

**FILIAL FACTORS OF KWASHIORKOR SURVIVAL IN URBAN GHANA:
REDISCOVERING THE ROLES OF THE EXTENDED FAMILY**

Richard L. Douglass^{1*}, Brenda F. McGadney-Douglass², Phyllis Antwi³, Nana A. Apt⁴

¹*Corresponding Author. Senior Fulbright Scholar, School of Public Health, University of Ghana, Legon 2001- 2002; Professor of Health Administration, Eastern Michigan University, Ypsilanti, Michigan 48197, USA.

²Visiting Scholar, School of Social Work, University of Ghana, Legon 2001-2002; Associate Professor of Social Work, The University of Toledo, Toledo, Ohio 43606-3390, USA

³Professor, School of Public Health, University of Ghana-Legon, Accra, Ghana

⁴Dean of Academic Affairs, Ashesi University, Accra, Ghana; Professor of Sociology, Director, Center for Social Policy Studies, University of Ghana- Legon, Accra, Ghana

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ABSTRACT

This paper discusses the findings of two field studies in urban Accra, Ghana that investigated the social and familial factors that were associated with survival of childhood kwashiorkor, a protein-caloric deficiency form of malnutrition that is endemic in that nation. Data was collected from qualitative interviews with family groups that included teenaged survivors of kwashiorkor, and the adults who were involved in the young person's childhood rearing, including those who were responsible for compliance with the Ghana Ministry of Health malnutrition rehabilitation effort. Extensive interviews were documented in audio and video tape and field notes by a team that included the fields of social work, public health, nursing and sociology. All members of the participating families who were involved in the data collection were offered compensation for their time as well as full protection of privacy through the human subjects informed consent protocol and oversight of the University of Ghana, Eastern Michigan University and Wayne State University. The findings included reporting of a consistently critical role of the grandmothers and other senior women in the family units. The senior women either managed the economics and maintenance of the extended household, or took principal responsibility for sustaining the malnourished children's participation in rehabilitation efforts. In some cases, the mothers were deceased and two or more senior women in the family carried out roles of parenting as well as familial economic support and coordination of care for the afflicted child. The findings suggest that full compliance with rehabilitation efforts for a single mother with multiple children and no extended familial support system would be very difficult and more likely to result in non-compliance and failure of the child to survive. Suggestions are offered for family-oriented, community health education regarding the irony of this form of malnutrition being endemic in communities that do not lack appropriate food. Implications for increased recognition and support for the elderly and senior family members to enhance child survival are discussed within the context of changing social and epidemiological profiles of urban centers in Ghana and elsewhere among developing nations of sub-Saharan Africa.

Keywords: Kwashiorkor, Malnutrition, Rehabilitation compliance, Grandmothers, Endemic malnutrition

*What befell the Child implanted in her womb?
Did we not refuse to attend the ceremony of his Birth?
And when he died so young of kwashiorkor, how many wept for him?*
Kofi Anyidoho (From "Akansasnoma")
Professor of Literature, University of Ghana, Legon

French

FACTEURS FILIAUX DE LA SURVIE AU KWASHIORKOR DANS DES ZONES URBAINES DU GHANA: REDÉCOUVERTE DES RÔLES DE LA FAMILLE ÉLARGIE

Résumé

Ce document présente les résultats de deux études de terrain effectuées dans des zones urbaines d'Accra au Ghana. Ces études ont porté sur les facteurs sociaux et familiaux qui ont été associés à la survie au kwashiorkor de l'enfance, une forme de malnutrition causée par la carence en protéines et en calories, et cette malnutrition est endémique dans ce pays. Des données ont été collectionnées à partir d'interviews qualitatives auprès de groupes familiaux qui incluaient des adolescents survivants du kwashiorkor, et des adultes qui ont été impliqués dans l'éducation de jeunes enfants, tels que ceux qui étaient responsables de se conformer aux initiatives de réhabilitation en matière de nutrition entreprises par le ministère ghanéen de la Santé. Des interviews extensives ont été publiées sur cassettes audio et vidéo et au moyen des notes de terrain par une équipe qui représentait des domaines tels que le travail social, la santé publique, l'infirmerie et la sociologie. Tous les membres des familles participantes qui étaient impliquées dans la collecte des données ont reçu une indemnisation pour leur temps ainsi que la protection des renseignements fournis, à travers le protocole de consentement informé des sujets humains et par la supervision de l'Université du Ghana, l'Université de l'Est de Michigan et l'Université de l'Etat de Wayne. Les résultats comprenaient un rapport sur le rôle de plus en plus important des grand-mères et d'autres femmes âgées de la famille. Les femmes âgées s'occupaient de la gestion de l'économie et de l'entretien du ménage élargi, ou alors elles prenaient la principale responsabilité d'appuyer la participation des enfants mal nourris aux initiatives de réhabilitation. Dans certains cas, les mères étaient décédées et deux ou plusieurs femmes âgées de la famille avaient pris la relève dans les rôles des parents et de l'appui familial au niveau économique ainsi que la coordination des soins des enfants affligés. Les résultats suggèrent que pour une mère seule qui a plusieurs enfants il serait très difficile de se conformer entièrement aux initiatives de réhabilitation si elle n'a pas d'appui de la famille au sens large, et la conséquence serait sans doute la non-conformité à ces initiatives et la non survie de l'enfant. Des suggestions sont offertes en vue d'une éducation orientée vers la famille et la santé de la communauté en ce qui concerne l'ironie de cette forme de malnutrition qui est endémique dans des communautés qui n'ont pas d'alimentation appropriée. Des implications visant la revalorisation du rôle des personnes âgées et des membres de famille âgés ainsi que l'appui à ces catégories de personnes pour qu'elles contribuent davantage à la survie des enfants font l'objet de discussions dans le cadre du changement des profils sociaux et épidémiologiques des centres urbains du Ghana et d'ailleurs dans des pays en développement de l'Afrique sub-saharienne.

Mots-clés: Kwashiorkor, malnutrition, se conformer aux initiatives de réhabilitation, grand-mères, malnutrition endémique.

INTRODUCTION

Kwashiorkor is the most prevalent form of protein energy malnutrition (PEM), and was brought into the medical lexicon by Cicely Williams in 1933 [1]. In 1952, an early WHO/FAO report described kwashiorkor as, "...the most serious and widespread nutritional disorder known to medical and nutritional science" [2]. Students of human nutrition have studied clinical presentations of kwashiorkor for over 50 years. Detailed clinical descriptions and medical guidance for kwashiorkor were first published in 1954 [3]. Over the last seventy years kwashiorkor's prominence has hardly diminished. Globally, in 1997 the WHO estimated that about one third of all children are affected by Protein Energy Malnutrition (PEM); over 20 % of these children live in Africa [4]. The disorder complicates all infectious diseases, wrecks havoc on compromised immune systems, and kills about 10 million children under 5 years of age annually [4]. In Ghana, childhood malnutrition represents the sixth leading cause of death among children under five, with over half of these deaths attributed to kwashiorkor. Those who do not die often suffer from numerous long-term complications, including physical stunting, depending on the age of the child at onset of the disorder [5, 6].

Today, aside from places where there is open warfare or major social cataclysmic events, it is difficult to understand how this affliction of very young children remains endemic in places like urban Ghana. It seems to be inconsistent to find endemic malnutrition in places where food appears to be widely available without a deeper understanding of the social factors that cause PEM. If the general economic and social conditions of urban Accra or other cities in Ghana are compared to many other places, kwashiorkor would not be expected. In Accra, food is currently not in shortage, and protein-rich seafood from the Bay of Guinea is in abundance in the markets. Kwashiorkor, however, remains endemic, as it has for all of the last 70 years since Cicely Williams called it "the problem that shouldn't be" [1, 8, 9]. She concluded that kwashiorkor's etiology was more complicated than merely an absence of sufficient and sufficiently nutritious food and poverty; kwashiorkor reflects a poverty of knowledge. In urban Ghana cases of childhood malnutrition, including kwashiorkor, are found within neighborhoods, communities and markets with abundantly available food.

The research reported here reflects work that was initiated in January 1999 and continued through June 2003. Initial qualitative data were collected in July 1999 as a pilot study that sought to determine the status of post-adolescent young people who had suffered from kwashiorkor in urban Accra, Ghana [10, 11, 12]. Very little has been reported about the long-term consequences or effects of kwashiorkor, while there is substantial literature dealing with the short-term, clinical recovery of cases. Our purpose was expanded. From the pilot study, it became clear that the physical/intellectual status of the cases of young adult survivors was not as much of an issue, as was a need to understand how it was that these youth survived while others did not. How were these cases detected, diagnosed and successfully included in an extended treatment and rehabilitation program? Our focus in the field shifted towards the behaviors, attitudes and abilities of the adults in these

children's lives that facilitated compliance with the interventions of the Ghana Ministry of Health. While the pilot study was an inquiry of the status of survivors, the work became an inquiry of the compliance of whole family units with an intervention regimen [11,12].

It has been our observation that Kwashiorkor's continuing presence in urban Accra reflects social norms, customs, gender, and age discrimination, in addition to poverty and/or a lack of knowledge about the nutritional needs of young children [10]. Maternal illness or the presence of twins has also been frequently associated with kwashiorkor [11, 12]. Substitutes for breast milk, including concoctions such as egg white mixed with cocoa, have been documented in cases that produced severe diarrhea, which became the precipitating medical crisis that brought the child's kwashiorkor to the attention of the Ministry of Health. In fact, the majority of kwashiorkor cases come to medical attention because of a physical crisis that is secondary to the ongoing malnutrition.

There are many social and cultural factors that can be elements of normal activities within homes and family life that have the effect of denying the most vulnerable family members the protein and micronutrients that they require [11, 12, 13, and 14]. From a socio-clinical perspective, kwashiorkor can be frustrating because, afflicted children are "good" behaviorally; they are usually passive, quiet, and not agitated as would be expected of children who are starving. A child's full, often-bloated, belly can be mistaken for the child being anything but malnourished, and even fat, by a parent who does not understand what is actually going on with the child. The classical red hair, due to hair growth without sufficient nutrients, can be interpreted more as an embarrassment to the family than as a medical problem. In fact, in urban Accra, children with kwashiorkor are often not apparent because the red hair is often masked with shoe polish or some other agent [10]. By the time the child is recognized to be in poor health, it is often too late and permanent disability, physical stunting, or death is the consequence.

Interventions with kwashiorkor require recognition, acknowledgement of a medical problem, acceptance of the need to act, and knowledge of what to do. In our fieldwork, it was often observed that the mothers were not – initially - responsible for suspicion, recognition or acknowledgement of a pediatric medical problem; more commonly it was a grandmother, or a great aunt, who recognized the child's condition based on memories of widespread hunger in the past. The other most likely source of initial recognition was by a community health nurse, who lives and works in her community, as a constant presence of the Ministry of Health. The community health nurses in urban Accra are often intimately familiar with whole extended families, including all the deaths, sickness, births, hospitalizations, accidents and other significant events within hundreds of families. In our work, it was the community health nurses - given an absence of available medical records for all of the last 20 years - who made it possible to find cases that had been detected and survived. Ongoing outcome evaluation or available secondary data were unavailable for purposes of evaluating the long-term kwashiorkor survivors [10, 11, 12].

Once recognized to have kwashiorkor, either by family members or a nurse, the child is typically hospitalized at the Korle-bu Teaching Hospital, returned to the community, and then expected to participate in weekly rehabilitation and nutrition support programs as an outpatient for up to three years. The rehabilitation protocol includes monitoring the child's health, health and nutrition education for the mother, provision and on-site preparation of food supplements, and social support from mothers whose children have also had some form of malnutrition [1, 11, and 12]. Sustained participation in the program, however, is a challenge and non-compliance is a common problem. Children who do not complete the program, because their parent could not comply with the weekly regimen, as will be discussed below, are at high risk of failing health or death. In our field interviews most of the participants were aware of children who died subsequent to the parent dropping out of the rehabilitation program. This awareness was a motivating factor for some to remain in compliance [10, 11, 12].

METHODOLOGY

Study Site

The research reported here began with a pilot study in 1999 that was conducted within the Jamestown district of Greater Accra. In this pilot effort, the methods of case identification and selection, formulation of meaningful hypotheses, and development of a data collection protocol were completed with a small number of cases and their families (four youth, including a set of twins and three extended families). The initial research question was based on our perception of a paucity of published long-term follow-up data on the quality of life, health status, and social status of young adults who had suffered from kwashiorkor as children, but survived. Dettwyler made similar observations over ten years ago [15]. Our initial concern was to determine what kind of contributing member of the community, a kwashiorkor survivor would be; or, would a "typical" survivor be dependent upon the family or community and represent a cost, rather than an economic or social asset to the nation. It was clear with even our small initial pilot study cases that were all strong and contributing young people, that long-term consequences of stunting and other disabilities, such as mental impairment, were not evident. Our initial cases participated in school, had specific adult ambitions and expectations, participated fully in familial responsibilities, and were normal in every respect [10, 11, 12]. During the pilot study in 1999, however, we did find suggestions of remarkable and extensive roles that grandmothers and great aunts appeared to have played in the initial recognition and rehabilitation of the survivors. We became aware of the extreme vulnerability of families who have little or no cash savings, who have no property, and who live day-by-day in an endless effort to provide meager food, shelter and basic needs. The 2001-2002 effort, therefore, was largely directed to determine not if the surviving cases were functional young adults, but to find out how it was that they were able to succeed in an extensive rehabilitation and intervention program while many others did not. In other words, what was uniquely effective in these families that sustained their compliance with the rehabilitation program?

Sample and Site Selection

Fieldwork in 1999 began with case selection by the community health nurse staff of the Princess Marie Louise Children's Hospital in Jamestown, a district of Greater Accra. In the 2001 - 2002 effort, the research sites were extended beyond Jamestown to include the communities of Chorkor and Korle-Gono. These communities are proximal to the Korle-bu Teaching Hospital complex and also to vast markets where the families usually conducted most of their economic activities. All of the families in the study were Ga, who most frequently are either fishermen or market traders.

Medical records of children's participation in the Ministry of Health nutritional rehabilitation program, subsequent to an acute hospitalization are unlikely sample frames for research in urban Ghana. Medical records, as with all paper documents, are generally not available in the hospital or from polyclinics or the families themselves. Such records have relatively short "shelf lives" due to poor storage arrangements, climate and exposure to humidity. The community health nurses usually represent the only option for case recognition from previous years, because the nurses themselves, as previously noted, often live in the neighborhoods in which they serve. Such arrangements can last for many years, creating a living oral history, among these nurses, of the lives of large numbers of people. This personal history was essential for us because our research questions asked family members to remember events and circumstances that might have taken place 16 - 20 years earlier. The community health nurses became essential partners in the selection of cases, both in the 1999 pilot study and in the 2001 - 2002 field studies.

Data Collection

The data collection protocol involved the participation of the research team meeting with entire family groups at a location of convenience to the families. The team involved the two senior authors of this paper, a social epidemiologist and a social worker, a public health physician, a Ministry of Health community health nurse, and one or more students who operated cameras and recorders. Consulting team members included a nutritionist and a gerontological social scientist (the third author of this paper).

A total of 46 individuals, comprising 15 families, were included in family interviews. These families included 15 index kwashiorkor survivor cases. Two families had two index cases because the twin siblings had both been kwashiorkor survivors. The families included 10 grandmothers, 11 mothers, 3 surrogate mothers, 2 fathers, 2 adult siblings and 3 aunts. Several grandmothers, mothers and fathers who had been instrumental in the initial survival of the kwashiorkor case were deceased at the time of these interviews and their roles were discussed regarding their instrumental participation in the initial diagnosis, participation in various aspects of the family's functioning, and the index case's compliance with the Ministry's intervention protocol. Among these 15 families, two mothers had abandoned their children.

Interviews began with introductions about the purposes of the inquiry and completion of all human subjects consent forms for both Eastern Michigan University and the University of Ghana. Participants were given full documentation of the purposes of the research and how to contact members of the research team. The signatory process was video recorded for full documentation. The interviews then proceeded to the following:

- An assessment of family relationships, including kinship and informal, non-kinship dependencies;
- The roles of all senior family members with a focus on grandmothers and similarly generation members of the immediate family;
- The specific roles of different family members regarding participation and compliance with the nutritional rehabilitation program;
- Nutritional practices and beliefs of the family;
- Health practices and beliefs, including the use of traditional healers in addition to, or instead of the Ministry of Health or private, modern medical services;
- Religious beliefs and spirituality;
- An assessment of the kwashiorkor survivor's early childhood to young adult health history and social functionality; and
- An assessment of the family's economic resources, work histories, sources of income, and how the responsibilities of the household were distributed.

The interviews were directed first to the most senior member of the family. Specific questions about current social functionality were directed to the kwashiorkor survivors, themselves. These methods are consistent with similar qualitative field efforts in comparable locations with vulnerable populations in the developing world; including sub-Saharan Africa [16,17,18,19,20]. All interviews were audio taped and video-recorded and all team members took field notes. Ghanaian members of the team served as translators when required. Most Ghanaians speak at least some English, however, detailed and emotional topics are often more comfortably discussed in one of the vernacular languages that are common in urban Accra. All participating family members, including siblings, parents, grand parents and other immediate household members were provided with a token of our appreciation for their willingness to participate in these interviews (\$20 US equivalence in Ghanaian Cedis, each). The interviews often required over two hours to complete. Efforts were made to ensure as much privacy as possible, despite the often-crowded conditions in which participants lived or in the markets where some of the interviews took place. Arrangements were made for possible follow-up interviews for clarification or for further discussion of points made during the interviews.

Data Analysis and Interpretation

The descriptive and qualitative data were tabulated and organized with debriefing sessions by the field team to ensure that information nuances and unique points were recorded and credited accurately to specific family members. Deacon and Piercy (2001), among others, have provided standardization of field and clinical data from combinations

of observer's structured notes and systematic interpretation of findings; these processes were comparable to our process immediately following each family interview. Key words and phrases, the context of responses, repetition by different family members and a quantification of specific phrases provided internal assessments of the interviews. Grouped internal assessments then provided a means of generating findings that were consistent among the interviews and discovery that was either infrequent or distinctly different from others.

RESULTS

The most general and consistent finding from these family interviews was the collaborative and interdependent roles of the extended family members. Our cases benefited from the active efforts of grandmothers, great aunts, and other family members to ensure the child's rehabilitation participation and to remain in compliance with the Ministry of Health rehabilitation programs. These families were characterized by collective decision-making, rather than the isolated decision-making of a single parent or caregiver. These families were highly motivated, decision-making groups whose efforts ensured that the afflicted child would survive; all participating family units were highly aware of similarly malnourished children who had died.

In most cases the collaborative decision-making did not include men. The fathers of the index cases were only involved in two of the interviewed family interviews; the issue of male involvement, especially the absence, or lack of involvement, of most of the fathers or senior men in the lives of the index cases was consistent with discussions with most of these families. In all but two of the families men, in general, and index case fathers, in particular, were absent due to death, inability to participate because of work, or abandonment.

The majority of mothers and surrogate mothers believed that the child became sick due to lack of breast milk and/or because the child was given a substitute, such as egg whites with cocoa. This finding is consistent with Appiah, who commented on the knowledge about causes of kwashiorkor among women in the Volta Region of Ghana [21]. Of Appiah's 95 interviewed women, of whom 46 had well nourished children and the others had children with kwashiorkor, 67 believed that the condition was caused by a lack of the right kind of food [13]. The malnutrition cases in our study was often not the precipitating medical event that brought the child to the attention of the Ministry of Health, or to a hospital, as was first noted in our pilot study. Most frequently, diarrhea was the precipitating clinical event. The mothers in our studies were less likely to recognize kwashiorkor as a medical problem than the grandmothers or other senior women in the household. This raises the important public health question of the probability of a single parent with multiple children recognizing the vulnerability of a sick child before the acuity of the condition would make medical intervention and rehabilitation unlikely to succeed.

The familial condition that was most closely associated with child survival, by way of full compliance with the rehabilitation program's weekly participation, was the presence of extended and senior family members. Grandmothers, more often than the mothers, were the ones who recognized kwashiorkor as a medical condition that could lead to a child's death. Grandmothers expressed their memories and remembered specific situations of widespread hunger and starvation in the past.

Once the kwashiorkor case was enrolled in the Ministry of Health's rehabilitation program, the family faced a daunting compliance challenge. These economically vulnerable families were expected to participate for as long as three years in weekly outpatient care and nutrition education programming, while also struggling to earn sufficient incomes to provide food and shelter for the extended family and other dependants. The grandmothers and other older women would often either take responsibility for transporting and ensuring rehabilitation program participation, to allow the mothers to work in the markets, or they would take over the market duties to ensure that the family would have sufficient income to provide food. These assumed responsibilities of the grandmothers are consistent with Apt's study of Ghanaian elders, especially grandmothers in a broader sociological context [22].

In these Accra neighborhoods, there was little evidence of savings or surplus economic resources; families living at this level of poverty, certainly including the families in our interviews had little or no financial reserves. Because of these circumstances, the burden of getting a child to a weekly rehabilitation program, over an extended time frame, was significant because it profoundly interrupted the essential economic activity of the family. In our opinion, large and dedicated families, with knowledgeable and experienced grandmothers or other senior women, were essential to the survival of these kwashiorkor cases. Although we have no case evidence, it seems highly unlikely that a single mother, with multiple children, without the support of extended and dedicated family members, would be likely to meet the expectations of rehabilitation participation, as well as to adequately meet the economic needs of her family. Such is the harsh reality of a 24-hour market economy. We believe, based on these interviews, that the participation and assistance of the grandmothers and other older women in the family are likely to distinguish between kwashiorkor rehabilitation cases in urban Accra that succeed, and those that do not. We would speculate that single parents with multiple children, of whom one had kwashiorkor, would find full compliance with the rehabilitation program's expectations to be nearly impossible.

DISCUSSION

The roles of grandmothers and senior women became apparent as these family-based interviews were conducted. Initial observations were reinforced with the addition of each new case. Throughout the process, however, we also noted the nearly incomprehensible presence of malnutrition within communities and market places where protein-rich foods were in abundance - and had been in abundance in the recent past. Upon further discussions with colleagues and some of the research participants, it became clear that

poverty, per se, was clearly not the principal cause of these cases of kwashiorkor, nor was the absence of poverty the principal reason that the children survived. In some very traditional homes, the oldest men have access to the meat, fish or fat first and may conclude their meals before women or children can begin. Some women expect to feed the men first and are as resistant to change as the men. Similar customs, although significantly less common than in decades past, can continue to put the youngest children at the bottom of the familial food chain [11, 12]. These and other contributing causes can be directly modified with culturally sensitive and persistent public health education. Such education efforts must be ongoing, because we noted that without personal experience or history, the younger mothers were less likely - than the older women - to recognize kwashiorkor as a medical disorder. Just as Williams first observed when kwashiorkor was introduced into the medical lexicon, and from the very same location, pediatric deaths from kwashiorkor are largely preventable, this is not a problem of poverty; it is caused by a "poverty of knowledge" [1, 8, 9].

Clearly, our work in urban Accra has limited generalizability without substantial replication and verification in a variety of populations. We strongly encourage such efforts. The consistency of our findings, however, regarding the senior women in the families was noteworthy. The powerful roles of the senior women in the survival of these kwashiorkor victims were a theme throughout each family's interview. None of the younger women challenged or failed to support and reinforce the conclusion that the child would have been in grave danger if the senior women were not available, actively engaged in the life of the family and child rearing, and that there were collective decisions regarding the child's welfare.

In addition to replication and investigation of the criticality of roles of elderly women in child survival from malnutrition, it is also important to consider investigations that directly compare the success of families without extended familial members, such as single parents with a malnourished child, against families with the collective participation of older women. This comparative analysis would isolate the relative success or failure in rehabilitation as a question of compliance with a long-term, rehabilitative and medical intervention. The findings of such a comparative analysis would have implications for the larger and more generalizable literature on compliance with medical regimens.

When conducting research "on the ground", in places like the crowded, impoverished neighborhoods of urban Accra, Ghana, large public health questions can quickly become condensed into issues of practicality and circumstance. In Ghana, malnutrition represents the sixth leading cause of death of children less than five years old [5, 6]. Dealing with this kind of endemic condition is a source of continuing frustration to public health leaders who must also deal with the challenges of urbanization, population growth and migration into the urban centers and inadequacy of sanitary or other essential elements of the infrastructure. New public health challenges now constitute morbidity and mortality threats that can eclipse traditional killers such as kwashiorkor [13, 14]. The efforts of community nurses as counselors, primary care specialists, referral agents, advocates, and public health educators represent, in our opinion, the best hope for thousands of

vulnerable children in places like Accra. We hope that the national ministries in such places recognize the cost-effectiveness of the work of all these people. Similarly, appropriate government ministries should recognize the vital roles of the older women in the survival of children. The significant value of intergenerational interdependence should be recognized as an essential element of economic stability and improved public health. Three quarters of the women in Ghana are in the labor force [5, 6]. Ghana is an extreme case, as it has as many women in the documented workforce as males and the proportions of women who are working and are principal family breadwinners is rising faster than those for males. Older women rarely retire in such environments and their continued familial contributions are essential to the ability of younger women to contribute in the labor force.

Collective decision-making, such as we observed in the extended families of our index cases is consistent with a larger perspective of parenting, and childrearing. In many places that have experienced severe marginalization of indigenous people, economic or political domination by small minorities or distant nations, the survival of traditions as well as communities has been attributed to the roles of senior women. We believe that collective decision-making for important aspects of child rearing or a family's economic situation is a hallmark of people who have faced oppression, economic or physical exploitation, and other historical challenges and that this is true globally [23, 26,27].

Contemporary public health circumstances in many Sub-Saharan African nations suggest that the value of collective decision making within familial structures will be an essential HIV/AIDS, malaria, tuberculosis, roadway crash casualties, and domestic or civil as well as international warfare all create increased intergenerational dependence and cross-generational roles and responsibilities that place substantial burdens on the oldest members of society. It would seem to be most critical that governmental policies and resources acknowledge the importance of the elderly members of society who often have the responsibility to rear the next generations while also continuing to sustain other aspects of families and communities [27].

CONCLUSIONS

We know that previous efforts to provide adequate treatment and to seek the eradication of malnutrition among children in emerging nations have primarily focused on clinical interventions and community health education [28,29]. Providing nutritional education, economic circumstances that create adequate supplies of appropriate food, and political stability, however, appear to be necessary, but insufficient. Our cases were brought to treatment in a general environment of political and economic stability. The collective familial decision-making of these families was central to their sustained compliance in rehabilitation, at the case level; we suggest that this element of the successful outcomes of these cases is generalizable to the pursuit of eradicating endemic kwashiorkor at the level of communities. Findings from this study have demonstrated that informal active involvement of senior members of the household, such as surrogate mothers and especially grandmothers, is vital to the survival and physical and emotional well being of

kwashiorkor victims. The role and importance of senior women in the survival of these children has been under-appreciated, but consistent with a broader understanding of the significant, gender-specific roles, responsibilities, and traditions of subSaharan, Africa's grandparents [24,30,31]. We would encourage the public health authorities of nations with large, vulnerable populations of children to find ways to support the senior members of the community, especially the grandmothers and other older women, who are essential to these nations' futures.

The appropriate way to use such information and the means of engaging appropriate members of Ministries of Health and organizations whose missions are focused on child advocacy remain to be determined and must be sensitive to cultural norms and expectations. Such is the reality for all social or political responses to human need. Male-female role expectations, intergenerational role dynamics in a rapidly changing Africa, distribution of wealth, and the introduction of nuclear families rather than multi-generation households all will influence any public effort to attack endemic childhood malnutrition or under-nutrition. These dynamic social considerations should become part of the debate over how to generate programs and services that are effective to specific populations.

In addition, our speculation of the relative probability of failure of a single parent with multiple children of whom one has kwashiorkor, needs to be tested in the field. We would not - based on these data alone - recommend discouraging such cases from being enrolled into rehabilitation programs with limited resources just because of the potential for non-compliance.

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CONTRIBUTORS

Richard Douglass and Brenda McGadney-Douglass developed this paper mutually. Professor Phyllis Antwi played a key role in the research design and participated in field interviews. Important conceptual development, verification of sociological and related social science literatures from contemporary African literatures were brought to our attention, and earnestly discussed between 2000 and 2003, in the context of our field work, with Professor Nana Apt, who is the third listed author.

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