WVU Heart & Vascular Institute™

Vascular Care in Rural America and the Role of Community-Engaged Research to Optimize Outcomes

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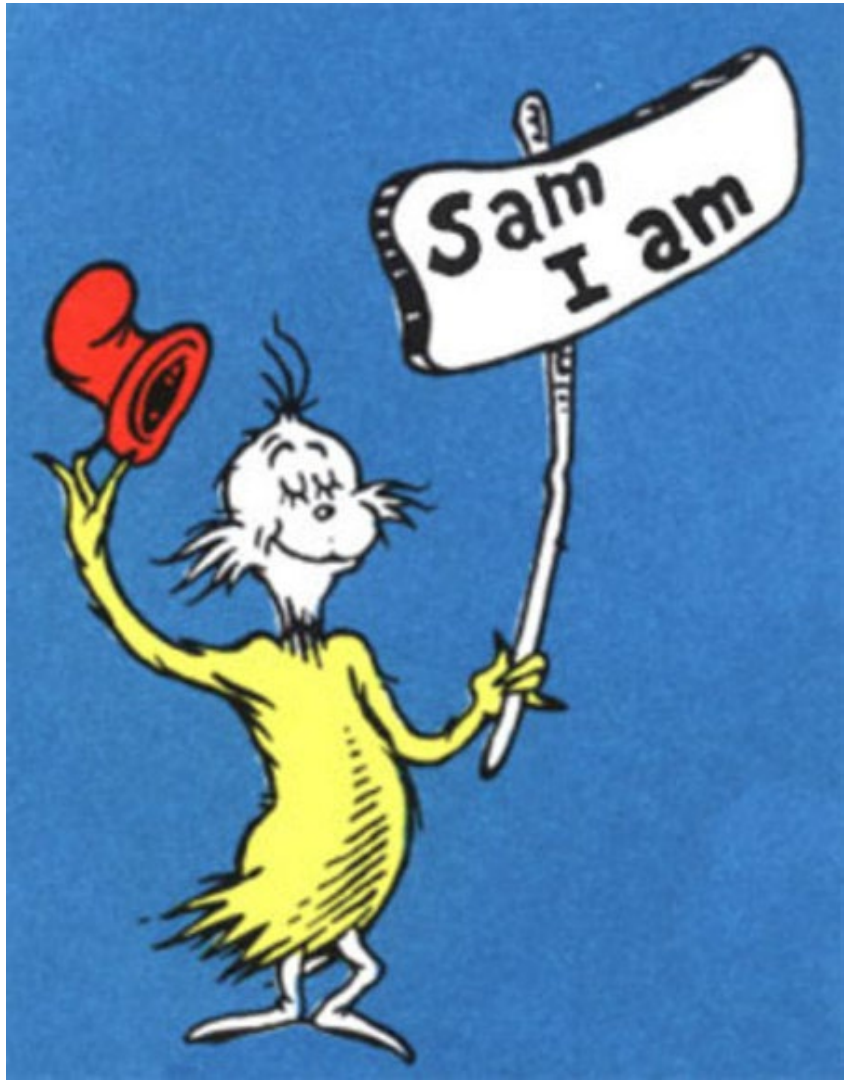
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Today's Talk

- Rural health in America
- The social determinants of health and their application to health disparities in PAD/diabetes-related amputation
- Community-engaged research as a tool to address amputation disparities
- My work
  - Mixed methods approach to understanding amputation in WV
  - Implementing a community-engaged amputation prevention intervention in a high-risk rural area

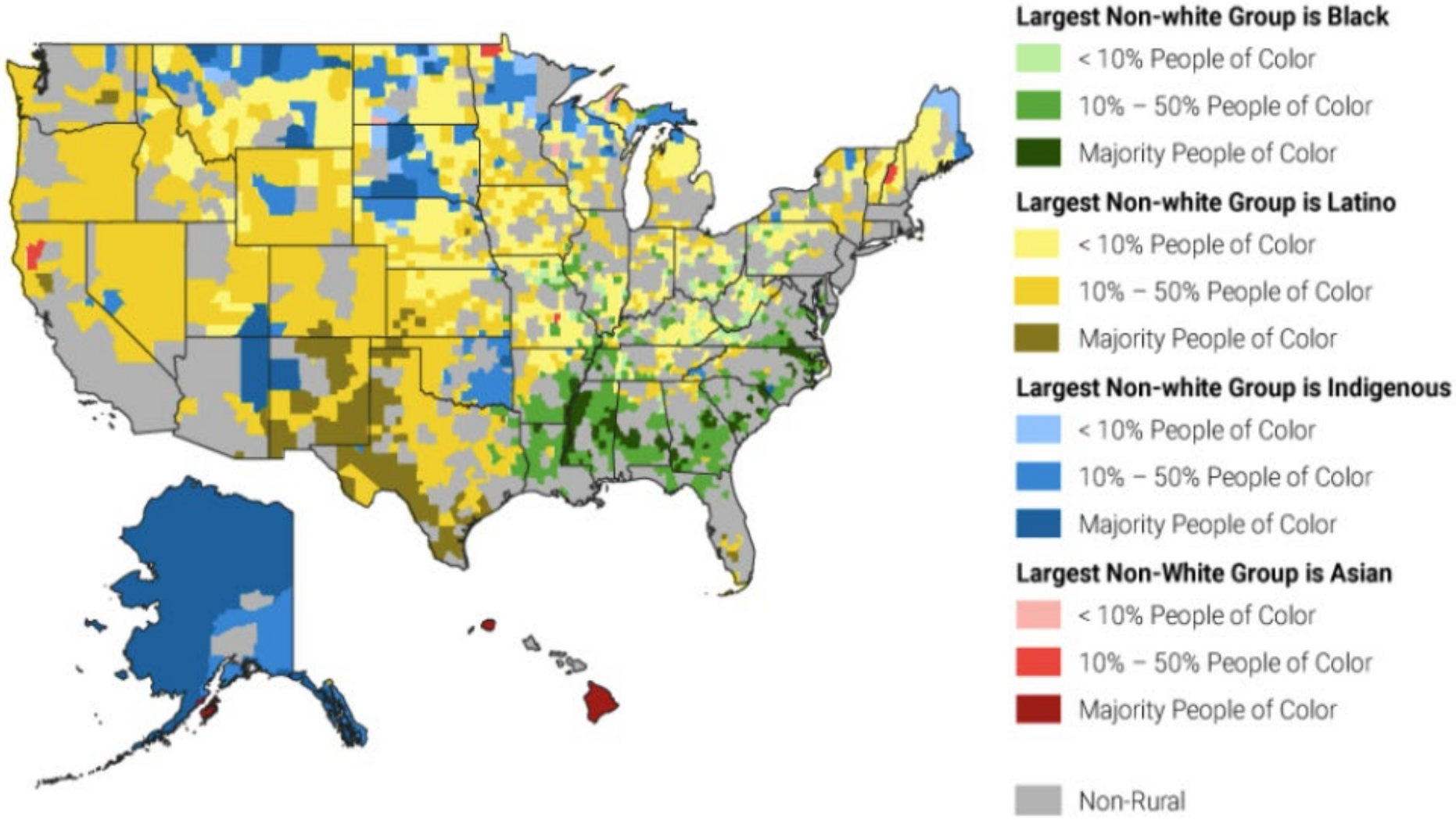
Rural populations in America

- 85% of US land mass
- 17-49% of the population (>2 dozen rural definitions in use!)

https://www.cdc.gov/nchs/data_access/urban_rural.htm#2013_Urban-Rural_Classification_Scheme_for_Counties.

https://www.ers.usda.gov/webdocs/publications/105155/eib-246.pdf?v=2184.8

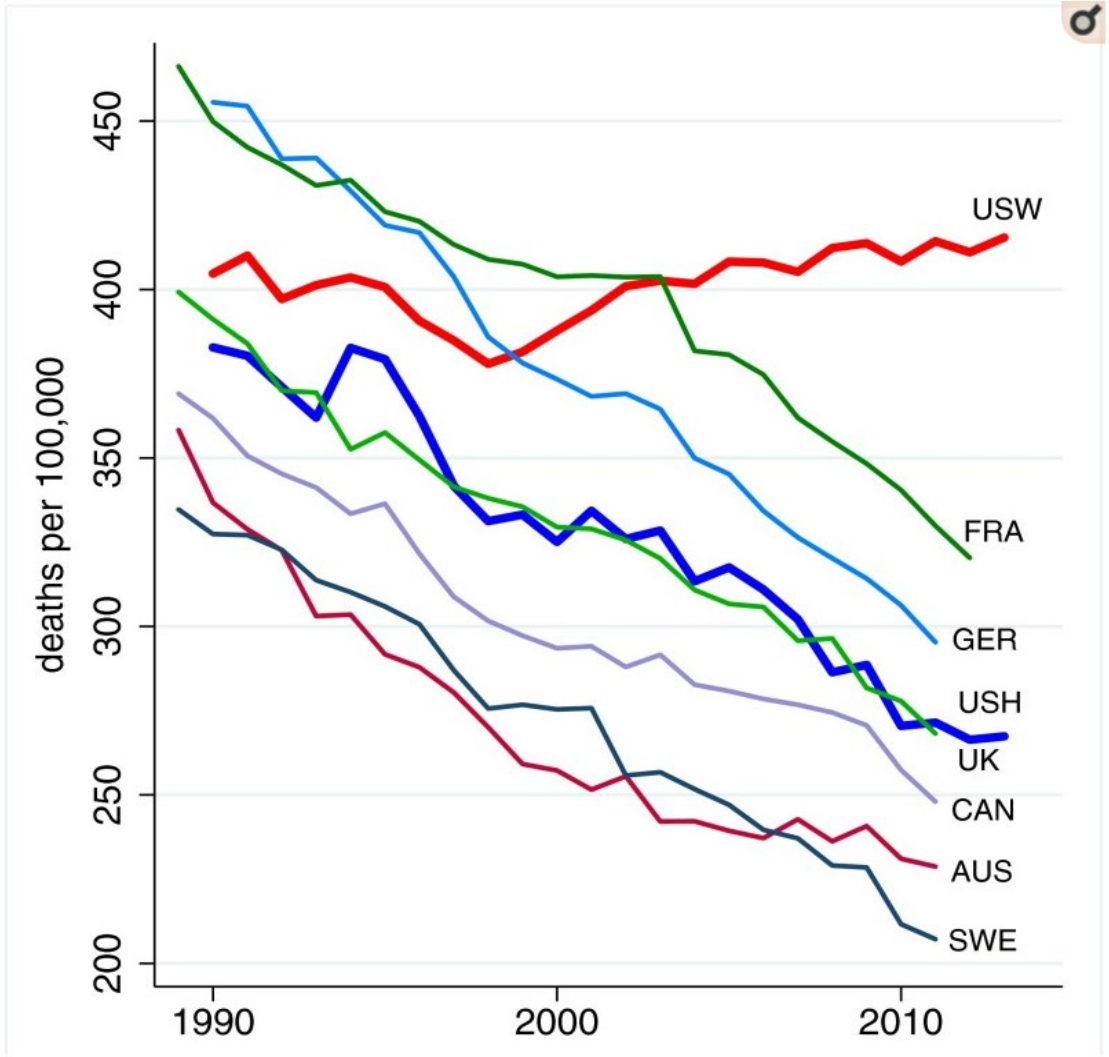
Rural America is not a monolith



https://www.brookings.edu/blog/the-avenue/2021/09/28/mapping-rural-americas-diversity-and-demographic-change/

Rural populations have significant risk factors for vascular disease

- Compared to urban counties:
  - Older population
  - Higher poverty rate
  - Riskier health behaviors
  - More chronic disease
  - Higher death rates (20% higher)
- Causes of death in rural areas: CAD, CVA, CA, COPD, deaths of despair



All-cause mortality, ages 45–54 for US White non-Hispanics (USW), US Hispanics (USH), and six comparison countries: France (FRA), Germany (GER), the United Kingdom (UK), Canada (CAN), Australia (AUS), and Sweden (SWE).

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Rural populations face unique challenges

Social Determinants of Health

- “The conditions and environments in which people are born, live, learn, work, play, worship and age”
- Comprise **75%** of the risk factors that affect our health

Lowry M. Want healthier communities? Address social factors. Voices 2018; http://www.publichealthnewswire.org/?p=address-social-factors
Bierman AS and Dunn JR. Swimming upstream. Access, health outcomes, and the social determinants of health. J Gen Intern Med 2006; 21: 99–100.

When it comes to health – Where you live matters

Case study: Amputation disparities in vascular surgery

85% of lower-limb amputations are preceded by a foot ulcer

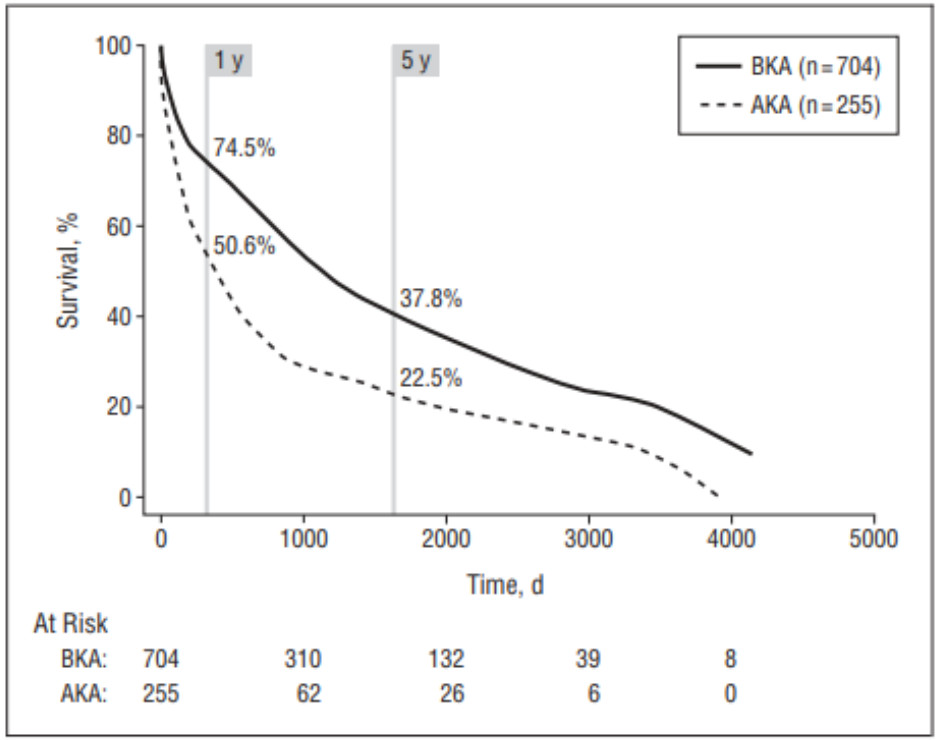


Figure 1. Actuarial survival in below-knee amputation (BKA) patients vs above-knee amputation (AKA) patients ($P<.001$).

Aulivola B, Hile CN, Hamdan AD, et al. Major lower extremity amputation: outcome of a modern series. Arch Surg. 2004;139(4):395-399; discussion 399.

Amputation is a marker for quality of care

Most Recent Data:
4.9 lower extremity amputations per 1,000 adults (2016)

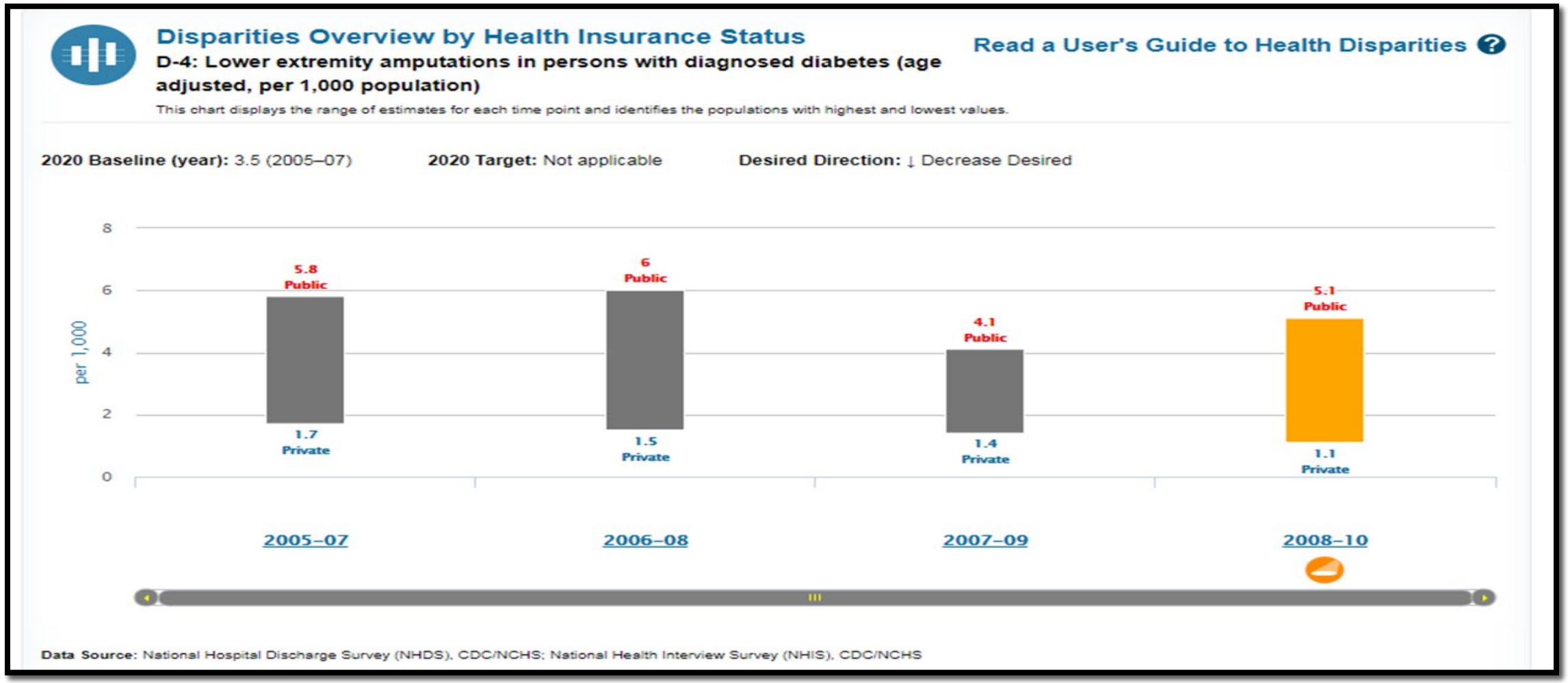
Target:
4.3 per 1,000

Desired Direction:
Decrease desired

Baseline:
4.9 lower extremity amputations per 1,000 adults aged 18 years and over with diagnosed diabetes occurred in 2016 (age adjusted to the year 2000 standard population)

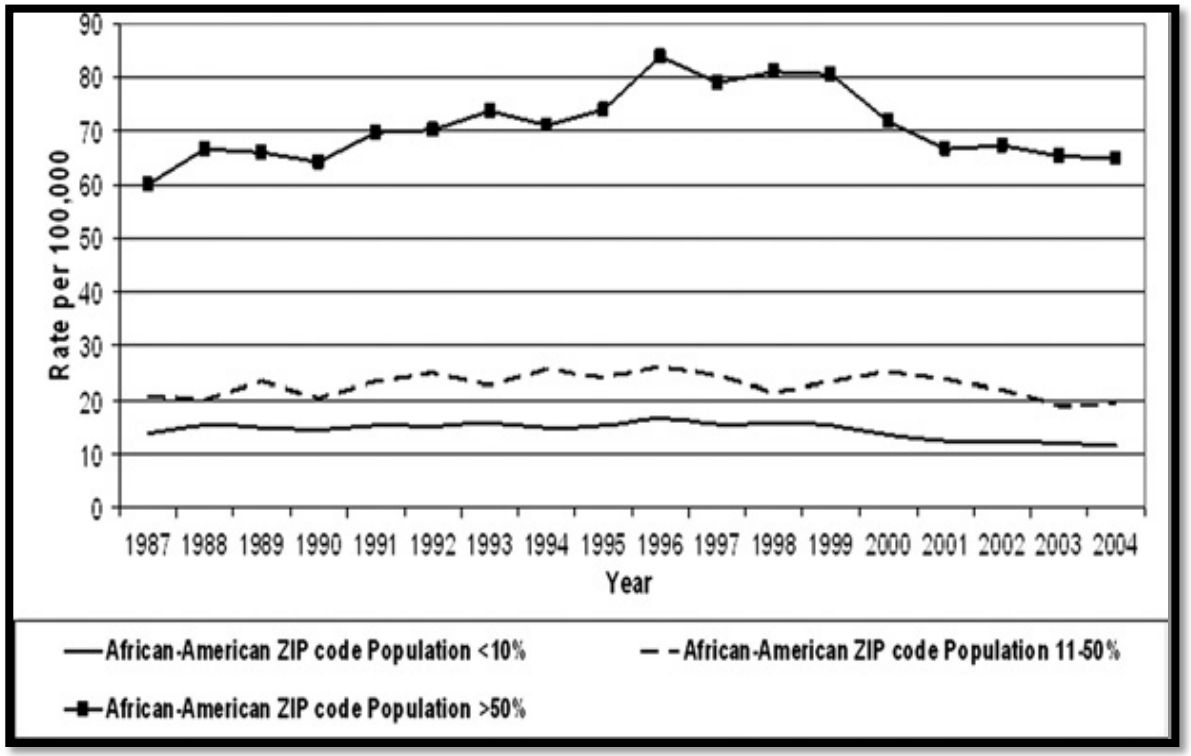
https://health.gov/healthypeople/objectives-and-data/browse-objectives/diabetes/reduce-rate-foot-and-leg-amputations-adults-diabetes-d-08

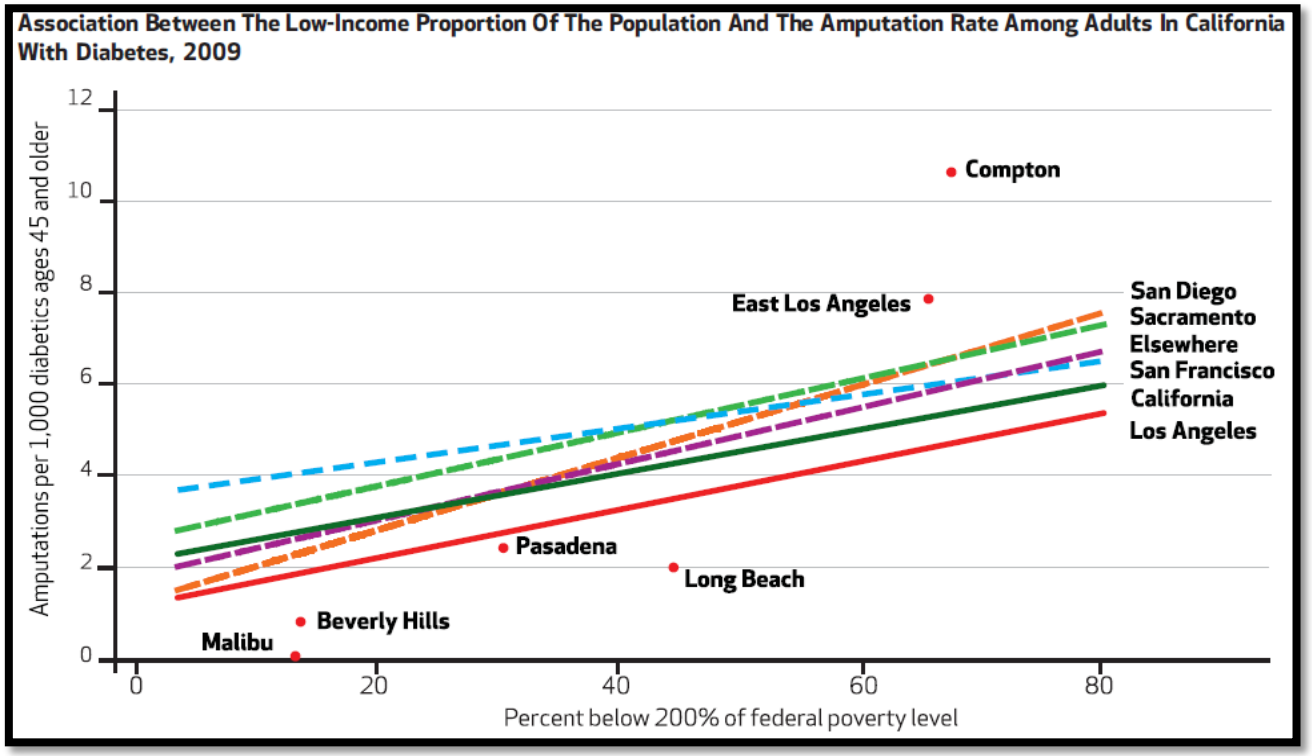
Amputation disparities related to race and socioeconomic status are well documented



https://www.healthypeople.gov/2020/data/disparities/summary/Chart/4121/3

Race/ethnicity, SES and community are connected





Feinglass J, Abadin S, Thompson J, Pearce WH. A census-based analysis of racial disparities in lower extremity amputation rates in Northern Illinois, 1987-2004. In. Journal of Vascular Surgery. Vol 472008:1001-1007

Stevens CD, Schriger DL, Raffetto B, Davis AC, Zingmond D, Roby DH. Geographic clustering of diabetic lower-extremity amputations in low-income regions of California. Health Aff (Millwood). 2014;33(8):1383-1390.

Amputation and the social determinants of health

- Amputation disparities are a marker of health inequity and social injustice
- Amputation disparities are inextricably linked to community context
- Addressing amputation disparities are therefore dependent on community factors and context and are best addressed at the level of the community

“If health is socially determined, then health issues are best addressed by engaging community partners who can bring their own perspectives and understandings of community life and health issues to a project.”
- McCloskey et al.

Principles of Community Engagement, 2nd edition 2011. Clinical and Translational Science Awards Consortium, Community Engagement Key Function Committee Task Force on the Principles of Community Engagement. Ch. 1. Community Engagement: Definitions and Organizing Concepts.

Community-Engaged Research (CEnR)

- Research approach that engages community members as equal partners
- Rooted in concepts of community organizing (justice, fairness, empowerment)
- Focused on moving towards social action and sustainable change
- Like medicine, it is a blend of science and art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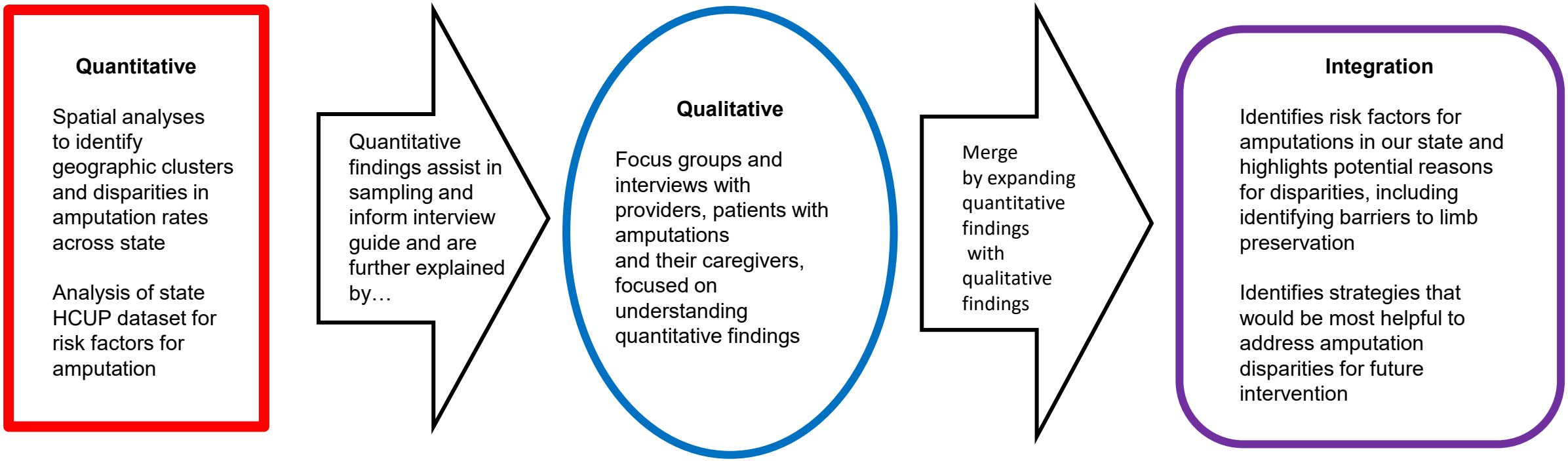
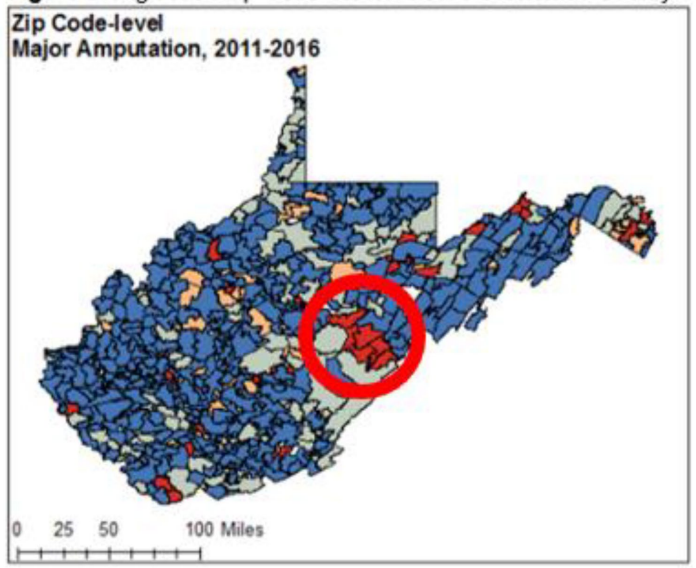
Understanding diabetes and vascular disease-related amputation in rural WV – a Mixed Methods Design



Preliminary Findings

- HCUP analysis found that DM/PAD pts in WV undergo amputations at rates 6 times higher than the rest of the country (12/1000)
- GIS analyses found significant geographic variation in amputation across the state, with a large amputation cluster in Pocahontas County (RR>1.5) despite controlling for risk factors
- Our qualitative work (informed by our quantitative findings) with 64 patients and providers found that education, geographic and cultural barriers, and care coordination were the most important barriers to limb preservation
- We brought these findings to public health officials, primary care providers and key community stakeholders in Pocahontas

Figure 2. High-Risk Zip Code Cluster near Pocahontas County



Save a leg, Save a life: A Community-Engaged Project to Prevent Diabetes and Vascular Disease-related Amputation in Pocahontas County, WV

- **The Project**
  - 5-year NIH-funded (K23) practice-based research project that uses a community-engaged approach and mixed methods to develop, implement, and assess an amputation prevention intervention in Pocahontas County (PC), WV
- **The Problem**
  - Amputation is devastating yet highly preventable and serves as a marker for disparities in quality and access to care in addition to inequities in the SDOH
  - Routine foot exams to identify foot ulcers and coordinated multidisciplinary care for patients with high-risk feet has been shown to decrease amputation risk by up to 86%. However, these interventions are not widely adopted and have not been adapted to rural communities

Study Overview

- **Aim 1**
  - Leverage existing relationships to establish a multi stakeholder PAB
  - Perform M and M style case review of amputations in the county
  - Establish baseline of current DM and PAD care in outpt clinics in the county
  - Using the above data, work with PAB to adapt existing evidence-based amputation prevention interventions to develop an intervention for clinics at PC
- **Aim 2**
  - Implement intervention in 3 rural clinics and assess feasibility and acceptability
  - Collect baseline data for future efficacy study
- **Aim 3**
  - Disseminate to stakeholders and widely across state
  - Establish PABs in other high risk regions
  - Lay ground work for large scale quasi experimental (stepped wedge across WV) trial

Amputation cluster - Pocahontas County (PC)

- Rural area in Southeast WV, 3.5 hours from tertiary care
- Highly mountainous, (near Snowshoe), 8500 residents
- Poverty rate 18.9% (compared to 12.3% US avg)
- Cardiovascular disease deaths 313.7/100,000 (241.2/100,000)
- Diabetes deaths 34.9/100.00 (24.7/100,000)
- Northern and Southern regions designated an MUA
- Healthcare providers
  - PMH 25 bed critical access hospital with rural clinic (FQHC), wound care clinic, visiting podiatrist
  - CCWV 2 clinics (FQHC)
  - One private practice clinic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Community engagement – Project Advisory Board and Community Advisory Board

- **PAB:** 12 members
  - CCWV clinic nurse supervisor, CCWV CQO, CCWV Medical director, 4 podiatrists, physical therapist, wound care and vascular nurse from Elkins (1.5 hrs away – closest), 1 traveling podiatrist from Morgantown (goes twice a month x 12 years)
- **CAB:** 7 attendees (plus one dog)
  - Co-directed with PFRN/food pantry director, local hospital PR, local hospital diabetes educator, senior community leader, clinic nurse supervisor, day report leader, community members

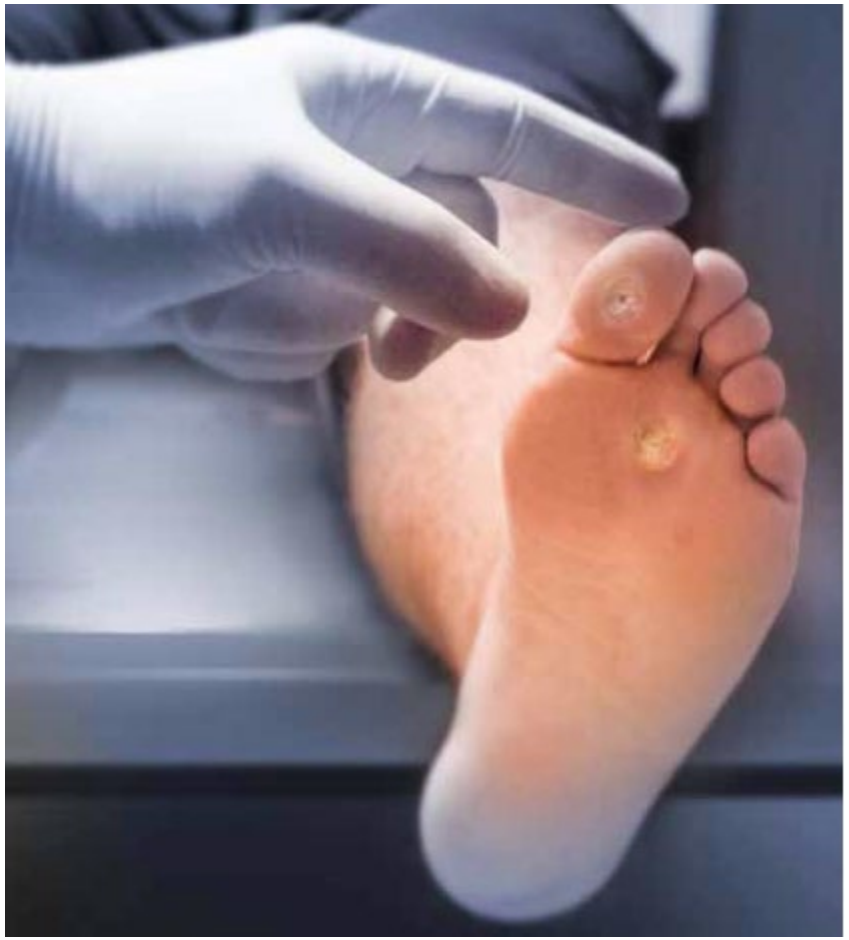
Project Advisory Board Activities

- Quarterly Zoom meetings
- Patient care needs identified
  - Transportation, food insecurity, wound care, specialists
- Chart review input
  - Informed data collection strategy
  - Checkpoint for findings
    - ~2600 individual patients screened
    - 1082 with DM/PAD risk factors (361 DM (14% prevalence), 888 PAD risk – 35 diagnosed in chart), 43% foot exam rate (national goal 76%)
- Community M and Ms
    - 37 limb complications, 6 amputations (national avg 2.4/1000 DM)
    - 1/6 amputation patients and 7/37 foot complication patients had recorded foot exam in their records

Community Advisory Board Activities

- Have met monthly in person since August 2022
- Needs identified:
  - Access to specialists, diabetes education and awareness of community resources, medication costs, transportation to clinic, food accessibility
- Outputs:
  - Diabetes resource guide (in progress)
  - Diabetes support group (started in December – meet monthly)
  - Lions club event for retinopathy planned for May
  - Applied for federal funding for project FARMacy

Aim 2: Implement and assess the feasibility and acceptability of the adapted, evidence-based amputation prevention interventions



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Clinic Focus Groups – Pre-Implementation

- Adamant that foot exams are being done
- Lack of PAD knowledge
  - “I don't know if we have anybody that comes in with PAD. We deal with diabetes a lot.”
- Frustrations getting patients to show up
  - “Even when we had that specific diabetic day, we had quite a few that did not show. It's like they don't want to deal with it, don't want to face it. So if they don't see the numbers or whatever, they don't have to deal with it.”
- Requesting wound care knowledge (basic care, supplies, referral options)

Implementation – Foot exams

Priority	Definitions	Action	Follow-up
Urgent (active pathology)	• **Open wound** or **ulcerative area**, with or without signs of infection • **New neuropathic pain** or **pain at rest** • Signs of **active Charcot neuroarthropathy** (red, hot, swollen midfoot or ankle) • **Vascular compromise** (sudden absence of DP/PT pulses or gangrene)	**Immediate** referral/ consult	**Determined by specialist**
High (ADA risk category 3)/in remission	Presence of diabetes with a **previous history of**: • **Ulcer** • **Charcot neuroarthropathy, foot deformity** or • **Lower extremity amputation** **Or, moderate risk and:** • **Unable to perform self-care** • **eGFR < 15**	**Immediate or "next available"** outpatient referral	Every **1-2 months**
Moderate (ADA risk category 2)	• **Peripheral artery disease +/- LOPS** • **DP/PT pulses diminished** or **absent** • Presence of **swelling** or **edema** • **Unable to perform self-care** • **eGFR < 15**	Referral **within 1-3 weeks** (if not already receiving regular care)	Every **2-3 months**
Low (ADA risk category 1)	• **LOPS** +/- longstanding, nonchanging **deformity** • Patient requires **prescriptive or accommodative footwear**	Referral **within 1 month**	Every **4-6 months**
Very Low (ADA risk category 0)	• **No LOPS** or **peripheral artery disease** • Patient **seeks education** on: foot care, athletic training, appropriate footwear, preventing injury, etc.	Referral **within 1-3 months**	**Annually** at minimum

Foot Exam implementation metrics – 10/27/22 – 3/9/23

- Foot exams performed: 124/174
  - Foot exam completion rate: 71.3% (baseline 43%)
  - Refusals: 37
- Complete exams (all 4 components): 101- 81% (baseline 6%)
- Abnormalities identified: 166 (69% of exams)
- Referrals made:
  - Podiatry: 20
  - Vascular: 6
  - ABIs: 0
  - Diabetes education: 1
  - Wound care: 2
  - Diabetic shoe Rx: 5

Clinic Focus Groups – 6 Months Post-Implementation

- More foot exams are being completed
- Patients are more receptive to and cognizant of foot exams
  - “Used to not ask even if their foot was falling off”; “I know that you guys have stressed this”
- Communication among staff and between staff/providers and patients has improved
  - “Everybody knows before the start of the day who the diabetics are”
- Significant lack of resources/specialty care in their area
  - “We have the hardest time getting patients their shoes”; “pretty darn extra rural”; “stars have to align”
- Would like additional education, specifically for wound care

Next up

- 9 and 12 month follow up
- Hot-foot Hotline
  - Live April, 2023
- Project ECHO
  - Begins July, 2023

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Food insecurity project (the community engagement ripple effect!)

Conclusions

- Health disparities occur within the context of the environment a person lives in and is therefore a marker for inequities in access to healthcare and other social determinants of health
- Rural populations have significant health risk factors and specific challenges in accessing care
- Empowering community members (in rural areas, and everywhere else) and building access to resources may be the key to reducing health disparities in the long-term

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  - Julie Fleming, PT Davis
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THANK YOU!
Questions?
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