

UNIVERSITY
OF
CALIFORNIA
HEALTH



Annual Report

Center for Data-driven Insights and Innovation

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| LETTERS OF INTRODUCTION

Letter from Atul Butte and Cora Han

Established in 2018, the Center for Data-driven Insights and Innovation (CDI2) swiftly demonstrated the ability to harness data on behalf of the University of California Health system. Our early successes in supporting improvements in operations and reducing costs proved timely when California and the world faced the global COVID-19 pandemic. CDI2 leveraged our data asset, the UC Health Data Warehouse (UCHDW), producing dashboards, metrics, and analytics around the virus.

Post-pandemic the healthcare data landscape has continued to rapidly evolve. Advances in artificial intelligence and other technologies present unique opportunities and challenges. Leaders, partners, and patients want to understand and access more data while also maintaining the very highest standards of privacy, security, and equity. CDI2 remains at the center of UC Health's data-driven effort, having cultivated exceptional expertise in data science and governance to serve and protect patients and communities in our health system. CDI2 prioritizes building and maintaining collaborations and partnerships that are respectful, trustworthy, and values-driven. In this context, we are thrilled to present our 2023-2024 Annual Report.

We express our gratitude to all the CDI2 and UCHDW team members for their hard work, dedication, and contributions to these remarkable accomplishments. We also extend our deep appreciation to President Michael Drake and the UC Office of the President (UCOP), Oversight Board members, our UC campus and health partners, and other esteemed colleagues for their trust, collaboration, and support. We look forward to another year of progress, innovation, and data-driven decision-making as we continue to advance excellence across UC Health.

Fiat Lux,

Atul Butte, MD, PhD
Chief Data Scientist

Cora Han, JD
Executive Director and Chief Health Data Officer



Atul Butte, MD, PhD
Chief Data Scientist



Cora Han, JD
Executive Director and
Chief Health Data Officer



Letter from David Rubin

The Center for Data-driven Insights and Innovation is working at the leading edge of rapid and transformative changes happening in health care. This evolution presents challenges, especially as health systems nationwide contend with limited financial resources, workforce constraints, and questioning of evidence-based medicine.

In this environment, the continuously evolving field of health data science offers an unprecedented opportunity while also requiring careful consideration of governance, ethical use, transparency, and inclusivity. We must navigate these dynamics and harness the potential of health data science to advance our understanding of health conditions, discover new treatments, and identify approaches to delivering inclusive care that is most effective for everyone.

CDI2 is dedicated to leveraging UC expertise in data science to meet the growing demands for data and analysis to answer questions and unlock discoveries that have challenged generations of researchers and clinicians. Importantly, the work it leads and enables helps improve outcomes for people in historically marginalized communities as part of our mission to improve health justice and equity.

The successes described in this year's report are examples of the impactful care that advance the health of all Californians, while providing discoveries that will influence care well beyond our state. I'm inspired by their work and optimistic for the future of health care enhanced by the powerful work happening in this field.

Sincerely,

David Rubin, MD, MSCE
Executive Vice President
UC Health



David Rubin, MD, MSCE
Executive Vice President
UC Health

| HISTORY, MISSION & VISION

History

2015-2018

Our Beginning

- UC Leadership Retreat and Big Health Data Initiative
- Center for Data-driven Insights and Innovation created
- Built the UC Health Data Warehouse (UCHDW) – consolidating data from 6 Medical Centers into one central data warehouse

Ramp Up & Provide Operational Support

- Partnered with UC Health leaders to focus on data for operational improvements and cost savings
- Built out Data Science team to 10 members
- As coronavirus pandemic emerged, began providing critical reporting and analysis

2018-2020

2020-2024

Pandemic Response & Growth

- Continued critical support in response to pandemic
- Expanded collaboration with operational teams across UC Health
- Built data science research environment
- Launched systemwide data governance task force
- Established systemwide Real World Evidence (RWE) collaborative

Scale & Accelerate

VISION

CDI2 will revolutionize what it means to be a data-driven healthcare system

CDI2 STRATEGIC GOALS

- Data and analytics to support UC Health leadership
- Effective usage by the UC research community
- Evidence-based products, services and partnerships
- Governance for responsible health data and AI practices
- Modernize UCHDW infrastructure and AI tools

2024-2029



Mission

CDI2 responsibly leverages health data in innovative ways to advance improvements in clinical care, research, and operations throughout UC Health, driving decisions and discoveries that empower and inspire the people of California, the nation, and beyond.

Vision

CDI2 will revolutionize what it means to be a data-driven healthcare system.

CDI2 is dedicated to every Californian's right to access equitable, high-quality, personalized healthcare. We cultivate exceptional expertise in data science and governance to collaborate with partners across UC Health and with partners in the public and private sectors. By leveraging health data and insights in these collaborations, we empower our partners to reduce costs, improve care quality, and accelerate state-of-the-art research. We are relentless in catalyzing transformational change in healthcare and a more just future through the responsible and safe use of health data - serving as a model for the nation and the world.

I CDI₂ TEAM

CDI2 Team

The CDI2 team is led by Atul Butte, MD, PhD (Chief Data Scientist) and Cora Han, JD (Executive Director and Chief Health Data Officer), and reports on a quarterly basis to an Oversight Board with representatives from each campus. This past year, we welcomed Josh Stuart, PhD, Professor and Baskin Endowed Chair of Biomolecular Engineering at UC Santa Cruz, to the Board. The full and current membership of the Oversight Board is shown in Appendix 1, and the complete CDI2 and UCHDW team rosters are shown in Appendix 2.

In October 2023, we welcomed Dr. David Rubin as the new Executive Vice President of UC Health. Under his leadership, CDI2 continues to make significant progress in advancing our data-driven initiatives and partnerships. We are fortunate to have the guidance of our Oversight Board, chaired by Tom Andriola (UC Irvine), which brings valuable expertise and perspectives to guide our strategic direction.

The primary function of CDI2 is the maintenance and growth of the data analytics capabilities and technical infrastructure for the UC Health Data Warehouse (UCHDW), a unique system-level data asset that contains electronic health records (EHR) from the six academic health centers—UC Davis, UC Irvine, UC Los Angeles, UC Riverside, UC San Diego, and UC San Francisco. The UCHDW also includes claims data from the UC self-funded health plans, as well as other data from external sources including Vizient and the California Department of Health Care Access and Information (HCAI).

At this writing, the UCHDW contains data on over 9 million patients receiving care at a UC facility. Since 2012, these patients received care in over 400 million encounters. In those encounters, UC Health conducted over one billion procedures, ordered or prescribed nearly 1.4 billion medications, made more than 4 billion vital signs and test result measurements, including 40,000 sequenced cancer genomes, and assigned more than 1.2 billion diagnosis codes.

CDI2 collaborates closely with various teams and departments across UCOP and UC Health, including Executive Leadership, Strategic Sourcing and Value-Based Initiatives (formerly Leveraging Scale for Value, including Pharmacy and Supply Chain), Clinical Strategy and Operations (including UC Population Health and the UC Cancer Consortium), as well as with each health campus. Our team has developed over 150 unique dashboards and contributed to dozens of data-driven projects across UC Health. The data and analytics provided by the CDI2 team have also enabled 10 new peer-reviewed articles published this year (32 to date), demonstrating our commitment to advancing research and clinical care.

Aligned with the UC Health strategic goal of expanding a diverse interdisciplinary workforce, CDI2 hosted its second round of interns through the Health Career Connection (HCC) program. This program is a valuable bridge, introducing students to the vast array of healthcare professions and fostering their potential interest in these fields.



Selected Collaborative Impact in FY23-24



Identified external funding prospects, resulting in
**MORE THAN
\$1 MILLION**
in external research funding

Partnered with UC BRAID to pilot
5
**SYSTEMWIDE
CLINICAL TRIALS**

Supported systemwide experts by
**CREATING MORE THAN
50 COMPARATIVE
DASHBOARDS,**
providing actionable data for clinical interventions, improved care quality, and reductions in health disparities

**30%
INCREASE**
in patients identified who received optimal care through dashboard improvements in chronic disease management, such as diabetes



Provided expert guidance to the UC Health Policy & Regulatory Affairs team, facilitating changes to mandates for

**SAFE AND SECURE
HEALTH INFORMATION
EXCHANGE (HIE)**

Partnered with clinical ambulatory pharmacists to identify opportunities to manage medication costs,

**RESULTING IN
\$1 MILLION IN
SAVINGS**

by transitioning to lower-cost prescriptions without reducing care quality

Significantly grew usage of CDI2's data science research environment, leading to

**10 NEW
PUBLICATIONS
(32 TOTAL TO DATE)**

authored across our campuses.



**CONVENED FIRST
SYSTEMWIDE
HEALTH AI
GOVERNANCE
FORUM,**

promoting coordination to mitigate harms and maximize benefits of AI use across UC Health

SYSTEMWIDE PARTNERSHIPS & PROJECTS

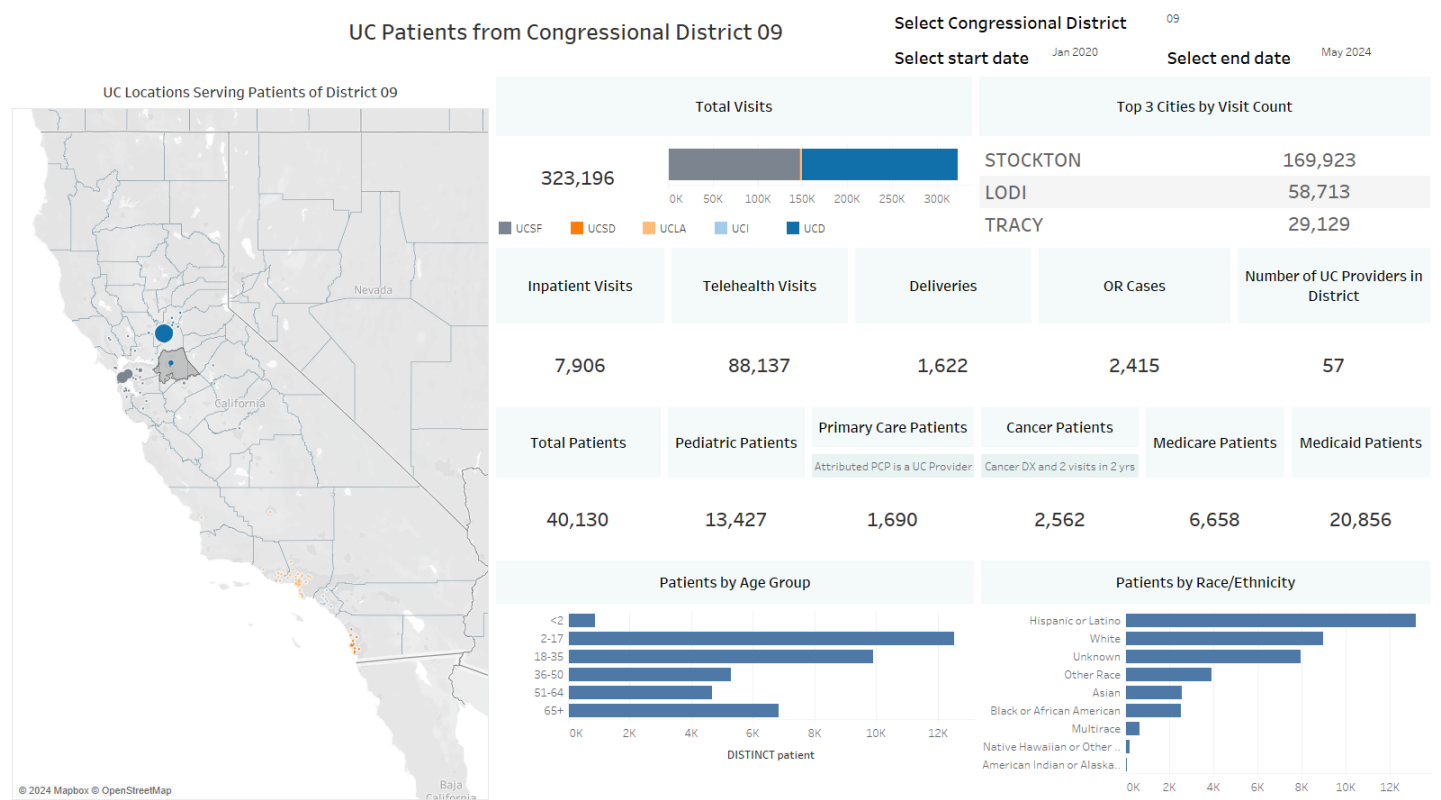
Executive Leadership & Strategy

Each year, CDI2 supports UC Health executive leadership on emerging strategic, legislative and policy initiatives, providing data, analytics, and guidance. In FY24 CDI2 provided expertise on topics including health information exchange, artificial intelligence, and reproductive health services.

Driving Decisions Made by Executive Leadership, Policy, and Strategy Teams

For example, this year, CDI2 developed a dashboard for the UC Office of Federal Governmental Relations (FGR) to highlight care provided to UC patients by congressional district. The dashboard displays the volume of patients, number of encounters, and types of care and displays those metrics on a map of California; information that can be filtered by selected congressional district. This work supports FGR’s outreach efforts to members of Congress that are in rural areas of California not near UC Health facilities. Data such as these highlight that UC Health hospitals support many of their constituents even if these hospitals are not located in their district (for example, in Figure 1, Congressional District 09 is not located near UCSF Health or UC Davis Health, yet those two locations support over 300K patients). UC Health also provides cutting-edge treatments such as CAR-T therapies to patients in these rural areas; support crucial to communities and their leaders.

Figure 1. Congressional District Dashboard



Strategic Sourcing and Value-Based Initiatives (formerly Leveraging Scale for Value)

During FY 23-24, CDL2 contributed to several projects with the Supply Chain and Pharmacy teams in the department of Strategic Sourcing and Value-based Initiatives. These efforts were designed to reduce costs, enhance revenue, and improve patient care quality across the UC academic health centers by way of system-level data analytics.

Supply Chain

Supporting Cost-Effective Healthcare through Strategic Partnerships

Individual health centers across UC can and do purchase medical supplies for their specific campus; yet there are opportunities for significant cost savings by combining supply chain efforts at a system level. This year, UC Health launched the Clinical Optimization, Value, and Engagement (COVE) strategy, a clinician-led and evidence-based program that seeks to reduce the nearly \$1.2B spent on purchasing supplies. These collaborations will be pivotal in our pursuit of alleviating financial pressures by targeting specific areas for cost reduction without compromising the quality of care.

As an example of how data can inform this supply chain strategy, CDL2 developed a dashboard to link operating room (OR) supplies and implants to clinical outcomes. Clinical data from the electronic health record, along with outcomes data from the Vizient clinical database, was linked to OR supplies and implant manufacturers to compare various outcomes. Findings from this dashboard provide UC Health leadership with measurable data to identify and negotiate with more optimal cost-effective manufacturers while also comparing the effectiveness of candidate medical supplies.

Pharmacy

Optimizing Inpatient Medication Use

CDL2 developed a dashboard to track usage of beta-lactam antibiotics, which include penicillins and cephalosporins, for patients with and without an allergy. The goal of this project is to optimize utilization of high-efficacy antibiotics, typically beta-lactams, to support patient recovery. The infectious disease pharmacists and physicians will continue to utilize this dashboard to target cost-efficient medication therapy and drive optimal antibiotic use.

Supporting Timely Pharmaceutical Care for Cardiac Patients

Cardiac patients are often treated with blood thinners (also known as “anticoagulant medications”) to reduce the risk of clotting following surgery. Heparin and direct thrombin inhibitors (DTIs) are different kinds of anticoagulants. Allergy to heparin is rare and the medication is cost-effective, but patients may be at an increased risk of a life-threatening reaction called heparin-induced thrombocytopenia. To reduce the risk of developing this reaction, patients may instead be given intravenous direct thrombin inhibitors (DTIs), an effective but costly alternative. CDL2 is supporting the pharmacy team in tracking patients who received intravenous DTI but do not have positive test results indicating that they have a heparin allergy. In these cases where DTI medication is not needed, transitioning the patient off the DTI medication within 12 hours can enable cost savings.



Identifying Cost Savings by Reducing Medication Waste

The rising cost of specialty medications is a recognized challenge in healthcare today. A lesser-known contributor to the cost of medicine is the unintentional waste of medicine lost when vials are only partially used. CDI2, working with pharmacists and clinicians from each campus, is tracking the cost savings obtained when patients receive standardized dosages of their medication rounded to the nearest vial size. The team has focused initially on high-cost intravenous medication for cancer. Importantly, this standardization improves patient care quality by reducing dosage errors while also saving drug costs via eliminating waste.

Increasing Care Quality through Benchmarking

CDI2 and the pharmacy team collaborated to identify and track Key Performance Indicators (KPIs) across UC Health locations. This dashboard not only serves to support accreditation but also provides timely benchmarking to improve patient care quality systemwide.

Clinical Strategy & Operations

CDI2 maintains a strong partnership with the Clinical Strategy and Operations team, which includes **UC Population Health (UCPH)** and the **University of California Cancer Consortium (UCCC)**. Over the past fiscal year, projects focused on health equity in maternal care, reporting of quality measures, cancer care, and incorporation of new data into the UCHDW regarding radiation treatment in cancer.

UC Health Clinical Quality Committee (CQC)

The UC Health CQC coordinates and oversees the overall quality performance of the UC academic health centers with a prioritized focus on achieving equity in access, care, and outcomes. This committee drives systemwide improvement work that lifts the performance of all UC academic health centers and provides the Health Services Committee of the Regents with prioritized and timely information to support its oversight function for clinical quality and safety across UC Health. In support of this program, CDI2 draws upon data from **Vizient** to create dashboards showing rates of readmission, mortality, number of days in the hospital, and other patient-related data. Recently, UC Population Health metrics were added to the dashboard with the goal of addressing health disparities.

In addition to the quality metrics, CDI2 began to work with CQC members and health equity experts on a systemwide Severe Maternal Morbidity (SMM) dashboard to track indicators such as acute myocardial infarction (AMI), acute respiratory disease syndrome (ARDS), eclampsia, sepsis, and shock during delivery. The rates were adjusted to take into consideration the additional risk of existing comorbidities. Analysis of this data focused on identifying potential disparities by race/ethnicity, insurance status, and the social vulnerability index. In addition, CDI2 has partnered with CQC and our Ambulatory Quality Leads to develop an initial set of metrics to track ambulatory access. Outpatient access measures will be used to drive timely and equitable access to UC Health clinics across a diverse group of communities. By providing these dashboards and analyses, CDI2 plays a crucial role in improving the quality of patient care.

UC Population Health

CDI2 has continued to partner closely with UC Population Health to support data-driven population health management strategies, including analyses aimed at reducing health inequities and improving clinical quality of care.

- For diabetes, the teams have continued work on stratifying race/ethnicity disparities of A1C control for non-English speakers.
- For hypertension, analytics stratifying blood pressure control by fixed-dose combination medications has enabled supporting transitioning patients to take a single combination pill rather than two separate pills.
- CDI2 developed a dashboard of new prescriptions for Humira Biosimilars to track patients that have been transitioned off the original, more costly Humira. The dashboard tracks prescriptions by specialty and whether the drugs were dispensed in a UC pharmacy or not. This will help identify opportunities to educate providers as well as encourage internal UC pharmacies to fill the prescriptions.
- CDI2 has been providing influenza vaccine data throughout the flu season to track vaccination rates at each UC and systemwide. This year, there are new dashboards and an additional focus on childhood influenza vaccinations. The data was provided by site and included in analyses to identify potential disparities.

UC Cancer Consortium

The UC Cancer Consortium conducted a robust assessment of the cancer genomics data available in the UCHDW, focusing on the data structure and contents relevant to research. In response to this evaluation, CDI2's data team simplified the model used to work with genomic data, from 5 tables to 2 tables, allowing cancer researchers a more streamlined approach to link the genomic data to the rest of the clinical data in a patient's electronic health record.

CDI2 worked with the UC Irvine Radiology/Oncology team to bring data into the UCHDW related to specifics around radiation treatment, such as how much radiation is administered, and the radiation technique used.

In collaboration with UC Population Health, the Oncology Medical Home project began working on two new measures that CDI2 provided data for: inpatient days/visits in the last 30 days of life and 7-day follow-up after an inpatient visit for the advanced cancer patients.





Supporting Local Analytics Teams

In addition to population health efforts at the system-wide level, CD12 coordinates quality measures reporting across all the academic health centers as part of the Quality Incentive Program and supports population health initiatives at individual academic health centers, including projects targeting cost and utilization reduction (claims processing) at UCSD and UCLA, as well as dashboards to understand chronic disease management.

Coordinating Program Support for Medi-Cal Quality Incentive Pool (QIP) Payments

CD12's coordination efforts and the data from the local instances of the UCHDW enabled each UC Health center to submit a dataset to the California Department of Health Care Services (DHCS) for the most recently completed QIP Performance Year of the program. In a recent paper out of Johns Hopkins, Saraswathula et al. estimated that the cost of a single quality measure on average is \$34k, of which 65% is related to data collection and validation, representing \$22k of the total cost. Estimating that data collection is a quarter of the expense, each measure costs \$5.5k to collect data. With 50 measures in QIP, each site would spend \$275k/year on data collection for a total of \$1.365M systemwide. However, due to the leadership and technical support of CD12, this expenditure is \$55k/year/site, saving \$1.1M annually systemwide.

Supporting Local Population Health Teams

CD12 continues its work with local population health teams, processing Medicare, Medicare Advantage, and commercial claims into cost and utilization metrics at UC San Diego Health and UCLA Health. CD12 also continues to support improvement of blood pressure readings across ambulatory clinics at UC San Diego Health and UCLA Health.

Enhancing Participation in American Medical Group Association (AMGA) Programs

CD12's expertise and rapid turnaround time have made them a valuable partner in the American Medical Group Association (AMGA) programs. CD12 expanded support for AMGA's Rise to Immunize (**RIZE**) program by submitting data on behalf of all UC Health locations. The RIZE campaign seeks to promote and increase the rate of routine adult vaccinations, frequently referred to as an 'immunization bundle' (i.e., influenza, pneumococcal, Td/Tdap, and zoster). We are pleased to share that three UC Health campuses – UCSF, UCSD, and UCI – are the top 3 nationwide for highest rates of immunization bundle vaccinations. UC Health also holds the top 5 slots for influenza immunization alone.

Participation in American Heart Association (AHA) Recognition Programs

Most recently, CD12 is now reporting performance data on behalf of the UC Health sites to the AHA for the **TARGET: Blood Pressure** and the **TARGET: Type 2 Diabetes** Honor Roll programs. These programs recognize and honor hospitals across the United States who provide the most up-to-date, evidence-based care to patients with high blood pressure or diabetes. Preliminary data indicate that all UC Health centers perform at top levels across most or all measures.

RESEARCH SUPPORT & ENGAGEMENT

A primary function of CDI2 is to enable the next generation of clinical research. CDI2 has advanced this aim by expanding its research portfolio and further developing the data science environment that enables secure data analysis.

Growing the UC Data Discovery Platform (UCDDP)

The UC Data Discovery Platform (UCDDP), our secure data science environment, allows researchers to query and analyze a HIPAA limited data set generated from the UCHDW. The EHR data in the UCHDW includes diagnosis, medication and device usage, procedure, test result, and vital sign data on over nine million patients over the past 12 years. This rich data resource does not require IRB approval for use.

Over the last year, CDI2 has engaged with researchers throughout the UC system to build awareness of this resource. Outreach has included multiples presentations including to the KL2/Atmos Scholars Symposium, the deans and research leaders for the UC Health professional schools, the Nurse Researcher Collaborative, and others. This has led to increased interest by clinical, population health, and other researchers who have incorporated the use of the UCDDP into their projects and proposals. The total number of users working on this platform has also grown by 16% this year.

Researchers who are interested in using the UCDDP work with our partners at each UC Health site to begin the process of developing their research queries locally. Each project undergoes local review to evaluate the scientific merit of the project and to confirm the value of running the query centrally. CDI2 provides documentation and support for users of the UCDDP, as well as resources for getting started in the Databricks environment. We look forward to building upon these existing resources in the coming year.

Utilizing the UCHDW for Systemwide Clinical Trials

CDI2 continued to partner with University of California Biomedical, Research, Acceleration, Integration, and Development (UCBRAID) in FY2024 to launch an expanded pilot to enable more systemwide clinical trials across UC Health. To date, the pilot enrolled five studies, with collaborators at five of the academic health centers. This effort is focused on diversifying clinical trial cohorts, as well as improving efficiency surrounding participant recruitment across the system, with a goal of providing a clinical trials recruitment service available to all sites. Participating studies are on-track to initiate recruitment in April 2024.

Leveraging Data to Improve Diabetes Care

In October 2023, Rohit Vashisht, PhD, along with collaborators at UCSF, UC Davis, UC San Diego, and CDI2 published results in JAMA Network Open from a study that examined the real-world effectiveness and safety of various second-line medications prescribed in addition to metformin for type 2 diabetes treatment. Analyzing data from the UCHDW on nearly 32,000 patients across five UC academic health centers, the study found that newer drugs like GLP-1 receptor agonists (e.g., Ozempic and Trulicity) as well as SGLT-2 and DPP-4 inhibitors were more effective at controlling blood sugar than sulfonylureas. In addition, certain second-line drugs reduced the risk of heart and kidney problems, while others were linked to a lower chance of developing liver issues. Utilizing the integrated data and analytics of CDI2's DDP environment, the team was able to generate important insights from over 10 years of clinical data in a matter of hours. This study demonstrates the tremendous potential for clinicians to analyze the latest real-world data to generate fresh insights for a wide range of clinical outcomes.



UC Health's data-driven system speeds research to benefit patients with diabetes

By: Rohit Vashisht, PhD

[READ MORE](#)

Early Ascertainment of Breast Cancer Diagnoses: The WISDOM Study

CDI2 supported the WISDOM Study breast cancer screening trial in their efforts to determine if real-world clinical data could be used to effectively ascertain breast cancer cases for their study. The study team used electronic health record (EHR) data from the UCHDW to develop a process for identifying cases among WISDOM participants who had received care at a UC academic health center and compared those breast cancer cases to the diagnoses that participants had self-reported. They found that ascertaining cases by combining EHR data from the UCHDW with self-reported data achieved acceptably high accuracy with greater timeliness than cancer registry reporting enables.



| HEALTH DATA GOVERNANCE

Earlier this year, CDI2 completed the UC Health Data Governance Task Force Report and presented the report to President Drake's office for his review and distribution across UC. The report, released to the public on May 1st, represents the culmination of several years of work by more than thirty task force members from across UC Health and UCOP including scientists, clinicians, ethicists, privacy and regulatory experts, and IT specialists. Together, these experts developed a set of recommendations that will enable UC to be a strong data steward of its patients' data, a role that is ongoing and will evolve in the face of technological and regulatory changes. The Task Force developed three sets of recommendations:

Development of a Justice-based Model of Health Data Use

- Development of a strategic plan for ongoing approaches to transparency in how UC uses patient data.
- Development of educational materials on Health Data, including what it is, what purposes it can be used for, why it is valuable, and what steps UC Health patients and Californians can take to learn more.
- Enhanced governance structures, created with input from experts in bioethics, data science, and artificial intelligence.
- Creation of a public council, with representatives from communities throughout all UC medical center catchment areas, to advise the UC Health Data Office in CDI2 and local governance offices on data use, data sharing, and public communications about these topics.

Tracking of Health Data Collaborations

- Development of a pilot Health Data Set Access Repository managed by the UC Health Data Office in CDI2 that will capture key elements of data sharing agreements.
- Development of systemwide resources within the UC Health Data Office in CDI2 regarding executing data sharing agreements, including guidance, templates, and education around utilization of the Health Data Set Access Repository.
- An annual or biennial systemwide data conference, hosted by the UC Health Data Office in CDI2.

Updated Data Sharing Guidelines

- Following a comprehensive review of the Interim Operating Guidelines, which established a provisional framework for assessing data sharing collaborations with third parties, the Task Force generated a definitive set of Data Sharing Guidelines and recommended their adoption systemwide.

These recommendations will be incorporated into local and systemwide processes and CDI2 looks forward to continuing this work in the years to come.



| ARTIFICIAL INTELLIGENCE

The safe and responsible development of artificial intelligence (AI) in healthcare is an important issue, yet AI is not new for the Center. For example, in FY2021, CDI2 scaled and supported implementation of an AI machine learning algorithm to predict the risk of unplanned admissions or emergency department (ED) visits over the next 12 months in primary care patients across UC Health. The original algorithm was developed by UCLA Health in a secure environment with a goal of helping patients avoid unnecessary ED visits and hospitalization by using risk scores to identify, and then proactively conduct outreach to, at-risk patients to coordinate their care, encourage self-management, address social determinants of health, and ensure completion of physician care plans. This systemwide model is currently being used by UCI Health to identify patients in their primary care population who are considered high risk for unplanned admissions and ED visits.

CDI2 is also currently working with teams of researchers developing algorithms that may be used for clinical decision support. For example, CDI2 is working with a UCSF research team that developed a model to identify patients who might have interstitial lung disease (ILD), a rare lung disease that can cause lung scarring. The AI model was developed and trained at UCSF, and then run in the systemwide UCHDW to identify patients across all the UC Health locations who might have the disease. Chart review by the research team was able to identify those patients who have confirmed ILD, and the team is currently assessing model performance.

Alongside these efforts, CDI2 has continued its work to support systemwide development of AI governance, or the guardrails that are essential to enabling the trustworthy deployment of AI in healthcare settings.

AI governance involves developing processes for evaluating and mitigating risks around transparency, fairness, safety, privacy and security, and ethical issues. To further these efforts, in October 2023 UC Health began to convene the UC Health AI Governance Forum, with the goal of enabling the UC academic health centers to share expertise, resources, and concerns related to safe and responsible AI development and deployment. CDI2 has done this work in coordination with larger AI governance efforts managed by the UC AI Council that address managing AI risk across the UC system.

CDI2 also participates in national efforts aimed at developing guidelines to promote the adoption of credible, fair, and transparent health AI systems. For example, CDI2 plays a leadership role in the Coalition for Health AI, a membership-based nonprofit that aspires to develop consensus-based best practices with the testing, deployment, and evaluation of AI systems.



EXTERNAL PARTNERSHIPS & PROJECTS



As UC Health continues to navigate the complexities of the healthcare landscape, CDI2's forward-looking strategy includes developing evidence-based services and partnerships to advance healthcare solutions and diversify revenue streams. Over the past fiscal year, CDI2 made progress pursuing such partnerships with external organizations whose goals and values converge with those of UC Health.

Developing UC Real-World Insights

CDI2 is laying the groundwork for a new initiative called 'UC Real-World Insights,' a service that shares selected insights from UCHDW data with external partners with the goal of improving treatment efficacy and healthcare decision-making. With UC Real-World Insights, CDI2 and domain experts across UC Health will perform analytics on the rich data in the UCHDW to provide selected insights on an aggregate level to biopharma and medical device companies. In the coming fiscal year, CDI2 will launch pilot programs with strategic partners, gather critical feedback, and build additional communication channels, including an interactive website that showcases the service.

Initiating Studies for Better Healthcare Outcomes

In the last year, CDI2 built a fruitful collaboration with Genentech, obtaining funding of \$515,000 for the Diabetic Eye Disease Care Continuum Study at UCSF and UCI. This study harnesses electronic health record data to scrutinize the continuum from referral to diagnosis and treatment, pinpointing reasons for suboptimal referral and screening rates. The insights garnered will unravel care barriers, guide systemic interventions at UC Health, and sculpt future research directions to address care continuum disruptions.

Advancing Real-World Evidence (RWE) through Conferences and Collaboration

CDI2 continues to convene the systemwide RWE Collaborative, with representatives from each health campus, to foster and promote RWE-specific resource sharing and research partnerships. Building upon the previous year's success, CDI2 hosted a two-day event in April 2024 accentuating data-centric healthcare innovation. Day one, dedicated to community and industry partners, illuminated UC Health's data prowess, patient perspectives on data sharing, AI's healthcare role, and thriving industry collaborations. The second day pivoted towards internal UC staff, faculty, and students, deepening knowledge in RWE project execution, the intricacies of data sharing, and the pragmatic integration of AI in healthcare systems.

We extend our gratitude to the personnel at The Cove and our UC Irvine colleagues for their support and look forward to future collaborative events.

From Data to Action: Driving Healthcare Innovation

High Satisfaction

90%+ attendees were “very satisfied” with event overall, speakers, registration, and venue.

Valuable Content

Insightful panels, especially those with patient perspectives and AI focus.

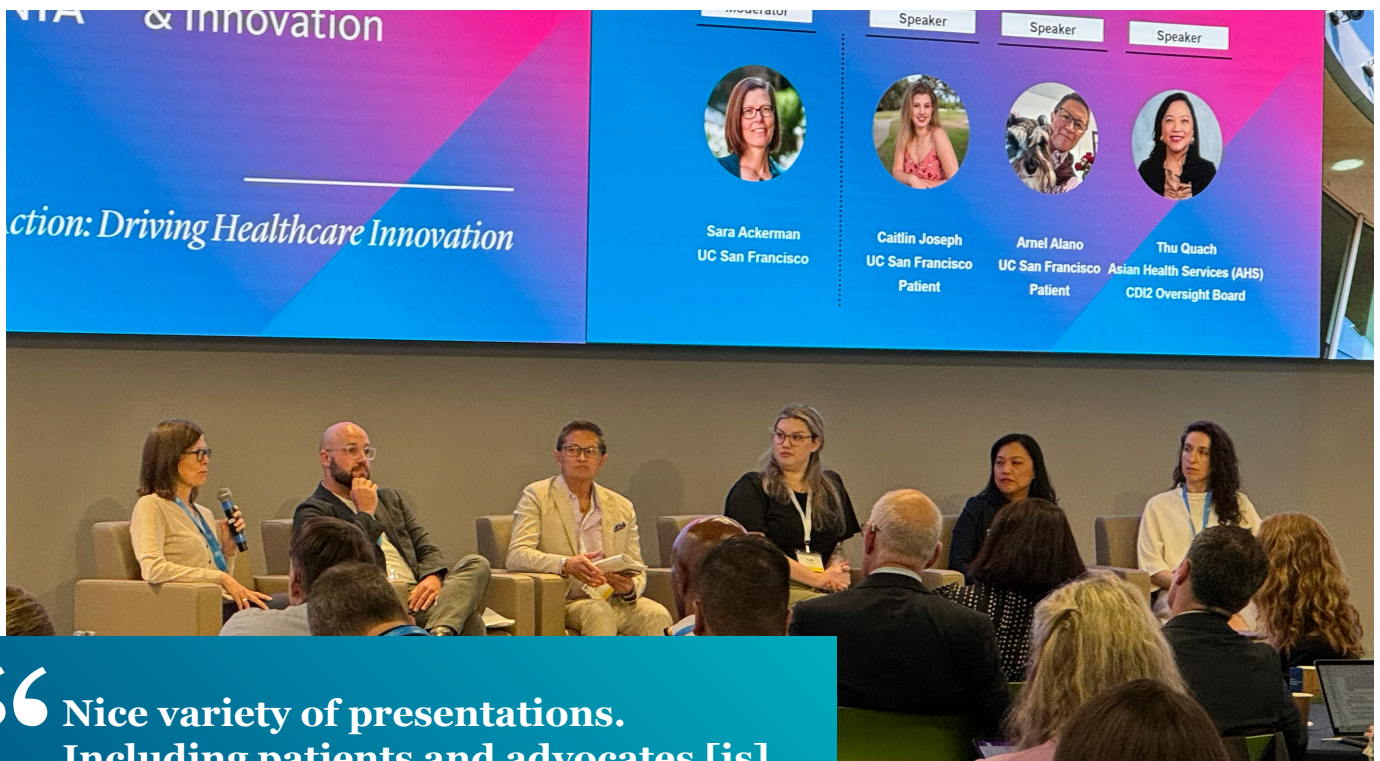
Strong Networking

Excellent opportunities for connection and knowledge sharing.

“Really enjoyed the panel discussions.”



“Extremely well organized. I appreciated the know-before-you-go emails.”



“Nice variety of presentations. Including patients and advocates [is] so important to transparency.”



“Excellent opportunity for networking.”

FUTURE OPPORTUNITIES & CONCLUSION

CDI2 is proud to be a collaborative and dynamic partner with UC Health leadership, systemwide departments and units, as well as teams at local sites. As we look forward to the next fiscal year and beyond, we remain guided by the goals of UC Health and the values of the UC Office of the President: accountability, collaboration, diversity and inclusion, excellence, innovation, integrity, and being mission-driven.

CDI2 Strategic Plan 2024-2029

Based on our unique strengths and capabilities and with the assistance of the UCOP Strategy and Program Management Office (SPMO, the in-house consulting group at UCOP), CDI2 developed a 5-year Strategic Plan for 2024-2029. SPMO and CDI2 held focused workshops with leadership and staff, consulted with stakeholders throughout the process, and incorporated feedback into future planning.

CDI2 identified five goals to pursue in fiscal years 2024-2029:

2024-2029 Strategic Plan	
Goal 1	Equip UC Health leadership with data and analytics to strategically drive measurable improvements in access, quality, clinical integration, and patient experience
Goal 2	Enable the UC Health research community to increasingly leverage the power of the UCHDW for research and innovation via new tools, platforms, and resources
Goal 3	Develop and promote Real World Evidence products and services, and foster UC partnerships to reduce costs and generate new revenue streams
Goal 4	Implement systemwide and CDI2 governance for responsible health data use and AI practices to accelerate research and innovation
Goal 5	Advance UCHDW technical infrastructure, analytics capabilities, and novel AI tools

For each of the goals, CDI2 outlined key actions, indicators of progress, and estimated resource needs.



Future Opportunities

Through its strategic planning process, CDI2 identified three main themes that are the focus of our future efforts: translating data into action, creating a dynamic community of users, and artificial intelligence. Together, these themes encompass the intention to expand the breadth and impact of CDI2's existing work, as well as forging new territory in data governance and AI.

Translating Data into Action

CDI2 will continue to collaborate with partners across UC Health and outside UC to use data to guide decisions and expand the UCHDW and its capabilities to meet the challenges of the future. This means strengthening our core partnerships with UC Health departments, augmenting the data in the UCHDW, and building additional real-world evidence services. For example, in the coming years, CDI2 will continue to support the Severe Maternal Morbidity project helping to inform decision making around access to and timing of maternity care. CDI2 will also enhance systemwide collaboration around real-world evidence, sharing research opportunities and resources.

Creating a Dynamic Community of Users

CDI2 recognizes the opportunity to build awareness and visibility for the UCHDW and the Data Discovery Platform (DDP) within the UC Health community. There is also an opportunity to reduce the technical burden for researchers with little or no coding experience, so they can leverage the UCHDW effectively to address their research questions. Finally, we see an opportunity to use the unique information in the UCHDW to address the very real burden of access to potential research participants for disease-specific clinical trials, including the expansion of diversity in clinical trials recruitment.

Educating the research community about these resources meets a stated need by research chancellors and other stakeholders. It also supports the ongoing world-class research enterprise by enabling researchers to take advantage of systemwide data to increase sample sizes and to diversify their research cohorts, in keeping with NIH requirements and other regulatory obligations.

Artificial intelligence (AI)

CDI2 will develop and enable others throughout UC Health to develop AI solutions in a responsible manner. Among other things, CDI2 will enhance analytics around clinical notes, and develop AI features that others across UC Health can use. CDI2 will also make investments to expand the technology footprint for our data, analytics, and research environment.

In addition, data are at the core of AI technologies, and as UC Health begins to develop and implement AI tools throughout the healthcare delivery system it is essential that there be strong data governance processes in place and appropriate guardrails around safety, fairness, transparency, privacy, cybersecurity, and effectiveness. To this end, CDI2 will lead efforts to operationalize the recommendations published in the UC Health Data Task Force report. CDI2 will also support systemwide collaboration around AI governance, including the development of guidance.

Conclusion

As CDI2 reflects on the progress made throughout this year, data-driven healthcare continues to evolve with great potential. The Center's efforts in advancing operational efficiency, fostering innovative research, and improving patient outcomes underscore its critical role within UC Health. Moving forward, CDI2 remains focused on harnessing the power of health data responsibly and equitably, with a strong commitment to collaboration, transparency, and cutting-edge AI solutions. As we embark on the next phase of our journey, CDI2 is well-positioned to meet the growing demands of a dynamic healthcare landscape while continuing to champion excellence, equity, and innovation across all levels of the UC Health system.



| CAMPUS-SPECIFIC IMPACTS

UC DAVIS



2.5% INCREASE

in number of patients who received
Optimal Diabetes Patient Care



INCREASED
utilization of
the UC Data
Discovery
Platform by

17 USERS



REDUCED
spending on
drugs by
\$150,000

**12%
INCREASE**

in number of diabetic
patients who received
cardioprotective drugs



UC IRVINE



INCREASED
utilization of the
UC Data Discovery
Platform by
22 USERS



ALLOCATED
\$515,000
to fund the Diabetic Eye Disease
Care Continuum Study
(In collaboration with Genentech)

3.8% INCREASE
in number of patients who received
Optimal Diabetes Patient Care

REDUCED
spending on drugs by
\$85,000

7% INCREASE
in number of diabetic patients who received cardioprotective drugs

UCLA



**7.2%
INCREASE**

in number of diabetic
patients who received
cardioprotective drugs

2.7% INCREASE

in number of patients who received
Optimal Diabetes Patient Care

REDUCED

spending on drugs by

\$150,000



INCREASED
utilization of the
UC Data
Discovery
Platform by

18 USERS



UC SAN DIEGO



INCREASED utilization of the
UC Data Discovery Platform by
58 USERS



REDUCED
spending on drugs by
\$20,000

26.2%
INCREASE
in number of
diabetic patients
who received
cardioprotective
drugs



4.1% INCREASE
in number of patients who received
Optimal Diabetes Patient Care

UC SAN FRANCISCO



3.1% INCREASE

in number of patients who received Optimal Diabetes Patient Care



REDUCED
spending on
drugs by
\$100,000



5.4% INCREASE

in number of
diabetic patients
who received
cardioprotective
drugs

LAUNCHED
systemwide clinical trials
recruitment pilot with
UCBRAID



I APPENDICES

APPENDIX 1

Oversight Board Membership

Committee Leadership

Chair

Tom Andriola, MS

Vice Chancellor, Information, Technology and Data,
UCI

Campus Appointees

Davis

Jason Adams, MD, MS

Director, Data and Analytics Strategy

Irvine

Lisa Gibbs, MD

Chief, Division of Geriatric Medicine and Gerontology

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Albert Duntugan, MHA

Chief Data Officer

Riverside

Helen Lau, RN, MROD

Director, Quality, Patient Safety, Risk and Population
Health

San Diego

Parag Agnihotri, MD

Chief Medical Officer, Population Health Services

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Kay Burke, MBA, RN, NE-BC

Chief Nursing Informatics Officer, Health
Informatics

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Georgette Lewis, MPH

Deputy to the Chief Clinical Officer, *UC Health*

At-Large Appointees

CMO/CQO

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Chief Medical and Digital Officer, *UCSD Health*

Research

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Non-Health Campus

Josh Stuart, PhD

Professor, Jack Baskin Endowed Chair of BME, *UCSC*

Ethics

Barbara Koenig, PhD, RN

Prof. Emeritus of Medical Anthropology and
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Medell Briggs-Malonson, MD, MPH, MSHS

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UCLA Health

Patient Voice

Ysabel Duron

President and Executive Director, *The Latino Cancer
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Thu Quach, PhD, MPH

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APPENDIX 2

CDI₂ Team

UC Health Team

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APPENDIX 3

Campus & Health Partners

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Edgar Tijerino

Chief Information Security Officer UCLA Health

Mike Kennedy

Chief Technology Officer UCR Health

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APPENDIX 4

Publications

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