

Executive Summary

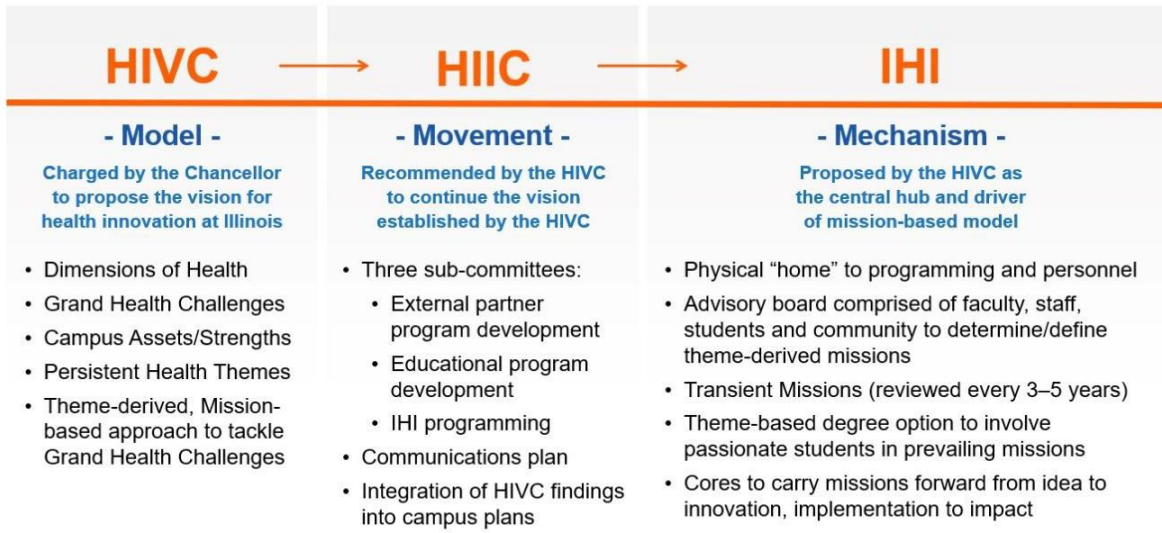
On June 20, 2022, Chancellor Robert Jones charged a Health Innovation Visioning Committee (HIVC) to **propose the future role of Illinois as a pioneer in establishing a new technology-driven academic health research and education model that makes a significant, visible, and sustained impact on human health.** Culminating in this White Paper Report on January 15, 2023, the HIVC was successful at meeting this charge. The proposed model builds upon and leverages interdisciplinary faculty expertise and resources, interdisciplinary research units, and colleges, departments, and programs that engage in health-related research and education. The proposed model is designed and poised to enable Illinois to be the leader in technology-inspired health innovation that addresses the greatest health challenges that exist, encompassing personal physical and mental health, public, community, and rural health, and global health. Solving these greatest health challenges will be difficult, but uniquely achievable at Illinois not only because the model is different and better than what currently exists, but because holistic interdisciplinary approaches are needed; approaches that only Illinois can deliver. Through a highly interdisciplinary and campus-integrated mission-driven approach to tackle these challenges, the proposed model includes five cores of **research, education, community engagement, partnerships** (clinical, allied health, and industry), and **translational entrepreneurship** to address the health challenges in ways that are unmatched by industry or other academic or clinical institutions.

A New Model

The implementation of the proposed model consists of new infrastructure, with an **Institute for Health Innovation (IHI)** (formerly considered as a Translational Research Facility) serving as a central hub with programming and centralized human participant research resources and health innovation space to meet the core needs for driving missions forward. Each mission represents an outward spoke from the hub that connects to resources, educational units, and interdisciplinary programs across campus, representing the rim of a wheel that will enable a network of broad and collective expertise unparalleled at other institutions.

This new model and hub-spoke-rim infrastructure of IHI is unique at the University of Illinois Urbana-Champaign (Illinois) and is designed to serve as a focal point for both new efforts with external partner engagement in health innovation, science, and technology from clinical and allied health partners, community partners, and industry partners, as well as complement and support the many existing efforts across campus. The IHI will absorb the programmatic elements and efforts of the Interdisciplinary Health Sciences Institute (IHSI) and will become its physical embodiment. Faculty (tenured, tenure-track, specialized) and professional project management staff cluster hiring will be initiated to expand the expertise and capacity on campus for driving missions forward. Missions are expected to be highly dynamic, last approximately 3-5 years in duration with potential renewals, and to be prioritized based on emergent health needs and the contributions and impact that Illinois can make on human health as it carries out its land grant mission. This model will support a culture that is not afraid to fail, but has the willingness to be bold, move fast, and expect change.

Recommendations for next steps include the formation and charging of a Health Innovation Implementation Committee (HIIC) that will include three sub-committees focused on: 1) external partner program development; 2) education program development; and 3) IHI programming, design, and construction. A communication plan will be developed to inform and respond to campus stakeholders, faculty, staff, and students who provided feedback, and to inform external partners about the newly proposed model and infrastructure plans. Finally, the outcome of this work will be used to inform the development of the university's next Strategic Plan and our future Boldly Illinois campaign.



Collectively, based on the established interdisciplinary culture, climate, and spirit that defines Illinois, our directed efforts through this new model, infrastructure, and personnel will lead to the establishment of an engine that leverages health innovation, science, and technology to address the most critical and emerging needs of our state, nation, and world to improve the human condition and humanity, both now and for generations to come.

I. Introduction

For over 150 years, the University of Illinois Urbana-Champaign has met its land grant mission to serve the state of Illinois and to make a national and global impact. Illinois solves major problems and changes the world. Technological achievements from Illinois have led the way for new crops and agricultural practices, new high-performance computing, communications, and data analytics that have had global impact. The spirit of innovation that has enabled Illinois to solve some of the greatest challenges and problems can also be directed toward improving human health. Illinois is a place where interdisciplinarity is the norm, and where seemingly disparate expertise can collectively come together to solve major challenges that other academic institutions, industries, and agencies simply cannot.

The Chancellor’s Health Innovation Visioning Committee (HIVC) was assembled and charged on June 20, 2022, to **propose the future role of Illinois as a pioneer in establishing a new technology-driven academic health research and education model that makes a significant, visible, and sustained impact on human health**. This report summarizes the development and basis of this new model. A new model is critically needed because the challenges and problems affecting human health and our humanity today, and in the future, cannot be solved using the existing infrastructure, processes, and models at Illinois.

Many of the most pressing challenges affecting human health, such as obesity and metabolic diseases, mental health, population aging, disparities and inequities in public and community health, and environmental and global health, are not new, yet remain unsolved. Importantly, there is an acute need to develop and train the health provider and caregiver workforce of the future to leverage technological innovation. Many of the experts and elements of the solution exist at Illinois, yet there is no centralized or cross-campus model to leverage our many strengths and assets. It is therefore critical that a new model be developed. How will this new model be different from existing interdisciplinary research units and programs that currently exist? A new, innovative model for sustained impact must comprehensively include not only research, but also education, community engagement, clinical and industry partners, and entrepreneurial activity to go beyond translating ideas to practice, and to transforming the way we practice.

The most representative example of the power and future potential that exists at Illinois is SHIELD – Target, Test, Tell (“SHIELD”) (sidebar). Illinois, collectively as an interdisciplinary community of faculty, students, staff, campus and civic leaders, and health departments, were confronted with one of the greatest global health challenges in our generation, and we demonstrated what we can do when needs are the greatest. Illinois needs to codify a model that will enable us to address other grand health challenges that exist today, and those that are yet to emerge.

STORY

SHIELD: Target, Test, Tell

In the Fall of 2020, a large multidisciplinary team at the University of Illinois Urbana-Champaign (UIUC) created a multimodal solution that successfully mitigated the spread of COVID-19 amongst 50,000+ faculty, students, and staff. Hundreds of colleagues from across campus worked around the clock and delivered a series of major breakthroughs within six weeks, including a first-of-its-kind streamlined saliva test (covidSHIELD) that subsequently proved to be deployable on a massive scale. The SHIELD team performed more than 1,000,000 covidSHIELD tests and an in-depth analysis showed that COVID-19 related deaths in Champaign County were reduced by more than 4-fold relative to expected. UIUC’s SHIELD story quickly became the subject of national and international headlines, and leaders of the SHIELD team served as passionate and impactful advocates for fast/frequent testing for SARS-CoV-2 through many major news outlets (CNN, ABC, NPR, Bloomberg, Washington Post, USA Today, New York Times, etc.).

The HIVC charge was clear, but the committee recognized that it could be expanded in scope to include ways in which technology could also be used for social innovation and change. Discussions and development of our proposed model therefore included this important area. The HIVC recognized that the proposed model was to be driven by missions from the outset, such as the COVID pandemic and the SHIELD response. It is a mission-driven focus that will propel the interdisciplinary solutions to emerge, and it is recognized that missions and their call for innovative solutions will change over time.

The HIVC recognized the importance of its charge, and the brief duration given for development of this new model. The HIVC emphasized its role in the “visioning” of this new model and recognized that more work will be needed to implement the proposed model, likely through a follow-on committee and sub-committees. Finally, the HIVC recognized that following this vision and proposed model that incorporates technology-inspired health, transformative education, and the social innovation to improve the human condition, practical next steps are needed to collectively reach the functioning outcome of this new technology-inspired model for health innovation at Illinois.

The Health Innovation Visioning Committee’s Process

The Chancellor’s HIVC was composed of 21 faculty members and 3 supporting staff (**Appendix A1**) representing a breadth of academic disciplines from across campus, all related to human health. It was noted that this relatively small number of committee members necessitated a plan to reach broadly to all the stakeholders from across campus, and therefore this was one of the first duties for the committee. The HIVC was guided by the Chancellor’s charge letter (**Appendix A1**), which included six direct questions (detailed in **Section IV**). The HIVC first identified and listed the extensive array of campus assets, which included existing units, programs, and initiatives. This list was subsequently utilized to identify a full list of campus stakeholders that needed to be contacted to not only share the Chancellor’s charge, but also to receive essential feedback on the roles that each stakeholder and their respective campus units have in regard to human health. The HIVC developed a Stakeholder Feedback Form (**Appendix A2**) that included seven questions to address the requested information in the charge letter. Over a period of several months, HIVC members distributed and collected this Stakeholder Feedback Form, met with key stakeholders, faculty, students, and staff individually and/or in small groups. Working with IHSI Communications Staff, a new HIVC website was developed (healthinnovation.illinois.edu) to serve as a focal point for information as well as a portal for completing and collecting feedback via the Stakeholder Feedback Form. A campus-wide communications campaign was developed where announcements of the charge and HIVC goals were shared, including through campus MassMail, eWeek, and other digital media platforms. Three in-person Town Halls were held at varying campus locations and times to present overviews of why this charge was given and why the HIVC was formed, to explain the process of stakeholder input, and to have interactive and engaging discussions about campus needs, resources, and vision around technology-inspired health innovation for Illinois. Stephen Boppart (HIVC Chair) presented the HIVC’s charge, vision, and goals at the Chancellor’s Executive Leadership Council Retreat (August 23, 2022), to the Campus Research Administrators Working Group (CRAWG) (August 26, 2022), and to the Council of Deans (December 7, 2022). A presentation of the Interim HIVC Report was given to the Chancellor and senior campus leadership by Stephen Boppart roughly mid-way through the committee’s work (October 17, 2022).

After soliciting input from individuals and groups of stakeholders in nearly 50 identified units, as well as online submissions representing faculty, staff, students, postdocs, and administrative leaders in 9 colleges, 4 institutes, and 24 departments/units, a semi-quantitative word mining approach was performed by Halil Kilicoglu (iSchool, HIVC member) to identify common word/phrases across more than 450 responses to the seven questions. The HIVC thoroughly reviewed these findings and had extensive discussions to align this analysis within the context of the questions asked and feedback received. The committee then developed a report outline, which included experiential story telling of examples from HIVC members based on individual or stakeholder feedback to provide a more personal connection, meaning, and motivation to the information shared in this report. Finally, the outline was expanded to this final report that was reviewed, revised, and approved by all HIVC members. The HIVC members would like to express their gratitude for the opportunity to serve on this committee and to help shape the future vision for technology-inspired health innovation at Illinois.

Throughout the HIVC's work, committee members, campus stakeholders, faculty, students, and staff regularly asked why this charge was given, and why it was so important to Illinois and to our future. Our answers were often shared as stories, some of which can be found as sidebars, excerpts, and quotes throughout this report.

The HIVC discussed how we would define success, including the success of our committee's work as well as the success of the newly proposed model. The success of our HIVC's work is to be measured by the level of awareness, input, and engagement from across campus regarding the Chancellor's charge and the vision of a new proposed model that we put forward. The HIVC believes we have successfully responded to the charge given, and that the vision and model represent an incredibly profound opportunity for Illinois to differentiate itself from among all its peers. The success of the newly proposed model is yet to be determined but will be known by the impact that it will have on the human condition, and on humanity, from the individual in our local community to the global health innovations that improve the lives of millions on planet Earth. This success represents the essence of our land grant mission, and what Illinois does best.

STORY

Partnership and innovation

SHIELD opened the doors for increased collaboration and innovation. We supported early COVID-19 testing efforts with local healthcare providers and developed partnerships to staff our clinical studies. Engagement with other communities in the state grew as an Illinois team established pop-up testing clinics for agricultural workers and others and supported the efforts of SHIELD Illinois to disseminate the COVID-19 saliva test, including the development of a readily deployable diagnostic lab, mobileSHIELD.

STORY

Labor, Health, Equity, Action Project

The Labor, Health, Equity, Action Project (LHEAP) team pursues a dynamic research agenda on the intersections of the structural, socio-cultural, and immunity factors involved in transmission of SARS COVID 19, as it affects essential laborers in agriculture, pork processing, and related industries who are often racial minorities. Central to this project and as a form of committed reciprocity and public health, the team coordinates free pop-up COVID testing in Champaign County with a focus on people who live and work in Rantoul, Illinois with limited access to testing, and drawing on a network of committed community partners and volunteers.

II. Framework and Background

The collective input and discussions resulted in the HIVC systematically developing a process flowchart that would operationalize the proposed model, as shown in **Figure 1**. Each element in this chart will be discussed in greater detail to highlight the process by which health challenges are identified, missions are formed and carried out, and impact is made.

The HIVC first recognized that multiple dimensions of health exist, and that many factors influence and determine our health. This high dimensionality and broad scope of health is reflected in **Figure 2**, which the HIVC developed to capture this broad concept.



Figure 1 | Process flowchart that the proposed model and infrastructure will follow for impact.

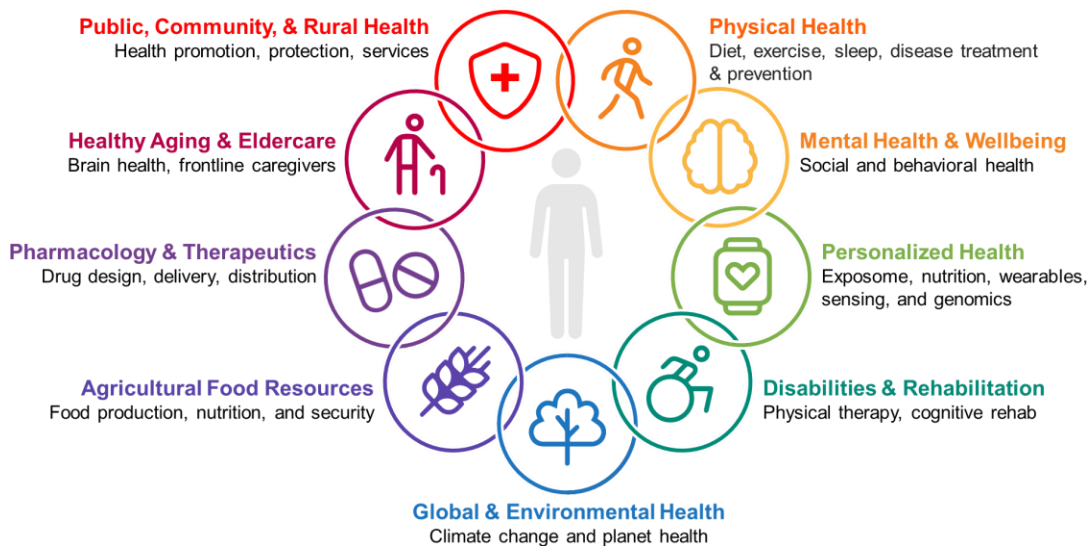


Figure 2 | The multiple dimensions, determinants, and expanse of areas that affect human health.

Two ideologies currently exist that have attempted to similarly capture the breadth of health that we seek to define. The first is the “One Health” initiative (**Figure 3**), which defines and illustrates how our human health is intimately connected with the health of the animals in our environment, as well as the health of the environment and planet. This concept emphasizes how all aspects must be considered in

defining the health of the individual. The second ideology is captured in the Exposome, which represents the collective set of exposures, lifestyles, behaviors, stimuli, experiences, food sources, and contaminants that we as individuals have interacted with throughout our lifetime, from *in utero* until death. Importantly, it is not simply the list of these, but the intersection of these with our genome, which is highly individualized. This ideology implies that it is the intersection of our individual genomics with our exposures that define our individualized health phenotype (**Figure 3**). Both ideologies are valid, but we recognize that more is to be gained and understood by combining these, recognizing that human health spans not only the individual, but also the community, the public, and globally. By combining these two ideologies, we appreciate the magnitude of what our new model for health innovation encompasses, and what impact that technology-inspired health innovation can have on not just the human condition, but on all of humanity.



Figure 3 | Current ideologies that capture the multiple dimensions of human health. One Health (top) and the Exposome (bottom). The proposed model comprehensively considers the entire spectrum of human health, from the individual genomics and response to the environment, to local and global communities and the planet. Images from the World Health Organization and Niedzwiecki, *et.al.*, The Exposome: Molecules to Populations, *Ann. Rev. Pharm. Tox.*, 59:107, 2019.

Identifying some of the greatest health challenges that Illinois would take on is relatively straightforward. The difficulty lies in clearly defining the missions that are feasible, have clear milestones and metrics for success, and would result in translatable and sustained impact. Some examples of the grand health challenges identified by the HIVC are listed in **Table 1**.

Table 1 | Committee-identified grand health challenges (incomplete list).

Providing care and services for a large aging population
Monitoring and managing chronic disease via a hospital at home
Addressing major healthcare workforce shortages across all levels
Diagnosing, treating, and managing mental health
Providing accessibility, identifying disparities, and eliminating inequities in health and care
Eliminating poverty
Overcoming the rise of resistance in infectious disease
Preparedness for the next pandemic
Accommodating neurodegeneration until treatments are found
Managing cancer as a chronic disease
Providing food resources to optimize nutrition
Reversing the effects of climate change on human health
Finding health data management and analytical solutions while ensuring privacy
Provide actionable public health communication, while addressing health (mis)information

From these Grand Health Challenges, six stakeholder themes emerged (**Figure 4**), and the HIVC considers these as potential themes from which missions would emerge for our new model for technology-inspired health innovation. Importantly, Illinois will need to establish the educational and training opportunities for the future health professions that will not only be technology-inspired and technology-savvy, but also in sufficient numbers to address the growing populations in need of this knowledge, experience, and skills.



Figure 4 | Graphic showing six themes that collectively capture the greatest health challenges that exist today. From these themes, missions will emerge.

The new model will be mission-driven and will draw these missions from the themes presented in **Figure 4**. The model will support a culture that is not afraid to fail, but has the willingness to be bold, move fast, and expect change. Ideas for missions are expected to originate from all across campus, and from various think-tank and ideation events such as campus and community make-a-thons. Faculty, students, staff, and partners involved in this new campus-wide approach will unite via their missions to address major grand challenges that affect human health today and will utilize technology-inspired innovations to address these challenges. For example, one mission would be to develop the technology, infrastructure, data analytics, and social innovation needed to successfully meet both the “aging in place” and the “hospital at home” needs for our aging population. Each mission will incorporate five cores that also provide a progress continuum to carry the mission forward from idea to innovation, and then finally from implementation to impact. In this new campus model and approach, these cores are: 1) Research, 2) Education, 3) Community Engagement, 4) Partnerships (clinical, allied health, industry), and 5) Entrepreneurial Translation (**Figure 5**).

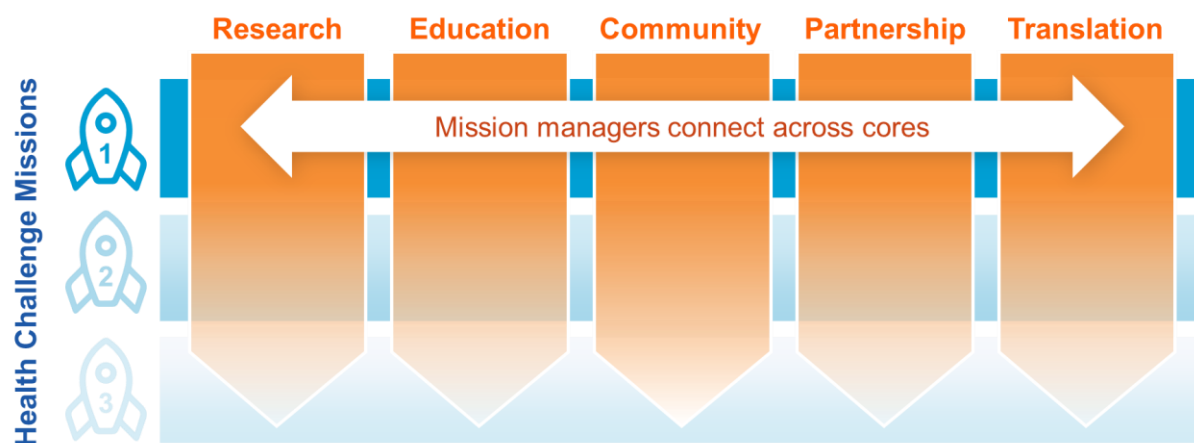


Figure 5 | Relationship of health challenge missions to the five cores in the proposed model for technology-inspired health innovation at Illinois. Each mission will progress through and include all five of the core areas, leading to definitive outcomes and sustained impact. Dedicated mission managers will oversee the progression.

The HIVC envisions that the health-related missions that Illinois and our partners will take on will not be persistent efforts that exist for decades, but will be highly dynamic and transient, following well-defined goals and metrics for success. Defining, deciding, and prioritizing which missions to address will be an established process that incorporates collective feedback and input from all those contributing to and ultimately impacted by the outcome of the mission, not only including faculty, staff, and students, but also community, clinical, industry, and government partners. Missions will be weighted by their significance and impact, and the likelihood for success and sustained change. The model will operate much like the themes defined by IGB, with missions being reviewed every 3-5 years and potentially renewed or redefined as justified.

Faculty, students, and partners will converge in a physical space (an envisioned **Institute for Health Innovation (IHI)**, formerly referred to as the Translational Research Facility (TRF), but retain their home-department space to which they would return after their mission has been completed, and after successful translation into practice. There would be no permanent faculty occupants in this physical space to ensure a dynamic environment in which teams converge, complete a mission, realize the impact, and dissolve; only to consider accepting the challenge of the next mission. The IHI would serve

as the infrastructural hub in the envisioned hub-spokes-rim model (**Figure 6**), with each of the missions serving as spokes, connecting outward and cross-campus to the various existing departments, colleges, interdisciplinary research units, centers, and programs.



Figure 6 | Graphic showing the hub-spokes-rim model. IHI serves as the hub, with multiple missions serving as the spokes that connect with all the campus units, programs, and resources, as well as external health, industry, and translational partners to advance technology-inspired health innovation at Illinois.

To summarize, there will be a systematic process and flow that captures the multiple dimensions of health into major health challenges. These challenges are grouped into themes from which the missions will be derived. The missions will be carried out via five specific contributing cores, all of which are operationalized by new campus infrastructure, the IHI. The IHI will serve as mission control to successfully orchestrate the completion of each mission and guide it to a significant and impactful outcome.

Educational Elements in Missions

The educational elements of the missions will be linked to existing departments and colleges through two mechanisms, to be described further in **Section V**. Briefly, the first mechanism would be a “plus X” program for undergraduate and graduate students, where their primary degree would be accompanied by a “+ MISSION” or a “+ THEME” title, such as Computer Science (CS) + MISSION/THEME, Sociology + MISSION/THEME, or Ethnic Studies + MISSION/THEME, etc.). This is similar to the “CS + X” program currently offered on campus, recognizing the fact that these missions, or health, can be linked in some way to every degree program that is already currently offered. Students will have the option to accept missions that may already be in progress when they begin their undergraduate or graduate studies, or depending on the start of their home degree program, may accept and start with a mission launch.

The second mechanism is to offer students the opportunity to pursue a health theme- or health mission-based degree, rather than a discipline-based degree. Students are increasingly focused and committed to solving major societal or global problems and are often challenged to select the single discipline or degree program that will provide them with the knowledge and skill sets needed to solve these problems. For example, a student may be passionate about solving poverty that exists in rural America. No single discipline alone would meet the educational needs for this student. Currently, it is possible for students to develop and pursue an *Individual Plan of Study (IPS)* degree option through LAS. Similarly, there is an Interdisciplinary Health Program in AHS. Another example is the Cancer Scholars Program, in which a major societal problem (cancer) is used to motivate a student’s entire undergraduate education

Under the auspices of the College of LAS, over the years I have had the pleasure of supervising a number of students whose interest at the intersection of the brain sciences and health innovation led them to create and complete their own individual clinical neuroscience IPS, combining course work, lab work, and independent readings as a capstone to their Illinois education.”

- Neal J. Cohen, PhD

by combining both classroom instruction and research. Such programs would be expanded to other colleges, or centralized, and serve as the mechanism for such theme- or mission-based educational degree programs. The HIVC noted that each of the planned missions could also be partially supported by an NIH T32 training grant, and mission members would submit training grant proposals at the time that new missions are being defined and launched. These two educational mechanisms would apply to graduate programs as well, and could include various certificates, concentrations, and minors, with all being associated with health innovations that augment, complement, and significantly expand the interdisciplinarity of the educational curriculum the student pursues. Further, these educational programs could be extended to include professional Master’s degrees, stackable certificates that can be combined to meet degree requirements, and various online programs.

Addressing Health Disparities, Inequities, and Access

The research and educational programming that this new model envisions extends beyond the campus footprint and into our local and state-wide communities. At all levels of this new model, process, and plan, there is intention to address the health disparities, inequities, and challenges with access that exist with health resources, education, and learner diversity. Continuing education with development and support of life-long learners is a clear goal for our institution. Our model envisions connections and outreach, beginning with our local communities in Champaign County, where knowledge and information is openly shared, and where

our community members and partners become actively engaged with us, even participating directly on missions, and focused on health innovations. Importantly, the HIVC expects that all of the bold missions to be pursued will include milestones and outcomes that serve to address health disparities, inequities, and access. The HIVC also expects missions that specifically address these as their grand challenge. Several representative stories of related ongoing project efforts are presented here.

STORY

STEM Illinois’ Nobel Project

With 80+ community and university partners, the Nobel Project is a public engagement effort to expand the number of students of color and other marginalized groups to be leaders and innovators in STEM fields and health careers. Students are trained as community health workers and co-creators of tech tools that will put wellness solutions at the fingertips of the public nationally and globally.

STORY

Health Data Literacy Ambassadors Program

The Health Data Literacy Ambassadors program empowers youth as change agents, highlights career pathways, and builds connections and partnerships with the local communities. Fifteen teams from across the state conduct needs assessments of health topics in their communities and develop data analytics projects to address issues that arise from their assessment.

*STORY***Studying the exposome to address health disparities**

A team of researchers is working with youth of color to explore the exposome and its relationship to health disparities. Youth will co-create an interactive digital platform to track and potentially measure exposures over their lifetime and envision innovative housing to be produced by the Wellness Store.

*STORY***Illinois Kids Development Study (IKIDS)**

From the beginning, IKIDS has adopted innovative approaches to assess the impact of prenatal exposure to environmental chemicals on early neurodevelopment. IKIDS is also one of 10 ECHO cohorts that participated in a pilot study to measure exposure to over 100 environmental chemicals in a small sample (1.5 ml) of maternal urine, many of which had never before been measured. Partners at the Family Resiliency Center developed several short videos and held workshops to communicate findings with childcare advocates and providers.

Capturing and Assessing the University's Strengths

An essential part of the HIVC's due diligence was to capture and assess the university's strengths in health, as a foundation on which to build new needed infrastructure, programs, and personnel. As described previously, a comprehensive and systematic approach was taken by the HIVC to reach out to all stakeholders across campus, and to collect feedback that was used to assess our assets and strengths.

The HIVC discussed these findings and placed these within the context of our charge and objectives. The summary interpretation of our responses was that there was a clear need for a model and infrastructure that will set Illinois apart from its institutional peers and will define Illinois as an epi-center for health innovation and impact. There was a clear focus on preventative health and wellness, as opposed to medical care and disease treatment, including mental health and wellbeing, the health of our communities, accessibility and social innovation to tackle the social determinants of health, translational pathways to make real practical change with our technologies and innovations, and a need for novel educational programs to not only provide our students with the knowledge and skills to address major health challenges, but also to increase the workforce and build a new culture of innovation and technology into the social threads and dynamics of care, prevention, intervention, and maintenance of health.

III. Leveraging Assets and Strengths while Addressing Weaknesses, Threats, and Challenges

The University of Illinois Urbana-Champaign is recognized both internally and externally as an institution fully supportive of interdisciplinary research and education. The HIVC recognized that this strength could be leveraged for the development of a new model for technology-inspired health innovation.

Interdisciplinary teams, research, and educational programs will be required to address the major challenges and missions identified. Interdisciplinary expertise at Illinois is clearly evident by the 10 interdisciplinary research units (IRUs) that have been established across campus, including the Beckman Institute, the Carl R. Woese Institute for Genomic Biology, Interdisciplinary Health Sciences Institute, NCSA, Prairie Research Institute, the Cancer Center at Illinois, Center for Social and Behavioral Studies, among many others. Collectively, these IRUs, the low or absent barriers between departments, colleges, and units, the acceptance and recognition of the value of interdisciplinary research, teaching, and service in faculty promotion and tenure processes, and the broad support from administrative leadership for interdisciplinary endeavors, all represent major strengths at Illinois that can be leveraged for the successful development of this new proposed model.

The university's successful envisioning, launch, and now growth of the Carle Illinois College of Medicine (CI MED) is another existing strength and example that leverages both the interdisciplinary expertise from across campus in its distributed and diffuse faculty engagement and teaching model, as well as its focus on developing future physician-innovators who are comfortable with and capable of envisioning and promoting change in medicine and healthcare delivery systems through a technical, engineering- and innovation-based approach in its curriculum. While much future potential exists for CI MED, the HIVC recognized that the multiple dimensions of health and wellness that the committee's charge encompassed was significantly larger in scope than the focus of CI MED on clinical medicine and the education of medical students. Clearly CI MED represents a complementary partner in the new proposed model that shares a similar vision for using technology-inspired approaches for advancing medicine and medical care, which is complementary and additive to the focus of this new model on a more comprehensive approach to using technology and innovation to advance human health.

The campus has many long-standing IRU's as well as more recent investments that can be leveraged in support of this new model. The recent \$75M commitment to a new Cancer Center building, commitments to a new Translational Research Facility (TRF) as well as a Research Park Graduation Facility (EnterpriseWorks 2.0), and funds from the Discovery Partners Institute (DPI) and Illinois Innovation Network (IIN) to support new directions in Artificial Intelligence and Quantum Computing, all support the interdisciplinary activities on campus. The investments in the cross-campus Personalized Nutrition Initiative and Microbial Systems Initiative are other examples of recent health-focused investments that will also leverage our campus' strength in interdisciplinarity. More specifically, the initial and expanded programming for the TRF aligns directly with the goals for this new campus-wide technology-inspired health innovation model and can be leveraged as both a physical home and central hub for the model proposed here.

The target focus for the proposed model is to impact the health of multiple communities. Our students, Champaign County residents, and rural Illinois communities will be some of the first people to benefit from the proposed model, particularly for tracking health trajectories over years to assess outcomes, benefit, and impact. This also addresses the land grant mission of the university, and through UI Extension, this model can leverage an existing network that connects health innovation to various populations throughout the state to which it is intended to serve.

The HIVC recognized that many assets, resources, ideas, and strengths exist, can be leveraged, and can be used as a launch pad for this new model and the impact it will bring. However, it was clear that to achieve the desired outcome and impact, better organization and infrastructure is needed, particularly

because of the breadth of fields that are associated with and affect human health. To address this, the HIVC described the need for systematic process (**Figure 1**) and flow of ideas that lead to missions (**Figures 4 & 5**) that are carried out utilizing infrastructure (**Figure 6**) that supports the proposed model, consisting of a central physical space (IHI) and hub, along with the missions that represent the spokes on a wheel, all connecting to the rim representing our networks of units, programs, and initiatives across campus. A strong dedicated team of new and existing program and project management staff and scientists (mission managers) are needed along these program spokes for implementation, information sharing, feedback collection, and to drive missions forward in a highly networked manner. The HIVC recognized as one current opportunity how well positioned campus and this new technology-inspired health innovation model will be for addressing challenges associated with rural health, and how Illinois can become a national and global leader in technology-inspired health solutions not only for rural Illinois, but also for rural, low-resource, and developing regions and countries world-wide.

Weaknesses, Threats, and Challenges to the Model

While *Strengths* and *Opportunities* abound, *Weaknesses* and *Threats* to our success exist. The HIVC recognized that in comparison to academic institutions such as Harvard, Stanford, Washington University, Northwestern, or UIC, UIUC does not have a large academic research hospital, medical center, or professional allied health training infrastructure. Concomitantly, UIUC and our local community have only limited research-focused healthcare expertise (physicians, allied health professionals). The HIVC noted the presence of UIC's College of Nursing on the UIUC campus, identifying the potential for more collaborative interactions and programs within the University of Illinois system, including partners at UIC and the UI-COM in Chicago, Peoria, and Rockford, as well as other academic medical institutions and centers within the state. The HIVC expressed the potential for UIUC to utilize the DPI as one conduit between UIUC and Chicago-area medical institutions.

Finally, the HIVC recognized a significant **Weakness** in our ability to carry out the missions in the new model due to limited staffing in personnel at all levels. This included limited time and available effort from existing tenured, tenure-track, and specialized faculty to dedicate to this new model and its missions. The HIVC realized that new faculty hiring initiatives, including cluster hiring, would be needed, rather than solely relying on split partial appointments or zero-percent appointments with existing faculty on campus. A weakness also exists due to limited research and education support staff, including program and project managers, research scientists, instructors, and other permanent staff. Additional hiring will be critically needed to support the proposed infrastructure of this model. Because community engagement with local and rural partners and leaders is an integral part of this new model, support for appointments, engagement contracts, and collaborative agreements will also be needed, as few currently exist to support the vision proposed for this new model.

Three major **Threats** to the proposed model were identified by the HIVC. The first major threat is the competition that exists with other existing academic medical and allied health centers that have large established programs and significant financial and donor resources to rapidly adopt and implement the technology-inspired health innovation model being proposed. However, while these larger academic medical and allied health centers often serve as a hub for driving collaborations and connections across their institutions, their reach and breadth are not as far and wide as what is being proposed here. Often the institutional culture of interdisciplinarity and collaboration are not as universal as to what exists at Illinois.

The second major threat is the rapidity that other institutions have at moving and supporting ideas-to-innovation, and innovation-to-impact with commercialization, dissemination, investment, and adoption of use. Illinois has a well-established entrepreneurial ecosystem that supports faculty and student innovation and translation, but this represents only the start for a wide-open conduit for the translation and integration of ideas into healthcare, medicine, and health-impacting industries. Related, there are limited personnel and growth opportunities for mid- and late-stage companies in Champaign County, including difficulties in attracting C-level expertise locally, and providing business and economic incentives for mid-scale manufacturing, the next step beyond the formation of the start-up and any initial manufacturing capabilities. This threat is best addressed by developing closer and collaborative ties with local business leaders and drivers of economic development in our community, county, and state.

The third major threat is to our current intellectual resources at Illinois. The broad, diffuse, interdisciplinary, and distributed expertise model that is Illinois' major strength is also a threat, as faculty become increasing split between academic and research units, institutes, centers, programs, and campus commitments. This has strained growth in CI MED and represents a finite cap on the ability for our campus faculty, researchers, and staff to pursue new initiatives and directions, such as the model proposed here. For the successful adoption, implementation, and growth of this new model, personnel resources of time and effort need to be additive, not dividing. As Gene Robinson stated during a stakeholder feedback session, "We can't divide the pie any longer. We need to grow the pie."

The HIVC also identified four **Challenges** that exist in the adoption and implementation of this new model. Challenges were seen as less concerning than the threats noted above, yet still represented hurdles that will need to be addressed. The first challenge identified is the need for a physical location or hub that would represent the focal point for resources in support of this new model. The TRF was considered most appropriate and timely, given the alignment of the current programming for the IHI, as well as the availability of resources to develop this physical building. The second challenge is to address capture of ICR to not only the new IHI, but also other IRUs across campus, based on a new financial ICR distribution model. The third challenge is to identify stable and sustainable funding for the proposed interdisciplinary efforts through a combination of state support, campus support, advancement efforts, industry sponsored research and educational programs, investor venture capital and angel funding, and federal and private foundation funding. Importantly, funding stability is needed for continuity of critical staff and infrastructure support that spans the expected 3-5-year time durations for each mission. Finally, the fourth challenge identified is to establish mechanisms for continued envisioning and building of infrastructure as well as to promote incubation (think tank) of ideas that will be responsible for identifying the missions to pursue, defining and validating the milestones, and reviewing ongoing coordination and metrics of success. Such challenges can be realized with a team of investigators and partners who will be involved in each specific mission, as well as members from new external and internal advisory boards comprised of leading national and local stakeholders who will share and promote the vision.

There was consensus among HIVC members that the implementation of this new model, along with its new physical infrastructure, dedicated personnel, and innovative approach, would leverage the multiple strengths and resources at Illinois and be able to address the anticipated weaknesses, threats, and challenges.

IV. Charge Questions Addressed

The Chancellor's charge included **six key questions** to be addressed by the HIVC. These were used to guide committee efforts, to establish stakeholder questions and the collection of feedback, and to shape the formation and development of the new model for technology-inspired health innovation. This section explicitly reiterates the six charge questions and the HIVC's response to each one.

1. Inventory the University's assets and strengths across colleges and institutes that can be capitalized upon for innovation to advance health and human welfare. These should span physical, mental, emotional, and community health.

The HIVC identified the University's assets and strengths and reported how these can be capitalized in support of the newly proposed model. A broad and comprehensive definition of health was used in the HIVC's work, which included physical, mental, emotional, and community health, among many other dimensions as illustrated in **Figure 2**.

2. Propose and define key interdisciplinary themes across the University's comprehensive research enterprise that position Illinois to pioneer breakthrough, transformative research and innovation for technology-inspired health and wellness, as well as profound social advances.

The HIVC noted the University's interdisciplinary culture and climate as its primary strength and major competitive advantage for the development of this new model. Key interdisciplinary themes that would drive significant benefit and impact and would position Illinois as an international leader in transformative research and innovation for technology-inspired health and wellness were identified in **Figure 4**. The HIVC noted that successful missions from each of these themes would lead to profound social advances, the improvement of the human condition, and the betterment of humanity.

3. Likewise, propose changes to existing and/or envision new educational and training models and infrastructure that could support development of bold new approaches to academic health that advance health innovation and its impact throughout our nation and the world.

The HIVC developed a vision and a new model that incorporated research, education, community engagement, clinical and industrial partnerships, and translational entrepreneurialism (**Figure 5**) that would support new approaches in our academic institution that leverages technology-inspired health innovations that will have local, state, national, and global impact on human health. This model was summarized in earlier sections and is detailed in the following **Section V** of this report.

4. Identify investments in infrastructure, equipment, faculty, and research personnel that are critical to capitalize on previous and proposed investments to advance the impact of health innovation.

As noted above and detailed in the model description to follow in **Section V**, the HIVC has identified the needed investments in infrastructure, resources, and personnel, capitalizing on previous and ongoing investments to impact health innovation and position Illinois as a leader, without the need for untenable investments to build-out a large-scale peer-equivalent academic medical and health center. Illinois does not require a large academic medical and health center to be innovative, only the infrastructure and personnel to complete the missions it has identified as being important to improving the health and lives of our citizens and global communities.

5. Identify key stakeholders – whether current or aspirational – that can be utilized in strategic partnerships to grow our portfolio in health innovation and technology and expand its impact. (including industry and public-private partnerships).

The charge to the HIVC was to primarily perform an introspective review and envision a new model for technology-inspired health innovation. Having done this, the HIVC recognized that an important next-step and future charge would be to include an extrospective assessment and collect external partner input. Preliminarily, the HIVC identified clear external clinical, health, industry, entrepreneurial, and community and state institutional partners, which include: **Clinical/Health:** Carle Health, OSF, Mayo, UIC, Washington University; **Industry:** GSK, P&G, Abbott, Siemens, Medtronic, Apple, Google, Meta, Microsoft; **Entrepreneurial/Innovation:** DPI/IIN, Chicago ARC, Research Park, 1871, Matter, P33; **Community/Institutional:** Champaign County Economic Development Commission, Mayors and Councils from Champaign and Urbana, CUPHD and IDPH, Governor’s office, state and federal legislators, and policy makers; **Federal and Private Agencies:** NIH, DoD, ARPA-H, NSF, USDA, and other federal agencies, Chan-Zuckerberg Initiative, Gates Foundation, Mellon and Carver Foundations, and other private foundation partners.

6. Review program statements for the Research Park-based Graduation Facility (including Enterprise Works) and the University Avenue-based Translational Research Facility and propose a strategic plan to integrate the campus mission to advance health innovation and translation.

The HIVC reviewed these program statements and incorporated these plans into the proposed model detailed in the following **Section V**. In brief, the prior programming plan for the TRF aligned well with the proposed model. TRF programming elements were expanded to incorporate additional elements for the proposed model. The HIVC viewed the evolution of the TRF into a new interdisciplinary research unit on campus named as the Institute for Health Innovation (IHI), and that the IHI would become the physical home for not only the new proposed model, but also become the physical embodiment of the Interdisciplinary Health Sciences Institute (IHSI). The IHSI name would be changed to the IHI, and the programming for IHSI would be incorporated into IHI. IHI and the translational health innovations taking place there would be closely linked and serve as a feeder to both Enterprise Works and the Graduation Facility in the Research Park.

V. Development and Description of the HIVC Recommended Model

This section outlines the proposed and recommended model for technology-inspired health innovation on the UIUC campus. This model incorporates five major cores or elements: Research, Education, Community Engagement, Clinical and Industry Partnerships, and Entrepreneurial Translation as depicted in **Figure 5**. This model is envisioned and developed to support mission-based challenges, to be mission-driven, and to seek to apply technology-inspired solutions for health innovation.

Instrumental to the success of this model is the human capital, the personnel, and the expertise. The roles that individuals will have in support of this new model are detailed below.

Education and Training of Students and Health Professionals. This new model will work toward theme- and mission-based degrees, rather than the more traditional discipline-based degrees. Two mechanisms will

be employed for undergraduate students. The first will be to extend the Individual Plan of Study (IPS) degree option currently offered in LAS to other colleges across campus. IHI will work closely with student advisors and education-based personnel in various departments to assist students in developing their theme- or mission-based IPS and the course requirements that would satisfy degree requirements. The second mechanism would be through a “DISCIPLINE + MISSION/THEME” program, similar to the existing “CS + X” program, but where the student would complete the degree requirements for their chosen discipline and enroll in additional coursework that directs their discipline-based education toward one of the missions in IHI, or a particular applied focus on health innovation. The second mechanism would similarly be applied for graduate degree programs, where a graduate student would have the option to direct their graduate degree toward an applied challenge in health and utilize technology-inspired ideas from the graduate research toward innovations in health. These new programs could be coupled with named certificates or concentrations that would accompany their formal degree program name. Additionally, such certificates would be designed to be “stackable”, so that completion of a coordinated set of certificates separately would build toward a degree. Examples of certificates include community engagement, public health, or building upon current AHS professional degrees in MPH, Health Administration, and Health Technology. These educational programs can also be extended to professional Master’s degree programs and to various online certificates and degree programs. The HIVC recommended building joint technology-inspired health innovation programs with Parkland College, as an outstanding local resource for expanding certificate and degree training programs in the allied health sciences, including health technician certifications (med-tech, radiology-tech, surgical-tech) and caregiver training programs (nursing aides, home health). Strong local and regional partnerships like this will serve to address the current and growing workforce and staffing shortages in the clinical, health, and caregiver professions.

Scholarly Activity of Faculty. This new model will seek to emphasize the campus focus and support for interdisciplinary team-based research and innovation regarding faculty promotion and tenure. While UIUC has been a leader at recognizing faculty excellence that emerges from team-science approaches to addressing complex problems that require interdisciplinary thinking and solutions, this model will incorporate changes in Provost Communications that emphasize the value of interdisciplinary research and teaching, and more specifically identify how individual contributions to team-science should be evaluated for promotion and tenure, for both tenure-track and specialized faculty. Redefining what constitutes successful interdisciplinary team-based research and teaching for promotion and tenure will enable the successful adoption of the proposed model. This team-based campus model will also ensure continuity and longevity for the proposed model, as the mission-driven research will no longer be as dependent on individual faculty grant funding but will serve to diversify the risks and the investments with larger teams, programs, and centers. To successfully envision and implement this model, clusters or groups of faculty hiring programs are recommended. Faculty hiring will intentionally seek to address diversity and equity goals and include both tenure-track and specialized faculty positions at both junior and senior ranks, and with home units broadly across campus. The initial cluster hiring plan would focus on expertise in technology-inspired health innovation, broadly defined and not limited to a particular college. Further commitment is recommended for future cluster hiring searches that align with the themes and the defined missions.

Hiring and Continuity of Professional Staff. The HIVC repeatedly recognized and discussed the critical need for investing in existing and expanded human infrastructure to support the proposed model.

Because the implementation of this model will utilize a physical central hub (IHI) with mission teams to connect across campus to other educational and research units (also external partners), professional mission managers will be recruited, hired, and supported to operationalize the missions, coordinating between and within the five cores integrated into each mission (**Figure 5**), and ensuring communications between multiple interdisciplinary units.

Community-Engaged Partners. Essential to every mission will be the expected outcome and impact on our communities, whether local, state, national, or global. This mission-driven model will identify and engage community partners who will serve to connect our community members with the education and research at UIUC. By establishing a “*Communiversities*” approach with service learning and volunteer opportunities for students, faculty, and staff, there will be mutual benefit, and improved health, wellness, and wellbeing through the technology-inspired health innovations emerging from this model and effort. The “*Communiversities*” approach also allows for long-term and caring relationships that create unprecedented access for community youth and their families to university faculty, students and other resources, with the goal of fostering the genius present in our youth and breaking down barriers for them to become global leaders. This connection with our communities exemplifies our land grant mission for discovery and innovation that directly impacts and improves the lives of the citizens of Illinois and beyond. This new model, and our land grant mission, will enable Illinois to achieve what cannot be done in industry or elsewhere, and a primary driver for this new model and team will be to not only identify the technology-inspired health innovations that can solve grand health challenges, but also identify those health challenges that cannot be addressed by industry or other partners alone, and lead the way.

Translational Entrepreneurialism for Economic Impact. Working closely and collaboratively with clinical, allied health, and industry partners, the last core in the operationalization of this model (**Figure 5**) involves a focus on translational processes all the way to real-world implementation, adoption, and use. This was a major programming focus in prior embodiments of the Translational Research Facility, which will be furthered and expanded to support this new model. This core will leverage the existing strengths out of the Research Park and EnterpriseWorks, and further complement the development of the Graduation Facility (EnterpriseWorks 2.0) as a means for moving ideas to innovation and then to implementation and impact. The HVC recognized the economic impact that this new model and focus on technology-inspired health innovation would have on our local business community, and that the economic impact would be great. The construction and establishment of the IHI on University Avenue would serve to further define a “*Health Corridor*” along University Avenue and become an epi-center for health innovation. The corridor further represents a conduit and connector between the cities of Champaign and Urbana, between Carle Health, OSF, and Christie Clinic medical institutions, and between the university and the local community north of and around University Avenue. The IHI would join current physical infrastructure along and around this corridor including the Beckman Institute, NCSA, the Health Care Engineering Systems Center (HCESC), and the future Cancer Center at Illinois (CCIL) building, as well as the clinical research at Carle Health (Mills Breast Cancer Institute, Neuroscience Institute, Heart and Vascular Research Institute, etc.), and potential future Clinical Trials Research Institute on the Carle campus.

Institute for Health Innovation. The physical embodiment of this new model for technology-inspired health innovation will be a new Institute for Health Innovation (IHI). The IHI represents an evolution and visioning growth of the previously envisioned Translational Research Facility. The IHI would be sited in

the lot immediately East of the Beckman parking garage, on University Avenue, and along the Health Corridor. This is the same site originally planned for the TRF. The IHI would serve as centralized physical space with human capital resources (faculty, staff, students, industry partners, clinical partners, human research participants, engaged community members, and administration) to support technology-inspired (and translated) health innovation. This Institute would be a centralized resource and campus hub for collecting, integrating, and driving campus missions based on the distributed and interdisciplinary ideas, innovations, and solutions from campus units, partners, and community. The missions can be represented by spokes emanating from the central IHI hub and connecting to the rim, which reflects the campus assets, resources, IRUs, colleges, centers, and programs (**Figure 6**).

Because of the broad charge and goals for the IHI, and their similarity to those of IHSI, the IHSI would be renamed and reimagined as the IHI, and the IHSI name would no longer be used. The programming for the IHI would be similar to the NIH CTSI (Clinical and Translational Science Institute) model which will serve to provide an umbrella coverage of services across the institution, and even across several universities and external partners. The programming for the TRF was previously developed in 2021 by a separate Steering Committee charged by VCRI Susan Martinis and former Provost Andreas Cangelaris that focused on providing a facility to fill the gap between faculty research labs and start-up companies, facilitating the translation of health-related science and technology. The programming for the IHI was expanded based on the needs for this proposed model, as well as developments in CI MED, the Cancer Center at Illinois, AHS, HCESC, and other units across campus. IHI programming remains focused on health innovation, the five cores identified in **Figure 5**, and the mission-driven approach to tackling grand health challenges. Envisioned programmatic elements are listed in **Table 2**.

Table 2 | Programmatic Elements in the Institute for Health Innovation.

Technology-inspired Health Innovation-focused
Central hub and “Mission Control” for driving missions and educational program connections across campus
Interdisciplinary Health Sciences Institute (CTSI-like) cores (become physical realization of IHSI)
Human Research Participant Testing and Procedures (sleep studies, behavioral, samples)
Biospecimen Collection and Repository (biofluids, cells, tissues)
Human Research Participant Data Repository and Data Analytics
Human Imaging (complementary to Beckman, Carle)
CI MED Faculty Research Labs → New Physician-Scientist Hires (overflow from MBCI)
CI MED Student Innovation Space
Clinical Trials & Clinical Research Space
Industry Partnership Colabs and Centers
Mayo Clinic & Illinois Alliance (Institute) for Technology-Based Healthcare (aspirational)
Cancer Center at Illinois – Translation space (until CCIL building completed)
Collision and Collaboration Spaces – Open workspaces, water coolers, meeting rooms
Human Participant Friendly – Welcoming forum, café, ample parking, accessibility
Community Engagement Spaces – educational, project driven, community research, partners
GMP-compliant facilities for first-in-human studies (tissue engineering, cell delivery, implantable devices, trials)
Center for Health Informatics
Community Health Worker Academy
Possible new location for ARCHES / HCESC

The IHI will be the central hub for driving the defined missions. With its facilities and resources for human research participants and education, it will work in complementary ways with the campus Office for the Protection of Research Subjects (OPRS). IHI will be advantageous for the OPRS and for campus by offering a centralized physical location where human participant research can take place, particularly biospecimen collection, data collection, and procedures involving human research participants, and as a central repository of biospecimens and biodata. This will help centralize oversight and optimally ensure compliance and safety.

The IHI will be considered as a campus IRU, with both similarities and differences. Similarly, it will be highly interdisciplinary and have dynamic missions that will initiate and evolve-out over durations of 3-5 years. Faculty will be appointed to IHI as either in-residence or as affiliates and may occupy physical space. All faculty will maintain home-unit affiliations. Translational and human participant research and innovation spaces will be dynamically allocated based on mission needs, and appointed faculty will retain their research lab space in their home units so they can return and resume their research program as missions conclude.

The IHI will differentiate itself by: i) the intense and specific focus on technology-inspired health innovation, ii) the focus on translational human-based research, iii) the focus on integrated entrepreneurial training and programs to move ideas to innovation to implementation to impact along with health-tech industry and health partners, iv) the focus on community engagement for both health innovation research with community partners as well as education and programming to give back the knowledge and findings to our communities, and v) the focus on economic development in our county and state. The most profound difference of IHI will be its new education model where IHI will work closely and collaboratively with degree granting departments and colleges to design new theme- and mission-based degrees, as well as new joint degrees that include theme- and mission-driven goals and develop and utilize technology-inspired health innovations.

The IHI will serve as both a centralized physical hub and as mission-control for the missions that will reach broadly across campus, and IHI will work collaboratively with other IRUs, Centers, and Programs. It is not intended to replace any existing entity, and IHSI will evolve into the IHI by name. Rather, IHI will leverage, complement, facilitate, and build strengths and connections for technology-inspired health innovation programs across campus. The vision of this new model and IHI aligns with both the university's next Strategic Plan and the Boldly Illinois campaign, including fostering scholarship, discovery, and innovation, providing transformative learning experiences, making a significant and visible social impact, and stewarding current resources for generating additional resources for strategic initiatives. Our health, and the societal benefits of technological innovation, are both personal and evident. The vision for technology-inspired health innovation at Illinois will resonate clearly for future advancement campaigns to engage alumni and philanthropic donors in support of this direction of our land grant mission to improve the human condition and all of humanity.

VI. Moving Forward: Considerations for Future Committee Work

The HIVC defined specific recommendations for moving forward toward the proposed model and the IHI infrastructure detailed in **Section V**. These include:

- 1) **Assemble and charge a Health Innovation Implementation Committee (HIIC).** This committee will be responsible for continuing the vision established by the HIVC. The suggested approach is to establish three sub-committees to more fully define, develop, and implement the proposed model. The three sub-committees include:
 - a. External partner program development sub-committee. The charge to this sub-committee will be to inform and connect with potential external partners and external stakeholders that would interface with the IHI and this new model. The primary focus for the HIVC was an internal introspective assessment for the proposed model and IHI. This sub-committee would now look externally, including partners in the **Clinical and Allied Health Sciences** (Carle Health, OSF, Mayo Clinic, UIC, WashU, etc.), **Community** (local, rural, Chicago, state), **Industry** (GSK, P&G, Apple, Meta, Microsoft, Google, Siemens, etc.), and **Government** (CUPHD, IDPU, state legislature, federal agencies).
 - b. Educational program development sub-committee. The charge to this sub-committee will be to inform and connect with colleges and departments to further develop and refine the proposed education, degree, certificate, and concentration mechanisms outlined in this report. This sub-committee would also inform and begin working with the Faculty Senate and Educational Policy Committee members on the proposed programs, as well as analyze the faculty promotion and tenure process for its support of cross-cutting team-based scholarly excellence.
 - c. IHI programming sub-committee. The charge to this sub-committee will be to finalize the programming for this new institute. The IHI programming sub-committee should include members from Facilities & Services to define building specifications that match the programming for the institute and for implementing the proposed model for technology-inspired health innovation. Working with campus administrative leaders, capital funding commitments for this new institute should be finalized. Working with advancement, philanthropic goals should be determined and targeted. Support from this committee and others across campus will be available to promote this vision and new model to potential donors and industry investors. Finally, an architecture firm should be hired and building construction plans should be determined, for expected completion in 2025.
- 2) **Define and implement a communications plan.** A campus-level communications plan should be established and targeted to campus personnel and involved stakeholders regarding the HIVC report and the actionable next steps that are being taken to further develop and implement this new model for technology-inspired health innovation. The communication plan should also include information on the programming and construction of the IHI, as well as the evolution and renaming of IHSI as the IHI. A similar communications plan should be developed for sharing this vision, report, and plans with external partners, stakeholders, government leaders, and the general community.
- 3) **Integrate the findings and plans from the HIVC report into the discussions and planning for the next Strategic Plan and for the Boldly Illinois campaign.** As discussion groups and committees are regularly meeting for the next Strategic Plan and Boldly Illinois campaign, the HIVC Report should be widely shared and discussed with these committee members and senior leadership.

The HIVC believes the proposed vision and model presented here should be integral elements in both the next Strategic Plan for the university and for the Boldly Illinois campaign.

VII. What Illinois Can Achieve

Together, Illinois is ideally positioned to achieve this vision and the proposed model. The HIVC sees the future of technology-inspired health innovation as:

- 1) A new model of education, research, and innovation inclusive of the multiple dimensions of health.
- 2) The reduction toward elimination of disparities that exist in the access, delivery, and receipt of care, including food insecurity, to enable wellness and well-being.
- 3) Educating students and our communities to comprehend the intersections of society and technology, living with sensors and technology while ensuring privacy.
- 4) Creating and disseminating health innovations through community engagement and economic development.
- 5) Leveraging existing interdisciplinary assets, resources, faculty expertise, and infrastructure already in place at Illinois, including our student population as research participants and citizen scientists.
- 6) Educating and training future generations of health providers, home health technicians, and care givers to meet the expanding need.
- 7) Harnessing the power of Big Data with data analytics and AI to inform health care decision making.
- 8) Developing next-generation technology and innovations for personalized health and front-line care.
- 9) Fostering entrepreneurial activities and engaging with industry and private foundations to disseminate ideas and innovations for impact.
- 10) Designing and building future sensorized home living environments that maximize and monitor our health.
- 11) Leading the field of disability research, para-athletics, and support services for students with disabilities.
- 12) Building relationships with health and clinical partners, public health departments, local governments, and state surveys that have implementation paths for delivering the health innovations that emerge.
- 13) Addressing the social determinants of health with technological determinants of health.
- 14) Driving governmental information and public policy for the state and nation.

The future of technology-inspired health innovation at Illinois will be driven by our land grant mission to improve the human condition and all of humanity.

VIII. Acknowledgements

The HIVC members would like to thank Chancellor Robert Jones for the opportunity to establish a vision for technology-inspired health innovation at Illinois. We appreciate all the ideas, suggestions, and feedback comments from our many stakeholders, students, and partners throughout this process. We thank Bridget Melton and Kacey Nelson from IHSI for providing invaluable communications and graphic design support that enabled shared messaging and feedback collection, and we thank Leta Summers

from IHSI for providing administrative support for all the scheduling and coordination of the HIVC. The HIVC would like to acknowledge the contribution made by Halil Kilicoglu, HIVC committee member, for his text analysis, summary, and report based on the collected stakeholder feedback. Finally, Stephen Boppart would like to thank Kraig Wagenecht from the OVCRl for Project Management support to the committee and would like to thank all of the HIVC members for their collective insights, perspectives, and contributions to the vision and proposed model reported here. Their visions were inspirations.

Appendices:

A1. Chancellor's Charge Letter (includes list of committee members)

A2. Stakeholder Feedback Form

APPENDIX A1. Chancellor's Charge Letter



Office of the Chancellor

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June 20, 2022

Health Innovation Visioning Committee

Stephen Boppart, Chair, GCOE, CI MED (BioE, ECE)
Rohit Bhargava, CCIL (GCOE, BioE)
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Ryan Dilger, ACES (Animal Sciences)
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Carin Vanderpool, Vet Med (LAS, Microbiology)
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Neal Cohen, IHSI (LAS, Psychology) *ex officio*
Paulanne Jushkevich, OVCIA *ex officio*
Susan Koshy, LAS (OVCRI/IHSI Faculty Fellow) *ex officio*
Melanie Loots, OVCRI *ex officio*
Gillian Snyder, IHSI *ex officio*
Kraig Wagenecht, OVCRI Project Manager *ex officio*

RE: Chancellor's charge to assess the University's Health Innovation Ecosystem and develop a pioneering vision for sustained global innovation in education and research impact on human health

Dear Colleagues:

The University of Illinois Urbana-Champaign is renowned for disciplinary excellence at scale, across many fields in research and education, as well as our demonstrated ability to bring together diverse teams to solve complicated problems. The COVID-19 pandemic, one of the most complex health problems in our lifetime, underscores the importance of personal, public, and global health. Our university's response to the pandemic through the SHIELD program exemplifies the impact that we can have through health innovation and education. Our research community and our academic units have made significant contributions to human health, and our recent high-impact successes build on investments in unique infrastructure and new assets. Yet perplexing health-related challenges persist. Illinois can meet those challenges by leveraging the strength of our hallmark interdisciplinary approaches to research and education and harnessing the spirit of innovation that spans the entirety of campus.

I invite you to build upon this strong foundation by participating in a Visioning Committee to assess the university's health innovation assets in the colleges and institutes. This team will propose the future role of Illinois as a pioneer in ***establishing a new technology-driven academic health research and education model that makes a significant, visible, and sustained impact on human health.***

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I challenge you to think broadly and boldly about how technology-inspired health, transformative education, and social innovation can uniquely position Illinois as national and global leader in health innovation to generate many more examples like SHIELD that improve the human condition and impact humanity.

Computational and biological advances, emerging knowledge of the human genome, a changing climate, profound impact of social and behavioral sciences, and ongoing inequities in access to food, health care, and education present an incredible opportunity to reflect on our mission as a land-grant institution that serves humanity and envision a healthier future for all humankind. Building on expertise in these and other emerging areas of health, as well as achievements in our Next 150 Strategic Plan, I ask you to work with representatives of units from across campus to envision a cohesive, coordinated plan to bring about transformative change and impact for the state, nation, and world. Your work will involve forming and driving focus groups, and consulting with key research and educational units that include Interdisciplinary Institute and Center Directors, Deans and Associate Deans, as well as other research and education leaders across campus. I also ask you to convene junior and senior faculty to secure their valuable input.

Specifically, I ask you to address the following opportunities and questions:

1. Inventory the University's assets and strengths across colleges and institutes that can be capitalized upon for innovation to advance health and human welfare. These should span physical, mental, emotional, and community health.
2. Propose and define key interdisciplinary themes across the University's comprehensive research enterprise that position Illinois to pioneer breakthrough, transformative research and innovation for technology-inspired health and wellness, as well as profound social advances.
3. Likewise, propose changes to existing and/or envision new educational and training models and infrastructure that could support development of bold new approaches to academic health that advance health innovation and its impact throughout our nation and the world.
4. Identify investments in infrastructure, equipment, faculty, and research personnel that are critical to capitalize on previous and proposed investments to advance the impact of health innovation.
5. Identify key stakeholders – whether current or aspirational – that can be utilized in strategic partnerships to grow our portfolio in health innovation and technology and expand its impact.
6. Review program statements for the Research Park-based Graduation Facility (including EnterpriseWorks) and the University Avenue-based Translational Research Facility and propose a strategic plan to integrate the campus mission to advance health innovation and translation.

I encourage you to think comprehensively: including not only direct allied health professions and medicine, but more broadly mental as well as physical health, public and rural health, agricultural technologies that improve the production, nutrition, and safety of our food resources, environmental health for the betterment and protection of our planet, and global health, for sustaining life, health, and wellness in all communities, societies, and populations around the world.

I anticipate that technological as well as social innovation will underpin this vision. Technology increasingly integrates and connects our lives, and advances have the potential to improve both our individual health as well as the broader human condition, including our families, social groups, communities, nation, and world. Yet, as we employ technology toward this goal, it is imperative to monitor and evaluate possible social, mental, and physical ramifications, to optimize and fully capitalize on technology's benefits to humankind.

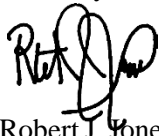
Your proposed plan for the development of Illinois as an epicenter for health innovation should complement and support our investments and strategic goals for the Carle Illinois College of Medicine, Cancer Center at Illinois, College of Applied Health Sciences, Interdisciplinary Health Sciences Institute, Carle-Illinois Strategic Affiliation Steering Committee, Mayo Clinic and Illinois Alliance, JUMP-ARCHES, Beckman Institute, Center for Social and Behavioral Sciences, and the many other key units on campus related to health.

By its very name and nature, IHSI serves as a focal point for bringing individuals, teams, and campus units together. Building on IHSI's growth and successes under Professor Neal Cohen's leadership, and the work of the Health Sciences Strategy Task Force from 2018 (<https://healthinstitute.illinois.edu/health-priorities>) this Visioning Committee will set the foundation to elevate health sciences and education, as well as technology and social innovation here at Illinois. I have asked Professor Stephen Boppart, a tireless advocate for envisioning and developing technology to improve human health, to serve as chair of this Visioning Committee. Professor Boppart will also be appointed Interim Director of IHSI as of August 16, 2022, when Professor Cohen steps down from his Directorship and begins a well-deserved sabbatical.

The focused term of this visioning committee is July 1, 2022 – January 15, 2023, with a white paper report summarizing the discussions, findings, recommendations, and potential requested by the end of this term. I also request a draft presentation of your work in late September, so that I and key members of my senior leadership team can provide interim feedback such that you can appropriately prepare the final report. Mr. Kraig Wagenecht from the OVCRl will serve as the Project Manager for the committee, and IHSI will provide logistical and administrative support for your work.

We look forward to your participation and contributions that are critical to the next steps of investment and impact in our strategic planning for our health innovation eco-system here at Illinois.

Sincerely,



Robert J. Jones
Chancellor

cc: A. Cangellaris,
S. Martinis

APPENDIX A2. Stakeholder Feedback Form

HEALTH INNOVATION VISIONING COMMITTEE (HIVC)

Stakeholder Input Form

The HIVC has been charged by Chancellor Jones to consider a new technology-inspired academic health research and education model that makes a significant, visible, and sustained impact on human health. We have been asked to think comprehensively, broadly, and boldly how such a model can uniquely position Illinois a national and global leader in health innovation that improve the human condition and impact humanity.

The HIVC embraces broad input from its University and external partners. The Chancellor's charge to the HIVC included key opportunities and questions for consideration. Please utilize the following to provide your unit's input.

University Stakeholder/Unit Name:	
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	Opportunities and Questions	Stakeholder Input
1.	Broadly thinking, what areas, terms, or themes describe, affect or characterize human health?	
2.	What innovations, including technologies, processes, or interventions, are needed to address the major health challenges we face today as individuals, a community, and globally?	
3.	What are the health- and technology-related assets across campus? What are our aspirations needs, programs, and infrastructure?	
4.	What are some of the ongoing efforts related to health in your unit, or that you are aware of, that the Health Innovation Vision Committee could support or build upon?	
5.	What are proposed changes to existing and/or new educational and training models and infrastructure that could support development of new academic health approaches?	
6.	What investments in infrastructure, equipment, faculty and research personnel are critical to capitalize on previous and proposed investments to advance health innovations?	
7.	What barriers or bottlenecks might exist for our campus to move broadly and boldly toward becoming a national and global leader in health innovation?	

Other input/comments: