**BACKGROUND**

Parental concerns about vaccine safety and necessity have led to increasing vaccine hesitance. Because parents recognize healthcare providers as the most reliable source of vaccine information, providers may have the greatest potential to impact vaccine acceptance.

Many interventions have been tried by researchers and healthcare providers to increase vaccine acceptance, specifically among hesitant parents, but none have been validated in any prospective study. The American Academy of Pediatrics suggests using a presumptive approach, the C.A.S.E. approach, and motivational interviewing (MI) as potential tools to garner vaccine acceptance. Yet these strategies differ significantly in their fundamental premises and methods of approach. (Table 1)

**METHODS**

- Five pediatric providers were recruited to implement the communication strategies.
- All providers attended a day-long retreat and eight, one-hour training/debriefing sessions. Training topics included: vaccine safety, efficacy, and licensure; how to refute common vaccine myths; and the two communication strategies.
- Providers were supplied with books, journal articles, and videos to complement the training.
- Providers implemented a presumptive/C.A.S.E. approach for four months, and then used an MI approach for four months.
- Providers received scripted tools for both approaches. Vaccine education materials were placed in each exam room for providers to give to parents with vaccine questions.
- A research assistant shadowed the providers weekly to observe progress and provide coaching with the communication methods.
- Providers completed anonymous online surveys regularly to assess their confidence in addressing vaccine hesitancy and satisfaction with the strategies.
- Individual interviews were conducted at the end of the study to gather provider feedback on strategy preference and opinions and recommendations for project improvement.

**RESULTS**

- Providers were more confident in their ability to address vaccine hesitancy and parental concerns as the study progressed. (Figure 1)
- Providers believed the seven-hour retreat was valuable because it increased their knowledge of vaccines and confidence in vaccine promotion.
- They acknowledged that education and training on vaccines and communication strategies to address hesitancy are insufficient in medical school and residency.
- Proficient provider implementation of the communication strategies was a gradual process that required frequent practice and coaching. Ongoing trainings/support were critical to ensure provider accountability in adopting the strategies.

**CONCLUSIONS**

A presumptive/C.A.S.E. approach was easier to learn and more readily used with the accepting and minimally hesitant parent. MI was perceived to be useful for the more strongly hesitant parent. Changing provider communication required persistent coaching and training. Meaningful change is not likely to occur with a single educational encounter.

Increased provider training opportunities in vaccine safety, efficacy, and licensure, countering common anti-vaccine myths, and communication strategies may help improve provider confidence in managing vaccine hesitancy.

A prospective study to validate increased vaccine acceptance with MI versus presumption/C.A.S.E. vs a combination of the two methods is warranted.

**Limitations:**

Generalizability of the study findings may be limited due to the small sample and homogeneity of the assessed providers. The study was not designed to assess if increasing provider confidence translates into greater vaccine acceptance in parents.

**Acknowledgements:**

The research team would like to acknowledge the Sanford Health Pediatric Clinic in Moorhead, Minnesota for participating in this pilot study. Participating providers included: Amanda Oney, CPNP, Dr. Melissa Kunkel, Dr. Samantha Perleberg, Dr. Brennan Forward, and Dr. Stephanie Hanson.

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**OBJECTIVES**

This pilot study assessed these communication strategies in a small group of pediatric providers. Measures included provider confidence in managing vaccine-hesitant parents and their subjective appraisal of the contrasting approaches.

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**Table 1:** Contrasting a Presumptive/C.A.S.E. Approach to Motivational Interviewing

The Health Implications of Daily Smoking, Lack of Exercise and, Inability to Afford Medical Care on North Dakota Residents
Nathan Fix, Sonja Bauman
Center for Rural Health

Abstract

• Cigarette smoking is the principal preventable cause of death in the United States, and is responsible for nearly one in every five deaths annually.1 Cigarette smoking damages human health by harming nearly every organ of the body.1 This present study focused on North Dakota current smokers and investigated the association between the cost of consulting a doctor and exercising over the duration of one month. Additionally, this study explored how these factors affect a smoker’s overall health. Data specific to North Dakota was selected from the 2016 Behavioral Risk Factor Surveillance System (BRFSS), for adults 18 and older, which included 14% daily smokers; 57.6% of which are males and 42.4% are females.2

Methods

• 2016 Behavior Risk Factor Surveillance System (BRFSS) provided a represented probability sample.
• Smoking status was split into four categories focusing on daily adult smokers and adults who have never smoked.
• Poor health days, either mental or physical, were organized into six categories ranging from 0 to greater than 20 health days within the past 30 days.
• Cost barrier to seeing a doctor and those who reported exercising at least once in the past 30 days were combined and defined as:
  – no cost barrier and exercise
  – no cost barrier and no exercise
  – cost barrier and exercise
  – cost barrier and no exercise
• Quantitative research methods were used to analyze the relationship between the variables.
• Assessed for relationship between smoking status, cost barrier to health, lack of exercise, and poor mental or physical health days.
• SPSS version 24 was used for all analyses

Results

• Among North Dakota adults in 2016:
  – 14.0% are daily smoker
  – 5.7% are current smokers (some days)
  – 24.8% are former smokers
  – 55.5% are non smokers
• 55.3% of North Dakota adults who had reported 0 poor health days had never smoked compared to daily smokers, 14.5%.
• In moving from 0 to >20 poor health days, the percent of daily smokers increases from 14.5% to 28.5%.
• 61.1% of North Dakota daily smoking adults without health cost barrier, who had exercised reported 0 poor health days compared to 51.8% of those not exercising.
• Fewer adult daily smokers (7.6%) who exercised and had no cost barrier reported having more than 20 poor health days than those who did not have a cost barrier but did not exercise (11.4%).
• 40.2% of North Dakota daily smoking adults who experienced a health cost barrier and exercised reported 0 poor health days compared to 28.6% of those not exercising.
• Fewer adult daily smokers (19.9%) who exercised and had a cost barrier reported having more than 20 poor health days than those who had a cost barrier but did not exercise (49.6%).

Conclusions

• This study highlights that smokers are more likely to experience poor health days that non smokers.
• Considering that there is a much larger percentage of adults in North Dakota who have never smoked compared to those who smoke daily, the increasing trend across the number of poor health days for daily smokers is telling of smoking’s impact.
• Both daily smokers and non smoker who exercise report better health than those who do not exercise when there was no cost barrier.
• Like those without a cost barrier, adults with a cost barrier but exercised reported better health than those who did not exercise.
• Nearly half of daily smokers who do not exercised and had a cost barrier had more than 20 poor health days in the past 30 days.
• This study underscores the important role physical exercise plays on health. Daily smokers who exercised had better health outcomes even if they did not have a cost barrier keeping them from seeing the doctor.
• Daily smokers should be encouraged to exercise regularly, since this study showed that those who experience exercise fewer poor health days.
• Limitations include:
  – Self reporting data
  – Non clinically diagnosed poor mental or physical health day
  – Experiencing a cost barrier was reported at the discretion of the individual.

References

Evaluation of Breastfeeding Rates, Durations, and Support in North Dakota
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E: amir.alakaam@UND.edu; D: 701.777.3753

Introduction
Breastfeeding offers many benefits and is an essential strategy in reducing morbidity and mortality among mothers and infants. The aim of this report is to describe the current situation regarding breastfeeding rates, durations, and support in North Dakota (ND), as well as explore breastfeeding practices in ND health facilities.

Benefits for Infants:
- Infants who are breastfed have reduced risks of:
  - Asthma
  - Obesity
  - Type 2 diabetes
  - Respiratory infections
  - Sudden Infant Death Syndrome (SIDS)

Benefits for Mothers:
- Breastfeeding can help lower risk of:
  - Heart disease
  - Type 2 diabetes
  - Ovarian cancer
  - Breast cancer

Baby-Friendly Hospitals Initiative (BFHI):
The initiative promotes breastfeeding by providing support to mothers and infants and a Baby-Friendly designation (BF) for compliant facilities through the implementation of ten steps of practices called the "Ten Steps to Successful Breastfeeding." Figure 1.

The Ten Steps has been shown to have a significant impact on breastfeeding rates and durations.

ND Breastfeeding State Laws:
- In 2009, the ND Legislature passed legislation to protect a woman's right to breastfeed her child in any location public, or private, where the woman and child are otherwise authorized to be.
- This legislation also established an "Infant-friendly" designation for workplaces that adopt breastfeeding support policies.

The breastfeeding support policies include:
- Allowing flexible break times for expression for milk.
- Providing a clean, private space (not a toilet stall or restroom) for pumping or nursing.
- Access to a clean water source for washing hands and cleaning breast pump equipment.
- Providing a place for storing breast milk such as a refrigerator.

Healthy People Objectives 2020

<table>
<thead>
<tr>
<th>Healthy People 2020</th>
<th>Breastfeeding Rates</th>
<th>North Dakota 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Postpartum</td>
<td>81.9%</td>
<td>82.3%</td>
</tr>
<tr>
<td>6 Months</td>
<td>60.6%</td>
<td>51.5%</td>
</tr>
<tr>
<td>1 Year</td>
<td>34.1%</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

The CDC mPICN Survey: ND 2015

<table>
<thead>
<tr>
<th>mPICN Care Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor and Delivery Care</td>
</tr>
<tr>
<td>Feeding of Breastfed Infants</td>
</tr>
<tr>
<td>Breastfeeding Assistance</td>
</tr>
<tr>
<td>Contact Between Mother and Infant</td>
</tr>
<tr>
<td>Hospital Discharge Care</td>
</tr>
<tr>
<td>Staff Training</td>
</tr>
<tr>
<td>Structural &amp; Organizational Aspects of Care Delivery</td>
</tr>
</tbody>
</table>

Breastfeeding Initiation Rates by Birth Hospitals (2016)

<table>
<thead>
<tr>
<th>Facility</th>
<th>County</th>
<th>Initiation Rate</th>
<th>Total Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>West River Regional Medical Center</td>
<td>Adams</td>
<td>83%</td>
<td>1430</td>
</tr>
<tr>
<td>CHI St. Alexius Health</td>
<td>Burleigh</td>
<td>85%</td>
<td>1083</td>
</tr>
<tr>
<td>Sanford Medical Center</td>
<td>Burleigh</td>
<td>80%</td>
<td>317</td>
</tr>
<tr>
<td>Essentia Health</td>
<td>Cass</td>
<td>68%</td>
<td>314</td>
</tr>
<tr>
<td>Sanford Medical Center</td>
<td>Grand Forks</td>
<td>43%</td>
<td>98</td>
</tr>
<tr>
<td>CHI St. Alexius Health</td>
<td>Ramsey</td>
<td>79%</td>
<td>1194</td>
</tr>
<tr>
<td>Queen's N. Bunkard Memorial Health Center</td>
<td>Rolette</td>
<td>84%</td>
<td>1988</td>
</tr>
<tr>
<td>CHI St. Alexius Health</td>
<td>Minot</td>
<td>85%</td>
<td>1406</td>
</tr>
<tr>
<td>Jamestown Regional Medical Center</td>
<td>St. John</td>
<td>85%</td>
<td>898</td>
</tr>
<tr>
<td>Trinity Hospital</td>
<td>Rugby</td>
<td>85%</td>
<td>1670</td>
</tr>
<tr>
<td>CHI St. Alexius Health</td>
<td>Williams</td>
<td>85%</td>
<td>143</td>
</tr>
<tr>
<td>Home Births</td>
<td></td>
<td>85%</td>
<td>248</td>
</tr>
<tr>
<td>Other out of State Facility Birth</td>
<td></td>
<td>80%</td>
<td>324</td>
</tr>
<tr>
<td>All ND Outsource Births</td>
<td></td>
<td>82%</td>
<td>11364</td>
</tr>
</tbody>
</table>

Source: ND CLS, NDSD and CDC NCHS 2016

Conclusion
- ND has seen a steady increase in breastfeeding rates and durations over the last years.
- ND exceeded the Healthy People 2020 goals. However, ND did not meet the goal of breastfeeding rate at 6 months and at 12 months.
- The breastfeeding rates show that most mothers in ND want to breastfeed but do not continue to breastfeed as recommended.
- Although few breastfeeding policies have been implemented to improve a breastfeeding-friendly environment, no studies have examined the effectiveness of these policies in ND.
- Most of the health facilities in ND successfully document mother's feeding decisions and provide counseling to mothers who are intended to breastfeed; however, these facilities do not meet standard guidelines for formula supplementation.
- Most of the health facilities in ND follow the breastfeeding guidelines and implement model breastfeeding policies.
- The breastfeeding rates and durations in ND improved; however, more research and strategies are needed to identify facilitators and barriers for providing breastfeeding support in ND.
- ND has the opportunity to reach Healthy People 2020 objective that is specifically related to breastfeeding duration and lead the states in best breastfeeding practices and support.
- Develop resources and training programs for healthcare staff could help to implement the Ten Steps in ND hospitals.

References
The Architecture of Rural Healthcare: Supporting access to health in rural and remote areas

INTRODUCTION
Many remote and rural areas in the United States lack adequate access to basic healthcare services such as primary, urgent, and emergency care typically provided by healthcare systems and hospitals. In addition, many rural communities are comprised of an increasingly aging population, a growing number of patients with chronic illnesses, and in some communities a high volume of tourists that need urgent care.

Remote communities struggle with providing access to these basic but essential healthcare services taken for granted in more populated areas. Increasing access to care, improving the efficiency of care delivery and advances in technology are all altering how access to medical care can be delivered in geographically isolated locations.

At the same time, increasing healthcare provider shortages place a particular strain on access to medical care in rural communities. This evolving context for care in rural America increases the pressures to provide greater access to better care with limited physical and human resources.

METHODS
A comprehensive literature and case study review was employed to identify background issues in healthcare and best practices for rural healthcare architecture. From the literature review, over 63 articles were reviewed with 7 of these articles directly or indirectly applicable to topics related to rural healthcare objectives.

Primary research was gathered through site visits and formal observations of selected best practice case studies in a cross-section of rural and remote communities in the US and Canada along with interviews of design professionals and health providers associated with the identified projects.

RESULTS
1. OPTIMIZE ACCESSIBILITY
   1.1 Centrally located to dispersed populations
   1.2 Located along major highways
   1.3 Co-located with other essential services in the community

2. OPERATE SELF-SUFFICIENTLY
   2.1 Energy independent and back-up
   2.2 National insurance dependent

3. EMPLOY MODULAR CONSTRUCTION
   3.1 Pattern a grid structure option
   3.2 Utilize prefabricated construction

4. STANDARDIZE CLINICAL SPACES
   4.1 Standardization clinical layouts
   4.2 Plan universal room indicators

5. CREATE ADAPTABLE SPACES
   5.1 Plan rooms with multiple purposes
   5.2 Accomodate changing needs over the lifespan circumstances & the life of the building

6. MAXIMIZE STAFF CONNECTIVITY
   6.1 Centralize work stations
   6.2 Optimize open clinical pods
   6.3 Provide hearing for clinicians

CONCLUSION
The intent of this thesis is to provide guidance on how architecture can support the access and delivery of healthcare in frontier communities. It is based on the understanding that many rural and remote communities lack access to primary and emergency care due to distance and provider shortage barriers. The needs of rural communities were used to identify a series of design objectives that architecture must accommodate to allow access for patients in isolated areas. The proposed unifying objectives for design claim that architecture must be accessible, promote high quality care, be visibly sustainable, and maintain cultural relevance.

Health service conditions in frontier regions struggle with retaining clinical staff and optimizing the efficient and effective use of their services. Solving provider shortages in underserved medical areas is the first challenge for rural health. The design of a rural clinic can include staff centered environments that support efficient practices and optimize staff satisfaction. Solutions for rural clinic facility design necessitates a balance between staff focused design, best practices, and providing healthy patient centered environments.

Guidelines distilled from the research outline how architecture can support access and provide appropriate settings for small rural clinics. Various guidelines should be taken into account when formulating a comprehensive building. The most common users of the building are the staff and the guidelines need to express their healthcare work processes. The guidelines also target operational processes with standardized plans.

Following the development of the design guidelines, a model space program provides options to determine space needs for a frontier clinic. Each of the public, staff and clinical zones are organized to support optimal uses for efficiency and effectiveness. They collaborate to support patient care and community development.

Several limitations to the study of rural healthcare begin with the variations in culture across the extensive geography of rural America. A single solution cannot adequately support vastly different frontier communities with contrasting health needs. Population health needs will drive planning and design decisions for each clinic service and operation. The relative lack of access to documentation of best practice case study examples for frontier healthcare facilities was a significant limitation in this study.