Annual Report to UMBC
FY 2019
(July 2018 to June 2019)

October 31, 2019
Message from Cynthia Woodcock, Executive Director

We are pleased to update the UMBC community on our work and the dedicated people behind it.

As a public university, UMBC’s mission includes not only research and teaching, but also service to the state of Maryland. The Hilltop Institute epitomizes the spirit of this three-part mission. We work with our state agency partners to harness the power of data to promote evidence-based decision making. We collaborate with faculty to identify research questions important to policymakers and apply sophisticated data analytics to address them. We are also helping to prepare the next generation of data scientists, health services researchers, and public policy professionals.

Below, we highlight one project that is an excellent example of our contributions to state health policy in Maryland. This project is led by Ian Stockwell, Senior Director of Analytics and Research/Chief Data Scientist. In the pages that follow, we report on current sponsors and projects, as well as staff accomplishments.

Maryland Primary Care Program (MDPCP)

The state of Maryland has entered into a Total Cost of Care All-Payer Model contract with the federal government that is designed to coordinate care for patients across both hospital and non-hospital settings, improve health outcomes, and constrain the growth of health care costs in Maryland. A key element of the model is the development of the Maryland Primary Care Program (MDPCP). The MDPCP is a voluntary program open to all qualifying Maryland primary care providers that offers funding and support for the delivery of advanced primary care throughout the state.
To support this initiative, Hilltop entered into an interagency agreement with the MDPCP to design and implement a model that will predict the risk of avoidable hospitalizations for individuals in Maryland’s Medicare population. To develop the Hilltop Pre-AH Model™, Hilltop researchers created an algorithm that identifies a given individual’s relative risk of incurring a potentially avoidable hospitalization or emergency department (ED) visit.

The Hilltop Pre-AH Model™ uses Medicare claims and other publicly available data sets to calculate a wide range of risk factors based on patients’ diagnoses, procedures, medications, utilization, demographics, and environmental characteristics. The model estimates event risk instead of financial risk, so that the risk scores are specifically designed to predict the likelihood that an individual incurs an avoidable hospital event in the next month. It uses the most recently available Medicare claims data in order to generate new risk scores on a monthly basis, thus allowing the model’s predictions to flexibly adapt to changes in patients’ circumstances. These features of the model differ from those of the Centers for Medicare & Medicaid Services (CMS) Hierarchical Condition Category (HCC) risk scoring model, which uses diagnosis codes and a limited set of demographic information in order to predict medical expenditures over the following year. Hilltop is training and hosting the model, as well as disseminating risk scores to providers in collaboration with CRISP (Chesapeake Regional Information System for our Patients), Maryland’s health information exchange.

Led by Hilltop’s Senior Director of Analytics and Research/Chief Data Scientist Ian Stockwell, PhD, the research team includes Policy Analysts/Data Scientists Morgan Henderson, PhD, and Fei Han, PhD. At the Maryland Department of Health, Howard Haft, MD, is Executive Director and Chad Perman, MPP, is Program Director of the MDPCP.

**Medicaid Outcomes Distributed Research Network (MODRN)**

In many states, Medicaid agencies are partnering with research centers at public universities to conduct data-driven policy analysis and support program development, monitoring, and evaluation. These state-university partnerships offer unique advantages as states strive to address the many challenges facing Medicaid programs today. Currently, Medicaid agencies in 23 states have active partnerships with 26 public universities. In 2014, AcademyHealth established the State-University Partnership Learning Network (SUPLN) to support these partnerships. Hilltop, with its nationally recognized 25-year partnership with the Maryland Medicaid program, is one of the founding members of the SUPLN, and Hilltop Executive Director Cynthia Woodcock chairs the SUPLN steering committee.

In 2017, SUPLN created the Medicaid Outcomes Distributed Research Network (MODRN) to examine Medicaid data across states. The distributed research network uses a common data model and standardized analytic code for conduct of local analyses of Medicaid administrative data. Results are then aggregated to present cross-state comparisons of Medicaid initiatives to advance policymaking. MODRN facilitates efficient, data-driven analyses without the need to share sensitive person-level data across states.

According to the CDC, the U.S. opioid overdose epidemic continues to evolve. In 2016, 66.4% of the 63,632 drug overdose deaths involved an opioid. In 2017, 67.8% of the 70,237 drug overdose deaths involved opioids, with increases across age groups, racial/ethnic groups, county urbanization levels, and in multiple states.
**Examining the Quality of Opioid Use Disorder Treatment in a Medicaid Research Network**

With funding from the National Institute on Drug Abuse, researchers from Hilltop and eight other state-university partnerships—Kentucky, Michigan, North Carolina, Ohio, Pennsylvania, Virginia, West Virginia, and Wisconsin—are harnessing the power of MODRN to assess opioid use disorder (OUD) treatment quality and outcomes in Medicaid, with the goal of informing policy decisions on coverage and payment for evidence-based OUD treatments in Medicaid. The nine state-university partnerships are now constructing and will report on 15 standardized measures of OUD treatment performance. Then they will link Medicaid claims to vital statistics to examine the association between the quality of OUD treatment and fatal and non-fatal drug overdoses. Finally, the researchers will examine associations between Medicaid coverage policies, OUD treatment quality, and overdose outcomes.

Julie Donohue, PhD, Professor of Health Policy and Management and Director of the Medicaid Research Center at the University of Pittsburgh, is the principal investigator on this project, and AcademyHealth is coordinating the interstate activities. At Hilltop, David Idala, MA, Director of Medicaid Policy Studies, and Shamis Mohamoud, MA, Senior Policy Analyst, are leading Hilltop’s MODRN work.

**Using Section 1115 Medicaid Demonstration Waivers to Increase Access to Substance Use Disorder Services: Experiences in Virginia and Maryland**

With funding from the Robert Wood Johnson Foundation’s Research in Transforming Health and Health Care Systems program managed by AcademyHealth, Hilltop is partnering with researchers at Virginia Commonwealth University (VCU) to examine the experience with §1115 waivers for substance use disorder (SUD) treatment in Maryland and Virginia.

These waivers granted by CMS enable Maryland, Virginia, and a number of other states to receive federal matching payments for Medicaid beneficiaries aged 21 to 64 who receive inpatient and residential SUD treatment in institutions for mental disease (IMDs). The waivers are intended to increase access to the full continuum of addiction treatment services, improve quality of care and coordination with co-occurring physical and mental health conditions, and reduce overdose deaths.

To compare and contrast the effect of the waivers in Maryland and Virginia—states with different approaches to addressing the integration of behavioral health and somatic health care and the opioid crisis—Hilltop and VCU are conducting semi-structured interviews with state officials, providers, and other stakeholders and taking advantage of MODRN to analyze Medicaid administrative data.

The Principal Investigator of this work is Peter Cunningham, PhD, at VCU. Cynthia Woodcock is Co-Principal Investigator.
In FY 2019, Hilltop’s interagency agreement with the Maryland Department of Health (the Department) for policy analysis and analytical support for the Medicaid program—renewed annually since 1994—topped $10 million. For HealthChoice, Maryland’s Medicaid managed care program, Hilltop conducts an annual evaluation and develops risk-adjusted capitated payment rates for participating health plans. Hilltop provides operational and analytic support for program innovations and delivery system reforms in primary care, behavioral health, and long-term services supports. To support this work, Hilltop maintains an extensive data repository. Below are highlights of Hilltop’s work for the Department.

**Addressing the Opioid Crisis**

**Data Monitoring:** Hilltop continues to perform data analytics to assist the Department in monitoring opioid prescribing by Medicaid providers and use of Screening, Brief Intervention, and Referral to Treatment (SBIRT), medication-assisted treatment (MAT), and methadone replacement therapy.

**Chronic Health Homes:** The Affordable Care Act (ACA) allows states to design and manage health homes for Medicaid participants with chronic health conditions. Maryland’s Health Homes program, launched in 2013, targets individuals with a serious persistent mental illness or opioid SUD. Hilltop’s evaluation of the program is in process. Preliminary findings suggest that the longer participants remain in the program, the lower the per-participant rates of hospitalization and ED visits.

**Federal Grant Applications:** Hilltop assisted the Department with two proposals in response to federal solicitations. Funding decisions are expected to be announced soon.

**Integrated Care for Kids (InCK):** The Center for Medicare and Medicaid Innovation (CMMI) offered grants to pilot and evaluate a new pediatric model to combat the nation’s opioid crisis. InCK is a child-centered local service delivery and state payment model to improve the health of and reduce expenditures for children under the age of 21 covered by Medicaid and CHIP. To support the Department’s application for this grant, Hilltop supplied data on children with high-cost, high-service use.

**Maternal Opioid Misuse (MOM):** CMS announced the MOM model grant opportunity to better align and coordinate care of pregnant and postpartum Medicaid beneficiaries with OUDs. Hilltop assisted the Department in its application for this grant by providing data on pregnant women, new mothers, and infants. Specifically, Hilltop calculated the number of mother and infant birth pairs with and without MOM, compared the use of NICU days between infants born with and without neonatal abstinence syndrome (NAS), identified the number of ED visits and hospital inpatient admissions for pregnant Medicaid beneficiaries with and without SUDs, and analyzed the cost of birth by mothers with and without OUDs.

**Other Initiatives for MD Medicaid**

**The DataPort:** In FY 2019, to replace the decision support system that Hilltop has hosted on behalf of the Department for many years, Hilltop developed and soft-launched the Maryland Medicaid DataPort, State Edition. The DataPort is supported by Hilltop’s new master analytic database (described below), uses Tableau® for data visualizations, and gives authorized Department users data exploration tools that provide tiered levels of data granularity. The initial launch of the DataPort included five years of Medicaid eligibility and managed care capitation data. Hilltop also developed and provided an extensive resources module that includes navigation tips and training manuals. In FY 2020, Hilltop will continue to develop the State Edition and begin to develop the Public Edition, which will eventually replace Maryland Medicaid eHealth Statistics.

**Master Analytic Database:** In FY 2019, Hilltop began development of a multi-purpose SQL Server database that supports DataPort and will eventually provide powerful analytic tools for Hilltop staff. The database is updated monthly with Maryland Medicaid MMIS data. Hilltop tested several data transfer options to find the one that optimized speed and security. When the database is updated each month, an extract-transform-load (ETL) process is run to apply modeling schemes and techniques that create database views. These views serve as the source data for the DataPort and are designed to minimize query time for users.
Mini-Retreat on Strategies for Addressing High-Cost Drugs in Managed Care: In FY 2018, Hilltop competitively procured an independent study of the processes and methodologies used in HealthChoice rate setting. The study, completed in May 2018, was conducted by Milliman, Inc., in collaboration with Manatt Health Strategies, LLC, and resulted in ten recommendations for strengthening Maryland’s rate setting process and integrating a greater focus on value through payment initiatives. Noting that Maryland did not have a consistent approach to addressing high-cost/low-volume drugs, one of the report recommendations was to leverage available tools to develop and implement a standardized framework for evaluating and determining the risk of high-cost drugs. To begin implementation of this recommendation, Hilltop and Optumas co-facilitated a mini retreat for Department staff on March 13, 2019. The purpose of the retreat was to define criteria for addressing high-cost drugs and review options for potential approaches in Maryland.

Maryland HIV Medicaid Affinity Group: Convened by the Department, this group’s purpose is to establish consistent and frequent (at least monthly) data exchanges to provide more robust information on Medicaid participant HIV testing, care continuum participation, and re-engagement efforts to inform quality improvement efforts with Medicaid payers and providers. Hilltop’s role is to provide technical support and analytics. In FY 2019, using data from the Enhanced HIV/AIDS Reporting System (eHARS), Hilltop provided information on the number of Medicaid participants with a diagnosis of HIV/AIDS.

Greater Baltimore HIV Health Services Planning Committee: Hilltop assisted the Department in completing a request for the Greater Baltimore HIV Health Services Planning Committee to identify the number, demographics, and service utilization for Medicaid participants aged 50 and older with a diagnosis of HIV/AIDS. Hilltop also conducted an analysis of the number of Medicaid participants with HIV/AIDS and a co-occurring behavioral health diagnosis.

National Diabetes Prevention Program: This program runs the Lifestyle Change Program, an evidence-based program established by the Centers for Disease Control and Prevention (CDC) to prevent or delay the onset of type 2 diabetes. In FY 2019, Hilltop assisted the Department in evaluating the outcomes of the program, received data from some of the Medicaid health plans, and provided a summary of the quality of these data. Hilltop also performed an analysis of the prevalence of prediabetes in the HealthChoice population.

Diabetes in Baltimore City: Hilltop calculated the number of Medicaid participants who resided in Baltimore City with a diagnosis of diabetes using the definition from the HEDIS measure Comprehensive Diabetes Care, which includes type 1, type 2, and gestational diabetes.

Vaccines: Hilltop performed several analyses pertaining to Vaccine for Children (VFC) visits, the meningococcal vaccine, and the human papillomavirus (HPV) vaccine.

Cannabis for Medical Reasons: Hilltop conducted an analysis to identify Medicaid participants who, after registering with the Maryland Medical Cannabis Commission, were authorized to receive cannabis for medical reasons.
Hilltop completed a study funded by the Center for Mississippi Health Policy titled Estimating the Costs to Mississippi Medicaid Attributable to Tobacco. To conduct the study, Hilltop researchers analyzed Mississippi Medicaid claims data and quantified the financial impact of tobacco use on Mississippi’s Medicaid program.

State-level cost estimates of tobacco-related illness in the literature typically apply national estimates of Medicaid’s share of costs to state-specific Medicaid spending totals. Hilltop’s methodology for this study, however, accounted for differing prevalence rates for tobacco-related diseases in the Mississippi Medicaid population, differences in Medicaid members’ rate of smoking compared to national averages, and the effects of the state’s provider payment policies on costs. This approach could be adapted to other states to quantify their specific costs to Medicaid for tobacco-related illness.

Because tobacco impacts multiple body systems, Hilltop conducted a literature review that identified diagnosis codes from the U.S. Surgeon General’s 2014 Report—The Health Consequences of Smoking – 50 Years of Progress—as well as more recent literature to calculate a smoking-attributable fraction (SAF) of individual smoking-related diseases. These SAFs were then applied to actual Medicaid spending for each diagnosis, resulting in an estimated cost of tobacco per diagnosis, which were then summed to estimate total costs.

The estimated cost of tobacco-related illness to Mississippi Medicaid was $388 million in 2016 and $396 million in 2017, or about 9 percent of annual Medicaid expenditures. These estimates were somewhat lower than cost estimates derived using national estimates of the burden of tobacco-related illness to Medicaid, most likely because children and younger adults are the dominant demographic in the Mississippi Medicaid population.

The Hilltop methodology could help policymakers evaluate the return on investment (ROI) for tobacco cessation support and coverage, smoke-free ordinances and laws, limiting ages for tobacco purchases, and changes to taxes on tobacco and nicotine products.

The Center for Mississippi Health Policy published an issue brief that summarizes the study methodology and elaborates on the policy considerations, and Hilltop published a report in December of 2018. Hilltop also presented its findings before a committee of Mississippi policymakers in January 2019.

Cynthia Woodcock was Principal Investigator and Senior Policy Analyst Charles Betley was Project Manager. UMBC Professor Carlo DiClemente, PhD, provided consultation on the study methodology.

Validation of Projected Savings from Medicaid Anti-Obesity Interventions among Children

The Robert Wood Johnson Foundation awarded a grant to the Nemours Foundation to construct an estimator of Medicaid savings from interventions in childhood obesity to be used by state governments considering such interventions. Hilltop was a subcontractor to the Nemours study and supplied actual Medicaid costs for children with and without obesity diagnoses to help validate the results of the predictive model. The model is now available for use by Medicaid agencies and health plans: https://www.movinghealthcareupstream.org/building-the-business-case-for-investment-in-childhood-obesity-prevention/.
State Reinsurance Program a Resounding Success

In 2019, Hilltop was an important behind-the-scenes player in the state’s efforts to develop policy options for lowering premiums for health insurance policies offered through the state’s ACA marketplace. Working with the Maryland Health Benefit Exchange (MHBE), Hilltop estimated the cost of a state reinsurance program (SRP) using the state’s all-payer claims database. Governor Larry Hogan signed into law House Bill (HB) 1795 on April 5, 2018, authorizing the reinsurance program and directing the MHBE to apply for a §1332 waiver from the federal government. This waiver was required to implement Maryland’s program. To fund the reinsurance program, the Governor signed HB 1782 on April 10, 2018, which authorized the state to collect the 2019 federal health insurance provider tax that the federal government had suspended.

Hilltop assisted with the §1332 waiver application submitted to CMS on May 31, 2018. CMS approved the waiver on August 22, and insurers immediately re-filed 2019 rates with the Maryland Insurance Administration (MIA). Prior to approval of the reinsurance program, insurers requested an average rate increase of 30 percent; with reinsurance, the MIA approved rates with an average decrease of 13 percent.

Collaborating with UMBC Colleagues

Hilltop often collaborates with UMBC departments and faculty. Below are some current examples.

Algorithmic Fairness: Within broad federal guidelines, states can receive “waivers” to provide home and community-based services for Medicaid beneficiaries who prefer to receive long-term services and supports in their home or community rather than in an institutional setting. State budgetary constraints limit participation in these programs, and many states have long waiting lists. Consequently, waiver programs—which offer more services and relaxed financial eligibility— are in economic terms a scarce resource in need of allocation. Hilltop is collaborating with UMBC’s Department of Information Systems on a project funded through the National Science Foundation’s EArly-concept Grants for Exploratory Research (EAGER) program to use a machine learning model to predict individuals’ risk of institutionalization. This information can then be used to prioritize the list of individuals who are waiting for a spot in a waiver program. This work crosses the boundaries of multiple disciplines (machine learning, fairness, health IT, public policy, ethics) to solve an urgent, real-world problem.

Multi-Dimensional Mapping Project: Hilltop has embarked on an exploratory project with the Imaging Research Center to create a geographic visualization consisting of a two-dimensional map of Maryland that would display aggregate information (i.e., unique individuals, Medicaid costs) by geographic area for specific health events on a third dimension. The initial data source would be Maryland Medicaid claims, encounters, and eligibility data, with emergency services data added at a later date. Its primary use would be to enhance the health and wellbeing of Maryland residents by informing policymakers of the geographic distribution of select health events.
Hilltop’s Advisory Board Activities

Since its inaugural meeting in August 2018, Hilltop’s Advisory Board has met three times. The Board provides counsel on strategic direction to advance our mission, including how best to develop new or enhance current programs and initiatives; how we might “scale up” program models for replication in other sectors or states; and how we might diversify our partnerships and funding base. Board members are also helping facilitate new networking opportunities and introductions to prospective funders and research partners. Two Board members are UMBC colleagues: Dana Bradley, PhD, Dean of the Erickson School, and Susan Sterett, PhD, Professor and Director of the School of Public Policy. Read more about all ten members—appointed by Freeman Hrabowski—here: https://www.hilltopinstitute.org/who-we-are/advisory-board/.

Contributing to UMBC’s Educational Mission

Creating Profound Impact through Health Information Technology: Ian Stockwell, PhD, spoke to UMBC about the impact of his work on the field. Watch the video and read the full interview here: http://gritinaction.umbc.edu/profound-impact-health-tech/

Current Hilltop Students:
Kelechi (KC) Emezienna
Undergrad Student, Engineering

Raad Mustafa
Intern, Information Systems

Kiki Malomo-Paris
GRA, Public Policy (PhD)

Thomas Gower
GRA, Public Policy (Health Policy track)

Shalini Sahoo
GRA, Gerontology

Sushmitha Macheri
GRA, Information Systems

Student Opportunities: UMBC students who are considering careers in health policy and health care data analysis are welcome to explore employment and research opportunities at Hilltop. We offer several part-time student internships and graduate assistantships each year.

After they graduate, Hilltop students often return to us as full-time hires. Most recently, Prashant Rana joined the programming operations team as a programmer.

“As a GRA, I was always surrounded by challenging and innovative work, and I knew I wanted to start my career off at Hilltop. I believe as a young programmer, Hilltop is providing me with a chance to serve the society while enhancing my knowledge and skills. Hilltop’s collaborative teamwork ensures that we tackle some of the most difficult tasks with proper planning to achieve the desired results.”
Hilltop’s workforce currently has 45 full-time staff of policy researchers, analysts, and programmers—most with master’s degrees—and a handful of contractual staff. Five employees have doctoral degrees, 13 staff members are UMBC alumni, and 2 are currently enrolled in UMBC advanced degree programs. To read more about our staff, go to https://www.hilltopinstitute.org/who-we-are/our-team/.

In the past fiscal year, Hilltop welcomed 5 new team members and welcomed back 3 returning members! In order pictured: Steve Shirley, Director of Program Administration; Christin Diehl, Manager of Aging and Disability Studies; Dolapo Fakeye, Senior Policy Analyst; Matt Clark, Policy Analyst; Rosa Perez, Policy Analyst; Erick Geil, Senior Programmer; Prashant Rana, Programmer; Min Kim, Policy Specialist.

Organizational Advancement: Ian Stockwell has been appointed Hilltop’s new Senior Director of Analytics and Research/Chief Data Scientist. This appointment is in recognition of the outstanding work that Ian has been doing to build our expertise in data science and advanced analytics and develop faculty partnerships for research. Pete LaMarsh has been appointed Interim Manager of Programming Operations, and Jack Clark is Manager of Technical Innovation and Automation.


Hilltop Staff Award for Innovation: This award recognizes a staff member who develops an innovative product, process, methodology, or approach to addressing a complex problem or issue. In May 2019, Alexis Smirnow was recognized for developing and implementing the staff and student data specifications and SAS training program. Alexis was also nominated for designing and implementing the methodology for the SHOP study, and Charles Betley was nominated for his work on the Mississippi Medicaid tobacco use study.

UMBC Service Awards: Three Hilltop staff were honored at the 2018 service awards ceremony. Kevin Pyles, Programmer, was recognized for 10 years. Brittney Zylstra, Senior Programmer, and Ki So, former Director of Program Administration, were recognized for 5 years.
Presenting & Publishing Our Work

AcademyHealth ARM Presentations


Betley, C. (2019). April 15 is the day tobacco companies pay $9 billion for tobacco illnesses, but is it enough? The Conversation.


Hilltop Mourns the Loss of John O’Brien

In May of 2019, Hilltop was deeply saddened with the news that John O’Brien passed away. He played a crucial role in the development and implementation of Maryland’s Medicaid managed care program. John was Hilltop’s Director of Health Policy Studies from 1996 to 2007, when he left to serve as Deputy Director of the Health Services Cost Review Commission. As an appointee in the Obama administration, he served as the Office of Personnel Management’s Designated Representative to the White House for its myriad responsibilities under the ACA, ran the Federal Employees Health Benefits Program, and spearheaded the establishment of the Pre-Existing Condition Insurance Program. Recently he and his consulting firm partner, Jonathan Foley, joined Hilltop’s team for the HSCRC Multi-Functional TA Contract. John leaves behind his wife Teresa, daughter Helen, and countless friends and colleagues who will miss his warm disposition.
Funding

All funding for Hilltop is provided by extramural sources; Hilltop receives no funding through UMBC’s budget. As of April 30, 2019, Hilltop’s projected revenue was $10,152,806. From this, Hilltop contributed $1,812,375 to UMBC for Financial & Administrative (F&A) recovery.