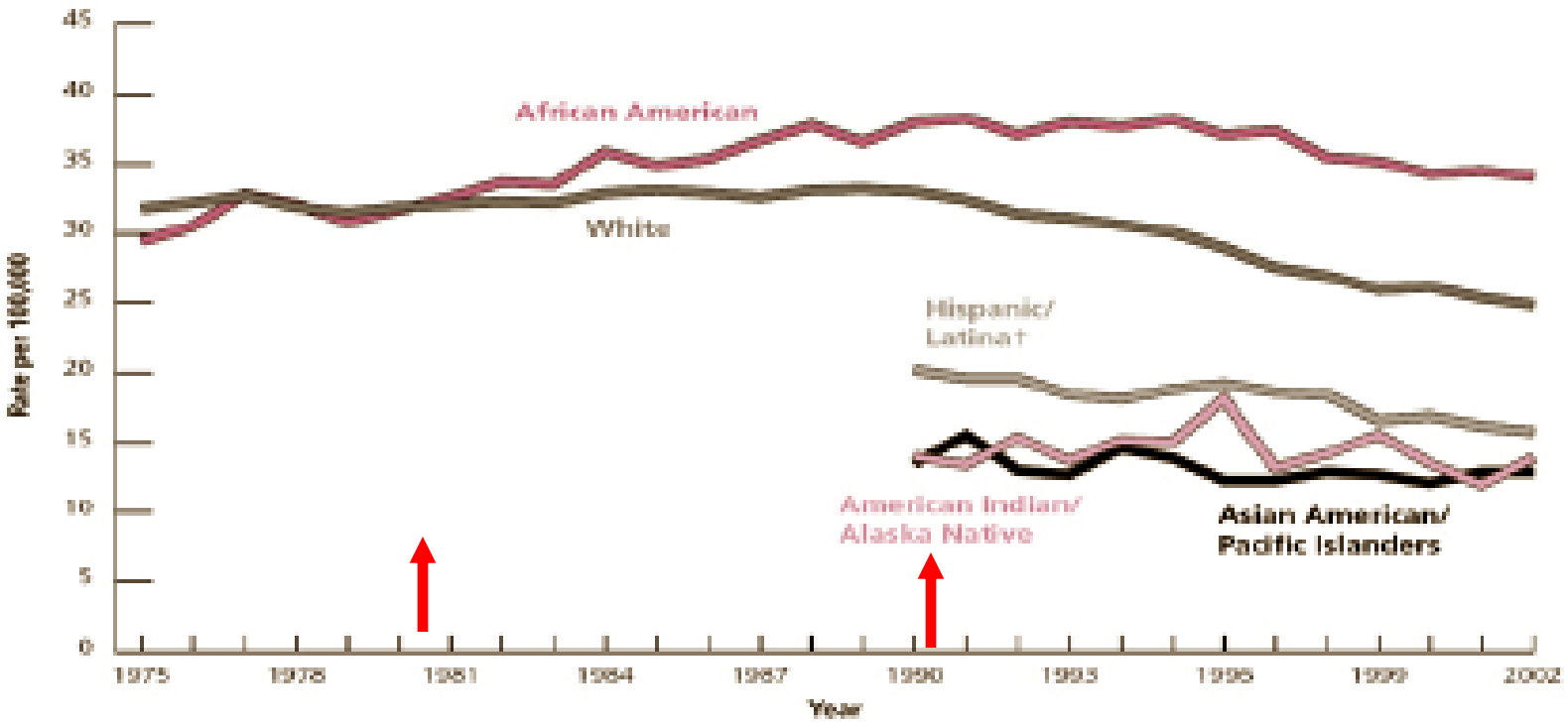
Beliefs, Insurance or Both: Impact of Lay Models of Cancer on Mammography Adherence

Mathilda B Ruwe, MD, MPH, Ph.D.
John Capitman, Ph.D.
Michele David, MD, MPH, MBA

American Public Health Association 13th Annual Meeting and Expo
November 3-7, 2007, Washington, DC

This project was made possible by:
Funding from the Susan Komen Breast Cancer Foundation
Support from The Haitian Health Institute, Boston University Medical Center and Brandeis University, The Heller School for Social Policy and Management

Exb. 1.The Technology Paradox
Breast Cancer Mortality 1975-2002



American Cancer Society, Surveillance Research, 2005-2006
Data Source: National center for health statistics, Centers for disease Control and Prevention 2005
Rates are standardized to 2000 U.S. population. Information includes all states except Connecticut, Maine, Maryland, Minnesota, New Hampshire, New York, North Dakota, Oklahoma, and Vermont

- **Women of color least benefited from improved screening and treatment of breast cancer**

Study Goals

- This study is part of a larger effort to understand unique barriers faced by Haitian women
- In 2004 Haitians were estimated at 60,630 in Massachusetts
- This is both a policy and methodology study
- Lessons learned could apply to studying factors influencing disparities in access to care in other racial ethnic groups or health conditions

Study Goals

- Study tested utility of the Cultural Explanatory Model (CEM) of cancer in explaining screening disparities
  - Differences in concepts of illness/health between the provider and the patient can result in miscommunication and failure by the patient to adhere to recommended care

(Kleinman, 1978)

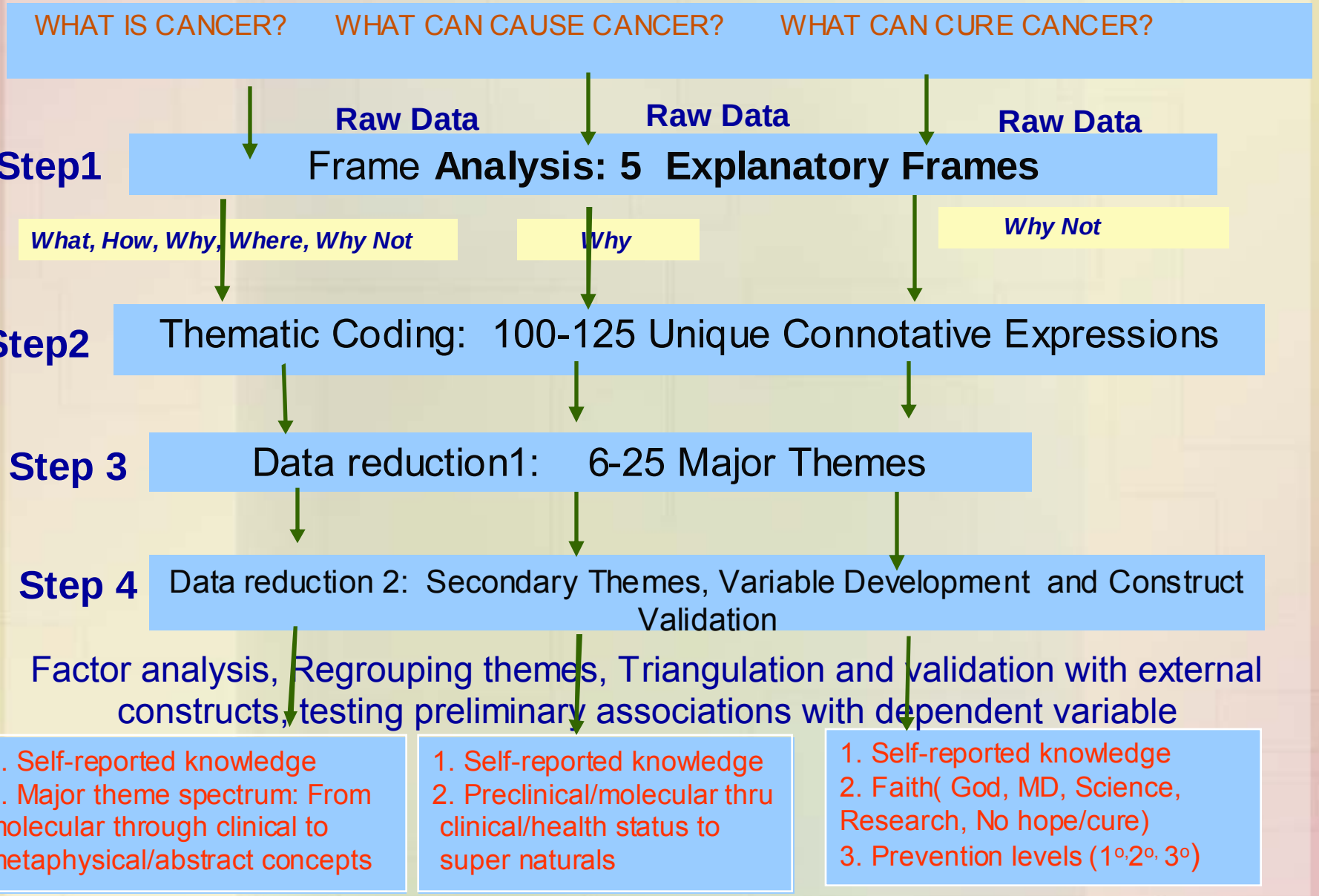
Research Design

- Population-based cross-sectional
- Exploratory, theory-driven
- Qualitative and quantitative
- Multi-ethnic sample: N=750
  - Haitians: 284
  - White : 143
  - African American: 163
  - Latina/Caribbean/other: 160
- Age: 40 and over
- Setting: Eastern Massachusetts
  - Greater Boston area

Qualitative Questions

- Please tell me, in your own words, what is cancer?
- Please tell me, in your own words, what causes cancer?
- Please tell me, in your own words, what can cure cancer?

Exb. 2: Qualitative Analysis Flow Chart



Exb. 3: What is Cancer? Main Concept

	Percent
1. Disease /sickness	38%
2. Something bad	19%
3. Growth	10%
4. Cell	12%
5. Sore/ulcer	6%
6. Virus	5%
7. Bacteria/microbes	3%
8. Hormonal imbalance	1%
9. Immune reaction to foreign matter	1%
10. Devil/Satan/beast	1%
11. Tissue	1%
12. Poison	1%
13. Blood clot/bad blood	1%
14. Combination /other	1%

Exb. 4: What is Cancer? Characteristics

	Percent
1. Eats/gnaws body inside	19%
2. Killer/death sentence/plague of death	15%
3. Incurable, uncontrollable	13%
4. Rapidly replicates, gone crazy, weird	12%
5. Abnormal or damaged or deformity	9%
6. Spreads	6%
7. Creates growth	5%
8. Severe/major	5%
9. Develops inside the body	4%
10. Scary	3%
11. Due to being hit	3%
12. Painful	2%
13. Something that gets in from outside	2%
14. Due to bad luck	2%

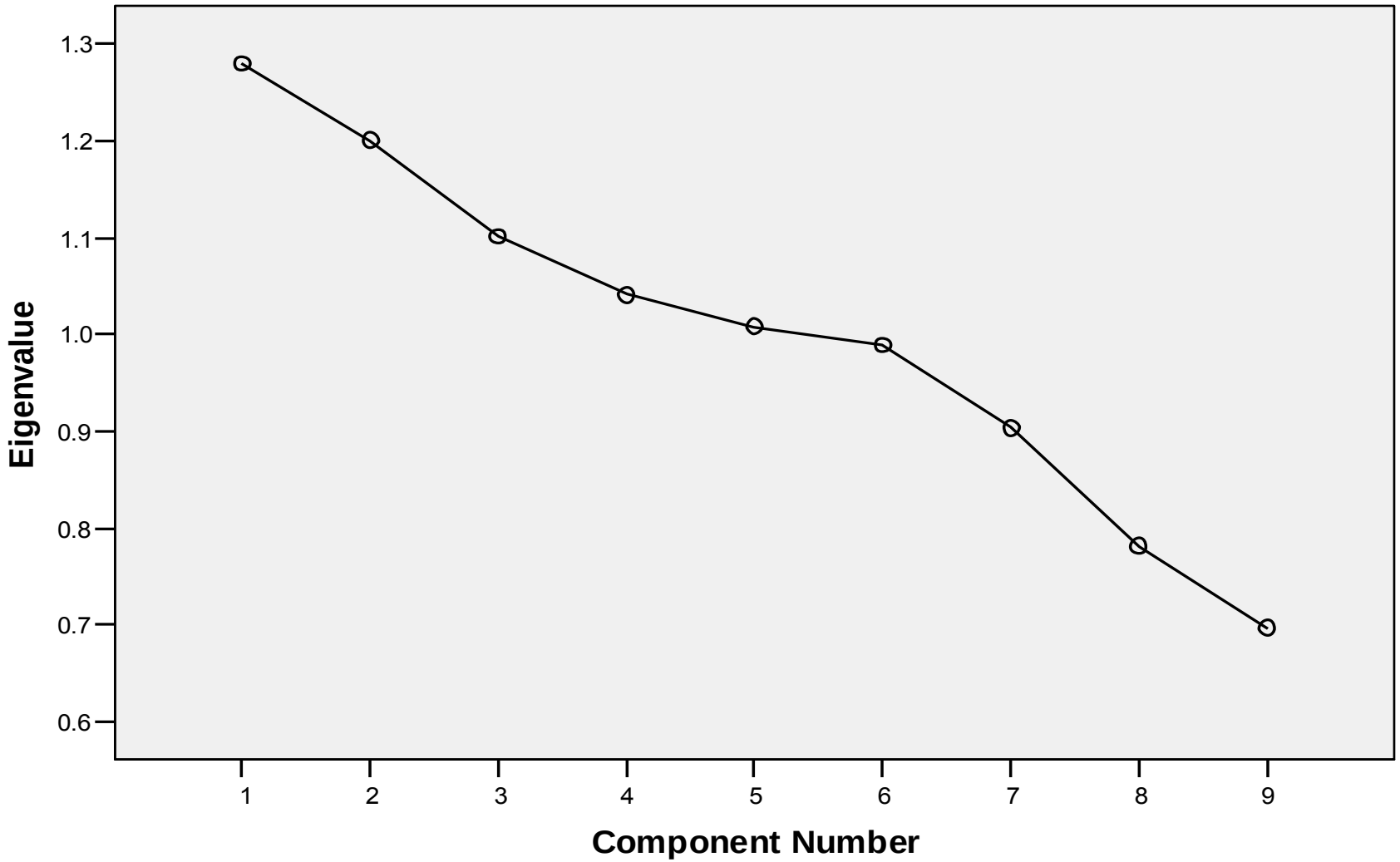
Exb. 5: What Can Cause Cancer?

	Percent
1. Substance abuse	35%
2. Environmental Pollution	25%
3. Trauma	10%
4. Radiation:	8%
5. Stress	5%
6. Chronic health problems	3%
7. Unhealthy diet	5%
8. High tech food	3%
9. Viruses/bacteria/microbes	2%
10. Sexual behavior birth control pills/no breast feeding	1%
11. Many factors	1%
12. All others	2%

Exb. 6: What Can Cure Cancer?

Theme	Percent
1. Doctor's	31%
2. Faith in God	19%
3. Research/ Medical Knowledge	18%
4. Death/no cure	9%
5. Lifestyle change	7%
6. Early detection	4%
7. Clean environment/ better world	3%
8. Money/Government	3%
9. Self efficacy	1%,
10. Food without chemicals	1%
11. Education	1%
12. All other	1%

Factor analysis showed a spectrum of responses: Exb. 7. Scree plot of what can cause cancer



1.Molecular	2.Clinical	3.Social Behavior	4.Environmental	5.High Tech	6.Trauma	7.Stress	8.Spiritual	9.Other

Major racial/ethnic differences were observed in major themes

- Haitians expressed illness concepts (sores, ulcers, lump) and social concepts (trauma, if you are hit..)
- White women expressed more preclinical disease concepts of cause—cells, DNA, hereditary and high tech environmental factors—radiation, nuclear plants, electro magnetic fields
- Like Haitian, African American expressed illness concepts (sores, ulcers, lump) but also more social concepts (e.g., substance abuse, tobacco etc)
- There was consensus across groups on pollution as a major causal factor
- These themes clearly reflect social experience and different experience with cancer

Quantitative Analyses

- **Validation of self-reported knowledge**
- **Descriptive statistics**
  - Mammography uptake by race/ethnicity
  - Mammography adherence by race/ethnicity
  - Self-reported knowledge by race/ethnicity
- **Multivariate analyses:** Two-level logistic regression
  - **Level 1 logistic regressions**
    - Level 1 Model A: self-reported knowledge as dependent variable, other socio-psychological variables as predictors
    - Level 1 Model B: health insurance as dependent variable, other socio-psychological variables as predictors
  - **Level 2 logistic regressions**
    - Uptake as dependent variable and self-reported knowledge, health insurance, other variables plus level 1 residuals as independent variables
    - Adherence dependent variable and self-reported knowledge and health insurance, other variables plus level 1 residuals as independent variables

Variables

- **Dependent variables**
  - Appropriate mammography uptake—age 40 or less
  - Appropriate mammography adherence—annual/biennial rate

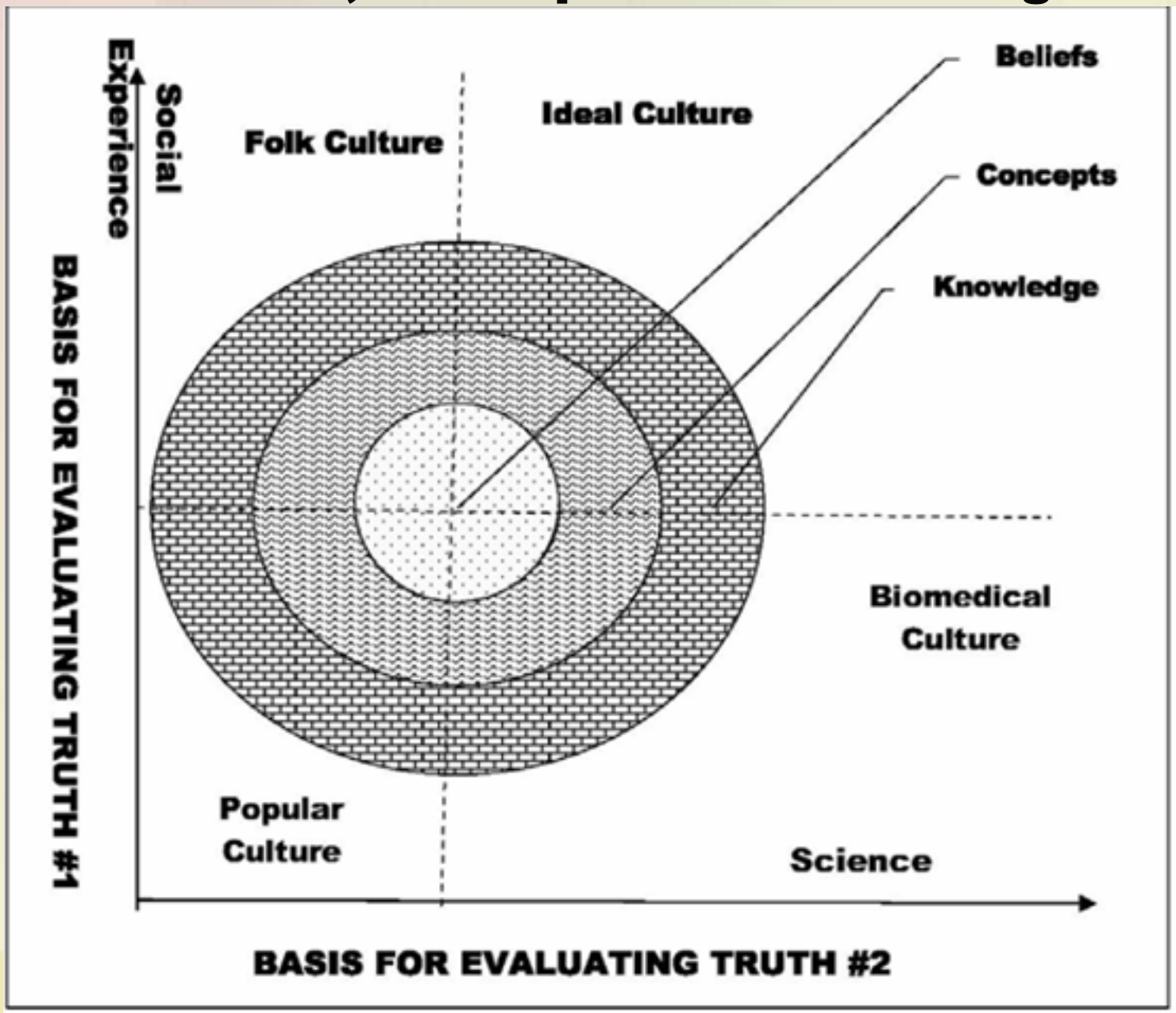
Variables

- **Primary independent variables**
  - Qualitative data-derived variables:
    - Self-reported knowledge of cancer cause
    - **Validated themes** of cancer cause
  - Health insurance type: Private vs Medicaid or Medicare
- **Covariates**
  - Age
  - Provider factors
  - Socio-economic factors

How Did We Define Self-reported Knowledge?

- **Any response** other than "I don't know"
- There was **no right or wrong** answer
- Assumed **two basis for evaluating the truth**
  - Science
  - Social and cultural experience
  - With patient's self-declared knowledge being rooted in social and cultural experience as opposed to provider's knowledge which is rooted in science and practical experience
- Assumed, **part of a continuum**
  - Beliefs→ concepts→ knowledge

Exb. 7: Hypothesized Relationship Between Health Beliefs, Concepts and Knowledge



Validation of Self-Reported Knowledge

- Factor analysis of major themes (not shown here)
- Correlated with other known variables
- Compared covariance structures with that of health insurance

Exb. 8: Correlation of Self-reported Knowledge with Known Beliefs

	What is cancer?	What can cause cancer?	What can cure cancer?
Fatalism (1-5)	-.03	-.23**	.08*
Fatalism1	-.01	-.16**	.03
Fatalism2	-.06	-.19**	.09*
Efficacy (1-5)	.02	.14**	-.05
Efficacy1	.04	.13**	-.07
Efficacy 2	.02	.08*	-.01
Efficacy 3	.04	.15**	-.07
Modesty(1-5)	.04	.09*	-.00
Modesty 2	.03	.09*	-.02

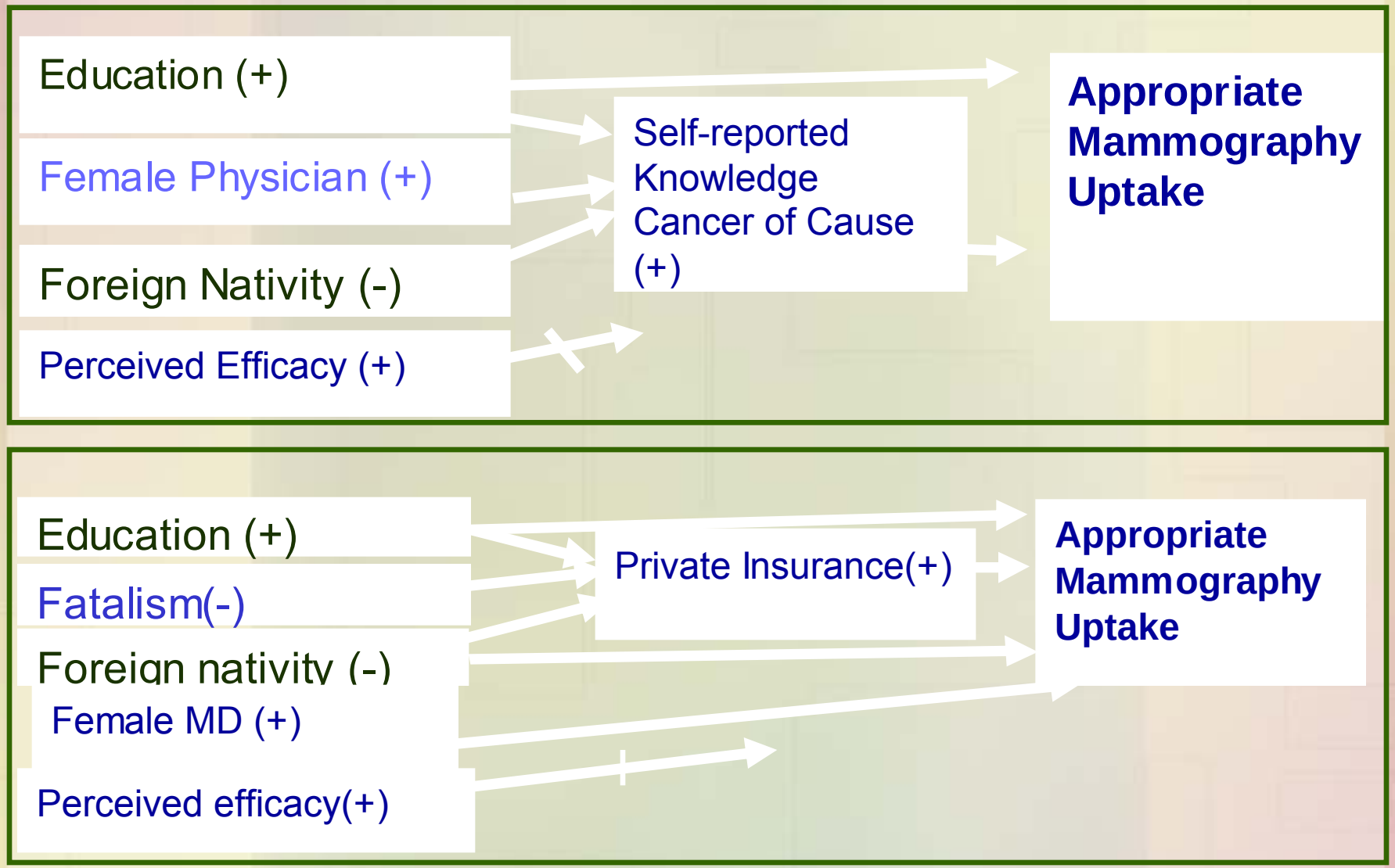
Note pattern of positive and negative correlation

Exb. 9: Correlation of Self-reported Knowledge with Other Socio-cultural Factors

	What is cancer?	What can cause cancer?	What can cure cancer?
Education (≥high school)	.07	.28**	-.07
Researcher Evaluated Knowledge	.01	.09*	-.04
Evaluated Knowledge (1,0)	.00	.09*	-.03
Patient Language (Non-English)	-.04	-.28**	.10**
Staff Language Preference	-.04	-.04	.11*
MD's Gender (female)	-.01	-.14**	.00
Income (≥20,000)	.12*	.10*	-.11*
Health Behavior--Alcohol Use	-.03	.08*	.01

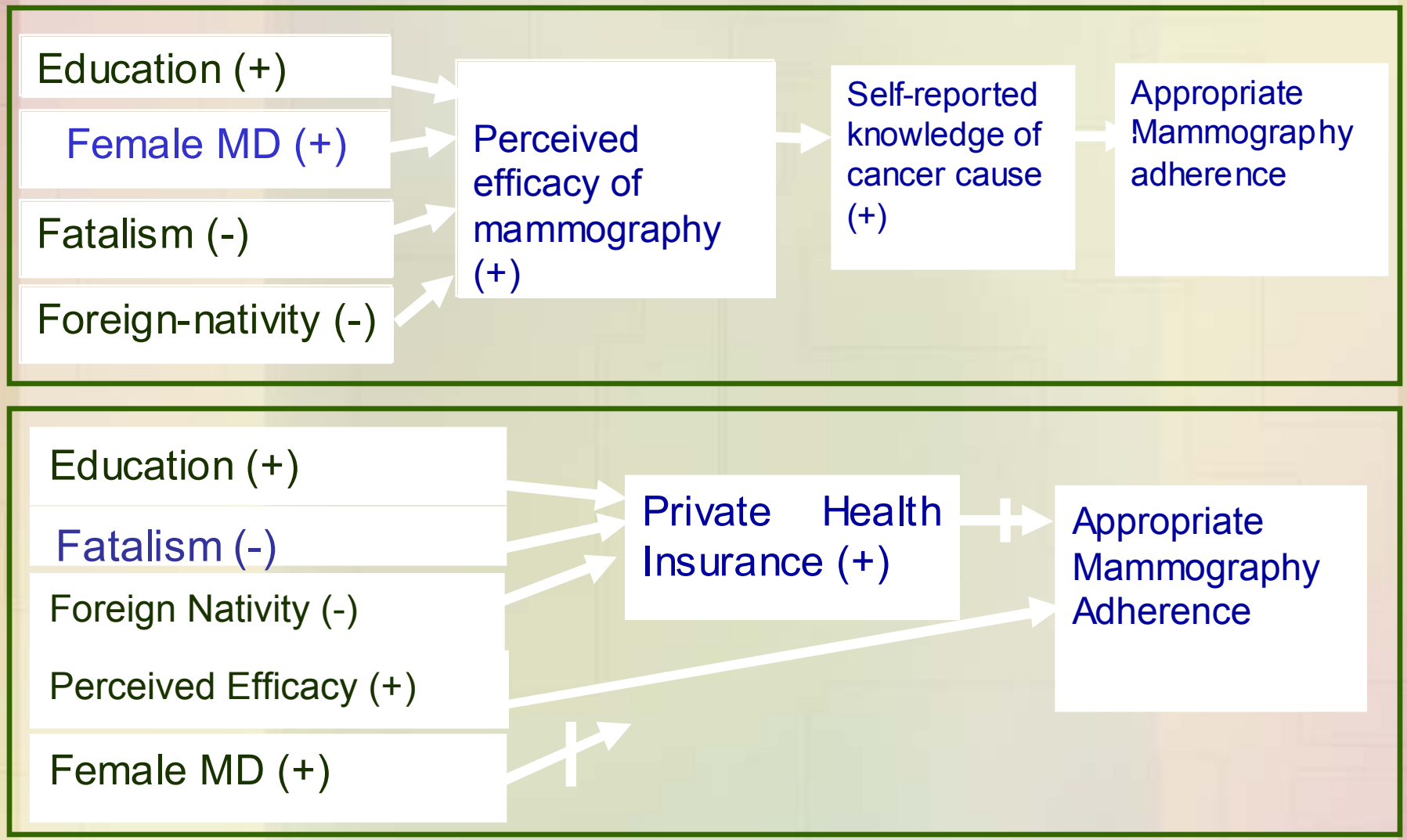
Note little correlation with evaluated knowledge

Exb.10: Covariance Structure of Self-reported Knowledge of Cancer Cause and Health Insurance in Relation to Mammography Uptake



- Education and Foreign Nativity were associated with both health insurance and self-reported knowledge of cancer cause

Exb. 11: Covariance Structure of Self-reported Knowledge of Cancer Cause and Health Insurance in Relation to Adherence



Education, foreign nativity and fatalism were significantly associated with both self-reported knowledge of cancer cause and having private health insurance in relation with adherence

Bivariate and Multi-variate Analyses

- Racial ethnic distribution of self-reported knowledge
- Impact of self-reported knowledge and insurance on mammography uptake and adherence

Exb. 12: Race/ethnicity and Self-reported Knowledge

	Haitian	White	African American	Latina/ Caribbean/ Other	Total	P
What is Cancer?						
N	277	142	155	145	719	
Percent	79.4%	84.5%	77.4%	80.7%	80.3%	.460
What Can Cause Cancer?						
N	267	130	159	155	711	
Percent	40.8%	74.6%	71.1%	63.9%	58.8%	0.000
What Can Cure Cancer?						
N	267	131	159	155	712	
Percent	71.9%	66.4%	59.7%	60.6%	65.7%	0.031

- Haitians were less likely to report what can cause cancer
- But more likely to report what can cure cancer

Exb. 13: Race/ethnicity and Mammography Uptake [1] and Adherence [2]

	Haitian N=284	White N=143	African American N=163	Latina/ Caribbean N=160	Total N=750	P-
[2]Annual mammo-graphy	12.7%	11.2%	13.5%	7.5%	11.5%	.313
[2]Biennial/ Annual mammo-graphy	41.9%	51.7%	60.7%	43.8%	43.8%	0.001
[1]Age at first mammogram (=<40 yrs)	39.4%	53.1%	66.3%	62.5%	52.8%	0.000

- Haitians were the least likely to have appropriate uptake and adherence

Exb.14: Logistic Regression, Uptake and Adherence

	UPTAKE		ADHERENCE	
	OR	CI	OR	CI
Self-reported knowledge of cancer cause	2.50*	1.08-5.79	1.70*	1.11-2.6
Haitian	.35***	.19-.62	1.21	.71-2.04
Haitian X self-reported knowledge	2.89*	1.17-7.14	.49*	.25-.96
US years>=40	1.18	.74-1.87	1.44¥	.96-2.15
Age >=65	.14***	.08-.23	.58**	.38-.89
Trauma	.35**	.17-.73	1.24	.64-2.43
Spiritual	.12¥	.01-1.33	.27	.02-2.99
Medicaid	.54**	.39-.78	.85	.63-1.21
Medicare	.69	.37-1.29	.84	.48-1.46
Inverse probability weight of level1 fitted errors	.69	.43-1.11	ns	ns
Constant	1.95	NA	.78	NA

Summary of Findings

- Self-reported knowledge appears to be higher order construct than individual beliefs—and a measure of collective efficacy:
  - It was correlated with both psychological variables (e.g., high perceived efficacy of screening, low fatalism, high modesty as well as tangible structural variables education level, nativity, language and MD gender preference)
- Health insurance and self-reported knowledge had a complex relationship and shared some underlying factors:
  - Higher education, nativity and low fatalism predicted both health insurance and self-reported knowledge

Summary of Findings

- Haitians and women 65 years and older less likely to have had appropriate mammography uptake or adherence than other women

- Health insurance and beliefs played a complementary explanatory role
  - Self-reported knowledge of cause was a significant predictor of mammography adherence and uptake
  - Health insurance was a significant predictor of mammography uptake and not adherence
  - Trauma concepts were significant predictor of uptake not adherence

Conclusion

- Self-reported knowledge and non-biomedical concepts of cancer play a complementary role to health insurance
- Different factors seem to influence age at first mammogram and interval adherence
- Haitians face unique barriers to appropriate mammography uptake and adherence

Implications

- **Policy and Practice Implications**
  - Study supports routine collection of uptake and adherence measures in addition to ever and mammography in past 2 years
  - Study supports patient centered health literacy
  - Cultural competence training should include patient perspectives
- **Research Implications**
  - Access and adherence research should include CEM
  - Need to understand implication for cultural competence training
  - Need to understand the meaning of self-declared lack of knowledge

End of Presentation

Acknowledgements:
The Susan Komen Breast Cancer Foundation
The Haitian Health Institute, Boston University Medical Center
Michelle David, MD, MPH, MBA and Nicole Prudent, MD, MPH
Brandeis University, Schneider Institute for Health Policy
The Heller School for Social Policy and Management
The Dissertation Committee

Direct further questions to
Mathilda B Ruwe, MD, MPH, PHD
Central Valley Health Policy Institute
California State University, Fresno
559-228-2165
mruwe@csufresno.edu