Planning for Project ECHO® in New Hampshire

THE NEW HAMPSHIRE PROJECT ECHO PLANNING FOR IMPLEMENTATION AND BUSINESS SUSTAINABILITY PROJECT SUMMARY REPORT

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Executive Summary

Assuring a healthy New Hampshire requires making sure that all of the state's residents can get the right care in the right place at the right time. Yet, access to timely, effective health care is not always a given in our state, especially for vulnerable populations. Health and community care workforce shortages, long distances to care, and social, economic, and cultural barriers make accessing care challenging for many.

The Project ECHO Model™ is an evidence-based method using web-based teleconferencing to link specialist teams with community-based sites to help community providers improve their ability to manage complex conditions. It has been proven to improve health care outcomes for vulnerable populations with limited access to care because of socioeconomic factors or geography.

The New Hampshire Project ECHO® (Extension for Community Healthcare Outcomes) Planning for Implementation and Business Sustainability Project (Planning for Project ECHO in NH) undertook a planning process to inform how to best to develop Project ECHO at UNH to serve New Hampshire health and community care providers and ultimately improve access to effective, timely care. Planning for Project ECHO in NH also developed a business and sustainability plan for long-term success of the UNH Project ECHO Hub and an evaluation plan for measuring efficacy.

Planning for Project ECHO in NH included:

1. A Project ECHO Needs Assessment and Prioritization Process, including review of existing needs assessments in the field; a stakeholder survey of health and community care providers conducted by the New Hampshire Citizens Health Initiative (Initiative); and analysis of data from the NH Comprehensive Health Information System (NH CHIS), NH's all-payer claims database (APCD).
2. A business and sustainability plan including Key Informant Interviews, an environmental scan, and a template for business sustainability planning to identify funding sources and structures to sustain Project ECHO in NH.
3. A framework for Project ECHO evaluation.

Stakeholder Survey

The Stakeholder Survey used the chain-referral (snowball) method and distributed an anonymous online survey link through Initiative and partner email lists and other referrals. The survey was intended to reach NH health and community care system stakeholders and potential participants in Project ECHO case-based distance learning sessions.

In responses to open-ended questions, respondents identified top challenges and training needs in the areas of payment and financial sustainability and workforce development. In

open-ended responses, clinical topics of top concern were mental and behavioral health, including substance use disorder. When queried about topics for potential Project ECHO sessions, respondents showed greatest interest in adult behavioral health and substance use disorder topics followed by care for older adults, chronic disease, and pediatric and adolescent behavioral health. Generally, preference for potential Project ECHO topics did not vary significantly by profession or organization type, and where existing, significant differences were tied to occupational interests.

Access to support for continuing education and training varied across organization types and professions sometimes significantly, with primary care providers more likely to be supported with both time off and the cost of attendance paid, and those working for behavioral health organizations likely to receive time off only.

Claims Analysis

Planning for Project ECHO in NH sought to better understand the burden of disease and utilization of treatment for several priority areas as a method to plan for future ECHO trainings and project sustainability. The Center for Health Analytics (CHA) at IHPP produced analysis using administrative claims data from the NH Comprehensive Health Information System (NHCHIS), NH's all-payer health care claims database which includes Commercial, Medicaid MCO, and Medicare data. Data was analyzed using SAS software and the Optum Symmetry Episode Treatment Grouper software (Optum ETG Grouper). Based on information from surveys and key informant interviews, the analysis focused primarily selected conditions. Claims analysis identified prevalent conditions, explored the cost of conditions, and conditions where there were issues of distance to or time to appointment for follow up care after a new diagnosis. Conditions that were prevalent and represented high medical costs varied by payer; however, mental/behavioral health conditions and chronic diseases (e.g., diabetes and respiratory disease) were consistently identified. Needing to travel long distance was common for substance use disorder conditions.

Business Sustainability Planning

The Business and Sustainability Planning phases included Key Informant Interviews (KII), an environmental scan, and developed planning templates and processes for future Project ECHO sessions. Funding considerations and potential sustainability were included in the analysis

The KII indicated preferences for Project ECHO sessions that include:

- Complex care management for patients with specific combinations of conditions:
    - COPD, diabetes, depression
    - Diabetes, experiencing homelessness, HIV, schizophrenia
    - Hypertension, cardiology, pulmonology

    - Opioids: community-based care, substance use disorder, behavioral health
    - Pediatric behavioral health: schools, pediatricians, families, behavioral health, specialists
    - Pediatric psychiatric medication management: families, specialists, wrap around supports
- ECHOs that can address New Hampshire's physician shortage areas and support the growing number of APRNs practicing in New Hampshire.
- Key Informants also commented on issues of geographic access to specialist, timing of Project ECHO sessions, and telehealth opportunities. Psychiatry, neurology, and dermatology access appear limited across the state.

The Sustainability Planning phase of the project identified environmental drivers and key funding considerations for sustainability of Project ECHO in NH and the UNH Project ECHO Hub.

Evaluation Plan

Development of an evaluation plan and template for future UNH Project ECHO sessions included a review of key evaluation concepts and frameworks currently used with Project ECHO and a suggested master timeline. An evaluation framework specifically for interdisciplinary Project ECHO sessions was developed.

Key Findings and Conclusions

Planning for Project ECHO in NH has demonstrated that Project ECHO holds significant potential as an important education and training service for New Hampshire's health and community care providers. As shown in the planning study:

Key Findings

- NH providers are challenged to meet requirements for professional certification, citing barriers of time, and travel to attend education and training, the cost to attend, and the difficulty in taking time away from their practice with no one available to cover for their absence
- NH care providers want more learning opportunities on the key issues facing the state and those they are facing in practice, including caring for older adults, chronic conditions, and mental health and substance use disorders. Care providers feel extraordinary pressures on financial sustainability and work force issues, citing concerns about insurance, payment, technology, and challenges with recruitment and retention of providers across the care spectrum.
- Claims data were analyzed to better understand the prevalence of conditions in the NH population, which helps ECHO planning efforts by determining which conditions are likely to be of interest across many providers. In the analysis, there was a

consistency across payers in the high prevalence of behavior health conditions, as well as joint degeneration and chronic medical conditions. These conditions also represented high total medical costs.

- Related to access to care, claims analysis showed that distance for care was variable across conditions; however, substance use disorder conditions had some of the longest distances to care. Chronic medical conditions, particularly respiratory disorders, had some of the longest elapsed time to receive specialty care.

Conclusions

The New Hampshire Project ECHO Planning for Implementation and Business Sustainability Project concluded that there is a significant need for and interest in Project ECHO-like case-based distance learning in NH, based Stakeholder Survey and in key informant interviews. Claims data analysis showed that the prevalence, cost, and access to care for many conditions underscore the opportunity to support providers. Data from the Stakeholder Survey, key information interviews, and claims analysis indicated convergence on a number of potential topic areas where interest and health care system data converge, including topics on chronic disease, mental/behavioral health, and chronic pain from degenerative joint disease. Development of a sustainable and effective Project ECHO HUB at UNH would be an important education and training service for New Hampshire's health and community care providers.

Note: This research was completed before the COVID-19 pandemic in 2020, however, the report was completed at the beginning of the pandemic. We expect that results might have included many requests for pandemic-related Project ECHO topics if the survey and KII were done today. The UNH Project ECHO Hub planning team has worked to be responsive to those changing needs.

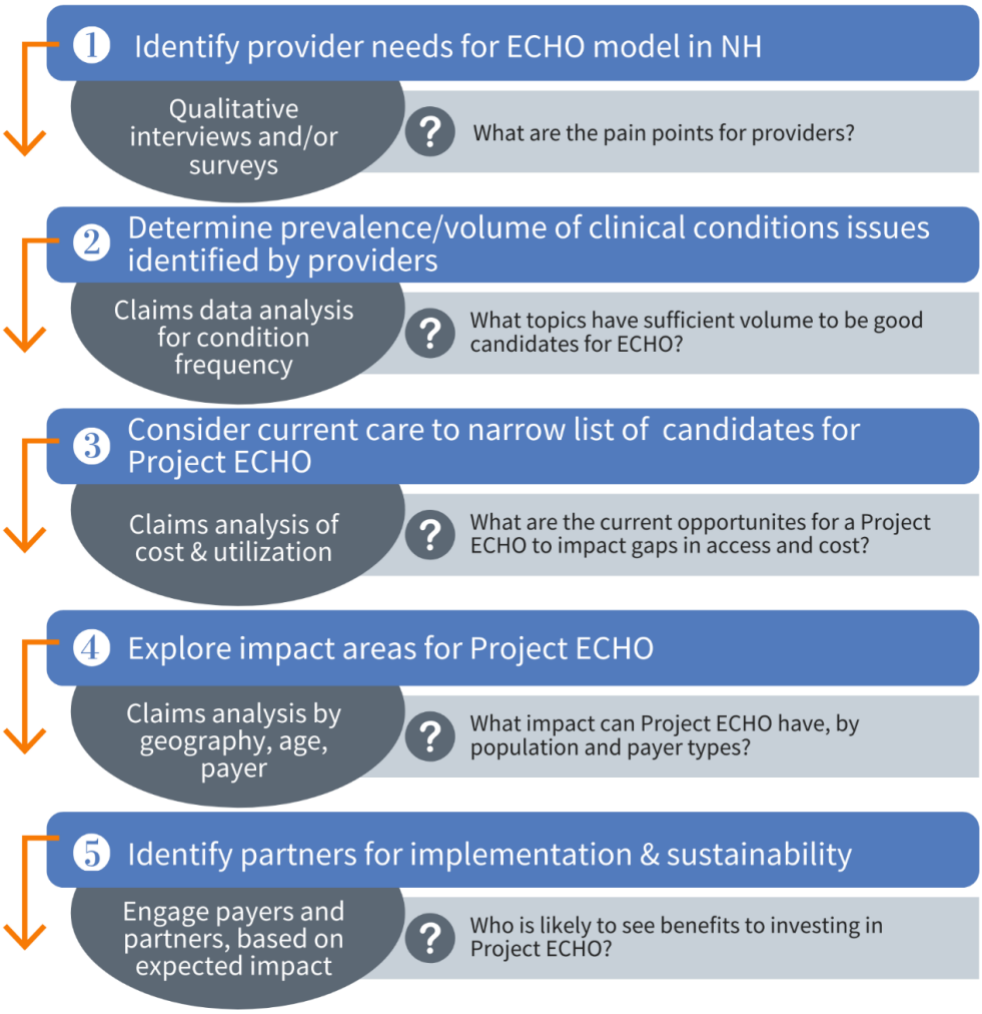
Introduction

Workforce shortages and the lack of available training can cause unequal access to care in some areas. Project ECHO (Extension for Community Healthcare Outcomes) has been proven to improve health care outcomes for vulnerable populations with limited access to care because of socioeconomic factors or geography. The New Hampshire Project ECHO Planning for Implementation and Business Sustainability Project (Planning for Project ECHO in NH) undertook a process to inform how to develop Project ECHO at UNH to best serve New Hampshire health and community care providers. Planning for Project ECHO in NH sought to develop a business and sustainability plan for long-term success of Project ECHO and the UNH Project ECHO Hub, along with an evaluation plan for measuring efficacy.

The Project ECHO model is an evidence-based method using web-based teleconferencing to link specialist teams with community-based sites to help community providers improve their ability to manage complex conditions.[1–4] Project ECHO was developed in 2003 by Sanjeev Arora, MD at the University of New Mexico Health Sciences Center to improve care for people with Hepatitis C who were not able to access specialty care. Project ECHO has now been successfully replicated around the United States and the world. The ECHO model is particularly useful for complex health conditions where access to specialty care is limited by the number of specialists or by distance, and where care could be managed by community providers given the requisite education and mentoring. The Project ECHO interdisciplinary model uses case-based distance learning to provide real examples and real-time learning opportunities.[4] The Project ECHO model develops professional peer learning and knowledge networks across diverse geographies and communities of practice and has proven to expand access to care for rural and underserved areas.[4–6] Although typically used in medical and health-related disciplines, the model has been successfully translated for training use with non-health related disciplines, such as education and law enforcement.[7,8] Project ECHO programs utilize a tele-mentoring approach in the education of clinicians in a hub/spoke design to connect community-based providers to expert multi-disciplinary faculty. Project ECHO educational sessions are most often convened weekly or monthly for 60-120 minutes, during which case presentations, demonstrations, and didactics are provided, and recorded for both synchronous and asynchronous observation. All knowledge is shared in a “learning loop” at no cost to participants. Professional continuing education credits are provided for multiple disciplines.

Planning for Project ECHO in NH had five general considerations to guide the work (Figure 1).

Figure 1. Project Considerations



1. **Identify Provider Needs for ECHO Model in NH**
   The Project team sought to identify provider and organization needs and preferences for continuing education and training. There was specific emphasis on identifying the topics of greatest interest, including those for which Project ECHO-like case-based distance learning would be particularly appropriate.

2. **Determine prevalence/volume of clinical conditions or issues identified by providers**
   Data were needed to estimate prevalence of conditions to identify those that were highly common in NH and likely to be of interest for many providers.

3. **Consider current care, to continue to narrow the list of candidates for Project ECHO Sessions**

For those topics that met criteria related to interest level and prevalence to support potential Project ECHO sessions, data were also needed to understand where there were challenges in providing and accessing care, and where there might be opportunities to impact costs of care.

4. **Explore impact areas for Project ECHO**
   Claims data analysis was needed to further explore the sub-populations, geographic areas, and types of payers represented in the conditions that: are of importance to providers, have sufficient volume to support a Project ECHO session, and have opportunities for impact in cost and utilization. The analysis identified health conditions for which vulnerable populations lack access to specialty care that could be augmented by community-based providers and geographic areas for provider recruitment, and education.

5. **Identify partners for implementation and business sustainability**
   Information about potential for cost containment or cost savings from implementation of Project ECHO sessions were important for developing a sustainability plan, including a strategy for reaching out to public and private payers, and other possible partners, to develop a model for sustainable infrastructure and payment for Project ECHO in New Hampshire. Important in this sustainability planning is an overall plan for how Project ECHO activities developed in NH could be evaluated for outcomes and effectiveness.

Project Activities

To address these considerations, Planning for Project ECHO in NH included:

- A Project ECHO Needs Assessment and Prioritization Process. This process sought to better understand the topics for which providers expressed the most need for support and that be potential candidates for Project ECHO sessions. There were multiple components to this process, including review of existing needs assessments; a Stakeholder Survey of health and community care providers; and analysis of data from the NH Comprehensive Health Information System (NHCHIS), NH's All-Payer Claims Data (APCD).
- Development of a Business and Sustainability Plan. This part of the work included key informant interviews, and environmental scan, and the creation of a template for business sustainability planning to identify funding sources and structures that could sustain Project ECHO in NH.
- A framework for Project ECHO evaluation. This part of the project included identifying the possible impacts of Project ECHO in NH. The Project team worked with an evaluation consultant to develop a high-level evaluation plan and template for Project ECHO activities that could guide both the development of the Project ECHO programs and sessions and serve as a template for future evaluations.

Project ECHO Needs Assessment and Prioritization Process

Stakeholder Survey

Planning for Project ECHO in NH included a Stakeholder Survey to assess the continuing education and training needs and interests of NH healthcare and community care providers, with a focus on case-based distance learning, as is done in Project ECHO. The survey was intended to identify needs for and barriers to accessing continuing education and learning for NH organizations and further identify interest in topic areas that might be best served by using the Project ECHO model.

Methods

The survey was protocol was approved as part of the overall study design by the University of New Hampshire Institutional Review Board (IRB). The survey used the chain-referral (snowball) method and was distributed via an anonymous online survey link through NH Citizens Health Initiative (Initiative) and partner email lists and other referrals. The survey was intended to reach NH health and community care system stakeholders and potential participants in Project ECHO case-based distance learning sessions. The chain-referral distribution of the survey through Initiative and partner email lists reached a broad audience of NH stakeholders; 201 responses were received during the survey period.

Survey responses were analyzed using the Qualtrics survey platform with additional analysis using Stata statistical software, and Dedoose mixed methods analysis software.[9–11] The entire survey was completed by 56% (*n*=112) of respondents, 169 respondents partially completed the survey, 2 declined consent, and an additional 31 respondents dropped out of the survey at the point that consent to participate in the study was requested. The survey demonstrated internal reliability with a Cronbach's Alpha score of 85.4%.

Results

Respondents included a wide range of professions, including primary and specialty care, behavioral health, public health, and education. The largest respondent groups identified themselves as primary care and behavioral health clinicians. Similarly, respondents represented a range of organizations serving NH residents, with the greatest number of respondents coming from outpatient health care practices and behavioral health organizations.

The survey questioned respondents on preferences for continuing education, including preferred modes, forms of credit, and barriers to pursuing continuing education and training. Respondents identified in-person education sessions, onsite training, and on-demand

recorded webinars as their top three preferred modes for education, training, and technical assistance.

Respondents were asked to identify their top three barriers to obtaining the continuing education and training that they need. Time and Cost predominated as barriers; Time away from practice/No one to cover for my time away was also identified as one of the top three barriers.

The majority of respondents received support from their organizations for their education and training with 56% receiving support for both the cost of attendance and paid time to attend. Respondents who worked for behavioral health organizations were significantly more likely at a $p<.05$ level to be provided with time off only and not covered for cost of attendance than were those work forked for health care practices. Looking at the professions represented by the respondents, primary care providers were significantly more likely, again at a $p<.05$ level, to have both the cost of attendance and time off covered than behavioral health professionals or specialty medical providers medical providers.

The survey asked stakeholders about their interest in a range of potential topics for Project ECHO sessions. Respondents were first asked about Topic Categories of interest. Topics ranked by number of High Interest responses showed greatest intensity of interest in adult behavioral health and substance use disorder, care for older adults, chronic disease, and pediatric and adolescent behavioral health. Variation in preferences for Project ECHO topics was generally explained by typical interest patterns, e.g., home care and long-term care provider organizations were most interested in older adult issues, respondents from the K-12 education field were most interested in pediatric issues.

"Improving access to and quality of geriatric mental healthcare services in communities, enhancing pipeline and workforce of geriatric psychiatry specialists, and finding ways to improve geriatric knowledge among generalist mental health and general health providers."

Topics and subtopics with High respondent interest are shown in Table 1.

Table 1. Survey Results on Topics of Interest

Topic/Subtopic	High Interest
	n
Adult Behavioral Health	
Managing Depression with Co-occurring Chronic Health Conditions	62
Managing Chronic Pain	46
Older Adult Behavioral Health	37
Substance Use Disorders	
Managing Chronic Pain	57
Alcohol Use Disorder	48
Medications for Addiction Treatment	47
Care for Older Adults	
Older Adult Behavioral Health	44
Managing Polypharmacy	40
Managing Care Transitions between Acute Care, Long-Term Care, and the Community	36
Chronic Disease	
Managing Multiple Chronic Conditions	65
Diabetes and Depression	39
Diabetes	35
Pediatric and Adolescent Behavioral Health	
Depression in Children and Adolescents	47
Anxiety in Children and Adolescents	47
Substance Use Disorder in Children and Adolescents	42
Care Transitions Management	
Reducing Readmissions	37
Person-Centered Planning	37
Managing Care Transitions between Acute care, Long-Term Care, and the Community	31
Quality Improvement Practicum Topics	
Integrated Behavioral Health and Primary Care	45
Reducing Readmissions	36

Topic/Subtopic	High Interest
Managing Care Transitions between Acute care, Long-Term Care, and the Community	27
Infectious Disease	
Tick-borne Illness	32
Hepatitis C	21
HIV	15

Qualitative analysis was conducted of responses to open-ended questions, as shown in Table 2. Respondents identified top challenges and training needs in the areas of payment and financial sustainability and workforce. Concerns about financial sustainability and workforce issues varied in intensity by the type of the organization (Figure 2). In the open-ended responses, the clinical topics of top concern were mental and behavioral health, including substance use disorder.

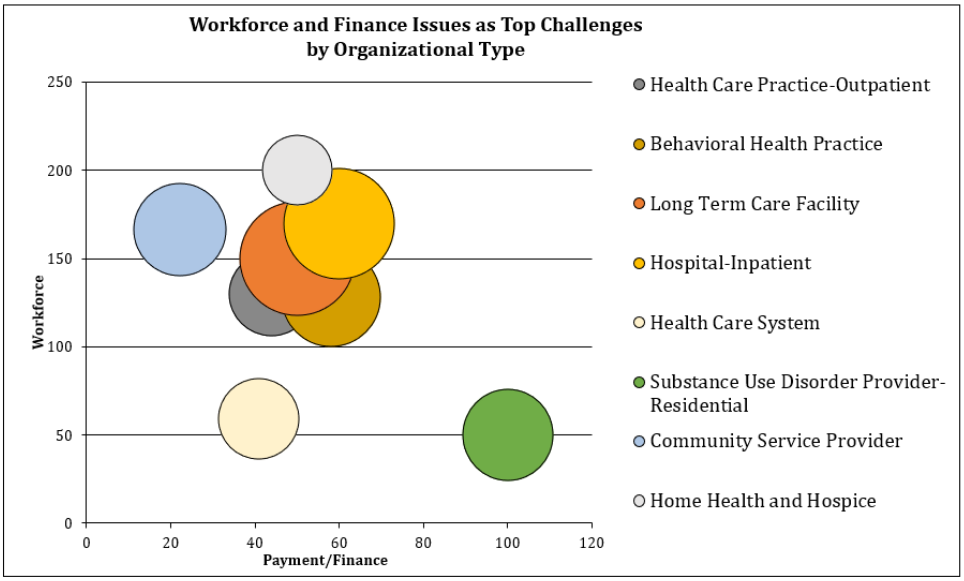
Table 2. Qualitative Analysis Code Frequency

Qualitative Analysis Code Frequency	Number of Mentions
Health Conditions	164
Aging	22
Behavioral Health	82
Pediatric Behavioral Health	22
Trauma	16
Cancer	1
Chronic disease (Other or Unspecified)	4
Congestive Heart Failure	1
Chronic Obstructive Pulmonary Disease	2
Diabetes	4
Hepatitis CCV	4
HIV	1
Intellectual/Developmental Disabilities	5
Primary Care	6
Substance Use Disorders	44
Opiate Use Disorder	15
Medications for Addiction Treatment	9

Qualitative Analysis Code Frequency	Number of Mentions
Comorbidities/Co-Occurring Condition	7
Health System Issues	525
Access to Services	41
Administrative Issues	240
Organizational Relationships and Collaboration	12
Change Management/Leadership	23
Electronic Health Records /Technology	54
Telehealth	11
Payment/Finance	122
Value Based Care	9
Regulations	15
Reporting Requirements	8
Integrated Care	46
Care Coordination	11
Patient Engagement/ Patient Centered Care	20
Population Health	32
Tools	3
Acuity	5
ED Boarding	1
Social Determinants of Health	19
Quality/Evidence-Based Practice	26
Patient Safety	3
Workforce	174
Recruitment	14
Retention	12
Interprofessional and Team Based Care	15
Mental/Behavioral Health Workforce Shortage	12
Nursing Shortage	8
Primary Care Workforce Shortage	12
Specialty Care Workforce Shortage	11
Provider Burnout	6

Qualitative Analysis Code Frequency	Number of Mentions
Training	75
Competencies	2
Leadership	4
Modules	2
Other	40

Figure 2. Qualitative Results: Workplace and Finance Issues as Top Challenges by Organizational Type



Limitations and Recommendations

The results of the Stakeholder Survey are limited by the method of chain referral method of survey distribution, as well as the limited number of survey responses. Further study of specific provider groups with random sample survey distribution would be beneficial to the field.

Stakeholder Survey Conclusions

The New Hampshire Project ECHO Planning Stakeholder Survey reached a range of NH health and community care stakeholders that represented the Initiative's core audience and likely participants in NH Project ECHO programs. Both quantitative and qualitative data from the survey identified topics of interest and concern and needs for continuing education and training and opportunities for future NH Project ECHO sessions. Future Project ECHO session planning should incorporate content that responds to the strongly expressed concerns from the field about financial sustainability, technology, and workforce availability.

Respondents indicated that time to attend continuing education sessions, cost, and time away from practice or available coverage were top barriers to their participation in continuing education and training. Because Project ECHO sessions are free to participants and designed to be completed at the participants' own site, this finding supports the premise that the Project ECHO model is responsive to needs of NH's professionals in the field.

"Educational efforts to support culture change, increase/maximize/optimize team-based care; standardized onboarding /training for new staff; EMR function and interoperability with other EMRs"

Not surprisingly, given NH's current challenges with behavioral health care and the opiate epidemic, respondents indicated that topics of greatest interest were mental and behavioral health, including substance use disorder, with specific interest in the pediatric and older adult population. Additionally, given NH's aging population, care for older adults and chronic disease care also generated high interest responses. Given the competing demands on community providers' time, it is likely that although providers might pursue continuing education on topics of "Some Interest," it is much more likely that they would participate in Project ECHO sessions on topics of "High Interest."

All Payer Claims Data (APCD) Analysis

Planning for Project ECHO in NH included several claims analysis components to better understand the burden of disease, treatment patterns, and cost for priority areas, to inform planning for future ECHO trainings and project sustainability. For this part of the project, the Center for Health Analytics (CHA) at IHPP produced analysis using Commercial, Medicaid Managed Care Organization (MCO), and Medicare administrative claims data from New Hampshire.

Methods

Data Sources

Data for this analysis came from the New Hampshire Comprehensive Healthcare Information System (NH CHIS), NH's All-Payer Claims Database (APCD). The analysis used medical eligibility and medical claims data only. Information about NH CHIS can be found on the website: https://nhchis.com/.[12] Table 3 outlines the data and timeframes used in analysis:

Table 3. Data Sources

Source	Timeframe	Criteria and Notes
NH Medicaid MCO	CY 2016 - 2018	- Does not include Fee for Service or Medicaid Expansion claims - Included ages 0-64
NH Medicare	CY 2016 - 2018	- Includes Medicare Parts A & B only - Included all ages
NH Commercial	CY 2016 - 2018	- Does not include members with indemnity coverage - Included ages 0-64 - Gobeille decision impacts enrollment and total costs in 2016.[13]

Eligible Population

The following rules were applied to members for inclusion in the analysis:

- Members had to have at least 12 months continuous enrollment.
- Members were included regardless of whether the member's last known address is in New Hampshire or not.
- The member must have a valid or non-missing birth date, gender and zip code on the member's last eligibility record in the analytic period.
- Members age, gender, and geography assignments were determined by information from the member's last eligibility record in the analytic period.

Defining Conditions and Episodes

- Clinical conditions were identified using the Optum Symmetry Episode Treatment Grouper software (Optum ETG Grouper). The Optum ETG Grouper gathers service lines that are clinically related and assigns them to an Episode Treatment Group (ETG). ETGs exist for chronic and acute conditions.[14]

Suppression

Member counts per ETG are suppressed when total per stratification is less than or equal to 10 members to protect member privacy. Rates per ETG are suppressed when member counts are less than or equal to 20 members due to rate instability.

Results

Claims data were analyzed to understand the rate of common chronic conditions in NH, focusing on the topics identified through stakeholder input provided in the initial phases of the project. Based on information from the Stakeholder Survey and Key Informant Interviews, the analysis focused on selected chronic ETGs including: Asthma; Chronic Obstructive Pulmonary Disease (COPD); Diabetes; Other Drug Dependence; Alcohol Dependence;

Cocaine/Amphetamine Dependence; Opioid/Barbiturate Dependence; Depression; Anxiety; and Attention Deficit Disorder.

Administrative Prevalence

The analysis used "administrative prevalence" as the measure. Administrative prevalence was defined as the rate in which an eligible member has an indication of a chronic condition ETG in the analytic period.

The most prevalent of these chronic conditions for the different payers are shown in Table 4.

- For the Commercial population, cardiovascular and behavioral health conditions were most common. The 5 conditions with the highest rates were hypertension, obesity, anxiety, depression, and hyperlipidemia.
- For the Medicaid population, behavioral health conditions and asthma were most common. The 5 conditions with the highest rates were other neuropsychological or behavioral disorders, asthma, depression, other drug dependence, and attention deficit disorder.
- For the Medicare population, the 5 conditions with the highest rates were hypertension, cataract, hyperlipidemia, joint degeneration of the back, and diabetes.

Table 4. Administrative Prevalence: Ranking of Selected Chronic Conditions by Payer

Rank	Condition (Rate of Members with Condition per 1,000)		
	Commercial 10/2017 -9/2018	**Medicaid 7/2017-6/2018**	**Medicare 7/1/2017 – 6/30/2018**
1	Hypertension (167.0)	Other neuropsychological or behavioral disorders (192.6)	Hypertension (652.4)
2	Obesity (132.5)	Asthma (148.8)	Cataract (527.2)
3	Anxiety (120.2)	Depression (134.0)	Hyperlipidemia (370.5)
4	Depression (114.2)	Other drug dependence (130.8)	Back - Joint degeneration (290.7)
5	Hyperlipidemia (106.5)	Attention deficit disorder (128.0)	Diabetes (241.3)
6	Other neuropsychological or behavioral disorders (96.0)	Obesity (121.5)	Obesity (221.5)
7	Contraceptive management (96.0)	Anxiety disorder/phobia (113.5)	Knee & lower leg Joint degeneration (196.6)
8	Asthma (94.2)	Hypertension (83.4)	Glaucoma (190.3)

Rank	Condition (Rate of Members with Condition per 1,000)		
	Commercial 10/2017 -9/2018	Medicaid 7/2017-6/2018	Medicare 7/1/2017 – 6/30/2018
9	Back - Joint degeneration (92.4)	Development disorder (71.7)	Ischemic heart disease (189.2)
10	Other drug dependence (72.8)	Contraceptive management (69.9)	Mood disorder, depressed (187.0)

Costs

In addition to understanding the prevalence of conditions of interest, there was also a need to analyze the costs of the selected conditions. For this analysis, the amount that each condition represented of the total cost for members with the conditions was calculated. The top 10 conditions for each payer, ranked by the percentage of the medical costs that each condition represents of the total costs for members with that condition is shown in Table 5.

- In the Commercial population, orthopedic conditions (Knee and lower leg and back joint degeneration) represented the highest portion of costs within the selected conditions.
- In the Medicaid population, behavioral health conditions (autism and child psychosis, bipolar mood disorder, opioid/barbiturate dependence, depression and other neuropsychological disorders) represented the highest portion of costs within the selected conditions.
- In the Medicare population, chronic physical health conditions (ischemic heart disease, chronic obstructive pulmonary disease, and cerebral vascular disease) were the highest costs condition, represented the highest portion of costs within the selected conditions.

Table 5. Cost Attributed to the Top 10 Most Administratively Prevalent Conditions: Ranking of Percentage of Total Cost for Members with Selected Conditions by Payer

Rank	Condition (Percentage of Total Cost for Members with Selected Conditions)		
	Commercial 10/1/2017 – 9/30/2018	Medicaid 7/1/2017 – 6/30/2018	Medicare 7/1/2017 – 6/30/2018
1	Knee & lower leg joint degeneration (19%)	Autism & child psychoses (43%)	Ischemic heart disease (16%)
2	Back joint degeneration (14%)	Mood disorder, bipolar (33%)	Chronic obstructive pulmonary disease (11%)
3	Diabetes (11%)	Opioid/barbiturate dependence (29%)	Cerebral vascular disease (11%)

Rank	Condition (Percentage of Total Cost for Members with Selected Conditions)		
	Commercial 10/1/2017 – 9/30/2018	Medicaid 7/1/2017 – 6/30/2018	Medicare 7/1/2017 – 6/30/2018
4	Depression (10%)	Depression (21%)	Knee & lower leg joint degeneration (10%)
5	Neck joint degeneration (10%)	Other neuropsychological or behavioral disorders (14%)	Chronic renal failure (10%)
6	Contraceptive management (6%)	Attention deficit disorder (12%)	Malignant neoplasm of skin, major (9%)
7	Asthma (6%)	Anxiety (12%)	Back joint degeneration (8%)
8	Chronic sinusitis (6%)	Diabetes (11%)	Macular degeneration
9	Hypertension (5%)	Epilepsy (10%)	Hypertension (5%)
10	Anxiety (5%)	Chronic obstructive pulmonary disease (10%)	Diabetes (5%)

Analysis of Travel Time and Distance for Specialty Care

Additional claims analysis was performed for conditions for which access to specialty care was a particular concern. The conditions selected were alcohol dependence, anxiety disorder/phobia, asthma, attention deficit disorder, cocaine or amphetamine dependence, chronic obstructive pulmonary disease (COPD), diabetes, mood disorder, depressed, opioid/barbiturate dependence and other drug dependence.

The analysis focused on understanding the time and distance to specialty care for "new cases." New cases include eligible members who had an episode of a selected ETG in the analytic period and had no indication of the same ETG in previous 12 months. The members were selected for analysis if they were determined to have a new case of one of the selected conditions, had claims and a valid anchor record (management, surgery or facility). Members with only ancillary or pharmacy record types were excluded from the Specialty Care/Office Visit analysis.

For the purpose of identifying claims that indicate use of specialty care, specific procedure codes (CPT, HCPCs, Revenue, and ICD Procedure Codes) and provider taxonomies were selected for each condition. Service lines were flagged when the procedure code was found on the service line of the claim or, in some cases, if the procedure code in combination with a provider taxonomy was found on the service line. Distance was calculated as the geodesic distance in miles between the centers of the member's zip code and provider's zip code. The calculation does not account for driving routes. Provider zip codes are determined through

the provider's NPPES data. NPPES data is self-reported and may contain instances of outdated data. Many health events include claims from multiple providers. Each of these providers could potentially have a different zip code. CHA developed a hierarchy to select a location.

Distance to Care

The average and median distance to care were calculated for the selected conditions, by payer. Results are shown in Table 6.

- For the Commercial population, substance use disorder treatment ETGs (alcohol dependence and cocaine dependence) had the highest average distance to care, both over 100 miles; median values were over 14 miles.
- For the Medicaid population, farthest distance to treatment was for diabetes at an average of 71.2 miles, and a median of 7 miles.

For Medicare members, the farthest distance for care for COPD was an average of 99.7 miles and median of 10.2 miles.

Table 6. Distance to Specialty Care for Chronic Conditions

	Distance Members Traveled for Specialty Care for That Condition (Miles)					
Chronic Condition Description (ETG)	**Commercial (Non-ERISA) 10/2017 -9/2018**		**Medicaid 7/2017-6/2018**		**Medicare 10/2017-9/ 2018**	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**
Alcohol dependence	110.09	14.45	33.81	9.20	83.45	12.05
Anxiety disorder/phobia	62.94	10.60	31.39	7.90	37.05	9.20
Asthma	33.14	11.90	18.34	11.10	83.52	9.50
Attention deficit disorder	71.89	10.90	52.91	8.65	72.59	9.95
Cocaine or amphetamine dependence	109.01	27.55	30.07	15.35	66.00	14.75
Chronic obstructive pulmonary disease (COPD)	30.51	10.35	37.77	10.15	99.77	10.20
Diabetes	52.38	8.05	71.19	7.25	30.27	7.60

	Distance Members Traveled for Specialty Care for That Condition (Miles)					
Chronic Condition Description (ETG)	**Commercial (Non-ERISA) 10/2017 -9/2018**		**Medicaid 7/2017-6/2018**		**Medicare 10/2017-9/ 2018**	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**
Mood disorder, depressed	52.28	10.80	32.66	7.90	63.37	10.90
Opioid/barbiturate dependence	58.56	20.75	24.54	13.65	41.62	9.45
Other drug dependence	49.70	9.30	11.61	6.20	63.22	13.75

Time to Receive Follow-Up Specialty Care

Another potential indicator of the limit to access to care for this analysis was the time from diagnosis of a new case for condition to a follow up appointment with specialty care, shown in Table 7.

- For the Commercial population, the longest time from diagnosis to a specialty care appointment was 64.89 days for COPD.
- For Medicaid members, the longest time from diagnosis to a specialty care appointment was 86.43 days for COPD.
- For Medicare, the longest time from diagnosis to a first visit for specialty care for was 77.29 days for an appointment for asthma.

Table 7. Time to Specialty Care for Chronic Conditions

	Number of Days for Members to Receive Specialty Care for Condition					
Chronic Condition Description (ETG)	**Commercial (Non-ERISA) 10/2017 -9/2018**		**Medicaid 7/2017 6/2018**		**Medicare 10/2017-9/ 2018**	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**
Alcohol dependence	24.12	8.00	37.14	13.00	28.83	5.00
Anxiety disorder/phobia	41.79	16.00	36.83	15.00	55.60	24.00
Asthma	48.34	28.00	61.85	40.00	77.29	52.50

	Number of Days for Members to Receive Specialty Care for Condition					
Chronic Condition Description (ETG)	**Commercial (Non-ERISA) 10/2017 -9/2018**		**Medicaid 7/2017 6/2018**		**Medicare 10/2017-9/ 2018**	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**
Attention deficit disorder	39.48	21.00	42.72	21.00	35.92	20.50
Cocaine or amphetamine dependence	14.07	4.00	53.50	12.00	40.04	18.00
Chronic obstructive pulmonary disease (COPD)	64.89	43.50	86.43	67.50	75.29	54.00
Diabetes	31.41	21.00	47.31	25.50	41.42	24.00
Mood disorder, depressed	47.07	20.00	44.46	17.00	64.33	28.00
Opioid/barbiturate dependence	21.23	7.00	23.37	6.50	33.22	8.00
Other drug dependence	32.06	10.00	38.29	16.00	51.18	15.00

Limitations and Recommendations

Limitations

The APCD from which the analytic data set is drawn does not include the entire commercially insured population because of limited authority of states to collect data from plans covered by ERISA and certain insurance programs, such as Veterans Administration. Because this analysis is based on adjudicated administrative claims data, this analysis also does not include the uninsured population.

Recommendations for Further Analysis

This analysis is based on medical claims only; it does not include pharmacy claims data. Without prescription data, this analysis is likely under-reporting costs. Areas for further analysis could include pharmacy claims.

Although not included in this report, there were analyses focused on the occurrence of multiple chronic conditions. The complexity and cost of treatment of people with multiple conditions could be considered for future analysis specifically when designing an ECHO and

engaging partners for ECHO training. Further refinement of analysis for time and distance to follow up appointments could include driving times and distances.

Claims Analysis Conclusions

The health care claims analysis identified the range of conditions across the three payer types that have the greatest administrative prevalence for NH and the highest costs for medical treatment. Claims data showed consistency across payers in the high prevalence of behavior health conditions. These conditions, as well as joint degeneration and chronic conditions, represented high medical costs.

Related to access to care, claims analysis showed that distance for care was variable across conditions; however, substance use disorder conditions had some of the longest distances to care and longest time to receive specialty care.

Business Sustainability Plan and Key Informant Interviews

Planning for Project ECHO in NH considered the Stakeholder Survey, Claims Analysis, and Key Informant Interviews, collectively, to develop a model for funding sustainability and business planning for the UNH Project ECHO Hub.

Key Informant Interviews

As previously noted, 21 Key Informant Interviews (KII) across eight different types of organizations were conducted to identify key clinical and treatment issues, as well as administrative considerations related to care delivery (Table 8).

Table 8. Stakeholder Organization Type and Number of Interviews Conducted

Organization Type	Number of Interviews Conducted
Area Health Education Centers	2
Critical Access Hospitals	2
County Corrections	1
Federally Qualified Health Centers and Hospital-Owned Practices	4
Health Foundations	5
Home Health & Hospice / Visiting Nurse Associations	2
NH DHHS Medicaid & Public Health	2
NH Health / Trade Associations	3

Conditions and Topics of Highest Interest

Key informants were questioned on which conditions would be of the highest interest to the interviewee or their organization. Behavioral health and dermatology were the highest interest conditions and topics listed. Medication management and reconciliation for psychiatric and non-psychiatric conditions also ranked high. Other high interest topics are tied to chronic care conditions such as congestive heart failure, COPD, and diabetes.

Administrative topics cited by the highest number of seemed to cluster in two areas. The first focused on care management, reducing gaps in care, care coordination and integrated care, which are all required to ensure success in new payment models by reducing costs, improving quality, and considering social determinants of health (SDOH). The second focused on leadership, clinical process improvement, clinical quality measurement, pay for performance measures, and project management, which all are required tools to provide provider organizations the tools they need to navigate and be successful in a value-based payment environment.

Perceived Return on Investment

Interviewees were asked about the expected return on investment (ROI) that could be attributed to the high interest condition and administrative topics. They included:

- Complex care management for patients with specific combinations of conditions:
    - COPD, diabetes, depression
    - Diabetes, experiencing homelessness, HIV, schizophrenia
    - Hypertension, cardiology, pulmonology
    - Opioids: community-based care, substance use disorder, behavioral health
    - Pediatric behavioral health: schools, pediatricians, families, behavioral health, specialists
    - Pediatric psychiatric medication management: families, specialists, wrap around supports
- ECHOs that can address New Hampshire's physician shortage areas
- ECHOs that can support the growing number of APRNs practicing in New Hampshire.

Key Informants also commented on issues of geographic access to specialist, timing of Project ECHO sessions, and telehealth opportunities. Not all areas of the state, whether rural, suburban, or urban, have access to specialists for community-based care referrals. Psychiatry, neurology, and dermatology access appear limited across the state. For more rural, smaller hospitals, there is an opportunity for Project ECHOs that connect community-based care practices with specialists for training.

Clinician interviewees were asked about the best time of day to access Project ECHOs and how long they should be. Primary care practitioners stated that lunchtime would work best.

Hospitals preferred early afternoon after rounds and orders were completed, and they also cited a maximum of one hour.

Those interviewed generally believed that reimbursement challenges impacted uptake of technologies. Mobile applications beyond electronic medical record (EMR) portals for scheduling medication refills and provider messaging are few and far between. Early adopters in community-based care have included dermatology and behavioral health. [15]

Funding Suggestions and Comments

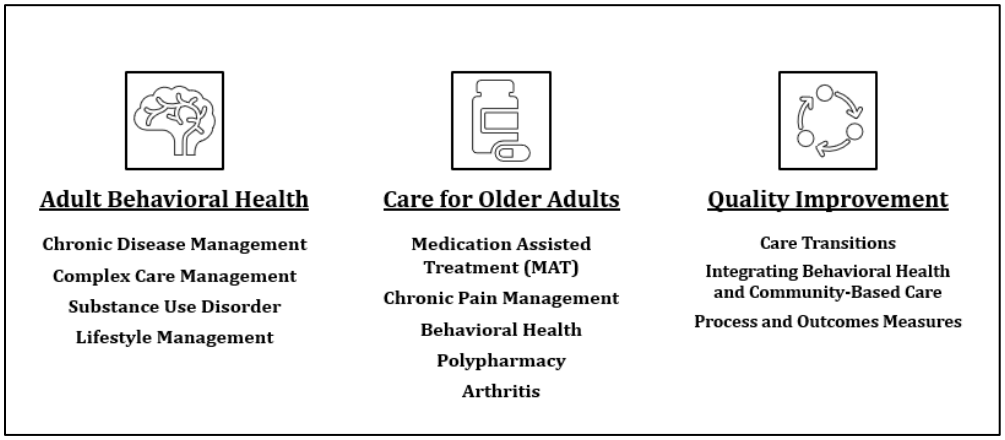
Five areas of potential funding identified in the interviews:

1. Foundation grants;
2. Continuing medical education (CME) funds;
3. Payers including Medicare, Medicaid, and commercial funders;
4. Government agencies including CMS, SAMHSA, CDC and HRSA; and
5. Hospitals, ACOs and other providers who can demonstrate health outcomes.

Business Planning and Sustainability Synthesis and Conclusions

From the stakeholder survey, Key Informant Interviews (KII), the health claims analysis, and internal team input, the topics shown in Figure 3 were deemed to be of the highest interest for potential topics for business and sustainability planning for the UNH Project ECHO Hub and future UNH Product ECHOs:

Figure 1. High Priority Areas for Project ECHOs



In order to determine which topics under each priority area would be viable for consideration by the UNH Project ECHO team, a Project Scoring Calculator was developed. The calculator was designed to be used by UNH Project ECHO leadership while considering their own ideas for projects or by soliciting projects from outside stakeholders. A screenshot of the calculator is found in Figure 4. The calculator has three categories of selection criteria – impact, resources, and sustainability –with specific selection criteria and ratings for each. Each

potential project will receive an overall rating to be compared with other projects under consideration. The calculator is flexible in order to accommodate either different criteria or the weighted rating values.

Figure 2. Project Scoring Calculator

Product Selection Criteria	Description	Rating Options			Criteria Scoring	Rating
IMPACT						
1. Impact of Project ECHO Initiative to Advancing Community-Based Care Knowledge	The degree of demonstrable impact the program or service will build on and/or have on the advancement of community-based care knowledge based upon ECHO outcomes in other states. The extent to which the program or service directly aligns with organizational and/or community needs strategy.	H = Fully	M = Partially	L = Minimally	H = 7 M = 5 L = 3	
2. Alignment with Project ECHO Strategic Plan and UNH Telehealth Practice Center Goals	The degree to which the Project ECHO opportunity aligns with the Project ECHO and UNH Telehealth Practice Center Goals and the degree to which it supports faculty and student learning opportunities.	H = Fully	M = Partially	L = Minimally	H = 5 M = 3 L = 1	
RESOURCES						
3. New Resources Required	The number of new resources as FTEs and/or contracted resources required to offer the ECHO, including access to faculty and SMEs.	H = >10	M = 2-10	L = <2	H = 1 M = 5 L = 7	
4. Internal Resource Effort	Estimated number of hours for internal resources to stand-up and annually support the ECHO. *(Measured in days - one FTE equivalent)*	H= >120 days (12 or greater weeks)	M = 41-120 days (8-12 weeks)	L = < 40 days (2 FTEs 20 hours each * 5 days = 8 weeks)	H = 1 M = 3 L = 5	
5. Operational & Technical Feasibility	The degree of operational and technical feasibility to stand-up and support the product or service (e.g. personnel, faculty, space).	H = High	M = Medium	L = Low	H = 1 M = 3 L = 5	
SUSTAINABILITY						
6. Measurable Efficiency	The estimated financial return in terms of potential reduction in healthcare costs -- either medical or administrative -- during the life of the ECHO.	H = >$5M	M = $1-5M	L = < $1M	H = 5 M = 3 L = 1	
7. Financial Sustainability	The degree to which the proposed ECHO has access to long-term, dedicated funding sources to generate adequate revenue.	H = Fully	M = Partially	L = Minimally	H = 7 M = 3 L = 1	
Selection Score (Range of High = 23 and Low = 9)						

Product Road Map

In order to develop the UNH Product ECHO sustainability plan, it was important to first define and understand the types of Project ECHO products and services that are provided to both internal and external stakeholders and customers. These products and services inform the development of the strategic direction and tools.

A Product Road Map was designed to provide the UNH Project ECHO team with a framework for current and future direction. Potential levels might include Base-level Project ECHO sessions, ECHO Extensions, Future Development Areas, and Managed Support Services, which might include Managed Support Services to are areas where the UNH Project ECHO team could scale and support other regional or sponsored Project ECHOs.

Evaluation Plan and Approach

Planning for Project ECHO in NH included a review of key evaluation concepts and frameworks currently used with Project ECHO. Project ECHO evolved in the medical field and most evaluation frameworks and methods reflect that discipline. Increasing use of the Project ECHO model in other fields and increasing use by interdisciplinary teams suggests a need to determine if the adaptations to the ECHO model fit the identified needs for the programs and

align with the educational approaches used in those disciplines. When Project ECHO is adapted for disciplines other than health care, it would be helpful to do a formative evaluation of such an initiative based on implementation science.[16,17]

Key Concepts and Frameworks in Evaluation of Project ECHO

Since Project ECHO was first launched in 2003, over 150 articles have documented the impact and growth of the ECHO Model™ across the globe. The most common evaluation measures were: satisfaction with learning; knowledge of the condition that was the focus of learning (e.g., chronic pain); self-efficacy/confidence in applying new knowledge; and self-reports of changes in practice. Fifteen of the articles addressed patient-related outcomes.

Moore's Evaluation Framework

The provider and patient outcomes used in these studies reflect a commonly used evaluation approach for Project ECHO: Moore's 7-level framework designed for continuing medical education (CME) programs that award credits for participation (Table 9).[18] Declarative and procedural knowledge (Levels 3A and 3B) and competence (Level 4) correspond to knowledge, skills and competence in the educational framework used in health professions education.[19] Level 5 performance can be a measure of practice change.

Table 9. Moore's Evaluation Framework

Level	Name	Description	Sources of data
1	Participation	The number of physicians and others who participated in the CME activity	Attendance records
2	Satisfaction	The degree to which the expectations of the participants about the setting and delivery of the CME activity were met	Questionnaires/surveys completed by attendees after a CME activity/program
3A	Declarative knowledge: *knows*	The degree to which participants state *what* the CME activity intended them to know	*Objective:* Pre- and posttests of knowledge. *Subjective:* Self-report of knowledge gain
3B	Procedural knowledge: *knows how*	The degree to which participants state *how* to do what the CME activity intended them to know how to do	*Objective:* Pre- and posttests of knowledge *Subjective:* Self-report of knowledge gain

Level	Name	Description	Sources of data
4	Competence: *shows how*	The degree to which participants *show* in an educational setting *how* to do what the CME activity intended them to be able to do	*Objective:* Observation in educational setting *Subjective:* Self-report of competence; intention to change
5	Performance: *does*	The degree to which participants *do* what the CME activity intended them to be able to do in their practices (practice change)	*Objective:* Observation of performance in patient care setting; patient charts; administrative databases *Subjective:* Self-report of performance
6	Patient health	The degree to which the health status of patients improves due to changes in the practice behavior of participants	*Objective:* Health status measures recorded in patient charts or administrative databases *Subjective:* Patient self-report of health status
7	Community health	The degree to which the health status of a community of patients changes due to changes in the practice behavior of participants	*Objective:* Epidemiological data and reports *Subjective:* Community self-report

Most evaluations of Project ECHO and similar telehealth programs address self-efficacy as well as Levels 1 through 4, using self-reports (surveys and interviews). Objective measures of declarative and procedural knowledge that are valid and reliable are not always available for every topic covered in Project ECHO programs. Objective measurement of Levels 4-7 requires direct observation and access to valid sources of data, including patient health records, which can be difficult to arrange.

Graham's Knowledge Translation Framework

As Project ECHO aims to "move knowledge, not people," it can be considered a mechanism for knowledge translation. Graham's knowledge translation framework for health care has two components: knowledge creation and action.[20–22] Knowledge creation has three phases: inquiry (basic research), synthesis of research, and resulting tools and products that can be applied to practice, such as clinical guidelines. In the first phase of the action cycle, a problem is identified, and the appropriate knowledge is selected and applied. The remaining action phases address the application of the knowledge to a local context, working through barriers and facilitators, and then monitoring, evaluating and sustaining how the knowledge has

changed practice. Research suggests that Project ECHO occurs in the first phase of the action cycle, with problem identification and selection of applicable knowledge.[23,24]

Graham's framework assumes that there is a gap in *knowledge transfer*: the knowledge exists (e.g., clinical guidelines) but the end-user may not be familiar with the knowledge or know how to use it. Project ECHO also assumes specialized knowledge is available for transfer/translation using case-based iterative guided practice. If the existing knowledge base is insufficient, there is *a gap in knowledge production* and case-based iterative guided practice would not be appropriate. Both Project ECHO and Graham's knowledge translation framework have underpinnings of social constructivist learning theories including characteristics of communities of practice. [24–28] Case-based learning and iterative guided practice are well-established pedagogies used in Project ECHO, and their use can be examined more closely, especially when Project ECHO is used with other disciplines.

Implementation Science

Project ECHO can be considered the implementation of an intervention in knowledge translation, bringing the discussion back to recommendations that a formative evaluation approach based on implementation science be used in future investigations of the ECHO Model.[16,17] Two implementation frameworks have been used by investigators evaluating ECHO Ontario Mental Health in Toronto: Consolidated Framework for Implementation Research (CFIR), and Proctor's implementation outcomes framework. [7–29] As with the frameworks developed by Moore and their colleagues, the CFIR and Proctor's work were designed for health care. [20,20,22,30,31]For example, Proctor refers to service outcomes that are related to the Institute of Medicine's standards of care.[32] The group from Ontario Mental Health have created a crosswalk of the CFIR and Proctor's implementation outcomes framework to create an approach to identifying organizational readiness to implement Project ECHO.[29]

Medical Research Council Guidance for Complex Interventions

The Medical Research Council (MRC) in the United Kingdom (https://mrc.ukri.org/) has multiple articles and books that address the development and evaluation of complex interventions in health care.[33–35] The framework is fairly broad and some constructs are similar to Graham's knowledge translation framework, the CFIR implementation framework , and Proctor's implementation outcomes.[20–22,30,31] Consolidated Framework for Implementation Research (CFIR The MRC Guidance framework, which involves both qualitative and quantitative measures, has not been used for Project ECHO, but the approach would be consistent with recommendations for a formative evaluation of implementation of ECHO across settings and disciplines.[17]

Results: Project Echo Evaluation Master Timeline

The proposed assessment/evaluation plan for the UNH Project ECHO accounts for the constructs in the frameworks discussed above. It is broad and comprehensive, representing the ideal state, as it is not possible for every construct to be evaluated for each Project ECHO intervention. Indeed, implementation constructs in participating organizations and the community at large may be difficult to anticipate when Project ECHO is initially launched. Similarly, it may not be possible to get baseline data regarding the knowledge gap in individual participants, or the status of their patients or recipients of their practice and services. Nevertheless, implementation constructs need to be addressed as part of formative evaluation, and as a Project ECHO program matures. Note that the term "assessment" is used during the Pre-ECHO and Baseline phases, while "evaluation" is used during the Implementation and Outcomes phases of the timeline.

Pre-ECHO: The master timeline for evaluation in Table 10 begins pre-implementation with an assessment of the gaps in knowledge and practice at a community or organizational level, and whether Project ECHO is the appropriate intervention to address the gaps and why, as opposed to a webinar or learning collaborative. Keeping with a formative evaluation approach, additional assessments address implementation factors, such as the capacity of the host organization to offer Project ECHO with fidelity to the model and of the potential participating organizations and the target audience of learners to avail themselves of the opportunity and benefit from it.

Baseline: During the period of program development, identify the content (topics) and structure (number of sessions, etc.), program goals and objectives, and learner outcomes so that they can be evaluated following the program. If possible, baseline knowledge and skills of the target audience (learners) can be assessed, as well as their expectations for participation so that their satisfaction with the program can be understood in context. If possible and appropriate, collect baseline information about the clinical status of the learners' patients (or students, and so on) relative to the topic of the program to better inform evaluation of clinical outcomes.

Implementation of Sessions: Attendance and learner satisfaction are collected after each session. Depending on the structure of the program, it may be important to evaluate learner knowledge and skills after each session. Track the cases that are presented in real time. Debrief after each session to address implementation as part of formative evaluation, especially with a new program of Project ECHO.

T_1 Generation 1 outcomes: Generation 1 outcomes refer to immediate outcomes for learners and their patients/service recipients, especially those presented as case studies. Once again, implementation factors need to be addressed and compared, if possible, to those factors

prior to program launch. Did Project ECHO work as expected for this audience, for these organizations, for this topic? Why and why not?

T_{1+N} Generation 1+N outcomes: Generation 1+N outcomes refer to the distal outcomes at the practice, organization, and/or community levels. These may include outcomes for patients (or students or service recipients), service outcomes (e.g., efficiency), and changes in practice. Sustainability of Project ECHO as an intervention should be addressed as a final phase of formative evaluation.

Table 10. Master Timeline for Evaluation of Project ECHO

	Timeline of Assessment/Evaluation Activities and Concepts				
	Pre-ECHO: Assess Knowledge and Capacity	**Baseline T_0: Program Development**	**Implementation of Sessions**	**T_1: Generation 1 outcomes Evaluate Outcomes**	**T_{1+N}: Generation 1+N outcomes Evaluate Outcomes**
Outer setting: Community, population	Gaps in knowledge and practice Appropriateness				Service outcomes Patient population health/service recipient outcomes Penetration
Inner setting: host organization/ UNH	Feasibility (incl Cost) Acceptability			Feasibility (incl Cost) Acceptability	Sustainability
Inner setting: participating organizations and practice settings	Feasibility (incl Cost) Acceptability			Feasibility (incl Cost) Acceptability	Service outcomes Practice change
Target audience: Program participants/ learners	Acceptability Feasibility (incl Cost) Appropriateness	Moore's levels 3A and B if possible Self-efficacy if possible Identify expectations	Moore's levels 1-3B post sessions if appropriate Self-efficacy if appropriate	Learner outcomes: Moore's levels 1-5 as appropriate Self-efficacy Feasibility (incl Cost) Acceptability	Colleagues of participants: Practice change Penetration

	Timeline of Assessment/Evaluation Activities and Concepts				
	Pre-ECHO: Assess Knowledge and Capacity	**Baseline T_0: Program Development**	**Implementation of Sessions**	**T_1: Generation 1 outcomes Evaluate Outcomes**	**T_{1+N}: Generation 1+N outcomes Evaluate Outcomes**
Patients/service recipients of program participants		Status relative to clinical condition/service needs		Moore's Level 6: Clinical Status/service needs outcomes	
Pedagogy: Characteristics of the intervention	Appropriateness Fidelity to model	Content and structure: Program Goals & Objectives Learner Outcomes Dose	Track attendance, cases, didactic presentations	Appropriateness Fidelity to the model Program Goals & Objectives Reach	

Evaluation Plan Conclusions

This evaluation planning component of the Project provides summarizes the comprehensive approach to assessment in preparation for launching a Project ECHO initiative, and for evaluation during and at the conclusion of the sessions. Not all constructs can or will be addressed for every Project ECHO; nevertheless, the plan provides a master timeline from which the users can choose which constructs best fit their project and at which points during the project.

Conclusions

Bringing together the results of the Project components creates a consistent picture of needs and opportunities for Project ECHO in New Hampshire. The Stakeholder Survey indicated a need for more options for continuing education and training for health and community are workers and their organizations. Stakeholders shared potential topics of interest on both specific conditions and populations and also on topics for cross-disciplinary work, such as managing multiple chronic conditions and integrated behavioral health and primary care. The Key Informant Interviews similarly raised topics of concern that were condition specific, and cross cutting. Claims Analysis provided insight into which conditions have a high Total Cost of Care and Chronic Conditions for which there was a delay in time from diagnosis to the first specialty appointment or a long distance to specialty follow up care. Table 11 displays overlaps of the various analyses, in effect triangulating issues of concern in the field across the data sources.

Table 11. Common Topics/Conditions Across Project Phases

Condition/ ETG	Survey (Y/N)	KII (Y/N)	Total Cost of Care (Payers)*	Administrative Prevalence (Payers)*	Distance to Specialty Follow Up (Payers)*	Time to Specialty Follow Up (Payers)*
Alcohol dependence	Y	N			✓✓✓	
Anxiety disorder/ phobia	Y	Y	✓✓	✓✓	✓	✓✓
Asthma	Y	N	✓	✓✓	✓	✓✓✓
Attention deficit disorder	N	Y	✓	✓✓	✓✓✓	✓✓
Autism & child psychoses	N	N	✓			
Cerebral vascular disease	N	N	✓			
Chronic obstructive pulmonary disease (COPD)	Y	Y	✓✓		✓✓	✓✓✓
Chronic renal failure	N	N	✓			

Condition/ ETG	Survey (Y/N)	KII (Y/N)	Total Cost of Care (Payers)*	Administrative Prevalence (Payers)*	Distance to Specialty Follow Up (Payers)*	Time to Specialty Follow Up (Payers)*
Chronic sinusitis	N	N	✓			
Cocaine dependence	N	N			✓	✓
Contraceptive Management	N	N	✓	✓		
Diabetes	Y	Y	✓✓✓	✓	✓	✓
Epilepsy	N	N	✓			
Hypertension	Y	Y	✓✓	✓✓✓		
Ischemic heart disease	N	N	✓	✓		
Back Joint Degeneration	Y	N	✓✓	✓✓		
Knee & lower leg joint degeneration	Y	N	✓✓	✓		
Neck joint degeneration	Y	N	✓			
Macular degeneration	N	N	✓			
Malignant neoplasm of skin, major	N	N	✓			
Mood disorder, bipolar	N	N	✓			
Mood disorder, depressed	Y	Y	✓✓	✓✓✓	✓	✓✓
Opioid/barbiturate dependence	Y	Y	✓			
Other drug dependence	N	N		✓✓	✓	✓
Other neuropsychological	N	N	✓	✓✓		

Condition/ ETG	Survey (Y/N)	KII (Y/N)	Total Cost of Care (Payers)*	Administrative Prevalence (Payers)*	Distance to Specialty Follow Up (Payers)*	Time to Specialty Follow Up (Payers)*
or behavioral disorders						

*The number of check marks refers to the three payer classes in the claims data, if the condition showed up in one, two, or in three different payer classes.

In summary, the New Hampshire Project ECHO Planning for Implementation and Business Sustainability Project identified a number of potential topic areas where interest and health care system data converge, including topics on chronic disease and mental/behavioral health, and chronic pain form joint disease. Development of a sustainable and effective Project ECHO HUB would be an important educational training service for New Hampshire's health and community care providers. The Project ECHO HUB at UNH has laid the groundwork to meet this need.

Note: This research was completed before the COVID-19 pandemic in 2020, however the report was completed at the beginning of the pandemic. We expect that results might have included many requests for pandemic-related Project ECHO topics as a result. The UNH Project ECHO Hub planning team has worked to be responsive to those changing needs.

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