

Evaluating Primary Care Delivery Systems for an Uninsured Hispanic Immigrant Population

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Hispanic populations experience disparities in health outcomes and health care. Using participatory methods, we evaluated 4 systems of primary care delivery for an uninsured Hispanic population. Best practices were determined that could be translated back to the partner clinics and the community. The assessment included patient service areas, provider discussion groups, patient surveys, calculation of travel distances, and costs. The following best practices were identified: improved proximity to services, enhanced bilingual services, affordable services, and integrated services. Researchers and providers not only identified translatable service delivery practices but also laid the foundation for ongoing research partnerships. **Key words:** *participatory research, primary care, uninsured Hispanic population*

THIS ARTICLE describes a collaborative research project that identified and addressed challenges experienced by both Hispanic patients and their primary health care providers, with the goal of establishing best

practices across a network of health service providers to the Hispanic community. Hispanics are the fastest growing ethnic population both in the United States and in Charlotte, North Carolina, a pre-emerging immigrant gateway with limited historical experience welcoming foreign-born newcomers.^{1,2} Charlotte has seen its Hispanic population increase more than 1000% since 1980.³⁻⁵ Although social networks play a role in immigration to this community, most are drawn to the area through economic opportunities in the construction, landscaping, personal services, and food processing industries.⁶ These jobs are characterized by low pay, limited job security, and occasionally physically dangerous working conditions that can negatively impact health.⁷ In addition, many arrive from rural Mexico or Central America and face challenges associated with adjustment to urban settings. They may have received little formal education in their homeland, and some are illiterate in their native language.⁶ Among Mecklenburg County's

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Hispanics, 16.9% of families are below the poverty line (more than twice the figure for the county as a whole). These characteristics affect the ease and speed with which Hispanic newcomers can integrate into the local culture. Most Hispanics concentrate in low-rent, multifamily apartment complexes, and aging housing stock in inner-ring suburbs where high-density Hispanic residential concentration provides the benefit of social support and public transportation routes and arterial roadways provide ease of accessibility to multiple job sites.⁵ Overall, access to amenities and services is difficult and the population faces challenges in their daily lives including access to health services.⁸⁻¹¹

The life course health development model highlights some important causes of health disparities in general and when used as a conceptual framework helps explain health and disease patterns—particularly health disparities—across populations and over time. Key concepts that directly relate to the immigrant experience are as follows: today's experiences and exposures influence tomorrow's health; health trajectories are particularly affected during critical or sensitive periods such as immigration; the broader community environment—biologic, physical, and social—strongly affects the capacity to be healthy; and while genetic makeup offers both protective and risk factors for disease conditions, inequality in health reflects more than genetics and personal choice.^{12,13}

Previous studies by our research network have identified access to affordable health care as a primary concern among Charlotte's Hispanic population.¹⁴⁻¹⁶ Furthermore, it has been reported that this group underutilizes primary care¹⁷ and faces disparities in health outcomes as a result. Patients who utilize primary care services have better health outcomes, reduced medical costs, and are less likely to suffer from disparities.¹⁸⁻²² Despite the existence of a network of safety-net health centers in Charlotte that provide primary care services to Hispanic immigrants, disparities in access to primary care have increased^{17,23,24} and uninsured immigrant pa-

tients go without medical care at a high rate.²⁵

PARTNERS AND PATIENTS

Congruent with the life course development model, our research team sought to identify best practices for delivering affordable primary care services to the uninsured Hispanic population in Mecklenburg County. Four health care delivery sites were chosen from among members of the Mecklenburg Area Partnership for Primary-care Research, which is a practice-based research network established in 2006 to address disparities in Hispanic health care access.^{2,26} Each site represented a distinct method of primary care delivery. Collectively, the sites' patient populations included the majority of the county's uninsured Hispanic population (Figure 1, Table 1).

CLINIC PARTNERS/CARE DELIVERY SITES

Community free clinic

A largely volunteer staff of providers cares for more than 2500 Hispanic patients. The clinic treats adults only and offers specialized care for patients with diabetes and heart disease. All of the patients lack insurance, and the majority of the patients speak only Spanish. Approximately 40% of the clinic budget is provided by a hospital system.

Low-overhead bilingual clinic

It provides care to more than 2000 patients from the Hispanic community, using a bilingual provider and staff. The clinic has reduced overhead by not taking appointments or insurance, thus avoiding costs associated with billing and filing insurance. All patient costs are upfront. This clinic is self-sufficient, for-profit, and receives no outside funding or grants.

Emergency department

The emergency department (ED) is located near a large Hispanic community that accesses

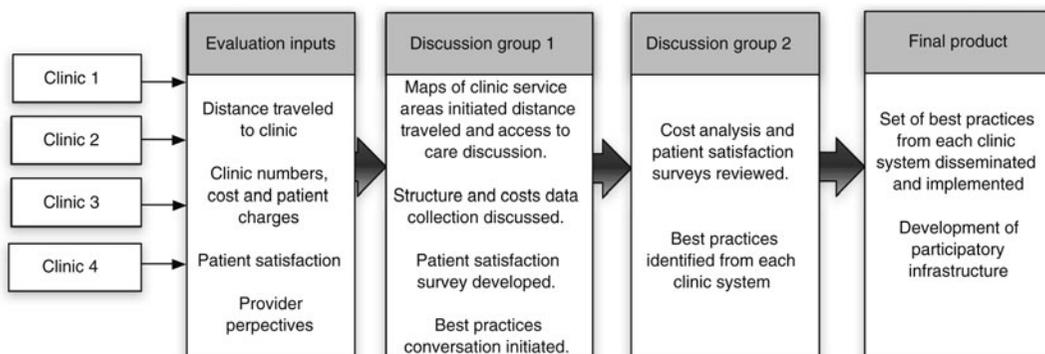


Figure 1. Overview of the project.

this ED for primary care. Approximately 60% of visits to this ED are primary care treatable or preventable,^{27,28} hence its inclusion in this study.

Hospital-affiliated clinic

The local non-profit health care system has ambulatory clinics that provide primary care for uninsured patients. One practice is de-

signed to provide care for more than 4000 Hispanic patients per year. Funds for this clinic are provided by the non-profit health care system and Mecklenburg County.

Provider representatives from each study site participated in the project as research partners. They reviewed and confirmed collected data and analyses across all components of the study and provided expertise about the challenges of health care provision

Table 1. Clinic Characteristics and Number of Patients

Practice	Practice Characteristics for 2008			Hispanic Patient Data for 2008			
	Electronic Medical Record	Total Patient, N	No. Full- or Part-time Bilingual Providers (No.)	Patients, n	% Medicaid	% Chronic Disease ^a	% Pediatric
Community free clinic	No	2 209	42 (3)	924	0	85	0
Low-overhead bilingual clinic	No	2 728	2 (2)	2 728	0	~40 ^b	~20 ^b
Emergency department	Yes	57 060	111 (2)	3 927	42	4	47
Hospital-affiliated clinic	Yes	10 564	12 (2)	5 489	66	20	78

^aUnless otherwise stated, included categories were diabetes, depression, heart failure, asthma, and HIV infection.

^bChronic disease was diabetes only. Data based on retrospective analysis of 1 week of appointments by physician.

for uninsured Hispanic community members. By actively promoting clinic partner involvement, we were able to demonstrate the value of participatory research. Among its benefits, the partnership facilitated collaborative decision making around study implementation, rapid dissemination of results, and ensured the translation of the research findings into clinical practice.

METHODS

The life course health development model highlights numerous factors affecting health outcomes. Our participatory methodology triangulated a combination of geospatial, quantitative, and qualitative analyses to address this complexity. To evaluate delivery systems and determine best practices that could be translated back to partner clinics, we assessed the following: clinic structure and costs; patient service areas; provider perception about working most effectively with the Hispanic uninsured; and patient perspectives about quality of care, travel distances, and service costs. The project was approved by Carolinas Healthcare System's institutional review board.

Discussion groups

Two discussion groups with representatives from each participating study site were held at the beginning and end of the study (see Figure 1). Ten providers were present for both groups, consisting of 3 physicians, 3 nurses, 3 administrators, and 1 bilingual translator.

The first goal of the discussion groups was to build trust between the partners and gather knowledge about their experience as providers for uninsured Hispanic patients. Providers were shown maps of the city's Hispanic population relative to the location of their and other partner clinics (see Geospatial Analysis section later). This approach facilitated discussion about the shared challenges of access and providing care, an initial group assessment of best practice elements, and the

introduction of data sharing and participatory research.

The second goal was to gather and share information about structure, funding, staffing, and costs at the clinics. This information was used as a basis for clinic comparisons and a foundation to refine both the structure and administration of the patient survey.

The third goal was to collectively review and assess the data collected; discuss the initial analysis; and ensure that the study's recommendations were relevant, applicable, and feasible for the clinics to implement. To achieve these goals, the first discussion group meeting was held at the beginning of the study and focused on the first 2 goals. The second discussion group meeting occurred toward the end of the study after data had been collected, de-identified, and analyzed. At the second meeting, participants shared preliminary results with clinic partners, discussed the value of participatory research, and validated the findings. It also provided an opportunity for the group to work collaboratively to determine how study results could be translated back into clinic practices to enhance access and services for the target population.

Discussion groups were directed by one of the primary investigators following a written agenda that included the content in Figure 1. Sessions were tape-recorded, fully transcribed, and evaluated using qualitative content and thematic analysis techniques (summarized in Table 2).^{29,30}

Throughout the project, researchers and clinic partners remained in regular communication, which facilitated ongoing sharing of information about research processes and findings.

Geospatial analysis

Geographic Information Systems (GIS) can be readily used to identify areas that require increased access to primary care services.^{15,31-33} Maps were developed using ARC GIS (ESRI, Redlands, California), an approach utilized by our team in previous research.¹⁵ Maps identified service areas for each clinic relative to

Table 2. Overview of Methods and Related Findings

Methods	Findings
Mapping of service areas	<p>GIS analysis verified boundaries of main service areas for each clinic. Maps showed providers high-density areas where Hispanics had limited access and where future services could be located. Maps also facilitated provider discussion on aligning patient residences and proximate clinics.</p> <p>Arterial road and bus route mapping allowed better understanding of patient travel challenges.</p> <p>Providers made a number of recommendations about how maps could be revised and used as a tool for improved service.</p>
Discussion groups with providers	<p><i>Access:</i> Providers had trouble meeting the demand for access to primary and specialty services. Partially a function of patient volume.</p> <p><i>Affordability:</i> Providers had common concerns about affordability, particularly where access was tied to patient income.</p> <p><i>Culture:</i> Providers recognized challenges flowing from disconnects around cultural norms, expectations, and language. For example, there was much discussion around use of interpreters and impact on quality of patient care. Providers detailed concern and evidence around patient fear over documentation status.</p> <p><i>Education:</i> Providers felt that improving health education and health literacy would help patients both in terms of access and outcomes.</p> <p><i>Navigating the system:</i> Providers were aware that patients had many issues around navigating the health care system. For example, comments were made about appropriate ED use and the importance of continuity of care.</p> <p><i>Changes in perceptions:</i> Between the 2 discussion groups, there emerged a deeper understanding of provider challenges and reasons behind those challenges; patient experience as Hispanic immigrants; importance of acculturation and length of time in the United States as factors contributing to improved access and health outcomes; and the value of participatory research.</p>
Survey of patients	<p>Patient surveys supported results of discussion groups. Despite differences in approach, cost, levels of cultural competency, language services, and access across the clinics, there were striking similarities with regard to patient satisfaction and perceived provider concern for their patients. Patients valued engaged and caring primary care doctors and judged the quality of visits on these human skills.</p> <p>Patients were significantly more likely to visit the ED as recent arrivals than as more established residents (4-10 y).</p> <p>Clinics with full bilingual services (front desk and provider) and affordable upfront costs were most appealing to patients who were willing to travel for these services.</p>

Abbreviations: ED, emergency department; GIS, Geographic Information System.

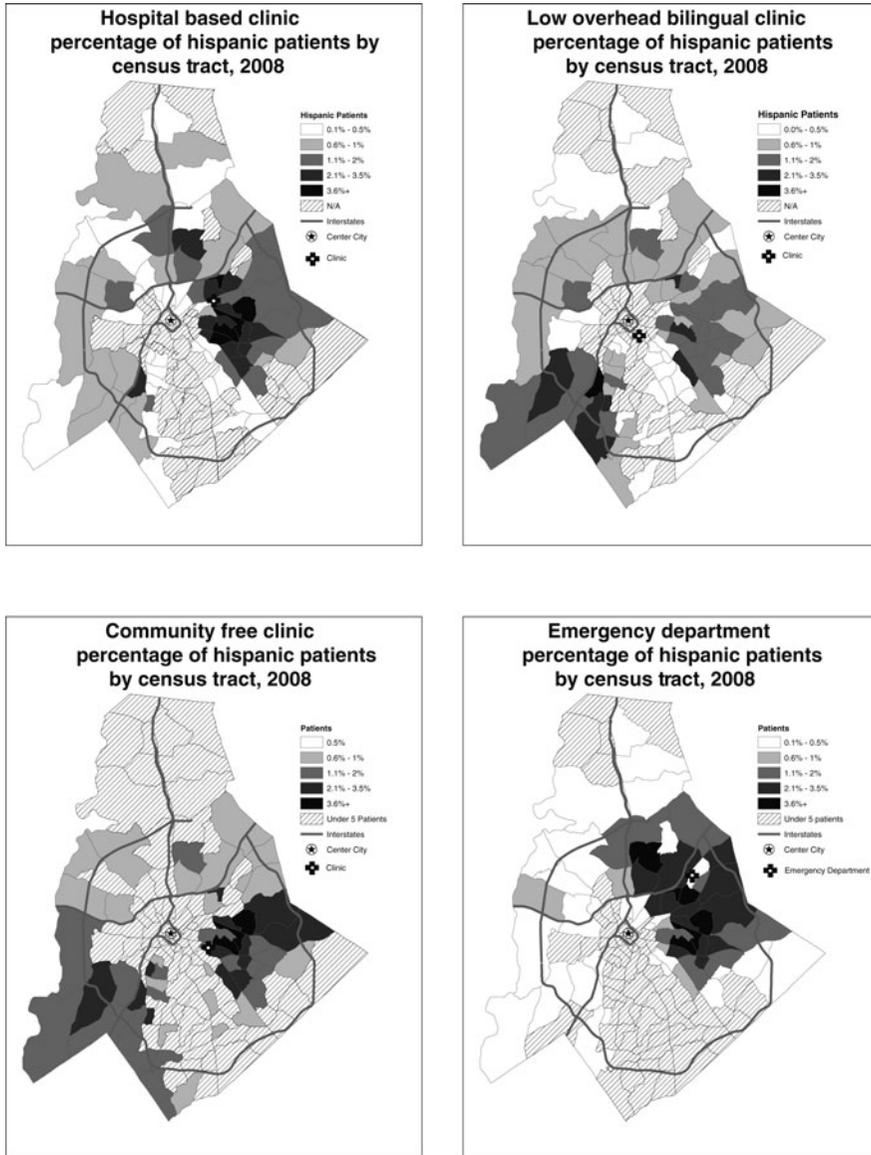


Figure 2. Maps of the patient population for each clinic.

patient residence (Figure 2, Table 3).³⁴ Specifically, visits for the ED and hospital-affiliated clinic in 2008 were extracted from hospital databases. Comparable data were submitted by the other clinic partners. Once de-identified and geo coded, the data set yielded maps at the census tract and zip code levels. The maps showed residential distribution of all Hispanic patients visiting clinics as a pro-

portion of all Hispanic residents in that particular geographical region (Figure 2).

Patient survey

Patient responses to questions about their perception of cost, distance, and quality of care were gathered using an amended standardized patient satisfaction survey

Table 3. Main Responses to Open-Ended Questions in Patient Survey

Practices (No. Open-Ended Responses/Total No. Completed Surveys)	Patient Satisfaction Perspectives			Longest Time in United States for Most Respondents, ^a y
	Would You Refer This Clinic to Friends, ^a %	What Do You Like Most About the Clinic? (No. Responses)	What Do You Like Least About the Clinic? (No. Responses)	
Community free clinic (survey responses: 39/42)	100	Overall attention (31)	Difficult to become a patient (3) Getting appointment (4)	4-6
Low-overhead bilingual clinic (survey responses: 38/41)	100	Overall attention (19) ^b Bilingual staff (12) ^b	Waiting time (14) ^b	7-10
Emergency department (survey responses: 39/45)	98	Overall attention (29)	Waiting time (5) Lack of attention (4)	1-3
Hospital-affiliated clinic (survey responses: 39/43)	100	Overall attention (23)	Waiting time (7) Slow on returning phone calls (5)	7-10

^aRespondents were asked “How long have you lived in the United States”? Choices were <1 year; 1-3 years; 4-6 years; 7-10 years; > 10 years.

^bSignificantly different from other clinics (Student *t* test, 95% CI, *P* < .05).

of the US Department of Health and Human Services.³⁵ The survey utilized a “yes/no,” Likert scale and open-ended questions. For example, “Please circle how well you think we are doing in the following areas: The provider gives you good advice and treatment” (great, good, OK, fair, poor), “Do you consider this center your regular source of care” (yes/no), “What do you like least about our center?” (open-ended). Three of the questions along with the responses are given in Table 3. The survey took approximately 15 to 20 minutes to complete and was conducted on-site at each of the clinics during the summer of 2009. A sample of approximately 40 to 50 uninsured adult Hispanic patients in each of the 4 clinics was surveyed. Patients were selected through purposive and convenience

sampling. Requirements for participation included being Hispanic, uninsured, and an adult. Patients were recruited and selected in 1 of 2 ways depending on the clinic type. For non-ED practices, the survey team visited waiting rooms at each practice during the course of a week per clinic. Patients who were waiting for, or had just finished, their appointments were recruited. For the ED, Spanish-speaking uninsured patients were recruited by ED staff. Patients were asked whether they would be willing to meet with research team members and complete a survey while waiting for discharge paperwork. In all cases, participation was voluntary and the survey was administered after the patient had seen the physician. Surveys in the ED were conducted in a private examination room. Surveys in the

non-ED clinics were conducted in a quiet, private space in or near the patient waiting room. All surveys were administered by bilingual, bicultural research team members. To ensure full comprehension of the survey, research team members offered to read questions aloud if participants indicated less than a complete understanding of the materials.

A total of 171 surveys were completed. It is important to emphasize that our goal was not to survey the entire patient base of each participating clinic (see Table 1 for total number of Hispanic patients in each clinic). Rather, our goal was to triangulate the survey data with the data from the geospatial analyses and provider discussion groups. This was done to identify variations in findings across the different methodological approaches. Our goal was to cross-validate results and provide a richer analysis that reflected a life course approach and illuminated “real-world nuances” essential to the successful translation of our results back into the practices.³⁰

Statistical analysis

Statistical significance of the patient satisfaction survey was assessed by *t* tests. These *t* tests were conducted between the ED and each clinic (see Table 3). The analyses were 1-tailed, type 2 *t* tests, with scores significant at the 95% confidence interval ($P \leq .05$). Qualitative responses were converted to a binary format. For example, with the question “What do you like most about the clinic?” all answers related to “the attention” were assigned 1 and all other responses were assigned zero.

RESULTS

Service area, travel distance, and access

Our first results flow from the triangulation of the geospatial and discussion analyses. Maps of each clinic service area were developed for discussion groups (see Figure 2). The maps enabled providers to identify and discuss issues around service area range and character, transportation routes (data not included here), and alternatives to clinic loca-

tion. Providers also discussed ways in which maps could be revised and utilized as a tool for improved service. It was suggested that information about bus routes and major arterial roadways should be included. Providers also decided that zip codes rather than census tracts should be used because clinic staff and patients were more familiar with zip codes.

Maps revealed large areas of Hispanic population, with no clinic representation. The ED located in the northern corner of the county noted that they were seeing patients from the southwest. “It’s interesting that you point out the lack of clinics in that southwest area, because I’ve noticed in the past year a tremendous increase in the Hispanic population in the ED that is from the southwest.”

The maps also allowed providers to suggest local clinics to patients who lived more peripherally.

The darker blue too is closer to [another clinic] sic so in a way this may help us say . . . ok, [another clinic], these are the patients that live closer to you and [another clinic], these are the patients that live closer to you. Maybe we need to talk about you taking those patients and let us focus more on the pink zone. So that helps us in looking at this.

One provider noted that maps “. . . show us where we’ll target our satellite clinics. That’s what we need to do, is to reach out into that community even if it’s a rented space.”

Arterial road and bus route mapping allowed providers to understand patient travel challenges and the extent to which transportation was a potential barrier to access. Another provider observed:

Looking at the maps in the southwest corner of the county there’s a pretty good concentration of Latinos. The clinics are not in the area. They are pretty much focused in the uptown and northeast side of the city. So, we hear this from our patients that there are some that are living in that area of the county and are having a very difficult time . . . Those are the patients that are spending 2.5 hours on a bus, various buses, to get to our clinic.

Providers also discussed the compounding challenge of local transportation policy. A Technical Corrections Act passed by the

Table 4. Average and Median Distance Traveled by Patients to Each Clinic

Practice	No. Patients Analyzed	Distance Traveled	
		Average, miles	Median, miles
Community free clinic	924	5.59 ± 3.49	5.00
Low-overhead bilingual clinic	2728	8.30 ± 2.76	6.25
Emergency department	3927	5.26 ± 2.72	4.76
Hospital-affiliated clinic	5489	4.56 ± 3.16	3.86

NC General Assembly in August 2006 made it harder for immigrants to get a driver’s license and virtually impossible for undocumented immigrants. One of the providers predicted that the effect of this new law on immigrant access to health care would continue to escalate as licenses expire, prompting outreach to try and address the problem:

The Hispanic population, they’re losing their licenses so they can’t drive and that’s one of the ideas . . . we have another project to resolve that issue. To help people to come in and drop them off and help a little bit . . .

Maps were also used in combination with calculations of distance traveled for each of the patient survey participants in the study clinics. The average distance traveled for Mecklenburg County patients in this study from their home address to a study clinic location was between 3 and 8.3 miles (Table 4). The ED, community free clinic, and hospital-affiliated clinics drew patients primarily from nearby areas, with proximity emerging as a significant factor in clinic choice for many of the surveyed patients. While this result was expected,³⁶ proximity to patient residence emerged as secondary to patient cultural comfort at the low-overhead clinic, which had the widest service area and highest patient to provider distance traveled (8.3 miles).

When combined with patient responses, the data revealed that patients in this low-overhead clinic were willing to travel comparatively longer distances than to the other clinics. Mode of transportation also emerged

as important to patients. Sixty-five percent to 75% of patients at the community free clinic and hospital system clinic relied on private transportation by driving themselves or having someone else drive. For the other 2 clinic types, private transportation reliance exceeded 75%, with the low-overhead clinic clearly showing the highest level of patients driving themselves. Patients at the community free clinic and hospital system clinic had the highest bus ridership, with approximately 20% of patients using this mode of transportation.

Patient satisfaction

The results of *t* tests demonstrated that the low-overhead clinic demonstrated the greatest patient satisfaction when compared with the other clinics. In addition to revealing transportation modes and patterns, the surveys showed that patients valued caring and engaged primary care doctors and judged the quality of visits on these human skills (“overall attention,” see Table 3). One patient said that what he liked most about the free clinic was “the attention and that they always attend to me with much kindness. I am very grateful”. Another stated, “The attention and service . . . everyone is very respectful and they make me feel calm and confident.”

Access to bilingual staff was important. When asked what they liked most, one patient described “attention and that they have translators and medicine” (open-ended questions and see Table 3). Bilingual staff was rated as

Table 5. Cost Associated With Services for Patients and Providers

Practice	No. Patient Visits	Provider Cost per Patient Visit, \$	Charge to Patient for Routine Visit, \$
Community free clinic	8 390	157	10 ^a
Low-overhead bilingual clinic	7 800	65	65 ^b
Emergency department	70 220	150.00 +	500.00 +
Hospital-affiliated clinic	28 964	293	0 + ^c

^aFree influenza vaccination.

^bInfluenza vaccination not included.

^cLowest visit charge for a patient on a sliding scale.

the most important factor in clinic choice in the low-overhead bilingual clinic. All 4 of the sites offered an interpreter or some kind of translation service via telephone. This service was not always available at the front desk.

Among the patients surveyed, length of time living in the United States varied by site. For example, patients who were recent arrivals were significantly more likely to visit the ED (<1 year, and length of time living in United States 1-3 years, 95% CI, $P < .05$) than more established residents (4-10 years).

This acculturation-related result was supported by the discussion groups. Several of the providers emphasized the relationship between decreased ED use and increased time in the United States as a positive trend for the clinics and as a focus for intervention. Providers noted that if newcomers knew more about which systems were geared to which health care needs, the use of the ED for primary care might decline further. One of the providers explained:

This is what I've noticed that is good for the clinics. It seems that the longer the time someone has spent here, the fewer ER visits there are. So they're becoming more savvy about the clinic system and how to access it and finding a home.

Overall, providers indicated that the patient surveys were very useful in clarifying points of satisfaction and dissatisfaction among their patient base:

It helps us to focus on what the problems are in terms of getting care specifically; in terms of—Is it transportation? Is it cost? It helps break down the strengths and weaknesses of the care we're currently providing. And then gives us a means in terms of what we can improve on, because before this we didn't have any objective data.

Affordability and costs

We examined costs in terms of patient charges, provider costs (Table 5), and cost perspectives given by patients and providers to open-ended survey questions and during discussion groups. From discussion groups, we learned that all providers were concerned about affordability. "We have patients who are able to pay for their consultation and they may not be able to do anything else for the rest of the month, except pay their bills". The ED provider noted: "We are forced to tell them to come back to see us as their regular family doctor. Because we really don't have a choice . . . we just take care of that."

The community free clinic and hospital-affiliated clinic screen patients to receive low cost services. For these clinics, there are additional concerns for the patients not seen due to qualification impediments or documentation status. "If they're undocumented then they're not eligible for sliding scale, so . . . that makes the financial burden that much more . . ."

The affordability of the community free clinic was clearly appreciated by the patients.

One patient noted, "It is accessible and economic for those that don't have medical insurance. Thank you for offering services that are almost free for people that do not have a lot of money." Patient surveys indicated comparative difficulty in affording care at the ED, the hospital-affiliated clinic, and the low-overhead clinic, with the highest charges coming from the ED (more than half of patients typically paid >\$100 per visit). For the ED, a patient noted that they needed "better payment plans because the prices for visits are already very expensive." There was consensus among providers in discussion groups and confirmed by patient surveys that most patients were willing to pay if they knew what they are paying for, with a preference for upfront costs.

Best practices for delivery of primary care

Our participatory and mixed-methods research identified elements of "best practices" among the provider partners that could be (and in some cases were) easily translated back into their clinical site. As seen in Table 6, these practices include using GIS maps as a tool to show current and potential clinic service areas to illuminate barriers to access related to distance and modes of travel and to identify areas lacking or overlapping service. Our research emphasizes the importance of enhancing cultural competency in clinics serving Hispanic immigrant patients. Ensuring that patients have access to bilingual staff from the beginning to the end of their visits is one element of this competency. The low-overhead bilingual clinic that offers full bilingual services, both at the front desk and with the providers, drew patients who were willing to travel greater distances and pay an affordable upfront cost.³⁶ Both patients and providers identified a culturally targeted, patient-centered medical home,^{8,37} with continuity of care as the ideal for receiving care.

DISCUSSION

Behavioral models of health care access consider individual-level need; predisposing

factors; enabling factors; and contextual characteristics of access, use, and quality of care.³⁸ Need and predisposing factors include relatively fixed sociodemographics such as age, gender, and nativity. Enabling factors, such as costs, income, and health insurance status, are also thought to facilitate or hinder access to care. For immigrants, additional characteristics, including language ability, literacy, place of birth, recency of arrival, and degree of acculturation, are also essential to consider when evaluating access to (and outcomes of) health care.^{33,39} For Hispanics nationally, bilingual services and cost are known predictors of disparities in access.^{40,41} But as the numbers of Hispanic immigrants increases, factors associated with the experience of migration and trajectory of settlement need to be considered. The life course health development framework suggests that achieving optimal health goes beyond medical/clinical care and current public health practice. The framework is rooted in social determinants and social equity models and provides an innovative way to look at long-term effects on populations, particularly those without access to health care. Instead of focusing on differences in health patterns one disease at a time, life course points to broad social economic and environmental factors as underlying causes of persistent inequalities in health for a wide range of diseases and conditions across population groups. It recognizes that health trajectories are particularly affected during critical or sensitive periods of the life course such as immigration.¹² In addition, it recognizes the role played by broadly defined environmental factors—physical, social, and biological—both in the capacity to be healthy and in equity of access and outcome.

This study identified and addressed challenges experienced by both Hispanic patients and their primary health care providers, with the goal of establishing best practices across a network of health service providers to the Hispanic community. A mixed-methods and participatory approach was utilized to intersect provider and patient perspectives. This approach facilitated the identification and

Table 6. Best Practices and Translation of Best Practices Into Clinics

Best Practice	Translation of This Research and Other Initiatives Into Everyday Practice
Use service area maps to identify clinic service areas	Providers are encouraging patients to utilize clinics closest to them.
High-need service areas were identified that currently have no clinic facility serving patients	Two clinics are planning to open satellite clinics in these areas.
Better understanding of patient travel needs	One clinic plans on operating a bus service to bring in patients unable to drive.
Target information about primary care clinic availability in the emergency department to recent immigrants	Some flyers are available in the emergency department detailing alternative continuity service.
Cultural comfortable—bilingual service availability	All new staff members in the low-overhead clinic are bilingual. Most clinics expressed interest in increasing bilingual service.
Costs—low-overhead model with upfront payment	Two clinics have added new services at new locations offering low-cost services to uninsured patients with chronic disease.
Streamlining access to clinics and clinic services	A committee meets regularly from across the community including safety-net providers, community stakeholders, and researchers to look at ways to streamline access to clinics and clinic services.
Hispanic community-targeted health care education	Efforts are being made to provide culturally competent chronic disease education information presented with low health literacy as a consideration.
Dissemination across the community-wide safety net	Researchers have presented results of this study to a monthly MedLink meeting that brings community-wide safety-net providers together.
Encourage continuation of partnerships between researchers and safety-net clinics	Several of the discussion group providers are active on MAPPR community advisory board that continues to focus on Hispanic health care.

Abbreviation: MAPPR, Mecklenburg Area Partnership for Primary-care Research.

implementation of best practices that reflected the life course position of uninsured Hispanic patients and could be translated into enhanced and more effective service.

In this research that highlights the power of participatory collaborative research, we developed partnerships with clinic providers from the outset of the study to identify problems associated with access in the practices and to develop effective strategies to over-

come these issues. Over time, partnerships evolved such that providers were willing to discuss both positive and negative issues associated with their clinics and work together to identify and operationalize solutions. Furthermore, establishing and nurturing partnerships between researchers and providers facilitate collaboration between clinics themselves, leading to greater streamlining and efficiency of service across the community.

Extending beyond this study, a continued relationship with the clinical sites has evolved. Each site has requested additional maps, helped verify data analyses, and assisted with qualitative research on other projects. Indeed, the partnerships from this project lay down the foundation for the development of a community-based participatory research network, which includes researchers, patients, providers, and Hispanic community members. This network has since worked together, using a participatory approach to identify and develop an intervention around a disease of importance to the Hispanic community.²

Our research has implications across a number of other areas. For clinical practices, we encourage streamlining of safety-net services so that barriers to eligibility and access are diminished. For practice and health education, GIS technologies can assess both current and projected patterns of access to distribute delivery of care more effectively.

Several limitations of the study are important to mention. Previous studies of patients' satisfaction with health care providers have revealed surprisingly positive evaluations that do not reflect actual opinions.^{42,43} Fear of authorities is high in the Hispanic community, which may add to patient reluctance to express real opinions. To mitigate against this and to maximize patient comfort and trust, we used a survey team comprising Spanish-speaking male and female students who did not wear hospital identification badges. The team members spent time in the clinics getting to know the front-desk and di-

rect provider staff, as well as the dynamics of each clinic. Their visible and extended presence in the clinic enhanced patient comfort and trust. This research established methods and partnerships that moved us toward our goal of using both patients and providers as full research partners.

CONCLUSIONS

Our findings align with other research that shows clinical sites with bilingual front-desk staff and providers, as well as clearly listed, upfront affordable costs, are best able to provide culturally comfortable and life course-sensitive primary care for uninsured Hispanic patients. In addition, we show that the combined use of participatory research partnerships and triangulated geospatial, quantitative, and qualitative methods allowed broad analysis of preferred practices for uninsured Hispanic patients. Such an approach also facilitated rapid dissemination and application of these results back into partner clinics. This study acts as a springboard for comprehensive analysis using patients and providers as research partners to further streamline services across all safety-net hospitals and clinics. The research methods used in our study could be used by other researchers, particularly in communities where the large-scale arrival of Hispanic immigrants has presented the health care sector with the challenge—and opportunity—of providing affordable and effective care to a rapidly diversifying population.

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