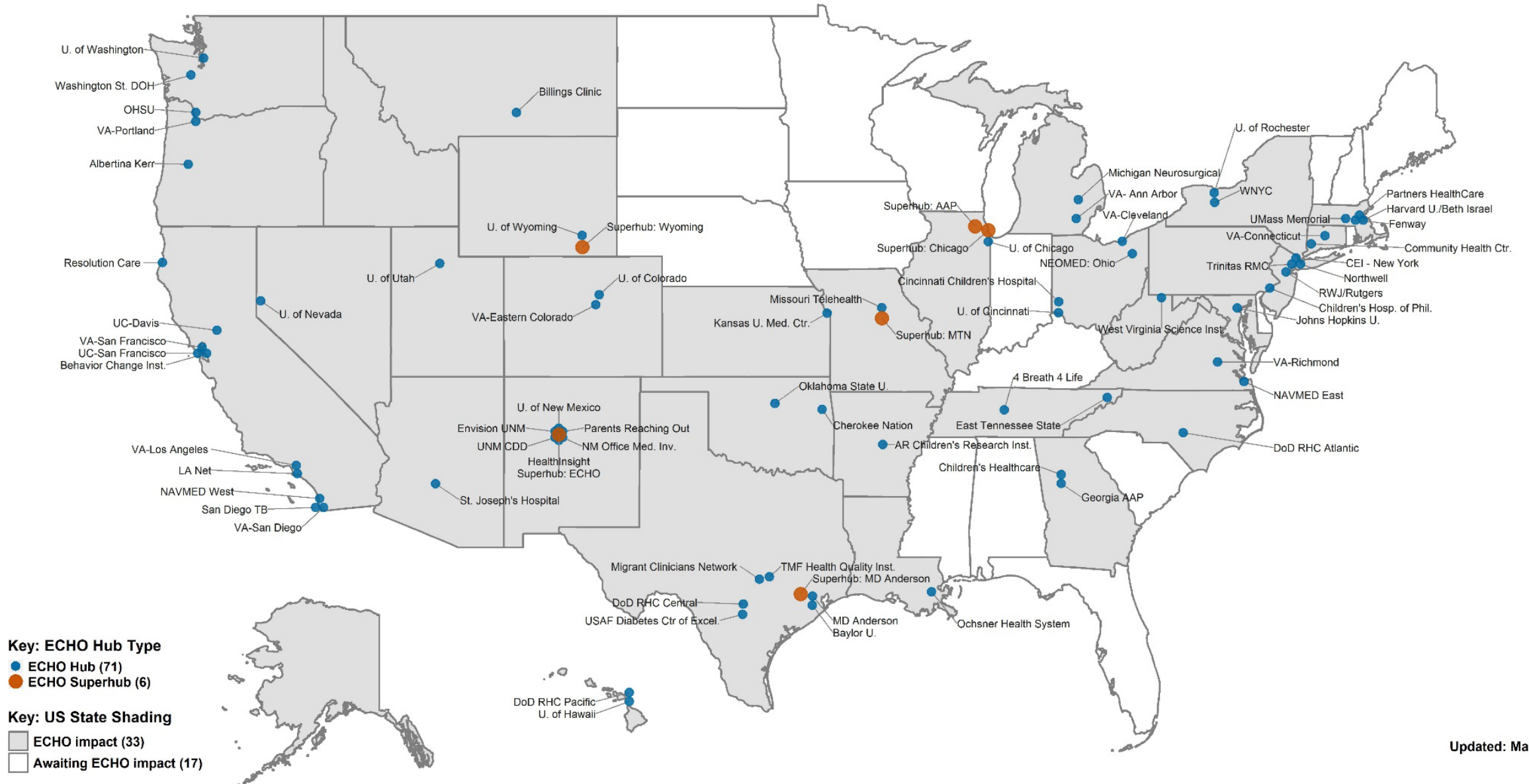


● Hepatitis C-Community  
■ Hepatitis C-Corrections





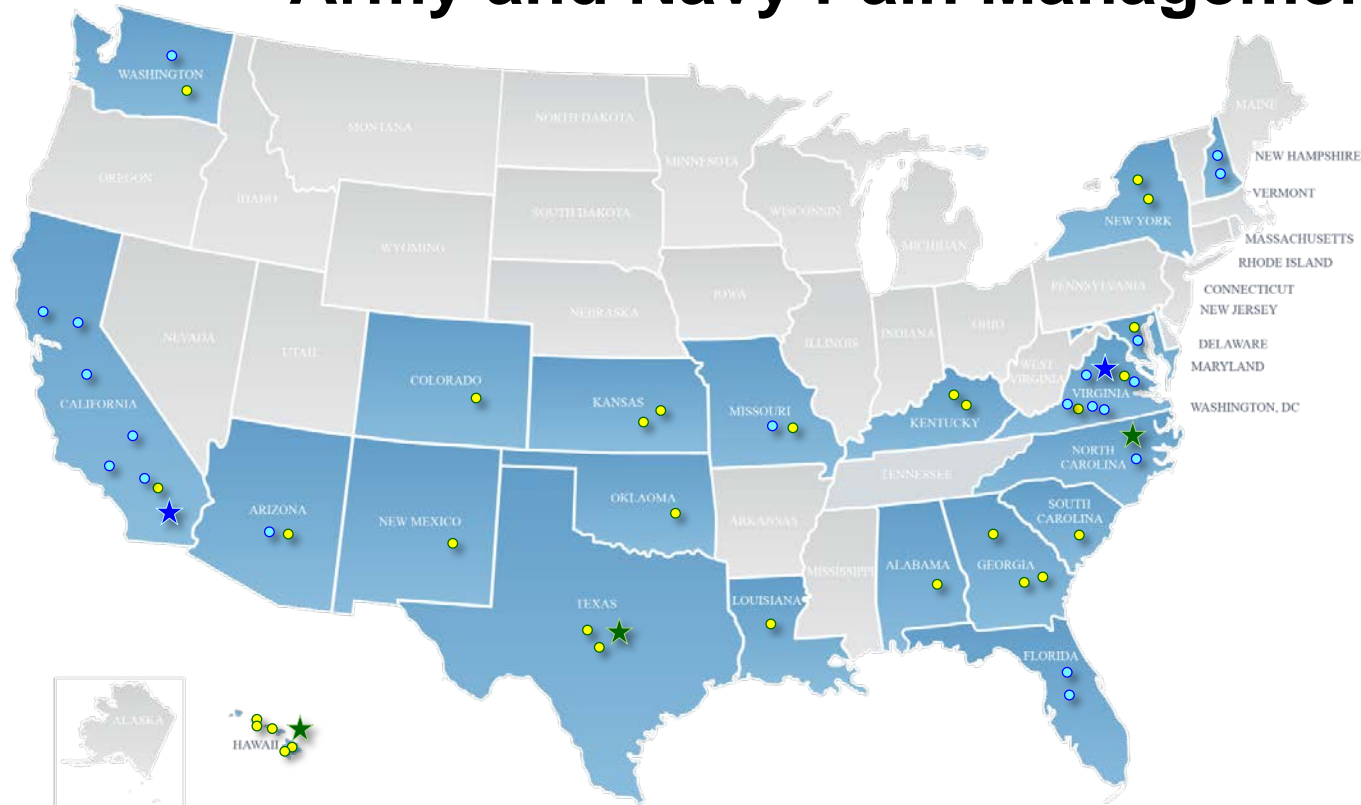
# ECHO Hubs and Superhubs: United States



Updated: Mar 13 2017



# Army and Navy Pain Management ECHO Clinics



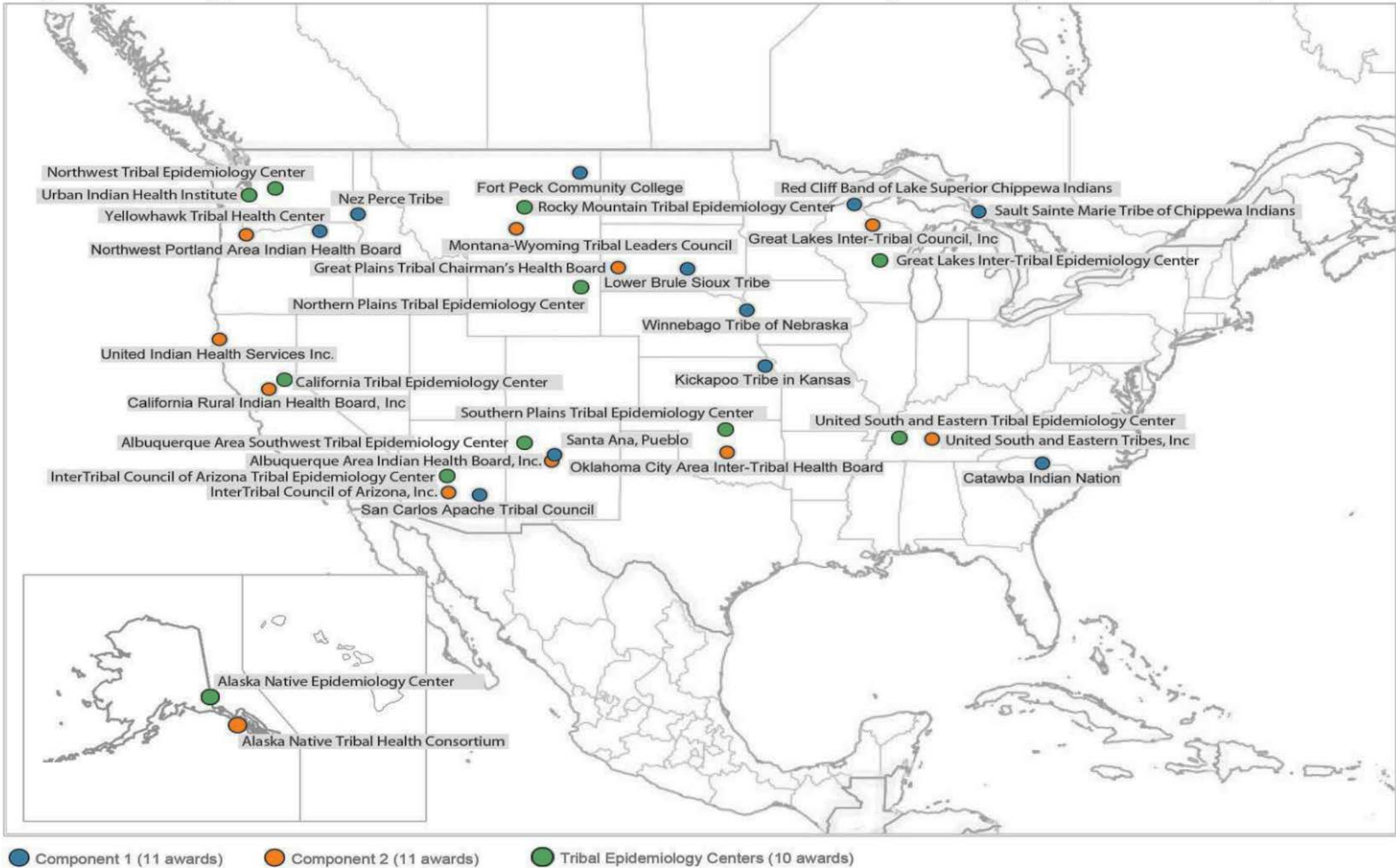
**★ Army ECHO Hubs:** Regional Health Command-Europe (RHC-E) – Landstuhl, Germany | Regional Health Command-Central (RHC-C)-Joint Base San Antonio-Brook Army Medical Center – TX | Regional Health Command-Pacific (RHC-P)-Tripler Army Medical Center – HI | Regional Health Command-Atlantic (RHC-A) – Ft.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

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

- Belgium:**
  - Brussels
  - 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

- Arizona:**
  - NH Yuma
- California:**
  - NMCS Naval Training Center
  - NH Lemoore
  - 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, Psychiatry, 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 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



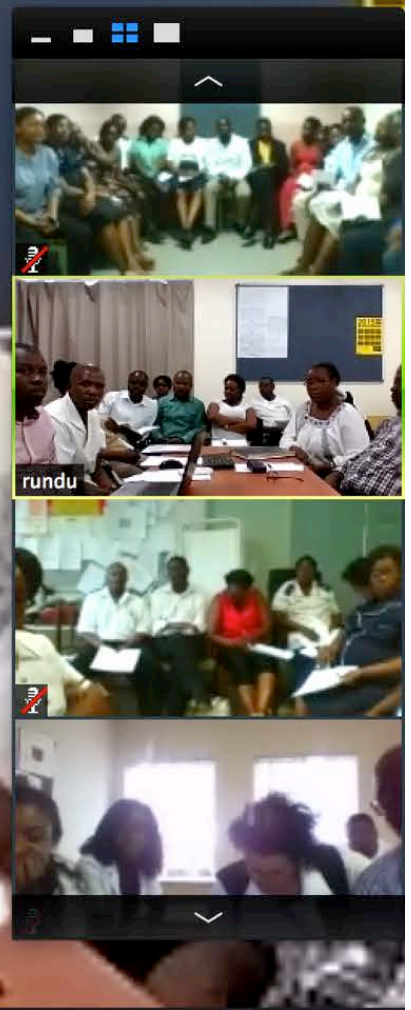
The University of New Mexico



University of Washington



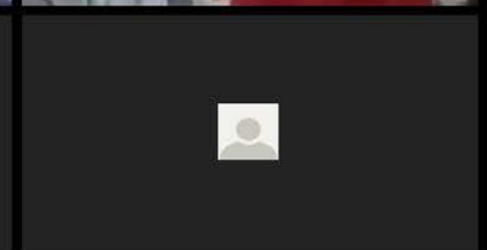
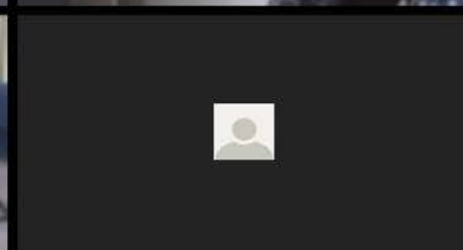




From Bruce Agins to Me (Private)  
Bruce when do you leave for SA?...









# ECHO Hubs and Superhubs: Global



Updated: Mar 14 2017

# Potential Uses of ECHO in Cancer

1. **Prevention: Smoking Cessation, HPV vaccination, HCV Treatment, HBV Vaccination and Treatment**
2. **Screening and Early Detection: Breast, Cervical, Colorectal Cancer, Oral and Lung Cancer**
3. **Cancer Treatment and Tumor Boards**
4. **Precision Medicine and Cancer Genetics**
5. **Survivorship**
6. **Palliative Care**
7. **Workforce Training and Development**

# What Makes ECHO Work?

