

PERCEPTIONS OF RISK: EVALUATING WOMEN'S HEALTH CONCERNS IN  
SILICON VALLEY FOR CREATING A VIABLE ONLINE BUSINESS

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by

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## ABSTRACT

This report evaluates the viability of an online toxins-testing business by investigating women's self-perceived health risks associated with commonly encountered toxic sources. An instrument was designed to qualitatively analyze the sample's perceived risks to their health maintenance and their awareness of toxic sources in their environment. The applied instrument also reveals the sources of risk awareness, how the interviewees avoid toxic sources, and if they would be interested in services to monitor their personal toxicity levels. The preliminary results from the analysis of 14 subject interviews of women between the ages of 22 and 53 living in Santa Clara County, California are discussed in conjunction with a stakeholder analysis relevant for the business being evaluated. Recommendations are given to the business to improve its overall business plan.

## ACKNOWLEDGMENTS

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## **1. Environmental Contamination and Women's Health**

There is growing concern about the bioaccumulation of toxins in peoples' bodies and what that means for reproductive and neurological health. From agricultural chemicals, industrial waste, landscaping fertilizers, and antibiotics to fatten poultry, humans, particularly children, are exposing themselves to new harmful chemicals that as a species we have not adequately adapted against (Cohen 2007). Medical ecology is particularly suited to this issue as it specializes in how people survive in their specific environment (McElroy and Townsend 1989). Although toxin exposure is a global phenomenon, particular regions of the industrialized world have an unequal share of the problem. One such region is Northern California's Silicon Valley. The Silicon Valley Toxins Coalition, a nonprofit that specializes in local environmental issues, writes on their website that many new industries coming out the area have environmental issues that need to be addressed. For example, solar technology uses Photovoltaic (PV) panels that are "based on many of the same toxic materials and manufacturing processes as electronics" that are common in several of the Superfund sites in Santa Clara County, one of the counties that make up Silicon Valley.

Superfund is the name given to the federal environmental program established to address abandoned hazardous waste sites. Despite the identification of a site as a Superfund with clear cleanup strategies in place, determining who to hold responsible for the contamination causes extensive delays to an already lengthy process.

Corporations can shut down or be bought and sold over and over again with active environmental compliance and clean up responsibilities in limbo.

As of the writing of this report, Santa Clara County takes on 25 percent of California's Superfund sites with a total of 25 listed sites, out of 98 in the entire state. No other county in the United States has a higher number of Superfund sites. The 2005 CERCLA Priority List of Hazardous Substances shows arsenic, lead, and mercury as the top three hazards found in Superfund sites (Agency for Toxic Substances and Disease Registry 2010). The body burden for female residents is particularly strong as the chemicals to which they are exposed to such as mercury and Bisphenol-A (BPA), likely have implications for how their children develop in utero (Xue et al. 2007).

Heavy metals such as mercury can not be destroyed through biological degradation and therefore continuously recirculate through a complex processes of absorption, and chemical combination. Although mercury is naturally found within the Earth, anthropogenic factors cause the mercury that is locked away to be exposed to the ecosystem. These emissions come from several sources including coal combustion, waste incineration, chlor-alkali facilities, and various industrial and mining processes. Mercury emissions from these sources are not monitored directly making regional analysis much more complicated.

Plastics "are often not only less expensive than alternative materials, but their properties often make them better" (Stevens 2002:3). Although plastics have revolutionized many different industries, there may be a down side to their ubiquity and usefulness. Bisphenol-A (BPA) can leach out of plastic into liquids and foods that are

heated in BPA-made plastics. BPA is very similar in structure to diethylstilbestrol (DES), which is a synthetic estrogen used to treat women for nausea during pregnancy. DES was thought to have caused major malformations and birth defects in newborn infants and possibly raised cancer risks for the children exposed. BPA in numerous animal studies has been shown to cause a wide variety of serious health effects, but no conclusive human studies have been published at this time (Food and Drug Administration 2010). BPA is not the only synthetic hormone utilized in plastics, but because BPA is used in so many common products and has shown effects at low doses, it quickly became labeled as a toxic chemical. As one can see, many factors complicate the study of mercury and BPA and their effects on whole ecosystems. Public health concerns involving toxins have a compounding effect which then in turn intermingles with other environmental and economic goals of public and private agencies and institutions. This again makes active environmental compliance and clean up responsibilities of Superfund sites much harder to pinpoint and evaluate.

To mitigate detrimental health impacts, many institutions offer public recommendations for limiting exposure to high-risk toxic chemicals. Government agencies, non-profit groups, and other organizations have made public service announcements on their web sites or through grassroots movements to caution people about various environmental dangers. Health educators are often known to present findings and prevention strategies to community groups when mortality dangers are high for a particular area (Balshem 1991 and Walton et al. 2004).

“Scientists from the Environmental Protection Agency (EPA) estimate that as many as 600,000 babies are born each year at risk of neurological and developmental problems because their mothers have high blood mercury levels from fish consumption” (Hightower 2009). Women are recommended to limit their overall consumption of certain species of fish when pregnant in order to limit their exposure to mercury. Although the recommendations seem to reach a wide audience, there appears to be one problem. No one has created an easy system of monitoring that can be done efficiently and at low-cost for those interested in keeping a more detailed record of their toxicity levels. For example, if a woman who wants to get pregnant finds out that she is over the recommended limit for mercury, she may want to retest as she adjusts her diet or tries techniques to rid the toxin from her body. One of this project’s research questions is to determine if the current study group prefers undergoing their toxicity testing outside of a doctor’s office.

A similar testing issue can be said of Bisphenol-A. From an overview of 25 blogs and websites, it appears that women who utilize online data pools are concerned about the damage BPA can cause their developing children, but currently there are no inexpensive tests available for consumers to test their levels. For example, Brandie posts online in TheMotherhood website community, “So now I’m wondering, how do we handle this? How do we get this chemical, that we know can affect our bodies, out of products and not only that, but get companies to share with us all the places it’s used in?” Fifty other separate posts that discuss BPA show up in the archives of this web community. Despite concerns, most OBGYN offices have not established environmental

toxicity testing as part of their suite of prenatal blood tests. This fact has implications for a testing service that can efficiently attract clients who are interested in various toxin screenings. Therefore the project report will utilize EMP Testing's Executive Summary (Appendix 1) to evaluate EMP's viability as a business conducting online environmental toxicity testing. A deliverable will be discussed that summarizes observations and sets some priorities for the new business.

Determining the significance of such high incidences of Superfund sites in Santa Clara County to women living in the area will help to better understand how women perceive health risks and how toxins are categorized in their cognitive schema. Medically speaking, toxins are defined simply as anything that causes damage at the cellular level and can induce neutralizing antibodies. This definition given by the American Heritage Medical Dictionary allows for many different categories of concerns that can range from acute and chronic involuntary exposures to self-inflicted, well-intended exposure on the individual level. Therefore, several goals of this project are to understand what women perceive to be risks to their health and, if applicable, the health of their children and if there is perhaps a sociocultural element to being an empowered patient as a geographical correlation to living in Silicon Valley. An instrument (Appendix 2) was created that uses semi-structured interview questions to develop data points and see if common themes emerge. The project studied how information is obtained that helps the interviewees make healthcare decisions and examines motherhood and if the role has changed the way some of the interviewees look at the environment. The conclusions from the project are discussed as a deliverable to a new business that conducts toxins testing. This report is

organized into five sections. The first section examines the health problems of environmental contamination and why a toxin testing service is feasible for a wide range of urban residents. Section 2 describes the methodological approach of the project and why this particular study sample was chosen. Section 3 describes the relevant stakeholders for a toxin testing service. Section 4 analyzes the ethnographic data, including themes of setting, women's health, and perceptions of risk. Finally Section 5 discusses conclusions and offers a deliverable to be used for a toxin-testing business to enhance its marketing and operational strategies.

### ***Significance of Project***

According to a 2007 letter written by Dr. Eduardo Sanchez, chair of the National Commission on Prevention Priorities, high value preventative care in the United States is greatly underused (National Commission on Prevention Priorities 2007). Dr. Sanchez writes that health care reform should include a stronger emphasis towards preventative services. Testing for toxicity levels can fall under a preventative health care model, although perhaps not likely considered 'high value' as the toxins of interest in this report are generally not life threatening, except in the case of extreme mercury poisoning. Despite not being one of the main healthcare concerns of today (Partnership for Prevention 2008), the effects of mercury and BPA can have financial consequences throughout a patient's lifetime. Mitigating these effects by providing easy testing procedures and the knowledge that these tests exist to women considering having children would be an important step to providing cost-effective strategies to healthcare. Working on solutions is best summed up by the statement that, "treating illness is

expensive, but preventing it can be relatively cheap” (Hackenberg and Hackenberg 2004:389). One major factor which should not be overlooked is that the American healthcare system does not provide equal access to medicine. Some of the access comes through various benefit packages offered through permanent jobs. Other times Americans purchase their own insurance to supplement other less comprehensive packages or to simply be covered privately because their employers do not offer health insurance. This variability can complicate an already complex healthcare system where certain populations and services can easily fall through the cracks.

Knowledge management can benefit from an understanding of the perceptions that people have of healthcare. Family networks, the media, physicians, and others can shape these perceptions. If BPA and mercury contamination are both considered strong hazards to women of child birthing age, then the public health care system would benefit from understanding how marketing and grassroots education has impacted women’s perceptions of health risks.

Direct-to-consumer business models such as the toxins testing business are becoming proliferate in technology rich Silicon Valley and are helping to close the gap on healthcare services. This includes various DNA sequencing companies such as Navigenics, deCODEme, and 23andMe. “A core component of the companies’ dot-comish strategy is to take their products directly to consumers, circumventing physicians and a traditional healthcare system” (Duncan 2009:102). While part of this concept can carry over to the toxins testing business, bringing costs low enough so that online toxicity testing is more inclusive is key. Many women are juggling financial responsibilities and



scheduling constraints. Therefore, understanding how women dealt with scales of importance when determining values for toxin testing, is critical for providing a service that will be useful to them. As Hibbard and Weeks show, cost sharing of health care through insurance partnering is a competitive business and individuals who can navigate the system as active participants will generally end up with better quality of care (Hibbard and Weeks 1987:1020).

## **2. Project Methodology**

### ***Instrument Creation- How Research Informs Practical Application***

I determined that semi-structured interviews would be the best approach for understanding women's general feelings toward their preventative health care options. The interview questions were written to purposefully avoid asking direct questions about mercury or BPA. This was done to limit researcher bias and encourage personalized responses since this project is based on perceived concerns. One sub-group of particular interest is women of child-birth age. They and any children they may have in the future are the most at risk for developing health problems relating to mercury and BPA contamination.

In order to learn about women's thoughts about health, their information flows, and their perceived environmental health risk, the instrument consists of three parts and began with a short 'warm up' series of questions. These first questions were created with two purposes-- they were meant to put the interviewee at ease and also to gather specific information such as age and occupation that could be used to compare with the interviewee's subsequent answers. The first part deals with identity and agency, the

second deals with personal environments and illness. The last part is concerned with decision-making schema. Information gathered from public online sources such as motherhood blogs, biocitizen homepages, and wellness websites helped to create a language that resonated with the intended population sample, female residents of Santa Clara County between the ages of 18 to 55.

Women obtain information on potential toxic sources through “grassroots” campaigns, which disseminate scientific studies, or through warning or informative product labeling and/or advertising as well as other socio-cultural networks. A reaction to the potential dangers of BPA is clearly present in commercial product marketing, with targeted labeling of plastic bottles, particularly baby bottles, sippy cups and pacifiers as BPA-free. Based on personal observations at big-box retail stores such as Target and WalMart, high-end grocery stores, as well as a preliminary overview of women’s themed websites and blogs, it appears that mothers who frequent these domains are generally aware of the medical uncertainties regarding the safety of Bisphenol-A, although there are certain populations within Silicon Valley that do not have access to the same informational resources and targeted marketing as the interviewees for this project.

Industry reactions to contamination dangers about mercury are not as clear-cut as they are for BPA. The fish industry has not initiated labels for its products and the consumer is left to handle the risks of toxic poisoning without government-enforced labeling standards. Although women appear to be aware of mercury contamination through fish consumption, much of that information comes from government warnings, which may or may not be as effective for reaching a broader audience.

Therefore, one research question was to determine what women "know" about BPA and mercury and to learn how their knowledge schema influences their choices. I did not expect that mercury would be one of the main substances discussed in the interviews as a perceived health risk for women without children or those with school age children and older. Mercury contamination is most critical for women who are pregnant. Several interview questions were written to get a feel of the types of foods women ate regularly so that if fish consumption came up, then the instrument would be equipped to learn if mercury was a concern (warm up questions four-five and question nine).

One of the aspects of living in California, and in the Bay Area specifically is that there is a tendency to celebrate nature. By the turn of the 20<sup>th</sup> century, a growing California middle class began to enjoy more leisurely activities. The creation of the National Parks system put California's diverse natural environment at the forefront of popular culture (Field and Vallee 2010). The popularity of California as a destination has been used to generate interest in visiting and relocating to the state even today. The project instrument was designed to probe this concept and see how interviewees felt about their natural world and its relationship to the built environment, and ultimately circle it back to their own wellness. One of the environments that people spend the most time in is their home. Therefore questions about women's personal environments were asked and used as a gauge to see if interviewees saw a connection between environmental degradation and illness. Question 1 of the instrument was meant to hone in on women's online identities and determine what might be influencing their healthcare choices and subsequent behavior-- I asked about online support groups, provider websites, and

general healthcare websites they visited. Understanding that mothers communicate to each other online about mercury and BPA, it was determined that the next step was to learn what illness prevention meant to women and to what lengths they might go to mitigate their health risks. Questions 2-5 were directly related to this focus. Obstacles to maintaining a traditional primary care relationship with a doctor were considered, and whether or not women in the sample felt empowered enough to be in control of their overall healthcare.

For the instrument, it was important to be aware of how BPA and mercury could be perceived. In comparing BPA and mercury, a simplified definition suffices. Mercury is a naturally available chemical that makes its way into the air we breathe and the food that we eat through human-based activities that release inorganic mercury into the environment. BPA, on the other hand is a man-made chemical used in plastics that has been thought to make its way into our bodies through a leaching process that taints the food and liquids stored in some bottles, cans, and storage containers. A generalized difference between the two chemicals is that one is a naturally occurring substance, while the other is artificial. This difference has the potential to affect peoples' perceptions of the risks each chemical poses to healthcare and the degree to which people feel they have the ability to mitigate the problem. Therefore, the instrument was geared to provide questions that resonated with both an environmental perspective and those from an industrial perspective. Part II of the instrument allowed for both perspectives.

Overall, I created the instrument to obtain a larger perspective on what concerns women were having about their health, and what some of the challenges women are

facing in Santa Clara County to being empowered patients. In terms of testing for toxins, cost is an important variable; therefore, the interviewees were asked about their thoughts on pricing and what would be considered a nominal fee for them to pay. One of the challenges I encountered was to create an efficient instrument that was less than twenty questions long in order to accommodate the busy schedules of people living in Silicon Valley. From the experience of conducting the fourteen interviews, it is believed that that balance was achieved.

### ***General Framework***

There are three main theoretical domains that have guided this project's instrument: biocitizenship, medical ecology, and epistemology. The term biocitizen refers to an individual who mobilizes for his or her community in order to achieve a cleaner, healthier environment for the sake of improved health and wellness. (Industry Compass 2.0 glossary of terms 2008). Biocitizens often create online communities to support their cause. For Michel Foucault, how these biocitizens behave would be of interest in understanding power dynamics and the forces of repression and oppression. (Marshall 1996:92). Biocitizens were of interest for this project because these individuals appeared most likely to pay attention to environmental concerns and potentially serve as a good comparison between other informants that are not as visible with their belief systems. It was expected that biocitizens would know of the health risks of living in Santa Clara County due to its high concentration of Superfund sites. Although this sample did not have any classically termed biocitizens (although two were considered more environmentally aware than the others), power discrepancy came up in the discussions.

This was seen between the perceived hegemony of insurance companies over its enrollees. Several of the interviewees described what they thought to be a lack of distinction between physician's independent medical decisions and those coming down from for-profit insurance company policies.

The second cultural domain utilized for the creation of the instrument is medical ecology. Medical ecology is "a special approach to doing medical anthropology that emphasizes the study of health and disease in environmental context" (McElroy and Townsend 1989:10). Medical ecology has its roots in cultural ecology which studies the relationship between humans and their natural environment. One of the tenants of cultural ecology is that human social systems are impacted by the natural world. Therefore, some of the interview questions are meant to understand how informants feel about the relationship between environmental degradation and health. The study area of Silicon Valley has particular limitations to health including a high incidence of Superfund sites that present certain adaptive strategies useful to understanding challenges to wellness in a high-tech, urban setting.

In order to understand how women make their medical decisions, I needed to unearth the epistemological premises they used to process knowledge, evaluate its credibility and make their healthcare decisions. So I constructed interview questions to elicit the cultural framings that influence their behavior. Key theoretical objectives in this decision-making schema are to learn how information is internalized and if given any value. Value and specifically value orientation is a concept that has been used extensively in medical anthropology to find the influences that determine care seeking (such as

Hartog and Hartog 1983, and Fong 1985). One value orientation is that of time. It is said that "groups with a future orientation can be seen as more likely to engage in disease prevention" (Chrisman and Johnson 1990:108). Another research objective of my project is to determine how much agency the population sample feels that they have over their health care.

### ***Santa Clara County residents***

The interviewees for this project come from Santa Clara County, one of fifty-eight counties in the state of California. This population is of interest due to its makeup in one of the most technically innovative locations in the world where empowerment, financial savvy, and competitive edge predominate. All but two of the residents interviewed for this project work in one of the six major areas of economic activity conducted in the county: Information Products & Services, Life Sciences, Innovation & Specialized Services, Business Infrastructure, Community Infrastructure, and Other Manufacturing (Silicon Valley Economic Development Alliance accessed July 2010). The two interviewees that do not fit the above are students, but once they graduate they likely would fall under one of these categories when starting their careers. According to the Silicon Valley Community Foundation website (accessed June 2010), the region has seen 88% job growth since 1995 and 23% since 2005 in certain industry sectors. Clearly there are many career opportunities within the sphere of Silicon Valley. On the other hand, as a consequence of the focus on business growth, Santa Clara County is ranked number one for the highest amounts of Superfund sites of all United States counties (Environmental Protection Agency website accessed August 2010). It would appear that a

county within Silicon Valley would be an ideal location to analyze the health concerns of busy, urban residents and better understand what they perceive to be health risks.

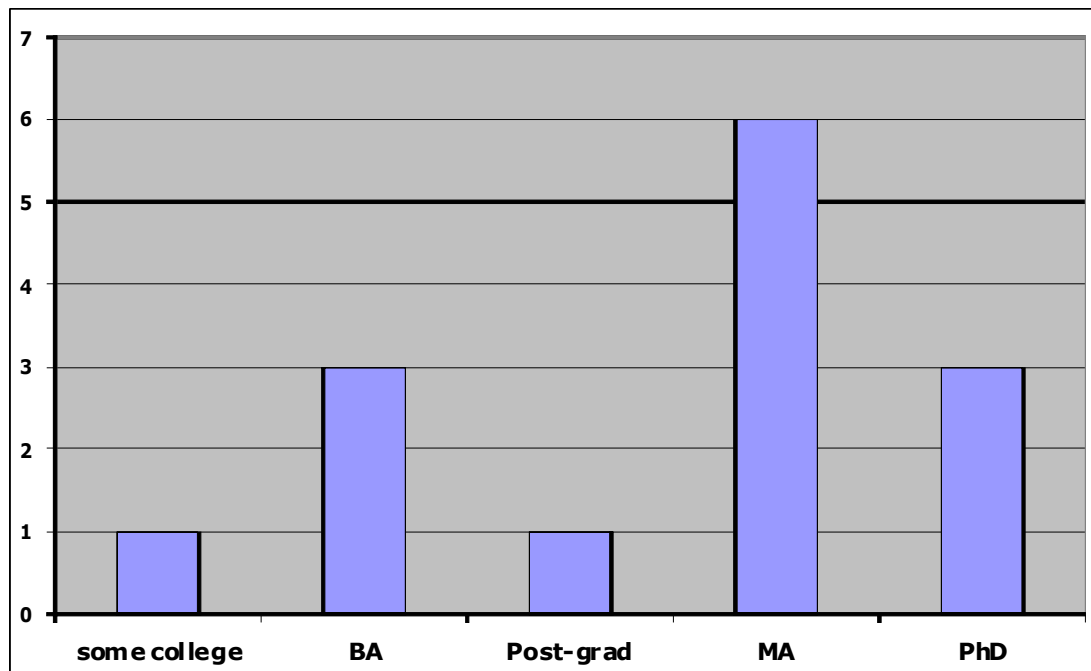
Santa Clara County is bounded by the cities of Milpitas and Los Altos to the north and Gilroy to the south. The city of San Jose is widely known as the capital of Silicon Valley, with many of its residents supporting the various research and development businesses located here. However, not all of the immigrants to the area came to work in Silicon Valley start ups and do not benefit from its high paying salaries. Ethnicity census data from 2000 show that approximately 34% of the population in Santa Clara County was born outside of the United States and the Hispanic or Latino population consists of 24% of the total population. According to the census data, there is a growing poverty population despite being an area of wealth and opportunity. This issue was raised in several of the interviews, particularly by long-term residents in terms of its affect on wellness. Regarding education, 27% of residents of Santa Clara County have some college or have completed an associate's degree. 24% have a Bachelors degree and 16% have a Masters degree or higher. Sixteen percent with a Masters is almost double as compared to the United States average. The numbers are almost the same between those with a master's degree or higher and those who have only completed high school. This divergence is a prime example of how the wealth discrepancy of this area is created. In 2000 women made up almost half of the entire population at approximately 447,500. These education and ethnicity percentages will be utilized to compare against the interview sample for this project



### *Study sample demographics*

Volunteers for the project were sought out through various college departments' email lists, flyers posted at grocery stores and community centers, online advertisements, and personal networks. Over eleven and a half hours of audio interview data were obtained throughout February 2010. The interviews were audio recorded and notes were taken during and after the interviews. They were conducted at interviewee's homes, nearby cafes, and library study rooms.

Fourteen women between the ages 22 through 54 were interviewed for their perspectives on health related issues. Five of the women are mothers. Two of the five mothers have children less than 5 years old. The remaining nine did not have children. Of the fourteen women interviewed, one had some college education without finishing a degree. Three had bachelor's degrees. Six women had master's degrees or were close to finishing at the time of the interviews. One had post graduate education, and three had PhDs (Figure 1). Almost half of the interviewees were foreign born, which is comparable to the thirty-four percent foreign-born residents of Santa Clara County demographics discussed above.



**Figure 1.** Highest education levels of the interviewees

### **3. Relevant Stakeholders**

The analysis of stakeholders section is meant to provide representations of different agencies and institutions that are involved in the study of mercury and BPA. The impacts these groups may have on a small business are discussed, as well as how they might impact women dealing with health concerns. The discussion also includes a brief outline of the stakeholders' online presence. This was done to provide a comparison point with what types of websites the interviewees visited for health care information. It turns out that several websites have become tools for many of the women interviewed to self-diagnose themselves. The stakeholders section is organized by scale. It begins with a description of global stakeholders, then shifts to United States federal actors with examples of research institutions that strongly interact with the federal government. The stakeholder section ends with a discussion of the role of physicians within the network of relevant stakeholders.

#### ***Agencies***

International bodies such as the World Health Organization (WHO) are leaders in global health matters, but how well does their information impact the women interviewed for this project? According to the WHO website success of their programs are to be measured against two populations of concern, women and the citizens of Africa. With a focus on women, WHO publications can provide extra resources for businesses to help understand the complicated issue of climate change and environmental degradation with impacts to health. Currently the WHO's publication list consists of 51 references for

mercury and none for BPA. This may be due to the WHO's focus on water sanitation, healthy subsistence strategies, and campaign against tropical diseases rather than dealing with a non life-threatening problem such as BPA contamination. The expected audience for the international body's website is not the women they are trying to help, but is geared toward policy creators and analysts. It is more likely that women would know of the WHO directly through its health services than by reading about them, and their recommendations for improved health online.

There are many agencies throughout the federal system that study health and wellness. The United States Food and Drug Administration (FDA), under the auspices of the Department of Health and Human Services, is one of the main agencies that are responsible for regulation enforcement. According to the FDA Mission Statement, the FDA is responsible for protecting public health and facilitating innovations that make food safer, and more affordable. They have a very comprehensive website and online resources for accessing their information. Under their food agenda tab is a section entitled, 'food basics.' Appropriately, is the topic, 'Which foods should I stay away from during pregnancy?' After a few links one gets to the 'What You Need to Know about Mercury in Fish and Shellfish' brochure. Currently FDA nutrition labeling for fish is voluntary, hence showing why such brochures are necessary. Only processed and packaged food is required to have standard labels. Unlike the WHO website, the FDA's website is geared for an interactive audience seeking information that they can use when making health and nutrition choices.

Until the FDA's National Center for Toxicological Research has reached conclusions about BPA safety from new research projects, they are supporting the plastic industry's actions to stop producing BPA-containing baby bottles and infant feeding cups for the U.S. market, and are supporting efforts to replace BPA or minimize BPA levels in other food can linings. The FDA is also supporting a shift to a greater oversight of BPA and taking into consideration public comment. In searching online blogs concerning BPA, the digital public at large still considers that the FDA is succumbing to industry pressures and may not have its citizens' best interests at heart. For example, while the FDA relies on the Agency for Toxic Substances and Disease Registry's dosing level for mercury of 0.5 micrograms per kilogram of body weight per day it is significantly higher than the EPA's reference dose of 0.1 microgram per kilogram of body weight. In the 1997 mercury study report to Congress, it was confirmed that the EPA's reference dose was correct. However, the inconsistency between government agencies continues to cause confusion and possibly elevate concerns about the agency's research's credibility.

In 2005, the government initiated a study through its new Center for the Evaluation of Risks to Human Reproduction, which should be researching both BPA and mercury toxicity. Other stakeholder groups at the national level include lobbyist groups such as the National Fisheries Institute (NFI), the U.S. Tuna Foundation, the American Chemistry Council, and the Electric Power Research Institute (EPRI), which represents operators of coal-fired power plants that have their own scientists. Although the executive branch of the United States in 2005 was seen as being against more regulation, a rule to control emissions of mercury from coal-fired boilers (the Clean Air Mercury

Rule 2005) was enacted. Despite the new regulations in place, many scientists outside of the corporate world are concerned that there are no systems in place that evaluate the effectiveness of these controls. Based on a review of these federal actors, a toxicity testing business appears to be a viable needs-based service.

### *Physicians*

Primary care physicians (PCPs) are the first doctors that most insured people will visit when they are sick. Typically, PCPs are doctors trained in biomedicine that will treat the patient's basic needs then send the patient to a specialist who will diagnose and treat the problem within one of the impacted body systems considered to be causing the problem. The interviewees of this study discussed alternative medicine, as well as western medicine, and the effects of having or not having insurance. Alternative medicine is often categorized with complementary medicine and can be thought of as the varied ways in which individuals use practices and products not considered part of conventional medicine. Women in this study sample mentioned that since they visit their OB-GYN yearly tend to use their OB-GYN as their PCP. Primary care physicians and other medical doctors are the main venue for patients to discuss and request specific medical tests. As front-stage actors, doctors and practitioners can influence their patients towards specific tests, although there are obstacles to maintaining the doctor-patient relationship including economic, social, and ideological differences (Guttmacher 1979). The obstacles women perceive to maintaining a relationship with their PCP became one of several themes brought up in the project interviews and also suggests the viability of a toxins-testing service.

## ***Researchers***

Clinical research in the medical field has brought about many advances in healthcare. From vaccines to antibiotics, medical researchers continue to study the cause of illness; how to prevent disease; seeking out cures for disease; and when cures aren't forthcoming, how to prolong life. Dealing with a growing and an aging population continues to bring opportunities for academic and industry-based researchers to study new medical breakthroughs. The funding situation of research institutions may depend on receiving competitive grant monies or may be part of a company's internal research and development department. These stakeholders play an integral role in medicine, but the results of their research can be filtered through various legislative regulations and economic perspectives of business leaders. Reputational bias can affect the way consumers perceive new medical knowledge.

The National Institutes of Health (NIH) defines clinical research as: patient-oriented research or research conducted with human subjects (or on material of human origin such as tissues, specimens and cognitive phenomena) for which an investigator directly interacts with human subjects. Patient-oriented research includes understanding: (a) mechanisms of human disease, (b) therapeutic interventions, (c) clinical trials, or (d) development of new technologies. Clinical research also includes epidemiologic and behavioral studies, and outcomes research and health (NIH Office of Extramural Research, glossary of terms 2009).

## ***CLIA***

The Clinical Laboratory Improvement Amendment (CLIA) is one of the main federal amendments that would be of concern to the labs described above and a business started for the purposes of measuring toxicity levels in humans. CLIA's main objective is to ensure quality testing on humans unless the work is being done for research purposes. One of the positive results of CLIA is that it is possible to research United States laboratories that conduct hair mercury testing. It has an online comprehensive database that can allow various search queries. Being CLIA certified is important to the development of a direct to consumer testing business whether there is an in-house lab or not because federal law requires any lab that handles human specimens to be certified. If there is not an in-house lab, the business would require partnering with a lab that already has its CLIA certification.

According to the 2010 CLIA update, 55.34% of all laboratories are part of a physician's office or a hospital. This shows a strong predisposition to testing in a clinical setting as opposed to more of a business environment. As anthropologists have learned in dealing with institutional review boards (IRB), it can be difficult to create a level of understanding between the researcher and IRBs when research does not fit any of the traditional categories. This is to be expected when attempting to deal with CLIA with a new research perspective. However, it is possible to get a certificate of waiver for tests with low error rates or those that are not likely to cause bodily harm if done incorrectly. This would be appropriate for the toxins testing business as it would primarily collect and analyze human hair to test for specific chemicals. Waived laboratories need to meet the



following three requirements; enrollment in the CLIA program, paying applicable certificate fees biennially; and following manufacturers' test instructions.

One study that succeeded in studying mercury at low cost was Greenpeace's recent Hair Sampling Project, co-sponsored by the Sierra Club. This project's methodology for mercury testing serves as the model for the toxins testing business as it is simple and does not require the participant to leave their home. Accessing the Greenpeace website, an interested client can fill out an online form, pay the nominal fee through a secured server, and receive a testing kit in the mail. After the hair sample has been mailed back, several weeks later Greenpeace sends a letter describing the results and providing general mercury toxicity information. This package includes the specific lab results from the testing. Greenpeace no longer offers this service and neither does the laboratory that worked with them. According to the lab, this was due to a staffing change and lack of personnel available to handle the work load.

One of the institutes associated with epidemiology and outcomes research is the Harvard Center for Risk Analysis (HCRA). Although the center's website lists their funding and conflict of interest policies, it has been written that the center has not been able to provide unbiased research results, and has had its reputation tainted by the interest groups that have funded its research (Case 2009). This goes for the two areas studied for this project-- mercury contamination and Bisphenol-A. As a representative of the researcher group, the HCRA helps to support the scientific arm of public policy, which may affect government programs and possible amendments to federal law. Money is transferred into these organizations by government grants and private foundations and

according to the Harvard Center's funding guidelines individual faculty members are able to garner those monies directly. Although a publication list is available online for its members, information on specific funding details are not listed. Total transparency of resources is a few layers deep.

In dealing with questionable economic sources of research, it is clear that there is no ideal program that separates scientific study and economics even if bias is not be as clear-cut as the Case article describes. However, it was not the goal of this project to study the constraints of scientific study in a capitalist economy. In terms of affecting a small business that offers testing services, research institutions such as the HCRA and Greenpeace have an in-direct impact as stakeholders. Their conclusions can impact how perceived risk is filtered into the media and ultimately to the individuals that may consider determining their toxicity levels. It is important for the toxin testing business to keep up to date on relevant research and be able to understand the power relationships that may impact the dissemination of information. Even if conflicts of interest play a role in how knowledge is disseminated, it is more important for the toxins testing business to understand how the public at-large shapes and acts on their own perceptions.

#### **4. Data Analysis**

After analyzing the fourteen audio recordings a number of general themes emerged. The majority of the subjects were of the opinion that preventative health care is not something that needs to occur in the setting of a doctor's office. Many found the process of visiting a traditional western practitioner riddled with obstacles and thus chose to avoid appointments. Living in the cultural sphere of Silicon Valley with its high risk,

high intensity mantra leaves little time or energy to devote to the large overhead of the waiting involved in seeing a western practitioner, and the hassles with billing and insurance. According to one researcher, "the regions's high tech economy is volatile, producing booms and busts that are experienced as intense physical episodic and daily stress" (English-Lueck 2010:8). Being productive and cutting edge in this region requires extra man hours that are often seen as requirements by employees. Others found the impersonal relationship to doctors not useful for the kind of partnership they found critical to having an individualized healthcare plan. The kind of mental and physical space described by the women would enable some to create opportunities to find alternatives to the traditional doctor-patient relationship. Others on the other hand, knew what they should do to be healthier but found time, money, and even family constrictions too daunting at their particular life stage to become empowered patients. Their health often took less priority over these strong socio-cultural powers.

The perceived health risks found in the interviews can be categorized by the source in which they base their concern and the potential severity of the associated risk. "Risk analysis is a scientific field that is concerned with predicting and mitigating environmental and other threats to human health and well being" (Tilt 2006:116). Early studies on risk perception found a dichotomy between voluntary and involuntary risks. According to an article on technological risks, people were found to readily accept more risk if they were the ones in control of it (Starr 1969). As becomes more apparent, control is an issue that impacts the health concerns of the interviewees and their subsequent behaviors. Overall, the risks discussed by the interviewees can be generally categorized

as coming from two basic sources. One set of risks come from information gleaned from sociocultural networks such as friends and family members with the other set of health risks coming from personal experiences within the body. As one interviewee put it, “I use my own, how I feel physically as my own gauge.” Health concerns brought up by the interviewees are listed in Table 1.

<b>Direct bodily concerns</b>	<b>Future concerns based on family history</b>
STDs	Diabetes
Dental	High Cholesterol
Pneumonia	Cancer- mostly general, but a few specific such as blood cancers, stomach cancer, and skin cancer mentioned
Asthma	Heart disease
Headaches	
Weight	

Circulation problems	
Back problems	
Mental health	

**Table 1.** Health Concerns Mentioned in Interviews

***Empirical Health Risks***

Based on the Centers for Disease Control and Prevention (CDC), all of the diseases listed in the future concerns category (Table 1) are in the 2007 top 10 list of leading causes of death in the United States. Pneumonia and asthma are the only risks listed in the bodily concerns category to also be included in the CDC top ten statistics of mortality. What this reflects is that the interviewees have a good grasp on the major problems statistically affecting mortality in the United States as well as Santa Clara County. Specifically, these concerns are also the focus of a county specific public health campaign that seeks to make positive changes in several different local sectors including schools, workplaces, and community (see Steps to a Healthier Santa Clara County Initiative).

***Youth vs. Experience***

The sample is relatively young with an average age of 33 so that the issues that currently concerned them are based on wellness issues that left untreated could impact their health in the long-term, but most did not have any significant health issues at the time of the interviews. Even so, many of the women discussed above were not ready to

commit the kind of time and energy into their wellness because they had too many commitments already. This reflects the concept that the younger portion of the sample does not have a future orientation schema to instill the value of preventive medicine. The older (40+ years) portion of our sample (n=3) seems to have integrated healthcare into more of an identity where prevention takes up a significant amount of their thought and planning. For example, Maria says, “if I can sit in front of the TV for 2 hours a day, I can work out 2 hours a day,” while Myra wakes up early to prepare herself a healthy breakfast of steel-cut oats and prepare her lunch for the day. Christina will do lots of research prior to any doctors visit for herself or her child. The project sample seems to be aligning with studies done by the Pew Research Center for generational differences in online activities. According to their results, study participants over the age of 33 dominated the amount of internet users seeking out health information (Pew Internet and American Life Studies 2009) unlike their younger counterparts. There is an assumption that the Pew conclusions would correspond to other sources of information seeking beyond just the digital.

### ***The Business of Social Networking***

In anthropology identity can be seen as the way in which individuals and collectives are distinguished in their social relations with other individuals and collectives. (Jenkins 1996:4). Although collective groups that originate through internet sites are becoming a major part of the new socializing process where common issues and concerns are discussed, the interviewees in this sample were not a part of a collective to deal with preventative healthcare strategies or mitigating against certain health problems.

One group dedicated to improving its member's healthcare through personal tracking is based out of the Bay Area of Northern California, which includes the Santa Clara County region. This meetup group is known as *The Quantified Self* and describes itself as a group dedicated to increasing self knowledge through tracking and monitoring. Past discussion topics have included chemical body load counts, personal genome sequencing, lifelogging, self experimentation, digitizing body information, sharing health records, and medical self-diagnostics. The concepts are technologically advanced with one member review stating, "imagine forty very smart and very successful people from Silicon Valley and Bay Area tech culture getting together in a room to share ideas about personal self-improvement projects they're working on in their spare time."

The identity of this collective is very clear. Engaged people doing innovative things in a language that resonates within the region- open source, proof of concept, life hacker, and feedback systems to name a few. It would be interesting to consider the most healthcare conscious of the current sample interacting in such a setting and any insights they may have gained through participation in this group. Further research may indicate whether or not the cultural schema as represented by *The Quantified Self* meetup group of Silicon Valley is the key to healthcare empowerment or whether the concepts discussed in this group are specific to the type of players that thrive in this high tech environment. Certainly setting plays a role how people engage their health concerns as is supported by the following thought. "Given the variability in behavior across settings is much greater than the variability between persons, one needs a theory that will account for both

differences in behavior between persons and differences in behavior across settings” (D’andrade 1992:27).

Regardless, public sharing of medical information and personal experiences with healthcare innovations were not found to be critical to the study sample in managing the complexities of modern healthcare. This may be due to perceived inaccessibility into such healthcare conscious groups or simply due to an unawareness of this and other similar group’s existences. None of the women were members of a particular online support group for healthcare, although all were comfortable utilizing the internet regularly. Networking with like-minded individuals is a technique straight out of the business world and may have an impersonal feel that several interviewed complained about at the doctor’s office. The study sample instead used family and friends to learn about health problems, such as Nancy who says, “I was talking to one of my pregnant friends and I was saying that there are probably a number of foods that I would avoid... then I would think about things like mercury.” In other cases interviewees used family and friends as a model of what not to do. Several of the women found family to be an obstacle to maintaining good health, particularly through poor food choices that were seen as traditional to their particular ethnic group.

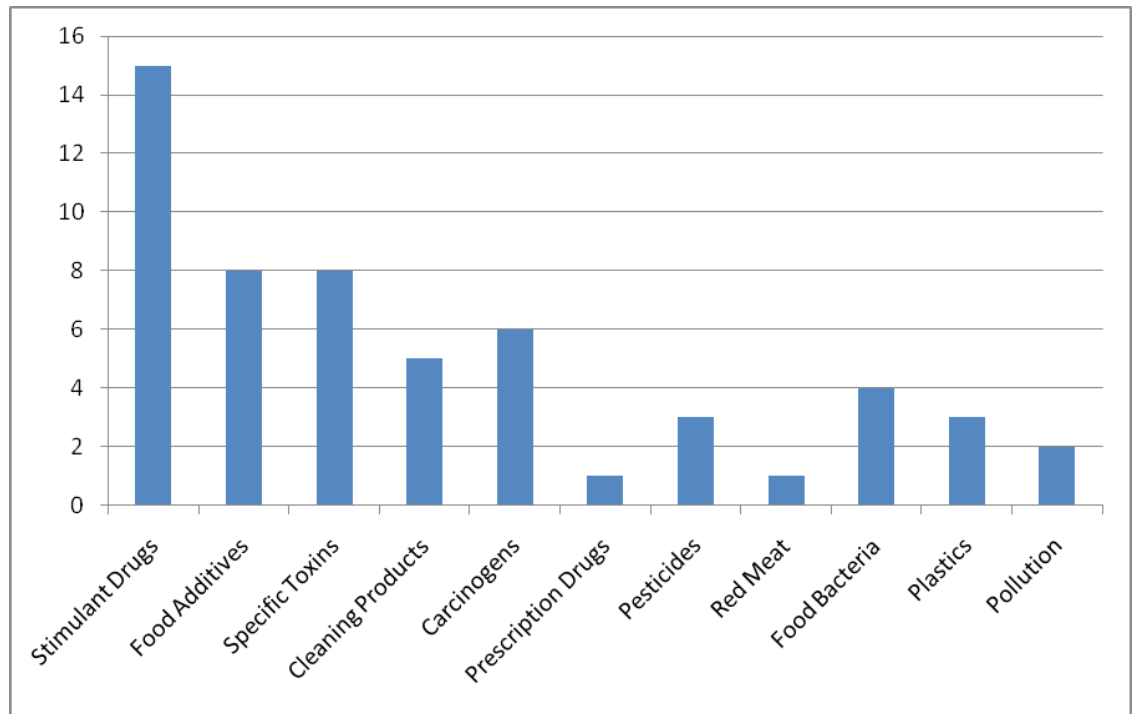
### ***Documenting Day to Day Control Strategies***

Our sample may not include members of the biomedical monitoring network or biocitizens who want to bring attention to environmental issues. However, when the question of illness was readjusted to reflect day to day action, individual concerns of the



interviewees became more apparent. Control and empowerment were beginning to manifest themselves when action points were brought up. The women were asked: what types of illness concern you the most and then later to list the top 5 substances they try to avoid at all costs (Appendix 2). Comparing the responses proved interesting as the top 5 question dealt with the aspects of healthcare that they were able to have some control over. It became apparent that environmental issues were not thought to be something that individuals perceived to have control over. “Pollution is a concern, but I do not know how to avoid that in my life.” Another interviewee stated that “in a way I am [in control of my health], but a lot of times because of the pollution and toxins we are exposed to, what happens to me later in life, I don’t have control over.”

Environmental degradation is one aspect of the general ecology of Silicon Valley that residents perceive. The study sample also discussed concerns over food sources and poor coping strategies meant to deal with work stress. The highest ranked top five substances that the interviewees listed tend to affect the body in an intense short-term way (Fig. 2). Stimulant drugs (including alcohol) topped the list of substances the interviewees avoided. Toxins and food additives were the substances that were discussed second highest.



**Figure 2.** List of Substances Avoided by Interviewees

### ***Decision Making as Impacted by Identity***

In clarifying how the interviewees made their healthcare decisions, identity came up in two major ways. One was through insurance status. The other was through what the interviewees called intelligence, but became better understood as the ability to access and interpret medical knowledge. The concept of intelligence and its impact on agency came up in more detail throughout the interviews and even though insurance status was something that was stated factually, had undertones of self-worth. Only one interviewee, Wanda, did not have insurance at the time of our meeting; but several including Kathy, Myra and Maria had long periods previously where they did not have insurance. This is a very common issue in the United States and reflects the toxin-testing business's concern

(see Executive Summary, Appendix 1) to keep preventive tests affordable. “In the years beginning in 2003, a stunning 82 million people - one out of three nonelderly Americans - went without health insurance at some point” (Hacker 2006:138). Maria had finally gotten health insurance through a new job at the time of our interview and when discussions came up about her carrier, would exclaim "woohoo!" For this hardworking, divorced mother of grown children, finally having insurance provided to her from a job became an achievement and something to celebrate and more importantly was something less for her to worry about. Having health insurance allowed another interviewee to feel in control over her health.

Concerning intelligence, one interviewee, Nancy, stated that “I feel that I am an intelligent person and that I should be able to make an informed decision.” Her confidence in herself undoubtedly came from being a scientist with a PhD education. Her analytical skills enable her to know which questions to ask and how to look at the bigger picture in order to fully understand a situation. Myra also had the desire for information. “I want to educate myself” she said, but later on also elaborated that “there’s a lot of stuff to be stressed about” and that in her life she found a balance by being able to “control what you can and be at peace with what you can’t.” Myra was one of the older in the small sample, and hence found through trial and error a system that worked for her to maintain her health. Her coping strategies for illness prevention are directly tied to her diet and exercise, but also looking toward a holistic experience where her spiritual and mental needs are also cared for. Myra’s education, like Nancy, the scientist, also likely allowed her to develop analysis skills, but unlike Nancy, a married scientist without

children whose intelligence was part of her self-described identity, Myra, a Masters graduate, seemed to be much more in tune with her body, perhaps due to her age, perhaps due to her role of mother, now to a grown child.

### ***Defining and Redefining Roles***

For those who managed to find healthcare empowerment, a readjusting of the traditional roles many have found themselves as patients and even consumers was required. As Bradd Shore writes, "meaning can be understood only as an ongoing process, an active construction of people, with the help of cultural resources" (Shore 1996:7). Some of the interviewees may state that living in Silicon Valley has impacted their health negatively, but it appears that the alternative thinking that has contributed to the success of the region may have helped some of the women find differing ways of approaching their health care management. The psychological conditions of the region do require some social readjustments and a good person-environment fit; however, the environmental conditions of the region also require different prevention strategies. Knowledge about the natural world and its condition appeared to be somewhat limited in the study sample, except again in the older portion of the group and the two interviewees who were studying the natural sciences. Those with less awareness of things such as Superfund sites and local community groups that work to improve the environment may have had hunches about poor air quality or toxic sources, but they knew little of the causes. Even so, their perceptions of risk showed that these environmental conditions worried them, but that they had little control over them and thus chose to ignore much of the potential impacts to their health. However, increased age, motherhood, and insurance

status appear to be three dynamics in this study that positively affect the role of preventative healthcare in these women's wellness management. Although there were differences in career level, highest education achieved, and ethnicity, all fourteen women had very similar concepts of preventative health care (Figure 3). Defining preventative healthcare is not an issue for the sample.

<b>What is preventative health care?</b>
<i>Going to the doctor regularly</i>
<i>Taking care of yourself all the time</i>
<i>Making sure I am aware of my own body</i>
<i>Eating healthy</i>
<i>Eating more fruits and vegetables</i>
<i>Not eating fried foods</i>
<i>Exercising</i>
<i>Getting enough sleep</i>
<i>Homeopathic remedies</i>
<i>Supplements</i>
<i>Limiting amount of food intake</i>
<i>Reducing red meat in diet</i>
<i>Getting tested for things</i>

**Figure 3.** Interviewee answers to what is preventative care

How, then, does this list compare with what healthcare initiatives and programs are offering to target populations? Are their prevention strategies targeting some of the

behaviors that the project interviewees describe? The funding choices are particularly telling as these initiatives often have to juggle limited budgets and resources amongst a range of well-deserving options. I will use an example of how insurance giant, BlueCross BlueShield collaborated with initiatives throughout the United States to improve consumer health. A yearly summary of thirty-eight regional BlueCross BlueShield partners described at least eighteen programs of which would have been open to the project sample-- women between the ages eighteen to fifty. Of those eighteen programs, four had missions specific to women. Other programs were geared towards children-based programs for fighting obesity, offering scholarships for nurses, and to issues affecting seniors. As the program report is just a summary of the work being done by the initiatives, specific prevention strategies were not as obvious to the reader. For example, measurements such as “thirty clinics reported increases in new patients over the last year” (Investing in America’s Health 2009:65) do not detail specific changes in patient’s behavior that accompany prevention strategies. However, some of the specific goals uncovered by the program summaries include food and activity logging, goal setting, participating in health education sessions, participating in walk-a-thons, getting screened for various illnesses such as diabetes, having pap smears, and mammograms, and making services more accessible to alternative schedules (weekends and evenings). None of these are in opposition of what the women of the project sample discussed for preventative strategies, although becoming more educated in health related matters and being better prepared to navigate insurance systems likely involved for the fourteen women more

independent online research rather than leaving home for a community-based outreach program.

### ***Doctor-Patient Relationships***

In attempting to fulfill the role of personal health care manager, the women interviewed for this project all have various relationships with doctors. One, such as Wanda, tries to avoid them at all costs, while another such as Kathy, feels comfortable emailing her doctor regularly with questions that she expects can be answered within 24 hours. As this project is geared toward understanding women's perceptions of risk to their own health and the health of their children's, it was important to be aware of the how the dynamic between doctor and patient has changed for female patients. Although the concept of the empowered patient is gender neutral, activists have studied the effects of sexism and stereotyping as active agents against good communication between female patients and their doctors (Halas 1979). In some cases the lack of equality between doctor and patient has caused much more serious life-death situations.

Indeed, disrespect appears to be part of the medical training physicians receive, as many female doctors have reported the sexism they observed during medical school (Worcester and Whatley 2000:8-11). On one extreme Christina says, "I am a little suspicious about maybe some Western..., the whole machinery around the medical field, what's really influencing certain doctors, pushing products or tests or whatever for just the financial or business part of it." Kathy on the other hand described her relationship as being very upfront with her doctor so that she can make more manageable decisions rather than hiding information or being worried about a judgment. She was satisfied with

the response she gets from the doctor's office such as getting tests results immediately, being able to order prescriptions online and also being able to inquire about health problems with a picture attachment. For Kathy, certain aspects of personal responsibility typical for this region resonate with her. She states that, "if you are not proactive about yourself, then no one is going to come and try to help you." Healthcare empowerment through the doctor-patient relationship can be attained through working with a doctor or avoiding them. Which option one chooses from is an individualized choice based on the types of coping mechanisms and prevention strategies at their disposal.

<b>What role does your doctor play in your preventative health care plan?</b>
<i>My doctor is a partner with me in preventative health care</i>
<i>If I can avoid going to the doctor I will</i>
<i>I go to regular check-ups</i>
<i>I always feel like there is more that needs to be done</i>
<i>Is a good information source</i>
<i>Haven't seen a doctor for years and years</i>
<i>We had more preventative and homeopathic care at home</i>
<i>Doctor doesn't play a role (but that was blamed on the overall healthcare system)</i>
<i>Its impersonal</i>

**Figure 4.** Answers to the role of doctors in prevention

### *Instilling Agency*



Education may be one way that people develop skills to become adept at dealing with the whole healthcare system, but as in the case with this interviewee, agency may involve avoiding a system that does not work for her. Wanda was raised in Santa Clara County by two parents who had worked in Silicon Valley's tech field until retirement. She was raised in a home that relied on preventative and homeopathic care with little faith given to western medicine's ability to resolve health care issues. For Wanda family traditional medicine was far too invasive. This thought was backed by multi-generational perspectives including her grandfather who told her the best way to not get sick was to avoid doctors. However, being employed as a child care provider recently made her go against her beliefs to visit the doctor. After fearing she may have caught the pneumonia her charge had gotten, she pushed herself to get checked out and assuage her employer's fears that she would get ill and not be able to take care of their child. After visiting the doctor she told me how she felt bombarded by all the possibilities of what she was suffering from and found herself completely overwhelmed by the potential outcomes. However, she soon realized that, "if I didn't go to the doctor, I would have gotten better, because it was a cold and I would have been fine." This latest experience helped her solidify her views that a mind-body connection was more important than dealing with problems through antibiotics or other medicines.

This interviewee represents a portion of Santa Clara County that supports alternative medicine and prevention. Rather than dealing with physicians, she would rather see people get educated about the body and how to care for it themselves. Wanda told me that "I think there should be more health educators" and that doctors are better

suiting for emergency situations. I found her point of view to be more aligned with what Silicon Valley is, in terms of being an empowered patient than she may realize. She puts her health in her own hands and it makes sense in that she usually knows why she becomes ill. Either specific foods she has eaten or some emotional trauma she has endured, she has become so in tune with her body that she can identify what causes her body to lose its homeostasis and has developed coping strategies that reflect this perspective. For her, it's simple to be happy and healthy, but she sees how people forget about that and instead get together in an unhealthy way. Therefore, it makes sense that the top 5 substances she avoids are toxic people, alcohol, television, sugar, and toxic chemicals. She understands however why people tend to reach out for these things and finds the overuse and addiction to sugar, alcohol and television to be a consequence of our modern society.

### ***Modern Lifestyle***

Our sample discussed stress in the context of living in a modern lifestyle. Although the term 'modern lifestyle' is notably vague this allowed the sample to define the term for themselves and discuss their own viewpoints. However, the sample all had general agreement with what the term meant. Words like “industrialized”, “disconnected”, and “expedient” were used by the study sample to describe a modern lifestyle. Several of the women had points on how stress was exacerbated by living in the sphere of Silicon Valley. Terms brought up when discussing Silicon Valley include “overworked”, “rat race”, “commute”, and “advanced”. Patricia felt that residents “still perform fine being in Silicon Valley, having to be this technologically based society puts

a lot of pressure for people to succeed. I think that can lead to higher level stress in this area.” Kathy felt that concerning health “I definitely think that stress plays a role, especially here or I guess San Jose where everyone is in a hurry, everybody is trying to get things done, doing the best they can.”

<b>Obstacles to optimal preventative health care</b>
<i>Stress</i>
<i>Lack of time</i>
<i>Little family support</i>
<i>The “rat race”</i>
<i>Doctors wanting to treat symptoms, not cause</i>
<i>Not resting the optimal amount of time when recovering from illness</i>

**Figure 5.** Interviewee answers to challenges of maintaining good health

Kathy, one of the younger women in the sample who moved here with her family when she was a teenager, responded that the root of the illnesses she was seeing around her was the environment. But for her there was more to environment than the ecological world around her. It was the pace of life and how it affected people. She elaborated that, "I got asthma when I moved here, and depression. My brother was depressed...I think stress is a big factor. We do live in a technologically advanced pocket of the world, so that tends to create more stress I think." This interviewee shows how it is important to consider that stress is not just an abstraction. It is the "events and circumstances that occur and increase the probability that an individual will become ill" (Dressler 1990:

250). Although stress is a broad term that produced limited physiological classification during the interviews, it is apparent that people know intuitively what stress is and how they are impacted by it. Individual stress often triggers family stress and Maria noted that "families are falling apart because people are being overworked."

This kind of problem tends to be compounded when both parents are working and there are no extended family members to relieve some of the burden or if finances are causing problems. Wanda, one of the interviewees who had lived in San Jose her whole life except for her college years stated, "it's so expensive here that people feel that they have to work at high stress jobs and get obsessed with material things...its shifting because people are trying to meet and use the natural resource for meditation and hiking." This individual recognized that despite the hurried pace, Northern California still had readily available opportunities to improve wellness regardless of occupation and wealth. Simple steps toward a healthier lifestyle were idealized by Nancy who enjoyed better walkability options--when the time was available. "We really like being able to ditch the car and walk to places, especially on the weekends, but during the week as well." Joyce too was interested in pedestrian-friendly options close to home, but wondered about some of the potential hazards she saw around her like electric plants and health disclosure signs as well as some of the invisible hazards such as pesticides. In one of her previous positions as a translator at a medical institution, she saw a rise in rare blood cancers which she linked to environmental contamination. As a mother, Joyce had clear stances on both fish consumption and the leaching of BPA out of plastics. She would eat salmon at home, but would never consider eating any fish products at Chinese restaurants.

Plastics were items she tried to avoid while she was pregnant and currently looks at all plastic labels to be BPA-free.

Joyce was like many of the interviewees who see a disconnect between the optimism of the technology industry and living in harmony with nature. There was some discussion of the impact of 'green' technologies that manufacture compact fluorescent light (CFL) bulbs with mercury. The contradiction of enhancing our lives through new, "green" technologies that utilize harmful toxins seemed to resonate with several interviewees and was seen by several of the women as affecting wellness. Patricia placed responsibility for peoples' wellness on local government. She felt that the citizens of San Jose were facing an uphill environmental battle against corporate growth that could only be curbed by strong legislation. Her perceptions were backed by visits to other cities outside of California that to her were cleaner and healthier.

### ***Agency Through the Internet***

Through the narratives the women shared it became clear to me that individual agency does not come from education status or career path; but for many in the sample, it grows out of a digital connection to health information that is convenient and neutral. Neutrality is an important concept that was introduced in one particular interview. New mother, Eileen had been back to work only a few weeks when I interviewed her. Her career was fast-paced and often included long commutes until her last move that put her within a half-hour drive of work. Taking time off of work for a doctor's appointment did not suit her desire for productivity, but when she did find an issue that needed addressing found that when she called into the doctor's office felt that her privacy was violated when

asked the nature of her visit. Here she was discussing information with someone she did not know, have a relationship with, or feel comfortable with. When she wanted to discuss a concern with the doctor, she had to go through hoops to set up an appointment and often felt that there was "a judgment at the other end."

The internet itself does not set up obstacles to retrieving information, although there is an assumption that you know how to determine what is reliable information. It does not care what time it is, how you look, and how much money you have. The one determining factor is if you can get access to the internet and as Maria reminded me, "hook up is expensive, computers are expensive." Maria is specifically referring to what is known as a digital divide--the gap between those who have internet access and those who do not. A digital divide exists in the United States that is mainly affecting the poor and old and may continue to do so if national broadband strategies do not take hold (Horrigan 2007). However, Wanda, who did not have internet at home or a smartphone with wifi capabilities found that the library was her friend. There she had access to the internet and could do in depth journal research on any health concerns she had. Her visits to the library empowered her to make informed decisions about her health management. As a resource, the benefits of easy access to information was something that many of the women thought was useful in their health care management. However, consulting groups outside of that healthcare network was not part of their behavior.

### ***Underused Information***

The role of community groups and local environmental non-profits was almost non-existent in helping the sample find online information about their community and

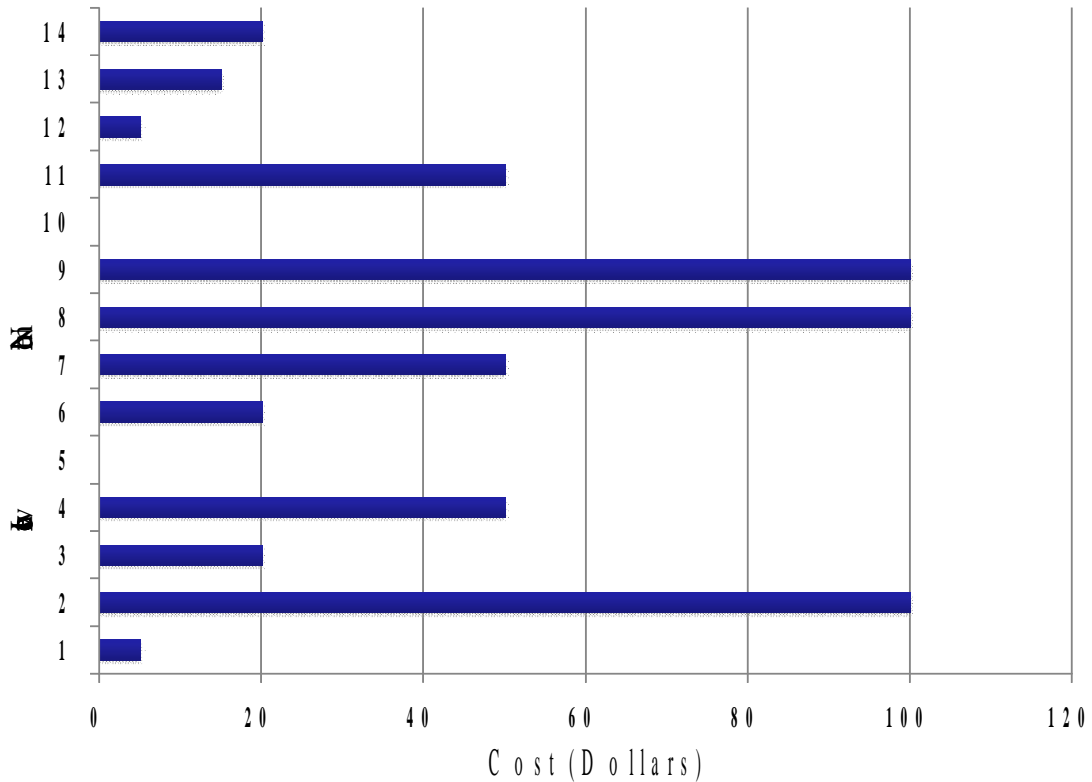
any known health risks about living there. This information is particularly interesting given that the women often used the internet to self-diagnose or improve some of the diseases they were concerned about including asthma, allergies, autism, and water contamination.

### ***The Economics of Prevention***

All of the women were asked to provide a monetary figure for what they found to be a nominal fee in return for a medical test that did not require them to visit the doctor (Figure 6). The test was described as noninvasive, handled online and confidential, but not elaborated on. Three variables came up that the women found important to determining what they would be comfortable paying for an out-of-pocket test. All of them felt that they needed one of the following: a scale of importance that was customizable for their specific health issues, a level of comprehensiveness, or data that was reliable. “If it was a basic test, \$20 is fine. If it was a bigger deal, then \$100 is fine.”

While Kathy wasn't comfortable paying any fee for preventative tests, she further explained that since she was just out of school that it was a temporary issue and that she would soon be more prepared to pay for preventative tests. Maria felt that for people making the minimum wage, that a \$20 preventative test is too expensive. Another thought that anything less than \$100 she would consider a nominal fee. Certain pricing challenges however emerged from the discussions. One interviewee was not aware of why a prevention service would have to be out of pocket. Joyce says, “I can't think of things that are critical that won't be covered already.” Christina stated "what can 20

bucks get you?" Again, the issue of credibility comes up and a few of the interviewees felt that quality of service may be reflected in its price.



**Figure 6.** Interviewees Nominal Fees Cost Distribution in Dollars

## 5. Conclusions

The National Commission's Prevention Priorities Study (2007) lists racial and ethnic disparities for people's use of preventative health care services. Although collecting ethnicity data for comparative purposes is a worthwhile expenditure, the goals of this project were not geared to maintaining ethnic labels. Rather, this project focused on understanding if there was a sociocultural element to being an empowered patient as a



geographical correlation to living in Silicon Valley. Another possibility was that residents of Santa Clara County were more aware of toxins and other health risks because they live within the vicinity of the highest number of Superfund sites by county in the United States. Due to the nature of this project, it is not possible to test one population against the other because all of the interviewees were based around Santa Clara County. A larger scale study could handle the additional data load.

Food choices and mental health concerns predominated the discussions on healthcare and wellness. The stress of living in Silicon Valley was acknowledged by most of the interviewees with some feeling that the greater community was suffering from a poor environment. Although there was a general mood of negativity concerning the state of the local environment, it was a passive acknowledgment in all but two of the interviews. In learning this, it is clear based on this sample that the avenue for introducing toxicity testing as a prevention strategy would be regarding the quality of available food and water choices. BPA and mercury were discussed in the interviews and even in some cases mentioned as one of the top 5 substances the interviewees try to avoid (Figure 2) listed under the specific toxins category. Although not in depth, the women perceived these toxic risks in terms of what they could handle in their day to day lives. Concerning choices, I heard from Eileen that she loves Whole Foods, but that it is too far or too expensive for some things. Several women mentioned reading *The Omnivores Dilemma*, a book that traces the origins of our food choices. Others have reduced or eliminated red meat from their diet. Mercedes mentioned that if she eats meat she travels thirty miles to a special location to purchase grass fed, hormone free beef even though

she buys mostly at local farmers markets for the majority of her other foods. Christina recalled her stint as a raw foods junkie. These women knew their food options and paid attention to what they were putting in their body, even if the foods were not healthy.

Being a mother complicated the issue. The mothers in this sample frequently discussed how motherhood often "heightened the senses" and that "we have to be healthy for the baby." Although none of the women were pregnant during the time of the interviews, the ones who did not have children learned from friends and family that they too would have to adapt to be healthy carriers for a susceptible baby in-utero. Many knew that raw fish was not good for a pregnant woman and that pesticides were also a concern for pregnancy. Although there appears to be a propensity towards healthy food choices and prenatal care within this sample, it is important to acknowledge that there are no high school only graduates in the sample and although several of the interviewees were just finished with school, they were not in a condition of poverty. One woman who was likely in the lowest income bracket of the sample, had taken on an identity for preventative healthcare, however, she is also one of the older women in the sample with a strong identity of being a mother.

Income and education level are not the only variables that affect prenatal care choices. In studying risk perception during pregnancy, research in medical anthropology has shown that folklore (for an example see Davis-Floyd 1987), religious affiliation (such as Lawless 1987), and cultural identity (for example Heriot 1996) all alter how biomedical advice is followed. Embodied experiences from previous pregnancies also can empower women to accept or reject certain prenatal advice (Browner and Press

1996:147). The current study sample seemed to indicate that avoidance of certain fish during pregnancy is considered a type of “authoritative knowledge” to be followed.

It appears based on the study sample that the creation of a toxin-monitoring business is viable for the needs of people interested in preventative health care management. The women discussed concerns of mercury and BPA without being directly questioned about such toxins. They mostly welcomed an easy way of testing, especially outside of a doctor’s office. The internet is a major venue of research and communication, but other mediums such as television and print were also utilized for health care information. There was some disagreement of the nature of out of pocket fees for preventative tests. Some interviewees were interested in affordability. Others were more interested in credibility. Getting what you pay for is an indicator of the cultural schema of the region where smart investments can have big pay-offs. Although Silicon Valley as a place impacted individuals towards credibility, the main consequence of living in Silicon Valley as per the study sample was stress. But stress did not impact the interviewees equally. The most empowered of the women were older than 40 and mothers- not those who typified Silicon Valley through career type or company affiliations. Women of grown children talked equally as much about mercury, BPA, and other health concerns as did women with young children. Initially, I did not expect mercury to be one of the main substances discussed in the interviews as a perceived health risk for women without children or those with school age children and older. However, this turned out to not be the case. I heard anecdotes of interviewee's friends that were impacted by mercury such as an older male surgeon or a female mathematician

working in the tech industry. The risk of toxin contamination to maintaining health was almost as high to the sample as was alcohol and sugar. In sum,

- Toxin Contamination through Food Quality and Environmental Degradation are Seen as a Perceived Risk to Wellness
- Silicon Valley as a Cultural and Ecological Region Introduced Large Amounts of Stress to Residents, but also Themes of Alternative Thinking, Empowerment and Business Credibility
- Online Preventative Testing was Welcome in a Credible, and Affordable Way

## ***Discussion of Deliverable***

Based on the results of the ethnography of fourteen women living in Silicon Valley, it is established that there is a need for an environmental toxins testing service that is easily accessible to consumers. EMP Testing is therefore set up to provide a viable service to its prospective clients. There are several observations to come out of the project's research that can benefit the new business, as well as recommendations for action that will be summarized below.

### **Observations**

#### *EMP Testing's Service is an American Solution*

Direct to consumer business models for healthcare services are most viable within the current American healthcare system of employer-based insurance plans. This is in contrast to more socialized governments such as Canada's whose healthcare system supports universal coverage to its residents. The lack of universal coverage in the United States is somewhat in flux politically, but is far from being an all-inclusive service. Also complicating the healthcare situation in the United States is that managed care often dictates which physicians a patient can see and the types of services covered, thus limiting patient choices. Although environmental contamination is a global issue, the recommendation is to initially focus the business on an American market where gaps in insurance coverage provide opportunities for businesses to develop an underutilized

service such as what is happening in the genetics field with companies like deCODEME and Navigenics.

### *Urban Regions Contain Complex Sociocultural Challenges*

The test site of Silicon Valley is a good model for the challenges that women in the sample face in finding a work-home balance that encourages wellness. High density populations, commuting, and environmental pollution were issues that concerned the sample; yet many who had this point of view were long-term residents that did not have plans to relocate to less urban, high-tech regions. Although there are challenges, the area provided ample career and educational opportunities. Several in the sample were still living at home with their parents, likely due to the high expense of living in Silicon Valley. An interesting piece of information to come out of several of the interviews was the lack of family support in attaining healthy food goals. In some cases this was due to a lack of freshly prepared foods, in other cases it was the family focus on culturally prepared foods that were not known for their healthy attributes. This combined with time constraints was a major obstacle to good health management. A marketing approach with cultural sensitivity to these issues may help to attain new clients. Urban residents also experience environmental hazards that they may or may not be aware of. Elucidating the hazards and any corresponding health symptoms will add interest to this problem.

### *The Emic Approach Offers Valuable Data*

In attempting to understand women's perceptions, mercury and BPA were part of half the sample's general knowledge base. One concern is that the women who identified

themselves as being vegetarian all ate fish, but did not reveal any concern with mercury contamination. Therefore it may be advisable for the business to have some amount of impartial education on what these chemicals are and how they are being studied by the scientific community. Several women in the sample discussed the Monterey Bay Aquarium's Seafood Watch program that helps consumers choose fish that are most sustainable and offers alternatives to choices considered poor. Although the program is utilized by a portion of the sample, some spoke about wanting more information that does not concern itself with just sustainable practices, but also food quality. The type of information they are seeking includes toxicity information.

### *Maintaining Credibility*

Although millions of people go without health insurance yearly in the United States, the women interviewed in the sample had perceptions of insurance coverage as being one aspect of medical authority. This concern with authority translates into a perception of credibility for a business that specializes in toxins testing. Some of the women couldn't imagine something important not being covered by their health insurance. Therefore, it is reasonable that they would question why lab procedures for testing mercury levels would be an additional out-of-pocket cost. Although there are gaps in prevention coverage between insurance carriers, this concern with insurance coverage should be taken into consideration and perhaps be addressed on the business website.

### **Priorities for Action:**

1. Find Partners

As the qualitative research shows, the women sampled are open to online medical services, but want to be sure that the services they receive are credible. A way in which to increase the business's credibility is to partner with someone in the medical field such as a physician or researcher specializing in toxicity testing and eventually once markets are established to partner with a nonprofit that can further the business's growth. One such nonprofit could be the Planned Parenthood Federation of America. A link posted to the business from the Planned Parenthood website could provide a monthly maximum visitor hit of 900,000 (annual report 2007-2008). This is well above EMP Testing's initial target market of 14,000 women discussed in their Executive Summary. Another venue is to establish a physical presence at one of Planned Parenthood's 97 affiliates which operate nearly 880 local health centers across the United States. Offering the toxins testing service at one or more of these sites, or at least having brochures available detailing the services offered would give additional credibility and potential sources of consumers to the business.

## 2. Support the Morality of Parenthood

All of the mothers in the sample talked about trying to stay healthy for their kids. Their children often provided the motivation for them to make choices to improve health and this perspective continued even after the children had grown up and were no longer living at home. This includes specific behaviors to trying to limit exposure to toxins. Mercury was specifically mentioned by several of the mothers. BPA was also specifically mentioned and in the cases that it was not mentioned by name was discussed as a plastics



or water bottle issue. There are many mother-based blogs and meetup groups that would be interested in hearing about how EMP Testing is providing a service to help mothers maintain their health and help keep their children from over exposure to toxins. Reaching out to these online communities would be a good way to support the morality of parenthood and promote the business.

### 3. Utilize Toxins Testing as a Bio Feedback Service

The qualitative research found that women in the sample were fairly concerned about food quality and eating a proper diet. If they were unable to follow their standards for nutrition, they were at least aware of the pitfalls of eating poorly. They accepted their food choices because they felt in control over them. By framing the toxins testing business in a food context, it is expected that the business will be able to attain new consumers that want to understand the impacts of their food choices. Mercury testing can give regular fish eaters the knowledge to either continue their consumption rate or make adjustments if their mercury levels are found to be too high. This service is also aligned with groups that are seeking out ways to become more empowered patients or to better understand their own individualized bodies through quantification of health related data. It is advisable to frame the service as a way of charting individual toxicity levels with other forms of data.

### 4. The Internet is a Critical Platform, But There are Other Client Channels

Although the internet was utilized frequently by the interviewees, there are other forms of information dissemination available for the business. The women all were

regular users of the internet and often sought medical information online. Google was utilized frequently to look up images and start a search of particular symptoms or medical terms. WebMD was also a website frequently brought up in discussions. In all but one case, the interviewees would rather have tests done outside of a doctor's office or lab when possible and welcomed tests that could be ordered online. Despite all the positives going for an online business, it is important to consider that television, magazines, and word of mouth all still provide information to people. These bases should be covered by EMP Testing to ensure a wide range of consumer channels.

#### 5. Expand the Market- Mercury Prevention is Not Just for Mothers

Although women who have children or want to have children are the focus of the business, it is clear that mercury poisoning affects more than just women. Several of the interviewees discussed friends that had suffered through the symptoms of mercury poisoning that included loss of cognitive function. The effects of bioaccumulation are serious enough to warrant testing, but also have the advantage from a business perspective of showing improvement once a diagnosis has been established and dietary changes have been made. It is therefore advisable to show that all individuals can suffer from symptoms relating to toxin contamination such as those coming from mercury or BPA and that improvement of those symptoms can be as easy as adjusting diet.

## **APPENDIX 1: EXECUTIVE SUMMARY FOR EMP TESTING**

EMP Testing is a start-up company with a prevention-based health care mission serving clients with noninvasive medical tests ordered online through a direct-to-consumer platform. The company website will offer low-cost testing packages and current information on the health risks of environmental contaminants initially for mercury, but will be expected to grow into other testing products.

EMP will initially target women who are or who want to get pregnant and are:

- Age 18-40
- Living in the United States
- Internet shoppers

Women in the 18-40 age group are a focus because of the known prenatal health risks for unborn babies stemming from mercury contamination. Although mercury contamination is a global concern, by focusing initially on the American market, regulation monitoring will be less complicated. Taking the EPA announcement that 1 in 6 women of childbirth age in the United States today have levels of mercury in their bodies that could cause neurological injury to their unborn children, it is estimated that for 4.25 million births a year, the number of at risk births is approximately 709,000. In the first 3 years we have a target of 2 percent of those 700,000 at risk. Fourteen thousand potential clients can bring in yearly estimated gross revenue of \$420,000.

The medical industry's clinical diagnostics sector is predicted to continue to rise with more people willing to take responsibility for their healthcare management. EMP Testing

expects to tap into this market and fill in the gap between insurance-based health care and customized health care management. Preliminary research finds that mercury testing is not part of routine prenatal care. Therefore, EMP's primary test will analyze mercury levels from a small hair sample, which the client sends in after receiving out testing kit. As an online business, mercury testing will not require visitation to a health care practitioner and does not require special permits as our test is done solely with human hair, not blood or urine.

EMP Testing will grow its testing business as revenues increase to include other environmental contamination tests such as for Bisphenol-A, and fire retardants, which are known to alter thyroid function.

Analysis results along with good customer service will give EMP Testing the ability to retain repeat customers. The service will allow customers to keep track of their toxicity levels, know what the current safety levels are, when to retest, and when to discuss the results with their doctor. This leads customers to being more empowered patients in an efficient way. Email communication and reminders will particularly appeal to the busiest of the target market.

EMP Testing is scheduled to begin operations in early 2011 as a corporation owned and operated by the author of this report, an applied anthropologist specializing in qualitative analysis. The business structure is subject to change based on which state it will be registered under. Several options on the northeast coast are currently being considered.

EMP Testing will differentiate its company in the marketplace in three specific ways:

- 1) By focusing on an online business, EMP Testing will be able to keep overhead low by not needing to open an office for at least the first few years of operation. Tests can be either run on a sub-contract basis with an existing lab or create a space for the testing equipment in house.
- 2) By keeping the cost of testing products low through having low overheads, the business will be part of the growing social entrepreneur movement that seeks to help a segment of society and not capitalize on their fears. Neutral marketing will be offered for people who “just want to know.” Low costs will also help to entice new clients who may not want to invest too much out of pocket or for those who do not have insurance.
- 3) The business plan is based on interviews with women in its target market and will continue to use insider perspectives to inform the business practice.

In the first year of operations, EMP Testing plans on at least breaking even for the costs of running its business. Expenses include web page development and technical support, equipment purchases and maintenance, research, marketing, and web and mobile application software development. \$40,000 is estimated to cover initial costs for the first year.

In order to properly fund the start up of EMP Testing, the financial package is as follows: personal equity, and federal assistance. The National Institutes for Health have many opportunities for small business grants that EMP is in the process of applying for. This new business will appeal to women interested in family planning and preparing themselves for a healthy pregnancy, a growing sector of the medical field. Our service is well suited to busy individuals who are concerned with the health issues of toxic

poisoning. The impacts of mercury contamination are well known physiologically and can be translated into financial losses. The true economic cost of mercury contamination in lost productivity is in the billions of dollars annually (Trasande et al 2005). This type of illness is completely preventable, but testing is an underutilized service. EMP Testing will fill in the gap.

## **APPENDIX 2: PROJECT INSTRUMENT**

This project is to learn about peoples' thoughts about health, where they get their information from, the risks they see to their health, and the ways they might improve their health.

### Warm up questions

1. Could you tell me your age and occupation?
2. Do you have any children?
3. Was today a typical day in your life?
4. What are your favorite types of restaurants?
5. What are your favorite dishes to prepare?

### Part I Identity and Agency

1. Are there any online support groups, or provider websites that you associate with or visit for health information?

PROBE: If no, are you part of any online groups? What inspired you to join the group?

What does preventative health care mean to you? How do bring to your attention preventative health care options?

2. Would you feel comfortable getting preventative tests without a doctor ordering them for you?
3. Have you ever wanted to take a medical test to screen for a particular disease? ie. for cholesterol, prostate cancer screening, osteoporosis screening...
4. Would you be willing to pay (a nominal fee) for tests that you thought were important?

### Part II Environment and Illness

1. Before you moved into your neighborhood, what kinds of information were useful in your decision to live there?

2. Did you have any health concerns about this particular location? ie. flight-path, near highway (exhaust pollution)
3. Did you consult any community groups that are concerned about the environment to better understand the environmental conditions of the area?
4. What kind of diet do you regularly eat?

PROBE: vegetarian, meat, fish? PROBE: Fresh, frozen? Farmers markets? Foodie?

1. What types of illness (a natural history approach) concern you the most? PROBE: Based on news, doctor, family?
2. What do you think causes these illnesses? (whatever was mentioned prior)
3. In your opinion, what part of [any illness previously mentioned] arises from aspects of our modern lifestyle?
4. What are the top 5 substances or chemicals that you try to avoid at all costs? What about for your children?

### Part III *Decision-making*

1. Do you feel that you are in control of your health?
2. What kind of role does your physician have in your preventative health care?
3. Can you think of any challenges or obstacles you had when trying to follow doctor's recommendations?
4. Do you keep a personal file of your medical records? How do you keep track of your medical records?

PROBE: How long have you been doing this? If I were to look at the file, would it be neat or messy? Easy to find? Are digital records an option?

5. How did motherhood change the way you look at health and the environment?
6. Finally, this is the last question. Is there anything else that you feel I should know about your personal health concerns or those of your family?



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