

Ethnographically Informed Community Evaluation: A Framework and Approach for Evaluating Community-Based Initiatives

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Abstract:

Objectives: This paper describes ethnographically informed community evaluation (EICE), a framework for evaluating complex community-based interventions, and illustrates its use in the evaluation of Baltimore City Healthy Start, a federally funded infant mortality prevention project. EICE, which is influenced by cultural anthropology and assets-based community assessment, supports continuous program improvement, resident involvement, and measurement of community-level change. This approach takes into account both individual and contextual levels of analysis.

Methods: The evaluation coupled a participatory approach with qualitative and survey research methods to study community context and how it might contribute to infant mortality and influence program implementation, and to assess community change resulting from the program. Data collection included focus groups, key informant interviews, surveys, neighborhood mapping, journaling, and a study of community problem-solving.

Results: The evaluation provided program-related feedback to staff, contributed to a collective understanding of the local context, validated and augmented outcome findings, and imparted skills and a sense of empowerment to the neighborhood. Results reveal a community burdened by crime and social problems, yet showing great diversity in physical and social conditions when examined at the census block group level. Nevertheless, these social and physical hazards in the community are more salient than any specific health issue such as infant mortality.

Conclusions: EICE is a powerful evaluation approach able to respond to the complexities of community-based maternal and child health initiatives designed to institute changes across multiple domains. EICE may be used, in whole or in part, as a supplement to traditional designs.

Keywords: Evaluation, Community-based research, Ethnography, Public health, Maternal and child health, Infant mortality, Qualitative research methods

Article:

Introduction

With the growing appreciation of the complexity of social and environmental influences on health and human development [1–4], numerous public health initiatives have incorporated strategies at various levels to strengthen families and communities. These initiatives include the World Health Organization's Healthy Cities projects, the Annie E. Casey Foundation's Making Connections initiative, comprehensive child development programs like Head Start and Early Head Start, and the Healthy Start infant mortality prevention program [5–9].

The programs, however, are based on complex theories of change that present both conceptual and methodological challenges to evaluators.

Traditional program evaluations typically mirror the individual-level focus of public health programs. These evaluations are appropriate when a program implements a single intervention and participants can be randomly selected for treatment and control groups.

However, new approaches that incorporate more sophisticated quantitative and qualitative methods are needed to capture the programmatic realities, contextual influences, [10–12] and outcomes of broad initiatives. Only a few studies using such methods have been reported [13–15], perhaps because of the challenge of presenting very complex information within the standard length requirements of most journals.

This paper describes an approach we developed, called *Ethnographically Informed Community Evaluation* (EICE), and reports its use in the evaluation of Baltimore City Healthy Start (BCHS), a federally funded infant mortality prevention project.

Program background and evaluation objectives

The Healthy Start Initiative began in 1991 as the Healthy Start Infant Mortality Prevention Demonstration Program and originally targeted 13 cities and 2 rural areas across the United States. When the demonstration phase ended in 1997, the initiative continued in Baltimore and 96 other sites. This paper focuses on the Baltimore City Healthy Start program (BCHS) during the demonstration phase, between 1991 and 1997.

The goal of the BCHS was to reduce infant mortality through provision of comprehensive, community-based services to pregnant women, their infants, and their neighborhoods. The program design was based on the view that outcomes such as infant mortality, which is associated with poverty and poor living conditions, cannot be overcome by intervening with individuals while neglecting the contexts in which they live.

The two-part evaluation encompassed (1) a participant-level evaluation, which examined reproductive health outcomes; and (2) a community-level evaluation, which looked at contextual variables hypothesized to influence program implementation and outcomes, and the nature and direction of community-level change. This paper reports on the community-level evaluation.

Conceptual framework: Cultural systems paradigm

In anthropology, the term “cultural ecology” is used to describe the transactional relationship between culture and environment. Accommodations and adaptations are made between human populations and their environments such that basic human needs are met. Through natural selection, certain cultural traits and patterns are favored and preserved. Cultural patterns can also directly alter environment such as through agricultural and residential patterns, and the interaction between culture and environment leads to a process of continuous change [16–20].

Whitehead’s “Cultural Systems Paradigm” (CSP) [17, 20], an ecological model in the tradition of cultural ecology, was first used to describe food-related behavior in a southern US community and has since been used to describe the ecology of other health-related issues. The CSP provided a template for development of the EICE framework. Figure 1 shows the CSP-influenced EICE conceptual model, which considers context at two levels: the human ecosystem and the cultural system. The human ecosystem comprises the physical environment (e.g., residential housing, public transportation), historical and socio-political processes (e.g., racism, segregated communities), and basic human survival needs (e.g., clean water, shelter). The cultural system includes individual and shared idea systems (e.g., accepted attitudes and beliefs) which are both influenced by and disseminated through social systems (e.g., social networks, families), which in turn influence behavioral patterns (e.g., health seeking behavior, practices regarding parenting). Material culture and technologies are the products of a cultural system, but also have profound effects on how people think and behave (e.g., use of automobiles, computers, cell phones).

Guided by the CSP, the EICE used (1) ethnographic approaches to data collection and analysis and (2) a model of participatory action research. The ethnographic approach went beyond simple adoption of qualitative methods to include the hallmarks of ethnography, such as a holistic approach to understanding cultural systems; examination of socio-cultural contexts, processes, and meanings within cultural systems; use of an emergent, interpretive and reflexive process; and the centrality of fieldwork in the research process [21].

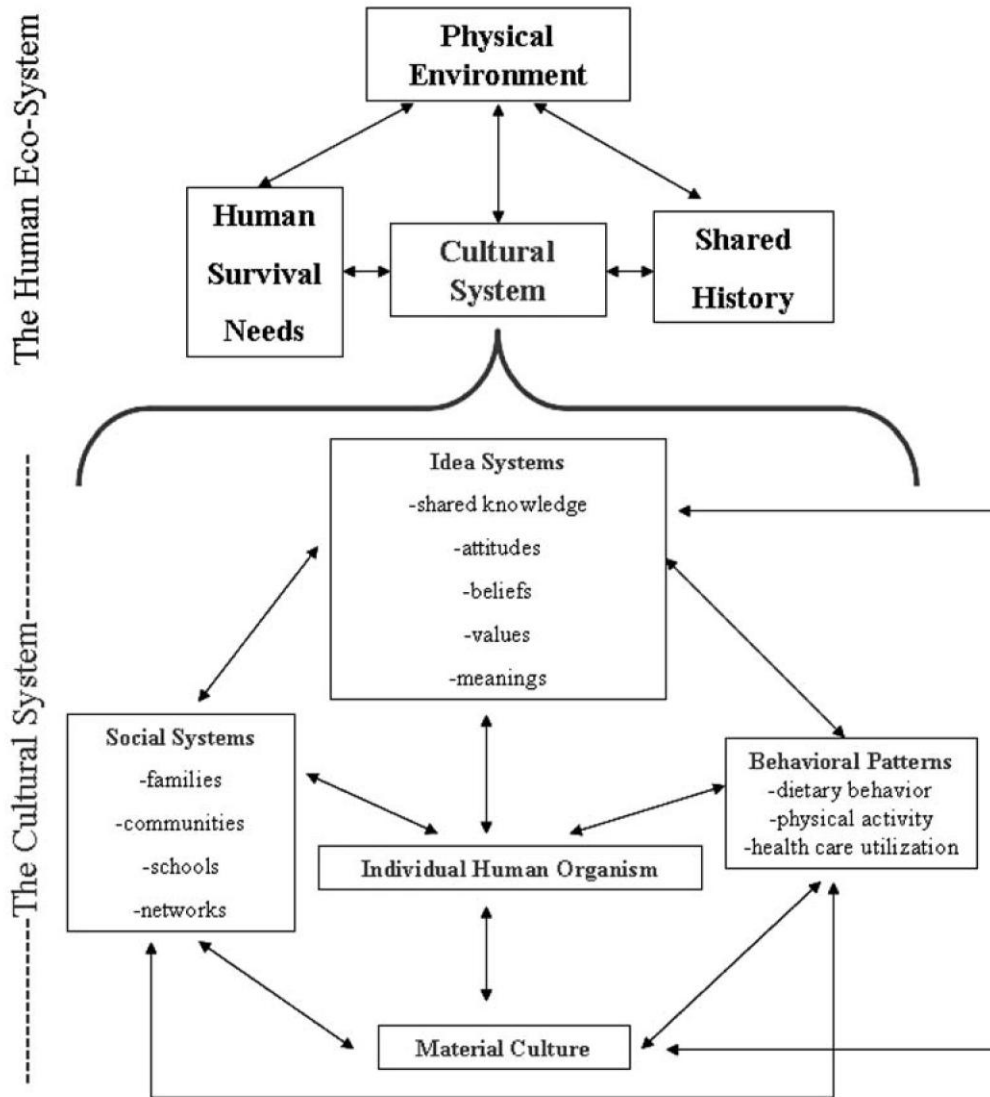


Fig. 1 Cultural systems paradigm

The EICE approach also embraced participatory research models of community evaluation [22–24] that stress collaboration for social change [3, 25, 26]. Our approach was a response to Hatch and colleagues’ entreaty to transfer knowledge and tools to the community and learn from the expertise and experience of community members, thereby building both evaluation knowledge and community capacity [27]. It has been argued that community participation in research varies depending on the epistemological assumptions of investigators, objectives related to community empowerment, practical issues of community entrée and data validity, and even local political dynamics and the community’s relationship to the scientific community [28]. There was a high level of participation by neighborhood residents in this evaluation because BCHS was involved in bringing about community transformation, and because the evaluation involved exploration of contextual and cultural issues related to health behavior and health outcomes. Interviewers from the community were used to reduce the social distance between interviewer and respondent, facilitate rapport, and thus increase the validity of the data [28]. One goal of the evaluation was to assure that benefits would accrue to the community from the research through building skills for future use (e.g., interviewing, community organization) [28].

Objectives of the evaluation

The aims of the community evaluation of BCHS were to understand how physical, social, cultural, economic, and political characteristics of neighborhoods were related to program priorities (e.g., reduction of infant mortality and low birthweight; increase in use of prenatal care), to provide continual feedback to program operations and policy staff for purposes of program improvement, and to examine ways in which neighborhood characteristics changed as a result of the program. The evaluation combined the expertise of local residents in designing, implementing, and interpreting research protocols and results with the expertise of trained professionals from outside the neighborhood skilled in research design, instrument construction, sampling procedures, and data analysis.

This paper describes the EICE framework and illustrates it using data obtained through the community evaluation of BCHS. Because of the comprehensive nature of the evaluation, a complete set of findings is beyond the scope of the paper. Instead, we illustrate how the methods used helped to describe the context in which the problems of infant mortality and low birthweight occurred, and how this description informed the development and refinement of the program.

Methods

The Healthy Start Community Evaluation was fully approved by the Johns Hopkins Medical Institutions Committee on Human Research.

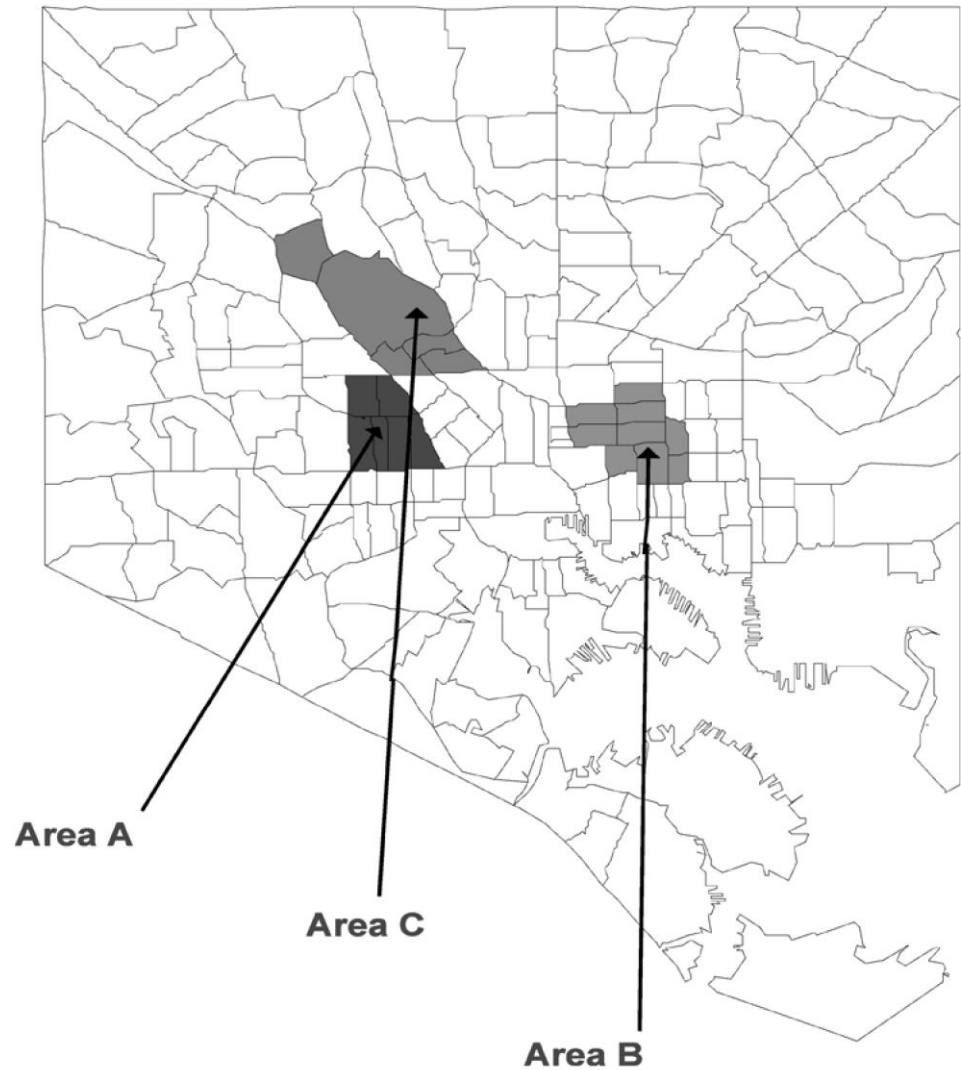
Setting

Baltimore was one of the original Healthy Start sites funded 1991. The most intensive efforts were in two target areas: a cluster of census tracts in West Baltimore (Area A) and a cluster of census tracts in East Baltimore (Area B, see Fig. 2). A third area that was similar to the other two in demographics and rates of poor perinatal outcomes was selected as a comparison community (Area C). The target areas were high-risk, underserved areas of the city where infant mortality rates were highest. This paper presents evaluation data only for the geographic area corresponding to Area A.

Data collection methods

A process of “neighborhood/community diagnosis” [29–31], including collection of ethnographic, household survey and secondary statistical data, was used to examine the residential context of poor perinatal outcomes. The neighborhood diagnosis produced an in-depth description of the physical and social context of BCHS and the language and salient issues used by residents to describe the problems, priorities and recommended solutions. Table 1 presents variables of interest for five of the domains of the conceptual framework most relevant to BCHS and the methods we used to collect data. For each of these variables, specific data types and/or indicators were delineated. Data collection methods included focus groups, key informant interviews, community surveys, neighborhood mapping and journaling. Table 2 presents a detailed list of topics covered and samples included for each of the data collection methods used.

Fig. 2 Baltimore City and three low-income neighborhoods



The inclusion of community residents as part of the evaluation team was a key feature of the evaluation. Residents helped frame and refine evaluation questions, including focus group, interview and community survey questions, and supported data interpretation; they also conducted interviews and coordinated portions of the research.

A community evaluation team that included between 4 and 8 neighborhood residents was formed (depending on the need at the time), with members selected based on residence in and commitment to the community and on skills needed for ethnographic data collection, such as communication skills, ability to read and write, and analytical skills. Community evaluation team members were hired through Maryland's welfare-to-work program, Project Independence. A local community evaluation team coordinator was hired part-time through funds in the evaluation sub-contract. Team members were trained in basic social science and ethnographic research techniques through role play, discussions, and experiential exercises. Residents received training in conducting neighborhood assessments, including mapping neighborhoods, conducting open-ended interviews, administering surveys, facilitating focus groups, entering data, and interpreting data.

Table 1 CSP domain variables and data collection methods

CSP domain and variables	Data collection methods
Physical environment <ul style="list-style-type: none"> • Housing conditions • Locations of community agencies and institutions • Streets, sanitation, traffic • Natural and man-made barriers • Commercial and industrial sites • Licensed liquor stores, bill boards, etc. 	Neighborhood mapping using primary (observational) and secondary sources of data Focus groups
Historical and socio-political processes <ul style="list-style-type: none"> • Community history and changes • Attention/neglect from city government • Investment from banks and private sector • Enforcement of codes • Racism, discrimination, segregation • Income and wealth generation 	Review of documents, records, and other secondary data Key informant interviews, focus groups, and surveys
Social systems <ul style="list-style-type: none"> • Nuclear and extended families and households • Social networks • Institutions, agencies, organizations and associations • Political units (neighborhood, ward, legislative district, etc.) 	Review of documents, records, and other secondary data Key informant interviews, focus groups, and surveys Journals
Idea systems <ul style="list-style-type: none"> • Definitions of community, community preferences • Ideas of health, illness, disease • Ideas regarding parenting, neighboring, roles in society • Personal and family priorities 	Key informant interviews, focus groups, and surveys Journals
Behavioral patterns <ul style="list-style-type: none"> • Use of health services • Patterns of physical activity, diet, self-care • Specific risk behaviors • Patterns of social interaction and neighboring • Community problem-solving capacity • Political activism • Parental involvement in schools • Collaboration between agencies and organizations • Neighborhood social control 	Key informant interviews, focus groups, and surveys Journals

Focus groups

Focus groups were conducted early in the evaluation to identify important contextual variables and key features of the neighborhood, particularly as they related to women, children, and pregnancy and birthing issues. Focus groups were also used to explore residents' perceptions of local concerns and strengths, and the salient language, beliefs, and norms of the community. A total of 26 focus groups were conducted on six separate topics; group sizes ranged from 6 to 12 participants, all of whom were African-American residents of the Healthy Start target areas. All groups were single-gender and were conducted by trained facilitators matched to the group by race and gender. Groups were held in community locations, such as community centers or meeting rooms in community-based organizations. The sessions were audiotaped and transcribed verbatim with names and personal identifiers removed.

Table 2 Data collection methods, topics and samples

Data collection methods	Topics	Sample
Focus Groups	Defining community Experience with programs in community Pregnancy and infant health Parenting and child development Education, employment and family planning Alcohol and illicit drug use	26 focus groups total in Areas A and B (6–12 persons each)
Key informant interviews	Identifying community leaders Community problem solving capacity Community history Interpretation of evaluation findings	37 community leaders in Areas A and B and members of community team
Community surveys	Perceived norms and personal attitudes: - drug and alcohol use - education and employment - parenting/child rearing - health care utilization - sense of community Personal behaviors - involvement in community - social network members and interactions - assessment of personal health status Awareness of BCHS and other programs Identification of community concerns	Two community surveys of 900 households (Areas A, B, and C), conducted in 1994 and 1996
Neighborhood mapping (including geocoding of data and development of geographic information system)	Primary data collection - vacant/boarded housing - traffic and sanitation conditions - businesses, service providers - places of worship - schools - recreation centers and parks - clubs and social organizations Secondary data - liquor licenses - housing violations - crime reports - birth certificates	Baseline mapping in 1993 (Area A) and 1994 (Area B). Secondary data from 1993 through 1997.
Pregnancy journals	Daily record of personal life experiences and struggles, feelings about pregnancy, prenatal care, intentions regarding breastfeeding, reflections on BCHS, issues in relationship to child's father.	11 women in Area A for average of 17 weeks

Key informant interviews

We conducted key informant interviews with selected community residents, leaders from community-based organizations and institutions, and “natural leaders” referred by local health and social service providers, to assess the mechanisms for community problem-solving in the target area [32, 33]. Community residents working on the evaluation team also served as key informants, and they provided important insight into every phase of the community evaluation.

Community surveys

We administered baseline (n = 900) and follow-up community surveys (n = 900) to collect data on the characteristics of individual residents, including their ideas and practices in areas of relevance to the program. The survey was administered in the two Healthy Start target areas and the comparison area. The survey was designed based on focus group findings, individual interviews, previous research related to perinatal health conducted by the investigators in similar neighborhoods in Baltimore, and the goals of the Healthy Start program. Items were developed with the participation of Healthy Start policy and operations staff and members of

the community evaluation team. The final instrument was pilot tested with community residents. Survey respondents were selected through a process of randomly selecting hundred-blocks and regularly sampling households and individuals within those hundred-blocks. The surveys were administered by the participant coordinators; the length of interviews ranged from 20 to 30 minutes.

Neighborhood mapping

Neighborhood mapping is a process of collecting data through direct observation and secondary data sources to describe the physical conditions of neighborhoods, the location of institutions and resources, and the social and demographic characteristics of residents. Primary data were collected during neighborhood walk-throughs with community members serving on the evaluation team who recorded detailed data on every block, street, and alley in the target areas. Simple data collection forms provided space to record addresses and descriptions for each category of interest. Secondary data sources included housing inspection data (including violations) from the Baltimore City Department of Housing and Community Development, liquor license data from the Baltimore City Board of Liquor License Commissioners, crime reports from the Baltimore City Police Department, and birth certificate data from Maryland Vital Records. The Healthy Start Program provided data on births and program participation.

Pregnancy journaling

In addition to community data, a neighborhood resident coordinated a small study of the daily experiences of pregnant women living in the study areas. Women expressing an interest were interviewed and given instructions about journal writing. The coordinator collected journals monthly, paid participants a stipend of \$1 per written page, and conducted monthly interviews to obtain information about the women's feelings about the pregnancy, prenatal care use and impressions, infant feeding intentions, impressions about Healthy Start, and relationship with the baby's father. The coordinator also recorded the gestational week, blood pressure, weight, and fundus size. Eleven women kept journals for an average of 17 weeks, recording their daily experiences and struggles[34].

Data analysis

Transcripts from the focus groups were analyzed for major themes using basic content analysis, and summary reports were issued for each of the topic areas listed in Table 2. Key informant interviews on community leaders, community problem-solving, and community history were transcribed and analyzed using qualitative analysis software for basic content analysis, and a separate report on community problem solving capacity was issued. Community surveys were analyzed using descriptive and multivariate statistics and reports were disseminated to the program and funding agencies. All of the neighborhood mapping data (including primary and secondary data) were geocoded using the desktop mapping software MapInfo. Data from the neighborhood mapping, as well as data from the community surveys and birth records, were integrated into a comprehensive geographic information system (GIS) that included neighborhood indicators for each census block group on physical characteristics such as density of vacant housing, social characteristics such as crime rates and levels of community involvement, and health status indicators such as rates of low birthweight, preterm birth, and use of prenatal care. Pregnancy journals were transcribed and edited for each of the participating women. These transcripts, along with notes taken from monthly interviews, were analyzed format qualitative methods, and a separate report on pregnancy case studies was issued. The data were used to develop case studies that allowed the community evaluation to see into the daily lives of women as they proceeded through their pregnancies.

Results

The community evaluation produced a wealth of data which resulted in 16 technical reports shared with BCHS policy and operations staff as well as community agencies and partners. Since these reports cannot possibly all be condensed into this paper, we highlight instead the contributions of the community evaluation to the program in understanding local context and helping to better frame, focus, and improve the program.

Area A comprised six census tracts in West Baltimore further divided into 29 census block groups. This area of the city was considered to be at high risk for adverse maternal and child health outcomes due to overwhelming poverty, inadequate housing, crime, and drug-related problems. A comparison of the target area population with the population of Baltimore City as a whole, using demographic data from the Claritas/NPDC for 1993, revealed a population very different from the city as a whole. The population of the target area was much more likely to be black (99% vs. 55%), less educated (53.6 % vs. 38.5% with no high school diploma), and poor (per capita income \$7,626 vs. \$14,289). The unemployment rate was nearly double that of the city as a whole (17.6% vs. 9.2%), and a greater proportion of residents were not considered to be in the labor force (48.8% vs. 39.3%).

Summary of findings from focus groups

Participants described how their neighborhoods had changed in regard to increasing social problems and loss of social cohesiveness. Broad social problems rather than the specific effects of these problems (e.g., infant mortality) dominated the discussions. Changes in neighborhood conditions frequently mentioned included loss of neighborhood unity; an increase in crime and a resulting feeling of loss of safety; the dominance of the drug trade; decline in housing conditions; loss of employment opportunities; and the dismantling of public programs and services. Table 3 provides sample quotations from focus group participants on each of these neighborhood issues. When asked to describe a neighborhood that would be good for women, infants and children, participants emphasized keeping the community safe and drug free, better housing, and better paying jobs.

Participants in all groups described parenting as a serious and stressful responsibility, and they saw neighborhood characteristics such as violence and drugs as exacerbating the problems of parenting. Some participants described how their children had learned to “hit the deck” in their own homes at the sound of gunfire from outside. Others described how drug dealers had tried to lure their young children (five to six years old) to “deliver packages” by offering gifts or money. Some parents felt the need to protect their children from danger by not allowing them to play outside or in anyone else’s home. Men and women both described the role of mother as all encompassing, including nurturing, meeting basic needs, teaching and guiding. Parenting topics emphasized included providing a loving home and developing relationships with the children. Most women noted a lack of involvement of men in parenting. Men, on the other hand, emphasized the role of being a leader and example to their children. This stimulated much discussion, because many of the men felt they were not adequately fulfilling this role, and the harsh economic realities of the city worked against their being good fathers. The focus groups identified key tasks of mothers and fathers and these were developed into survey items included in the community survey.

Focus group participants repeatedly spoke of “the problem with liquor stores,” which revolved around “the people that hang out near them.” People were seen consuming alcoholic beverages in public and at times they were intoxicated. Living near liquor stores was seen as undesirable because it added to the stress of living in a poor neighborhood and the potential for trouble.

In the focus groups, residents hammered on themes related to neighborhood poverty, crime and drug related problems, describing their neighborhoods as stressful for everyone, but particularly for women and children. Lack of opportunities to earn an honest living produced tremendous strain for men, resulting in breakdowns in their relationships with women and loss of their self esteem. Problems related to drugs, violence, poverty, poor housing, lack of jobs, and lack of neighborhood unity were consistently mentioned and were validated by the results from the community survey. Infant mortality was never raised as an important issue in the community.

Summary of findings from key informant interviews

Key informant interviews with community organization and service provider leaders and with pastors were important in understanding the history of the neighborhood, the nature of community problem-solving, and the available resources in terms of people, programs, skills, and connections. There were important differences among the three communities surveyed, particularly with regard to perceived levels of community organization and disorganization, livability, existence of resources, and relationships between and among neighbors [32].

The interviews, for example, revealed that working through an extensive network of small churches and ministers was vitally important in East Baltimore (Area B), but much less so in West Baltimore (Area A), where neighborhood associations, agencies, and individual community leaders were more important.

Summary of findings from community surveys

The baseline survey listed 11 social issues (derived from focus group discussions) and interviewers asked respondents to rate each as “a serious concern,” “a concern,” or “not an issue” for their community. Ninety percent of the respondents rated drug dealing, crime, and violence as serious concerns. Not enough jobs followed, with 83% of the respondents rating this as a serious concern. Insufficient number of parks and play areas, poor sanitation, and lack of government services such as job training programs were rated a serious concern by approximately two-thirds of the respondents. Availability of good food stores, the poor health of residents, and a poor school system were rated as serious concerns by 50% of the respondents.

The community survey also asked about the causes of infant death. Infant mortality in the community was most commonly attributed to the dangers in the community, accidents, and abuse. The most common reasons cited for infant deaths were social: approximately half of the respondents cited a dangerous community and abuse or neglect as the most common reasons for infant death, another 40% cited accidents, AIDS, and bad housing.

The community survey also assessed people’s awareness of Healthy Start and whether they could identify the focus of the program. In 1994, 36.9% of the respondents from Area A could accurately identify the focus of the program; this percentage increased to 50.8% in 1996.

Table 3 Priority issues in neighborhoods from focus groups

Issue	Selected quotations from focus groups
loss of unity	<p>“I’ve been living around here all of my life, probably longer than anybody sitting at this table. And I see a lot of changes since I was a child, how the community was when I was a child and how it is for these little children, and it’s a big difference. We had community leaders. You don’t have those anymore. We had togetherness, you know, parents stuck together. You don’t see any of that anymore. It has been a drastic change.”</p> <p>“A long time ago, people in the neighborhood, they helped each other . . . But it’s not like that no more. People are basically . . . they for they self.”</p>
Increase in crime and the loss of safety	<p>“[the people in the county] ain’t got to worry about no shooting and banging all these types of things you know, and getting their kids in off the streets. Their kids go out there and play like they want to you know. But ours, you got to put them right in the back yard and keep an eye on them. . . cause if they go over to the playground you’ve got to be right there on top of them. You can’t just send them and know they’re all right. You’ve got to be there with them.”</p>
Dominance of the drug trade	<p>“It’s a drug area. Everywhere you go, every corner you turn.”</p> <p>“Some people are scared. They don’t come out. But the drugs have got a lot to do with that.”</p>
Decline in housing and environmental conditions	<p>“Well, number one, it didn’t use to be this bad. Listen at me. You had clean blocks. That’s right. You didn’t see nothing like this. Just like I see guys sometimes throw trash in the street. I be standing there. I say man, there the trash can there. Why you got to throw it in the street?”</p> <p>“Like the poor houses, you know, where we live at, not me individually, but the community . . . it’s not a safe environment for little children, regardless of what you try to do, you don’t have enough to do it and without the landlord’s help you can’t do anything.”</p>
Loss of employment opportunities	<p>“What they need is more jobs. When I was locked up, they let me work for the city. I come home, now I can’t get a city job. That’s what they need.”</p> <p>“Some people have to hustle along with a job because they’re not making enough money. So they have to do little things on the side that they may not even want to do.”</p>
Dismantling of programs and services	<p>“Back there around in the sixties, we had - well, the city had a program where you had training programs that the city sponsored where you worked for the city and you got training at the same time. Nowadays, the city don’t sponsor no type of training program for kids now or adults, either way. We had all that then. Nowadays, everything is cut out.”</p>

Summary of findings from neighborhood mapping

Results from neighborhood mapping revealed that the target area was far from homogeneous in terms of the density of vacant housing, reported housing violations, the presence of liquor stores, and the rates and types of crimes reported. While the entire neighborhood could be considered an area with high risk for infant mortality, living conditions varied greatly between census block groups.

During the period when neighborhood mapping was conducted, 947 vacant houses were identified out of a total of 8,895 (representing 10.6% of all houses). Vacant houses were distributed throughout the study area but not uniformly. The count of vacant houses per census block group ranged from a low of 2 to a high of 87. Residents complained of the vacant houses because they were targets for illegal dumping, rodent infestation, and illegal drug activities (“stash houses”). They also posed a hazard for children who might venture in to play. A band of streets in the middle of the study area seemed to be the most concentrated area for vacant housing along with blocks in the northern and western sections of the study area. Areas with newly developed housing for home-ownership (Nehemiah Housing) and HUD housing projects (Gilmor Homes) were relatively free of vacant housing except around the perimeter of those developments.

Data from the Liquor Board of Baltimore City showed that 48 liquor licenses were renewed or awarded that year. Forty-two of these were type A, (i.e., package goods and carry-out liquor stores). Nine of the 29 census block groups contained no liquor stores, 8 contained one liquor store, 8 more had two or three liquor stores, and 4 census block groups had 4 liquor stores.

The Baltimore City Department of Planning collects data on housing inspections conducted every year. Data were geocoded and only records corresponding to the study area were extracted. These were then aggregated at the census block group level. Inspections conducted as a result of complaints issued by residents were of particular interest. The ratio of housing complaints to occupied households per census block group during 1994 ranged from 2.8 per 1,000 households to 148.1 per 1,000 households.

The Baltimore City Police Department collects statistics on crime reports every year. Crime data for the study area were extracted and geocoded using MapInfo; these data were then aggregated at the census block group level. Crimes were divided into two categories: personal crimes and property crimes. Personal crimes included murder, manslaughter, rape, assault, and robbery. Property crimes included burglary, larceny, stolen vehicles, and arson. The count of total crime reports per census block group ranged from 49 to 227. Violent crimes ranged from 12 to 85 per block group, while property crimes ranged from 31 to 150.

Summary of findings from pregnancy journals

The pregnancy journals provided a rich description of the daily lives of women in these neighborhoods as they progressed through their pregnancies. In particular, they revealed the strengths and weaknesses of their support systems and the ways in which daily demands affected the choices they made that contributed to pregnancy outcomes. Interpersonal issues (particularly with male partners and mothers), financial struggles, battles with addictions and mental health issues (particularly depression), and problems related to living in a stressful neighborhood environment dominated the descriptions of their lives [34].

How the findings were used

Sixteen separate technical reports were delivered to BCHS. The reports covered such topics as client recruitment and participation, vacant housing, community problem-solving, and the role of religious institutions in the target areas. Evaluation staff met regularly with BCHS program staff to make sure that information about the community was communicated back to the program. Reports generated on all community evaluation activities were shared with interested community organizations and service providers. Findings from the BCHS community evaluation were used early in the program to help tailor services to the needs, assets, and cultural milieu of the community. For example, early focus group reports were used in the development of the BCHS program components, particularly the curriculum used in life planning, parenting, and pregnancy and delivery classes.

Throughout program implementation, the findings generated were used to develop problem-solving strategies to strengthen recruitment and improve program services. Feedback was provided to policy and operations staff through reports, presentations, and meetings. By working with community institutions and organizations, the community evaluation increased the likelihood that the skills and experience gained by participating residents would be incorporated into the ongoing activities of local groups.

Data from the community surveys and neighborhood mapping were assembled into a GIS with indicators of neighborhood conditions as well as birth outcomes aggregated at the level of the census block group. The GIS permitted presentation of the data spatially, and also facilitated examination of the influence of residential context of pregnant women on their birth outcomes. An important finding from the evaluation was the presence of differential rates of low birthweight, very low birthweight, and preterm birth by census block groups [35]. Neighborhood mapping also showed variability in neighborhood physical environments, raising the question of whether differences in perinatal outcomes may be explained by differences in the density of vacant housing, differences in economic resources as measured by average household wealth and rates of home ownership, and differences in locations and numbers of available services. Maps such as the one shown in Fig. 3 provided a powerful visual means of explicating community context, risk, and program participation to residents, BCHS staff, and other stakeholders. The darkened census block groups in Fig. 3 represent areas of physical risk based on neighborhood mapping and factor analysis. The circles show level of program participation. Stakeholders were clearly able to see from this map that participation levels were generally higher in lower risk census block groups when compared with higher risk areas. The program was then able to develop improved means of recruiting and retaining participants from the higher risk areas. The community surveys provided a basis for assessing community change at the level of the resident, measured in part by comparing responses from the first survey with responses from the second survey, and for comparing neighborhoods. While changes occurred to a similar extent across neighborhoods, the changes were not uniform when examined at the census block group level. Neighborhood comparisons also revealed differences in awareness of Healthy Start; differences in social norms around parenting and life planning; differences in neighborhood interactions and social networks; and differences in the sense of community within neighborhoods. These findings suggest that 1) the program did not penetrate and exhibit the same level of intensity across all of the census block groups within the target areas; and 2) even with the same level of penetration and intensity, program activities produced differing levels of results/change depending on other contextual features.

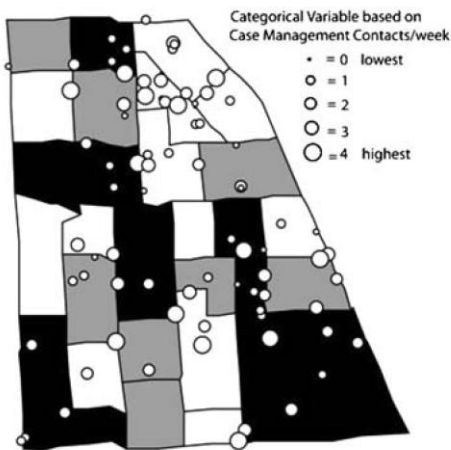


Fig. 3 Risk and program participation map

Discussion

How do we make sense of the volumes of information collected when using the EICE framework for evaluating complex community interventions? Obviously the information cannot be meaningfully reduced to a simple set of indicators or results, nor is it intended to do so.

Focus groups, key informant interviews, and pregnancy journals provide a rich description of the way life is experienced in a community, help to identify key community concerns and assets, and describe how the community works, who makes it work, and how it has changed over time. These methods provide information that may be used for both designing and improving programs. The rich understanding of the community supported the program and research staff in selecting appropriate and relevant change indicators, wording and selection of survey items, and the direction of program interventions. These methods also provide descriptive information that can support program replication in other similar communities and help to explain outcomes.

Data obtained through neighborhood mapping also has broad utility. A detailed description of the physical environment informs the development of an intervention and can also be used to observe change over time. When data based on client records, community surveys, or secondary data (e.g., birth certificates) are geocoded, a powerful GIS can be created, permitting the spatial presentation, manipulation, and analysis of data. This system can identify areas within a neighborhood where risks are highest, recruitment rates are lowest, and health outcomes are poorest, thereby providing meaningful, real-time information to program staff and other stakeholders. A GIS platform also supports further exploration of the relationships between and among these measures and the physical and social conditions of the community.

There are challenges and limitations inherent to the EICE approach. One such challenge is ethical responsibility. Confidentiality must be strictly enforced, particularly when using data that contains residential addresses or names. New methods of analysis and data visualization in cartography allow for geographic transformation of data to minimize the possibility of identification of locations for point data. In addition to the handling of sensitive data, evaluations must consider ethical issues related to conducting research in communities. For this reason we advocate participatory approaches that can both strengthen the collection of valid data and provide skills and opportunities to community residents, institutions, associations, and agencies. In addition, findings and reports should be shared broadly in the community, in written form and in public presentations.

A second limitation is that the EICE emphasizes examination of the broad physical and social features of the local context. It is not designed to evaluate outcomes for individuals enrolled in programs. It can, however, be used to examine what happens to a community when a large, complex, and highly funded program is implemented in a community. It can help the program be more responsive to community needs, build on community strengths, and use culturally competent approaches to outreach, education, and communication.

Perhaps the greatest limitations of the EICE approach are difficulty, cost, and the skills required to carry it out. Formative, process, and outcome evaluation is achieved through a mix of qualitative and quantitative methods conducted within a framework that builds on the idea that health problems and their solutions are related to the physical and social contexts in which they occur. The EICE framework considers a broad range of community-level factors that may influence the health status of a community or the rates of a specific health problem in the community. It also considers a broad range of community-level factors that may influence the implementation, acceptance, and success of an intervention. Considerable investments in time, resources, and patience are required to achieve this level of contextual understanding. The benefits, however, extend beyond the mere demonstration of program effects and include program improvement through on-going feedback; greater understanding of the impact of contextual factors on program implementation as well as program effects; increased knowledge of the contextual determinants of health and health-related behaviors; and contributions to building community capacity.

In a recent report, the Institute of Medicine called for a “transformed approach” to addressing population health problems [2]. The report’s authors called for multi-level ecological models of health, following suggestions that determinants at different levels—innate traits, individual behavior, social networks, living and working conditions, and broad social, cultural, economic, and environmental policies—interact to shape population health [2, 36, 37]. In addition, historical conditions and changes affect populations at many different levels [2, 38]. Thus, evaluations of public health approaches based on these composite and interactive principles must

mirror programmatic complexity in order to fully understand how individuals, communities, and systems interact and change over time.

The BCHS infant mortality project was developed based on this type of ecological health model. The evaluation design reflects the complex structure as well as the participatory intent of the program itself, moving beyond traditional evaluation designs to emphasize the usefulness of data for program implementation and replication; the interpretation of data informed by the voice of neighborhood residents; and the involvement of community members in the evaluation design and implementation.

This framework does not replace the evaluation categories of formative, process, and outcome evaluation, but builds a cultural ecological framework into such traditional evaluations. The approach has broad applicability to other community-based programs that employ multiple approaches at different levels to address or prevent such problems as violence, child abuse and neglect, and substance abuse, or to promote healthy families and neighborhoods. Programs with limited funding and scope may consider the adoption of the philosophy, which is oriented toward strengthening community capacity and recognizing the complexity of community-level intervention, informed by a cultural-ecological perspective.

Not every program will be able to adopt our approach in its entirety; however, many programs may find it useful to adopt portions of our evaluation design, or they may merge our understandings about integrating socio-cultural knowledge into the methodology and into orchestrating a more participatory approach.

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