

Why Global Health Matters to North Carolina: Effects of the Global Health Sector on North Carolina's Economy

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The state of North Carolina has long been regarded as a leading hub for research, innovation, policy, and service. This distinction can be credited, in part, to its efforts to discover, develop, and promote programs and activities to improve global health. The global health industry has become a considerable driver of economic activity in North Carolina. Measurement of the effect of this industry was the primary objective of a study recently conducted by a team of researchers at Duke University [1].

The businesses, organizations, and educational institutions that are involved in the global health sector are generators of significant economic activity in North Carolina and have measureable and sizable effects on the state's economy. The Duke University study is timely and relevant because it examines a sector that increases in importance as North Carolina continues to strengthen its relationships with the international community in the areas of manufacturing, trade, research, and humanitarian service. The ability to quantify the size of the global health sector across the state is key to realizing its value. This economic effect is of particular relevance to policymakers as they make decisions that will affect the investment priorities and globalization of North Carolina's economy.

Over the past decade, there has been a palpable surge in global health awareness, engagement, and activity, especially in academic institutions but also in nonprofit organizations, industry, government, and the general public. At the federal level, the President's Emergency Plan for AIDS Relief (PEPFAR), established in 2003 under the Bush administration, holds its place in global health history as the largest effort by any nation to combat a single disease. Building on the successful aspects of PEPFAR, the Obama administration has called for spending of \$63 billion over 6 years as part of the more comprehensive, "whole of government" Global Health Initiative. This initiative will continue robust funding of efforts targeting human immunodeficiency virus and acquired immunodeficiency syndrome, but it will also focus on broader global health challenges, including mater-

nal and child health, family planning, and neglected tropical diseases, through a more integrated approach to fighting diseases, improving health, and strengthening health systems.

Closer to home, leading universities such as Duke University, North Carolina State University, and the University of North Carolina (UNC)-Chapel Hill have all established institutes or formal programs that are dedicated to training the next generation of global health scholars and practitioners. As an emerging academic discipline, global health involves highly interdisciplinary and interconnected areas that include human and animal health, medicine, law, engineering, economics, environmental science, agriculture, and the social and biological sciences. This trend is seen at universities across the country, with new programs being established at such a rate that the Consortium of Universities for Global Health has incorporated to set standards, develop networks, and advocate for global health curricula in the United States and Canada.

Inspired by the work of Beyers and colleagues [2], who estimated the economic effect of global health on the economy of Washington State, Duke University researchers used an inclusive approach to account for economic activity generated by North Carolina's labor market, including analysis of data from nonprofit organizations, academic institutions, and industry output [1]. Global health activity, for the purpose of this study, was limited to the efforts of organizations based in North Carolina that actively seek to improve health conditions and eliminate health disparities in low-income and lower-middle income countries. Therefore, the study's estimates are conservative, representing a reliable *floor* of the true economic effect of global health activity in the state. The study analyzed economic data from 2007, the latest year for which complete data are available. However, there continues to be tremendous growth in global health activity in North Carolina, and the total economic effect has likely grown substantially over the past 3 years.

The data were broken down into the following 3 sectors: for-profit, which includes private and public businesses;

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nonprofit, which includes entities that are tax-exempt, such as charitable organizations and research institutions; and academic, which includes the economic effects of global health research at colleges and universities statewide [1]. In each of these groups, the effect of global health activities was calculated using an input-output model that measures economic effect in terms of employment, income generated, output, and tax revenue [3]. Economic effects were divided between direct effects and indirect effects. Direct effects are the immediate effects of global health activity on a given economic region, such as labor requirements or the value of a medical procedure produced by an entity engaged in global health. Indirect effects, generated by IMPLAN (IMPact analysis for PLANning [4]) multipliers, are the effects of global health activities on supporting industries that are necessary for global health activities, such as the construction of centers and laboratories that undertake global health research.

The study had several important findings [1]. First, in 2007, North Carolina's global health sector supported more than 7,000 jobs and \$508 million in salaries and wages. The effect of global health on the state's economy ranged from \$1.7 to \$2 billion.

Second, the strongest contributor to global health is North Carolina's nonprofit sector. Nonprofit organizations, defined as charities, nongovernmental organizations, and research institutions, together yielded 3,400 jobs, \$267 million in salaries and wages, and more than \$1 billion in total business activity. One of the largest contributors in North Carolina is RTI International, which is headquartered in Research Triangle Park, one of the oldest and largest science parks in North America. In 2007, RTI International received more than \$216 million in grants (representing 35% of their total revenue) from the US Agency for International Development for projects related to women's reproductive health, neglected tropical diseases, and malaria eradication [5].

Third, North Carolina's academic community also contributes significantly to global health, with nearly \$51 million in total business activity in 2007. Duke University and UNC Chapel Hill account for roughly 90% of the global health activity among the state's academic institutions. The most

significant contributors within these institutions are the Duke Global Health Institute and the UNC Gillings School of Global Public Health.

Finally, other notable considerations include the effect of North Carolina's pharmaceutical and research industries on global health. These areas represent the top 2 contributors among for-profit enterprises, followed by medical-apparatus manufacturing. The exports of most of these companies go to South Africa, Mexico, Brazil, Russia, and Turkey. In 2007, the total for-profit sector supported 3,000 jobs in global health, generated \$220 million in salaries and wages, and yielded \$591 million in total business activity.

How do these effects compare to North Carolina's economy as a whole? Global health is a modest, but growing sector of the state economy. In 2007, North Carolina had the ninth largest economy among US states, with a gross domestic product of \$400 billion and exports worth \$4.6 billion to countries with low and low-middle incomes. Exports to countries with low and low-middle incomes accounted for approximately 20% of North Carolina's total exports across all goods and services. North Carolina's labor force is composed of approximately 5.4 million workers out of a total population of 9.06 million people. Although the annual per capita income in North Carolina is estimated to be \$34,952, the mean annual salary in the global health sector is \$36,042, making it a higher-paying option for workers.

The global health sector is a significant and growing industry in North Carolina, and its relevance and economic effects continue to increase. The findings from the Duke University study verify that the global health sector provides thousands of jobs and economic benefits to the state while improving lives and reducing health disparities around the world. North Carolina's commitment to improving health conditions and eliminating health disparities is marked by its significant and tangible investment in global health, which improves the lives of underserved populations around the world, as well the lives of the citizens of North Carolina. The results of this economic analysis demonstrate the prominence—and promise—of the global health sector and suggest that North Carolina is once again transforming its economic landscape to reflect the importance of our global connections worldwide. NCMJ

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