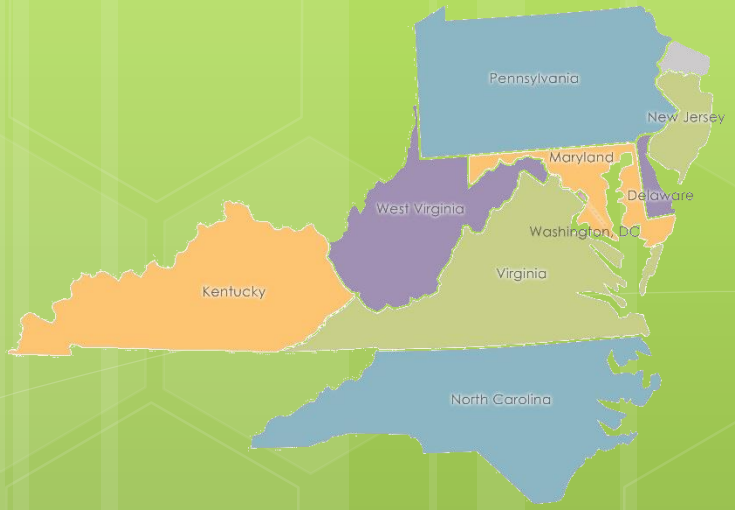
Mid-Atlantic Telehealth Resource Center

FLEX Reverse Site Visit

July 20, 2017



Serving Delaware, Kentucky, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, Washington DC and West Virginia

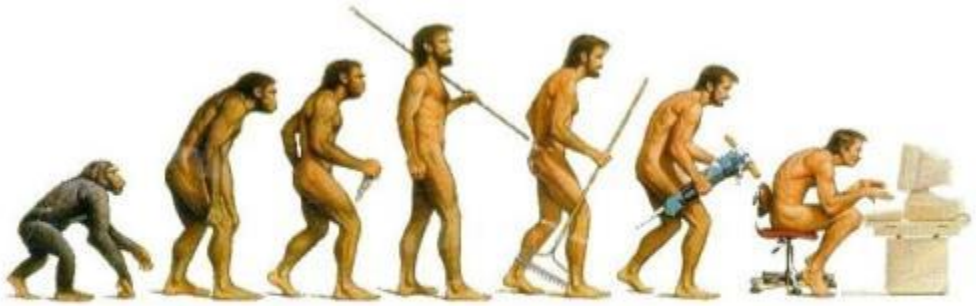
Leading Transitions to Value: Rural Use of Telehealth

Health Care - Past

Health Care - Present

Progress?

CARE	PAST	PRESENT
Location	Home	Clinic/Hospital
Provider	Generalists	Specialists
Interaction	Frequent	Episodic/Periodic
Relationship	Personal	Impersonal
Unit	Family/Community	Individual
Focus	Health	Disease



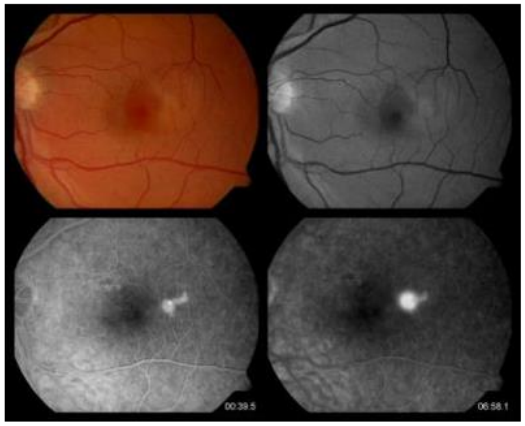
Somewhere, something went terribly wrong

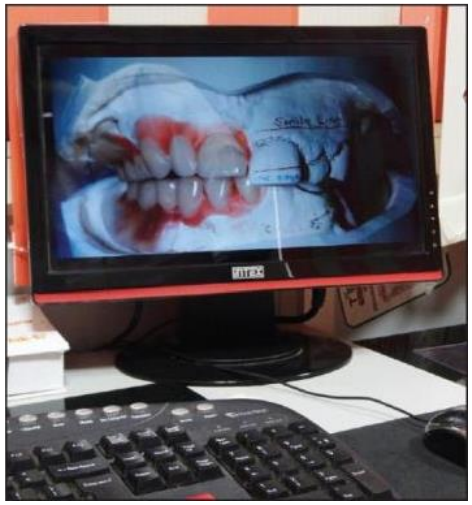
The Promise of Telehealth

A mechanism for enhancing health care, public health, health administration and health education delivery and support, using electronic communication and information technology.

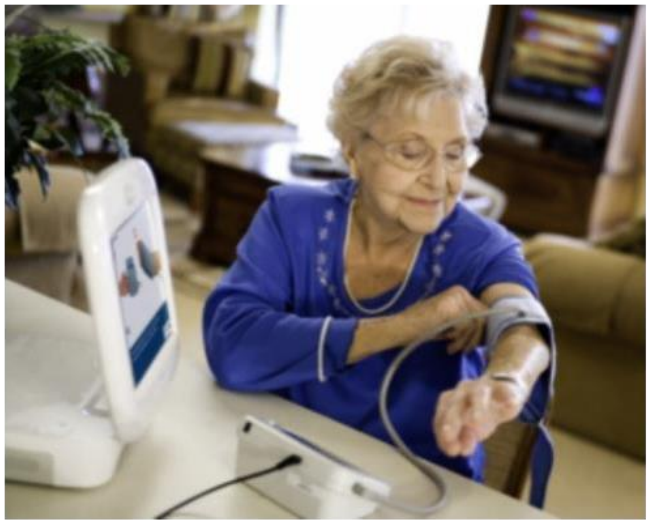
Synchronous

Asynchronous





Remote Monitoring



mHealth

Regular checkups help keep baby healthy! Take baby for her next checkup when she's 4 months old. For free or low-cost care, call 877-543-7669.
Text BABY to 511411
Get support throughout your pregnancy and baby's first year. You'll get FREE messages each week on topics like prenatal care, labor signs and symptoms, nutrition, breastfeeding, safety, baby's development, and more.
Click to Sign Up
Learn More

iPod
15:28
How are you feeling?
2013-1-31 15:27
Sad
Anxious
Angry
Stressed
Calm
Happy

tellspec

Drink smarter.
Change the way you think about drinking.
The world's most accurate smartphone breathalyzer.
BUY NOW
Your result:
0.03
App Store

97
73

MyChart

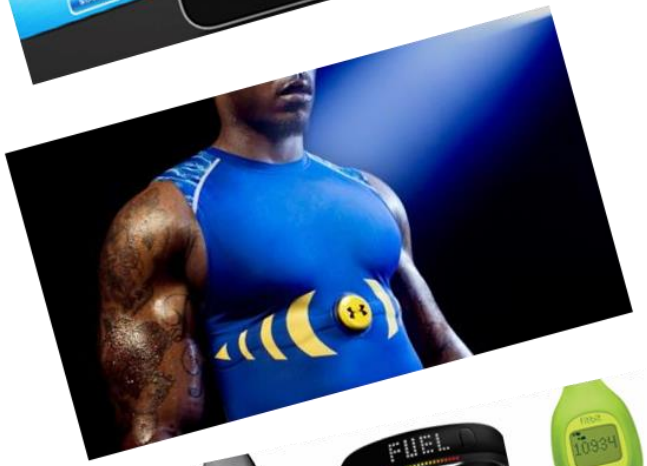
87 bpm

SAMSUNG
Main Menu
10:10 AM
Image View

mHealth

Aquafresh
TIME 2 BRUSH
START!
REMEMBER:
BRUSH FOR 2 MINUTES
CHOOSE AN OUTFIT FOR YOUR NURDLE!
DONE

Learn How to PREPARE for an Emergency



FUEL
10934
02:36.1
9748

POKÉMON GO
100 MILES

It Started With This

Necessity Breeds Invention

CRISIS

危

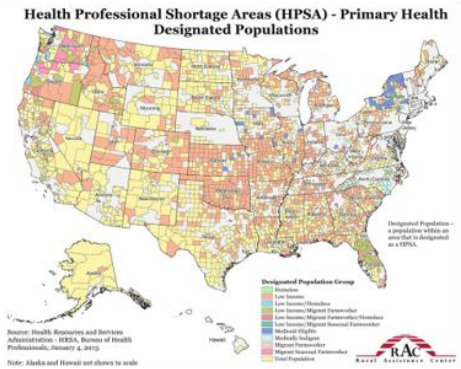
A time of danger;

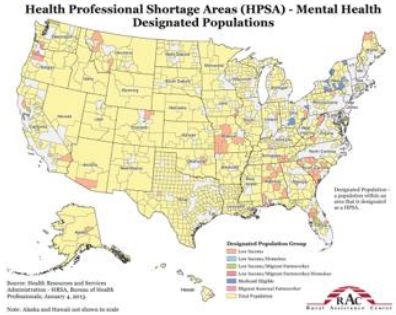
机

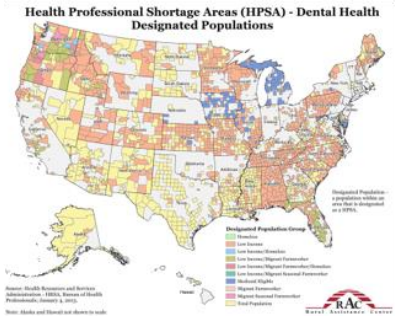
A time of opportunity;

"When written in Chinese, the word "crisis" is composed of two characters. One represents danger and the other represents opportunity."

~John F. Kennedy~

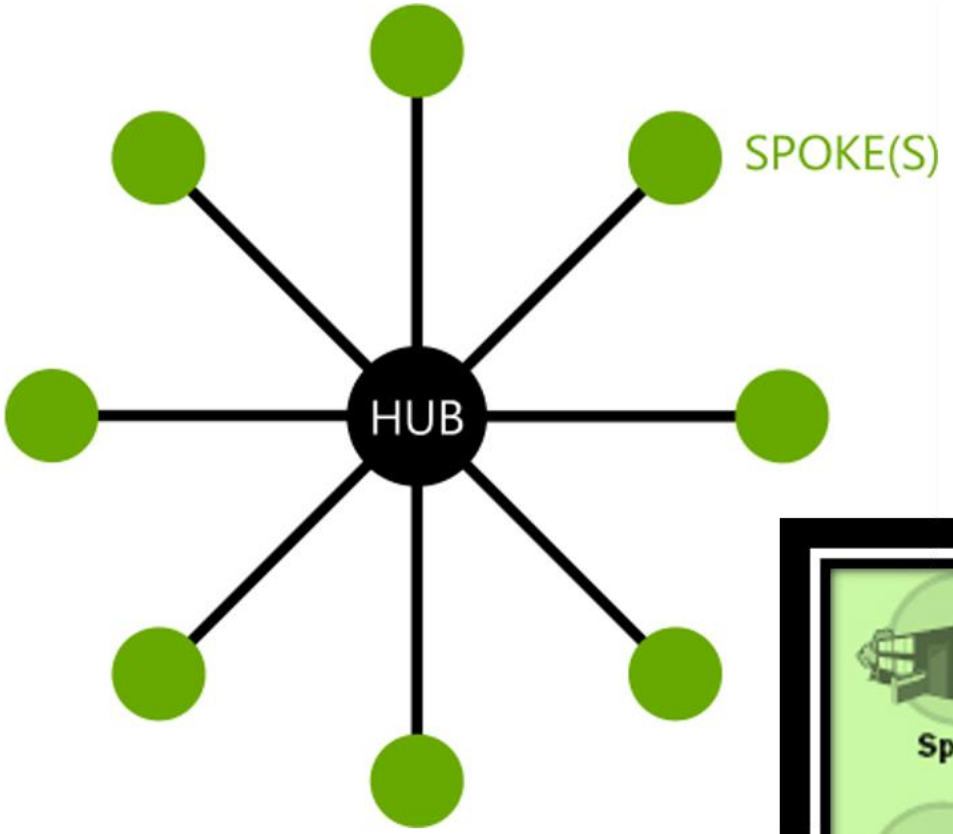


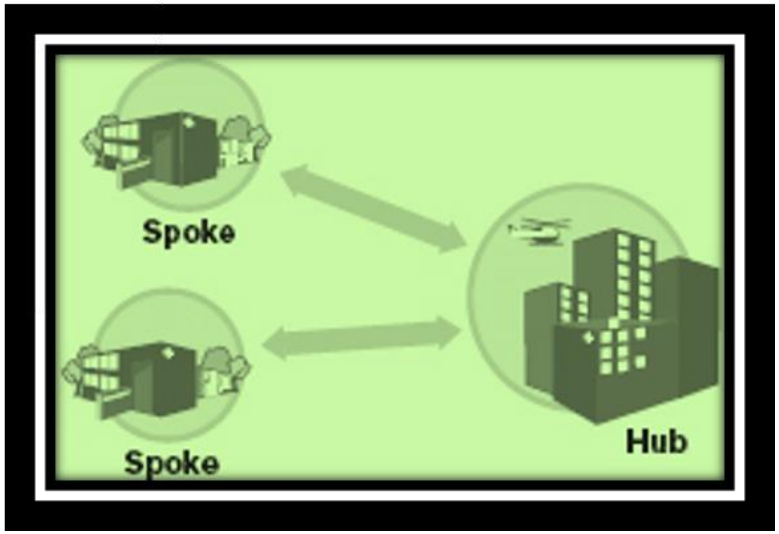




Mid-Atlantic Telehealth Resource Center

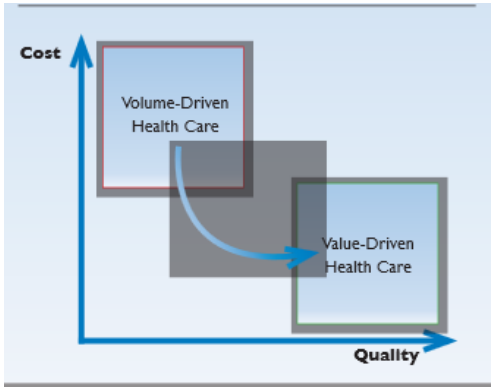
It Looked Like This





Things Changed

Things Changed



The Challenges

Which of these clinical, financial or patient engagement challenges are most important for your organization's successful transition to VBP? (Top Five)

Effective use of intervention strategies for chronic disease patients — 60%

Improve patient education and engagement — 55%

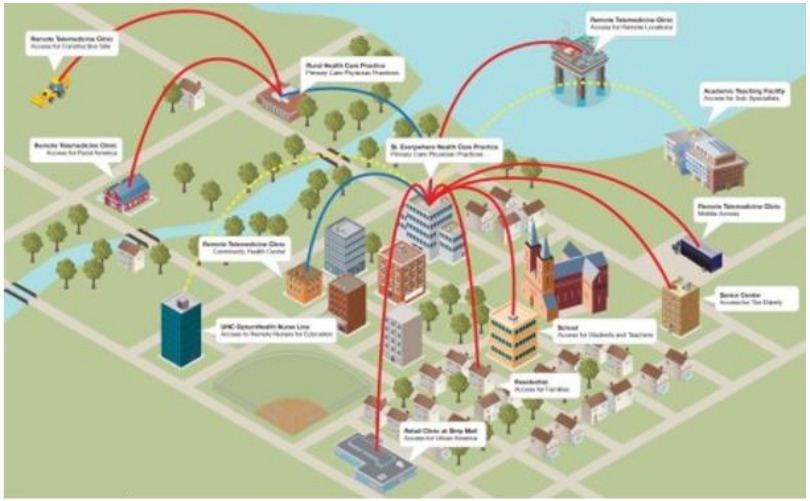
Reduce preventable readmissions — 49%

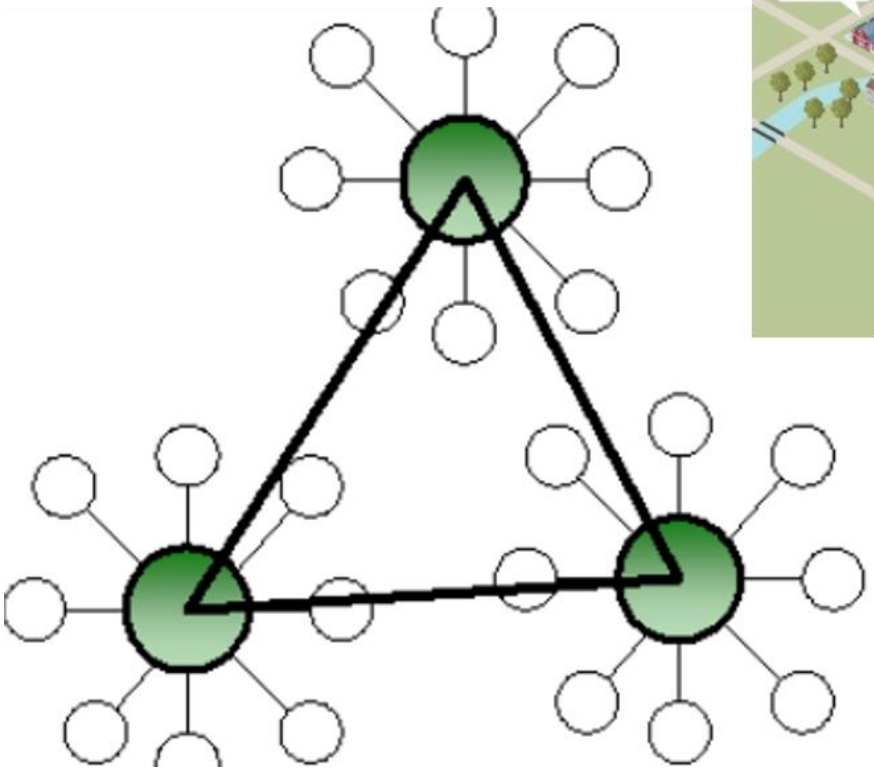
Improve patient/family experience and satisfaction — 47%

Improve transitions of care through better coordination — 45%

Things Changed

It Now Looks Like This





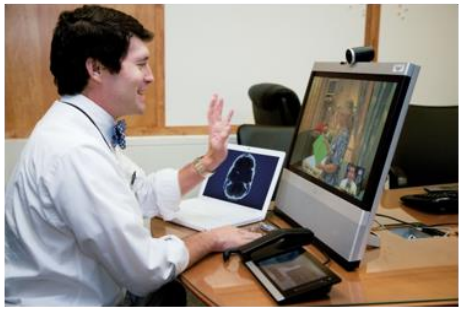
Telehealth

A Tool in the Toolbox for Rural

Telestroke – Time is Brain

"Telestroke networks should be deployed wherever a lack of readily available stroke expertise prevents patients in a given community from accessing a primary stroke center (or center of equivalent capability) within a reasonable distance or travel time to permit eligibility for intravenous thrombolytic therapy."[21]

–ASA Recommendations for the implementation of telemedicine within stroke systems of care, 2009



Stroke Care

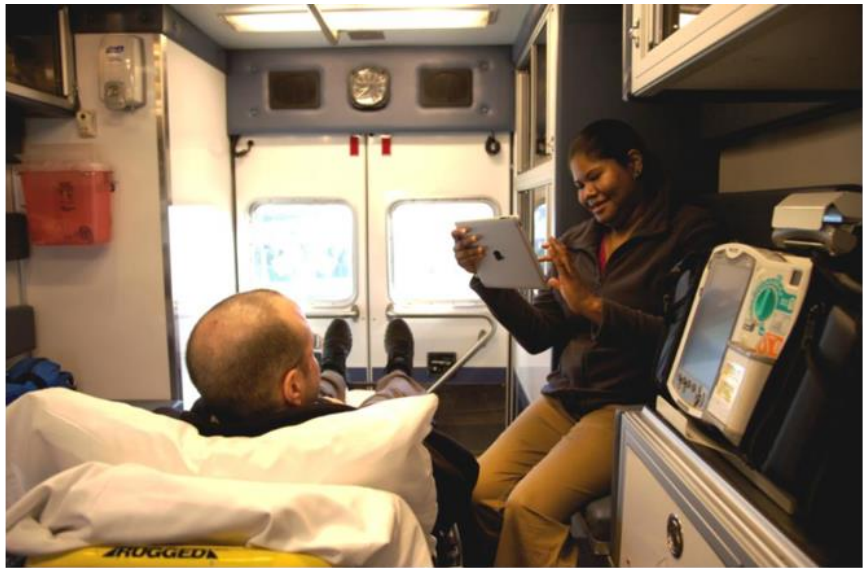
Speed, expertise and technology combine to give stroke patients prompt treatment that can prevent or minimize effects from a stroke.

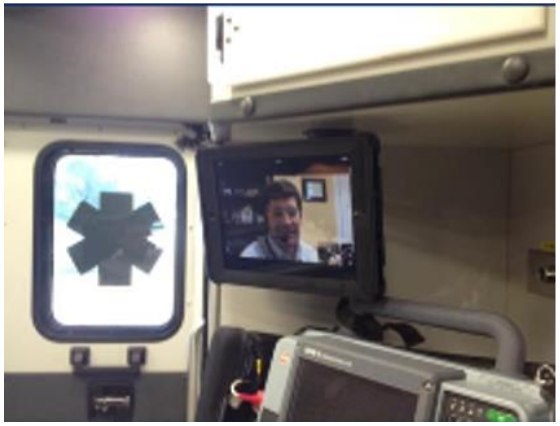
UVA & Partners have increased the use of life-saving tPA from 0 to 17%

American Heart Association | American Stroke Association

- **Administration of tPA at stroke centers = 10% - 20% of ischemic stroke patients**
- **Administration of tPA outside of stroke centers = 1% - 2% (without telestroke) and 10% - 20% (with telestroke)**

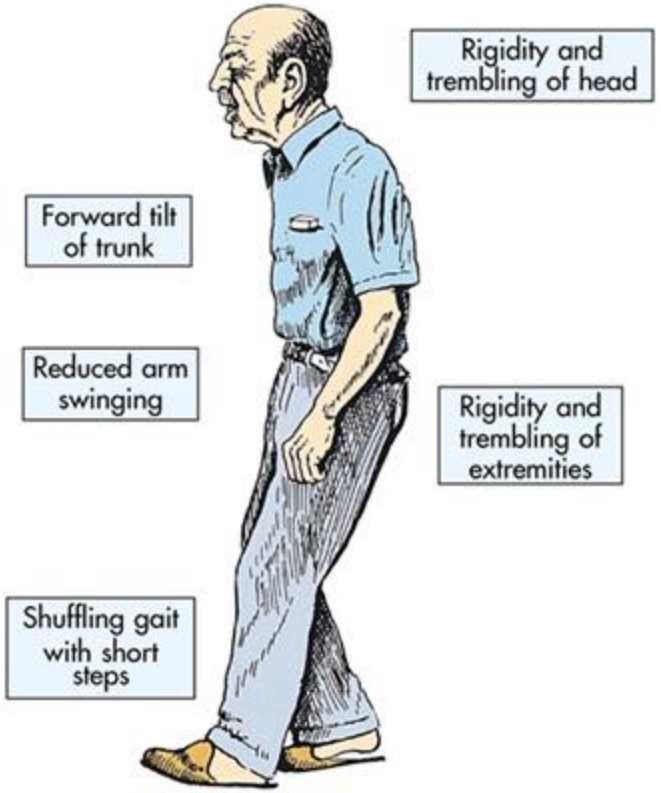
Mobile Pre-Hospital Telestroke

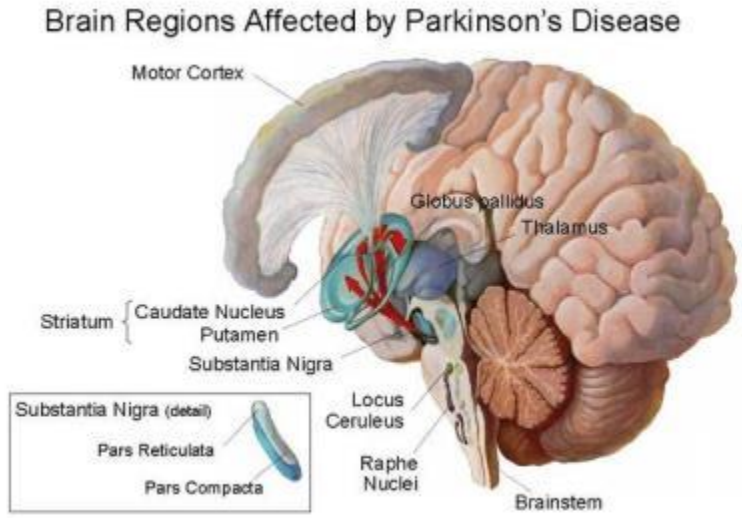




Rural Successes

Parkinson's Care





Parkinson's disease

Rural Successes

Retinopathy Screening

Investigation of factors on compliance with ophthalmic follow-up after diabetic retinopathy screening

Kerry N. Cotter[1], James T. Patrie, MS[2], Paul A. Yates MD, PhD[3]

1: Center for Telehealth, University of Virginia, Charlottesville, VA; 2: Department of Public Health Sciences, University of Virginia, Charlottesville, VA; 3: Department of Ophthalmology, University of Virginia, Charlottesville, VA

Introduction

While teleophthalmic screening offers expanded coverage, better patient compliance with annual diabetic eye screening, and demonstrated cost-effectiveness, this system is only effective when identified patients from screening adhere to follow-up recommendations and are treated in a timely manner.

Diabetic retinopathy (DR) is the leading cause of blindness among adults in the developed world and is a growing problem with global prevalence of type II diabetes projected to reach 439 million adults by 2030. Vision loss from severe diabetic retinopathy jeopardizes individual quality of life as well as places considerable financial burden on both individuals and society. Early detection and timely intervention can be 90% effective in preventing severe vision loss; therefore, population screening and subsequent follow-up for early signs of diabetic retinopathy is of paramount importance.

Figure 1. Depiction of vision loss due to DR.

Methods

This study was designed to investigate potential factors impacting patient compliance with the recommended initial ophthalmic follow-up examination after detection of diabetic retinopathy or other pathology on tele-ophthalmic screening images. We examined patients who completed screening at University Medical Associates (UMA), a UVA primary care clinic during a 26-month period. A 45° macula-centered image of each eye was captured by a nurse. Images were read by a UVA ophthalmologist; patients with evidence of DR or other pathology were contacted, and an appointment was scheduled at the UVA Eye Clinic. Patient demographic and health characteristic data were analyzed via multivariate logistic regression to determine which patient factors had a significant influence on compliance with ophthalmology follow-ups.

Figure 2. Patient Demographics (n = 632)

Male	308	49%	Black	318	60%	Self-Pay	236	37%	Mean HbA1c	8.4	
Female	324	51%	Asian	3	<1%	Private	60	10%	Mean BMI	34.3	
Mean Age	56		Hispanic	27	4%	Medicare	262	42%	Mean Systolic BP	138.5	
DM Type I	19	3%	Other	19	3%	Medicaid	73	12%	Mean Diastolic BP	75.9	
DM Type II	613	97%	White	265	42%	Other	1	<1%			

Results

Of the 734 patients who completed a DR screening and were recommended to follow-up with an ophthalmologist, 632 had a scheduled follow-up and at least one primary care appointment at UMA in the 12 months prior to the screening. Of these patients, 478 (75.6%) were compliant and completed the follow-up within the recommended timeframe. 154 (24.4%) were not compliant.

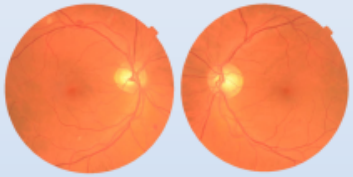


Figure 3. Screening images of the retina.

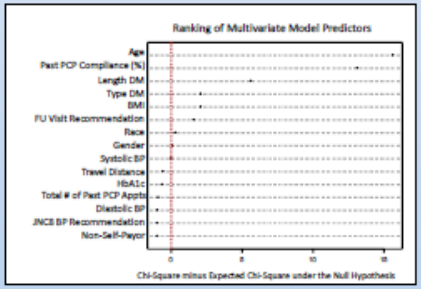


Figure 4. Multivariate logistic regression showed that age and past primary care appointment compliance (%) were the significant factors influencing ophthalmic follow-up adherence ($p<0.001$).

Predictor	Ratio	Odds Ratio (95% CI)	*P* value
Age	X + 10 years : X years	1.54 (1.25, 1.91)	<0.001
Past PCP Appointment Compliance (%)	X + 10% : X%	1.14 (1.07, 1.23)	<0.001

Figure 5. The odds that a patient would return for follow-up increased by a factor of 1.54 for each 10-year increase in age and by 1.14 for each 10% increase in past primary care appointment compliance.

Conclusions

As the number of telehealth programs is increasing, studies are needed to examine the sustainability and scalability of these programs in order to ensure long-term effectiveness. DR screening programs have shown improved access to short-term ophthalmic care, but have yet to demonstrate effectiveness in maintaining a patient's ability to access and comply with long-term eye care, which is especially important for patients with chronic diseases like diabetes. We believe that identifying those at highest risk of non-adherence to follow-ups (i.e. younger patients and patients with lower historical primary care appointment compliance) would help efforts towards increasing timely adherence to appointments, thus improving patients' ability to manage diabetic eye disease.

Diabetic retinopathy is irreversible; only further damage can be prevented. By making a screening program available to underserved patients, we have the critical opportunity to intervene and halt the progression of diabetic retinopathy, but only if the patient complies with subsequent follow-up exams. Therefore, it is very important to study patient compliance behavior. If we know which types of patients to target, we can implement various methods to help these at-risk patients adhere to future appointments, such as extra attention and motivation supplied by primary care providers and the assignment of case managers to patients. In addition, we can develop technology to help patients adhere to follow-up appointments, such as online scheduling, automatic phone reminders, maps showing proximity of care, etc.

While this study only examined teleophthalmology, we can suspect that other areas of telemedicine have similar outcomes with patient compliance. This data can help telemedicine providers design program protocols and understand the patients they serve. The better patient behaviors are understood, the more effective we can be at managing chronic diseases and improving patient care outcomes.

Questions or comments, please contact Kerry Cotter at kcbs@virginia.edu.
Special thanks to Samantha Sims, CMI, the photographer at UMA.

Rural Successes

High Risk OB

Perinatologists and Advanced Practice Nurses Collaborate to Provide High Risk Prenatal Care in Rural Virginia Communities

Christian Chisholm, M. D.[1], Wendy Cohn, PhD[3], Wendy Novicoff, PhD[3], Karen Rheuban, M. D.[2] Sharon Veith, MSN[1, 2]
Departments of Obstetrics & Gynecology[1], Pediatrics[2], Public Health Sciences[3], University of Virginia, Charlottesville, VA 22908

BACKGROUND

- Adequate and early access to risk-appropriate prenatal care can reduce the incidence of adverse outcomes.
- Access disproportionately affects women of low socioeconomic status and limited English proficiency in rural communities.
- Distance, cost of frequent travel, and limited number of perinatologists are barriers to high risk prenatal care in rural communities.
- Telemedicine has shown favorable results in a variety of clinical disciplines.
- Telemedicine can reduce barriers expanding the reach of perinatologists in collaboration with Advanced Practice Nurses.

DESCRIPTION OF PROGRAM

- The University of Virginia is a tertiary care center for a large rural geographic area in Virginia.
- Access to a perinatologist for high risk prenatal care can require travel up to three hours each direction.
- Prior to initiation of telemedicine at the initial telemedicine site, data revealed 45% of pregnant women who had been referred for on-site care at UVA did not keep a single appointment.
- Local clinics already serving the targeted population solicited as partners. (health departments & federally-qualified health center)
- Collaborative High Risk Prenatal Care Telemedicine clinics initiated in 5 rural locations between 2009 and 2012. (Culpeper, Harrisonburg, Lexington, Staunton, Waynesboro)
- Training for Advanced Practice Nurses (APN) and other nursing staff led by UVA perinatologists.
- Hands-on prenatal care at the local site provided by APN such as NP's & CNM, including initial and subsequent prenatal exams.
- Telemedicine visits conducted in real time via secure video teleconference with patient, APN, other staff at local site and perinatologist at hub site.
- Pregnant women in clinics could opt for traditional care on-site at UVA or telemedicine care at remote site.

REFERENCES

1. *ANGELS Annual Report.* (2010). Little Rock: University of Arkansas for Medical Sciences, ANGEL Program, www.uams.edu/angels.
2. Brooten, D., et. al. (2005). APN-Physician collaboration in caring for women with high-risk pregnancies. *Journal of Nursing Scholarship, 37*(2), 178-184.
3. Conger, M., & Plage, K. (2008). Advanced nursing practice in rural areas: connectedness versus disconnectedness. *Online Journal of Rural Nursing and Health Care, 8*(1), *http://www.rno.org/journal/ ISSN: 1539-3399.*
4. Lea, D., (2006). Expanding nurses' roles in telemedicine & genetics services. *MCN, American Journal of Maternal Child Nursing, 31*(3), 185-189.
5. Morrison, J., Bergauer, N., Jacques, D., Coleman, S., & Stanziano, G. (2001). Telemedicine: cost-effective management of high-risk pregnancy. *Managed Care,* http://ftp.managedcaremag.com/archives/0111/0111.peer_highrisk.html?page=2.
6. Nesbitt, T., Marcin, J., Daschbach, M., & Cole, S. (2005). Perceptions of local health care quality in 7 rural communities with telemedicine. *The Journal of Rural Health, 21*(1), 79-85.

STUDY QUESTIONS

1. Does the use of telemedicine improve access to subspecialty prenatal care for at-risk pregnant women in rural areas?
2. Does the use of telemedicine for high risk prenatal care improve perinatal outcomes for women from rural areas?
3. Are pregnant women satisfied receiving high risk prenatal care through telemedicine?

METHODS

- IRB approval obtained.
- Comparison group identified as patients referred to UVA from same clinics prior to initiation of telemedicine.
- Chart review to obtain demographic, patient access, and pregnancy outcome measures before and after initiation of telemedicine.
- Patient satisfaction survey mailed after delivery.
- Demographic, patient access, and pregnancy outcome data for pregnant women referred before and after the initiation of telemedicine clinics were compared using two-sample t-tests and chi-square tests.

RESULTS

Demographics

	Pre-telemed N = 181	Telemed N = 375	Comparison p-value
Age: mean	27.13 years	28.70 years	0.004
Hispanic Ethnicity	78%	48%	0.000
Gravidity	2.60	3.14	0.000
Race: White	80.1%	86.7%	0.000
Race: Black	3.8%	9.6%	
Medicaid	10.69%	41.12%	0.000
Self Pay	89.31%	51.07%	

Table 1: Demographics of pre-telemedicine and telemedicine patient populations.

Access to Care

	Pre-telemed N = 144	Telemed N = 323	Comparison p-value
Entry into prenatal care	13.6 weeks	13.8 weeks	0.758
Total visits	5.26	6.46	0.004
Missed ≥ one visit	57.1%	21.3%	0.000
Saved patient travel	N/A	162,126 miles	N/A

Table 2: Access to Care Measures for pre-telemedicine and telemedicine patient populations.

Outcomes

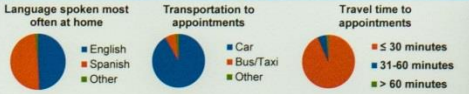
	Pre-telemed N = 144	Telemed N = 323	Comparison p-value
<37 Completed weeks (Preterm)	16%	17.3%	0.008
Gestational age: mean	37.88	37.97	0.777
Birth weight: mean	3137	3226	0.700
NICU days: mean	22.11	13.42	<0.010

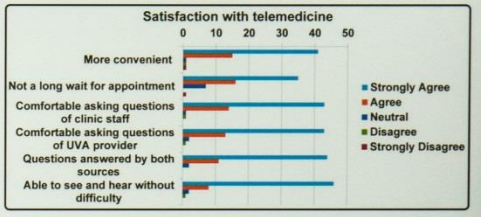
Table 3: Outcome Measures for pre-telemedicine and telemedicine patient populations.

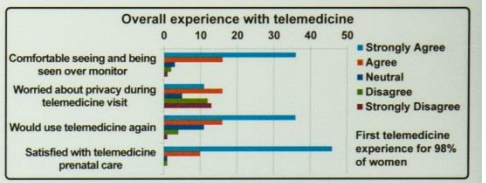
PROJECT SUPPORT

1. Governor's Productivity Investment Fund, Christian Chisholm PI (2008).
2. HRSA Telehealth Network Grant Program, Karen Rheuban PI, Christian Chisholm, Co-PI (2009-2012).

TELEMEDICINE PATIENT SATISFACTION N = 59







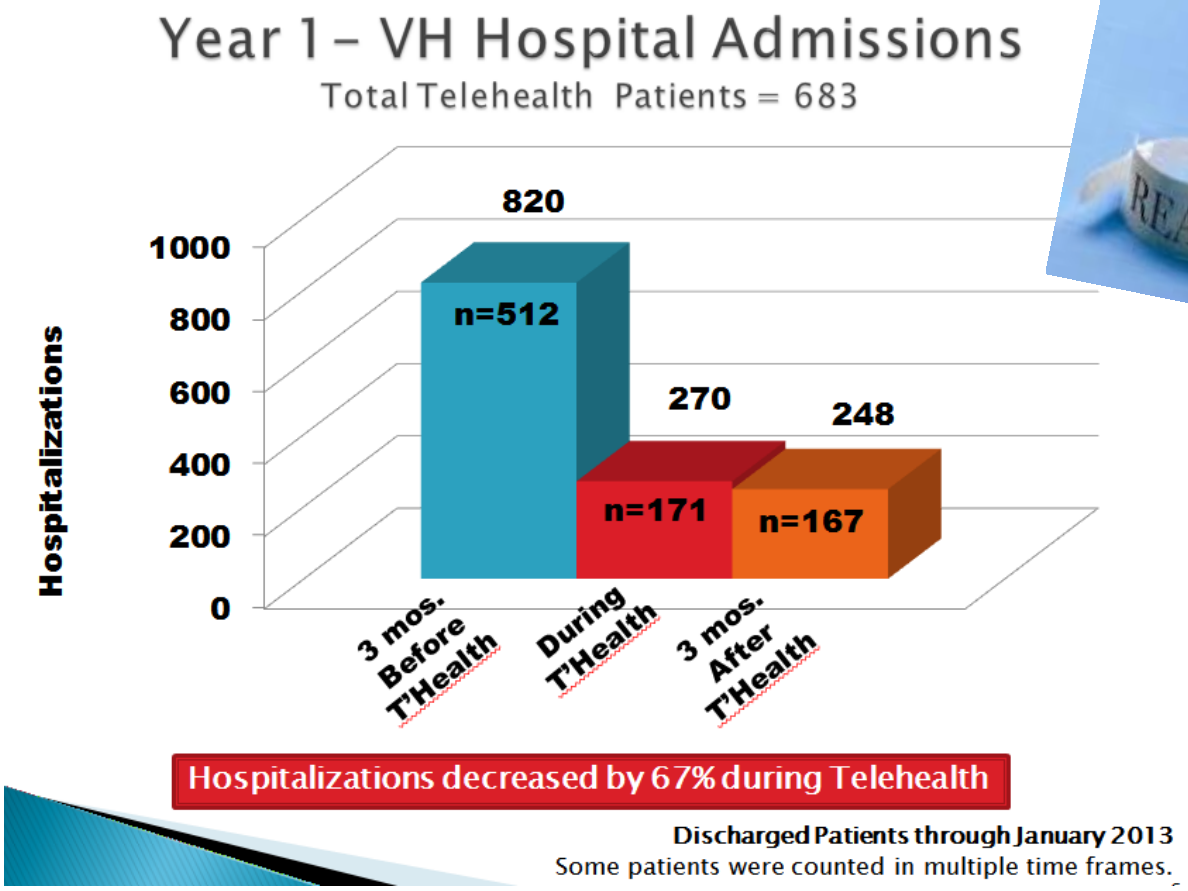
CONCLUSIONS

Collaborative care through telemedicine is an effective method for providing high risk prenatal care to women living in rural communities. When compared to a traditional referral clinic, telemedicine was associated with:

- *Improved access to care:* fewer patients missed visits (21.3% vs 57.1%); increase of 1.2 average prenatal visits; and 162,126 miles in travel saved.
- *Comparable rates of outcome measures:* prematurity, birth weight, and NICU admissions.
- *Reduced mean NICU stay* by 8-9 days.
- *High patient acceptance of telemedicine;* some women were concerned about privacy of health information.
- Limitations: limited follow-up, some missing data due to patient availability.

Rural Successes

Remote Patient Monitoring: Real Patients/Real Outcomes – Medium Sized Rural Health System



Rural Successes

Remote Patient Monitoring: Real Patients/Real Outcomes – Small Rural FQHC Look-Alike

- 72% decrease in costs
- 50% decrease in hospital bed days
- 81% decrease in ER visits

Roanoke Chowan Community Health Center
You Can Feel The Difference

Mosaic Medical
Real People. Real Care.

Replication in Oregon with Toolkit Coming Soon!

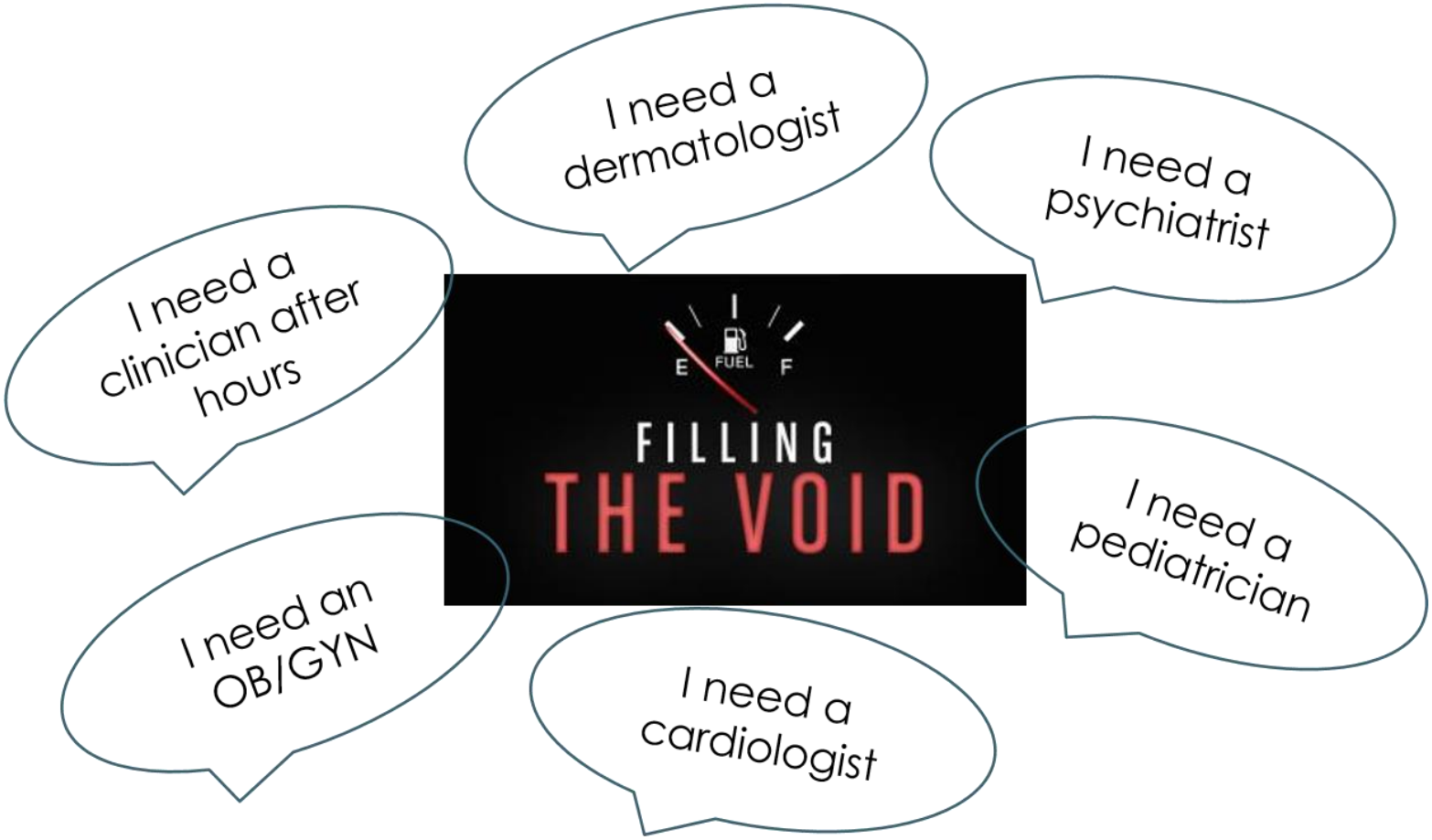
http://cotnexperience.blogspot.com/p/blog-page.html

Rural Successes

- Chronic Pain
- Palliative Care
- Dementia Care
- HIV/AIDS
- Epilepsy
- Rheumatology
- Addictions
- Hepatitis C
- Diabetes
- Weight Management
- Osteoporosis
- Developmental Pediatrics
- Psychiatry
- High Risk Pregnancy
- And Many More…

Access

Reasons for Adoption Abound



Reasons for Adoption Abound

Costs

Reasons for Adoption Abound

Readmission Penalties

Recruitment and Retention

Unnecessary Transfers

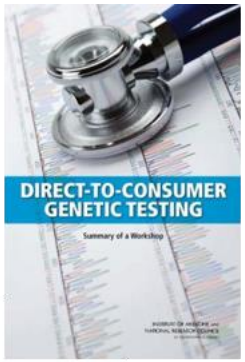
Meaningful Use Penalties

Medical Errors

Reputation and Patient Satisfaction

Around the Bend

Around the Bend



Growing Telehealth Options – On-Demand Medicine

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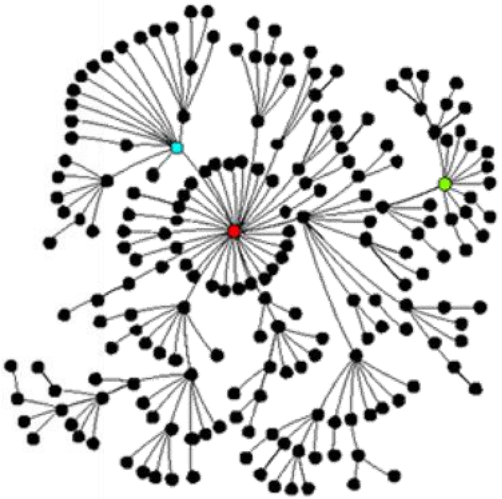
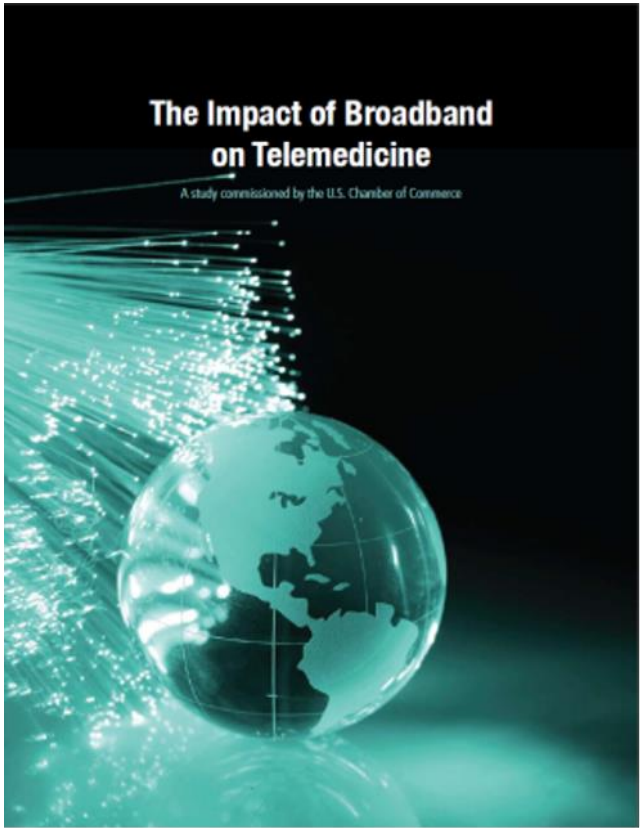


THINK Health

Source: THINK-Health curated list of telehealth companies, 24 September 2015

Rural Disparities



U.S. Chamber of Commerce, April 2009

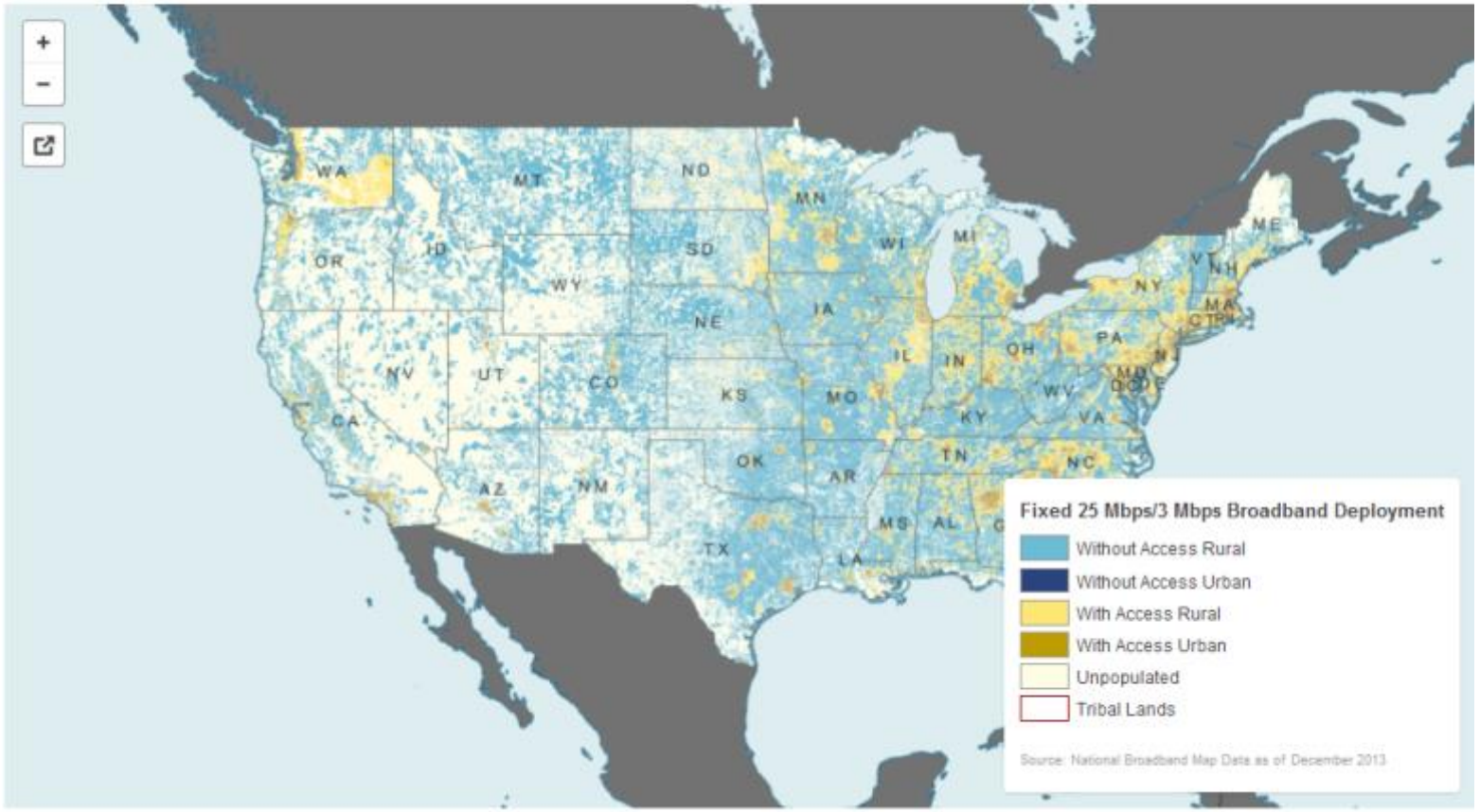
TELEMEDICINE CAN'T HELP THE PEOPLE WHO NEED IT THE MOST

WIRED, August 2015

"Telemedicine has been a buzzword for years now, but the rural communities that could benefit most from it also have the least access to fast and reliable Internet—an obvious prerequisite."

Rural Disparities?

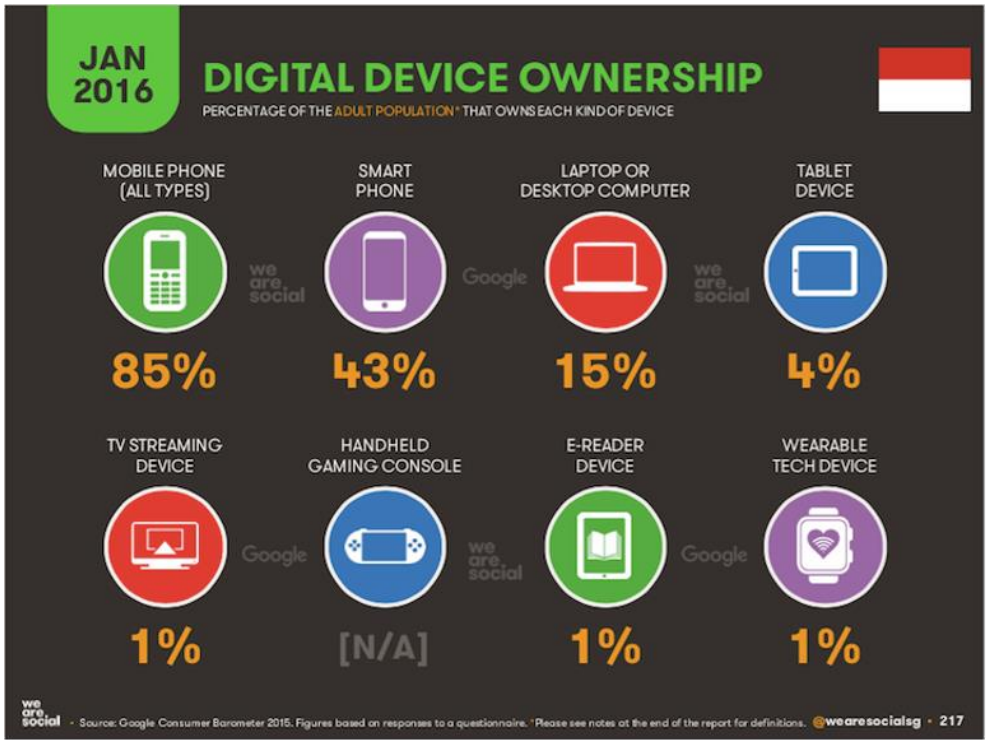
Fixed 25 Mbps/3 Mbps Broadband Deployment Map (2015 Broadband Progress Report)



Rural Disparities

FRIDAY, FEBRUARY 28, 2014

Rural and urban cellphone use are equal, but rural users are much less likely to have smartphones



Mid-Atlantic Telehealth Resource Center

Policy Changes

+ A –

FCC votes in favor of allowing Lifeline low-income subsidies for Internet plans

By Roger Fingas
Thursday, June 18, 2015, 11:46 am PT (02:46 pm ET)

The Federal Communications Commission on Thursday voted 3 to 2 in favor of extending the U.S. government's Lifeline program to offer subsidies for broadband Internet, and not just basic phone service.

Policy Changes

FCC ruling may pave way for better cell coverage in rural America

By Spencer Chase

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WASHINGTON, Oct. 20, 2014 - A decision by the Federal Communications Commission may further efforts to bridge the gap between urban and rural America.

The FCC unanimously voted on Friday to adopt a report and order that it says will "promote deployment of the wireless infrastructure necessary to provide the public with ubiquitous, advanced wireless broadband services," the commission said in a release.

Intentional Design

CARE	PAST	PRESENT	FUTURE
Location	Home	Clinic/Hospital	**Anytime/Anywhere**
Provider	Generalists	Specialists	**Team**
Interaction	Frequent	Episodic/ Periodic	**Continuous**
Relationship	Personal	Impersonal	**Personal**
Unit	Family/Community	Individual	**Population**
Focus	Health	Disease	**Prevention**

Who We Are?

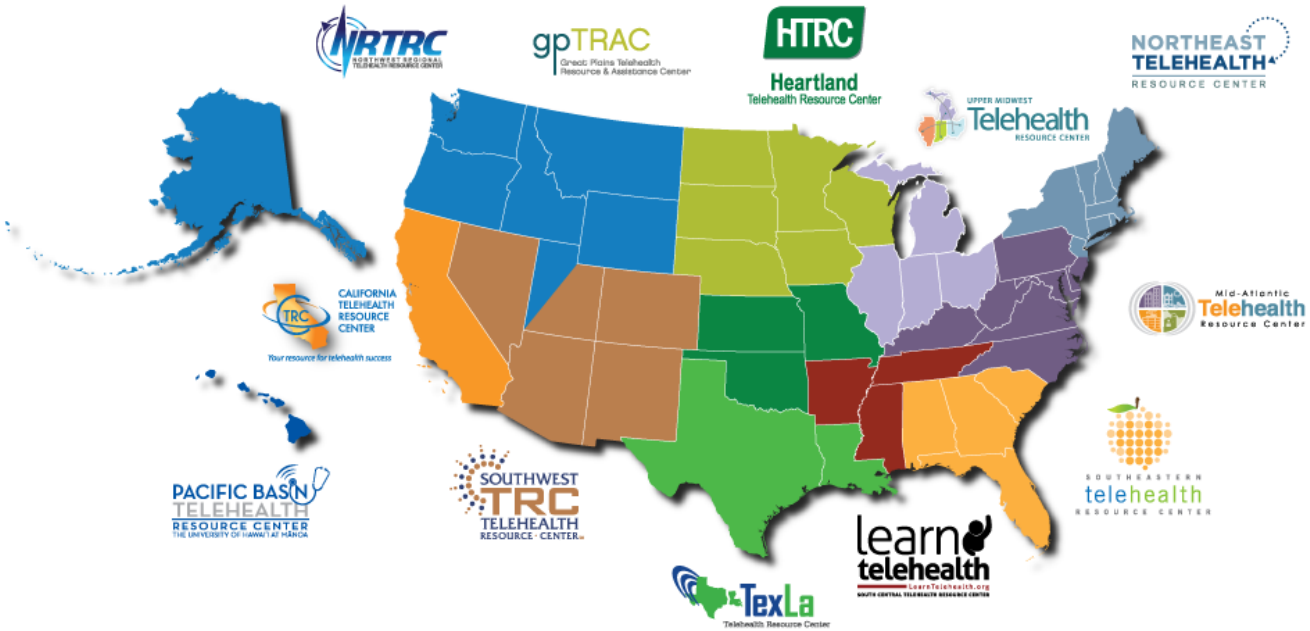
TELEHEALTH RESOURCE CENTERS

TRCs are funded by the U.S. Department of Health and Human Service's Health Resources and Services Administration (HRSA) Office for the Advancement of Telehealth, which is part of the Office of Rural Health Policy.

U.S. Department of Health and Human Services
HRSA
Health Resources and Services Administration

Who We Are?

TelehealthResourceCenters.org



TTAC TelehealthTechnology.org

Center for Connected Health Policy

2 National Resource Centers

NRTRC	gpTRAC	NETRC
CTRC	HTRC	UMTRC
SWTRC	SCTRC	MATRC
PBTRC	TexLa	SETRC

12 Regional Resource Centers

Mid-Atlantic Telehealth Resource Center

Contact

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