

ANNUAL

Impact

REPORT 2020

MESSAGE FROM

STEVE MIFF, PhD
PRESIDENT AND CEO



Our mission at Parkland Center for Clinical Innovation (PCCI) is to leverage clinical expertise, data science, and social determinants of health (SDOH) to address the needs of vulnerable populations. We accomplish this through projects that seek to discover new insights that help advance the health of our community, predict disease progression and future utilization needs, connect our community's health and social sectors to advance whole person health, and protect the most vulnerable members of our community from disease and other health threats.

At no time has our mission proved more critical than 2020, with the COVID-19 pandemic testing the healthcare, political, and social fabric of Dallas and communities around the world. One of our most memorable achievements this year has been our sprint to create advanced data science tools and leverage our Connected Communities of Care to enable Dallas civic and healthcare leaders to **identify-earlier, inform-earlier, and isolate-earlier**, and perform these functions with localized precision—to ensure we act where and for whom the risks are the highest.

Given our unique mission, as an innovation organization we believe it is critical to understand and show the type and quantity of impact we are making, not only to provide accountability and build trust and credibility with funders, our Board, and other key stakeholders, but to help us figure

out what is working, what holds promise, and what can (or should) be improved. With the overall goal to enhance the experience of care for each person, improve the health of populations, and reduce the per capita costs of health, for each project we undertake in support of our mission, we measure the extent to which it is:

- **Making a difference in the lives of individuals**
- **Optimizing how care is delivered**
- **Impacting the community as a whole**
- **Advancing the field**

This annual impact report provides highlights of our work during my fourth fiscal year at PCCI. Our accomplishments reflect not only our individual achievements, but our many collaborations and the community's commitment to our mission. Specifically, this mission is powered by our people, innovative collaborators like Parkland Health & Hospital System (Parkland), Parkland Community Health Plan (PCHP), and our community, all of whom give us the support and purpose we need to champion each project we undertake. The following sections of this annual impact report detail our structure, impact highlights, and activities supporting our mission. I hope that our team and other stakeholders can reflect on these data with pride, as I do, knowing that the difference PCCI is making in this community is truly remarkable.

Steve

STEVE MIFF, PhD, PRESIDENT AND CEO



OUR STRUCTURE

DRIVES INNOVATION AND IMPACT TO FURTHER OUR MISSION



ADVANCED PROVIDER TOOLS TO IMPROVE CARE

Through collaboration with safety-net providers like Parkland, we enable care-delivery teams to intervene earlier, respond differently, or prioritize engagement strategies. While impactful in all care-delivery settings, our tools are specifically tailored to safety-net providers as they disproportionally offer services to underserved populations. Examples of established models improving care delivery are highlighted in this report (i.e., PTIM, PARADE).

Our data science, data analytics, and technology services operate as a data-science extension for providers. As we collaborate to understand their common challenges and pain points, through our descriptive analytics and quality improvement processes we develop and implement high-impact data-science tools that can help these providers intervene earlier, optimize scarce or high-investment resources, improve quality and safety, maximize efficiency and efficacy, improve care transitions, achieve operational excellence and lean workflows, address disparities in access, or reduce total cost of care. For example, we rapidly aligned operationally with key Parkland strategic initiatives to battle COVID-19 transmission—especially among the community's most vulnerable populations—both inside and outside the hospital walls using deep data insights and geomapping for capacity planning, vaccine prioritization, identification of hot spots for increased community testing, and contact tracing.



INNOVATIVE SOLUTIONS FOR MEDICAID PAYERS TO IMPROVE OUTCOMES

We help Medicaid health plans and affiliated providers improve health outcomes for women, mothers, and children. Specifically, we leverage Artificial Intelligence (AI) and Machine Learning (ML), thoughtful data analytics, innovative digital tools, and SDOH to develop and implement solutions that identify at-risk individuals and provide technology-enabled outreach and patient engagement strategies. Empowering individuals and connecting them to their care dramatically increases their engagement and reduces health inequity, resulting in improved health and well-being. Examples of our sustained, successful programs include lowering Emergency Department (ED) visits and hospitalizations for kids diagnosed with asthma and improving full-term birth rates. These programs utilize ML-driven predictive models, cost and quality dashboards, and messaging techniques to identify at-risk populations and engage them directly.

We deploy our functional capabilities on a secure, cloud-based platform that provides payers with broad capabilities, including:

- A data platform that assembles data—claims, precise SDOH, environmental, and clinical
- Provider-facing actionable analytics for proactive patient management
- Text messaging to engage members
- Dashboards providing member cost and quality characteristics and enabling more precise payer community outreach to drive growth



COMMUNITY-BASED SOLUTIONS TO ACHIEVE WHOLE PERSON HEALTH

PCCI's Connected Communities of Care (CCC) address critical gaps between clinical care and community services in the current healthcare delivery system. CCC comprise a technology platform, community alliances, and governance for cross-sector data sharing, care coordination, and community alignment. We believe that CCC are the way to make SDOH actionable to ultimately achieve whole-person health.

CCC provide an innovative approach to facilitate cross-sector care coordination by:

- **Enabling community care partners to better provide targeted services to residents**
- **Reducing duplication of services across partnering organizations**
- **Helping to bridge service gaps in our currently fragmented system**

Our work focuses on (1) data analytics to help identify vulnerable populations, (2) advisory support for communities interested in developing their own CCC and (3) evaluation services to assess impact of established CCC programs. Our key initiatives include the CMS Accountable Health Community (AHC) program, the Episcopal Health Foundation Texas Accountable Communities for Health Initiative (TACHI), and the development of enhanced analytical tools to assess/index both population-level and person-level vulnerabilities that are used directly as part of our CCC work and more broadly across PCCI.



NEXT GENERATION DIGITAL DATA ENVIRONMENT TO ENABLE COORDINATED, PERSONALIZED CARE

Our success requires a top-of-the line digital data environment where we can securely assemble data from disparate sources and normalize and standardize data streams to feed into our state-of-the-art data analytics. Isthmus™ was conceptualized from our own need to have a healthcare-specific, interoperable, analytical platform to build and more rapidly deploy (e.g., weeks vs months) scalable and repeatable solutions and to collaborate more efficiently with organizations like Parkland. Isthmus enables advanced analytical solutions deployable in healthcare and community settings within workflows to drive actionability and improvement in outcomes. With its native cloud architecture, the use cases/frameworks built on Isthmus can be quickly scaled/cloned/extended and deployed as an independent instance for each collaborating entity. Isthmus supports a myriad of applications, from single-sign-on, web-hosted dashboards to deployment of predictive models.

Isthmus has been secured and architected in compliance with the HITRUST Common Security Framework (CSF) — considered the gold standard for its prescriptive imperatives around handling HIPAA and entailing a comprehensive and rigorous certification process. Our certification—expected from the HITRUST alliance in Q4 of 2020— will further boost our credibility and signal our commitment towards the highest security of data assets that we use on behalf of our business associates.

OUR IMPACT

MAKING A DIFFERENCE IN THE LIVES OF PATIENTS



I'm able to eat the things now I need and not just junk eating."

-Patient receiving case-management services through the Dallas CCC)

"It was helpful to me, because... it gives you great resources to find what you need."

-Patient receiving case management services through the Dallas CCC



"They've got me out of a real bad situation we were in for a little while."

-Parent of pediatric patient receiving case-management services through the Dallas CCC)

"I believe that anyone who feels supported, I think their situation is better than before."

-Patient receiving case management services through the Dallas CCC

"CCC brought awareness about the community."

-Case manager using the Dallas CCC

OPTIMIZING HOW CARE IS DELIVERED

PCCI shares its framework that helped Dallas to become one of the first metropolitan regions to scale a clinical and community partnership using a web-based information exchange.

HealthLeaders

exchange^{HealthLeaders}

During the two years of implementation, PARADE has demonstrated positive results combating ADEs, a problem that impacts more than 450,000 patients nationwide and increases the risk for re-admissions, lengthens the stay of patients by two to three days and adds almost \$4 billion in extra hospital costs annually.

HIT DALLAS



HIT
CONSULTANT

OUR IMPACT

THE COMMUNITY AS A WHOLE

Data science nonprofit PCCI has played an integral part in analyzing the data behind these diagnoses on a local level, guiding the providers who are screening, testing, and treating patients as the virus spreads.

D CEO Healthcare

Dallas-based PCCI created a COVID-19 vulnerability calculator in June to measure communities' vulnerability to COVID-19 by tracking and analyzing their comorbidity rates, population over age 65, social factors and ability to observe stay-at-home measures.

D CEO Healthcare

Dallas-based Parkland Center for Clinical Innovation created a COVID-19 vulnerability calculator in June to measure communities' vulnerability to COVID-19.

Becker's Hospital Review

The data experts at the PCCI in Dallas have developed something they call the "Vulnerability Index." It's a new way to spotlight what ZIP codes in North Texas are most at risk for COVID-19 infections.

KERA-NPR Dallas

D CEO HEALTHCARE
CEO The Business Of Healthcare in North Texas

KERA
NEWS

ADVANCING THE FIELD

(PCCI) in Dallas is using digital technology like machine learning and text message reminders to help prevent preterm delivery.

MD Connect

The PCCI developed a predictive algorithm that identifies in real time which newly hospitalized patients may be at high risk for a preventable adverse drug event and help facilitates timely, pharmacy-led interventions to improve safety and outcomes.

Healthcare IT News

"The Building Connected Communities of Care Playbook is one of the first step-by-step guides that provides specific details and steps to start taking action."

*— Elena Marks, President
Episcopal Health Foundation*

"Kudos to Kosel and Miff to produce a playbook that is pragmatic and timely. It will no doubt serve as a bellwether as others attempt to clarify their relationship between health and healthcare."

*— David Nash, MD Founding Dean
Emeritus at Jefferson College Of
Population Health*





PCCI'S IMPACT DURING THE COVID-19 PANDEMIC

PCCI'S IMPACT on Patients, Care Delivery, and the Dallas Community



PCCI became involved with Dallas County Health and Human Services (DCHHS), Parkland, and other civic, hospital, and public health leaders at the outset of the COVID-19 pandemic to address the multiple challenges the pandemic presented to care providers and the community. In order for DCHHS to launch public health initiatives to reduce the spread of COVID-19, it needed access to real-time, hyper-localized data to track infection rates, monitor effectiveness of local efforts, identify emerging “hot spots” and high-risk areas for proactive education and testing, and forecast community needs.

TAKING THE FIGHT TO COVID-19

To address this Public Health Challenge PCCI leveraged our CCC network to mitigate mortality and morbidity tied to COVID-19. Our CCC network aligning and connecting healthcare providers and community-based organizations (CBOs) across Dallas allowed us to quickly assemble data to provide geospatial analysis to help identify hotspot neighborhoods where the virus was having a disproportional impact on residents, and then turn that information into targeted communications and tactical containment efforts through community-wide awareness and education messaging and guided testing strategies. We also created a Vulnerability Index (VI) tool by geomapping data from disparate sources to identify—for proactive interventions—sub-populations who are at high risk for complications and mortality from COVID-19 and/or who harbor other SDOH factors that place them at greater risk of infection. DCHHS, Parkland, and PCCI have also collaborated to facilitate the contact tracing process, with positive results.

As of the end of October 2020,
contact tracing surveys were sent to
56% of ALL COVID-19 positive patients
that have ever been diagnosed in Dallas
County, with a completed survey return rate
of 25%—a quarter of every positive COVID
case ever in Dallas County.

With Isthmus, the geospatial analysis for Parkland and Dallas County was hosted for regular updates, via a COVID Hub website, in a record 4 weeks' timeframe amidst the critical first COVID-19 surge in early Spring 2020.

CRITICAL RESOURCE MANAGMENT

Given the large and diverse patient population that Parkland serves as the area's largest safety-net hospital, it functioned as a focal point for the Dallas COVID-19 response. But it faced a Care Delivery Capacity Challenge, given the disproportionate number of complex patients served, which can quickly exhaust its critical care bed capacity and intensive care resources. To solve this challenge, in collaboration with Parkland, PCCI created a capacity forecasting model that can evolve with disease surges. The model maximizes the available information to provide clarity for public health leadership by use of deployed frameworks for geocoded information and forecasts that hospitals and communities can use to track the course of the disease.



Our capacity forecasting model has predicted closely to the actual COVID census (i.e., the model has a low prediction error measured in terms of Root Mean Squared Error of 6.95).

As a result, the model is used daily in the Parkland COVID command center for resource planning and to project opening of new wings/beds for COVID patients and ICU departments.

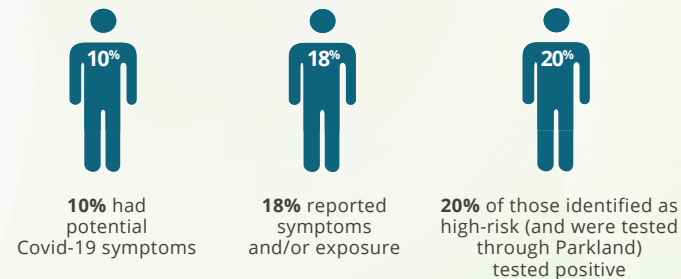
FRONTLINE SUPPORT

Finally, we knew that initial criteria used at the pandemic's outset, such as travel history, were not specific enough since the infection rates (and disease progression) became highly localized. Frontline staff needed additional real-time information about patient exposure to ensure effective testing, triage, prioritization, and follow-up.

To address this Frontline Care Management Challenge, PCCI created an Index to Manage Proximity through early identification of high-risk individuals. This index provided geocoded, confirmed COVID-19 cases at the block level and density details of the population living in that proximity. Index scores were incorporated into existing Parkland workflows and COVID dashboards to better manage scheduled outpatient visits and inform care management for unscheduled ED visits. The goal is to identify high-risk patients with upcoming appointments in the next 48 hours and then triage those identified as high risk for proactive outreach and to reduce spread through virtual visits and testing.

FIGHTING COVID-19'S SPREAD

Over an approximately 6 month timeframe, of the 2,907 high-risk patients identified and contacted and/or triaged:



PCCI created an additional version of this index (Proximity Index 2.0) to screen a broader list of Parkland patients, including those with at least 1 appointment in the past 18 months. Since July 22, Proximity Index 2.0 has identified 17,206 High Risk patients. PCCI's data-driven approach has helped Dallas leaders make pandemic-management activities more transparent and precise through an enhanced approach to disease prevention and mitigation.

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MAKING A DIFFERENCE
IN THE LIVES OF PATIENTS



Medicaid serves low-income individuals. By the numbers, in Texas, children constitute 69% and pregnant women 8% of the Medicaid caseload. Fifty-three percent (53%) of Texas births are covered by Medicaid and 44% of Texas children are on Medicaid or CHIP. PCCI is thus laser-focused on health outcomes for women, mothers, and children through our two key programs: pediatric asthma and preterm birth prevention. These innovative programs have proved extremely effective at driving health, quality, and cost outcomes for all stakeholders, including patients, PCHP, and participating community providers.

KEY HIGHLIGHTS

PEDIATRIC ASTHMA

Our Pediatric Asthma program utilizes a real-time predictive model that proactively—and dynamically—identifies very high-, high-, and medium-risk asthma patients for targeted, direct decision support interventions. Our bilingual program incorporates multiple touch points and messaging modes to improve medication compliance, reduce school absenteeism, and lower ED/hospital utilization. This program was first launched in 2015 and has since evolved both in scope and impact. Today, an estimated 40,000 children annually are part of this program and 1,100 of them are also enrolled in the text-messaging program. Through its inception, we have impacted close to 100,000 children. We have evaluated the performance of this program compared to the broader Medicaid cohort in the Dallas-Fort Worth (DFW) area to control for any systemic, exogenous factors impacting this cohort.

Given the known difficulties of sustaining gains in quality improvement programs, we are extremely proud to report that this program has shown a sustained impact over a 5-year period.



We have seen a
42% drop in pediatric
asthma-related ED
visits for our program
cohort.

In addition, the
program has
positively impacted
several other key
indicators, such as
Asthma Medication
Ratio
8% improvement



...and Asthma related
ED and
Hospitalization costs
(32% reduction)



Other benefits of helping kids with asthma include fewer missed classes, improved mental health, higher graduation rates, and household economic impact (e.g., reduced health-related expenses and fewer missed workdays). We know from clinical and public health literature that these indirect benefits accrue. As a result, while we don't have the data at present, we hope to begin gathering this data to provide insights into broader societal impact.

PRETERM BIRTH PREVENTION

Our novel Preterm Birth Prevention program consists in combining clinical, socioeconomic, and demographic indicators from diverse data sources to predict pregnant women who present at high risk for preterm delivery. By predicting preterm birth accurately and in a timely manner, the model provides an opportunity for targeted clinical and population-level interventions to reduce preterm birth rates among low-income Medicaid patients. As socioeconomic factors and psychosocial stress are increasingly recognized as important drivers of preterm birth risk, PCCI's risk prediction model paves the way toward novel approaches to preterm birth prevention, combining clinical and non-traditional preterm birth prevention interventions addressing SDOH targeted to specific subgroups of high-risk patients.

In a survey of program participants, 74% of those who responded (n=72) agreed that this program made them better prepared to take care of themselves and their babies.

There are also other long-term health and well-being benefits for the mother and the child when there is full-term or near full-term delivery, as quantified by extensive published literature. Many of these benefits carry well into adulthood and our future roadmap includes work to capture this data to quantify these benefits in our community. As further described in the *Advancing the Field* section of this report, The American Journal of Managed Care has accepted our manuscript describing our innovative approach to preterm birth prevention. It is set to be published in May 2021.



We have now run this program successfully for two years, with 37,664 pregnancies risk stratified per year.

Our success and experience with both our pediatric asthma and preterm birth prevention programs has also formed the foundation for new initiatives with Parkland through its Community Health Needs Assessment (CHNA) as described in the *Impacting the Community as a Whole* section of this report.

Since its inception, the preterm birth prevention program has impacted 1,345 pregnant women and improved meaningful outcomes:

- **12% reduction** in mean total cost per delivery
- **20% reduction** in preterm birth (<35 weeks)
- **and up to 24% increase** in prenatal care attendance



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OPTIMIZING HOW CARE
IS DELIVERED



In addition to our critical collaboration with Parkland to address the care capacity and frontline care-management challenges resulting from the COVID-19 pandemic, we have continued efforts this year to develop tools that enable care-delivery teams to intervene earlier, respond differently, or prioritize engagement strategies.

KEY HIGHLIGHTS

PARKLAND TRAUMA INDEX OF MORTALITY

The Parkland Trauma Index of Mortality (PTIM) is a real-time predictive model of in-hospital mortality assessment of trauma patients for clinical decision support. Most deaths due to trauma will occur in the immediate aftermath of the injury – in the critical first hours and days of an admission. This model was developed because provider teams needed a dynamic tool to estimate patient mortality risk for prioritization of interventions as the teams must make many consequential decisions about trauma care in rapid succession; i.e., when to stabilize versus intervene, how to sequence interventions, etc. In many cases, these decisions can feel like equal parts instinct, art, and science. Prior industry models provided only a static, one-time score at the time of admission.

THE PTIM MACHINE LEARNING ALGORITHM IS THE ONLY KNOWN MODEL THAT USES ELECTRONIC MEDICAL RECORD (EMR) DATA TO PREDICT —EVERY HOUR — 48-HOUR MORTALITY DURING THE FIRST 72 HOURS OF HOSPITALIZATION, THUS EVOLVING WITH THE PATIENT’S PHYSIOLOGIC RESPONSE TO TRAUMA.

First developed in conjunction with Parkland stakeholders and deployed in mid-2019, the model is currently operational in real-time and is integrated with the Electronic Health Record (EHR) system at Parkland, where it is used as one of the clinical decision support tools at Parkland’s level 1 trauma center. In addition to its ability to evolve with the patient’s physiologic response, the model requires no input from clinicians, relying solely on data present in the EHR. The model scans the EHR for the preceding 12 hours and gives a mortality prediction for the next 48 hours, thus providing a more clearly defined description of mortality risk. In addition, it has demonstrated an excellent ability to discriminate mortality and to sort patients into low-risk and high-risk groups.



Over a one-year period, PTIM has correctly identified 89% of the high-risk trauma patients and 92% of the low-risk trauma patients.

PTIM has the potential to make an enormous impact on trauma centers to better patient care, especially in the first 72 hours, when many of the critical-condition patients (from motor vehicle accidents or other traumatic events) arrive at



OPTIMIZING HOW CARE IS DELIVERED

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hospitals with no identification and little to no information about their past medical histories.



“By evolving with the patient’s physiologic response to trauma and relying only on EMR data, the PTIM overcomes many of the limitations of prior mortality risk models. It may be a useful tool to inform clinical decision-making for polytrauma patients early in their hospitalization.”

-PCCI’s PTIM paper published on Arxiv.org

PATIENTS AT RISK FOR ADVERSE DRUG EVENTS

This year PCCI has continued its collaboration with Parkland in the PARADE (Patients at Risk for Adverse Drug Events) project aiming to reduce inpatient and outpatient drug-related adverse events by evaluating appropriate patient risk at different points in their care: at admission, during hospitalization, and at discharge. PCCI developed a multifaceted predictive score to stratify newly admitted patients and, within the EHR, generate real-time, actionable worklists that trigger timely interventions by care teams, including pharmacy review and/or consultation. We developed PARADE on a framework for reconciling resource utilization, best practices, and clinical outcomes, which is easily replicable in— and scalable across—

diverse healthcare settings. As this multifaceted, predictive real-time risk score is EHR-integrated, it is readily accessible and actionable. A key feature of the program identifies and displays the reason for the risk score, so clinicians can take targeted actions. As a result, pharmacy staff or other care team members can select patients for timely interventions in descending risk order, maximizing the efficient use of limited resources for improved outcomes.

Our 2-year impact shows PARADE has resulted in sustained positive outcomes and impact across the areas of resource utilization, operational outcomes, savings, and clinical outcomes:

- **Actual cost savings of \$2,845,999**
(based on cost of Adverse Drug Events (ADE) prevented and HCUP_AHRQ estimates, through reduction in 30-day readmission rate)
- **432 work hours saved** per annum per pharmtech
- **Over 87,000** patients screened
- **23.5% reduction** in readmissions
- **1,987** minor ADE prevented
- **164** major ADE prevented



PCCI strives to achieve the broadest community-wide impact through: (1) support of initiatives closing the gap between providing clinical care and addressing non-medical needs to positively impact whole-person health; (2) support of Parkland and its CHNA strategic priorities; and (3) support of PCHP as it strives to quantify community impact.

KEY HIGHLIGHTS

BUILDING ACCOUNTABLE HEALTH COMMUNITIES

The CMS AHC Model focuses on systematically identifying and addressing health-related social needs (HRSN) of eligible individuals. The 5-year program is designed to screen for HRSN and refer and navigate individuals to community-based resources and to collect data to quantify the impact on healthcare costs and healthcare utilization. The program operates in 21 states across the country and PCCI serves as one of 3 AHC model implementation sites in Texas.

Through the program's 3rd year, PCCI is exceeding AHC expectations regarding targets for numbers of individuals screened for (and referred to) community-based services. And despite the added challenges facing all sites resulting from the COVID-19 pandemic, the PCCI-led AHC has continued to exceed monthly targets. Additionally, the positive impact revealed through ongoing qualitative feedback from individuals we've helped is incalculable.

AHC ACTIVITY	NATIONAL SNAPSHOT	PCCI-LED AHC PROGRAM
Completed Screenings	750,000	8,649
Eligible individuals reporting at least 1 HRSN	44,500 (33%)	5,639 (65%)
Breakdown of HRSN	- Food (34%) - Housing (25%) - Transportation (23%) - Utility (15%) - Safety (3%)	- Food (40%) - Housing (20%) - Transportation (20%) - Utility (19%) - Safety (1%)
HRSN Resolved	---	26.5%

These data reinforce the higher rate of vulnerable individuals constituting the Parkland community and their multiplier impact on overall utilization. Based on other studies' data, we know that individuals who are food insecure patients are 2.4x more likely to report multiple ER visits and those that are transportation challenged are 2.2x more likely to report an inpatient stay. As the AHC program continues, we will begin analysis of detailed care delivery impact measurement (cost and utilization). Findings across all 21 states will be reported in 2021.¹

NEW INITIATIVES SUPPORTING CHNA STRATEGIC PRIORITIES

The **Preterm Birth Prevention** initiative focuses on the consequences and barriers to obtaining prenatal care. Currently, 3% of all mothers who deliver at Parkland have had no prenatal care prior to delivery. PCCI has worked with Parkland to identify a cohort of those not receiving prenatal care (3-PT) (versus those receiving prenatal care) and examine the 3-PT cohort characteristics to identify barriers to care. Based on geomapping and data analysis, the top identified barriers were transportation, childcare, affordability (and immigration status concerns), and education and related support services (access to nutritious foods).



CLINICAL DATA ANALYSIS REVEALED 3-PT INFANTS HAD WORSE OUTCOMES—2.5X HIGHER INCIDENCE OF PRETERM BIRTHS, 1.5X HIGHER LENGTH OF STAY, AND 24% HIGHER NICU UTILIZATION.

Moms without prenatal care were 1.6x more likely to have pre-eclampsia while mental/behavioral issues and substance use are 3x more prevalent in in moms with no prenatal care. Longer term the initiative goals are to reduce—or remove—identified barriers to care, through rideshare and childcare programs, increased use of mobile clinics and telemedicine, improved alignment with CBOs providing support services, and comprehensive education through community outreach and connection of ED-utilizing mothers with support (e.g., text messaging) through Parkland programs.

Pediatric Asthma Management. Based on the insights from our Pediatric Asthma program with PCHP, *The Breath for Life, Learn for Life* initiative focuses on upstream asthma interventions to engage and improve patient care in identified zip codes (extensible to a broader geography). The engagement model will (1) identify asthmatic children early, (2) implement an educational text-messaging program monitoring patient symptoms and medication adherence, (3) utilize a predictive model for data-driven risk assessment and interventions (leveraging EHR best practice alerts), (4) incorporate broad collaboration among the Dallas Independent School District, DCHHS, and CBOs to improve asthma self-management capacity, and (5) avoid asthma-related ED utilization through enhanced community engagement via schools, after-school care locations, and other sites.

Sexually Transmitted Disease Prevention. We are also collaborating with DCHHS and Parkland on a *HIV-STI PrEP* initiative. Dallas County ranks 2nd highest in HIV, 6th in Syphilis, 21st in Gonorrhea, and 26th in Chlamydia infection rates compared to the other 254 Texas counties. DCHHS is leading the effort to reduce the transmission rate of sexually transmitted infections (STI), including HIV. The overall goal is to increase awareness and decrease rates of STIs in Dallas County's most affected zip codes. PCCI is supporting this initiative through its development and enhancement of data tools, including a predictive model that screens active Parkland patients to predict those at-risk for HIV infection (based on EHR, SDOH, and DCHHS STI data) to identify candidates for HIV pre-exposure prophylaxis (PrEP) to reduce HIV transmission.

Quantifying Community Impact for PCHP. This year we also developed a Medicaid data warehouse and analytical dashboards benefitting PCHP and the broader DFW community. The KPI dashboard provides a data-driven understanding of key financial and operational performance indicators while the market dashboard provides key insights on PCHP's membership and potential growth opportunities. In these dashboards we incorporated our unique geospatial capabilities, which provide advanced geographic visualization of provider network, membership, and member growth. These capabilities also enable several key strategic PCHP initiatives, such as the multi-dimensional quantitative Community Impact Index (CII), which PCHP will utilize to help key stakeholders (including legislators and HHSC officeholders) understand PCHP's benefit and community outreach.

¹This project is supported by the Centers for Medicare and Medicaid Services (CMS) of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award totaling \$935,813 with 100 percent funded by CMS/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CMS/HHS, or the U.S. Government.

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ADVANCING
THE FIELD

Discovery provides a critical stimulus to initiate the **innovation process**. Some of the most exciting discoveries and insights can come from projects that are new or in projects that continue to build on our ability to provide faster, on-time data analytics at the point of care. For example, as we continue to surface the actionable insights predicted on Isthmus™ through multitudes of avenues (e.g., EHR records, dashboard applications and web-based applications) as well as our predictive models, these insights are revealing trends and other pertinent information for decisionmakers. Thus, to systematize and formalize integration of these value-adds through Isthmus, we built Islet – based on interoperable SMART-on-FHIR standards, as this application framework brings highly contextual, real-time analytics right at the point of care. As with Isthmus, this new framework can be licensed to collaborating entities in the future to serve as a complementary revenue stream for our financial sustainability.

KEY HIGHLIGHTS

INDUSTRY-LEADING THOUGHT LEADERSHIP

Given the innovative nature of our work, we also assess impact through publications that examine our successes, challenges, and insights to benefit the broader community. Highlights this year include publication of our first book and 2 peer-reviewed articles.

Co-authored by Keith Kosel, PhD, MHSA, MBA and Steve Miff, PhD, our book [*Building Connected Communities of Care: The Playbook for Streamlining Effective Coordination Between Medical and Community-Based Organizations*](#) is based on the pioneering experience of PCCI and Parkland in Dallas to develop at scale one of the first information exchanges in the country to track SDOH and link healthcare providers with a wide array of CBOs to improve the health and well-being of the community's most vulnerable residents. This Playbook captures our learnings and practical insights over the last 5

years in an effort to positively impact other regions as they seek to create their own CCC.

The CCC can also help communities achieve better results before, during, and after a crisis event. This important feature was highlighted in the New England Journal of Medicine/ Catalyst peer-reviewed article [*Connected Communities of Care in Times of Crisis*](#) from co-authors Keith Kosel (PCCI) and David Nash, MD, MBA, Founding Dean Emeritus at Jefferson College of Population Health, focusing on how leveraging and optimizing the integration, coordination, and collaboration of all elements of a CCC network can be especially useful during a crisis, such as COVID-19.

The American Journal of Managed Care (a peer-reviewed journal) has accepted the manuscript for our preterm birth prevention program, set to be published in the Journal's May 2021 print edition. In this article, PCCI's Yolande Pengetnze,



ADVANCING
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MD, MS, FAAP and Xiao “Michelle” Wang, PhD, along with five co-authors, present PCCI’s novel approach to preterm birth prevention. The article focuses on preterm birth prediction among pregnant women for whom preterm birth prediction is typically elusive (i.e., pregnant women without a history of preterm births), uncovers socioeconomic drivers of preterm birth risk (such as neighborhood income level), and quantifies the mitigating effect of prenatal care on preterm birth risk in the context of other risk factors.

PCCI is also extremely proud of its internship program, the **Sachs Summer Scholars**. With a focus on women, this program immerses high school, college, and graduate students into the world of healthcare technology and science. Each intern works shoulder-to-shoulder with a PCCI mentor and participates in projects to positively impact the community. The program ended this year with a (virtual) presentation attended by healthcare leaders (both within and outside of Dallas). The individual interns presented on their projects relating to COVID-19, AI/ML dashboard development, geo-mapping, and the pediatric asthma texting program. The program is named in memory of PCCI board member, Michael Sachs a visionary healthcare leader and innovator who passed away in 2019.

STRATEGIC COMMUNICATIONS

This year we significantly raised awareness of PCCI’s expertise, projects, and accomplishments through updates to our website, increased activity on social media channels, and implementation of a robust media relations program. Through improved

imagery, messaging, and navigation and through introduction of new content (e.g., blogs), our website now provides visitors with a clearer understanding of PCCI’s expertise and mission. Website and social media statistics suggest that individuals are consuming more PCCI-created content. In addition, PCCI’s work, staff, and results have been featured in more than 110 media stories through diverse national and local media outlets, such as Becker’s Healthcare, Healthcare IT News, the Dallas Morning News and KERA-NPR Dallas

PATENTS

New challenges this year drove PCCI experts to find innovative ways to solve new problems. The resulting new technologies and methodologies led to 3 new patents awarded for patient management and care, and 8 additional patent filings, including filings for the Proximity Index, the community Vulnerability Index, and patents related to our core technologies and systems, such as the Community Data Insights (CDI) dashboard.





PCCI COMMUNITY OUTREACH



PCCI's commitment to the community extends to lending our expertise to community-based and public organizations and providing other needed community program support.

Starting from the perspective of individual employees, each PCCI team member takes advantage of 2 PCCI-granted days each year for volunteering activities. Although on-premises outreach slowed down due to the pandemic, PCCI continued to broadly support programs, such as by collaborating with Bonton Farms on a school supply drive, donating food and clothing to Millie's Pantry, providing—through an employee drive—a cash donation to Sharing Life, and rallying volunteers to help at the Genesis Women's Shelter.

PCCI leadership and staff members also volunteered to speak at a number of public and community-focused organizations to discuss the importance of innovation and community-centric programs. These organizations included Unlocking Doors, Dallas Area Gerontological Society, Texas Christian University, The City of Dallas, the American Hospital Association, Equity In Action, the eHealth Initiative, Vanderbilt University, the Texas Hospital Association, Southern Methodist University, the National Institute of Health, MD Anderson Cancer Center, the University of Texas-Dallas, the Texas Healthcare Advisory Council, UT Southwestern, the DFW Hospital Council Foundation and the Oklahoma Hospital Association.

In addition to speaking events, PCCI staff members also participated in opportunities to promote learning. For example, PCCI staff took top honors at the UT Southwestern Biomed Hackathon. And in addition to our summer internship program, we hosted an in-office event for UT-Dallas design students to demonstrate their latest design projects. PCCI leaders also provided AI and SDOH teaching modules to Texas Christian University engineering students.

PCCI WAS ALSO HONORED TO RECEIVE A NUMBER OF COMMUNITY RECOGNITIONS AND OPPORTUNITIES. FOR EXAMPLE:



DALLAS BUSINESS JOURNAL NAMED STEVE MIFF A "MOST INSPIRING LEADER" AND D MAGAZINE AND DALLAS INNOVATES NAMED HIM AS A FINALIST IN THEIR ANNUAL INNOVATION AWARDS



THE CITY OF DALLAS INVITED MIFF TO JOIN ITS DATA SCIENCE TECHNICAL ADVISORY COMMITTEE AND HE WAS ALSO NAMED TO THE SMU BIG DATA ADVISORY BOARD AND THE HEALTHLEADERS EXECUTIVE ROUNDTABLE



AIDA SOMUN (COO) WAS A RECIPIENT OF THE DALLAS BUSINESS JOURNAL'S 13TH ANNUAL WOMEN IN BUSINESS AWARDS



PCCI TEAM DIVERSITY

PCCI celebrates a diverse team of professionals who bring a wide range of backgrounds and perspectives that provide a competitive edge to our work. For example, 53% of PCCI employees are women and 58% of these represent diverse ethnicities. Additionally, 63% of PCCI's senior leadership team are female.

This year, we redoubled our efforts to promote ongoing employee engagement and a diverse and inclusive culture. PCCI named Capria Dees as Chief Diversity Officer, an executive-level position tasked with driving the principles of diversity inclusion through all areas of the organization. We also created an Employee Diversity and Inclusion Council made up of a cross section of employee volunteers who will provide their individual perspectives to PCCI leadership to ensure the organization's values are upheld.

Other activities this year have included creating a Diversity Calendar of events for 2021, organizing a Virtual Multicultural Pot Luck for the holidays (to replace our traditional—widely popular—in-office Pot Luck event), and hosting diversity and inclusion training events with subject-matter experts Chris Moreland (Diversity and Inclusion) and Greg Hiebert (Sustaining a Culture of Belonging and Inclusion).

Recognizing that STEM fields are often male dominated, PCCI's internship program, the Sachs Summer Scholars, is becoming one of the most prestigious internship programs in North Texas. The program provides unrivaled opportunities for high school, college, and graduate women from diverse backgrounds to work side-by-side with PCCI data scientists and clinicians and directly contribute to projects benefiting the community.



PARKLAND CENTER
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