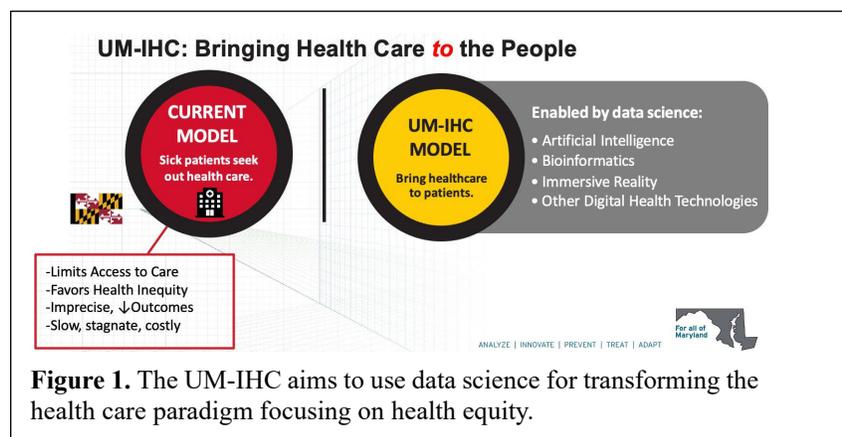


TESTIMONY IN SUPPORT OF SB 376 Higher Education – MPowering Joint Steering Council

January 24, 2024

Background and Goals

The University of Maryland-Institute for Health Computing (UM-IHC) is a unique collaboration between Montgomery County; the University of Maryland, College Park (UMCP); the University of Maryland, Baltimore (UMB); and the University of Maryland Medical System (UMMS). The UM-IHC serves as a hub for life science innovation and collaboration in Montgomery County, connecting federal agencies, startups, and private companies in the field. The institute leverages cutting-edge computation, artificial intelligence, and immersive visualization to advance biotech research and improve population health. Strategically located in North Bethesda to foster economic development and job creation by attracting and supporting life science businesses and entrepreneurs, the institute advances interdisciplinary research and innovation in the field of life science by providing a platform for collaboration among industry, federal agencies, and universities. The overarching goals of the UM-IHC are to leverage data science to decrease disease burden and improve wellness among all Maryland citizens by focusing on health equity and, in doing so, stimulate substantial economic expansion in the life sciences sector throughout the state. The UM-IHC seeks to transform the health care paradigm by using data science to build a proactive system defined by early disease detection, greater opportunity for patient engagement in health care, and deployment of treatment interventions that are efficient and effective. This approach addresses existential problems that plague current health care systems, which are costly, inefficient, and often biased (**Figure 1**).



Overview of UM-IHC

UM-IHC is uniquely equipped to have a significant impact in Maryland. Our focus on both economic development and research sets us apart from other university institutes. Our proximity to life science companies and federal institutions enables us to collaborate more effectively, share

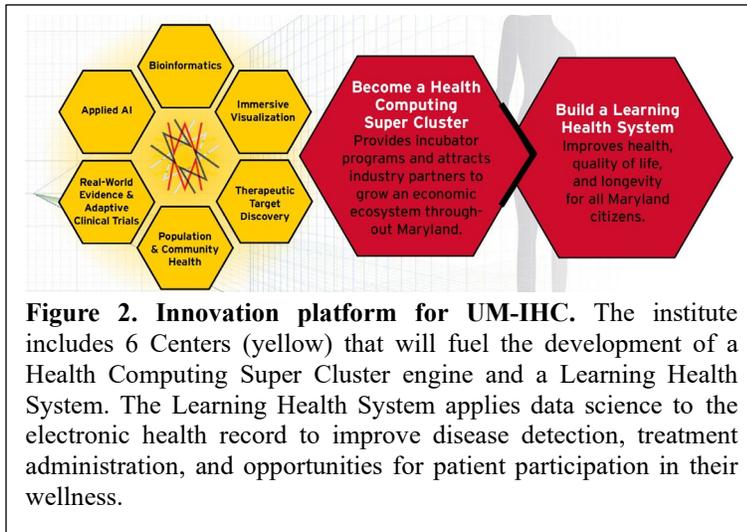


Figure 2. Innovation platform for UM-IHC. The institute includes 6 Centers (yellow) that will fuel the development of a Health Computing Super Cluster engine and a Learning Health System. The Learning Health System applies data science to the electronic health record to improve disease detection, treatment administration, and opportunities for patient participation in their wellness.

ideas, and conduct overlapping research. Accomplishing our goals requires top-notch data scientists, clinical content experts across disease and therapeutic areas (physicians, nurses, social workers, pharmacists, and other allied experts), and an accessible and diverse clinical population. Each of these entities is well-represented at UM-IHC via on-site contributions from UMCP, UMB, and UMMS— institutions that have made significant contributions in the fields of computer science, biomedical and

clinical innovation, and clinical operations. Additionally, we have access to the remarkably diverse de-identified UMMS patient dataset. This is crucial for research that has a positive impact on the health of both state and global populations. The UM-IHC is distinguished nationwide by its competency in advancing ideas using data science from concept/discovery to clinical application at the neighborhood level and commercialization at scale. Success at UM-IHC hinges on adequate financial support to advance programs in six UM-IHC Centers (**Figure 2**): Applied Artificial Intelligence, Bioinformatics, Therapeutic Target Discovery, Extended Reality and Immersive Visualization, Population and Community Medicine, and Real-World Evidence and Adaptive Clinical Trials.

Impact

Montgomery County has over 300 biotech companies, and Maryland has over 40,000 biotech workers. Our area, which is commonly referred to as the Capital Biotech hub, ranks third in the nation (just below Mission Bay and Boston) based on patents, grants, lab space, and venture capital funding. To grow the Capital Biotech hub, UM-IHC

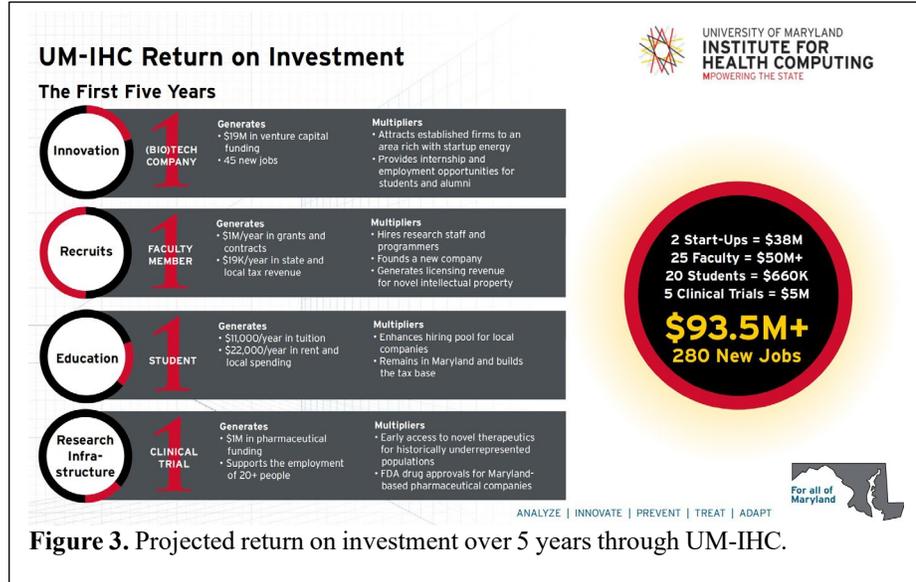


Figure 3. Projected return on investment over 5 years through UM-IHC.

will collaborate with local startups, federal agencies, and private companies by providing resources and expertise. These collaborations will contribute to both foundational and translational research. UM-IHC will host biotech community-building activities by organizing events, workshops, and symposiums. UM-IHC realizes that creativity and knowledge are the driving forces for economic development and is devoted to developing the next generation of talent. We will also provide executive education classes for professionals who want to gain cutting-edge skills. State funding is critical to ensure the success of the UM-IHC, which is committed to generating a substantial return on investment across several economic parameters (Figure 3).

The biotech community is witnessing the emergence of novel technologies in computational biology, artificial intelligence, immersive visualization, and computing resources and algorithms to handle big data that are leading to health care innovations. Computational biology is the crucial foundation enabling and advancing gene therapy and personalized medicine. Artificial intelligence and data science are driving the development of new drugs and therapies. We have seen the power of generative artificial intelligence to generate text, images, and videos. This technology is entering the biotech and medical communities and is poised to make a significant impact. Also, extended-reality devices are giving rise to a new area of immersive treatments. These devices allow health care professionals to interact with virtual content and enable scientists and medical professionals to understand and create novel therapies for pain, addiction, stress, anxiety, and phobias that differ from traditional drug-based treatments. Our use of immersive visualization with immense computation and artificial intelligence in health-related research empowers us to tackle problems previously thought impossible.

Utilization of State Funds

We anticipate UM-IHC will have a strong, favorable, longitudinal economic impact on Maryland. The institute will fuel the recruitment of venture capital to invest in Maryland companies at every stage of development in the health and human disease space and attendant job growth across all domains in the life science/biotechnology sector. Job growth will, in turn, drive migration to Maryland (**Figure 4**).

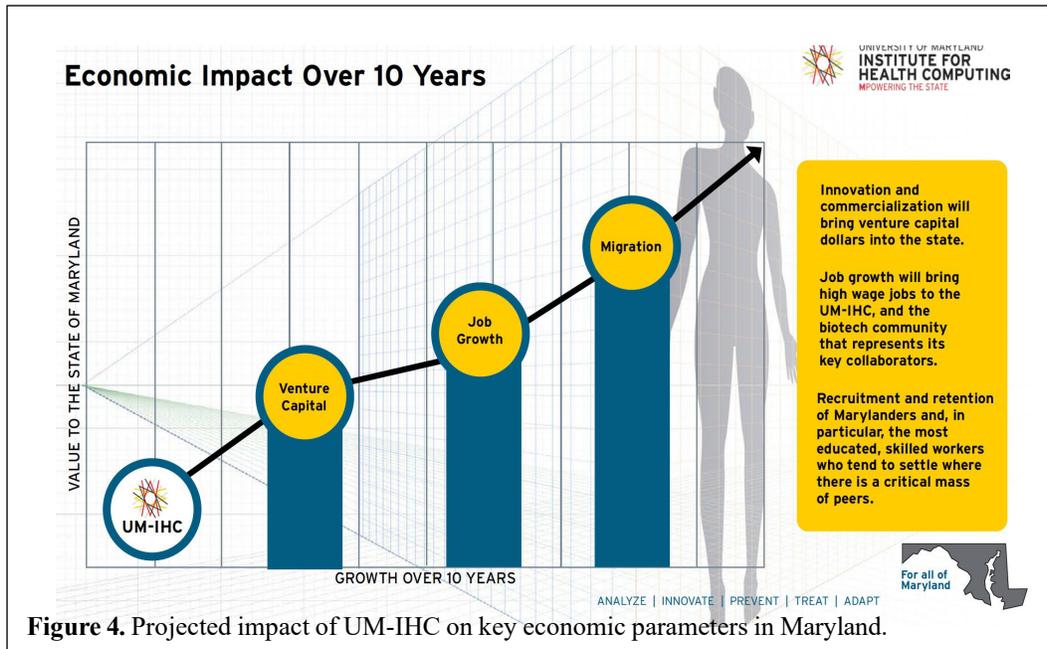


Figure 4. Projected impact of UM-IHC on key economic parameters in Maryland.

The UM-IHC aims to set the benchmark nationally by realizing the learning health care system model on a large scale, contributing to economic expansion by interfacing data science with a statewide medical system. Benefits include rural health care access, urban health equity, data-driven care, artificial intelligence-enabled medicine, enhanced patient safety, and lowered cost of clinical care.

Distribution of Funds

State funds would be split among:

- (1) Personnel (40%). UM-IHC personnel include researchers, clinical experts, computer scientists, database engineers, analytics specialists, epidemiologists, biostatisticians, and health economists, staff, post-docs, graduate students, and undergraduate students.
- (2) Computational infrastructure (30%). Artificial intelligence, immersive technology, and big data require fast computational clusters, storage units, power infrastructure, cooling systems, security, immersive devices, and networking infrastructure, along with extended reality equipment, and other hardware and software.
- (3) Startups (10%). UM-IHC will provide computational resources and expertise to startups to turn incredible ideas into products.
- (4) Educational Initiatives (20%). UM-IHC will organize classes, workshops, events, and symposiums for local companies, students, and industry professionals.

Conclusion

With state funding, UM-IHC will have the resources to conduct research benefitting the state and global communities, leading to the growth of our local economy and the development of biotech talents in Maryland. This will propel the Capital Biotech hub to the forefront of biotech research and cement Maryland's position as a leader in this field.