GLOBAL HEALTH MARKET OPPORTUNITY ASSESSMENT & ROAD MAP FOR WASHINGTON STATE

growseattle office of economic development

Washington Global Health ALLIANCE

2011
FINAL REPORT

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Final Report

INTRODUCTION

About the Project

The City of Seattle's Office of Economic Development (Seattle OED) and the Washington Global Health Alliance (WGHA), engaged BERK, a public policy consulting firm, to take a closer look at Washington's growing global health sector.

Global health can mean different things to different people. For the purposes of this project, **global health is defined as working to improve the health of the world's most vulnerable populations.**

In addition to this report, the project included an update of the 2009 Global Health Mapping Portfolio, to describe and map the current landscape in Washington, and a folio aimed at businesses to succinctly explain the market and opportunities in the global health sector.

The objectives of this report are to:

- Identify markets and opportunities for partnerships for Washington businesses to develop, manufacture, and distribute global health technologies and products.
- Foster connections between global health organizations and across public, private, and non-profit organizations to stimulate partnerships that improve health outcomes and increase economic development.

Funding for the entire project was provided by the Washington State Department of Commerce and We Work for Health Washington.

Approach

BERK reached out to Washington organizations known to work in global health to learn about current global health activities and partnerships, and to identify opportunities for increased collaboration and local economic development. BERK collected data on individual organizations as well as expert perspectives through telephone interviews and a work session with representatives from economic development organizations.

Interviews

BERK interviewed 25 global health stakeholders in April and May 2011. Interviews focused on where and from whom organizations procure products and services; how they solve problems or challenges that require expertise outside their organization; how they find business partners and collaborators;

and ideas to increase connections and collaborations among Washington's organizations and businesses. See Attachment A for the interview summary, including a list of interviewees and the interview protocol.

Data Request

A request for information on current global health activities was sent to 81 organizations; 59 organizations submitted information for a 74% response rate. Topics included organization location and number of employees, areas of expertise, location and number of projects and initiatives, and partnerships. In addition, many organizations sent supplementary materials describing recent projects.

Strategy Work Session

A work session to review and refine draft strategies was held on June 23, 2011 at Seattle OED with eight participants from organizations that work in economic development, workforce development, and manufacturing. For a list of attendees, see Attachment B

Report Organization

This report is organized in two sections:

- **Part I: Understanding the Opportunities in Global Health for Washington Industry.** Part I presents findings from stakeholder interviews that identify business opportunities in global health – both in Washington and around the world. This section focuses on health-related products, technologies, and devices. In particular, Part I describes the key characteristics of health-related products, provides real world examples, and identifies the industries and sectors that could potentially get involved in production.
- **Part II: Call to Action – A Road Map to Support and Grow Washington's Global Health Sector.** Building on the opportunity assessment, Part II identifies actionable strategies to promote collaborations in Washington that both improve health outcomes and local economic development. In particular, these strategies identify how convening organizations—the membership organizations and economic development agencies that support industry and business in Washington—can continue to support the sector.

PART I: UNDERSTANDING THE OPPORTUNITIES IN GLOBAL HEALTH FOR WASHINGTON INDUSTRY

Market Opportunities

Interview findings demonstrate that there are market opportunities in global health for professionals and companies in a variety of sectors. Washington businesses have excellent prospects to reach new markets around the world and diversify their client base. Currently, Washington's global health organizations are working on every continent except Antarctica. The sector's strong connections and working relationships with partners around the world present a real opportunity to reach new markets with global health solutions. Products and solutions range from biomedical and diagnostic devices to water filters and portable energy technologies.

Opportunities in Services

Many of the service opportunities stem from the rapid growth of the state's global health research organizations. Interviewees identified service-related opportunities for Washington businesses in facilities, data solutions, management and business support, and other professional services.

- **Facilities.** Many global health organizations are growing, which produces a need for additional space and remodeled facilities. Expansion and remodeling generates work for several building-related professionals, including construction, HVAC, architecture, interior design, and engineering. Laboratory space, in particular, requires high capacity air handlers and other infrastructure requirements.
- **Data Solutions.** Many global health research organizations generate and aggregate vast amounts of data, which require data storage and analysis. Benaroya Research Institute, for example, recently became a coordinating center for the Immune Tolerance Network, a large data consolidation effort supported by a federal contract through the National Institutes of Health. The network includes over 200 sites in 10 different countries all of which generate genome profile data, which are measured in terabytes of data. Data repositories like this require database management skills and often bioinformatics and statistics skills. Several interviewees noted that Washington is fortunate to have such a strong IT infrastructure and skillsets.
- **Management and Business Support.** Several organizations noted that as research is commercialized and companies are spun off, management expertise and mentors, provided by groups like Accelerator or the UW's Entrepreneurs-in-Residence Program, are critical to ensuring success in the early stages. There is significant need for skills to guide early stage companies through Small Business Innovation Research and Small Business Technology Transfer grants, subsequent rounds of financing, and general growth challenges until the company can produce sufficient revenues to increase hiring.
- **Other Professional Services.** The global health sector represents a strong market for professional services such as legal and consulting services. Growth in the global health sector has strong multiplier effects in the regional economy. While this growth often results from new funding awards, which come with additional scientists and researchers, it also creates a need for administrative and other support services.

Industry and Product Opportunities

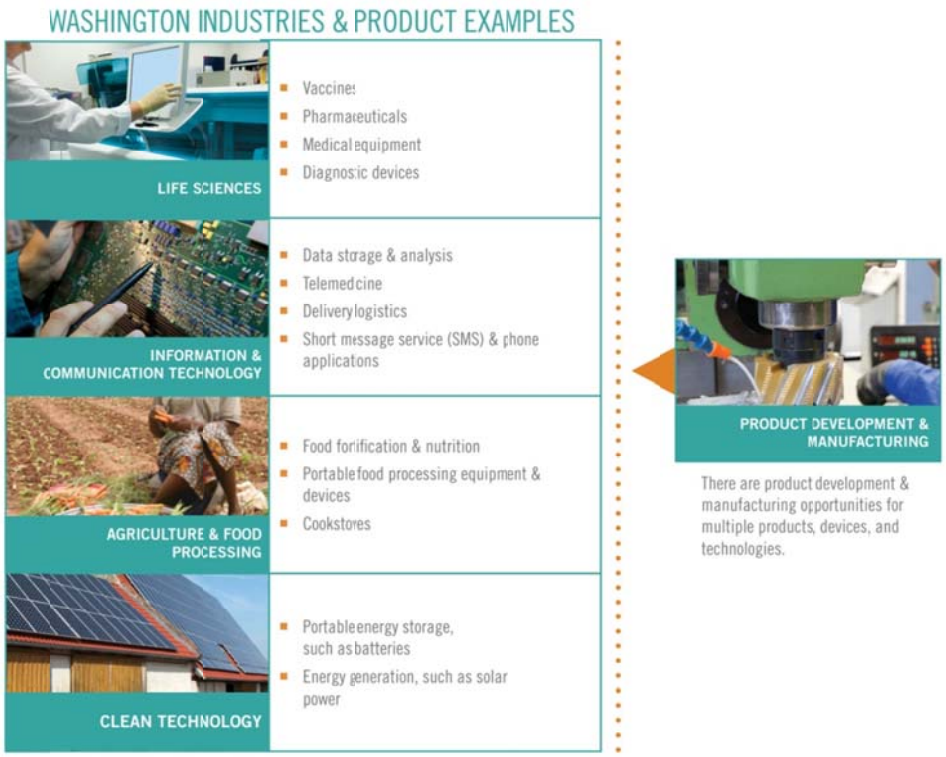
Global health solutions can encompass a spectrum of products, technologies, and devices. Global health represents a market for a diverse mix of high tech, low tech, medical, and nonmedical products and devices.

Despite the differences and varieties in the products, there are several common considerations for adapting or developing products for the global health market.

- Given the varied conditions across the world, and the fact that the end users may not be trained health care professionals, products need to be rugged, portable, and easy-to-use.
- Products must be both culturally appropriate and affordable. This often means that even successful products must be adapted for use in different countries and are rarely "plug and play."
- Portable power sources, such as batteries, are desirable given the unreliable power infrastructure in many countries.
- Products designed for the military, outdoor recreation, humanitarian aid, or disaster relief are often a good fit with global health markets.

Exhibit 1 uses information obtained through stakeholder interviews to highlight industries and sample products that have global health applications.

Exhibit 1
Washington Industries and Product Examples



Source: BERK, 2011.

Industries. Exhibit 1 illustrates some opportunities in global health for a number of Washington's leading industries and sectors including:

- **Life Sciences.** There are 175 biopharma companies, 205 medical device companies, and more than 25,000 direct life sciences jobs in Washington.[1] The industry can play a vital role in global health, providing vaccines, diagnostics, and other equipment needed to conduct point-of-care healthcare around the world.
- **Information & Communications Technology.** Washington has a vibrant and diversified information and communications technology sector, with global market leaders. There are opportunities for IT and telecommunications related to:
  - Data storage, analysis, and data mining in global health research.
  - Logistics and communications involved in the delivery of healthcare products and services and telemedicine.
- **Agriculture & Food Processing.** Products and technology related to food processing and food fortification can support global health. For example, PATH has teamed with manufacturers around the world to produce Ultra Rice, a manufactured "grain" fortified with micronutrients to improve the nutrition of people for whom rice is a staple food.
- **Clean Technology.** Washington's clean technology sector could be leveraged to address a key global health challenge: creating and sustaining a reliable power source. Energy storage and generation technology—including batteries and solar power—are potential solutions that could be employed.
- **Product Development & Manufacturing.** There are opportunities for Washington engineering, design, and manufacturing firms to develop products and devices that serve global health needs. One product area identified in interviews is the development and manufacturing of clean water technologies. For products that do not have an application in the developed world, the greatest opportunity is generally in the area of prototyping as competitive price points often necessitate production outside of the US. Other potential markets that overlap with global health include medical devices and defense.

Customers: Potential end users of products are often not the customers. Purchasers of new technologies and solutions include the military, national health ministries, and international humanitarian organizations, many of whom work in markets with significant purchasing power.

[1] Washington State Department of Commerce, Key Industries, 2011.

Product Development in Global Health: Examples of Success and Efforts Underway

The ability to sell products in new markets provides access to new clients and a greater opportunity to get to scale. Partnering with global health organizations can lead to access to governments and resources that can help facilitate entry into emerging markets. Innovation in support of global health is happening now in Washington.

Innovation in Medical Devices. Below are a few examples of the medical devices in development by for-profits and non-profits in Washington:

- **The Compass™ Global Pressure** is a low-cost, battery-powered medical pressure sensor with built-in wireless capability that allows the device to communicate with cell phones and laptops to enable remote diagnosis and monitoring of a patient's physiological status. Developed by Mirador Biomedical, a Seattle-based company, production is expected in fall of 2011 in Seattle.
- Nanofacture is a Bellevue-based company developing a **portable biosensor device** that will allow health care workers with minimal training to screen for and confirm infectious diseases at the point of care. Investigators at Seattle BioMed assisted with the design and validation of the tuberculosis diagnostics and researchers at the University of Washington co-developed the proprietary technology. KNR Systems, located in South Korea, is the manufacturing partner contributing high-volume, highly-scalable manufacturing processes and quality control.
- Seattle Children's Research Institute is developing the **Hansen Ventilator**, a simple mechanical ventilator for newborns in respiratory distress – a significant cause of death for newborns in the first four weeks of life. Named for Dr. Tom Hansen, the CEO of Children's Hospital, as well as a neonatologist and pulmonologist, the ventilator can be built for a few hundred dollars in contrast to the $30,000-plus price tag for a conventional unit. Next steps include manufacturing a series of prototypes, conducting clinical trials, and seeking approval from the FDA.

Innovation through Collaboration. Examples of collaborative partnerships are highlighted on the following pages.

CLEAN WATER TECHNOLOGY

Smart Electrochlorinator (SE200)

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What is it? The SE200 uses electrochlorination to treat contaminated water, making it safer to drink. It requires only a car battery, table salt, and dirty water to create a concentrated chlorine solution, which when added to water inactivates bacteria, viruses, and some protozoa. The SE200 produces enough chlorine in a 7-minute cycle to treat up to 200 liters.

The target wholesale cost of the device is US$100 with operational costs of US$0.05 per 1,000 liters, which is significantly more affordable than existing solutions and less than half the cost of liquid chlorine sold off the shelf.

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Who is involved? **Cascade Designs, Inc.** is a Seattle-based market leader in outdoor recreation and military outdoor equipment. Their family of brands includes MSR, Therma-Rest, SealLine, Platypus, and Tracks.

PATH is an international nonprofit organization that creates sustainable, culturally relevant solutions, enabling communities worldwide to break longstanding cycles of poor health.

Why partner? Cascade Design leads the design and commercialization of the SE200. PATH provides valuable experience in transitioning technologies into global health applications. They provide access to the end customer for feedback and experience in the field. The SE200 has been tested in 10 countries: Ghana, Guinea, India, Kenya, Mali, Niger, Nepal, Tanzania, Thailand, and Zimbabwe.

What about the business impacts? Cascade Design's new combination of outdoors and emerging markets is attracting talented new employees. It's also creating synergies. For example, with a focus on low cost targets, Cascade Design has found ways to reduce costs and improve quality that can be applied to other markets.

Photo Courtesy of Robyn Wilmouth in Kenya on behalf of PATH, 2010.

What's next? Funding from the Washington Global Health Fund is being used to hire sales and manufacturing staff to begin low rate production of the SE200 in Washington State.

PATH and Cascade Designs are seeking funding to identify key target markets and develop efficient ways to distribute and implement SE200s using sustainable business models and on-the-ground partnerships. Through partnerships, grant programs like the Washington Global Health Fund and existing tools from the private sector, there is the potential to sustainably reach hundreds of thousands to millions of people in the coming years.

MOBILE ULTRA CLEAN AIR ENVIRONMENTS

Who and what? MA2SI is building a highly portable, light weight patient isolation system that doctors and health care workers can easily transport to create an ultra-clean procedure room for wound care, cataract surgery, and patient isolation for communicable diseases in remote vilages where clean facilities are not available. Within minutes of powering up, the systems provide ultra-clean environments for surgical and trauma needs, or negative or positive pressure patient isolation. The systems are also well-suited for disaster response/emergency management needs.

Utilizing the same core technology, the company is developing effective retrofit solutions for airborne pathogen containment in hospitals, clinics, and surgery centers. These systems deliver focused, ultra-clear air to the point it is needed in order to dramatically reduce airborne infectious contaminants and particulates.

Adapting for global health. These systems have both developed and developing country applications. MA2SI believes the timing and opportunity is right to bring these systems to market for global health, disaster response, and medical stations in war zones. The product will be made more rugged and durable to survive transport in vehicles along unpaved roads. Until adequate operating capital is available, the focus will remain primarily on local lab and healthcare applications, permitting the company to gain broader market reach.

> *"By using local manufacturers, we are able to keep a close eye on schedules and quality to ensure they meet ours and our clients' stringent requirements."*
>
> - *Doug Woods, President and CEO, MA2SI*

How did they find their partners? MA2SI contacted Impact Washington, a non-profit that works with manufacturers, to find companies with the right expertise. Fabrication of the core technology platform has been sourced with **OmniFab** in Auburn, and a partnering relationship has been established with **ADVANTAC** in Monroe, which manufactures the units' frame system and cargo containers, for fabrication of the isolation systems.

More about ADVANTAC. Among other things, ADVANTAC builds decontamination units for the U.S. Air Force and Air National Guard, the primary Government response teams for domestic disaster response and other global humanitarian outreach. It is this product that is being adapted for MA2SI. While the U.S. Department of Defense has been a primary customer, ADVANTAC's team has significant medical device manufacturing experience and is actively working to diversify into other markets, including healthcare, that are less dependent on federal budgets.

What's next? MA2SI is working with the UW to begin clinical research at Harborview Medical Center in order to gather evidence in support of the product. One UW researcher is exploring the product's potential for on-site surgery in rural areas. When patients must travel to a hospital or clinic, they often elect not to have the surgery, or if they do, may not return for follow-up treatment, increasing the opportunity for infection. This product could increase the number of successful surgeries and improve health outcomes.

Cascadia MedTech Association: MA2SI is one of the first companies to work with this Federal Way Incubator. This accelerator provides a venue for early stage discussion and real collaboration. Garry Welch, the CEO, is a high tech and manufacturing operations executive with a record of success across diverse industries. Cascadia MedTech has opened the doors to the UW, McKinstry, the R&D department of the U.S Army and others.

PART II: CALL TO ACTION — A ROAD MAP TO SUPPORT AND GROW WASHINGTON'S GLOBAL HEALTH SECTOR

The global health sector is a bright spot in Washington's economy and represents a cluster of organizations and individuals with worldwide reach and renown. According to data collected for this project, an estimated 2,979 full-time equivalents work in global health statewide as of April 2011, and this number continues to grow.

This section answers the question: **What can be done to continue strengthening Washington's global health sector through continued collaboration and by introducing new players?**

The strategies outlined below come out of the interviews, data request, and workshop described in the Report's Introduction and build on the findings and opportunities outlined in Part I. Given the interest in economic development and job creation, the primary charge was to examine the opportunities from the perspective of Washington-based businesses and industry and explore how they can participate in and contribute to the innovation and impact that global health organizations generate.

This section identifies five key strategies:

1. Identify Market and Export Opportunities for Washington Businesses
2. Foster Collaboration in the Global Health Sector to Support Solutions
3. Communicate that Washington is a Nexus for Global Health
4. Coordinate with Regional Workforce Development Efforts
5. Maintain and Strengthen the Infrastructure to Support the Global Health Sector

This is not a traditional strategy document. This is a call to action—with specific strategies and ideas—to a broad-based group of stakeholders. The Washington Global Health Alliance (WGHA) and the City of Seattle's Office of Economic Development (Seattle OED)—as coordinating organizations of the South Lake Union Global Health Innovation Partnership Zone (IPZ)—are key implementers, but they cannot do it alone. The strategies seek to involve other convening and connecting organizations—including trade associations, membership groups, and government agencies, among others—to invest in and support this vital sector.

1. Identify Market and Export Opportunities for Washington Businesses

As identified in Part I of this report, there are promising market opportunities for a diverse array of Washington industries and businesses due to the growth and vibrancy of Washington's global health sector.

A. Communicate the opportunities in global health to businesses and industries. Global health is not on the radar of many Washington businesses and industries. To overcome this challenge, the opportunities must be presented in a way that both resonates with business and uses the existing networks and communication channels.

- **Conduct targeted outreach to complementary industries and sectors.** Many global health solutions require a convergence of expertise and skills. Targeted outreach should start with the industries and sectors identified on page 5, as they have skills and knowledge that align with global health needs and opportunities. Outreach should identify specific opportunities and next steps on how to turn the opportunity into a viable business venture.
  - Develop "leave behind" and web materials to enhance outreach effectiveness. The 2011 Market Opportunities Folio developed for this project is one existing example.
- **Develop a "Business of Global Health" Workshop designed for companies interested in entering the global health market.** Businesses not currently serving emerging markets need information on market characteristics, distribution channels, and potential local partners. In addition to outreach on a more targeted, organizational level, an event geared for businesses would present another opportunity to expand participation in the sector.

  ➔ **Consider launching the Workshop in conjunction with other events, such as the 2012 Life Sciences Innovation Northwest Conference.**
- **Use existing forums and organizations to spread the word.** Many organizations and forums could help broaden the conversation around global health through event co-sponsorship and agenda items. Trade organizations, for example, can help connect manufacturers with global health organizations to support product development. Potential partners include: Global Health Nexus, Global Washington, Washington Biotechnology and Biomedical Association (WBBA), Center for Advanced Manufacturing Puget Sound (CAMPS), Impact Washington, Xconomy, and Four Peaks.

B. Connect businesses to existing market and export support services. The US and Washington Departments of Commerce offer significant export-assistance resources for businesses of all sizes. Convening organizations, including Seattle OED, WGHA, and other partners, should spread the word about these resources to interested businesses.

➔ **The 2010 Washington Export Initiative strengthens state engagement with the federal government, expands relationships with overseas trading partners, and directs the Community Economic Revitalization Board to dedicate $3 million in funding toward export counseling via export assistance centers.**

C. Encourage global health organizations to think outside the sector. Washington is home to leading global health research and philanthropic institutions—mostly in the non-profit and

public sectors. WGHA and Seattle OED—in their roles as conveners—can help bring other perspectives into the conversation.

D. **Facilitate collaboration among Washington's Innovation Partnership Zones (IPZs).** The Washington State Department of Commerce has designated 12 IPZs across the states in a variety of industries. Facilitating interaction between IPZs with complementary competencies—including the South Lake Union Global Health IPZ and the Bothell Biomedical Device IPZ, and potentially others—is another way to access new business audiences in support of global health.

- **Share IPZ information and publications.** Each year the Bothell IPZ publishes a list of patents procured by companies within the IPZ boundary. Sharing this list with the South Lake Union IPZ is a concrete example of what collaboration across IPZs can look like.

  ➔ **An Innovation Partnership Zone (IPZ) is a unique economic development effort that partners research, workforce training, and private sector participation in close geographic proximity to promote collaboration in a research-based effort that will lead to new technologies, marketable products, company formation, and job creation.**

  ➔ **In the 2011 session, the Washington State Legislature created Innovate Washington, a new agency focused on technology transfer. Innovate Washington is another potential state partner in turning research and innovation into market products and technologies.**

2. Foster Collaboration in the Global Health Sector to Advance Solutions

While the first set of strategies focus on attracting new players to the global health sector, these strategies support organizations already in the sector by strengthening existing resources and relationships. Collaboration is essential to solving global health challenges; big and complex challenges require skills and expertise that cross organizations, disciplines, and sectors.

A. **Continue to assist information-sharing within the sector.** The global health sector has grown quickly; knowing who is here and what they do can be hard to keep track of, which can lead to missed opportunities for local collaborations. WGHA as a global health membership organization is well-positioned to facilitate information-sharing and help make connections.

- **Develop and disseminate resources about the sector.** The 2011 Global Health Mapping Portfolio, developed as a part of this project, is an information-sharing tool and way to identify organizations actively involved in the sector. The development and maintenance of a "who's who in global health" is another resource idea to keep people up-to-date on the sector's evolving organizations and activities.

- **Continue development and sponsorship of events to encourage sharing across global health organizations.** Interviews cited the important role WGHA played as a convener and encouraged more of the same in the future.

- **Explore opportunities for resource sharing among global health organizations.** There may be ways to efficiently share expensive resources, such as vivaria, or share information around organizational issues—such as the challenges associated with rapid growth.

B. **Convene around a problem.** Collaboration is not just about knowing who works in the sector, it's about finding solutions to problems. Several interviewees commented that to really engage organizations from different sectors will require convening around an important global health challenge or problem that would benefit from broad perspectives and expertise.

- **Organize issue-specific charrettes.** The charrette approach allows a select group of stakeholders to truly dig into a particular challenge or issue to understand the nature of the problem and brainstorm potential solutions.

  ➔ **Global Health Nexus, with it broad-based membership of over 80 organizations—including representation from the universities and community colleges, hospitals, and private sector companies—could be a great forum for this type of cross-sector problem-solving.**

- **Engage a broader audience by using web and social media platforms.** Another approach is to reach out to a broader audience, using a website, blog, wiki, Twitter, and other communication channels. To support the level of dialogue and interaction needed, this effort requires dedicated administrative and technical support.

C. Leverage the region's business expertise. Many local companies have experience working globally and several interviewees commented that it would be useful to share information and hear about best practices. Topics could include IT resources/solutions from Microsoft, logistics from Paccar and Costco, or getting to scale from Starbucks and Amazon. Collaborating with existing forums, such as Xconomy, the University of Washington's Foster School of Business, or Seattle University's Albers School of Business, could facilitate dialogue and increase opportunities to learn about working globally.

3. Communicate that Washington is a Nexus for Global Health

While the recent opening of the Bill & Melinda Gates Foundation campus has increased attention on the sector, work remains to communicate what global health is, who is involved, and the extent to which Washington is a major player. The goal of these strategies is to continue to build momentum, attract individual talent, companies, and organizations to the state, and ensure that Washington remains the hub for global health work.

A. Showcase the state's global health organizations. Washington is home to global health leaders and innovators. The impact of the work they do both here and abroad is tremendous. WGHA and Seattle OED should continue to support this work, by ensuring that the reach and the impact of the sector is widely communicated and understood.

- **Develop materials telling the sector's story.** The 2011 Global Health Mapping Portfolio is a key communications tool in telling the state's global health story locally, nationally, and globally that should be launched in a way that generates attention and buzz through press releases and media and legislative events.

- **Spread the word.** After the materials are released, maximize access to them, through links on WGHA member website and other partner global health and economic development organizations.

B. Raise the profile of global health through community events, panels, and discussions. Since its founding in 2007, WGHA has made significant headway in raising awareness and generating interest in the sector through their public events. Interviews noted the importance of continuing this work.

- **Continue to identify sponsors and partners that can help attract new participants for events, panels, and discussions.** The dialogue around global health should be continued. Bringing in additional voices will keep the conversation fresh and bringing in additional financial support will keep these efforts be sustainable over time.

➔ **The 50th anniversary of the Seattle World's Fair in 2012 provides a tremendous opportunity to showcase the work and reach of the sector during Global Health month in July and beyond.**

- **Encourage broad participation in the Prosperity Partnership Global Health Industry Tour.** Industry tours are quarterly, cluster-specific tours of the Puget Sound designed to help business, government, education, labor, and nonprofit leaders learn about important economic development efforts in our four-county region. The next global health cluster tour is scheduled for September 9, 2011.

4. Coordinate with Regional Workforce Development Efforts

There are a number of ways in which WGHA and Seattle OED could collaborate with the region's educational institutions and workforce development organizations to identify current job creation needs and future workforce implications.

A. Improve feedback between global health sector and workforce development organizations. Facilitate conversations between universities, community colleges, workforce development organizations, and the global health sector on needed skill sets. As the sector grows and moves beyond research, there may be other opportunities for training or education programs to fill identified needs.

- **Communicate the diverse career opportunities in global health.** The Global Health Careers Pipeline—developed by WGHA Ambassador Program—is a useful tool that can be used to identify career paths and outreach opportunities to specific fields of study at the high school, community college, and university level.
- **Support and promote existing global health K-12 school programs.** School programs, often at the middle and high school level, help cultivate the global health workforce of the future. In addition to supporting existing programs, the development of new programs should also be explored.

  ➔ **Examples of existing programs include: Seattle BioMed's BioQuest, Fred Hutchinson Cancer Research Center's Hutch High, and the WGHA Ambassadors Program.**

B. Connect with local immigrant and refugee populations. Area immigrants and refugees come from all over the world and many remain connected to their countries of origin. This group represents important language skills and cultural knowledge that can contribute to global health goals and business development.

- **Partner with the Workforce Development Council of Seattle-King County (WDC) to explore opportunities to connect these groups with global health efforts.** Local immigrant and refugee populations can support global health through assistance in developing and deploying culturally-relevant products and services. Strategies could include a training component, in which immigrants and refugees are trained in the use of global health products and serve as trainers in their country of origin.
- **Develop a network.** To formalize this engagement, a registry could be established for interested participants in product testing or training opportunities. Potential partners could include Global Health Nexus, Seattle OED, and WDC.

5. Maintain and Strengthen the Infrastructure to Support the Global Health Sector

Washington has established a strong foundation to support the global health sector. However, the work is ongoing and maintaining support and funding is critical for the sector's future. These strategies highlight the importance of ongoing advocacy and support at the state level.

As the primary organizations involved in the South Lake Union Global Health IPZ, WGHA and Seattle OED have a significant role to play as global health advocates and communicators.However, this work requires the involvement of all who have an interest in growing the sector.

A. Coordinate ongoing regional global health efforts. Coordination and information-sharing will help bolster the efforts of the individual agencies working in this area, including the Puget Sound Regional Council, enterpriseSeattle, and Seattle OED, and ensure efficient use of resources.

B. Continue to build relationships with local, state, and federal legislators. Washington's global health organizations have benefited from WGHA's outreach to and education of elected officials and policy makers.

- **Organize an annual legislative day to meet with state legislators.** A yearly daylong event to discuss recent accomplishments and identify sector needs will keep global health on the statewide agenda.
- **Invite elected officials to attend and participate at global health events.** To continue the dialogue throughout the year, convening organizations should invite elected officials to the various global health events and panels taking place.

C. Continue to provide financial support. To continue supporting this sector, funding is critical and requires the participation of multiple stakeholders in the public and private sectors. In particular, there are three identified areas that need sustainable funding sources to ensure their efficacy and reach.

- **IPZ Program at the Washington State Department of Commerce.** The IPZ program is an economic development tool that needs funding for programs and staffing to be fully leveraged.
- **The Washington Global Health Fund.** Created in 2010 by the State Legislature, the mission of the Washington Global Health Fund is to accelerate the commercialization of global health technologies and expand the global health sector in the state. Creation of a sustainable funding source will ensure the longevity of the fund and continued innovation in the sector.
- **WGHA.** The first sector organization of its kind in the country, WGHA has been a critical membership organization during a time of tremendous growth and a champion of the sector locally, nationally, and internationally. Membership growth and continued financial support is the foundation upon which their work can continue.

Attachment A
Interview Summary and Key Findings

INTRODUCTION

As a part of the Global Health Mapping and Opportunity Assessment, conducted in collaboration with the Washington Global Health Alliance (WGHA) and the City of Seattle's Office of Economic Development, BERK interviewed 25 global health stakeholders in April and May 2011. The objectives of these interviews were to identify:

- The technologies, products, and devices purchased by organizations for their global health work.
- Partnership opportunities between Washington-based organizations across the public, private, and nonprofit sectors.
- Specific examples of successful partnerships designing, developing, and/or producing a global health technology or device with a local company.

This stakeholder interview report presents key findings, grouped by theme. For each theme, a brief summary of what was heard is presented, as well as occasional paraphrased excerpts from the interviews. A list of the stakeholders interviewed and a sample of the questions asked are included at the end of this report.

KEY FINDINGS

Understanding Technology and Products Employed by the Global Health Sector

Out in the field, products should be rugged and easy to use.

Many of the products used by the global health sector must be designed to be rugged, easy to use, and portable. Often the end users are not trained health care professionals, and the products will be exposed to harsh conditions and may need to run on battery power for extended periods of time. For these reasons, products designed for the military and companies that work in the defense sector are often a good fit with global health.

- *SonoSite was originally funded in part by the U.S. Military. The military was interested to know whether ultrasound could be small enough to be used on the battlefield. It was designed to be easy to learn for non-traditional users and very rugged (it can perform on battery for extended periods of time, be exposed to dust, dropped, etc.).*

Infrastructure is a critical challenge and opportunity.

Communications systems, transportation networks, and energy are key environmental variables when conducting global health efforts in the developing world. If the community infrastructure becomes stronger, the health system can leverage that.

- *Transportable, self-sufficient energy is one need. Typically, energy needs to be provided locally.*

Rather than start from scratch, adapt what exists.

Several organizations emphasized the importance of deploying or improving existing technologies or solutions rather than developing new ones. This approach stems in part from a desire to improve efficiencies and lower costs. One organization stressed that even where an existing solution exists, it is not plug and play; some development or adaptation is always needed. Organizations often look to the local context to employ technologies that are locally produced and sustainable.

- *Invention is our last resort.*

Global health has a different business model.

Global health is different. The developing world cannot typically afford to pay developed world prices, but at the same time, they do not want donations, so the goal is to offer products and services at a lower price point.

Working in other countries presents challenges and opportunities.

A few interviewees requested help from either the state or others with business relationships with foreign countries. Rules around trade and customs vary and some are quite strict, which can make entry into certain markets prohibitive.

It was noted that global health nonprofit organizations, such as PATH, have deep knowledge and experience working with foreign governments—an expertise that can be leveraged by partner organizations.

- *What we bring to mitigate the risk is an understanding of the operating environment and the ability to define the opportunity, introductions to key stakeholders, knowledge of developing world health systems and procurement processes. We also help to create aggregation of demand often through public sector buyers.*
- *Nongovernmental organizations are more likely than start-up companies to be engaged in discussions with ministries of health in other countries. Down the road, can we put together and offer ministries of health packages of health solutions around global health and other issues?*

The presence of global health work in countries around the world presents an opportunity to gain access into these emerging markets.

- *Put in perspective, the United States represents only 5% of the world's patients. We have to have a long-term perspective, which many commercial companies do not have at present.*

Global Health Technology and Product Development Opportunities in Washington

Information technology (IT) is a strength in Washington that many global health organizations tap into.

From buying computers through Amazon to working with Microsoft on database management to hiring programmers, several interviewees noted how fortunate they feel to have such a strong IT infrastructure here in Washington.

- *The nice thing is that the IT world here is very rich and it's a very valuable resource.*

Data repositories and trials generate huge amounts of data that must be stored, mined, and analyzed. Database management was noted as a growing need along with bioinformatics and statistics. Even when programs or trials are run in other countries, the database management and IT support may still take place in Washington.

- *One of the big issues now is IT and cloud computing—the data we are generating is really, really big and needs to be really secure. We need a place to store the information, analyze, manipulate, and share securely. This is a real, pressing need.*

Cellular phone technology and mobile phone applications are an opportunity.

Cellphone diagnostics are now up and running, and there are many other applications that are in the early stages of development. Mobile phone applications were mentioned frequently as a real opportunity for communications, diagnostics, detection, monitoring, logistics, and decision-making programs.

- *This region is unique with the intersection between global health, technology, and entrepreneurship. There is real interest on the part of venture capital to get into this world and a lot of activity in mobile communications.*

Manufacturing in Washington.

There were several examples of manufacturing taking place in Washington. For example, the Puget Sound region is home to leading companies in ultrasound technology. In addition, Ma2si is working with Ultimate Survival Technologies to produce their mobile clean air units. However, when the goal is low cost production, it often means that products will be produced in China or elsewhere.

Seattle BioMed also noted that all of the smaller lab equipment operations have been bought up by the big companies. VWR and Fisher supply approximately 90% of their lab equipment, including chemicals, so this is not an area of opportunity.

The Washington Biotechnology and Biomedical Association (WBBA), the Center for Advanced Manufacturing Puget Sound (CAMPS), and Impact Washington were all mentioned as good connectors for organizations looking to find companies with a specific skill set or product.

- *Look at the middle stage—let's get our proof-of-concept down here. Global health and mass scale manufacturing requires different economics, which typically means that things will be made elsewhere.*

Other Critical Support: Workforce, Commercialization, and Business Support Implications

Organizations hire talent from here and elsewhere.

In addition to scientists, organizations need computer scientists, software developers, engineers, medical doctors, and statisticians, among others. In some cases, there are not enough being produced and they have to recruit from other education hubs, such as Boston, the Bay Area, or San Diego. While some organizations noted that their programmers could be located anywhere, others stated a preference for the ability to have ongoing personal interaction.

- *The most important thing that we buy locally is our scientists and product developers.*
- *We've heard the need for more baccalaureate degrees a lot from the community along with stronger math and science skills. Right now, it's not about suppliers and co-location; it's about quality of life and workforce.*

Sector growth has multiplier effects.

Expanding facilities and growth of the sector generates work for construction, HVAC, architecture, interior design, and engineering firms. This growth also creates a need for administrative and other support services.

- *Our institution and others like it are a force multiplier for the rest of the economy – people don't think about how federal money is a multiplier. Global health is a part of that; it's an important message.*

Expand commercialization beyond the institutions.

The continued need for funding, whether from venture capital, angel investors, grants, or other sources, was raised repeatedly, along with the valley of death from scientific research to application. A few interviewees noted that technology transfer would benefit from being more business-oriented rather than institutionally-focused. The University of Arizona's BioDesign Institute was cited as an example of an institute focused on getting research to become a product or service in the medical field.

- *It would be good if Washington had something similar that would serve all research institutions and focus on the transfer. Thinking more holistically about the whole state would be terrific.*
- *If you look around there are very few products developed here. It appears we are doing research for knowledge's sake and not application and that is not true, but intellectual property and other barriers are in the way and that may be why things do not move.*

Start-up support and management expertise for the sector were noted as needs.

Several organizations noted that more than the funding, there is a greater need for management services and mentors to guide early stage companies through Small Business Innovation Research and Small Business Technology Transfer grants, subsequent rounds of financing, and general growth challenges until the company produces sufficient revenues. One small start-up commented that they have to do networking, business development, and run a company all at the same time. They mentioned that getting help with the connections to companies that could provide a solution would be a big advantage.

- *The funding is not the issue – we have the money and we have customers, but the question is where do we get the management services? We don't have the infrastructure that exists in Boston, the Bay Area, or San Diego.*

Enhancing Collaboration in Global Health

Opportunities to leverage Washington expertise.

Organizations commented that the global health sector in Washington is a cooperative and not competitive environment. It was also mentioned that the WGHA and the 2009 Global Health Mapping Study support local collaboration. When grant money comes in, some portion of it is often passed through to other Seattle organizations.

SightLife listed examples of how global health organizations could benefit from other regional businesses, including learning or benefiting from IT resources from Microsoft, logistics from Costco, and scalability from Starbucks and Amazon.

Continuing need for coordination, sharing of resources, and development of a clearinghouse.

The number of organizations in the area was noted as both an opportunity to convene and get the word out and a challenge of overlapping objectives and members. Interviewees point to a need for continued coordination, resource sharing, and the development of a clearinghouse and sector directory. Several interviewees commented that knowing "who does what" is a challenge and can lead to collaborations across the country that could have been local. Others wondered whether there is an opportunity for greater sharing of expensive resources, such as vivaria. The Bothell IPZ was also cited as a potential resource, for example, through publication of its patent list.

- *There is a lot of existing infrastructure around that we could use: WGHA, WBBA, Global Washington, Xconomy, Alliance of Angels, and other angels and entrepreneurial groups. Four Peaks is an effort to have a dialogue on innovation and what could come from this region.*

Convene around a problem.

Several interviewees commented that a way to successfully engage organizations in different sectors is to convene around an important challenge or problem that requires broad perspectives and expertise. PATH was given as an example of an organization that could successfully play the role of convener and draw a broad group of participants.

- *We are constantly working on problems that have not been addressed before. It feels pioneering and that is the carrot for just about everyone. To be an integral and important part of creating something novel that will save lives is really great.*
- *It is better to find the problem first and then line up the resources to work towards a goal – you don't want to apply a resource before knowing what the problem is.*

Successful partnerships are taking place.

Stakeholders interviewed highlighted several examples of successful partnerships with other local and non-local companies. Many of these will be highlighted in case studies.

Partners come through many channels.

Many partnerships came about through personal networks or existing relationships. Others were more deliberate about identifying what they were looking for and using their networks or organizations like WGHA, WBBA, or Impact Washington to help find a partner with the right skill set and often a complementary mission or philosophy. Other partnerships came about because the organization had a track record and was approached directly.

- *I have been impressed locally at the deeply collaborative nature here; it's really exciting. On the other hand, there's a lot of activity that we don't know about. It's just not on our radar. You know who you know. We still need ways to bring people together—a common ground, a common space to share work and problems.*

Mission alignment is a key to success.

A clear alignment of missions was one factor cited by multiple stakeholders necessary for a successful partnership. This alignment includes understanding both the global health and business objectives.

- *Alignment is one key. We started with selecting the right partner – this starts with mission alignment. We don't expect companies to operate at a loss, but they have to understand our objectives and buy in.*

INTERVIEWS CONDUCTED

BERK identified a list of stakeholders to interview in consultation with WGHA and the City of Seattle's Office of Economic Development. Stakeholders represented organizations involved in global health efforts that spanned the spectrum from discovery to delivery and related organizations in the realms of technology and commercialization. Organizations included the for-profit, non-profit, and public sectors.

- Terrie Battuello, Bothell IPZ
- John Beale, Village Reach
- Anne Bugge, SonoSite
- Sailesh Chutani, Mobisante
- Dr. Kit Flowers, CRISTA
- John Gardner, Bainbridge Graduate Institute
- Claudia Harner-Jay, PATH
- Randy Hassler, Seattle BioMed
- Fred Holt, UW C4C
- Sandy Jehgers, SightLife
- Pat Lennon, PATH
- Susannah Malarkey, Technology Alliance
- Curt Malloy, IDRI
- Gena Morgan, PATH
- Peggy McCarthy, McCarthy Medical Marketing
- Laura McLaughlin, Cascade Design
- Maren Myers, UW C4C
- Joe Nadeau, Institute for Systems Biology
- Jack Nagan, Benaroya Research Institute
- Andrea Newton, Imaging the World
- Craig Rubens, GAPPS
- Lee Schoentrup, Seattle BioMed
- Gretchen Shively, PATH
- Ron Thomas, PNNL
- Chris Venti, Ultimate Survival Technologies (now known as ADVANTAC)

INTERVIEW QUESTIONS

Given the different stakeholders that participated, questions asked were tailored for each interview, but covered some or all of the following questions.

Strategic Opportunities

1. We want to connect global health organizations with other Washington organizations that have competencies and expertise that global health could leverage. (Potential examples could be from the realms of IT, mobile phone applications, software, and manufacturing, among others). What opportunities do you see here?
2. How could they support you?
3. Are there any products or technologies that you have not been able to find in Washington?
4. Are there any products or technologies that you would like to use or develop for your global health work? If yes, please explain.
5. Are there particular types of organizations that you would like to develop relationships with? If yes, please explain why.

Current Procurement Practices

6. Can you talk a bit more about the technology component of your products—do you develop the technology in-house or contract with someone else? If someone else, who?
7. Are there other key technologies or products you buy for your work? If so, what are they and who do you buy them from?
8. Who are your Washington-based suppliers?
9. If none, who are your suppliers and what do you like about them? Where are they located?

Partnership Example: Best Practices

10. Have you ever partnered with another organization (business, producer/manufacturer) to design, develop, and/or produce a technology for your global health work? If so, please describe.

    We'd like to highlight examples of successful global health partnerships that developed some kind of innovative global health technology, product, or device..

    a) Describe the outcome of your partnership. What was produced? How was/is it used?
    b) How did you find your partner organization? Why did you partner with them?
    c) What have been the keys to success in your partnership?
    d) What were the challenges, or lessons learned, in setting up or maintaining your partnership?
    e) Are there other partnerships that you would like to develop? If so, please describe what you are looking for.
    f) How can Washington state producers or manufacturers better serve the Global Health sector?
    g) Can you think of other opportunities or ways to foster greater collaboration?
    h) Who else should we be talking to? Can you give us a contact at your partner organization?

Attachment B
Strategy Work Session: List of Participants

On June 23, 2011, the project team invited stakeholders to the City of Seattle's Office of Economic Development to review and refine draft strategies related to expanding the global health sector.

Participants:

Bruce Jackson, enterpriseSeattle

Steve Johnson, City of Seattle's Office of Economic Development

Maren Ohaks Myers, University of Washingoton

Anna Pavlik, Workforce Development Council of Seattle-King County

Eric Shinfeld, Greater Seattle Chamber of Commerce

Jon Scholes, Downtown Seattle Association

Mary Trimarco, Washington State Department of Commerce

John Vicklund, Impact Washington

Project Team:

Vajra Allan, Washington Global Health Alliance

Julia Bosch, BERK

Dawn Couch, BERK

Tina Vlasaty, City of Seattle's Office of Economic Development