

2021 Washington Global Health Landscape Study

February 2022

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Photo courtesy of PATH/Kavindelejr

Prepared for

Washington Global Health Alliance

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A Note from WGHA



On behalf of the Washington Global Health Alliance (WGHA), I want to welcome you to our 2022 Global Health Landscape report. This represents an update to a study we last published in 2018, that tracks the economic impact of our global health community.

The state of Washington is home to a very large concentration of global health organizations who work and impact 162 countries in the world. This ecosystem of global health organizations is not only compelling and important for our local state economy, but increasingly pivotal in driving programs and health care on a global basis. This has never been more evident as during the last two pandemic years, where innovation, implementation and thought leadership originating in Washington's global health community has made an immense contribution towards the global pandemic response. Many of our global health organizations have been critical innovators spawning a veritable revolution in vaccine development, global trials, implementation science and diagnostics among many other fields. Notably, WGHA member organization the Fred Hutchinson Cancer Research Center serves as the operations center for the nationwide COVID-19 Prevention Trials Network (COVPN). The lines between global health and regular health have become blurred and these pandemic years have seen unprecedented collaboration between domestic health care providers and global health practitioners, increasingly incorporating global learnings into local health delivery.

Despite having to adjust to a new reality, Washington State's global health sector continues to achieve reductions in mortality from diseases such as malaria, pneumonia, rabies, and diarrhea. These accomplishments come from many different global health organizations: research foundations, direct care organizations, animal health specialists, and companies that develop and manufacture medical equipment and treatments. Collectively, global health organizations account for more than \$6 billion in economic output and indirectly support an additional \$4 billion of economic activity in other industries. More than 16,000 residents are directly employed by global health organizations, providing \$2.2 billion in direct labor income to families in 2021. Further, these organizations contribute more than \$361 million in local and state tax revenue.

Washington's global health organizations have been, and continue to be, at the forefront of health care delivery models centered on equity, working actively to address the disparities in health care access of many of the world's most fragile communities. The pandemic has evidenced the delicate state of our health care systems and widened global health care disparities. This study provides some examples of the ways that Washington State organizations have responded by leveraging local resources to facilitate inclusion and improve health care delivery both at home and abroad.



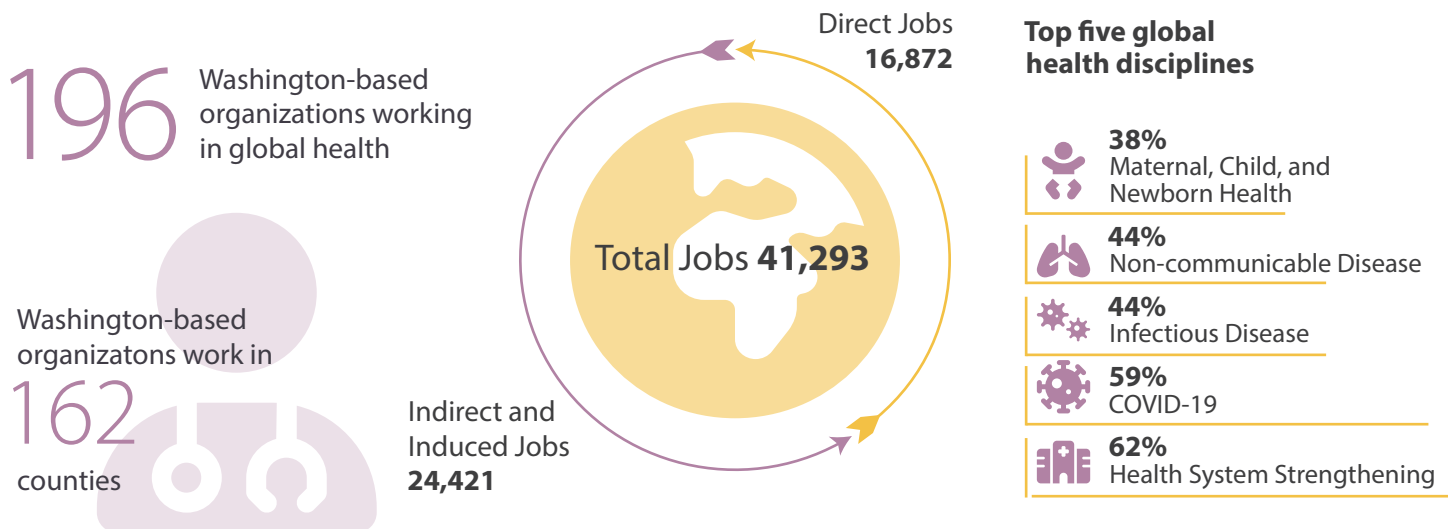
Maurizio Vecchione, President and CEO

A handwritten signature in black ink, appearing to read "M. Vecchione".

Washington Global Health Alliance

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JOBS

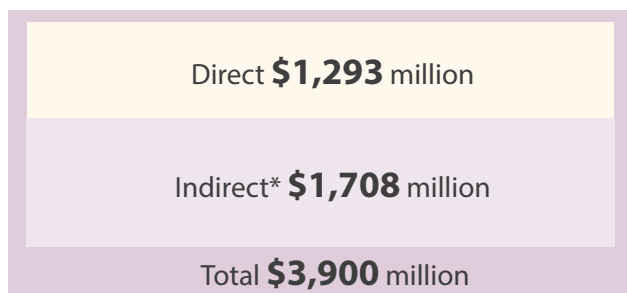


ECONOMY

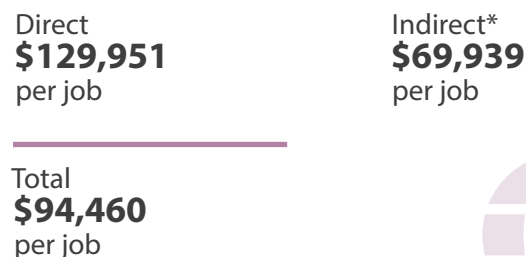


WAGES

Global Health Sector Wages, Salaries, and Benefits



Average Global Health Sector Wages, Salaries, and Benefits



*Indirect effects include two economy responses to the direct global health sector spending. The first response is the new business spending among local businesses as they buy more goods and services to meet growth. The second response is the spending of wages, salaries, and benefits associated with job creation

Background and Purpose

The last 2 years have presented global health organizations with new challenges and new opportunities. The evolution of the COVID-19 pandemic has challenged global health organizations in Washington State and around the world to innovate, such as offering services in new ways and shifting the focus of their work. Despite having to adjust to a new reality, the global health sector continues to contribute to Washington State's economy in impactful ways.

This study used updated techniques to measure and quantify the economic significance of global health organizations to Washington State. The study leveraged partners of the Washington Global Health Alliance (WGHA) to tell the story of Washington's global health network's impact across the globe and at home, as well as how the coronavirus pandemic has affected organizations.

Research Methods

RTI International conducted an analysis using economic data collected from several sources to determine indicators of the global health industry's economic impact in Washington State. Data sources included the 2021 Washington Global Health Landscape Survey, organization websites, Dun & Bradstreet (a commercial provider of business information), nonprofit organization 990 forms from ProPublica, and the 2018 Washington Global Health Landscape Survey.

After extensive research to determine and characterize the actors in the global health field in Washington State, RTI used employment data to estimate the direct, indirect, and induced impacts of this sector on Washington's overall economy. This study used IMPLAN, an input-output model, to render the state economy and capture transaction and spending flows across industries and through employee spending. IMPLAN can estimate the total impact of industry activity when either output or employment is known for a specific industry or economic event. Changes to the composition of global health organizations and use of IMPLAN instead of the Washington Input Output Model limited the ability to compare directly data presented in this report with data from earlier versions of the landscape study. However, use of IMPLAN allows for better comparability with economic impact studies conducted in other regions.

Washington State University's (WSU's) Paul G. Allen School for Global Health lies at the crossroads between animal and human health.

Founded in 2010, the Allen School is a leading research institution for endemic zoonotic infections (i.e., rabies or brucellosis) and emerging pathogens. Endemic zoonoses are diseases that can be transferred from animals to humans, and they are found in parts of the world where humans live near domestic animals and wildlife. One of the school's longest running projects is participating in the World Health Organization's Zero by 30 initiative to eliminate rabies as a cause of human suffering and death by 2030. Working with numerous partners, WSU leads in the development and deployment of thermostable vaccines at the community level throughout east Africa. Within the Serengeti district of Tanzania, just one of a number of communities where the Allen School is active, it is estimated that more than 600 cases of dog rabies and approximately 20 cases of human rabies are prevented annually.¹

The Allen School's combination of expertise in zoonotic viruses and existing global infrastructure led to its directing

the National Institutes of Health (NIH) Center for Research on Emerging Infectious Diseases for east and central Africa and, recently, led to a \$125 million collaboration with the U.S. Agency for International Development (USAID). Allen School staff will direct the USAID project Discovery and Exploration of Emerging Pathogens, aimed at strengthening global capacity to detect and understand the risks of viral spillover, which occurs

when a virus jumps from wildlife to humans. The goal is to collect more than 600,000 samples during the 5-year project—most of which will come from wildlife—then determine whether new emergent viruses from three virus families with high pandemic potential (coronaviruses, filoviruses, and paramyxoviruses) are present. Ultimately, project information will be shared with host-country and global partners to develop and implement interventions in communities to reduce the risks of potential

outbreaks. Dr. Guy Palmer, a senior director of global health at WSU, credits Washington State's strong network of global health organizations and its international focus for helping the Allen School bring their expertise to address gaps critical to improving global health and equity.



Photo courtesy of Washington State University

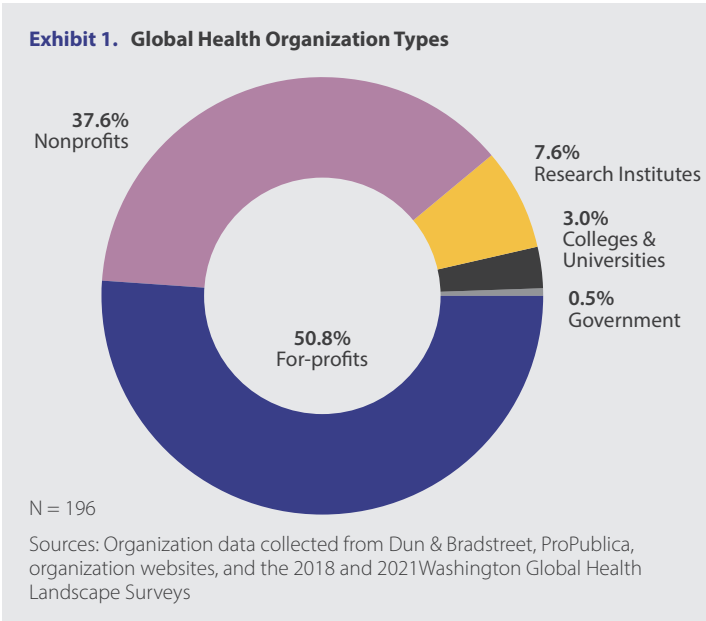
¹ Lankester, Felix. Personal communication with RTI, January 10, 2022.

Washington's Innovation Ecosystem

For purposes of this study, WGHA defined “global health” as working to improve the health of the world’s most vulnerable populations, both domestically and internationally.

RTI identified 196 organizations involved in global health and operating within Washington State as of 2021. As part of revising this study, RTI refined the list of organizations that could be counted as “global health” by including new organizations that directly engage in global health activities while excluding organizations that indirectly provide support for global health activities or specific services to global health organizations. Organizations that focused primarily on local or state health care or services were excluded from this analysis. RTI verified that organizations were still located in Washington State, performed global health activities, and were operational. As a result of this process, more than 125 groups previously included in the 2018 landscape survey were removed from the 2021 version. Simultaneously, an additional 79 organizations were identified as being active in global health and added to the study.

The global health sector in Washington consists of a variety of business types, as seen in Exhibit 1, self-identified through the Washington Global Health Landscape Survey and via company websites. In 2021, for-profit organizations continued to represent the majority, which includes biotechnology and pharmaceutical innovators such as Kineta, and management and scientific consulting companies like WGHA member Camber Collective. The second-largest sector, nonprofits, includes large Washington State employers and



²This was a response rate of 14%.

Exhibit 2. Work Disciplines of Survey Respondents



N = 33

Note: Respondents could select multiple answers, so the percentages do not add to 100%.

Source: 2021 Washington Global Health Landscape Survey

world-recognized global health actors such as PATH and the Bill & Melinda Gates Foundation. Research institutes in Washington include Seattle Children’s Research Institute, the Benaroya Research Institute, and the Allen Institute for Brain Science. Colleges and universities conducting global health research while training the next generation of global health workers include the University of Washington and WSU. The federal Pacific Northwest National Laboratory is a government organization involved in global health.

The 2021 Washington Global Health Landscape Survey asked organization representatives to identify the focus areas and activities of their respective organizations, resulting in 33 total responses.² Exhibit 2 summarizes the distribution of the various work disciplines under the global health umbrella. The majority of organizations self-identified as “health systems strengthening” (62%). “COVID-19” was a new category to reflect shifts in global health focus by organizations; despite this addition, percentages closely reflect the responses from 2018, which shows that organizations have continued their work as before but have added COVID-19 as another responsibility. Benaroya Research Institute shared in the survey, “At the onset of the pandemic, BRI swiftly pivoted to focus on COVID-19 research while continuing critical fundamental, translational and clinical research in other key areas (autoimmune, allergy and asthma, cancer).” Again, the majority of organizations agreed some of their global health work was related to COVID-19, reflecting the true pervasiveness of the pandemic and its ability to motivate innovation.

Exhibit 3 summarizes organization survey responses for activities contributing to improving global health. Compared with 2018, “education, outreach, and training” continues to be a top activity among Washington global health organizations (62%). “Data collection, evaluation, and surveillance” rose 20% since the 2018 survey, possibly reflecting the organizational shifts that took place to help respond to COVID-19. “U.S. or international policy and advocacy” was also significantly higher compared with 2018, a 17% increase.

Exhibit 3. Global Health Activities of Survey Respondents



Source: 2021 Washington Global Health Landscape Survey

Washington-based Providence is one of the largest health care systems in the United States, with a long history of service that began more than 170 years ago. Providence has since grown and evolved their Catholic mission to reach across borders; 30 years ago, they began an initiative to collect and redistribute over \$1 million worth of unused medical products and equipment annually, delivering to where there is

In 2012, Providence began its partnership with Medical Teams International to improve maternal and child health in Guatemala. The current Providence-Medical Teams program serves about 1,346 families, or 11,346 individuals, across 12 villages. Over 3 years of partnership from 2018 to 2021, child diarrhea incidents decreased from 43% to 22%, pneumonia cases decreased from 29% to 4%, and the percentage of moth-



Photo courtesy of Medical Teams International.

need internationally. The health care system also coordinates and mobilizes its employees to volunteer through in-country partners in Mexico, Guatemala, Nigeria, Malawi, and Uganda. These partners direct Providence to their most urgent needs with focus areas in maternal and child health; clinical training, education, and capacity sharing through telehealth; safe and dignified housing; water, sanitation, and hygiene (WASH); and food security.

ers and newborns who received a postnatal visit from a trained health worker within 2 days after birth rose from 33% to 95% for mothers and from 24% to 92% for newborns. Providence and Medical Teams quickly pivoted as Guatemala felt the impacts of the coronavirus pandemic, now incorporating public health education on combating the virus and ensuring funds for quarantine centers and providing personal protective equipment. “Working with partners that are agile, on the ground, and committed has helped us achieve goals during a turbulent time,” says Executive Director Brittn Grey of Providence’s Global and Domestic Immersion Programs.

Providence’s domestic and international activities exemplify how they are able to uniquely leverage their role to address global health inequities both at home and abroad.

Washington State: Global Reach

Washington's global health sector continues to make an impact abroad. According to the 2021 survey responses, Washington's global health organizations have active projects in 162 countries. The top 5 countries were all in sub-Saharan Africa and are Uganda (36%), Ethiopia (33%), Democratic Republic of the Congo (30%), Malawi (30%), and Nigeria (30%). Survey respondents noted that COVID-19 has forced organizations around the world to change how they operate. Despite changes such as going fully remote, halting hiring opportunities, and pivoting organizational priorities, Washington's global health organizations have proven to be adaptable and resilient in their global health efforts. For

example, Amplio Network, a member of the WGHA whose mission is to empower the world's most vulnerable communities through knowledge sharing, was forced to shut down in-person operations. However, during the span of the pandemic, the organization launched a COVID-19 awareness campaign in the Upper West Region of Ghana and distributed more than 200,000 Amplio Talking Books, an audio device designed for people with low or zero literacy skills. When asked about opportunities to improve global health work, organizations said common themes were focusing more on mental health (particularly with respect to the pandemics), using more proactive approaches for localizing approaches to health care, and scaling interventions through better leveraging of the private sector.

More than 40 years ago, the future founders of PATH recognized that while some people and communities had access to new technologies and medical advancements, many others were left behind. To close these gaps, which lead to significant health disparities globally, they founded PATH, a nonprofit based in Washington State. Today, the global team of more than 1,400 public health professionals and scientists, advocates, and engineers pursues its mission of health equity through innovation and partnerships. Working across more than 70 countries, PATH develops and scales solutions to some of the most pressing health issues, including climate change and maternal and newborn health, and, most recently, the COVID-19 response.

PATH's COVID-19 response demonstrates its local and global approach to public health. PATH has partnered with health ministries to stand up emergency operations centers, to track virus variants, and to ensure continuity of essential health service delivery. It has also supported the development of affordable vaccine candidates and helped create global mechanisms for their introduction. One initiative funded by the Bill & Melinda Gates Foundation and in collaboration with the Vietnam Ministry of Health assessed Vietnam's medical oxygen supply, provided

\$4.4 million to prepare hospitals with oxygen equipment, and implemented a streamlined system to match COVID-19 patients with oxygen-equipped hospitals (PATH, 2021).

In addition to making many shifts to prevent, track, and treat the spread of SARS-CoV-2, PATH is committed to working across sectors to strengthen entire public health systems and to increase access to primary health care, including in the community where it is headquartered. In Washington State, PATH has

partnered with the Department of Health, universities, and county governments to share accurate information on COVID-19 and ways to limit the spread of the virus. "At PATH, we fundamentally believe health is a human right, and that right is guaranteed when everyone, everywhere has access to the tools, services, and safety nets we all need to survive and thrive," said Cyril Engmann, Senior Director of Quality and Program Impact at



Photo courtesy of PATH/Matthew Dakin

PATH. "We are at a crossroads—we must do more than manage today's crisis. The global community must ensure a better, more resilient public health ecosystem that prioritizes the people and communities who have been stripped of these inalienable rights and asked to carry an unfair burden of disease, disability, and preventable death."

Global Health Affects Washington's Economy

In 2021, Washington's global health sector continued to increase in employment and accounted for a growing portion of the state's total economic activity. Global health organizations based in the state attracted external financial support from grant funding, donations, service and product revenue, and other sources. The medical and science aspects of global health work make it an important source of innovation for the state. In addition, global health organizations' missions attract highly educated workers with a high level of disposable income that buoys other sectors of the local economy.

Between 2018 and 2020, Washington global health organizations received approximately \$4.5 billion in grant funding, led by NIH in all 3 years. The urgency of COVID-19 resulted in a spike in grant funding. In 2020, more than half of NIH grants were allocated to COVID-19-related efforts. Compared with the 2018 Washington Global Health Landscape Study, there was an increase in grant funding due to the change in methodology for designating global health organizations and in response to the pandemic. This information is summarized in Exhibit 4.

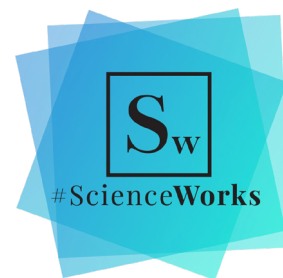
Exhibit 4. Grant Funding for Global Health Activities, Washington State, 2018–2020

FUNDING SOURCE	2018	2019	2020	2020 COVID %**
National Institute of Health (NIH)	\$895,980,967	\$954,743,103	\$1,534,730,789	56%
National Science Foundation (NSF)	\$8,804,770	\$3,783,837	\$4,586,131	23%
Bill & Melinda Gates Foundation	\$145,214,300	\$125,391,778	\$210,459,442	18%
United States Agency for International Development (USAID)*	\$107,192,060	\$139,231,015	\$223,076,572	12%
Department of State (DOS)*	\$34,648,601	\$34,812,810	\$50,960,157	4%
Center for Disease Control and Prevention (CDC)	\$14,724,257	\$5,985,493	\$11,196,130	
Total	\$1,206,564,955	\$1,263,948,036	\$2,035,009,221	

Notes: *Grants data delineated by fiscal year. **Excludes COVID-related funding for local response.

Sources: NIH, NIH Research Portfolio Online Reporting Tools; CDC, Tracking Accountability in Government Grants System (TAGGS); USAID/DOS, USAID Foreign Aid Explorer Data Query; NSF, National Science Foundation Awards Search; Bill & Melinda Gates Foundation, Awarded Grants Database.

Biopharma's Contributions to Global Health



"You're here to make the world a better place." That was the message Adriana Tovar-Salazar—now a biopharma scientist studying chimeric antigen receptor T-cells at Bristol Myers Squibb in Seattle—received from her mother when Adriana was a child in Colombia. At a young age, Adriana was fascinated by protein synthesis, which she calls the building blocks of life. Her fascination led her to pursue an education in science after coming to the United States as a teenager. Today, she combines her education with her passion for health equity, carrying her mother's message with her as she advances innovative cancer research and potential therapies.

Because of research conducted by Adriana and countless other biopharma scientists, cancer therapies have advanced exponentially beyond where they were 20 years ago when Adriana lost her father to the disease. Adriana joined the #ScienceWorks campaign to help raise the profile of pharmaceutical scientists like her and build trust in science. These scientists are real people with real lives, with real friends and family, and with real communities they are members of. You probably know a scientist. He or she may be the person you see walking the dog in the park every morning, a coach at your daughter's softball game, or, like in Adriana's case, your fellow gym goer.

These scientists know something simple. They know #ScienceWorks. They think outside the box while inside a lab and strive to make an impact around the world. Adriana's daily research in Seattle could someday affect the lives of cancer patients throughout the world. Washington-based scientists like her are at the center of a vibrant health care innovation ecosystem that includes academic research centers, biotech and biopharma companies, and philanthropy—all committed to continued scientific advancement. As we collaborate to expand global health access and improve health outcomes, #ScienceWorks is proud to support the WGHA in championing the contributions of biopharma scientists, whose work is an essential link in the supply chain bringing global health justice.

Science works. And scientists make the world a better place. To learn more, please visit www.scienceworks.us.

"You're here to make the world a better place."



Adriana Tovar-Salazar, a biopharma scientist studying chimeric antigen receptor T-cells at Bristol Myers Squibb in Seattle. Photo courtesy of #ScienceWorks

Exhibit 5. Global Health Employment and Growth Rate Compared with Washington State Employment and Growth Rate, 2013–2021

YEAR	GLOBAL HEALTH EMPLOYMENT	GLOBAL HEALTH ANNUAL GROWTH RATE	WASHINGTON STATE EMPLOYMENT	WASHINGTON ANNUAL GROWTH RATE
2013	12,615		2,960,071	
2015	13,333	2.8%	3,123,684	2.8%
2017	14,091	2.8%	3,289,580	2.7%
2021	16,872	4.9%	3,329,163	0.3%

Sources: Washington State employment data from the Washington Employment Security Division Annual Average Covered Employment Report. 2021 figure for Washington State is the preliminary second quarter number. Global Health employment comes from the 2018 Washington State Global Health Landscape Survey. An average annual global health growth rate was calculated using the 2015 and 2018 Washington State Global Health Landscape Survey employment data.

Global health employment rises at a faster pace than Washington’s overall employment

Washington-based global health organizations directly supported 16,872 jobs in Washington State in 2021. Since 2013, global health employment has grown from 12,615 to 16,872 jobs. Global health employment grew at an annual rate of 2.8% between 2013 and 2017. Since 2018, employment has grown at an annual rate of 4.9%, which is significantly faster than the rate of Washington State’s overall employment growth (Exhibit 5). This difference could be due to the impact of COVID-19 on different industries.

Leading employment sectors are scientific research and development services and colleges and universities

Although global health organizations span many industries, 70% of Washington’s global health employment is clustered in the scientific research and development services sector. A diverse workforce of scientists, doctors, study coordinators, and technical specialists are employed by research foundations such as the Allen Institute, Cancer Research and Biostatistics, and government laboratories such as the Pacific Northwest National Laboratory. These organizations engage in basic and applied research on human health conditions, planetary health, drug discovery, and advancements in medical technology. Academic institutions such as the University of Washington and WSU systems employ the second highest number of global health employees in the state. Universities advance global health through the formation and support

of research centers, collaborations with hospitals and other local partners, incubation of small medical and health businesses, and provision of specialized global health training and education. Other industries with significant global health employment include grantmaking, giving, and social advocacy organizations; ambulatory health care services; software manufacturing; and various types of manufacturing and technical services (Exhibit 6).

Exhibit 6. Global Health Employment by Industry, 2021



Sources: Organization data collected from Dun & Bradstreet, ProPublica, organization websites, and the 2018 and 2021 Washington Global Health Landscape Surveys

Global health organizations support employment, income, added value, and output in other sectors of the economy

In addition to direct employment, global health organizations spend money on goods and services from other sectors of the economy, thereby sustaining additional indirect jobs and sales. Legal services, accounting, advertising, and real estate are just some of many industries supported by global health organization spending. Even more jobs are supported by global health sector employees spending money in the local economy. This organizational and employee spending supports an additional 24,421 jobs in Washington State. Other measures of economic contribution include labor income, total value added, and output, as summarized in Exhibit 7.

- **Labor income** includes many forms of employment income, including employee compensation (wages and benefits) and proprietor income, which consists of income from self-employed individuals and independent business owners. Labor income indicates how much additional personal income is created by global health activities. Global health provided \$2.2 billion in direct labor income to families in Washington. For every dollar of direct labor income, another \$0.78 is generated in the state’s economy, representing a labor income multiplier of 1.78.
- **Total value** added is a measure of the contribution to gross domestic product (GDP) made by an individual

industry. It is the value of total output less the value of intermediate goods and materials or supplies that are used in producing them. In 2021, global health organizations contributed a total of \$7.0 billion in total value added to Washington’s economy.

- **Output** is the final value of goods and services. The global health industry directly produced \$6.2 billion of goods and services and contributed another \$4.9 billion in output in 2021.

Finally, Washington’s global health organizations contribute more than \$361 million to state and local tax revenue. Whereas many organizations in global health are nonprofits and are exempt from some taxation, for-profit companies in the industry provide sizeable amounts of tax revenue. These taxes include sales and property taxes (\$312 million), social insurance contributions (\$31 million), and a small amount of personal and investment taxes (\$17 million).

Washington’s global health sector is an important component of the state’s economy, and it is growing despite and because of new challenges like COVID-19. The entrepreneurial environment in Washington State supports well-established big employers and welcomes innovative small businesses in global health and related industries. Global health as a business attracts investment and a highly skilled, interdisciplinary workforce. Washington’s global health sector is resilient; it will continue to play a significant role in discovering innovative solutions for complex issues and advancing health equity in Washington and across the globe.

Exhibit 7. Economic Impacts of Global Health, Washington, 2021

MEASURE	DESCRIPTION	DIRECT	INDIRECT AND INDUCED	TOTAL
Jobs	Number of jobs	16,872	24,421	41,293
Labor Income (\$ millions)	Labor income is the value of wages, salaries, and benefits	\$2,193	\$1,708	\$3,900
Total Value Added (\$ millions)	Value of total output minus the cost of intermediate materials	\$3,948	\$3,009	\$6,957
Output (\$ millions)	GDP is a measure of the overall size of the economy	\$6,240	\$4,964	\$11,204

Note: Indirect and induced effects include two economy responses to the direct global health sector spending. The first response is the new business spending among local businesses as they buy more goods and services to meet growth. The second response is the spending of wages, salaries, and benefits associated with job creation.

Source: RTI analysis based on the 2021 Washington Global Health Landscape Survey and IMPLAN Pro V3.1, expressed in current dollars

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