

Harvard/MGH Center on Genomics,
Vulnerable Populations
& Health Disparities



Accelerating Implementation Science

A Health Disparities Perspective

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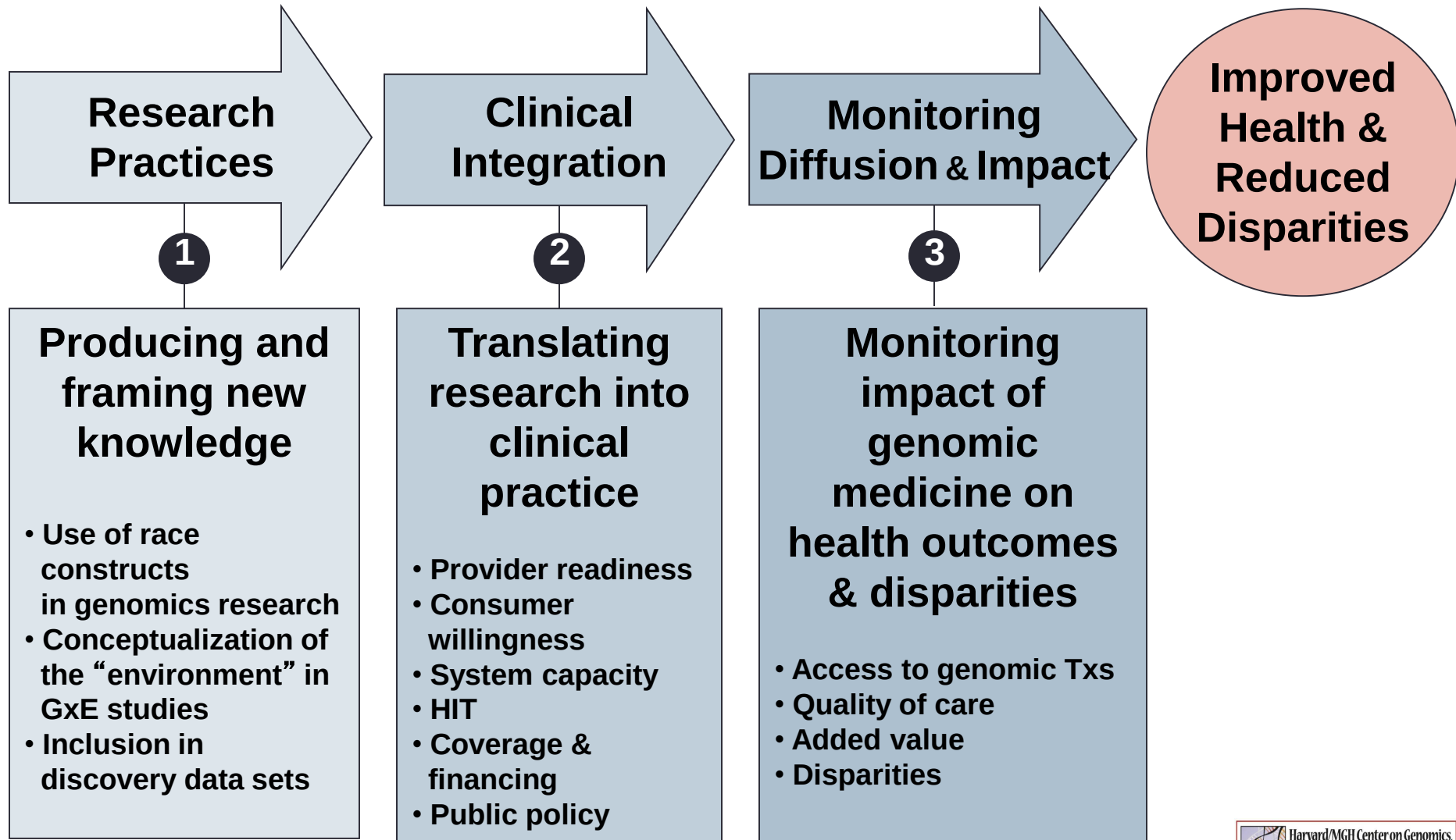
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Commitment to Ensuring that Novel Tx Strategies Reach Those Most in Need

“Genomics will only achieve its full potential to improve health when the advances it engenders become accessible to all”

- Eric Green & Mark Guyer, *Nature* 470:10, Feb 2011

Intersections of Genomics & Health Disparities Throughout the Research Trajectory



Outline

1. Prioritizing Clinical Cases to Focus On
2. For Cases Selected, Identify Outstanding Gaps For Knowledge/Evidence
3. Provider Readiness
4. Patient Willingness
5. Coverage and Financing
6. Data Infrastructure/HIT
7. Personnel: New or Expanded Roles and Costs Associated with Implementation
8. Tracking Outcomes and Continually Revising Priorities based on Emerging Evidence

1. Prioritizing Clinical Cases To Focus On

Rank	PREVALENCE (# affected)	COST (cost, in billions)	MORTALITY (# deaths)	DISPARITY (by Black/white disparity, mortality)
1	High blood pressure (71 M)	Heart conditions (\$76)	Heart disease (616 K)	Diabetes (2.1)
2	Mental disorders (59.5 M)	Cancer (\$70)	Cancer (563 K)	Cerebrovascular disease (1.5)
3	Arthritis (52.1 M)	Mental disorders (\$56)	Cerebrovascular disease (136 K)	Heart disease (1.3)
4	Heart disease (26.8 M)	Asthma & COPD (\$54)	Chronic lower respiratory diseases (128 K)	Cancer (1.2)
5	Diabetes (24 M)	High blood pressure (\$42)	Alzheimer's disease (75 K)	Alzheimer's disease (0.8)
6	Cancer (18.6 M)	Type 2 diabetes (\$34)	Diabetes (71 K)	Chronic lower respiratory diseases (0.7)

1. Prioritizing Clinical Cases To Focus On

Rank	PREVALENCE	COST	MORTALITY	DISPARITY (by Black/white disparity, mortality)
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2	Mental disorders	Cancer	Cancer	Cerebrovascular disease (1.5)
3	Arthritis	Mental disorders	Cerebrovascular disease	Heart disease (1.3)
4	Heart disease	Asthma & COPD	Chronic lower respiratory diseases	Cancer (1.2)
5	Diabetes	High blood pressure	Alzheimer's disease	Alzheimer's disease (0.8)
6	Cancer	Type 2 diabetes	Diabetes	Chronic lower respiratory diseases (0.7)

1. Prioritizing Cases To Focus On

- Improve Population Health & Reduce Disparities
- Prevalent vs. Rare Conditions
- Prevention vs. Treatment
- Quality/Completeness of Evidence Base

2. For Cases Selected, Need to Complete Evidence Base

- For which cases is the evidence strongest?
(e.g., Lynch Syndrome, *BRCA1/2*)
- Is the evidence available for all populations?
(e.g., work by Matthew Meyerson *et al.*)

3. Provider Readiness: Continued Low Literacy of Genomics among PCPs

- Feelings about genomic medicine versus other medical needs
- Provider readiness to implement genomic applications

3. Provider Readiness: Continued Low Literacy of Genomics among Physicians

PCP Preparedness in 2008 (N=1120)	PCPs (%)
Feel very confident in their ability to interpret genetic test results	5
Feel very prepared to counsel patients considering a genetic test	4

Physician Use and Education in 2012 (n=10,303)	Physicians (%)
Physicians who had either ordered or recommended a PGx test in the past 6 months	12.9
Physicians who had received PGx instruction in medical school or postgraduate medical education	29

Shields et al. Differential use of available genetic tests among primary care physicians in the United States: results of a national survey. *Genetics in Medicine*. 2008; 10(6):404-14.

Stanek E, Sanders C, Taber K. "Adoption of pharmacogenomic testing by US physicians: results of a nationwide survey". *Clin Pharmacol*.2012;91(3):450-458.

Minority-Serving Physicians' Experience Ordering a Genetic Test (OR, 95%CI)

	Breast Cancer n=938	Colon Cancer n=938	Sickle Cell n=936	Huntington's Disease n=940	Any Genetic Test n=944
High Minority	0.42 (0.23-0.79)**	0.39 (0.19-0.80)**	0.74 (0.45-1.21)	0.21 (0.08-0.53)[†]	0.67 (0.42-1.07)
High Medicaid	1.15 (0.68-1.96)	1.59 (0.87-2.92)	0.82 (0.51-1.31)	1.25 (0.67-2.34)	0.96 (0.61-1.51)

* p<0.05, ** p<0.01, †p<0.001. Note: Also included in model but not shown: physician age, self reported race, region, practice setting (independent practice versus those practicing in a health maintenance organization, hospital-based practice, community health center or other setting), experience with genetic education.

Minority-Serving Physicians' Experience Referring Patients for a Genetic Test (OR, 95%CI)

	Ever Referred to Genetics Center or Counselor n=943	Ever Referred to Specialist n=941	Ever Referred to Clinical Trial n=934	Ever Referred to Any Site of Care n=945
High Minority	0.73 (0.45-1.18)	0.63 (0.40-1.00)	0.46 (.22- 0.96)*	0.60 (0.36-0.99)*
High Medicaid	0.58 (0.37-0.92)*	0.64 (0.41-1.01)	1.04 (0.58-1.89)	0.49 (0.30-0.80)**

* p<0.05, ** p<0.01. Note: Also included in model but not shown: physician age, self reported race, region, practice setting (independent practice versus those practicing in a health maintenance organization, hospital-based practice, community health center or other setting), experience with genetic education.

Community Health Center (CHC) Provision of Non-Prenatal Genetic Counseling and Testing (N=914 CHCs)

<i>Services Provided (Directly or through Referral)</i>	<i>%</i>
Genetic Counseling	4.3
Any Genetic Testing	11.7
Testing to Assess Risk for:	
Breast Cancer	5.3
Colorectal Cancer	5.5
Huntington's Disease	2.9
Sickle Cell	8.7

Source: Shields et al, unpublished data

4. Patient Willingness

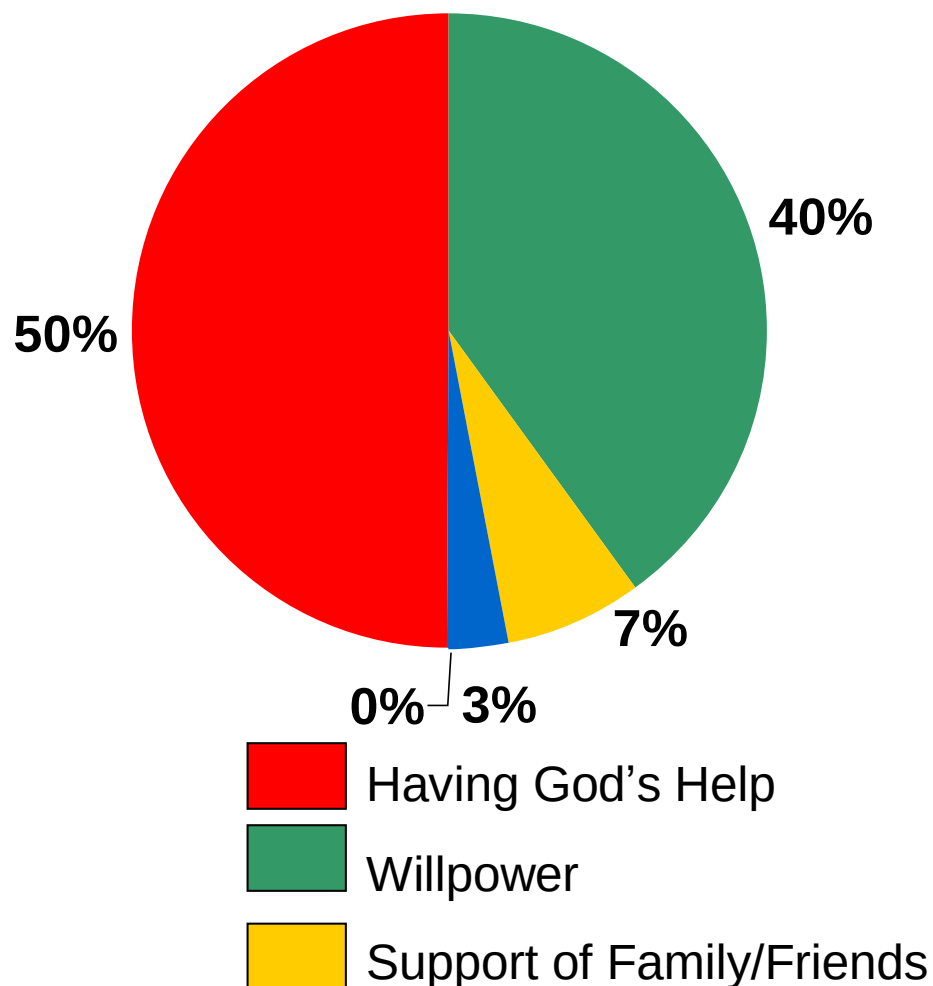
- If we build it, will they come?
- Different cultural beliefs and preferences across communities

National Survey to Assess Lay Attitudes and Beliefs about Nicotine Dependence and the Ability to Quit

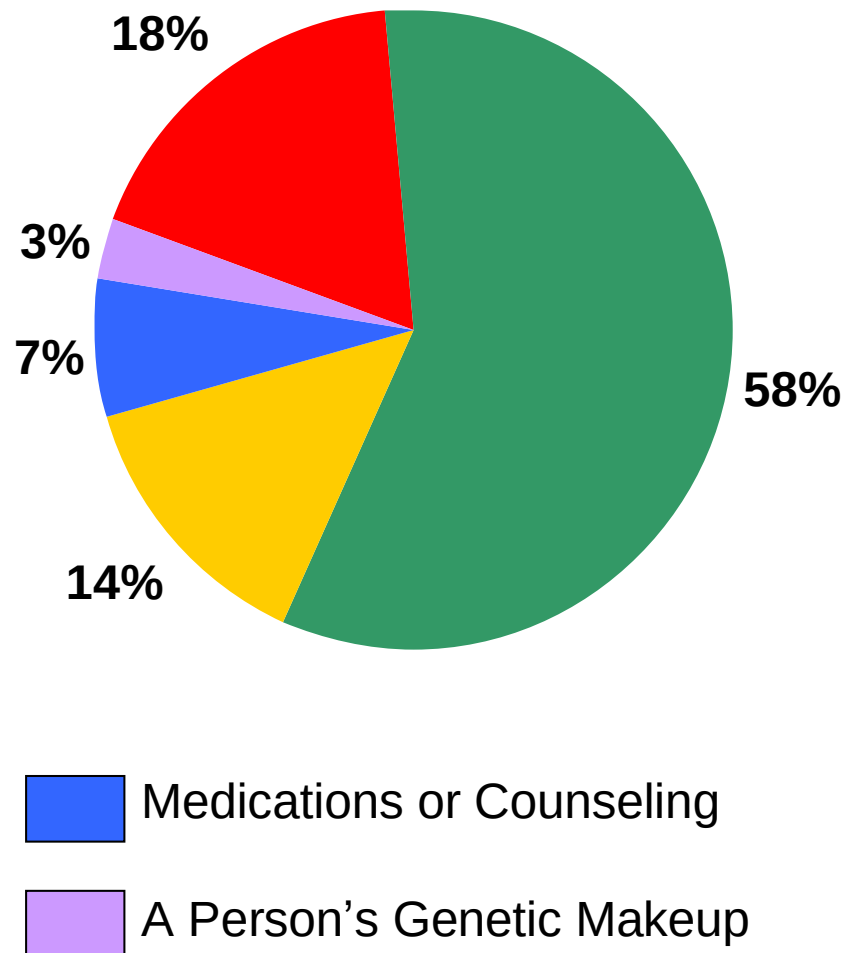
- Random digit dial survey of Black and white Americans
- Respondents asked to rate the importance of several factors influencing nicotine addiction & ability to quit
- Similar questions asked about alcohol and cocaine
- n = 2219 self-identified Black and white adults
- 40.1% response rate; 80% cooperation rate
- 393 smokers (188 AA; 205 white)

Greatest Influence on the Ability to Quit Smoking (n=2204)

African American Respondents:



White Respondents:



Controlling for age, sex, education, smoking status, religiosity, and health status:

- Blacks more likely to rate God's help as greatest influence (OR, 4.7; 95%CI: 2.50-8.89; $p < 0.0001$)
- Blacks less likely to rate medications as greatest influence (OR, 0.41; 95%CI, 0.19-0.90; $p = 0.03$)

Respondent Characteristics Associated with Rating Various Influences as the Most Important Influence on a Person's Ability to Quit Smoking:

Dep Variable	Respondent Characteristic	OR	95% CI	p
Willpower	Black	0.54	(0.3-1.0)	0.033
	Very Religious	0.44	(0.4-0.7)	0.0001
Family/Friends	Black	0.44	(0.2-1.0)	0.057
	Very Religious	0.46	(0.3-0.8)	0.01
Medications	Black	0.41	(0.2-0.9)	0.026
	Very Religious	0.91	(0.4-2.0)	0.808
God's Help	Black	4.71	(2.5-8.9)	0.0001
	Very Religious	5.7	(3.1-10.3)	0.0001

Controlling for age, sex, smoking status, education, and health status.

Black Smokers (n=392)

- Black smokers were MORE willing to be tested than white smokers (OR: 3.80, 95% CI:1.09 – 13.22, $p < 0.05$)
(controlling for intention to quit, time until first cigarette in the morning, past pharmacotherapy use, age, sex, race, and other beliefs about factors influencing ability to quit)
- But LESS likely to use pharmacotherapy!
- 32% Black vs. 57% white smokers ever used RX
- 91% Black vs. 75% white smokers were willing to be tested

5. Coverage and Financing

- Variable coverage of genomic tests within Medicaid
- Variable coverage within Exchange market
- Variable coverage/copays/administrative hurdles such as prior authorization across private insurer products

6. Data Infrastructure/HIT

- Maximizing the potential of Electronic Health Records (EHRs)
- Meaningful use and decision support

7. Personnel, New Or Expanded Roles, & Costs Associated With Implementation

- Genetic counselors
- Other kinds of counseling to support patients
- IT support

8. Tracking Outcomes and Continually Revising Priorities Based On Emerging Evidence

- Tracking the success of the intervention
- Becoming a learning organization/initiative
 - Documenting barriers/successes/failures
 - Allowing states, health plans, providers to learn from one another
 - Generating collaborative resources

Potential for Transformation

