

Design and Implementation of the Diabetes Impact Project: A Multisector Partnership to Reduce Diabetes Burden in Indianapolis Communities

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ABSTRACT

Context: Community-level health disparities have not arisen suddenly but are the result of long-term systemic inequities. This article describes the design and implementation of a community-engaged multisector partnership to address health disparities by reducing the diabetes burden in 3 Indianapolis communities through the implementation of evidence-based strategies across the prevention continuum.

Program: The project has 5 foundational design principles: engage partners from multiple sectors to address community health, focus on geographic communities most affected by the health disparity, practice authentic community engagement, commit for the long term, and utilize a holistic approach spanning the prevention continuum.

Implementation: The design principles are incorporated into the following project components in each community: (1) health system community health workers (hCHWs), (2) neighborhood CHWs (nCHWs), (3) community health promotion initiatives, and (4) resident steering committees, as well as a backbone organization responsible for overall coordination, project communication, evaluation, and partnership coordination.

Evaluation: This complex multilevel intervention is being evaluated using data sources and methodologies suited to each project component and its purpose overall. Each component is being evaluated independently and included holistically to measure the impact of the project on the health and culture of health in the communities. Key Performance Indicators were established upon project initiation as our common metrics for the partnership. Because complex interventions aiming at population-level change take time, we evaluate Diabetes Impact Project—Indianapolis Neighborhoods (DIP-IN), assuming its impact will take many years to achieve.

Discussion: Health disparities such as the diabetes prevalence in project communities have not arisen suddenly but are the result of long-term systemic inequities. This complex issue requires a complex holistic solution with long-term commitment, trusted partnerships, and investment from diverse sectors as seen in this project. Implications for policy and practice include the need to identify stable funding mechanisms to support these types of holistic approaches.

KEY WORDS: chronic disease, community development, community engagement, community health workers, health equity

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Context

More than 1 in 10 adults (10.9%) in the United States is living with a diagnosis of diabetes, and another 2.8% are estimated to have undiagnosed diabetes.¹

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This complex disease impacts individual health over decades and can diminish both quality and length of life. The burden of diabetes impacts not only those with the disease but also broader society. In 2017, the total annual US economic burden associated with pre-diabetes and diabetes was an estimated \$404 billion.² Seventy-five percent of these costs were medical costs, while 25% were attributed to reduced labor force participation and national productivity, as well as early deaths. The medical costs for each person diagnosed with diabetes in the United States (2017), on average, were 2.3 times higher than for those without diabetes.³ These repercussions are even more alarming when considering that by 2060 an estimated 1 in 6 adults will be diagnosed with diabetes.⁴

Both in terms of prevalence and severe complications, the burden of diabetes is disproportionately borne by members of racial and ethnic minorities, as well as individuals with low incomes or limited education.^{5,6} The prevalence of diagnosed diabetes among US adults (2018-2019) was 96% higher in American Indians/Alaskan Natives, 63.5% higher in Black people, 59.5% higher among Hispanic people, and 28% higher among Asian people, compared with White non-Hispanic people.¹ The rate of undiagnosed diabetes among Black, Asian, and Hispanic people is approximately double that of White non-Hispanic people.¹ Furthermore, the prevalence of diabetes among adults without a high school diploma is 89% higher than among those who have more than a high school education.¹ Adults with family income that is less than 100% of the federal poverty level (FPL) have a prevalence that is 2.5 times the rate of those with incomes at or above 500% of the FPL.¹

Disparities in diabetes are driven by social and structural determinants that span the socioecological continuum and influence the health of entire communities.⁷ Through structural racism, many urban communities, in particular, have been divested of basic resources such as equitable food access, quality schools, and safe housing.⁸ These communities, with more residents who are members of historically marginalized racial and ethnic groups, tend to have higher rates of poverty and clear inequities in the conditions of living required to support community health.⁹ To address disparities in diabetes and other chronic diseases using a socioecological approach, increasing numbers of interventions have engaged multisector partners and communities. Some have addressed primary prevention—focusing on policies, systems, and environments.^{10,11} Others used a more comprehensive approach—addressing prevention across the continuum.¹²⁻¹⁴

The purpose of this article is to describe the design and implementation of a community-engaged

multisector partnership to reduce the diabetes burden in 3 Indianapolis communities by implementing evidence-based strategies across the prevention continuum.

Program

The Diabetes Impact Project—Indianapolis Neighborhoods (DIP-IN) is an 8-year \$12 000 000 initiative to address health disparities in 3 racially and ethnically diverse areas of Indianapolis that are disproportionately burdened by type 2 diabetes. In 2017, a leader from the local public health department approached leadership of a health industry corporation to discuss investing in the health of the local community, specifically to address the rising burden of diabetes. Additional conversations then occurred with leadership from the local school of public health and the public hospital system. The timing of the conversations coincided with a study of life expectancy (2009-2013) in the Indianapolis metropolitan area. The study demonstrated a 14-year difference in life expectancy between residents of suburbs of Indianapolis and the city center (where the health industry corporation headquarters are located).¹⁵

According to one health industry partner, these findings served as a call to action.

... that study was a wake-up call to me because I was doing global health work, and when I learned that people in the city that I live in, the place that I love and call home on the route that I drive to work every single day, that people have the same life expectancy as Iraq and Uzbekistan; that for me was shocking and shameful, and I feel like I cannot sleep at night until that's no longer the case.

Design principles

DIP-IN has 5 foundational principles: engage partners from multiple sectors to address community health, focus on geographic communities most affected by the health disparity, practice authentic community engagement, commit for the long term, and utilize a holistic approach that spans the prevention continuum. Each design principle is complemented by the perspectives of key partners shared in program evaluation interviews. Questions included: “What do you see as the key pieces of DIP-IN? How would you describe it to others?” The partners interviewed included ($n = 12$) residents and organizational sectors such as academia, health care, community development, and health industry. Responses were coded by design principle and representative examples included in the following text. The interview protocol was deemed exempt by the Indiana University Institutional Review Board.

Engage partners from multiple sectors to address community health

After initial conversations, key stakeholders from the health industry, state and local health departments, academia, local health care system, community development, city government, and community residents convened to discuss the development of a comprehensive approach to reducing diabetes burden in Indianapolis (see Supplemental Digital Content 1, available at <http://links.lww.com/JPHMP/B191>, which lists the key partner organizations, the sector title used to identify them in this article, the attributes that contributed to their participation, and their roles during design and implementation).

At the time of convening, each organization was already involved in activities to improve community quality of life. DIP-IN provided a structure for the organizations to work collectively toward that goal. A lead backbone organization was identified early in the process, and the stakeholder group came to consensus on key design elements and partner roles in implementation.

Multisector collaborative partnerships have been identified as a promising practice for improving community-level improvements in health and well-being.¹⁶ No one organization or sector can single-handedly reverse conditions that have been in place for generations. Therefore, DIP-IN utilizes a collective impact framework to unify project partners^{17,18} and implement sustainable strategies.

One health industry partner valued the way the multisector partnership allowed diverse sectors to “tackle the same problem from different angles.” Another health industry partner reflected, “. . . each partner brings such a unique strength and so much value to the partnership, we’re going to go so much further if we’re going together versus going on our own. . . .”

Focus on geographic communities most affected by diabetes burden

The stakeholder group met over several months to identify potential community partners. The criteria for selecting potential geographic communities included (1) diabetes prevalence data from a citywide clinical information system and the county health department’s community health assessment, (2) sociodemographic data regarding diabetes risk markers, such as race and age distribution and poverty from the US Census, (3) prevalence of risk factors such as physical inactivity, and (4) existing neighborhood momentum and leadership around self-governance and improvement.

The group identified 3 geographic areas that met these criteria. These 3 areas were racially or ethnically diverse, had active neighborhood associations and community groups with strong links to the community-based organizations in their areas, and were involved in other health and quality-of-life initiatives. In 2018, approximately 43 000 people lived in these areas. Table 1 demonstrates additional demographic characteristics. Further demographic information is available on the DIP-IN data dashboard.¹⁹

The age-adjusted diabetes mortality rate in DIP-IN zip codes was as much as 2.3 times that of Marion County, where Indianapolis is located.²⁰ A resident partner framed the disparity in this way:

...it is mind-blowing to me, that the diabetes prevalence rate in these three neighborhoods is roughly 20%, which is so much higher than the state of Indiana or the United States or global diabetes prevalence rates, and that’s just unacceptable, and so I love that this project is acknowledging that’s unacceptable and trying to change that.

TABLE 1
Demographic Characteristics in DIP-IN Communities^a

Characteristics	Marion County	Near West	Near Northwest	Northeast
Proportion people of color (2018)	44%	72%	82%	94%
Median household income (2018)	\$46 692	\$27 908	\$28 920	\$26 650
Housing cost-burdened households (2018)	33%	45%	46%	42%
Poverty rate (2018)	19%	38%	35%	35%
Population age 25+ without HS diploma (2018)	14%	38%	20%	20%
Population far from grocery (food desert, 2019)	Not shown	5%	51%	55%
Population without health insurance (2018)	11%	20%	12%	18%

Abbreviations: DIP-IN, Diabetes Impact Project—Indianapolis Neighborhoods; HS, high school.

^aSAVI Community Information System and DIP-IN Community Dashboards, The Polis Center.²⁰

Practice authentic community engagement

The DIP-IN design is predicated on the belief that community residents are best able to decide what resources or actions are most likely to be effective in their community. Partner organizations with existing ties in these 3 communities worked with the backbone organization to convene meetings of actively engaged community residents and organizations. A key principle of community engagement is that the communities' rights of self-determination and autonomy regarding participation must be respected.²¹ The planning group recognized the importance of involving the communities before plans were finalized. No assumptions were made regarding whether communities would be interested. One partner from academia emphasized, "We needed to get a fairly high level of autonomy in this project to be able to choose the right neighborhoods and for them to choose us, I mean, it was a mutual process . . ." The following quote from a resident highlights mutual respect, a key principle of community engagement²¹:

I never once felt as if I was beneath a funder, even though I know they're bringing in millions of dollars, I never once felt like we were being belittled, when we were at the table, we were all at the table and it didn't matter if we were a resident or partner or funder, we never were separated or treated differently, and I think that that makes a difference too and it gives a lot more confidence to residents, because they know they can be equal to the individual sitting in the room.

The goal of reducing diabetes burden was described, and each community was asked for its input, which was incorporated into project design. It was important that organizational partners, including the funder, heard the residents' concerns and requests. Residents stated that the community had to have a voice in decision-making. One health industry partner commented,

. . . it became very, very clear that the solutions had to be driven by the community, and it became very clear what [partner organizations] could support—but they could not be the drivers of the solutions—and that the communities had to own the solutions in the approaches.

Commit to long-term investment and sustainable change

Disparities in diabetes rates are the result of long-term inequities that cannot be reversed quickly. The community meetings reinforced this idea. Residents were not interested in participating if this was only

for a 1- or 2-year period, and they were not interested in being "researched." Ultimately, initial funding for the project was for 5 years and has subsequently been extended to 8 years. One health industry partner expressed, "These problems did not occur overnight, and the solutions don't happen overnight either, and the impact doesn't happen overnight." Building trusting partnerships takes time,²¹ and the funder eventually agreed to fund an initial year of partnership and infrastructure building.

Utilize a holistic approach that spans the diabetes prevention continuum

DIP-IN takes a holistic approach to reducing the community burden of diabetes. Project goals include working with people with diabetes to improve control of the disease and reduce complications (tertiary prevention), increasing awareness of risk factors for diabetes and encouraging people at high risk to be screened (secondary prevention), and fostering an environment (physical and social) that supports greater health and well-being for all residents (primary prevention) (see Table 2).

One partner from academia described the project's holistic approach as promoting a "culture of health," in the community saying,

if we're going to address diabetes, we also address a whole host of other things which relate to nutrition and economic development and reduction in overall risk factors for chronic diseases, reduction in crime, increasing educational awareness, food security, a whole host of things.

Similarly, a resident partner described the need to consider health more broadly when addressing diabetes,

. . . in order for us to address diabetes, we had to think bigger and so like in our community, it is so much around activity and exercise and networking and building that relationship where now you know diabetes is just a second piece of it, but we're chipping at it . . . we will see better outcomes than if we were to just focus directly on diabetes.

Implementation

DIP-IN components

Building on the design principles, the stakeholder group helped guide the development of project aims and components grounded in evidence-based strategies. All project components are occurring in each of the 3 DIP-IN areas (Figure).

TABLE 2
DIP-IN Aims, Components, and Strategies

Aims	Components and Strategies
Holistic <i>Aim:</i> To reduce the burden of diabetes and improve community health in DIP-IN areas	All Strategies Considered Collectively Evidence-based strategies
Tertiary Prevention <i>Aim:</i> To reduce complications and improve quality of life among people with diabetes	Health System CHWs (hCHWs) To pair adults with diabetes with a health system CHW
Secondary Prevention <i>Aim:</i> To increase awareness of risk factors for diabetes and encourage people at high risk to be screened	Neighborhood CHWs (nCHWs) To embed nCHWs in the community for outreach and education
Primary Prevention <i>Aim:</i> To foster an environment (physical and social) that supports greater health and well-being for all residents	Community Health Promotion Initiatives (CHPIs) <ul style="list-style-type: none"> • To implement CHPIs in focus areas (ie, “clusters”) that include: <ul style="list-style-type: none"> ○ Access to healthy food ○ Access to physical activity opportunities and infrastructure ○ Life stressors and stress management ○ Social connections
Capacity Building <i>Aim:</i> To increase community capacity to lead DIP-IN initiatives through a focus on civic engagement and enhanced community leadership	Resident Steering Committees To engage resident steering committees in decision-making and CHPI investments Neighborhood CHWs (nCHWs) To build organizational networks of support for health in each community through nCHW actions

Abbreviations: CHPI, community health promotion initiative; CHW, community health worker; DIP-IN, Diabetes Impact Project—Indianapolis Neighborhoods.

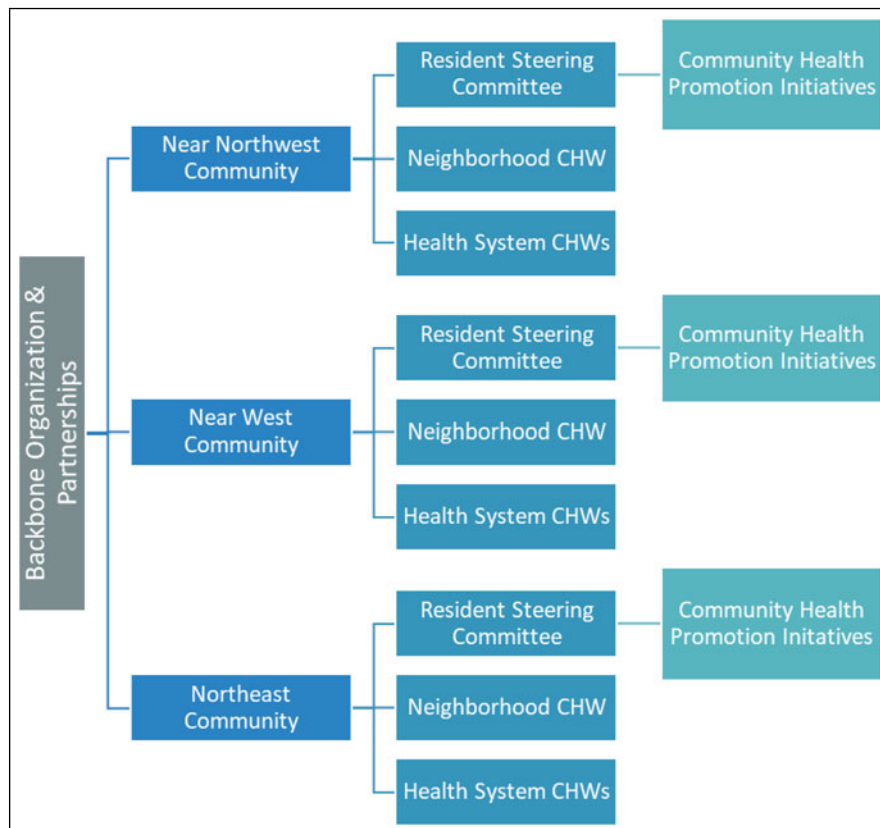


FIGURE DIP-IN Program Components
 Abbreviations: CHW, community health worker; DIP-IN, Diabetes Impact Project—Indianapolis Neighborhoods. This figure is available in color online (www.JPHMP.com).

Tertiary prevention: Health care system community health workers

To address tertiary prevention, DIP-IN incorporates community health workers (CHWs) who are individuals who serve as a bridge between residents and communities and the health care system, serving as support and advocates. Ideally, CHWs are members of the communities they serve. CHW interventions are evidence-based, cost-effective strategies for diabetes management.^{7,22} The primary organizational partner for this component is the largest public hospital system in Indianapolis, with Federally Qualified Health Centers located in each DIP-IN community. As indicated in Supplemental Digital Content 1 (available at <http://links.lww.com/JPHMP/B191>), this organization had some experience with CHWs and was interested in expanding this workforce into diabetes management. DIP-IN has 2 health care system community health workers (hCHWs) working in each community (3 funded by DIP-IN, 3 funded by the health care system).

These hCHWs focus on supporting people with diabetes who live in DIP-IN communities and have hemoglobin A_{1c} (HbA_{1c}) levels above 7.9% and are at a high risk for diabetes-related complications. The hCHWs typically conduct home visits and work with a caseload of 75 to 100 clients to improve diabetes-related behaviors and address social determinants of health that are barriers to personal health. Clients enrolled in the program receive hCHW support until they maintain HbA_{1c} levels below 7.0 for at least 3 months and do not have significant social needs.

Secondary prevention: Neighborhood community health workers

While there is extensive documentation of the effectiveness of hCHWs who work directly with people with diabetes, there is less documentation of the impact of CHWs who work outside of the health care setting.²² The neighborhood community health workers (nCHWs) are located within community-based organizations within the DIP-IN communities. nCHWs work with residents to increase control of their health by raising awareness of risk factors for diabetes, encouraging people at high risk to be screened, providing educational outreach, and sometimes serving as community organizers and advocates for social justice.²³

Primary prevention: Community health promotion initiatives

Selected by resident steering committees and supported by DIP-IN funds earmarked for each

community, these projects must be consistent with DIP-IN's primary prevention aim and have a direct presence and benefit to the community. The projects increase resources and activities in the DIP-IN communities. Most importantly, the projects support the growth of local organizations and residents who are working toward the DIP-IN primary prevention aim (Table 2). In this way, DIP-IN is strengthening local networks working toward improving community quality of life and expanding the culture of health. Examples of evidence-based strategies supported by DIP-IN community funds are included in Table 3.

Capacity building: Resident steering committees and nCHWs

Resident steering committees in each DIP-IN community meet monthly. Steering committees ensure authentic community engagement and operationalize resident decision-making authority to drive primary prevention efforts. The goal of this effort is to increase community capacity through a focus on civic engagement and enhanced community leadership. The committees include voting and nonvoting members. Voting members are residents who tend to be leaders in their local neighborhood associations. Nonvoting members are DIP-IN CHWs and members of the backbone organization. Residents receive a small honorarium to acknowledge their commitment and the seriousness of their role.

During the second year of DIP-IN, after a review of community-level data and scientific literature on evidence-based strategies to address diabetes prevention, each community chose an initial focus area that contributes to diabetes risk. These included improving healthy food access, increasing physical activity opportunities and infrastructure, reducing stressors or stress experiences, and improving social connection as an underlying thread. Eventually, communities will address more than 1 focus area. Each steering committee selects, supports, and occasionally implements evidence-based community health promotion initiatives (CHPIs). The nCHWs partner with the steering committees to identify promising CHPIs.

Evaluation

Design

This complex multilevel intervention is being evaluated using a mixed-methods parallel-convergence model to enhance the validity of results and the richness of lessons learned. These parallel evaluations will ultimately converge for an evaluation of the holistic impact of DIP-IN on the diabetes burden and overall health in these 3 communities. In brief, quantitative

TABLE 3**Examples of CHPIs by Cluster and Outcomes**

CHPI Cluster	Examples of CHPIs	Key Outcome(s)
To improve access to healthy food	<ul style="list-style-type: none"> • Expansion of a community garden that operates a CSA and youth gardener job training • Nutrition education and cooking demonstrations at community locations, led by the county health department 	<ul style="list-style-type: none"> • Percentage of residents living in areas of low food access • Percentage of residents who say they cannot get healthy affordable food in their community
To improve access to physical activity opportunities and infrastructure	<ul style="list-style-type: none"> • Expanded physical activity programs for youth and adults in community locations • Partnership with parks system to expand hours and offerings of physical activity programs 	<ul style="list-style-type: none"> • Percentage of residents who say they have access to a convenient place for physical activity • Percentage of residents who report weekly moderate or vigorous physical activity
To reduce stressors or stress experiences	<ul style="list-style-type: none"> • Deep breathing exercises for stress reduction posted on the Internet that include community members 	<ul style="list-style-type: none"> • Distribution of adult residents' self-rated stress level • Percentage of residents who experienced challenges with at least one basic need in past year (eg, housing, food, utilities, transportation, health care, prescription medications)
To improve social connections	<ul style="list-style-type: none"> • Community dinner series in the park 	<ul style="list-style-type: none"> • Percentage of residents reporting social isolation (lack companionship, feel isolated) • Percentage of residents reporting monthly or weekly interaction with neighbors
Multiple foci	<ul style="list-style-type: none"> • Implementation of the Diabetes Prevention Program in key community locations 	<ul style="list-style-type: none"> • To be selected from other focus areas as appropriate

Abbreviations: CHPI, community health promotion initiative; CSA, community supported agriculture.

evaluation approaches are utilized to assess the effectiveness of DIP-IN strategies in meeting each aim of the project and in assessing the relative contribution of each strategy to the overall impact of DIP-IN on the communities' health and diabetes burden. Qualitative evaluation approaches provide insight into why and how strategies succeed or fail or work differently in each community context.²⁴ DIP-IN's processes and outcomes are evaluated using developmental evaluation in which evaluation is ongoing, responsive to change, and used to inform future project iterations.²⁵

Key Performance Indicators (KPIs) were established upon initiation of the project. These include process measures (output KPIs) that are tracked to monitor implementation of project components over time in each of the 3 communities, as well as short-, medium-, and long-range outcomes (outcome KPIs) that are used to assess effectiveness in fulfilling the project aims. Process measures are monitored quarterly, while outcome measures are monitored yearly from clinical data and every 3 years via a community survey.

Quantitative data sources utilized in the evaluations include geocoded electronic medical records (EMRs), a DIP-IN Community Survey fielded at 3 time points (2019, 2022, and 2025), project records maintained in an online database (REDCap), and public secondary data that describe area health and contextual measures. Qualitative data sources consist of interview

transcripts, project records such as meeting minutes and team memos, and community context documents such as news media, social media, partner publications, and community newsletters.

The DIP-IN Evaluation Team consists of representatives from the backbone organization, county health department, community health information system, and other methodology experts. The evaluation plan prescribes data collection and analyses specific to each project aim individually as well as when considered as a whole (Table 2). The time periods considered in each evaluation vary because of phased implementation. Because complex interventions aiming at population-level change take time, DIP-IN is evaluated assuming its impact will take many years to achieve.²⁶

Holistic evaluation

The collective or holistic effects of DIP-IN will be evaluated by estimating population dose across all strategies and analyzing the degree of association between population dose and key long-term population-level outcomes.²⁷⁻²⁹ Population dose is a particularly useful tool for neighborhood-focused initiatives such as DIP-IN that “involve a portfolio of strategies at multiple levels (eg, individual, family, community) across multiple sectors (eg, school, worksite, neighborhood).”²⁷ This approach is

consistent with the socioecological model of health,²⁷ helping gauge the relative impact of strategies when many things are happening at once or may be happening differently from place to place. Population dose can be quantified or estimated for each strategy by multiplying the *reach* or penetration into the target community population by the *strength* of effectiveness of the given strategy.²⁹ The strength of each strategy will be assessed through direct strategy-level evaluation, literature review, or consensus by multiple raters within the research team.²⁷

Our key long-term population-level outcomes are (1) the change in distribution of HbA_{1c} across the adult population of DIP-IN communities over time in comparison with similar areas selected by propensity score matching, (2) the change in distribution of American Diabetes Association (ADA) risk scores among adult residents of DIP-IN communities per the DIP-IN Community Survey, and (3) the mean/median number of poor physical and mental health days in the last 30 days per the DIP-IN Community Survey. Anticipated outcomes are a narrowing and shift to the left in the population distribution of HbA_{1c},³⁰ lower ADA risk scores across the population, and a reduction in the average number of poor physical/mental health days.

In addition to statistically testing the association between DIP-IN population dose and population-level outcomes, geocoded health system EMR data will be analyzed separately. Applying generalized linear mixed models and quantile regression, a difference-in-difference approach will be used to estimate the collective effect of DIP-IN interventions on HbA_{1c} distribution. That is, outcomes for those living in DIP-IN block groups will be compared over time with those residing in comparator block groups of the city. Comparators were selected through propensity score matching using area-level diabetes prevalence, racial composition, percent older than 45 years, and Area Deprivation Index rank.

Finally, qualitative and quantitative findings will be triangulated to provide context and understanding of population dose estimates and findings of association (or lack thereof) with outcomes,³¹ particularly as the components of DIP-IN may be differentially implemented and/or differentially effective in each of the 3 communities.

Strategy-level evaluations

Tertiary prevention aim evaluation: hCHW program

Quantitative evaluation consists of a difference-in-difference analysis using geotagged EMR data to

determine whether residents of DIP-IN areas who experience the hCHW program have better outcomes than residents of comparison areas who did not experience the hCHW intervention. Before implementation of the hCHW program, key data variables about each CHW encounter were integrated within the health system EMR. Key outcomes are (1) change in average HbA_{1c} levels over time, (2) rate of hospitalization, (3) rate of emergency department visits, and (4) percentage of adults with diabetes who had at least 2 measures of HbA_{1c} in the past 12 months.

Secondary prevention aim evaluation: nCHW outreach

A database system (REDCap) is used to track the outreach activities of the nCHWs in each community, necessary to characterize reach (or penetration) for population dose estimates. For evaluation of this component, we use 2 different approaches. First, the percentage of residents who report having had a screening test for high blood glucose within the past 3 years will be compared across fieldings of the DIP-IN Community Survey (2019, 2022, and 2025). Second, a similar difference-in-difference analysis will be conducted as described earlier to determine whether adult residents of DIP-IN areas have better diabetes screening rates than residents of comparison areas over time. The main outcome is the percentage of adult residents with no prior diagnosis of diabetes who had a diabetes screening test within the last year.

Primary prevention aim evaluation: CHPIs

This evaluation is more challenging due to the community variation in initiatives over time and variations in the community context within which these initiatives occur. As indicated earlier, each resident steering committee chose a focus area. The focus areas are similar to “strategies” as described in the literature about population dose.²⁹ Each community selected a different focus area at the start but will also be phasing in additional focus areas over time. Some CHPIs address more than 1 focus area, and this will be taken into consideration in estimating strength. The community-level mix of funded initiatives will change over time and consists of initiatives of differing duration, frequency, intensity, and whether or not the healthy choice becomes the default for all participants²⁸—in short, differing likelihoods of success. A database (REDCap) is used to track each CHPI implemented by each community and includes quarterly progress updates and metrics. These updates include details for population dose estimates such as participant counts.

The CHPIs are grouped into clusters (Table 3) that correspond with the focus areas (ie, strategies) of DIP-IN, and the population dose for each cluster will be estimated by community.²⁷⁻²⁹ For DIP-IN's tertiary and secondary aims, strategy-level evaluations will be used for the strength assessment needed to calculate population dose. However, in the case of CHPIs, estimates of strength will often be derived on the basis of published literature or through strength ratings and consensus within the evaluation team.^{27,28} The key outcomes analyzed for association with the population dose of CHPIs vary by cluster.

Capacity building aim evaluation

DIP-IN has a fourth aim that is overarching. The strategies to address this aim hinge upon the activities of resident steering committees and nCHWs embedded within each community. The evaluation approach is primarily qualitative. Interviews and process documents are analyzed to understand whether and how DIP-IN builds capacity of individuals and organizations through leadership development, professional development, knowledge sharing, partner network expansion, and oversight of the CHPIs. The main quantitative outcomes for this aim are change over time in the percentage of residents who say people in the community are likely "to work together to make the community a better place to live" or to "actively participate in community or civic organizations," asked as part of the DIP-IN Community Survey.

Discussion

DIP-IN is a long-term investment in health equity and is replicable in other communities to address disparities in chronic diseases beyond diabetes. The design principles and components, while not novel individually, are novel as combined in this project and require innovation in evaluation. During the planning stage, key partners coalesced around a shared, bold goal of addressing diabetes inequities in a meaningful way.

The DIP-IN initiative aims to unite stakeholders from various sectors (residents, local public health department, academia, health care system, health industry, community development, and community-based organizations) with the common goal of improving the well-being of 3 urban communities. When working to address health, it is common to include health-related organizational partners, but other sectors are less commonly integrated. Community development is one such partner that can play an important role in impacting the health of low-income communities.³² Other organizations such as

non-health-related industries may not be aware of the health-related impact of their work but are important contributors to an overall culture of health in a community.

The nature of community engagement in DIP-IN distinguishes it from other similar approaches to reducing health inequities.¹²⁻¹⁴ DIP-IN reflects the underpinning values of design justice, where power is shifted from institutions to communities and supports the empowerment of communities to lead social transformation.³³ The impact on community is prioritized over the goals of the backbone institution. Community members are resident experts, while the backbone organization is a facilitator. The endpoints are community-led and community-controlled solutions.³³

The interplay of opportunities and challenges

When DIP-IN was initiated, there was a confluence of concern in and out of the health world related to the obvious health inequities experienced by some communities and a growing awareness of the impact of social determinants of health. There was an increasing recognition that these disparities are unacceptable and are the result of long-standing social and economic inequities that are not easily or quickly remedied, and DIP-IN responded in a way that leveraged the shared interests of its partners to address these inequities.

Another area of confluence that incentivized partnership was a growing interest by several key partners in expanding the CHW workforce in Indiana. CHWs have been members of the US health care workforce including within health departments for more than 60 years²³ but have not been widely utilized in Indiana. The health care system had participated in research projects employing CHWs to address maternal and infant mortality³⁴ and was interested in expanding to chronic disease. The backbone organization faculty had experience working with CHWs in chronic disease prevention.^{35,36} The health industry partner had supported CHW programs outside of the United States. In addition, the community development organization utilized personnel known as community builders whose responsibilities overlapped with CHW responsibilities. This common interest in expanding the CHW workforce allowed us to reach a shared approach across multiple sectors. Challenges included coming to a common understanding of how the work of CHWs and community builders overlap. To help fill an existing knowledge gap, DIP-IN utilizes neighborhood-based CHWs operating outside of the health system, blending the community development networking role of "builder" and the health sector's role of lay health worker.

To encourage sustainability, DIP-IN CHWs are purposefully integrated within existing organizational structures and practices. The goal is for the CHW work to benefit host organizations, rather than be solely for research purposes. For the hCHWs, the backbone organization and the health care system personnel incorporated CHW workflow into the EMR so that the CHW encounters could be accessed and utilized by the medical team to enhance patient outcomes. This focus on patient outcomes aligns well with a shift to value-based care reimbursement models where the focus is on patient outcomes rather than patient volume. This shift in focus allows for greater flexibility in how outcomes are achieved. Given the cost-effectiveness of CHW interventions, the flexibility of a value-based payment system may provide a new funding stream to support CHWs.

One major challenge in doing this type of work is the tension between traditional academic research and community impact. This type of design must blend the desire for robust results with pragmatism and real-world feasibility. This requires letting go of control,³³ adapting to the way others work, and even pushing on traditional scientific norms that favor individual-level studies in controlled settings. A commitment to authentic community engagement calls for this work to be done within a real-life context that is fluid and responsive to the community. Despite these challenges, there is evidence that allowing for shared learning and the emergence of solutions amidst uncontrolled, real-life circumstances is ultimately more impactful for population-level change.²⁶ Designing for and documenting change in this kind of project require patience and flexibility from all partners.

In conclusion, program interventions that support reducing risk factors for diabetes and improving evidence-based care are directly related to improving the health and well-being of the community. Health

disparities such as the diabetes prevalence in DIP-IN communities have not arisen suddenly but are the result of long-term systemic inequities. This complex issue requires a complex solution with long-term commitment and investment from diverse sectors. Policy, systems, and environmental changes and sustainable shifts in overall health and well-being take time, with few quick results. This requires a willingness to invest in initiatives for which future stakeholders, not those presently committed, may see the payoff. The work is difficult with many challenges but is vital to making health equity a reality.

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Implications for Policy & Practice

- Identifying sustainable funding for hCHWs and nCHWs is critical. Strategies are needed that include reimbursement for all aspects of CHW work including assisting with social determinants of health.
- Health care payment reform that addresses value-based care will allow a model such as DIP-IN to be sustainable.
- Working with communities where there are long-standing relationships already existing for community-level governance helps “jump-start” the program.
- Involving community economic development can be helpful for sustained effort beyond the funding for the project.

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