



A Multifaceted Approach to Lower Cancer Mortality Rates Among American Indians

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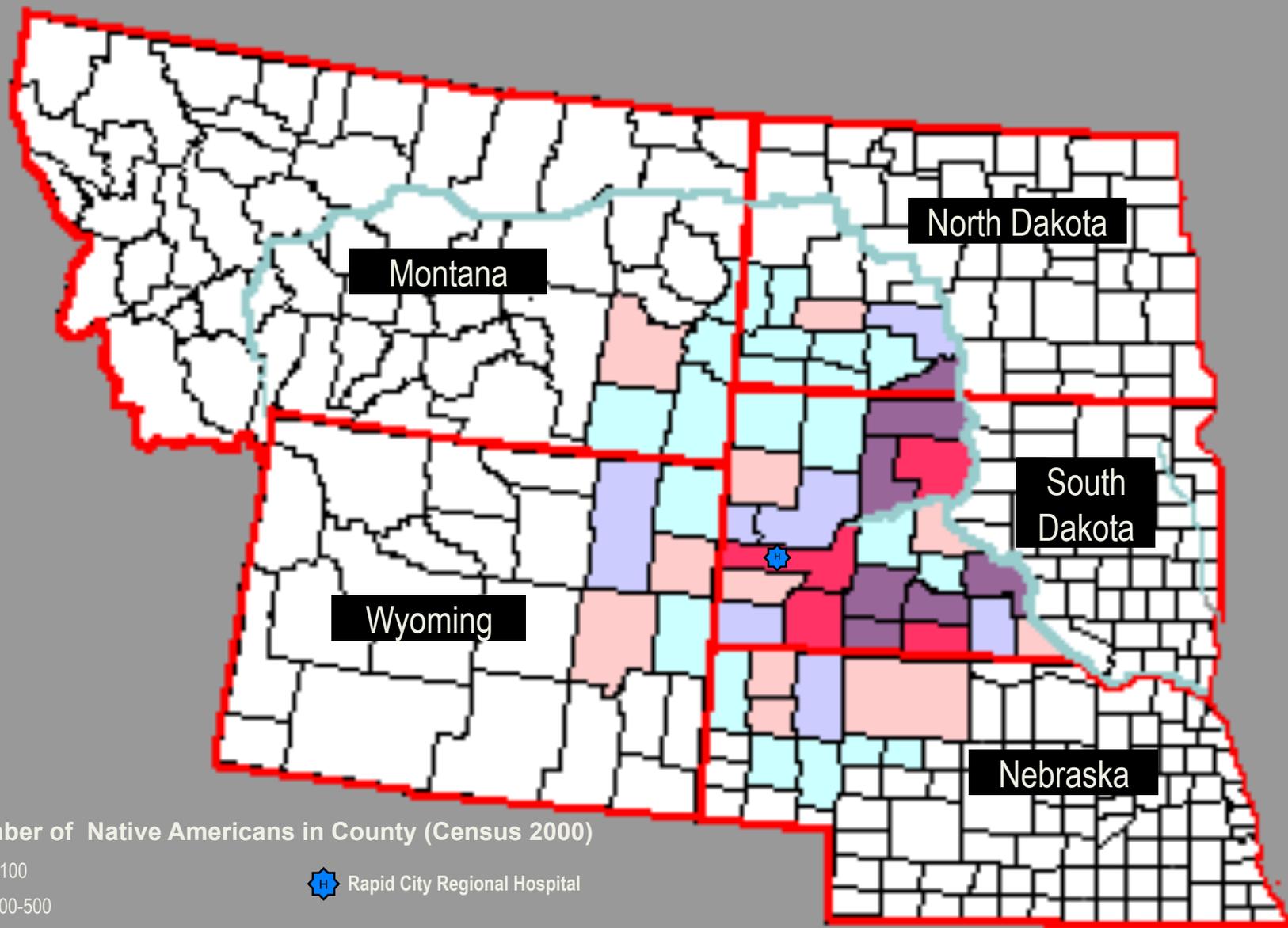


Average Annual Mortality Rates age adjusted, 1994-1998

Type rates are per 100,000	Northern Plains **	All IHS	U.S. all races
All Cancers	232.1*	129.4*	165.7
Lung/Bronchus	78.5*	33.7*	48.3
Prostate per 100,000 male	35.2*	17.0*	23.8
Colon/Rectum	27.1*	14.1*	17.1
Breast per 100,000 female	20.6	14.1*	24.2
Cervix per 100,000 female	4.5*	3.6*	2.7

** Aberdeen, Bemidji, and Billings IHS (10-state) Service Area.

Source: Espey DK, et al. Cancer Mortality among American Indians and Alaska Natives: Regional Differences 1994-1998. Indian Health Service. IHS pub. No. 97-615-28, revised October 2003. Rockville, MD.



Number of Native Americans in County (Census 2000)

- <100
- 100-500
- 500-1000
- 1000-4000
- >4000

 Rapid City Regional Hospital

Petereit et al J Clin Oncol. 2004 Nov 15;22(22):4452-5

Rogers, Petereit et al. American Journal of Public Health 95 (12):1-4; 2005

Key Elements of Disparity Project

- Phase II/III Clinical Trials
 - Prostate brachytherapy
 - Breast brachytherapy
 - IMRT / Tomotherapy
 - Reduce overall treatment duration
 - Phase II/III cooperative group trials
- Surveys
 - Address barriers to health care
 - General population
 - Cancer population
- Patient Navigator Program
 - Community education
 - Assistance with service and access issues
 - documentation and data collection
- ATM analysis
 - To determine association between ATM heterozygosity and sensitivity to radiation

Patient Navigation Summary

Two Navigation Programs

1. Community Navigation Program

- Community research representatives live each on each reservation
- Goal: promote education, outreach, networking

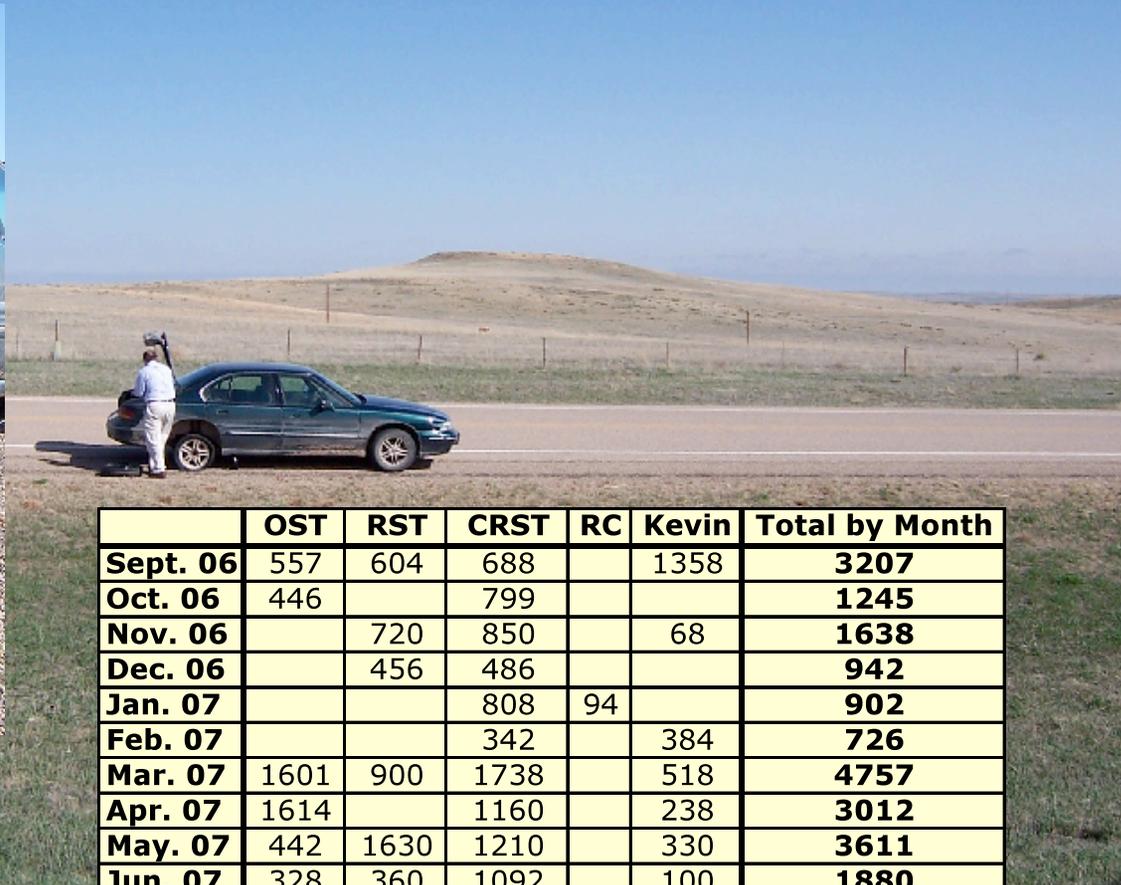
2. Cancer Navigation Program

- Goal: assist cancer patients during cancer treatment

Patient Navigation Objectives

- Education: Cancer 101 Modules
- Community surveys
- Cancer surveys
- Patient Navigation surveys
- Networking
- Lays foundation & trust for entire project

Yearly Mileage for *Walking Forward* Team September 2006 – August 2007



	OST	RST	CRST	RC	Kevin	Total by Month
Sept. 06	557	604	688		1358	3207
Oct. 06	446		799			1245
Nov. 06		720	850		68	1638
Dec. 06		456	486			942
Jan. 07			808	94		902
Feb. 07			342		384	726
Mar. 07	1601	900	1738		518	4757
Apr. 07	1614		1160		238	3012
May. 07	442	1630	1210		330	3611
Jun. 07	328	360	1092		100	1880
Jul. 07	172	360	1077		230	1839
Aug. 07		720	712			1432
TOTALS	5160	5750	10959	94	3226	25189

Average Treatment Interruptions Impact Patient Navigation

Treatment Delays in Days	N	Mean	95% Confidence Interval		Sign.
			lower	upper	
Control Group (curative radiation/ not navigated during treatment)	74	4.45	1.132	4.855	0.002
Experimental Group (curative radiation/ navigated during treatment)	42	1.45			

Petereit, Molloy et al. Patient Navigator Program to Reduce Cancer Disparities in the American Indian Communities of Western, South Dakota. *Cancer Control: Journal of the Moffitt Cancer Center*. July 2008

Petereit DG et al The adverse effect of treatment prolongation in cervical carcinoma. *Int J Radiat Oncol Biol Phys* 32:1301-1307, 1995

Cancer Survey: Knowledge and Attitudes

- Native Americans scored lower on screening knowledge battery ($p=0.0001$) and exhibited more negative attitudes about cancer treatment than non-NA's ($p = 0.0001$)
- In multivariable analyses, Native American race was the only factor found to be significantly predictive lower screening knowledge and more negative attitudes about cancer treatment, even when adjusting for income, education, and geographic remoteness.

Guadagnolo BA, Cina K, Helbig P, Petereit D. Assessing Cancer Stage and Screening Disparities Among Native American Cancer Patients. When Free Primary Care is not Enough. Public Health Reports 124:79-89, 2009

Cancer Survey: Persistent Stage Disparity

- Native Americans presented with more advanced-stage screen detectable cancers than non-NAs (breast, cervix, colorectal, prostate) 45% vs. 24%, $p=0.04$.
- Of patients with screen-detectable cancer, the identifying diagnostic was a screening test for 68% of white vs. 37% of Native American patients. ($p=0.006$).

Community Survey

Adjusted Odds ratios for Cancer Screening

	Cervix	Breast	Prostate	colorectal
	OR	OR	OR	OR
Age				
41-60	0.66†			
61-80	0.69†	2.14‡	2.92§	2.14§
Male	n/a	n/a	n/a	0.82
Education**				
High school	1.25	1.33	3.45	2.8
> High school	0.91	1.47	2.56	1.93
Frequency of physical exams††				
More than once a year	2.75	2.04	0.45	2.24
One time a year	2.1	1.13	0.62	2.05
Every 2-3 years	3.19	2.88	‡‡	‡‡
Doctor or nurse recommended cancer screening	4.94	5.20	8.58	6.37

*Bold type indicates significance at $p < .05$

†Baseline category for comparison is: age 21-40

‡Baseline category for comparison is: age 41-60

§Baseline category for comparison is: age 51-60

**Baseline category for comparison is < high school

††Baseline category for comparison is never had physical exam

‡‡Too few individuals in this category to estimate an odds ratio

Conclusions from the Community Survey

- Cancer screening was markedly underutilized in this sample.
- Only forty-four percent of individuals reported ever receiving cancer screening.
- Strongest determinant of receiving cancer screening overall or for a specific cancer site was a screening recommendation by a doctor or nurse.
- Planned interventions: to be discussed

Phase II Trial HDR Brachytherapy

Stage I and II Breast Cancer: Rapid City PI Petereit

- Similar criteria as previous APBI RTOG trial
 - 34 Gy/10 Fxs
- Endpoints:
 - Evaluate the rate of acute, late toxicities
 - Efficacy, local control, cosmesis
- 32 pts (4 AIs) enrolled on clinical trial out of about 100 total procedures
 - 12 pts interstitial technique, 20 pts Mammosite
 - 2 G3 toxicity: recurrent infection requiring drainage
 - both with Mammosite technique

Phase I/II Prostate Hypofractionation Trial

University of Wisconsin (Low Risk Disease) Mark Ritter, MD, PhD, PI

Collaborators:

- Clinical:

- Patrick Kupelian, MD Anderson, Orlando
- Jeffrey Forman Wayne State University
- Dion Wang Medical College of Wisconsin
- Daniel Petereit Rapid City, South Dakota

- Physics/Radiobiology:

- Wolfgang Tomé University of Wisconsin
- Jack Fowler University of Wisconsin

- Statistics:

- Richard Chappell University of Wisconsin

Phase I/II Prostate Hypofractionation Trial Low-Risk Disease (Low Risk Disease)

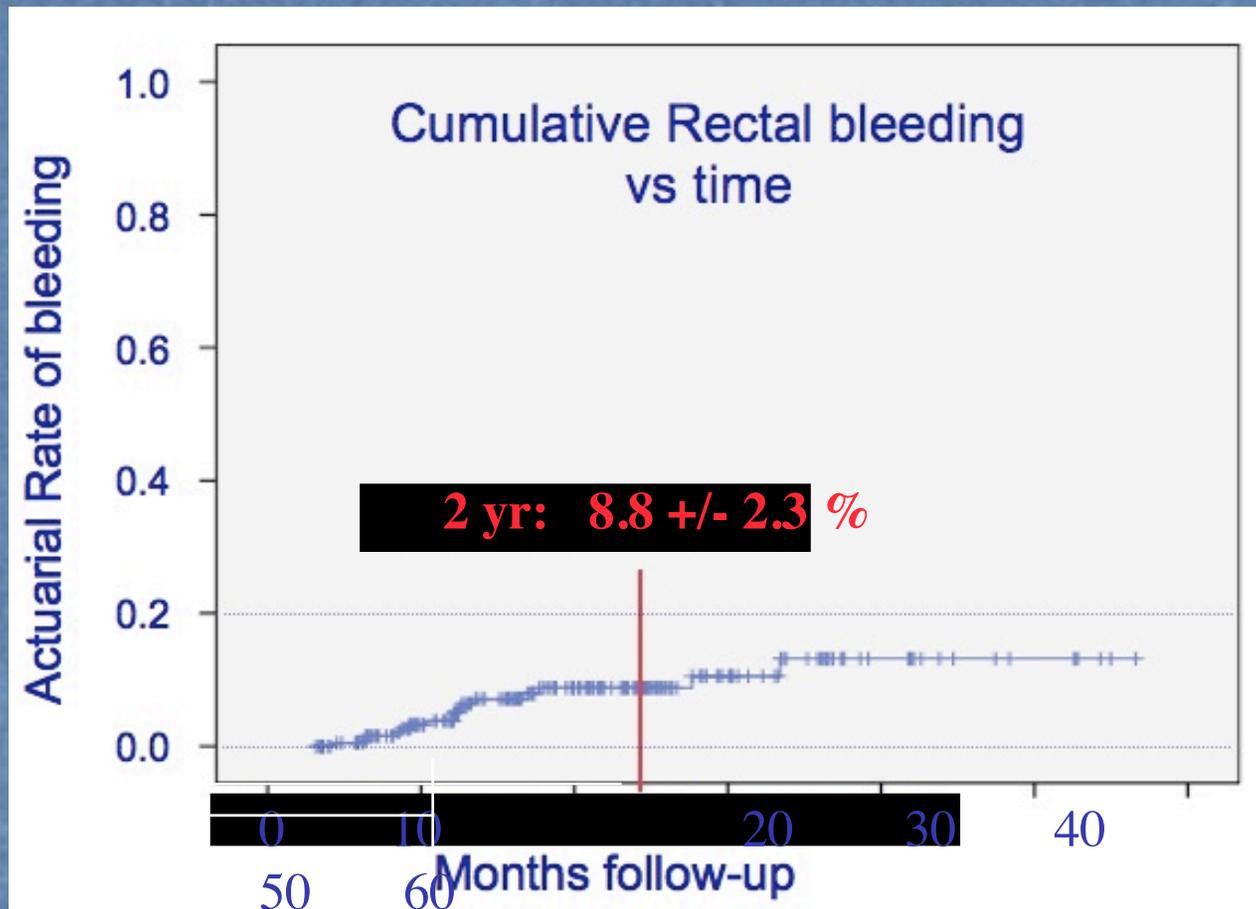
Mark Ritter, MD, PhD, PI

Fract. Level	Dose per Fx (Gy)	# Fxs	Total dose (Gy)	Tumor NTD (alpha/beta =1.5)
I	2.94	22	64.68	82.6
II	3.63	16	58.08	85.1
III	4.3	12	51.6	85.5

Predicted late toxicities equivalent to 75-77 Gy in 2 Gy fractions

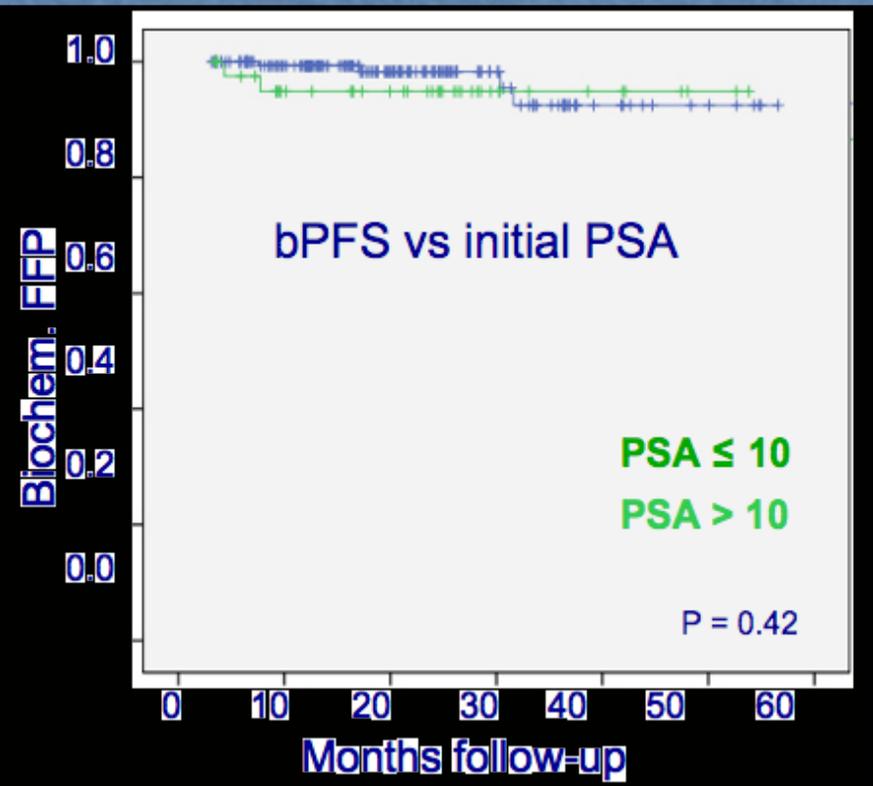
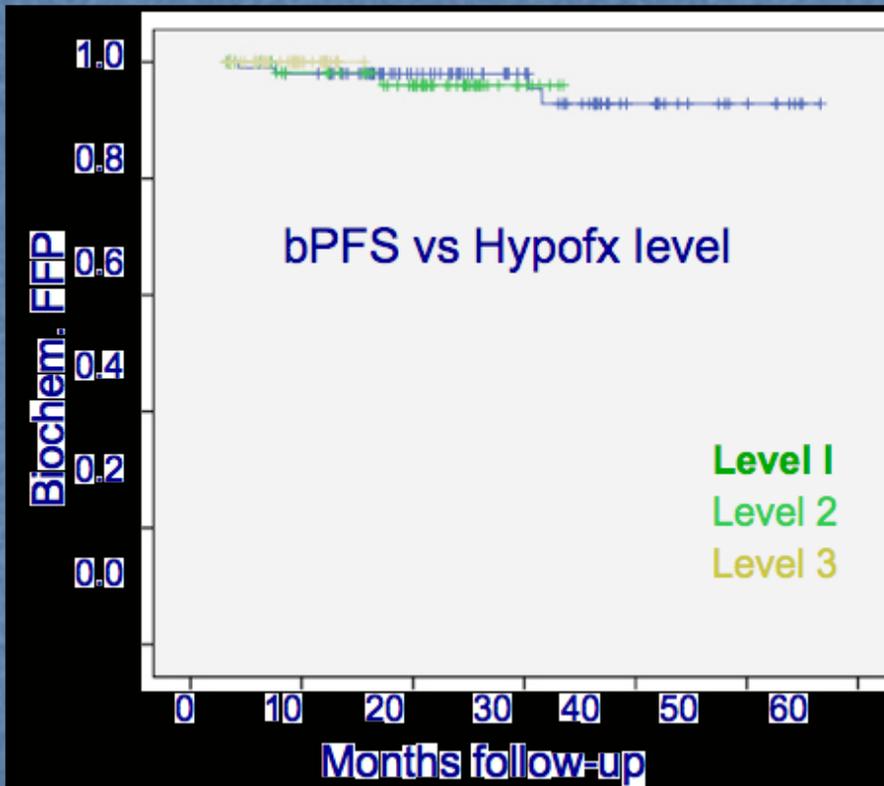


Rectal Bleeding



Biochemical control (early results)

(nadir + 2)



Phase II Study IMRT PSI Boost for Intermediate to High Risk Prostate Cancer

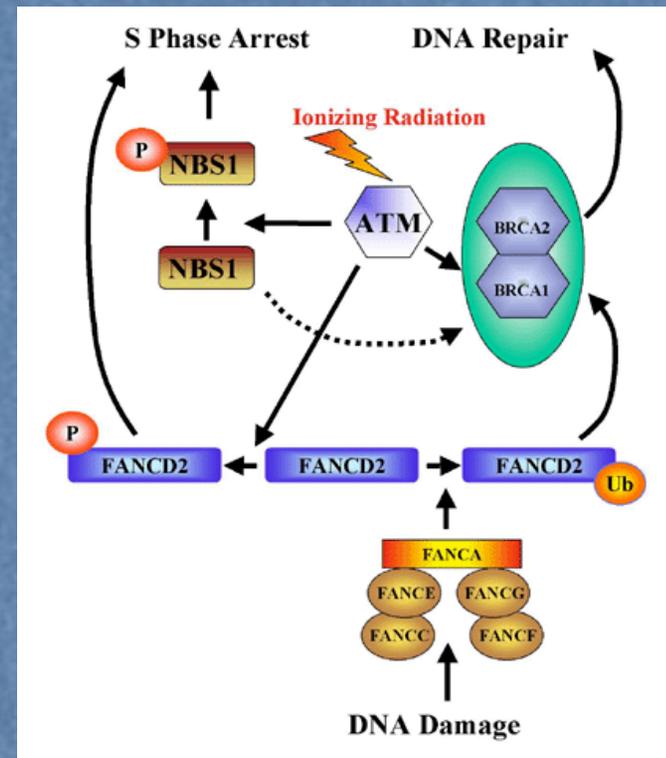
- Patient eligibility: intermediate to high risk prostate cancer, low risk LN involvement, high risk capsular penetration
 - Similar criteria to RTOG 0815
- Androgen ablation: 6 to 12 months
- EBRT 2.2 Gy X 16 over 15 treatment days, PSI boost 110 Gy (I-125)
- Endpoints:
 - Evaluate the rate acute, late toxicities
 - Efficacy HDR boost
- 6 pts (1 Als) enrolled
- No G3 toxicities

High-Risk Prostate Phase II IMRT Protocol: PI Mark Ritter, MD, PhD

- 28 fractions
 - 56 Gy pelvic LNs
 - 70 Gy prostate (Kupelian regimen)
- Number of patients enrolled
 - Rapid City: 8 patients
 - UW: 37 patients
- Adkison, JB et al ASTRO 2008 Poster Pelvic Nodal Dose Escalation in Conjunction with Hypofractionated IMRT for High Risk Prostate Cancer (N=37)
 - Dosimetric analysis and preliminary results
 - Acute toxicities: G2 GU 40%, G2 GI 16%
 - Late toxicities : 1 G3 GU (temporary foley)
No GU G2 and above
 - 3 biochemical failures

ATM mutations in Native Americans: Possible Association with Cancer and Radiotherapy Toxicities

- PIs: Moser, A. & Petereit, D.
- To determine the association between ATM heterozygosity and sensitivity to radiation
- Gene sequencing & analysis underway
Amy Moser, PhD, UW
- Rapid City enrollment:
 - 95 American Indians
 - 52 non-Natives
- Study closed



ATM Preliminary Results

- DNA was isolated from 153 NA and non-NA undergoing radiation therapy for various cancers. 141 samples have been all or mostly sequenced.
- Variants were identified in 18 of 62 sequenced exons
 - 16 exonic variants would result in an AA change, functional change protein
 - 5 exonic variants would not change AA
 - 5 exonic variants may be new compared to current literature

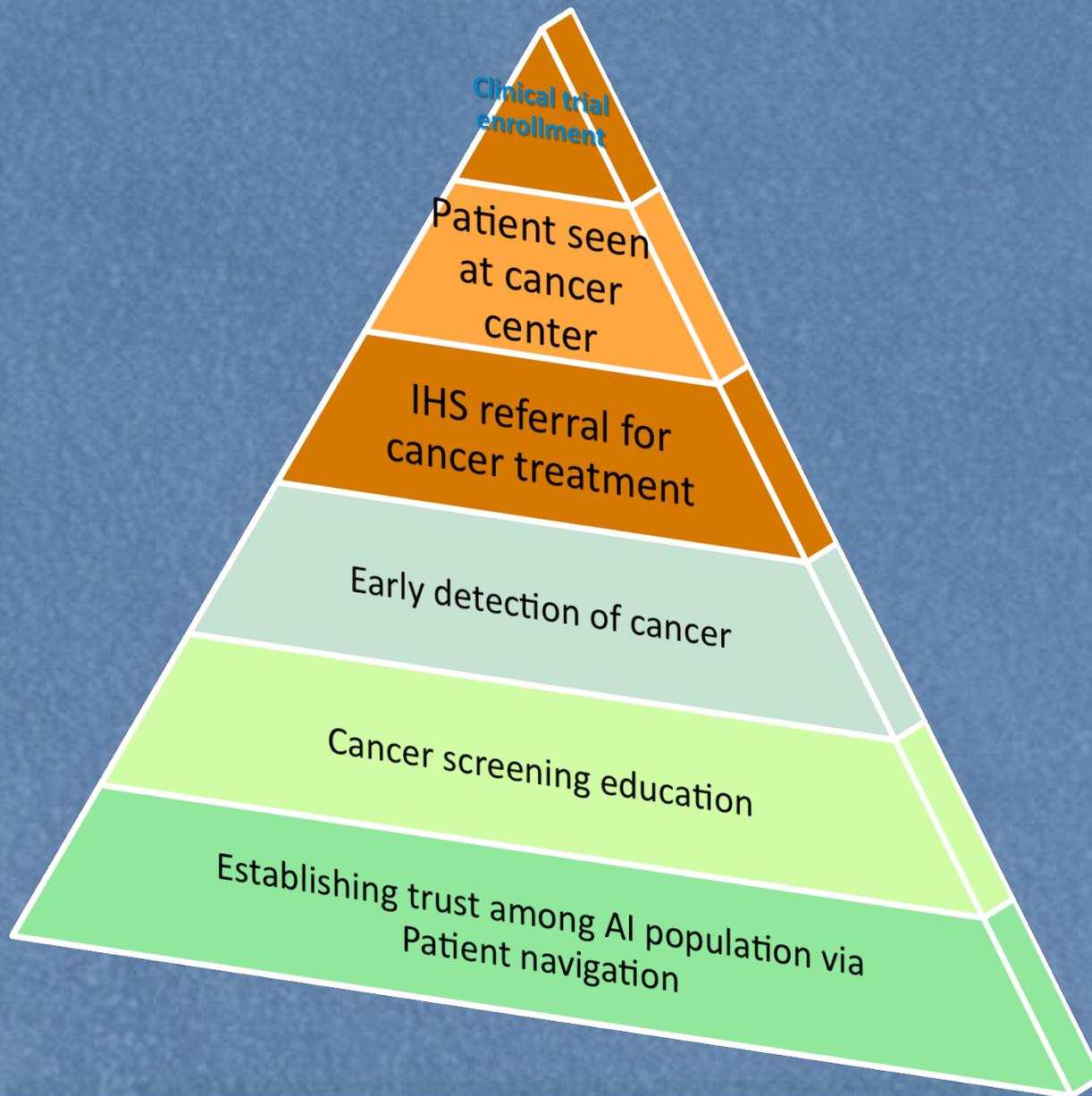
Petereit DG, Burhansstipanov L. Establishing Trusting Partnerships for Successful Recruitment of American Indians to Clinical Trials. Cancer, Culture & Literacy feature of Cancer Control: Journal of the Moffitt Cancer Center. July 2008.

Patients Entered on Research Trials During the Walking Forward Era (2002-2008)

Research Study	Als	Non-Als	Total
CDRP treatment trials	10	81	91
Cooperative Group Trials	27	270	297
ATM	90	52	142
Patient Navigation	325	0	325
Community Survey	984	0	984
Cancer Survey	193	150	343
GRAND TOTAL	1629	553	2182

Clinical Trial Development

- Difficulty accruing to phase III trials where one arm involved a temporally shorter treatment time.
- ?-Need for increase in the number of phase II trials for common disease sites at various stages of presentation to increase inclusiveness for underserved populations.



Walking Forward Navigator-Driven Community Education and Screening

- Goal: Expand and enhance a Navigator-driven cancer education and screening program with American Indians (AIs) in the Northern Plains
- Aim: Increase AI screening for breast, cervix, colorectal, and prostate cancers by 20%
- Educational modules using audience response systems
- Analysis underway: 325 participants to date

Continuation of Walking Forward

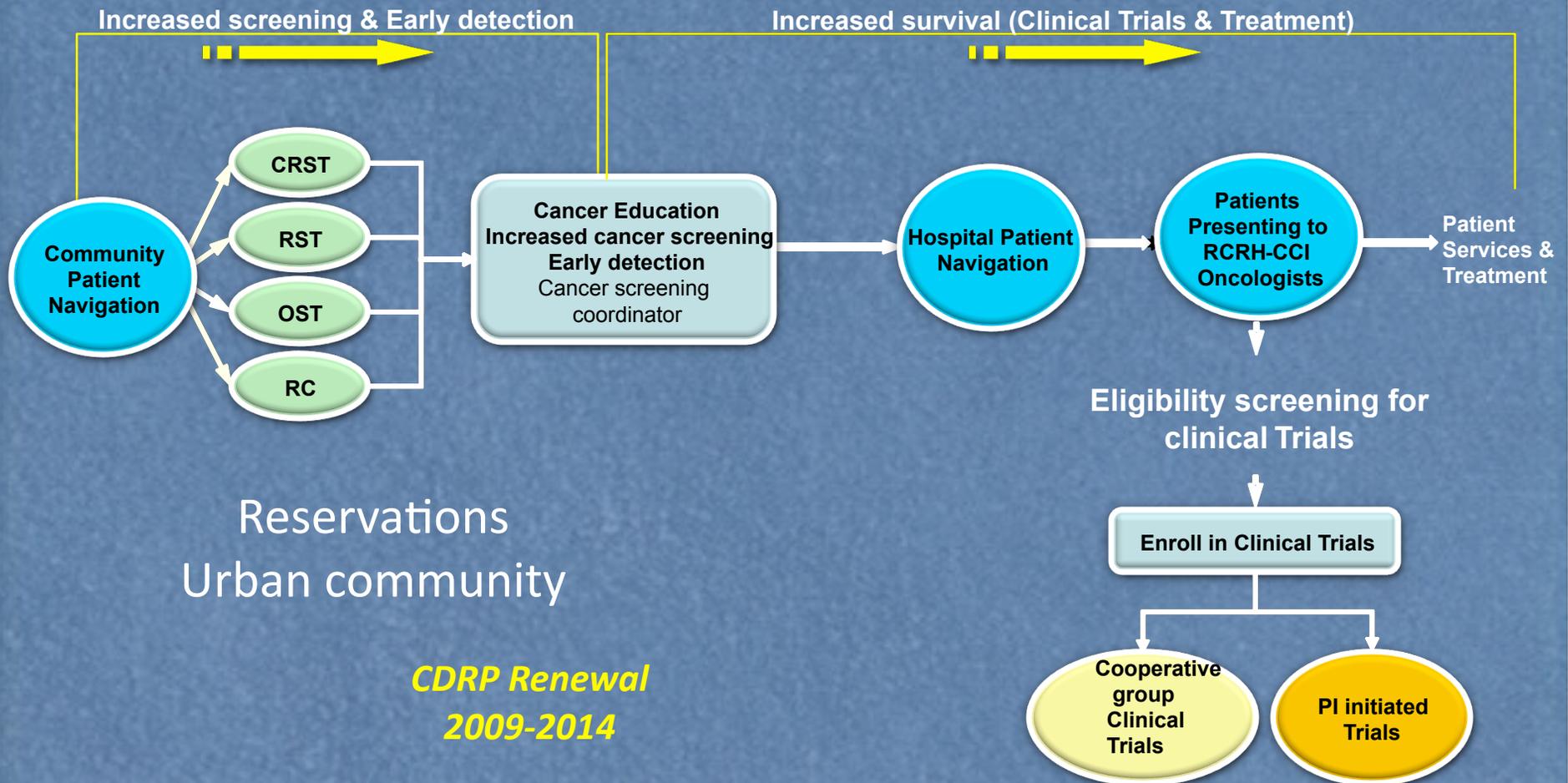
Specific Aim 1: Expand the current patient navigation program using hospital and community-based navigators.

Specific Aim 2: Expand the scope of NCI sponsored clinical trials.

Wisconsin Oncology Network

Specific Aim 3: Identify genetic responses to radiation that could be predictive of adverse responses *in vivo*.

Continuation of Walking Forward



*Specific Aim 3: Identify genetic responses to radiation that could be predictive of adverse responses *in vivo*.*

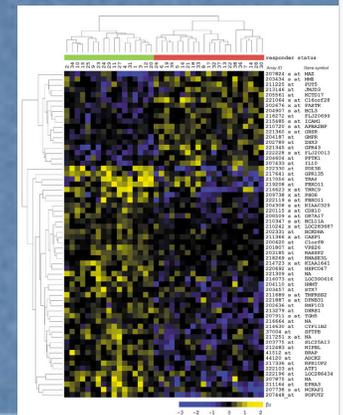
Using gene array technology, gene expression changes in lymphocytes after radiation exposure will be characterized as a surrogate to determine whether the expression pattern differs between AI patients who experienced adverse reactions, as compared with those who did not

20 AI cancer patients: 10 with and 10 without radiation sides effects

Goal: identify markers that might be used to identify AI patients who are likely to suffer adverse reactions due to radiotherapy, and to begin to understand the genetic basis of adverse reactions

Svensson, J.P. et al. PLoS Med, 2006. 3(10): p. e422.

Relevance: hypofractionation schedules may not be indicated for patients prone to developing XRT complications, consider surgery or brachytherapy





Walking Forward Tree



When we look into the eyes
of our relatives, we know
how precious life is.

**WALKING**Forward
To'katakaiya zanniyan omani pi ye/yo.

Walking Forward, a program of Rapid City Regional Hospital (in partnership with the National Cancer Institute), seeks ways to help families and communities protect life and health. By working together, doctors, other health care workers, and people in the community can address cancer prevention, detection, and early treatment.

We are committed to walking forward toward a healthier life for all the people we serve.

Mitakuye oyasin!

Hear more about the Walking Forward program on KILI Radio every other Wednesday from 10-11 a.m.

For more information call 800-232-0115 ext. 2305 | E-mail: walkingforward@rcrh.org

 **RAPID CITY
REGIONAL HOSPITAL**
353 Fairmont Blvd., Rapid City, SD

  Cancer Disparities Research Partnership



NCI CDRP Staff:

Norman Coleman, MD

Frank Govern, PhD

Bhadrasain Vikram, MD

Rosemary Wong, PhD

-Received NCI's Director Merit Award

Collaborators

- University of Wisconsin
 - Minesh Mehta, MD
 - Mark Ritter, MD, PhD
 - Amy Moser, PhD
 - Paul Harari, MD
 - Richard Steeves, MD PhD
 - Sarah Esmond, MA
 - Rebecca Koscik, PhD
- MD Anderson
 - Ashleigh Guadagnolo, MD



CDRP Highlights



- Produced **annual increases in disparity population accrual** onto first NCI radiation oncology, then later onto surgical and medical oncology clinical trials
- **Community outreach and patient navigation** are **KEY** before successful patient recruitment
- CDRP **heightened awareness of cancer disparities** in RTOG and led to annual NCI/ASTRO Cancer Disparity Symposium
- CDRP increased new researchers, presentations and publications on cancer disparities
- CDRP **helped establish culture of research**
- Grantees start competing for outside funds to sustain various CDRP program components

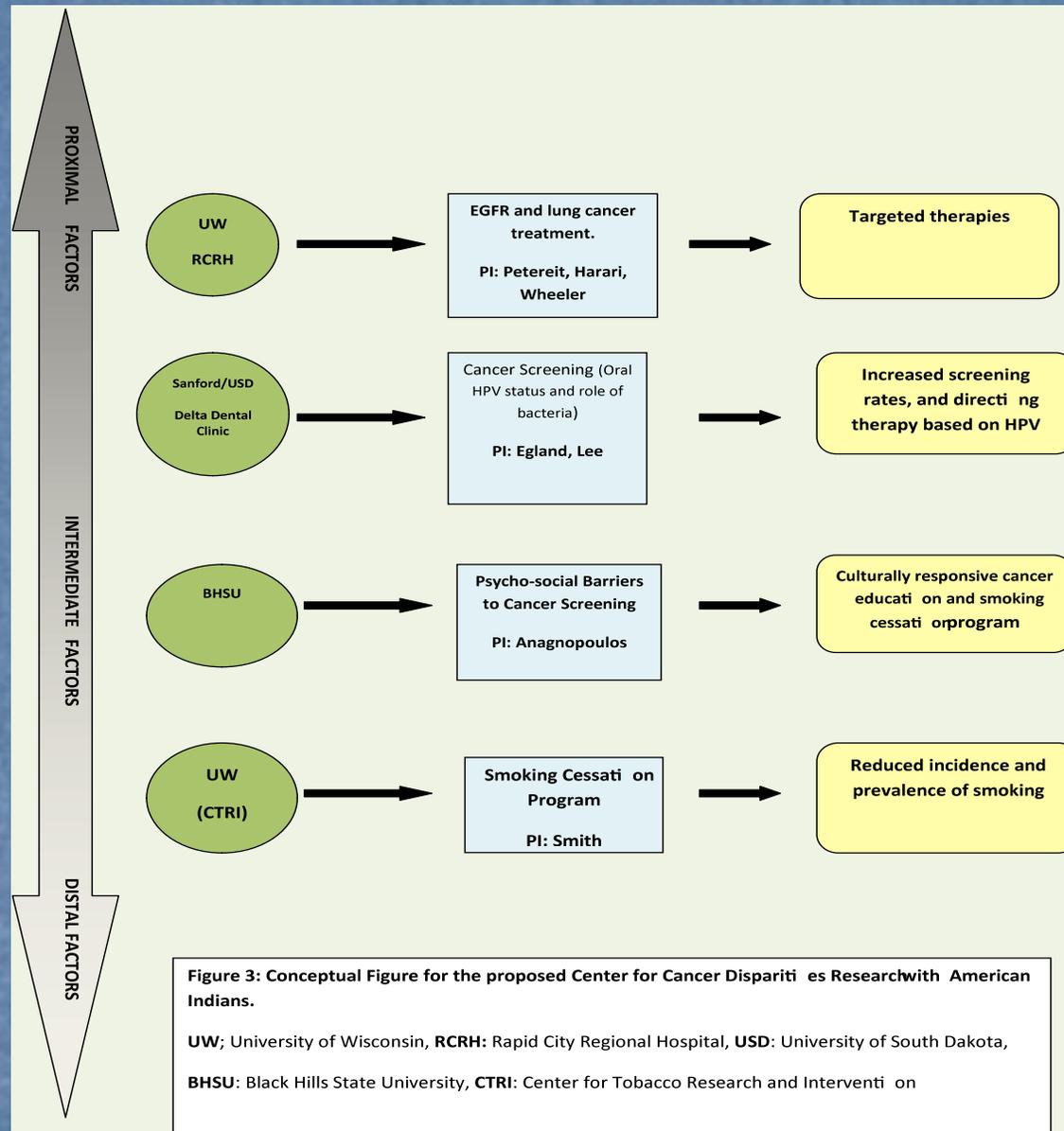


CDRP Lessons Learned



- Need **target-population appropriate** research, i.e., clinical trials and behavioral/social science studies; require both scientific and IRB review.
- Need minimum of 1 radiation oncologist plus involvement of additional oncologist as co-PI
- Additional time for infrastructure development, more formal orientation
- Additional intrinsic and extrinsic incentives for mentor/partners - in addition to funding, includes being part of network; successful renewals serve as mentors
- Support for **patient navigation and community outreach** efforts prior to clinical research recruitment
- Continued support for current competing grantees to help achieve sustainability

Transdisciplinary Research to Reduce Tobacco-Related Cancers in American Indians



Assessment of EGFR Mutations to Personalize Lung Cancer Care in American Indians

- Aim 1: Examine NSCLC histology, smoking status and gender as predictive surrogates for the presence of EGFR mutations in the American Indian (AI) population.
- Aim 2: Determine the EGFR mutation rate in AI and non-AI patients with non-small cell lung cancer (NSCLC)
- Aim 3: Improve treatment outcomes in locally advanced lung cancer by enrolling patients on clinical trials based upon EGFR Mutation Status.
- Paul M Harari, MD; Deric Wheeler, PhD; Daniel G Petereit, MD
UW-Madison (UWSMPH) and Rapid City



07/30/2



Thank you NHLPA for helping our kids
Rushmore Hockey Association
Rapid City, SD

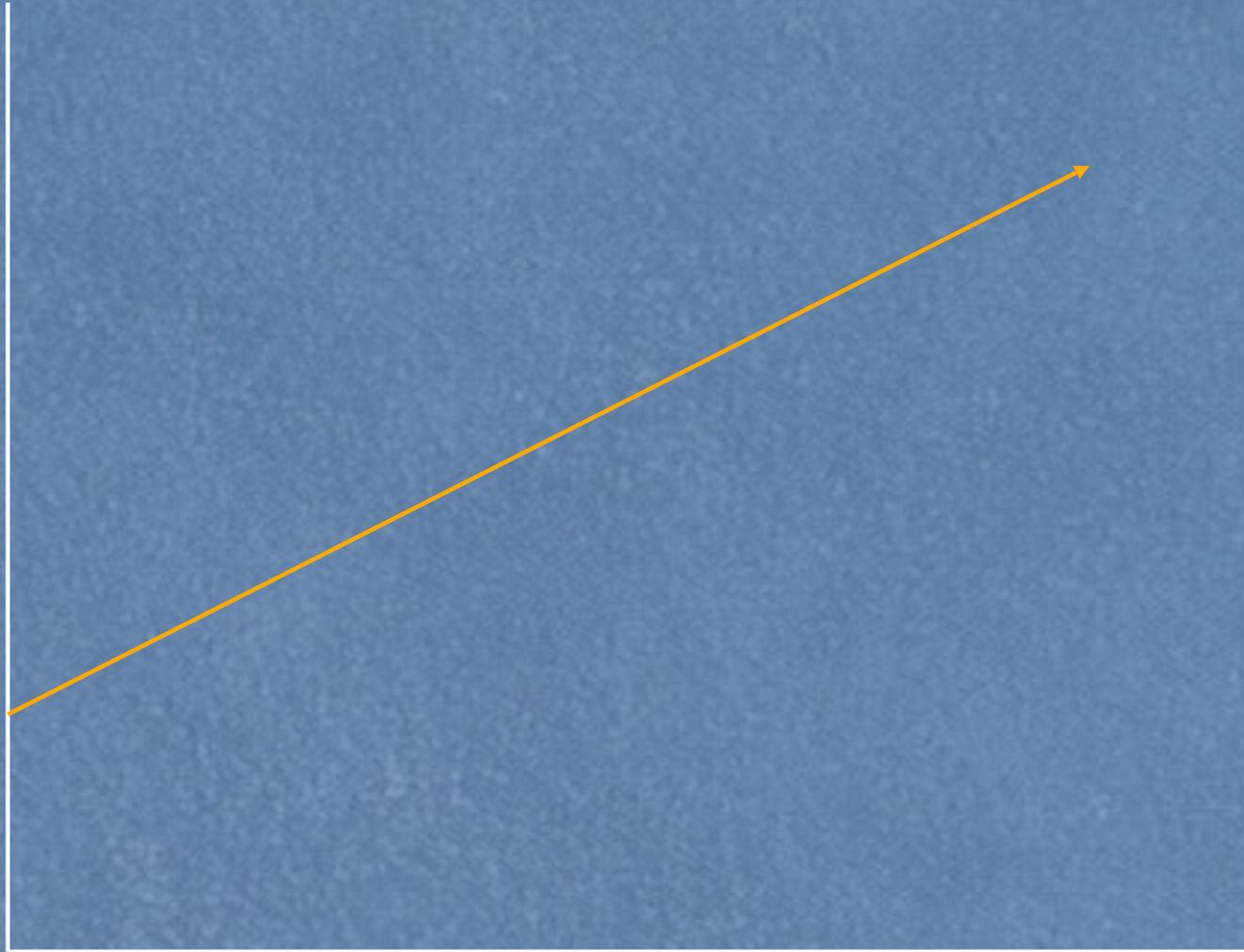
Healthy People 2010

- Healthy People 2010 has two overarching goals:
- **Goal 1: Increase Quality and Years of Healthy Life**
- **Goal 2: Eliminate Health Disparities**



¹ www.healthypeople.gov (DHHS statement on national health objectives.)

Quality



Access

Estimated impact of improvement (insured)

- **If Texas (69%) improved to the level of the best performing state, Mass, (93%)**
 - **Currently ranks 51st**
- **Additional number of adults who would be insured: 3,559,309**

The Commonwealth Fund, <http://www.commonwealthfund.org>

Racial dynamics after reform

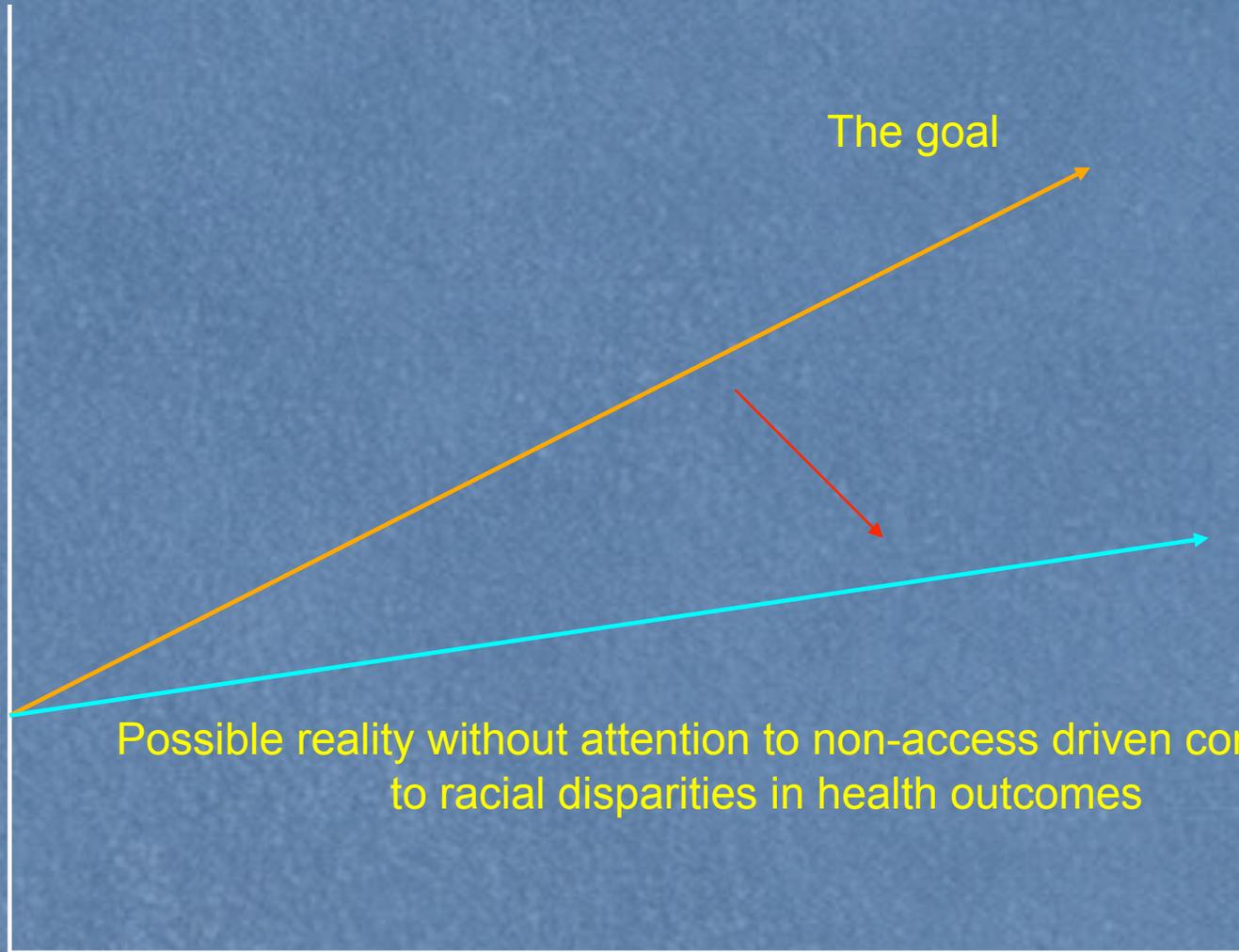
- Racial minorities are over-represented among the currently uninsured and underinsured.
- Racial minorities are under-represented in health care professions (African Americans, Hispanics, Native Americans).
- What will be the impact on delivery of quality, effective health care when these populations have better access in much greater numbers?

Quality

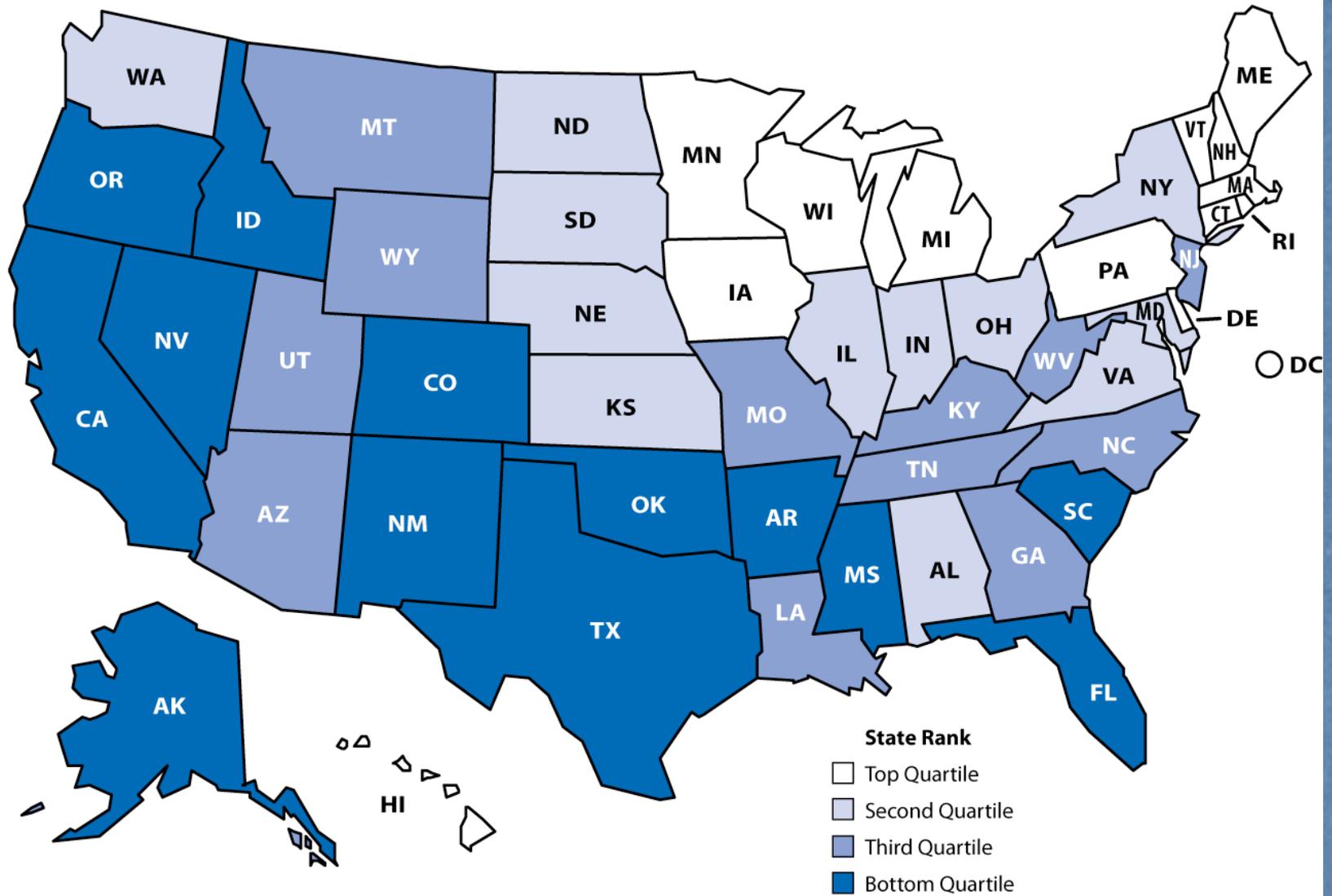
The goal

Possible reality without attention to non-access driven contributors to racial disparities in health outcomes

Access



State Ranking on Access Dimension



SOURCE: Commonwealth Fund State Scorecard on Health System Performance, 2009

Quality

- Trust is a linchpin in the provision of high quality care
- Cancer treatment involves multi-modal, protracted treatment regimens that can be overwhelming for even the most trusting and medically savvy of patients

Special Thanks CDRPs PIs

- Michael Steinburg, MD; David Khan, MD
- Patrick Maguire, MD
- Raymond B Wynn, MD; W Sam Dennis, MD;
William Burleson, MD
- Dwight Heron, MD
- Bobby Bains, MD

Life's most persistent and urgent question is,
'what are you doing for others'.

Martin Luther King, Jr.



