Institute for Healthcare Improvement

Innovation Project Final Report:
Exploration of Health Equity
Wave 35: April - June, 2015

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Intent & Aim:
The goals of this 90 day cycle of R and D work were to:

1) Do a better job of communicating what creates health;
2) Identify an overall framework to organize our interventions;
3) Discover where progress has been made in improving health equity through outlier analysis;
4) Identify a global measure of disparity that takes into account geography, gender, race/ethnicity and socioeconomic status; and
5) Outline next steps beyond this 90 day cycle of work.

Background:
David Kindig and Greg Stoddart defined population health as *"the health outcomes of a group of individuals, including the distribution of such outcomes within the group*."[1] In the U.S., there is frequently no correlation at the state level between improving the health outcomes of a population and improving the distribution of those outcomes within the group. That is not to say that there aren't examples where a state may have improved both an outcome and the distribution, but there is no certainty that working on an outcome will improve health equity in that same outcome.

Often health equity is measured bivariately, comparing one racial/ethnic sub-population against another, or comparing different income levels, etc. However, some are arguing for a global measure of disparity that considers multiple issues. Yukiko Asada explains two such measures in

[1] Kindig D & Stoddart G. What is population health? American Journal of Public Health. 2003;93(3):380-383.

her paper[2], and uses such a measure to analyze 90 counties in the U.S. for disparities in another paper.[3]

The Triple Aim has measured: population health, health care experience and per capita cost. Our measures have focused on the mean of the group. It would be good to add a measure of health equity to this work.

The CDC says, "Health equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances."[4] It is our hope to improve the opportunity for individuals and communities to achieve their health potential.

IHI has previously done some work on health equity, primarily in addressing disparities in the quality of health care provided to underserved populations. The most significant projects were the HRSA Health Disparities Collaborative, which brought together community health centers to work on a variety of disparities (race, socioeconomic status, age, gender) in health care, particularly around access to care. The focus was on improving the quality of care provided to disadvantaged populations and not on addressing the upstream determinants of health. The Indian Health Service (IHS) work on improving primary care by nature had to address disparities as individuals served by the IHS suffer some of the worst health disparities in the country. In 2008, IHI developed a health care equity blueprint, which proposed five categories of improvement strategies to reduce inequities in health care delivery.[5] Finally, emerging work through the 100 Million Healthier Lives initiative through the health equity hub and the SCALE work with communities provide a new avenue to expand IHI's work in health equity, expanding beyond access and quality of health care and into the multiple determinants of health, which are discussed below.

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[2] Asada Y. A summary measure of health inequalities for a pay-for-population health performance system. Prev Chronic Dis 2010;7(4):A72. http://www.cdc.gov/pcd/issues/2010/jul/09_0250.htm

[3] Inequalities in multiple health outcomes by education, sex, and race in 93 US counties: Why we should measure them all
Yukiko Asada1*, Alyce Whipp1, David Kindig2, Beverly Billard1 and Barbara Rudolph3

[4] http://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/overview/healthequity.htm

[5] http://www.ihi.org/resources/Pages/Tools/HealthcareEquityBlueprint.aspx.

Description of the Work:
We conducted this work through state level data analysis using the CDC Wonder Compressed Mortality File and the American Community Survey (ACS), literature scanning, and expert interviews.

Results from the 90 day cycle of work:

Part I and II: Communication and Organizing Frameworks

One intent of this project was to do a better job of communicating what creates health. We studied research on the production of health to give us insight on how to improve health equity.

In the article "Producing Health and Consuming Health", Evans and Stoddard start out with a simplistic model which is illustrated in Figure 1 and steadily build it into the more complex model in Figure 2.[6] They created these two models to illustrate what society's thinking has been and an alternative to that thinking. In this work, they are trying to show a more robust picture of what creates health for individuals and populations.

Figure 1- Simple model of health production

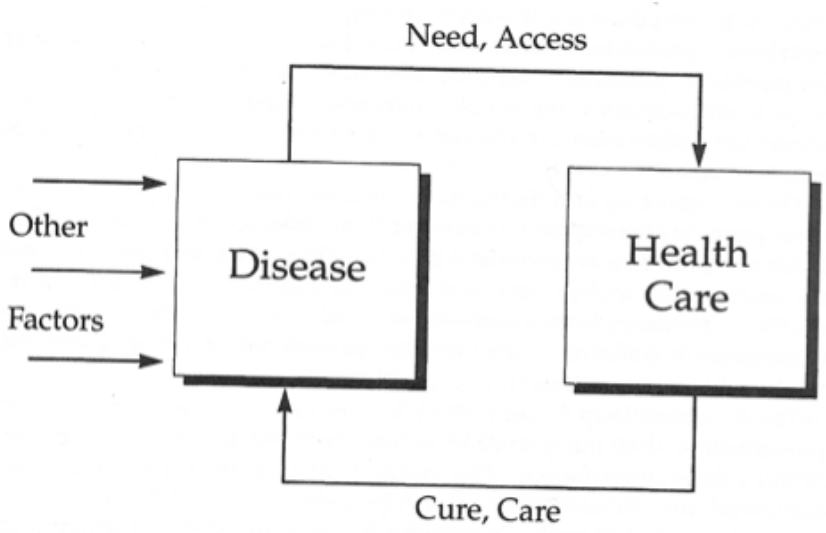


Figure 2- Detailed Model of health production

[6] Producing health, consuming health care RG Evans, GL Stoddart - Social science & medicine, 1990 – Elsevier

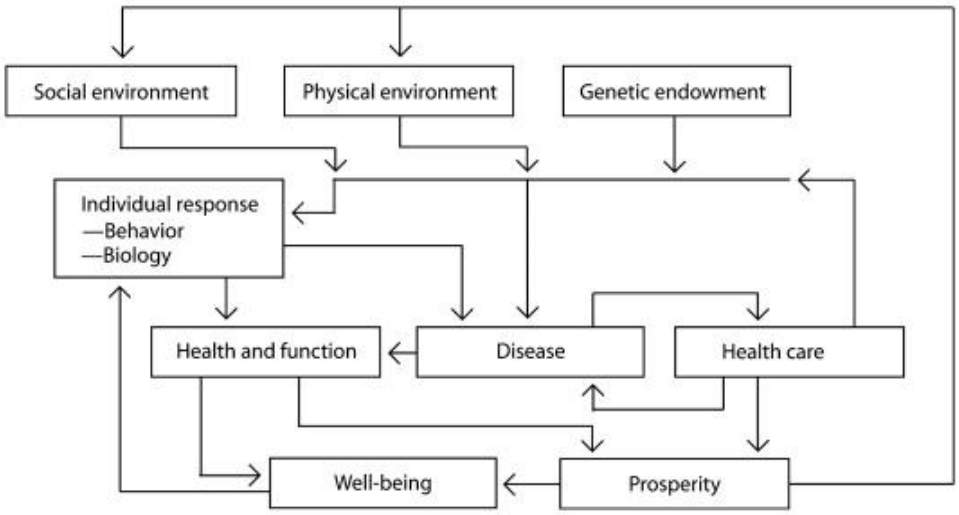
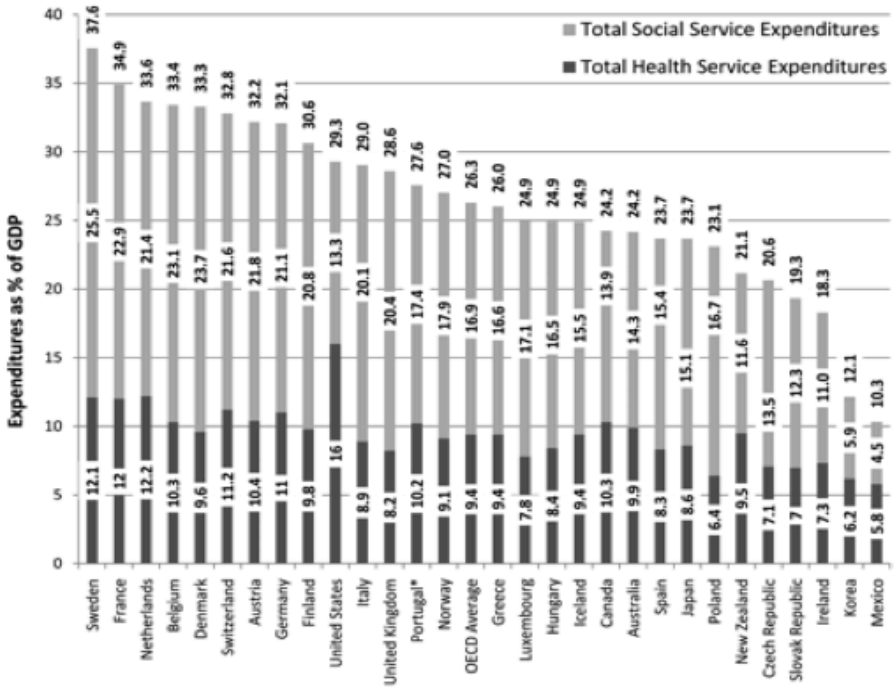


Figure 1 is the predominant model for how the US allocates health resources. The thinking is that, if individuals can have access to health care services, it will produce more health for them and for society. This model thus assumes that the provision of health care - practitioners seeing patients one at a time, diagnosing and treating - will produce health. This model holds for preventative care, similarly administered through one on one interaction for prevention. Again, the thinking is, if this model is applied to health equity, all we need to do is provide access to health care for everyone and the health equity gap will disappear. However, evidence suggests that access to health care alone is insufficient to reduce health disparities. Indeed, Evans, Barer and Marmor spent much of their book, *Why Are Some People Healthy and Others Not*, refuting that simplistic model.

Other developed countries seem to give more weight to social service expenditures, as illustrated in Figure 3.[7] In this figure, we see that the US is an outlier, with far more spent on health care than social services. In this world-wide experiment, most societies that spend more on social service tend to have better population health outcomes as measured by life expectancy.

Figure 3 Total Health and Social Service expenditures

[7] Bradley et al_Health-Social Expenditures_BMJ Qual Saf 2011

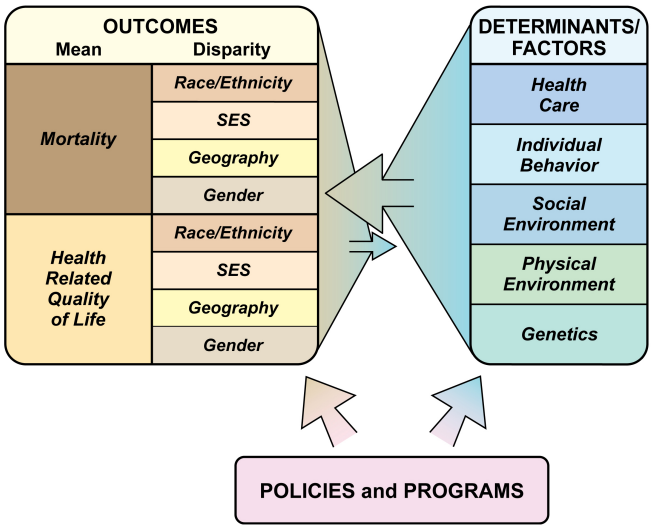


Knowing the limitations of the health care based model, why have alternative approaches to the health production, as illustrated in figure 2, not captured more focus and hence more dollars for the production of health in the US? In part, the complexity of alternative models of health production prevents effective communication. When we talk about the multiple determinants, it seems as if we want to tackle all known problems in a society. Because the simple medical model is easy to understand, it has garnered enormous amounts of societal resources. Now that health care is so big, it is almost heresy to say that it isn't the solution. We will only control the per capita health care spend when society sees the need to do so.

Figure four illustrates work from Dr. David Kindig. It is an approach that the team at County Health Rankings has used to help with their work.[8] We believe that Figure 4 is a reasonable model to use to explain not only health production, but also health disparities. We think it incorporates some of the issues that Evans and Stoddard consider, but is simpler for people to understand. During this 90 day cycle, we had the opportunity to see it used.

Figure 4 The determinants of health and outcomes.

[8] http://www.countyhealthrankings.org accessed on May 14th

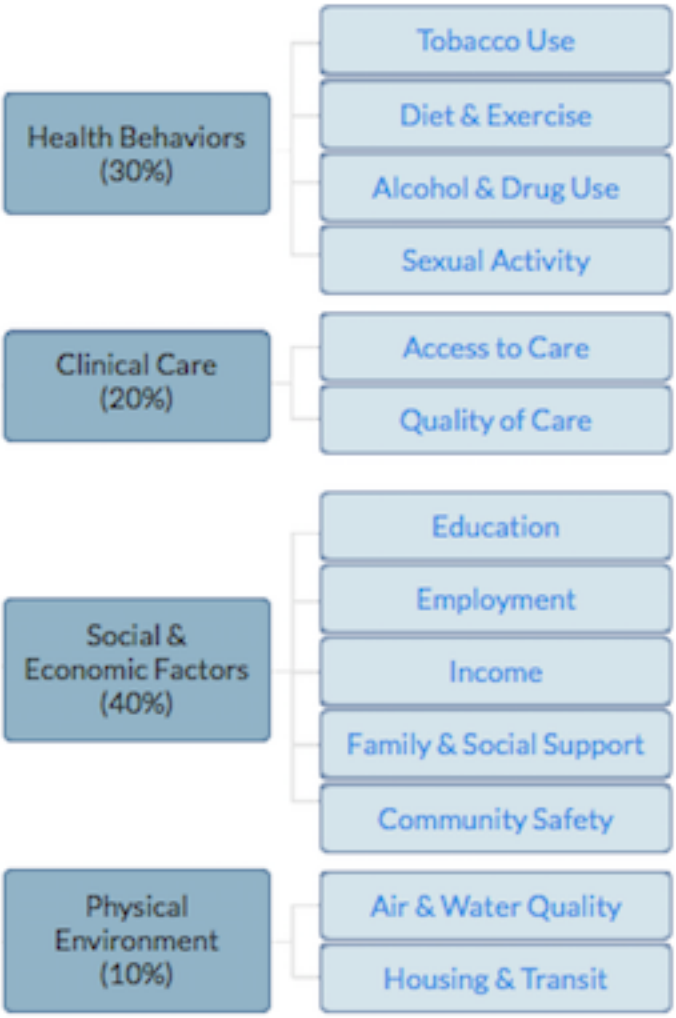


While visiting central Illinois in support of a new community health coalition, we attended a series of meetings. In a meeting of health care leaders, we saw a C-suite executive take a sheet of paper with the basic outline of the Kindig model and use it to explain the production of health without prompting or previous discussion of the model. There seemed to be general acceptance in the room of this model. And, at the end of two days of meetings in which we met with United Way, business leaders, health care leaders, social service agencies, local politicians and public health, not once did we hear about the need for more hospital beds, or physical health care services. What we did hear was about children living in poverty and mental health needs. We recognize that one test of this communication strategy is not enough, but we were encouraged by its results.

Another important aspect of this work is not only to develop a better communication strategy, but also an overall framework to organize our interventions. For now, we think of the work of the county health rankings and David Kindig on the multiple determinants of health as our default driver model.[9] See figure 5.

Figure 5 County Health Rankings Driver Diagram

[9] http://www.countyhealthrankings.org/roadmaps/what-works-for-health accessed on May 14th



Part 3: Outlier Analysis

During this wave we reviewed all-cause mortality rates at the state level. Our goal was to look for states that were making progress in decreasing overall mortality and reducing the black-white disparity in mortality. Based on conversations with Dr. David Kindig and preliminary data that he shared with us, we knew that differences existed between many states on these two indicators. We spent some time thinking about the overall trends and the absolute number differences. We picked three states that had overall lower white mortality and lower black mortality compared to the US.

Based on these data, we focused on three states for further analysis: Massachusetts, Rhode Island, and New York.

Figure 6: Massachusetts Mortality Data

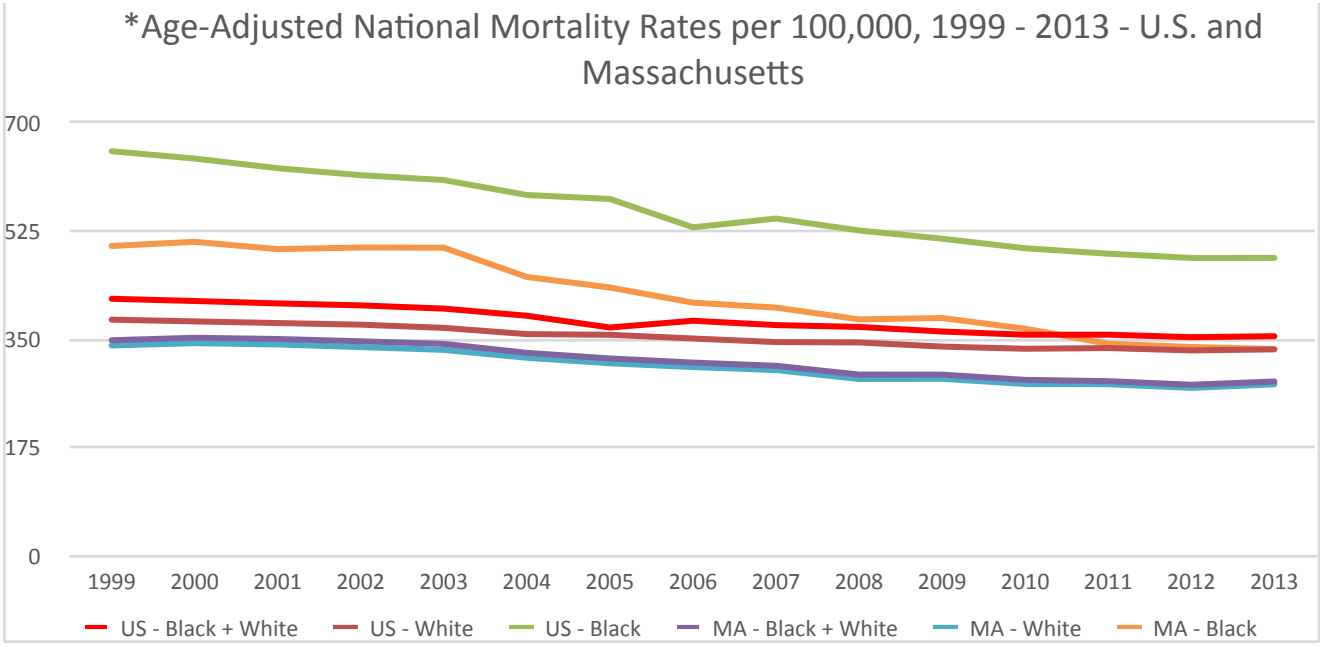


Figure 7: Rhode Island Mortality Data

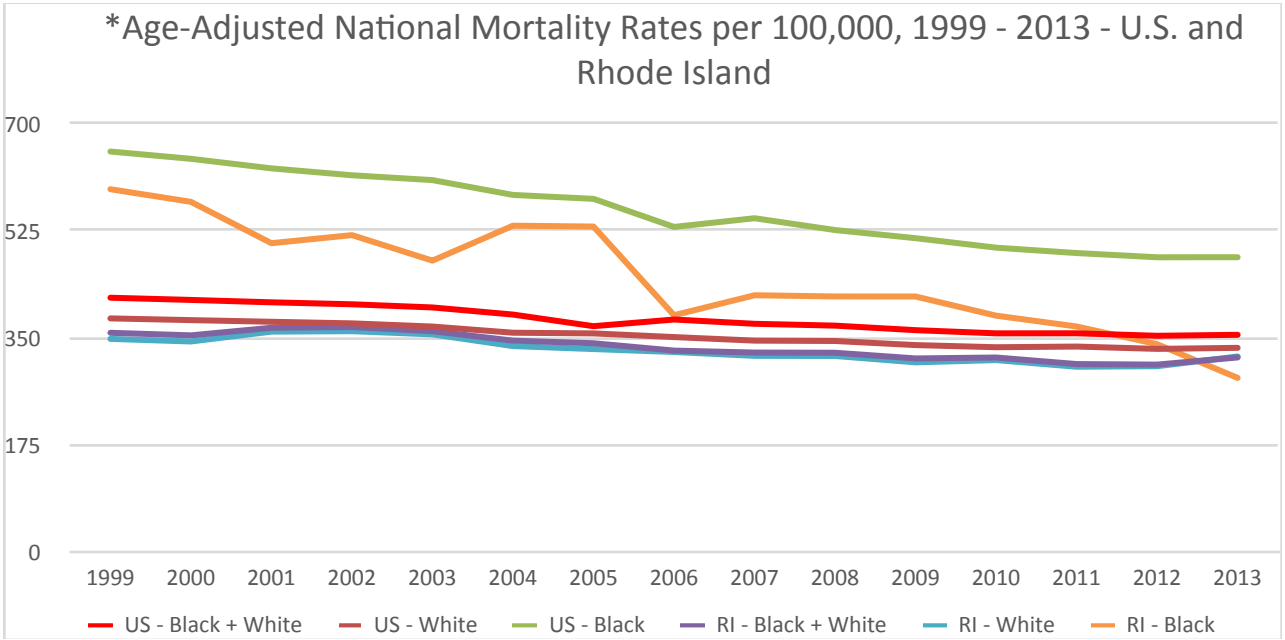
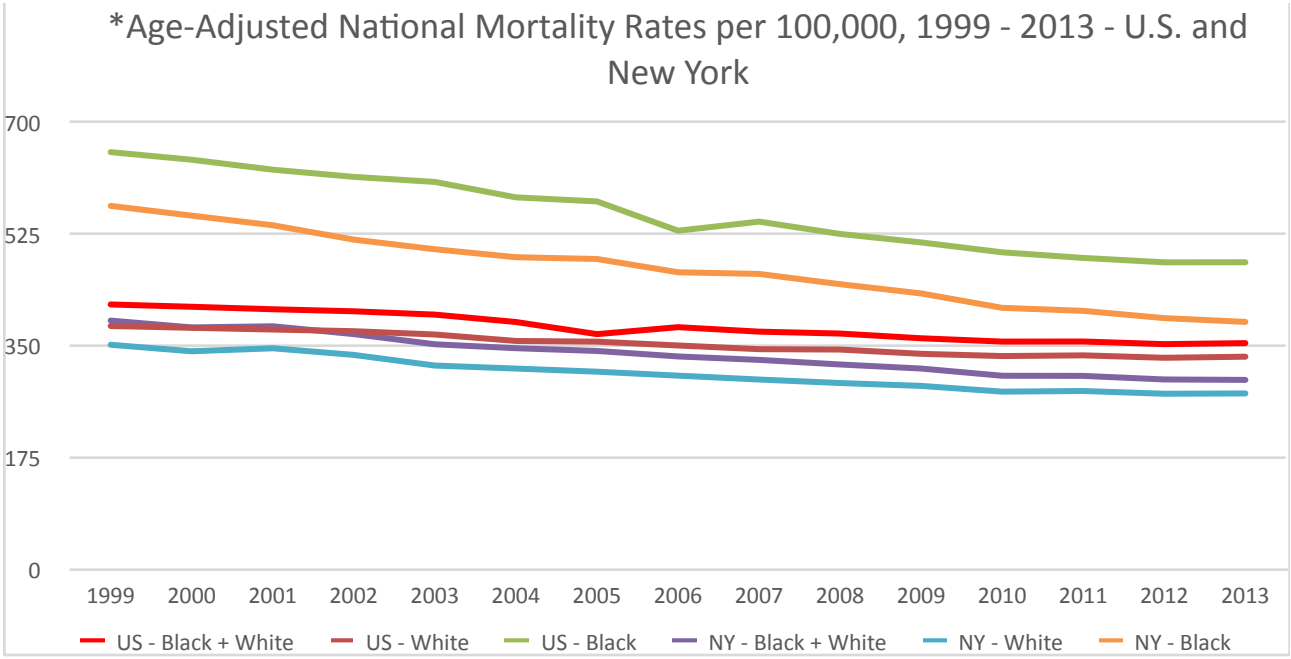


Figure 8: New York Mortality Data



* Data source: CDC Wonder Compressed Mortality Database. Sample: Black/African-American and White only; not Hispanic or Latino; ages >1 to 74. Age adjusted using 2000 U.S. standard population.

These graphs demonstrate an overall trend of decreased mortality in the US, both for the entire population as well as for both white and black sub-populations. Between 1999 and 2013, there has been a 14% reduction in mortality for blacks and non Hispanic whites along with a disparity reduction of 17% nationwide. We selected Massachusetts, New York, and Rhode Island because they had both fairly low black mortality rates to begin with, and experienced some of the largest decreases in the black-white disparity while also seeing improvements in overall mortality rates. Since income is so often correlated with poor health outcomes and can confound the causal relationship between race and outcomes, we examined changes in median household income in the three states; the changes were unremarkable as black median household income remains far below that of whites in the states. See the Appendix for the graphs of median income.

The differences in the rate of disparity reduction for New York and Massachusetts were not statistically significant. Rhode Island had a large decrease in black mortality, with the age-adjusted black mortality rate dropping below the state and national rates as well as the state rate for the white population. We are continuing to investigate the cause of this large decrease in mortality for black residents of Rhode Island.

Table 1 shows the white and black population sizes for each state from 1999 – 2013. Data is from the U.S. Census and the American Community Survey. Data not available for 2001 and 2003.

Year	Massachusetts – White	Massachusetts – Black	Rhode Island – White	Rhode Island – Black	New York – White	New York - Black
1999	5,521,542	405,159	912,101	50,292		
2000	5,367,286	343,454	891,191	46,908	12,893,689	3,014,385
2001						
2002	5,626,212	428,263	957,030	62,506		
2003						
2004	5,581,053	434,545	962,437	65,958		
2005	5,548,846	438,892	956,569	66,483		
2006	5,568,643	446,721	947,030	67,328		
2007	5,576,368	447,879	937,845	67,040		
2008	5,601,486	455,880	929,778	66,847		
2009	5,664,723	468,838	930,287	67,617		
2010	5,289,078	422,303	866,678	62,082	12,764,402	2,990,591
2011	5,294,754	431,907	863,294	62,282	12,768,805	3,013,740
2012	5,310,948	446,347	859,686	64,711	12,808,268	3,037,255
2013	5,318,548	454,887	876,853	81,306	12,779,326	3,042,152

We used Massachusetts as a test case to identify what macro-level (policy and program) factors contributed to its black mortality rate being lower than the national average. These reasons include:

- The MA health reform law, which was passed in 2006, reduced overall mortality rates.[10] A 2013 study found a significant decrease in all-cause mortality (-2.9%, p = 0.0003; approximately 8.2 deaths per 100,000 adults) and a significant decrease in deaths from causes amenable to health care (-4.5%; 0 < 0.001). However, racial disparities in mortality, access to care, and in other health care quality metrics such as screening and preventative care remain after the law was passed.[11,12] While there was some marginal improvement, it was not statistically significant. This is a good example of the population mean improving while having no effect on changing the distribution or reducing disparities. Even though disparities were not reduced, absolute rates for black mortality decreased as a result of increased health coverage and thus access to health care services, even while not at the same rate as other racial/ethnic groups.
- Massachusetts has been working on reducing health disparities for many years. There are numerous inter-agency task forces as well as academic research centers focused on disparities reduction located in the state. While this is the case in other states, the concentration of academics and health systems in Massachusetts seems to make this a unique factor to the state.
- Massachusetts has a smaller black population than many states, and these individuals may be generally healthier for a variety of reasons, such as being more educated. Massachusetts has one of the highest percentages of blacks with a college degree (~25%)[13] and the percentage of black high school graduates (73%) is marginally better than the U.S. average of 69%.[14] While median income for blacks ($44,157 in 2013) in

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[10] Sommers, Long & Baicker. Changes in Mortality after Massachusetts Health Care Reform. Annals of Internal Medicine. 2014;160:585-593.

[11] Zhu J, Brawarsky, Lipsitz S, Huskamp H & Haas JS. Massachusetts Health Reform and Disparities in Coverage, Access and Health Status. Journal of General Internal Medicine. 2010;25(12):1356-62.

[12] Van der Wees PJ, Zaslavsky AM & Ayanian JZ. Improvements in Health Status after Massachusetts Health Care Reform. The Milbank Quarterly. 2013;91(4):663-689.

[13] State of the States: The Poverty and Inequality Report. The Stanford Center on Poverty and Inequality. 2015.

[14] http://www.governing.com/gov-data/education-data/state-high-school-graduation-rates-by-race-ethnicity.html

Massachusetts is still considerably lower than for whites ($71,042 in 2013), it is the 8th highest in the country.[15]

- Massachusetts is a politically liberal state and has high social service spending and thus a strong social safety net – it ranked fifth in per capita state spending in 2013 ($8,597).[16]
- Massachusetts is a wealthy state and has relatively low rates of poverty. Massachusetts is one of only four states (Massachusetts, New Jersey, Rhode Island, and Washington) that provide more than 60 percent of the support needed to bring incomes up to the poverty line.[17] However, blacks are much more likely to live in poverty than whites in the state.
- Massachusetts has lower levels of unemployment than most other states (7.6% vs. 9.1% nationally). This has held throughout and after the Great Recession.[18]

Part 4: Measurement of Disparity

We did not spend a great deal of time working on measures of disparity during the cycle. We did, however, reach out to both Matt Stiefel and Kevin Nolan who worked on the Triple Aim measurement white paper. They plan to revise or add a section to the paper on health disparity. We believe that disparity should be measured whenever we are looking at overall population measures like mortality or health status. We know that you can look at disparity by geography,

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[15] 2013 American Community Survey data

[16] Calculations by Kaiser Family Foundation based on National Association of State Budget Officers State Expenditure Report: Examining Fiscal 2012-2014 State Spending; Table 1; and the U.S. Census Bureau Resident Population Data, 2013. Retrieved June 4, 2015 from: http://kff.org/other/state-indicator/per-capita-state-spending/

[17] State of the States: The Poverty and Inequality Report. The Stanford Center on Poverty and Inequality. 2015.

[18] http://www.massbudget.org/report_window.php?loc=LaborDay2011_TemplateFinal2.html

gender, socioeconomic status and race/ethnicity, and thatthere are existing examples of global measures. [19,20]

Conclusions and Recommendations:
This cycle of work has been helpful to get a better understanding of health equity and to narrow down what IHI's contribution could be. We were able to review IHI's past work, ongoing work like 100 Million Healthier Lives, examine at data at the state level, and connect with experts around the county. We were also able, via email, to reach out to many former Triple Aim collaborators and learn about work they were doing on improving health equity.

An important question that has been on our mind while doing this work is, "What should IHI be doing in the health equity space?" Health equity is produced by multiple determinants, some of which are far upstream from health care. This is a very broad field and it would be easy to get lost. Based on interviews and discussion, we propose that IHI should help health care work on the multiple determinants of health **that they can directly influence**. We are not limiting our thinking on this to just the provision of health care services. Health care needs to do a better job in providing quality health care for all, and they need to do more in closing health care equity gaps, but that is not enough. They need to work with their own employees, some of whom live in or close to poverty, such as housekeepers. They can improve the career tracks for lower educated employees. They can think about where they build facilities, and who builds those facilities for them. Many health systems are physically located in very poor areas of town and they need to be more involved in their adjacent neighborhoods. Many health systems have significant capital that they invest in traditional investments: stocks, bonds and other investment tools. However, some are now starting to invest money in their communities for both financial gain and community improvement. This is beyond the typical community benefit model, which has traditionally focused on the provision of charity care and making up for Medicaid shortfalls. For example, health care can expand its role in both prenatal care and early childhood care from a typical medical model to a model that looks at this period of time as part of life course.

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[19] Asada Y. A summary measure of health inequalities for a pay-for-population health performance system. Prev Chronic Dis 2010;7(4):A72. http://www.cdc.gov/pcd/issues/2010/jul/09_0250.htm

[20] Inequalities in multiple health outcomes by education, sex, and race in 93 US counties: Why we should measure them all
Yukiko Asada1*, Alyce Whipp1, David Kindig2, Beverly Billard1 and Barbara Rudolph3

We are not trying to be exhaustive in the areas that health care can have an impact on health equity, but we are trying to help us move beyond health care only considering the provision of health care as a lever to reduce health disparities in the communities they serve. But, as described above, we are not asking health care to work on everything. We think they should focus on areas where they can have some direct impact. For example, it is probably not a good idea for health care to try to influence a K-12 curriculum.

We also think that as opportunity presents itself that IHI should be directly involved in geographic communities that would like to partner with IHI on health equity.

In the next 90-day cycle, we plan to focus on the following activities:

1. Identify health care organizations and collect examples of health care working on multiple determinants of health;
2. Work with and test ideas with health care organizations that are interested in working on health equity;
3. Build a basic change package and opportunity assessment tool. This may include a modified driver diagram; and
4. Continue to pursue some outlier analysis work at the county level and perhaps do a little more exploration on Rhode Island's significant decrease in the black-white disparity in mortality.

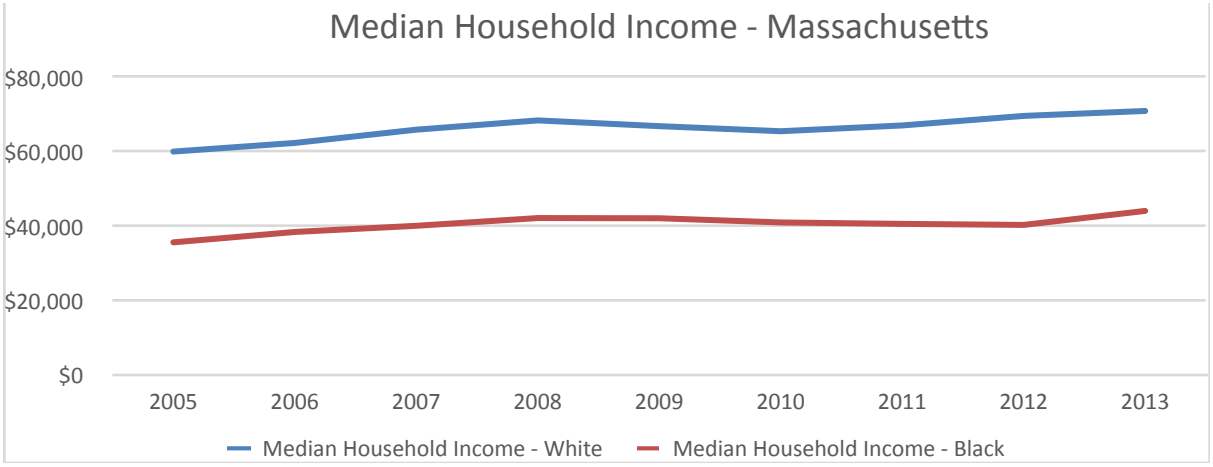
Open Questions:

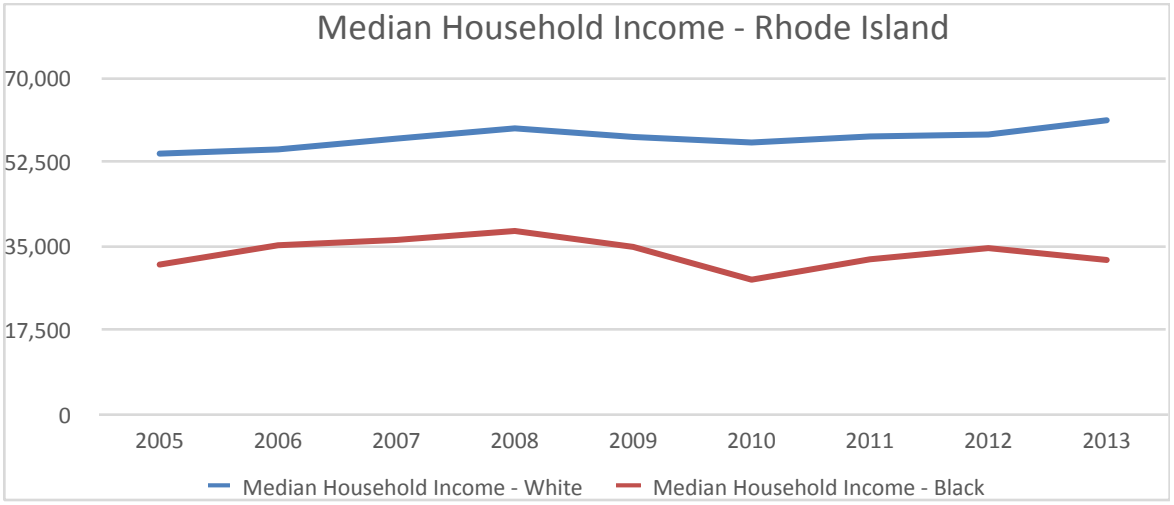
1.How can we do a better job communicating an alternative model to the medical disease based model? *Where would you put resources? Do we need to contain health care expansion in other fields such as wellness and social service, etc.*

2. What data should we pursue to find outliers' positive deviants and then look backwards to see if there were any special causes?

Appendices:

Median Household Income – data from the American Community Survey (ACS)


Median Household Income - Massachusetts
$80,000
$60,000
$40,000
$20,000
$0
2005
2006
2007
2008
2009
2010
2011
2012
2013
Median Household Income - White
Median Household Income - Black


Median Household Income - Rhode Island
70,000
52,500
35,000
17,500
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2005
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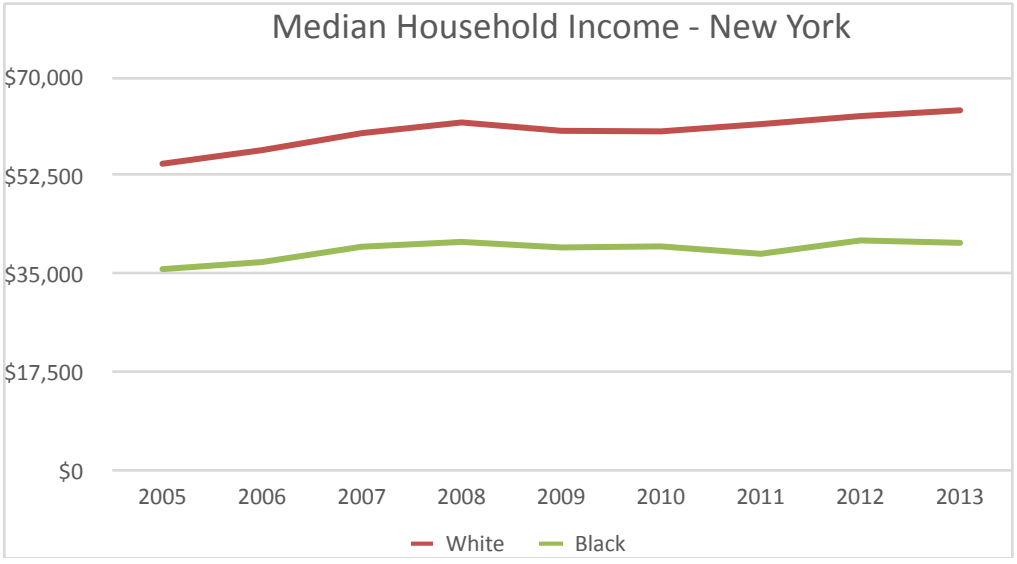
Median Household Income - White
Median Household Income - Black


Median Household Income - New York
$70,000
$52,500
$35,000
$17,500
$0
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