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Using the Pathways Community HUB Care Coordination Model to Address Chronic Illnesses: A Case Study

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ABSTRACT

Background/Objectives: Ohio communities are developing and expanding care coordination initiatives to integrate care for low-income pregnant women. Some of these initiatives are guided by the Pathways Community HUB model, which uses community health workers to address health, social, and behavioral risks for at-risk populations. This study documents the development, challenges and management responses, and lessons learned from implementing a Pathways Community HUB care coordination program for another population -- low-income adults with chronic disease risks.

Methods: The study utilizes data extracted from the Care Coordination Systems (CCS) database used in Lucas County, Ohio between 2015 and 2017 and interviews with program managers. Based on CCS data and insights from those interviewed, we describe the development and accomplishments of a Pathways Community HUB program for adults with chronic illnesses and identify challenges and lessons learned.

Results: The Toledo/Lucas County program addressed more than half of 3,515 identified health and behavioral risks for 651 low-income adults in the program during its first two years of operation. Key challenges included building community support, establishing capacities to coordinate care, and sustaining the program over time. Establishing community networks to support program services and developing multiple funding sources are key lessons for long-term program sustainability.

Conclusions: Documenting challenges and successes of existing programs and extracting lessons to guide implementation of similar public health efforts can potentially improve delivery of interventions. The Pathways Community HUB model has demonstrated success in addressing risks among at-risk adults. However, more comprehensive assessments of the model across different populations are warranted.

Key words: Pathways Community HUB model, care coordination, chronic illness, risk reduction, low-income

INTRODUCTION

Organizations across Ohio and nationwide have implemented healthcare coordination initiatives to expand access to needed services, reduce costs, and improve outcomes. This article addresses the development of a Pathways Community HUB care coordination program for low-income adults with chronic illnesses in Ohio. A HUB is an impartial autonomous entity that has a role in coordinating care for at-risk clients.¹ It serves as a linkage point for a network of community based organizations (CBOs) that provide services for at-risk populations and it is responsible for monitoring and improving quality of care coordination services. Through the HUB model, payments are aligned with measured outcomes.

The Pathways Community HUB model originated in Richland County, Ohio, in 2002, and it has expanded to more than a dozen Ohio locations and to at least five other states. Fueling this expansion is evidence showing the model successfully prevented low birth weight (LBW) births in Richland County,² and the enactment of state legislation (SB 332) to establish a system of qualified HUBs throughout Ohio to serve at-risk pregnant women. In Ohio, Medicaid Managed Care (MMC) plans also support services for certain Medicaid clients served by certified CHWs working for

“a qualified community HUB.”³ The Ohio Commission on Minority Health has also funded HUBs focused on addressing the needs of pregnant women.³ As a result, a number of Ohio communities now operate HUB programs serving low income pregnant women, and existing evidence suggests that these HUBs are effective in improving birth outcomes.^{2,4}

This article presents a case study suggesting that the Pathways Community HUB model may also be used productively to help coordinate care for low income adults with chronic illnesses. It offers evidence that a HUB program in Lucas County, Ohio, has aided the integration of low-income adults into health and social service systems that identify and mitigate their individual risks. It also identifies challenges associated with these efforts, responses to address these challenges, and lessons for others who want to extend care coordination initiatives to address health risks for low-income adults with chronic illnesses.

Healthcare coordination can be viewed broadly as the organization of patient care across more than one service provider to facilitate delivery of health-related services.⁵ Studies suggest that it holds potential for improving healthcare quality and reducing costs.⁵⁻⁸ The Pathways Community HUB model uses Community Health Workers (CHWs) to help coordinate client care. CHWs

are typically members of the targeted sub-population(s) and have been shown to be effective in reaching at-risk audiences and implementing new models of care coordination.⁹⁻¹¹ The Ohio Board of Nursing regulates the certification of CHWs throughout Ohio. To build its CHW workforce to address chronic illnesses, the Lucas County HUB and its partners recruited individuals from the targeted audience and hired them using public recruitment efforts. They also recruited potential CHWs through informal networks of social service agencies such as the Salvation Army, Food Banks, Community Action Agencies, and – in some cases – by engaging with former HUB clients as well.

Under the HUB model, CHWs perform a structured assessment of clients' health needs using standardized tools and "Pathways" to link beneficiaries to community resources and track outcomes.^{1,2,12} They also identify and assist clients in mitigating their risks through completion of identified Pathways, which helps ensure accountability for progress and serves to support coordination among all parties involved in an individual's care.¹³ The HUB model tracks the progress of interventions to mitigate identified risks ("Pathways"), and the completion of Pathways defines measurable outcomes compensated through payments tied to the mitigation of patients' risks. The uniqueness of the Pathways Community HUB model lies in the breadth of risks it addresses (social, behavioral, and medical), the tracking of progress and outcomes at the individual level, and the connection between confirmed risk mitigation and payments for the CHWs who coordinate services.^{1,13}

While the Pathways Community HUB model has demonstrated success in addressing needs of at-risk pregnant women, some Ohio communities are using it to address another key health need – management of chronic illnesses for at-risk adults. The 2017-2019 Ohio State Health Improvement Plan (SHIP) identified chronic disease as one of three priority drivers of poor health status, premature death, and unsustainable healthcare.¹⁴ It also recommended that efforts to address social determinants of health be undertaken. Pathways Community HUB programs follow up on this recommendation by addressing social, behavioral, and health risks.

To improve interventions for low-income adults with chronic illnesses in Ohio, it makes sense to learn about the challenges and successes of existing programs and extract lessons to guide similar public health efforts in other settings. While there are manuals which help communities understand steps to develop Pathways Community HUBs¹ and several assessments of HUB programs suggested positive impacts in their communities,^{2,4,15,16} there is no known literature documenting the development, challenges and management responses, and lessons learned from implementing the model for low-income adults with chronic illnesses. In addition, because adults with chronic illnesses may be less acutely affected by their risks/illnesses than pregnant women are affected by their condition, there is reason to believe that the challenges of using the HUB model to coordinate care for adults with chronic illnesses may differ from the challenges for pregnant women who have often been the subject of Pathways Community HUB programs. It therefore seems sensible to investigate use of the Pathways model for this population. In this article, we undertake this task.

METHODS

Setting

The study was conducted in Lucas County, Ohio. According to U.S. Census Bureau 2017 estimates, Lucas County, located in Northwest Ohio, has a population of 430,887 people and a median household income of \$44,820 (2017 dollars).¹⁷ Its population is 20.1% African American, 74.6% White, and 5.3% other races. Approximately 11% of the population has less than a high school education.¹⁷ The most recent Community Health Assessment

(CHA) of Lucas county reports that 74% of Lucas County adults were overweight or obese based on Body Mass Index.¹⁸ Additionally, the county's reported 36% obesity rate exceeds the 30% obesity rate reported for Ohio and the United States.¹⁸ The Lucas County CHA also reports higher rates of obesity, diabetes, asthma, and hypertension for its African American population than for its White population.¹⁸

Procedures

This case study emerges from a program evaluation conducted for the Hospital Council of Northwest Ohio (HCNO) and the Centers for Disease Control and Prevention (CDC) between 2015 and 2017, and interviews and follow up communications with key HUB officials in 2018 and 2019. The evaluation relied on quantitative data extracted from the Care Coordination Systems (CCS) database used to support the HCNO program in Lucas County, and insights provided by HUB staff. The data include information on engagement of health systems and service providers in the Pathways Community HUB care coordination program, participation and enrollment, staffing, Pathway assignments and completion rates, and other information yielding insights on the development of the program, the challenges it faced, and how those challenges were addressed. Data downloads were made 6, 18, and 24 months after program inception, and data from these downloads underlie the information presented in this article. Where appropriate, we supplement information from this program evaluation with information pertaining to other Pathways Community HUB programs.

We conducted targeted interviews with HUB staff and CHW supervisors in 2018 to gain insight into the Lucas County program's evolution and sustainability, as well as into challenges, management responses, and lessons learned. Participants were asked questions relating to planning, implementation, program growth, challenges and management responses, lessons learned, and program sustainability. Follow up communications provided further clarifications as needed.

Measures/Outcomes

Our case study addresses quantitative and qualitative outcomes. Qualitative outcomes investigated include challenges and lessons learned in implementing the Pathways HUB model, including those relating to client participation and services received. We use various quantitative measures to describe the program's development, including the number of clients referred and receiving Pathway assignments in the program and measures of risk reduction as demonstrated by Pathway Mitigation Success Rates and Workload Production Rates.

Statistical Analysis

Descriptive analyses of the program's development were performed using SAS software version 9.4 (SAS Institute, Cary, NC, USA). For the qualitative component of the study, content analysis was used to analyze data collected through in-depth interviews and associated follow-up inquiries.

Institutional Review Board Approval

A university Institutional Review Board approved the study protocol.

RESULTS

The 2013/2014, Lucas County CHA revealed chronic disease outcomes that ranked lower than Ohio and the nation¹⁹ and it provided impetus to expand Lucas County's existing Pathways Community HUB program to low-income adults with or at-risk for chronic illnesses. The initial community-wide Northwest Ohio Pathways HUB was launched in 2007 to serve at-risk pregnant women. The HUB is a regional clinical-community linkages system administered by the Hospital Council of Northwest Ohio (HCNO), which contracts with care coordination agencies throughout the

community that employ CHWs to connect low-income residents to needed medical, social, and behavioral services. HUB staff provide trainings for CHWs and their supervisors, as well as contracts for outcome-oriented services, data tracking, and other administrative services. Below, we describe development of the HUB program for low-income Lucas County adults with or at-risk for chronic diseases, identify challenges associated with the program's development and implementation, and outline management responses to these challenges. We also discuss lessons learned. Our analysis focuses on three stages of the program's development: 1) planning; 2) implementation, and; 3) positioning for long-term sustainability.

Planning

In planning the adult chronic disease program, HCNO's HUB managers faced two key challenges: building support and establishing capacities to reduce risks for clients. Effective care coordination requires community support in the form of both services for the targeted population and funding resources. HCNO benefited from existing Lucas County efforts to address community health needs, including the HUB's establishment to serve at-risk pregnant women and improve birth outcomes. The Toledo Community Foundation and the Stranahan Foundation provided initial financial support for HUB efforts to improve birth outcomes in Lucas County. Key stakeholders were also engaged to help develop a successful grant application to the Centers for Disease Control and Prevention (CDC), which yielded base funding for three years to develop and initiate a program to serve adults with or at-risk for chronic diseases. Drawing on community support and federal resources, HCNO's HUB program issued a Request for Proposals to identify and subsidize key CBO partners to become care-coordinating agencies (CCAs) for adults with chronic diseases and provide care coordination services. By the end of 2015, HCNO had engaged four of the seven health systems in Lucas County,²⁰ and had developed additional support from other health and social service providers.

HUB managers at HCNO also faced the challenge of building capacities to enroll participants and identify their risks, as well as empower participants to address and reduce their risks. This meant hiring and training staff and establishing tracking capacities to coordinate care for clients. Contracted CCAs hired CHWs from among individuals in the targeted low-income adult population, and the HUB worked to ensure these CHWs received training needed to achieve and maintain certification from the Ohio Board of Nursing. CHWs were trained to understand their roles in recruiting and enrolling clients, completing checklists to identify risks and Pathways needed to address those risks, making referrals to community stakeholders to address the risks identified, and entering data into a database to track and coordinate service delivery. To support this effort, HCNO's HUB contracted with CCS, a private vendor that developed the database. By the end of 2015, the HUB was supported by at least seven trained CHWs,²⁰ who were recruiting low-income adult clients and working to reduce these individuals' chronic disease risks.

Implementation

HUB managers at HCNO also faced implementation challenges. Enrolling and engaging clients, identifying and mitigating risks through Pathway completion, and managing data entry and extracting information from the CCS database to support program improvements all posed challenges.

a) Enrollment and engagement in the program

The HUB identified prospective clients through canvassing conducted by CHWs and referrals from healthcare providers, hospitals, managed care organizations, and other external agency partners. In the first six months of the program, 177 clients were engaged, and participation – as measured by referrals into the program – accelerated to 757 individuals after two years. Of the 757 referred participants, 651 individuals actually received Pathway assignment services. Figure 1 displays the growth pattern in the program's participation over its first two years of operation.

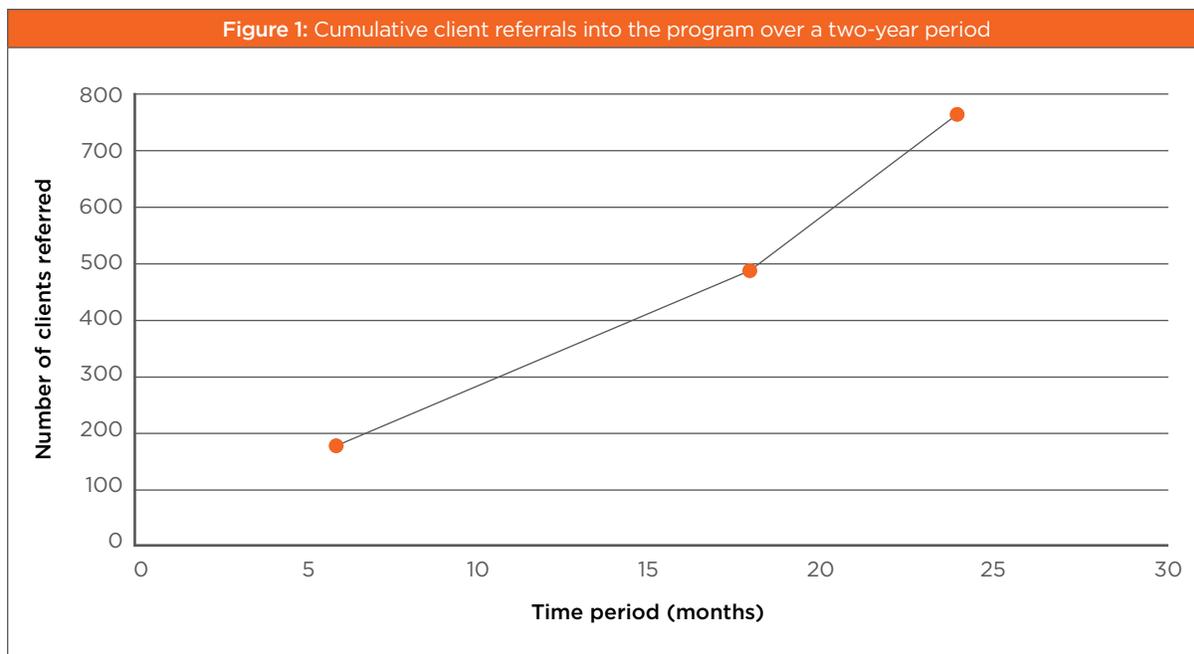


Table 1 summarizes characteristics of the individuals referred to the program during its first two years. Low-income Lucas County adults with or at-risk of chronic illnesses, particularly African Americans were disproportionately affected. The majority were female (65.9%), Black/African American (52.2%), had a high school education or less (60.8%), had an annual income of less than or equal to \$10,000 (53.4%), and were not employed (69.9%). At an average age of 51 years, participants often had multiple chronic conditions (mean of 5.2). The HUB reached these targeted sub-populations by building partnerships with organizations connected to them and by identifying CHWs with ties to them as well.

Table 1: Demographic characteristics of 757 clients who were referred to the Pathways HUB program in Toledo	
Variable	Frequency
Age (mean, std)	51.1 (14.8)
Number of Chronic Conditions (mean, std)	5.2 (3.4)
Gender (n, %)	
Male	257 (33.9)
Female	499 (65.9)
Transgender	1 (0.1)
Race (n, %)	
Black/African American	395 (52.2)
White	251 (33.2)
Other*	30 (4.0)
Missing	81 (10.7)
Highest Level of Education (n, %)	
Less than High School Graduate	211 (27.9)
High School Graduate	249 (32.9)
Some College	126 (16.6)
College Graduate	69 (9.1)
Don't Know	11 (1.5)
Missing	83 (11.0)
Refused	8 (1.1)
Average Annual Income (n, %)	
Less or Equal \$10,000	404 (53.4)
Between \$10,000 and \$25,000	264 (34.9)
More than \$25,000	36 (4.8)
Don't know/Missing/Refused/Unknown	53 (7.0)
Employment Status (n, %)	
Employed	139 (18.4)
Not Employed	529 (69.9)
Don't know	5 (0.7)
Missing	84 (11.1)
Prefer not to respond	2 (4.3%)

*American Indian or Alaskan Native, Arab/Chaldean White, Vietnamese White.

b) Identifying and reducing health risks

Client Pathways, as identified and assigned by CHWs, increased over the first two years of the program, reflecting the growing number of clients and risks being managed. Fifty-five participants in the first six months of operation were assigned a total of 232 Pathways. These Pathway assignments reflected identified sources of risk for the clients involved, a process resulting in determined mitigation steps for addressing and/or reducing these risks. The assigned Pathways included Medical Home, Health Insurance, Medical Referral, Housing, Education relevant to their condition and/or situation, Smoking Cessation, and referrals for a wide range of social services. More Pathways reflecting additional risks and increased client participation were subsequently added to the program through efforts to expand the available services for clients. This contributed to a total of 1,396 Pathway assignments after 18 months and 3,515 Pathway assignments after two years.

Opening Pathways for clients is a key step toward mitigating chronic disease risks, which are addressed and/or reduced by completing Pathways. Pathways are assigned to address identified risks to clients, and they include a range of factors present-

ing known health risks. For low-income adults, risk factors (and associated Pathways) include mental health issues,²¹ lack of health insurance coverage (Freeman et al, 2008),²² and a range of other established risks to health (see Table 2). Certified HUBs are required to use standardized Pathways in mitigating risks (through Pathway completion), and/or propose the development of new Pathways to the Pathways Community HUB Institute (PCHI), which certifies HUBs. For example, for a client with identified behavioral health issues, her/his Behavioral Health Pathway is considered complete if there is a confirmation that s/he has kept three scheduled appointments.¹

A Pathway may also be considered “finished incomplete” when the risk could not be completely addressed through the program. In these situations, it is the practice in the HUB model for CHWs or others to document the reasons a Pathway could not be completed. During the program’s early months, relatively high rates of “finished incomplete” discharges were experienced, with clients being discharged without completing all assigned Pathways. A large proportion of these discharges occurred because clients were “lost to follow up,” a finding identified during the formative evaluation efforts supported by the CDC grant. Analyses conducted during the course of the evaluation process revealed that personal contacts with clients tended to increase rates of Pathway completion,²⁰ and program managers subsequently took action to assure more regular CHW engagement with clients to support Pathway completion and risk reduction efforts.

The three most frequently used Pathways (Medical Referral, Education, and Social Services Referral) constituted 75% of all Pathways opened during the first two years of the HCNO program for low-income adults. Across these three Pathways, the average Pathway Mitigation Success rate (a measure of the rate of successful completion of Pathways that have been both assigned and closed) and Workload Production rate (a measure of the proportion of the HCNO HUB’s workload successfully completed, as of June 30, 2017) were 75.6% and 67.3%, respectively. These rates are slightly below the roughly 80% completion rates reported in previous work documenting Pathway completion rates for pregnant women.^{23,24} The three most frequently used Pathways were also completed relatively quickly, as they had a median duration of less than 10 days to completion as summarized in Table 2.

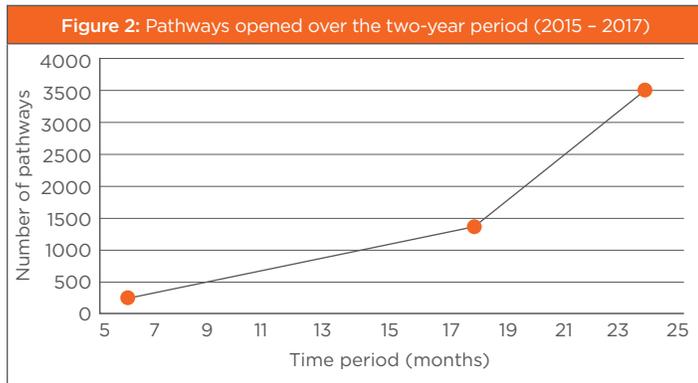
Table 2: Pathway completion rates and median duration times at 24 months				
Pathway	Total Pathways Assigned	Pathway Mitigation Success Rate (%)*	Workload Production Rate (%)**	Median Duration (days)
Most Frequent				
Education	366	94.6	90.7	1
Medical Referral	802	70.1	59.2	2
SSR Pathways	1,460	62.0	51.9	7
Overall	2,628	75.6	67.3	2
Less Frequent				
Medical Home	187	48.1	39.6	27
Health Insurance	152	40.0	32.9	18
Family Planning	10	30.0	30.0	25
Med. Assessment	153	36.8	27.5	2
Med. Management	15	25.0	20.0	6
Employment	50	16.2	12.0	117
Housing	167	21.1	11.4	83
Behavioral	19	12.5	10.5	33
Adult Education	63	9.6	7.9	36
Smoking Cessation	69	5.0	4.4	145
Overall	885	24.4	19.6	30

Note: Two Pathways (Lead and Immunization Referral), both with only one assignment each, were not included in the table.

***Pathway Mitigation Success Rate** = # of completed Pathways / (# of completed Pathways + # of Finished Incomplete Pathways)

****Workload Production Rate** = # of completed Pathways / (# of completed Pathways + # of Finished Incomplete Pathways + # of Pathways Opened but still pending)

Other Pathways that were less frequently assigned had completion rates of less than 50%. For example, the success rate for the Housing Pathway was below 25% and it typically took two months or more for clients to complete this Pathway. The limited availability of low-income housing in Lucas County made addressing this risk difficult. While services to meet the needs of adult clients were not always available, continuing relationship-building efforts by HUB managers did expand the availability of services, which seemed likely to contribute to improved Pathway completion rates as clients accessed these services. Figure 2 presents information on Pathways assigned over the first 2 years of the program, as well as an acceleration in Pathway assignments after 18 months. Overall, 651 clients, with assistance from CHWs, mitigated more than 1,770 identified risks by completing assigned Pathways by June 30, 2017.



c) Data management, evaluation, and continuous improvement

The HUB also faced challenges in managing information to coordinate services for clients, providing support payments for risk mitigations achieved, and enabling ongoing program improvements. Two challenges were particularly apparent: 1) a need to ensure that data were entered accurately and completely to track client progress and 2) a need to extract information.

During the early months, data entry problems were encountered, and data quality problems were identified by program evaluators hired through the CDC grant. Areas of concern included missing data, duplicate entries, and inconsistencies in entries across data fields linked to data entry practices and program and database design features. National certification standards for Pathways Community HUBs specify that CCAs are paid for verified actions taken to produce “completed Pathways,” thereby confirming that they have mitigated a specific risk identified for a client. They are not paid in full for “finished incomplete Pathways.” Furthermore, because the program had up-front funds to initiate services prior to developing an ability to bill payers for services, the HUB and its CCAs incorporated grant funded stipends for certain outcomes in the early years of the program. These payment features helped incentivize careful data entry. To further address data entry and quality issues identified after the initial training conducted during the summer of 2015, the HUB established ongoing training opportunities for those using the database and communicated needed design enhancements with the CCS vendor. Definitions of data elements were clarified and data quality improved, thus enabling confidence in the data used for the evaluation.

There were also challenges in extracting data from the database and in using it to inform program decision-making. Because the HUB and the national certification process are built on the ideals of care coordination and payments for risk mitigation, the CCS database was developed to track clients and their Pathways, coordinate services, and facilitate payments based on risk mitigations achieved. It was not developed to enable the compilation of relevant evaluative information, as was evident from the diverse reporting features in the database. With ongoing assistance from the database vendor and HUB staff, evaluators were able to

bring together information from multiple reporting formats in the database to enable usable data sets for evaluative purposes. Use of the CCS database is not required by national certification standards for the Pathways Community HUBs, but it is nevertheless our understanding that its vendor is taking steps to make it more conducive to program evaluation activity.

Program sustainability

The HUB took steps to address long-term program sustainability, and its program for adults with chronic illnesses remains operational as of this writing (in 2019). The Lucas County Pathways HUB became one of the first certified Pathway Community HUBs in the country with the establishment of the PCHI national certification program in 2014. As one of the nation’s early developing HUBs, its path toward sustainability may differ from those of other HUBs generally, which – according to the PCHI website – currently encounter certification costs of between about \$12,500 and \$31,000 to achieve PCHI certification.

After the Lucas County HUB’s certification, a CDC Partnerships to Improve Community Health (PICH) grant made it possible for the HUB to expand its services to include care coordination for adults with or at-risk of chronic disease. The CDC contributed approximately \$300,000 annually during the three years between 2014 and 2017 to enable the HUB to develop capacity and provide services for adults with or at-risk of chronic illness. This funding paid for staffing, operations, information systems, and evaluation related costs to expand the HUB’s services to adults with or at-risk of chronic illnesses. The CDC support was supplemented by additional funding from the Ohio Commission on Minority Health, which supported training CHWs and their initial employment. After the end of the CDC grant, the HUB sustained operations through contributions from other sources, including the Toledo Community Foundation, local hospitals such as Mercy, ProMedica, and the University of Toledo, and Lucas County Jobs and Family Services.

Additionally, in Ohio, MMC plans can make payments to support CHW services to Medicaid clients. In the second year of the Lucas County chronic illness program’s operation (2016-2017), HUB managers established contracts with three of Ohio’s five MMC plans to pay for the cost of CHW services through payments for enrollment and Pathway completion for adults with chronic disease risks. MMC outcome payments are playing a key role in enabling the program to sustain its services in Lucas County, but they are not sufficient to cover the costs of services for the program’s full client base. According to the HUB’s director, managed care payments for adult care coordination, on average, cover less than half of the employment costs for CHWs supporting the work of the Lucas County HUB. This is a lower proportion of cost recovery than what is achieved for health outcomes such as healthy birthweight babies and post-partum visits for at risk pregnant women enrolled in the HUB program for pregnant clients. In addition, CHW services (managed through the HUB) that are provided to adults with chronic illnesses who are not Medicaid eligible, or who are not enrolled in the MMC plans that contract with the HUB for outcome payments, are not reimbursed through the HUB.

DISCUSSION

The Pathways Community HUB model can be applied successfully to identify and mitigate risks for low-income adults with chronic illnesses. Over the course of two years, the Northwest Ohio Pathways HUB identified and sought to mitigate risks for 651 low-income individuals in the Lucas County, Ohio Pathways Community HUB program for adults with or at-risk of chronic disease. More than half of the Pathways assigned to these individuals to address risks were completed. The population served by this program is often highly mobile and may be homeless, so confirming that risks are addressed and/or reduced is inherently a challenge. As

a result, the Pathway completion figures presented in this article may not fully characterize the risk mitigations achieved. Nevertheless, these figures do suggest substantial efforts to identify, address, and reduce chronic disease impacts among low-income adults in Lucas County. Furthermore, the program's continuation attests to an ongoing capability to identify and mitigate chronic disease risks for low-income adults in Lucas County. These are not small accomplishments, nor were they easy to achieve.

HCNO's HUB managers faced multiple challenges. Managers had to develop community support to deliver and fund their services, and they had to establish ongoing capacities to coordinate care for the targeted audience. They also had to enroll and engage clients; assess their risks and enable assignment and completion of Pathways to mitigate risks; and use data systems to track care coordination progress, identify and guide service delivery improvements, and enable payments for CHWs based on their successful efforts to help clients mitigate their risk(s). To sustain the program, managers had to continue building relationships and identifying funding sources. Funding through Ohio MMC plans, and other organizations enabled continuation of the program beyond a federal CDC grant procured to develop and initiate it.

The Lucas County experience yields lessons for others seeking to develop and operate sustainable HUB programs serving low-income adults. Table 3 summarizes the challenges experienced by the program and management responses. It also identifies lessons learned from the development and operation of the chronic

disease HUB program for low-income adults during its first two years of operation. As the table indicates, during the planning stage, it is critical to develop community networks to support program services and funding. The HUB initially built community support from local organizations when the clinical-community linkages system was launched to serve low-income pregnant women. Subsequent to receiving a CDC grant, the HUB built partnerships with care coordination agencies to identify and serve low-income residents with or at-risk for chronic diseases, and trained CHWs to mitigate their risk(s) through data entry, tracking, and management processes that supported ongoing care coordination.

The program implementation phase also presented challenges, and steps taken by HCNO's HUB managers yield lessons for others. The HUB established key partnerships and enabled hiring of CHWs to reach its targeted clientele effectively. In addition, the program took advantage of standardized Pathways used in the certified Pathways Community HUB model and benefited from the client-tracking capabilities of systems used to support the model. Relatedly, the program worked to expand services for its clients in housing and other areas where sufficient services were not available and took conscious steps to deepen ongoing engagement with clients. To enable sufficient data quality, HUB managers found value in providing continuous training on data entry processes. In addition, while they found valuable support from a federal grant, HUB managers suggested tying payments to explicitly documented risk mitigation progress as early as

Table 3: HCNO HUB for Low-income Adults with Chronic Illnesses - Challenges, Responses, and Lessons for Others

Program Stage	Challenges	Lucas County Management Responses	Lessons for Others
Planning	<ul style="list-style-type: none"> Building community support to fund & deliver services. 	<ul style="list-style-type: none"> Built on existing service capabilities of the HUB Model to improve birth outcomes & reached out via informal networks. Issued a Request for Proposals (RFP). Sought local funding support. 	<ul style="list-style-type: none"> Use and develop community networks to support the effort with services & financial resources. Seek external funding to help attract local partners & to initiate & support risk identification and mitigation work.
	<ul style="list-style-type: none"> Establishing capacities to coordinate care – enroll participants, identify risks, & address/reduce risks through care coordination. 	<ul style="list-style-type: none"> Hired CHWs, with ties to targeted audiences. Trained CHWs to use existing Pathways tools, including database & Pathways certification resources. 	<ul style="list-style-type: none"> Build community support to develop capacity to identify and mitigate risks, and train and instruct CHWs on data entry & tracking processes to enable care coordination & risk mitigation.
Implementation	<ul style="list-style-type: none"> Enrolling & engaging clients 	<ul style="list-style-type: none"> Engaged partners with ties to the targeted audiences – CHWs, CCA's, & community partners. 	<ul style="list-style-type: none"> Establish community partnerships & take advantage of CHWs' community ties to reach & engage targeted client audiences.
	<ul style="list-style-type: none"> Identifying and reducing risks by assigning pathways and enabling their completion. 	<ul style="list-style-type: none"> Used standardized checklists to identify risks & assign pathways. Expanded pathways/services over time. Emphasized client engagement to build relationships for risk mitigation. 	<ul style="list-style-type: none"> Build on resources made available through the Pathways model & certification program. Continually work to expand local service availability Build relationships & regular communications with clients.
	<ul style="list-style-type: none"> Entering data & tracking progress. Extracting data to support program improvements. 	<ul style="list-style-type: none"> Up front & continuing training on data entry. Hired program evaluators to assess progress & define issues. Worked with evaluators, vendors, & staff to clarify data definitions & reporting formats. 	<ul style="list-style-type: none"> Train & re-train on data entry, management, & quality to support risk mitigation for clients. Tie payments to data entry and document progress ASAP, making sure that CHWs & CCA's understand processes & expectations. Engage evaluators to identify issues & suggest program improvements.
Program Sustainability	<ul style="list-style-type: none"> Sustaining the program over time 	<ul style="list-style-type: none"> Obtained a CDC grant to initiate the program & engage local supporters. Negotiated risk mitigation payments with Medicaid Managed Care payers. Solicited low cost/free support from local supporters. 	<ul style="list-style-type: none"> Plan for sustainability, seek external funding, & engage Medicaid payers to aid in mitigating risks.

possible. They also suggested working with external evaluators to provide ongoing feedback.

Another key lesson from the Lucas County experience relates to the value of planning for long-term sustainability. HCNO HUB leadership was aware that the CDC funding was temporary, so steps were taken from the beginning to maintain program sustainability after the grant ended in 2017. The HUB developed partnerships to build financial and programmatic capacities that did not depend on CDC grant funds and developed contracts with MMC plans. These efforts positioned the program to continue providing services and established an ongoing capacity to assist low-income adults with chronic illness in Lucas County.

While the HUB has provided care coordination to pregnant women since 2007, managers indicated that working with adults with chronic disease risks brought additional challenges. They suggested that reducing chronic disease risks for low-income adults should be recognized as a process that requires continuing engagements over long periods before it will achieve results. They also emphasized the importance of fully engaging with program clients and taking active steps to establish processes for ensuring data quality through entry, tracking, and management procedures. In addition, they suggested that efforts to train CHWs to ensure accurate data entry be emphasized, continually monitored, and improved to enable evaluations of program progress and suggestions for ongoing program improvements.

IMPLICATIONS FOR PUBLIC HEALTH

The experience of the Toledo Pathways Community HUB and the results reported above have implications for public health practice and policymakers in Ohio. For public health practitioners in Ohio communities, the information presented suggests that there are significant challenges to planning, implementing, and sustaining a Pathways Community HUB, and it defines and offers management strategies and lessons for public health practitioners seeking to address those challenges. It also suggests that successful efforts to address those challenges may yield beneficial results in the form of significant levels of risk mitigation for low-income adults with or at-risk of chronic illnesses in their communities.

This case study also has implications for policymakers. While Ohio has been innovative in expanding its Medicaid program and enabling MMC plans to support successful efforts to mitigate risk(s) through care coordination, this case study makes it clear that more can be done to identify and mitigate risks for low-income adults in Ohio. HCNO was able to develop its Pathways Community HUB program for low-income adults with or at-risk for chronic diseases because it built local support and obtained a CDC grant. To initiate additional efforts of this kind, the State of Ohio should consider establishing programs to provide financial support and strengthen community public health partnerships to enhance care coordination and mitigate chronic disease risks for low-income populations.

Ohio currently supports MMC payments for CHWs based on successful efforts to mitigate identified risk(s) (through the completion of Pathways, in the case of the Pathways Community HUB model) and it currently provides up-front funding for qualified community HUBs to address infant mortality. However, it is our understanding that not all MMC plans pay for documented risk mitigation for low-income adults with or at risk for chronic diseases, and those that do pay, do not appear to be paying the full cost. In addition, up-front funding payments from the state do not appear to capitalize the costs of establishing programs for low-income adults with chronic disease risks. Ohio may want to consider both providing funding to initiate care coordination programs for at-risk, low-income adults and requiring payments for documented risk mitigations across all five MMC plans for this audience. These changes in policy and practice would help enable

the expansion of service capabilities similar to those developed in Lucas County, while also providing funding to mitigate risk(s) for individuals whose care coordination costs are not currently covered by a MMC plan.

Finally, it is our understanding that MMC payments do not cover costs associated with program evaluation, through which HCNO's HUB recognized program implementation challenges and needed management responses. The State of Ohio may want to establish systematic funding for research and evaluation to support continuing improvements in care coordination services, including those relating to the Pathways Community HUB model. The initial work underlying this study was made possible through federal funding for evaluative studies. State funding for similar evaluative efforts would likely enable public health leaders and policy makers in Ohio to benefit from the ongoing generation of knowledge on challenges, management responses, and lessons learned from care coordination initiatives.

While this study and previous work^{1,2,24} suggest that the Pathways Community HUB model represents a promising approach for addressing health disparities, expanding healthcare access, and increasing the cost-effectiveness of healthcare services, further research relating to its use and impacts is warranted. More detailed and longer-term evaluations of existing programs for adults with chronic illnesses are also warranted, and more comprehensive assessments of Pathways Community HUB interventions would be helpful. A Risk Reduction Research Initiative (RRRI) has been established with the goal of guiding research to inform beneficial transformations in the health care and social service systems.²⁵ It also envisions further efforts to assess the extent to which specific identified risks and efforts to mitigate them actually result in positive health outcomes. More broadly, this initiative builds upon the risk-based focus of the Pathways Community HUB model and works to more comprehensively identify risks, evaluate the effects of risk mitigation, and assess the impacts of these risks and their mitigation on health and cost-related outcomes, both individually and in combination.

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