

Global Research Analytics for Population Health

G•R•A•P•H



Business Plan



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Executive Summary

The mission of GRAPH is to give local, national, and international policymakers information on the best investments to make if they wish to improve population health and longevity. To do this, we first identify those social and health policies that can significantly address risk factors for poor health and premature death. We then evaluate the cost-effectiveness of these policies. Because each village, community, county, state, and nation is unique, we build models that best reflect local circumstances. Factors like disease prevalence, physical infrastructure, or a community's demographic mix can radically alter what the best policy mix might be for any locality. This is done through the use of what we call "community diagnostics surveys," which provide all the data we need to make our models work be it Oshkosh Wisconsin or Mae Hong Son, Thailand. Ultimately, we provide a menu of policies, ranked according to the maximal health they produce locally. Finally, we are careful to not only provide menus of policy options, but also the ingredients and pictures needed for policymakers to understand what is that they are buying with their scarce dollars.

Why we do this? Most disease in the world can be prevented if we only had the resources and knowledge to do so. It may well be that the resources are there. After all, the world spends many trillions of dollars on health every year. But this money could be better spent if we only knew how. Because of ignorance, tens of thousands of people needlessly die before their time. But how do we get this information?

Our approach to prevention. It seemed like the best place to start was organizing what we already know. Our first project was therefore to evaluate preventable mortality using experimental evidence. However, this proved to be less than satisfying. We found that our research priorities are little better than our treatment priorities. Most of the proven "preventive" treatments are actually just ways of managing disease after it has already occurred, rather than before it has a chance to set in. This is a problem for many reasons. First, this approach is not very effective. For those with high cholesterol, doctors must treat 100 to 200 just to prevent a single heart attack. The rest must not only pay for the treatment, but also take a pill every day (and not feel so healthy as a result) and suffer the side effects of the treatment. This form of treatment is called "tertiary prevention."

Another approach is to detect disease early and then prevent it. One example is cancer screening, like colonoscopy. Although the person already has the disease, it can be treated and cured before it has a chance to become serious and kill. This form of treatment is less well studied than tertiary prevention, but a good deal is known about this approach. This approach is still less than satisfactory because many people who will never get the disease must undergo stressful invasive medical procedures. These tests themselves can sometimes place people at risk for early death.

A final approach is to simply prevent the disease in the first place. This is called primary prevention. Examples include diet, exercise, vaccination, building healthy neighborhoods and housing, occupational safety, seat belts, and food safety.



Many of these approaches have not been adequately evaluated. For instance, to live in a safe house, drive a safe car, and to eat well, one needs money. However, few cash assistance programs have been experimentally tested as health interventions.

Because our review of “what we know” turned up mostly expensive, weak, and sometimes even harmful preventive practices, we focus mostly on policies that are believed to be most effective by public health experts.

Our models also explore the “side effects” of our policy recommendations. Even the most effective and best-tested policies can produce unpredictable benefits or harms. If they are big enough, side effects can change the cost-effectiveness of a policy.

We refine our models over time. Our approach will not always initially produce the best information, but it will help us understand what we need to know when the evidence is imperfect. Therefore, in conjunction with our policy models, we conduct randomized-controlled trials (RCTs) of what experts believe to be the best interventions.

We have already begun our work. With respect to broader policies, we have policy models for pre-kindergarten interventions, reduced numbers of students per classroom, welfare reform, further lead abatement, and the federal Safe Routes to School (road safety) program that are all built on experimental or quasi-experimental data.¹⁻¹³

Current projects include: an evaluation of Bloomberg’s policies on life expectancy, an evaluation of New York City’s Vision Zero program, and an RCT of advanced social engineering methods for changing behavior (using online advertising with Bing—both subliminal and direct—to evoke behavioral change). Foremost, however, is our primary effort at identifying those policies that will produce the greatest reductions in the global burden of disease.



Mission

The mission of GRAPH is to give local, national, and international policymakers information on the best investments to make if they wish to improve population health and longevity.

What We Do

Public health researchers now understand the major causes of premature disease and death and how they come about. For instance, we understand that smoking is a major cause of heart disease and cancer. However, we have a relatively poor understanding of why people smoke in the first place.

It is largely believed that most risk factors arise from “social” causes—poverty, poor educational opportunities, and marketing from cigarette companies. Still, while we know that high school graduates are a lot less likely to smoke than high school dropouts, we are not sure either how to improve graduation rates or whether doing so will actually reduce smoking rates.

GRAPH will:

Identify those social and health policies that can significantly address risk factors for poor health and premature death.

Help our leaders make informed decisions based upon the return on different health investments they might make. Given that finances are limited, this information will allow them to better understand how to make the investments that will create the healthiest population possible, given limited resources.

This can be done using a technique called “cost-effectiveness analysis.” Using cost-effectiveness analyses, a “league table” can be generated. League tables rank different investments with respect to their cost per unit of health that these investments produce. The unit of health that we use is the “disability-adjusted life year (DALY),” or one year of life lived in perfect health. It accounts for both morbidity and premature mortality.

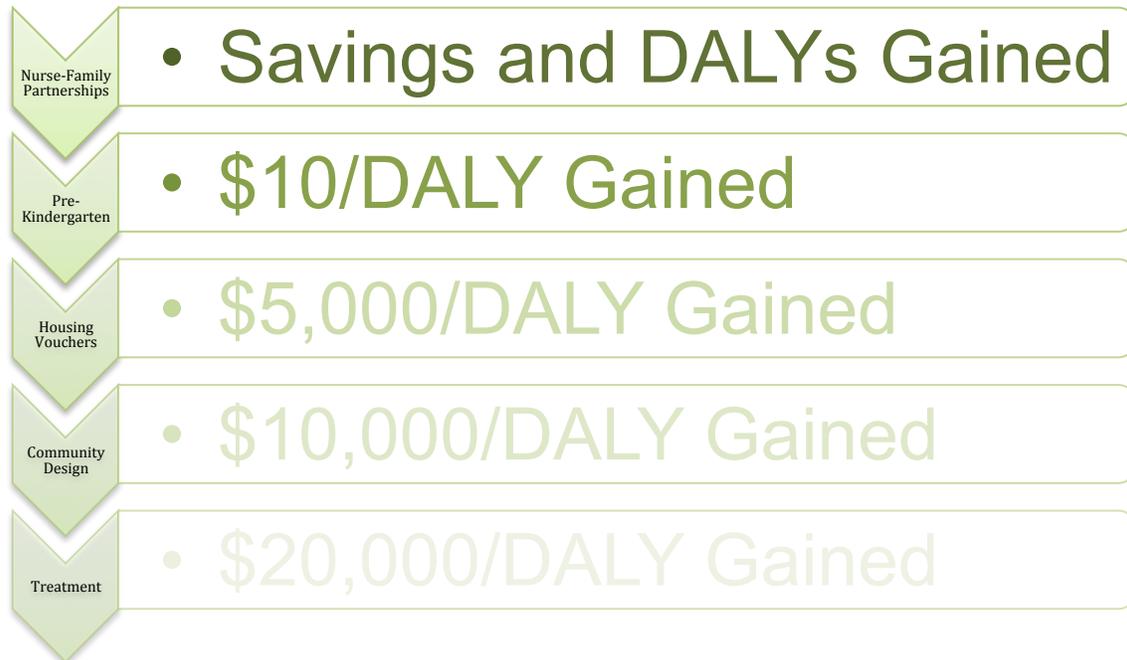
Why a league table? The reality is that even very rich cities, counties, or nations simply cannot afford to buy everything that might make people healthier. The idea behind a league table is simple. Very few investments come for free. For instance, we chose to invest in medicines to lower blood pressure, even though they produce a net cost to society.

In the hypothetical league table below, we show 5 hypothetical interventions and how they might stack up with respect to the investment required and the long-term returns on the investment in terms of money, health, and life saved. We see that Nurse Family Partnerships—a program to teach low-income mothers parenting skills—saves money and lives, so it is clear that this is an investment that should be made. Pre-kindergarten programs come at \$10/DALY gained, and redesigning our communities for health (e.g., creating walkable communities with public transit) comes at \$10,000/DALY gained. Thus, in this hypothetical



example, \$100,000 could buy 10,000 DALYs if it were invested in pre-kindergarten programs but only 10 DALYs if it were invested in community re-design.

This hypothetical “league table” shows the potential benefits of different social policy investments with respect to cost per health gain realized. The disability-adjusted life year (DALY) is roughly equal to a year of life lived in perfect health.



How We Do It

We build Policy Models that use the best available data to estimate the cost-effectiveness of both medical and non-medical risk factors for the leading causes of disease.

We take a very broad approach. We tackle policies that are believed to be most effective by public health experts. We came to this approach after a complete review of experimentally-tested primary preventive interventions—and their health impacts. Most such experiments have been conducted within the medical arena, and most have very little impact on health. While other organizations study interventions that have been “proven” using replicated experiments employing experimental methodology, GRAPH recognizes that some of the most powerful policy “medicines” we have in our toolkit were never properly evaluated.

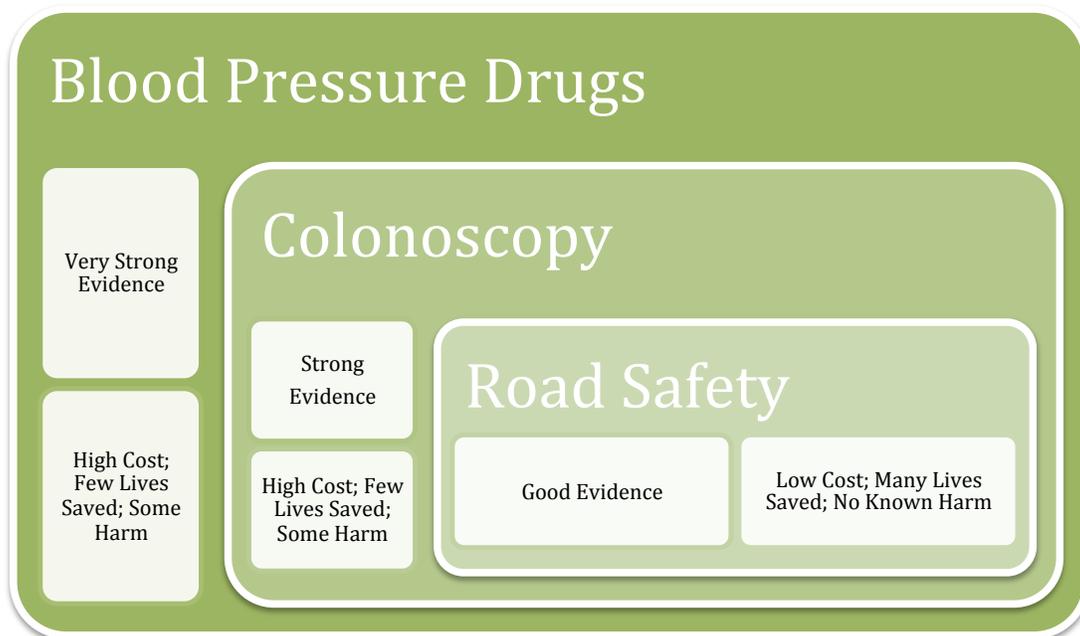
We explore the “side effects” of our policy recommendations. Even the most effective and best-tested policies can produce unpredictable benefits or harms. If they are big enough, side effects can change the cost-effectiveness of a policy.



The best-studied evaluations produce little benefit and come at a very high cost. Pharmaceuticals receive a disproportionate amount of testing and funding. They are by far the most commonly used form of disease “prevention.” Medical screening approaches, such as mammograms, prostate screening, and colonoscopy also receive a good deal of money and attention. But these approaches save very few lives and can come at some harm. It is intuitive that it is best to tackle disease where it starts—in the social conditions and the behaviors that they produce.

Example: Three Preventive Interventions

Three preventive interventions, the strength of the evidence supporting them, their potential to improve health and save lives, and their safety. The larger the box, the more common the use.



This does not mean that there is no place for current primary prevention interventions that have been experimentally evaluated. For instance, our review of existing experimental studies found that human papilloma virus vaccine was notably efficacious at preventing mortality in sexually active women.¹⁴ Likewise, motorcycle helmets are highly effective at preventing mortality among motorcycle drivers. However, the net impact of these sorts of interventions on the burden of disease in the population as a whole is very small. It is also self-evident that targeted interventions (e.g., universal vaccination and motorcycle helmet laws respectively) are useful and do not require further evaluation. For these reasons, we choose to focus on those policies that are believed to produce large population health impacts. For instance, our research has shown that, in the US, inter-generational poverty reduction has the potential to save 550 million DALYs and eliminating smoking could save 350 million DALYs, but providing everyone with health insurance would only save about 10 million DALYs.⁴



We refine our models over time. Our approach, which is based more on expert opinion than existing evidence, will not always initially produce the best information. However, it will help us understand what we need to test experimentally or quasi-experimentally. For instance, members of our team used the best available evidence to examine the cost-effectiveness of reducing the number of children in a classroom.² The thought was that this would improve education outcomes that would lead people to healthier, wealthier, and more productive lives.

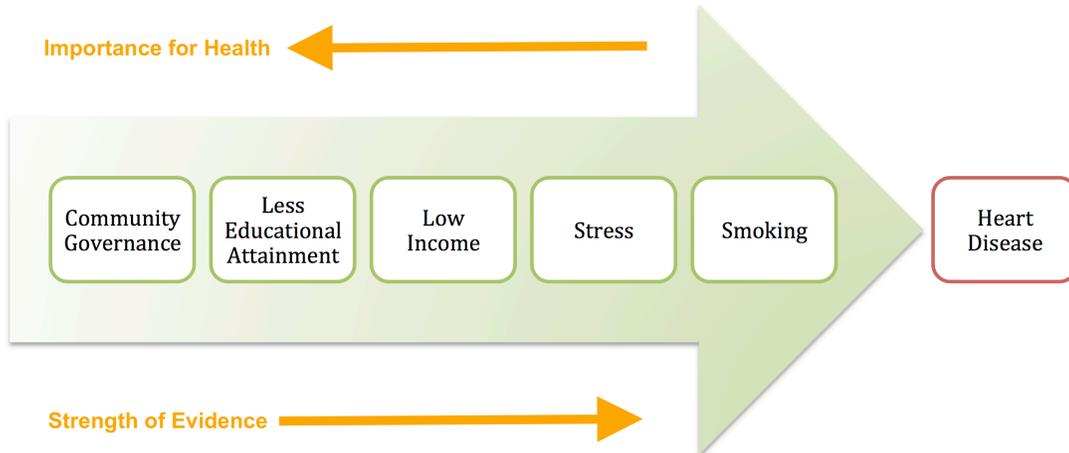
Indeed, when we tested our models using a randomized trial, it turns out that small class sizes does greatly improve education and wealth. However, at least through age 30, reducing the number of children per classroom in the early years doesn't improve life expectancy and may even reduce it.^{5,7} In fact, children in the treated group were at slightly higher risk of accidents. This policy needs to be re-evaluated when the kids are much older because education mostly helps people exercise, smoke less, have better jobs, and live in better neighborhoods. These benefits don't show up until heart disease and cancer set in later in life. However, other types of early intervention (like pre-kindergarten programs) have shown to produce sizable health benefits much later in life coupled with economic returns.¹¹ Therefore, even when the evidence is weak, it is important to think "outside of the medical box."

One Example: Heart Disease

We seek to make health happen by optimizing social policy. Many health experts believe that the best way to tackle heart disease is to prevent it before it has a chance to take hold.¹⁵ For example, heart disease can be prevented or delayed in most people by exercise, a healthy diet, and making sure not to smoke or live in a polluted area. But each of these "causes" of smoking also have underlying "causes." For instance smoking is a lot more common in poor people in part because smoking helps poor people cope with stress. We can keep following this chain of events back to their "root cause."

Unfortunately, the best research is not focused on how to prevent heart disease, but rather how to treat heart disease after it happens. Cholesterol-lowering drugs, anti-hypertensive drugs, and the like might help some extend their life, but people will be much healthier and live longer if they don't have the risk factors (and have to take the pills) in the first place.¹⁴ Society will also be better off without the added toll the disease takes on productivity, caregiving, and medical costs.

The figure below illustrates what one chain of causation might look like. It uses smoking as an example of one risk factor for heart disease.



We now have some ideas about how to reduce the rates of smoking among those who already smoke. Cigarette taxes, sophisticated marketing campaigns, banning smoking in public places, wellness programs, and even drugs are available to help people quit smoking.¹⁶ Through poverty reduction programs, however, we might actually do a better job of preventing smoking from happening in the first place.

The problem we face is that, even though we know that poor people are much more likely to smoke than wealthy people, it is not at all clear that poverty reduction measures will actually prevent people from smoking. Tackling poverty through policy might do as much for people's health as one would think on face value because poverty begins to damage health all the way back to the time of conception. Addressing poverty in adulthood ignores an entire life of exposure psychological stress, for example. (This might also make smoking even more damaging to the heart for poor people than it does for wealthier people.) For these reasons, many believe that tackling poverty earlier in life—by helping poor mom's cope with having children, and by giving children better educational opportunities—is the best way to go for the primary prevention of smoking.

Unfortunately, a weak evidence base can lead to poor policy investments. When many of the social investments that are thought to produce the most health are put to rigorous experimental testing, it becomes much less clear what works and what does not. Health insurance seems to provide good financial protection, reduce depression, and greatly improve preventive screening.¹⁷ However, it seemed to do very little with respect to improving physical health or saving lives when tested in two experiments.¹³ Welfare reform improved income and employment for poor mothers while saving billions of dollars, but may have also lead to premature death for some high-risk women.¹² Many other policies have proven their mettle. But these examples illustrate the importance of continuing to refine GRAPH's models with the best available experimental evidence.



Who We Serve

GRAPH seeks to provide funding agencies, local governments, shared-savings Accountable Care Organizations, the health ministries within nations, and the World Health Organization with the tools that they need to “fix” population health problems. GRAPH will serve as a research center, a “think tank” and a “do tank,”

providing both government and private entities with information that they need to optimize the health and longevity of the populations that they serve.

One multi-institutional project, the *Global Burden of Disease*, is a massive undertaking that has helped us understand the most important diseases in localities, nations, and globally. It also helped us understand the underlying risk factors for these diseases. GRAPH seeks to be the “cure” to

Global Research Analytics for Population Health (GRAPH): The Basics

Geographic focus: Global.

Policy focus: Those policies believed to produce the greatest health impacts.

Method of evaluation: Cost-effectiveness and systems science models.

Evidence-base: While we prioritize proven interventions, very few primary prevention policies have been rigorously evaluated. We therefore evaluate policies irrespective of the underlying evidence. We partner with other institutions—such as MDRC—that conduct experimental evaluations of the social policies we evaluate. This way, we can continuously improve the quality of our models.

the *Global Burden of Disease*. GRAPH will provide clear policy or health intervention instruments that require investment, alongside the return on such investments.

GRAPH seeks to fill what is undoubtedly the most important gap in the public health research community—solving the big question of how to generate health at the population level.

The GRAPH Approach

GRAPH’s models will account for the considerable uncertainty as to which policies or packages of policies might be needed to address the various risk factors for poor health, and that account for the vast majority of the global burden of disease. These models will also account for the unintended consequences of policy investments using “systems dynamics” science.

GRAPH will first build state-of-the-art decision analysis models to evaluate the right mix of policies to optimize health. We will then develop a “community diagnosis” survey instrument that will allow these models to be populated with key inputs from localities that request our services. This survey instrument will allow us to estimate the most cost-effective mix of social policies for a given



locality, the burden of risk factors, the economic costs of disease, and the health-related quality of life impact of each disease. In short, it will produce a “return on investment” for each of the recommended preventive policies. There are 5 major steps in this process.

1. **Identify those public health policies thought to be most effective at reducing the global burden of disease’s leading conditions.** One of our first projects will be to extend GRAPH’s existing research on the prevention of the major causes of death to the extension of health and longevity. This will entail identifying the underlying risk factors for the top 90% of the diseases within the Global Burden of Disease. To do so, we will elicit expert opinion to develop a list of potential policy interventions to address these risk factors.
2. **Model the impact of these policies on health and longevity.** We will develop stochastic decision analysis models that will evaluate the cost-effectiveness of these policies using state-of-the-art models and the forthcoming standards to be set by the second Panel on Cost-Effectiveness in Health and Medicine.
3. **Refine these models by linking health outcomes to ongoing social policy experiments.** We will engage major public and private research partners—such as MDRC—to prospectively and retrospectively collect health and mortality data from social policy experiments. These data will be used to improve the reliability and certainty parameters within our stochastic decision analysis models.
4. **Develop a community diagnosis survey based on the requisite model inputs.** We will develop an optimized community health diagnostic survey that allows us to modify our model inputs such that they can be tailored to a specific localities or sub-group populations.
5. **Market our services to consumers of preventive data.** We will engage major public and private research clients who wish to elicit GRAPH’s services to provide policy advice that advocates for public health change at the local, national, and global levels. By delivering carefully designed community diagnostic surveys, we will be able to predictively model local outcomes based upon prevailing conditions at the local level. Our preliminary market analysis suggests that a number of localities have already requested similar analyses (at considerable cost). Therefore, short-term funding will be derived from mission-relevant research partners and the long-term funding will be derived from government (e.g., local health departments or foreign governments) and private clients (e.g., accountable care organizations) to perform community diagnostics.

Contextualization of the Policy

The context within which any given policy is implemented is very important. In very low-income villages or refugee camps, it does not make a good deal of sense to install sophisticated water and sanitation systems. The money would be better spent on vaccines, foods, or other interventions where a basic latrine might do. On the other hand, a small, crowded town might be much better off with long-



term infrastructure investments that deliver clean water and sanitation than in food or medical programs. Some policies are challenging to implement within a given political economy. In the United States, it is difficult to create a universal health care system due to that nation's political economy. In some parts of rural India, it is difficult to scale up education interventions because management and corruption issues limit the quality of any schools that are built. GRAPH works on both a global and local scale. We seek to first build models that are most broadly generalizable across different contexts, and to build these models in a way that is flexible enough that they can be adapted to variations between different localities.

This variation will be captured in our “diagnostic surveys,” which allow us to change the underlying assumptions of the models based upon the underlying realities of the local context. For example, a schooling model might include a variable for management quality that accounts for the local availability of high quality managers at the pay scale offered by public schools. This way, we can provide local policymakers with information on the best mix of investments within their locality based upon an array of local, contextual variables.

Policy Selection

The Global Burden of Disease project allows for easy identification of the world's most pressing diseases and their underlying risk factors. Other efforts, such as the Robert Wood Johnson Foundation's County Health Rankings also help us identify key policies for reducing the burden of disease in localities.

Key to reducing the burden of disease in any given population is to reduce the prevalence of the underlying risk factors for that disease in the general population. GRAPH will solicit the opinion of leading experts on primary prevention strategies from across the political spectrum as to which of the underlying risk factors for these diseases are preventable via policy tools currently at our disposal. The following criteria are used to select the best policies to evaluate. Priority is given to those policies that are believed to have the greatest impact on population health, rather than the strongest evidence base, but the quality of the evidence base is still used as one criterion.

1. Are the risk factor(s) addressed by the policy responsible for a **large proportion of the burden of disease** within the population of interest?
2. Is there a reasonable **evidence base** supporting the causal association between the risk factor(s) and reduction in the disease in question?
3. Will the policy reasonably produce a **large reduction in the risk factor(s)** within the population?
4. Is there a reasonable **evidence base** supporting the causal association between implementation of a given policy and reduction in the risk factor in question?
5. Is the policy **reasonably easy to implement** within the context in question.
6. Is the policy **generalizable** to other contexts?



Modeling Approach

GRAPH will build models using a software package, TreeAge. We chose to do this because such models are quicker to build, the models are more transparent, and because it is easier to manage staffing transitions with a consistent, out of the box software package than it is with models that we build ourselves (e.g., using Python or C+ programming languages). The drawback of this approach is that such packages are less flexible than models we would otherwise build ourselves. Another key element to our approach is the evaluation of underlying model assumptions and the unintended consequences of policy actions using expert advice.

Partnerships

At the time of this draft, GRAPH was in the process of partnering with the Coalition for Prevention, the University of Washington, MDRC, J-PAL, and a number of other entities that either build models for policy evaluation or perform randomized-controlled trials. **Only our partnership with The National Prevention Science Coalition has been formalized as of July, 2015.**

By foreseeing the unintended consequences of a policy action over time, it is not only possible to better rank our policy recommendations, it is also possible to modify our suggested interventions and approaches based on the unforeseen harms and benefits that they might produce. For example, road expansion and upgrade efforts can reduce traffic congestion and improve safety over the short-term. But over the long-term, they can incentivize driving behaviors, thereby increasing accidents, pollution, and obesity. The solution may be to invest more in public transit than in road safety. We will use a formalized process for soliciting the unintended consequences of policies from experts rather than modeling them using a software package as this approach is faster and allows for a wider range of variables to be identified.

Our modeling approach is detailed in our textbook: *Cost-Effectiveness in Health: A Practical Approach*, 3rd Edition.

Presentation

GRAPH will generate customized reports for localities interested in optimizing their health investments. However, we will also develop a web portal and app that allows users to obtain data on an array of potential treatments for prevailing conditions. For instance, the Robin Hood Foundation has a very large portfolio of health investments. These include diabetes, asthma, primary care, HIV/AIDS, and so forth. Within each of these categories, they fund a number of organizations that do very different things (e.g., screening or improving food pantry offerings). Using our web portal, this organization could eventually evaluate which of these organizations should receive priority funding based upon



the cost/QALY return of each separate component of their program. A weighted average return on each investment could then easily be calculated.

Likewise, we will have an interface that allows users to enter various disease prevalence estimates to generate a table that indicates which investments will produce the largest bang for the user's buck.

Similar Research Efforts

GRAPH takes a unique approach to preventing disease by focusing on policies and by using cost-effectiveness models combined with decision science models. However, there are various other institutions that are working on primary prevention of the world's greatest health problems. We strive to collaborate with other entities, rather than compete against them. Preliminary conversations with other primary prevention research efforts have been initiated. Each brings a unique set of strengths and weaknesses to the understanding of the world's most pressing preventable diseases and conditions.

1. University of Washington. The Global Burden of Disease research effort is currently building "microsimulation" models that aim to tackle the complexity of any given disease. Their approach is similar in that primary prevention modalities are emphasized using models. Their approach is different in that they seek to tackle problems that more directly underlie diseases (e.g., sanitation) and use much more complex (and flexible) models with a very short analytic horizon. We will attempt to work in tandem with the University of Washington, focusing more on broader social policies rather than targeted interventions.
2. Washington State Institute for Public Policy. This institute is very similar to GRAPH in that it tends to focus on pragmatic model building, and non-medical policies. They differ in that they are focused on cost-benefit analysis (valuing health and life lost) and in that they are focused on Washington State. We will work with them to try to expand their existing models to broader populations, to import their data into our more flexible software, and to fill in any policy gaps that have been left open.
3. The Coalition for Prevention (of which GRAPH is a member), is a group of institutes that are focused on primary prevention of a broad array of outcomes. Few of these institutes have a health focus.
4. The Altarum Institute provides similar consulting services to tackle specific social policy issues in a comprehensive way. However, they do not take a systematic approach to reducing preventable disease in the general population.

The GRAPH Team

GRAPH is a mission-driven research center that draws upon a multi-disciplinary group of scientists and support staff.



Management. Continuous quality improvement protocols will be applied to processes and staff alike. Strengths, weaknesses, threats, and opportunities (SWOT) analyses will be carried out on a semi-annual basis. Staff motivation and performance incentives (e.g., raises for work well done) will be built into the management structure. More importantly, we will partner with—rather than just compete against—entities that do similar work. Many of these partnerships have already been developed.

The core GRAPH team will initially consist of a Director, a Managing Director, a Research Director, and a number of post-doctorate students supported by research assistants. In addition, GRAPH will contain an interdisciplinary research fund, such that leading Mailman researchers across all departments can be brought in to assist with the very complex models that will need to be generated. All participants will be involved in the publication process and will author papers produced under the GRAPH name. All marketing will be GRAPH branded. However, researchers will have individual authorship rights on the papers, reports, and books that GRAPH produces.

Director

The Director, Peter Muennig, will oversee and ultimately be responsible for all work produced by GRAPH. He will provide administrative oversight, mentorship for the team, and be central to the conceptual development and operation of GRAPH as a global research center.

The Director's responsibility is to oversee the research mission, for making management decisions with the Managing Director, helping to ensure management protocols are in place and adhered to, developing GRAPH's research agenda, participating in the research, and co-authoring major publications associated with GRAPH. The Director will participate in meetings with corporate and government partners when such meetings are relevant to core GRAPH activities. He will also actively engage key funders that wish to solicit mission-relevant projects and will be responsible for some outreach, such as maintaining relationships with foreign government officials and private decision makers. The Research Director at this point will be a part-time position.

Managing Director

The Managing Director, Zohn Rosen, will be responsible for overseeing project budgeting and coordination; conducting SWOT analyses; and, in conjunction with the Research Director, developing, implementing, and evaluating continuous quality improvement initiatives. He will be the primary liaison for corporate and government partners as well as the first point of triage for assessing the appropriateness of funded research projects for GRAPH. In deciding on relevant projects, all potential projects will be discussed and assessed with the Director. In addition, he will co-produce necessary research plans and presentations with the Director and participate in the execution of research projects and publishing efforts.



Post Doctoral Students and Affiliated Faculty

The research advisors will consult on technical decisions related to complex modeling problems, complex biostatistical problems, and complex epidemiological problems. They will participate in meetings with corporate and government partners when appropriate. Because it is unclear which projects will be tackled first, a special fund has been created to allow percent effort buyout for the research advisors. The research advisors will all be drawn from Columbia University, and will be interdisciplinary.

Research Associate

The Research Associate is responsible for the design and execution of research projects, directing data collection efforts, overseeing research assistants, and assisting with publishing efforts.

Research Assistant

The Research Assistant would be responsible for the production of the core decision analysis models. He or she would have experience in decision science, and at least one would have the ability to program in a major computer language (e.g., C+). We have developed a dynamic business model in which research assistants can be brought on to projects or removed from projects as needed.

Other research staff

Babak Mohit, Dr. PH, MPH, MBA, MHA (100% GRAPH budget). Babak comes to us from Hopkins, where he most recently developed the Social Return on Investment Calculator. He has decades of experience working in health economics more generally. GRAPH will serve as his post-doctorate. He will lead our training and education efforts for staff that need to learn decision analysis software.

Liu Junan (Funded by Chinese government) is an Associate Professor at Tongji Medical College, one of China's top 3 schools of public health. He has a Ph.D. in management science and specializes in primary care performance evaluation. He will lead efforts evaluating our work on the medical side of health policy.

Zhaowen Qian, Ph.D. (100% scholarship funded in the Netherlands) is an economist trained at Erasmus University in Rotterdam. She has a finance background and is interested in international finance. She will be working on the welfare analyses and helping us more broadly with cost analyses. Ultimately, she will be central to helping us translate our work to the middle income context.

Wenrui Li, Ph.D. ABD (self-funded/mixed scholarships) comes from U Mich quantitative analysis program and from the Central University for Finance and Economics. She is very interested in macroeconomics and, specifically, tax policy. She will be working with us on our tax models. She has experience working with the World Bank and her macroeconomics experience will help us with developing complex systems dynamics components to our models.



Jinjing Li, Ph.D., ABD (Funded by Chinese government) comes to us from Beijing University where she works in public health and has experience researching the non-medical determinants of health.

Shan Paterson, Ph.D. (self-funded) is a volunteer whose day job is building tax models for multi-national corporations interested in exploring new markets. She will be working with Wenrui on EITC and STAMP models.

Brigid Jung (RA 100% GRAPH, potential to be hired) will be providing research and writing assistance to the team.

Product

GRAPH will tackle the “big question” in public health: how do we make populations healthy? To this end, a number of journal articles and a book will be produced that provide comprehensive information to global policymakers surrounding how (after accounting for their political economy and overriding ethical concerns) they should invest fixed social policy funds.

GRAPH will also provide customized analyses for public and private entities that need to understand what the return will be on policy investments given fixed budgets at a reasonable cost to those parties. This will be performed through “community diagnostics,” or surveys that are tailored to the requisite model inputs for tailoring our analyses to localities with different socio-demographic compositions and disease patterns.

Marketing

All work by GRAPH team members will be branded. We will work closely with External Affairs to ensure that research products are disseminated. The new GRAPH website will contain news and updates on GRAPH products—including compelling interactive graphical representations of the work that we do—but will no longer contain generic population health metrics. The existing GRAPH website will be replaced with a more traditional website that blends in with the schools unified marketing strategy.

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