AN ANALYSIS OF THE SPECIAL SUPPLEMENTAL FOOD PROGRAM FOR WOMEN, INFANTS AND CHILDREN (WIC) EFFECTIVENESS AT THE LOCAL COUNTY LEVEL

by

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ABSTRACT

The federal government has enacted legislation providing a supplemental food program for low-income women, infants and children who have a medical and/or nutritional risk. The goals of the program, called WIC, are to decrease infant mortality and to improve the health and development of infants and children. This paper examines the effectiveness of the WIC program for 100 children added to the program starting November 1988 through August 1989 at the local county level. Data was gathered through a manual chart review of these children's records, and an evaluation of reports and schedules.

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INTRODUCTION

The Special Supplemental Food Program for Women, Infants and Children (WIC) currently serves approximately 4.5 million individuals including one third of all infants in the United States. It also serves individuals in the Virgin Islands, Puerto Rico, Guam, the District of Columbia and all 50 of the United States. Monthly food supplements and nutrition education are made available to low income pregnant women, nursing women, nonlactating women as well as infants and children up to the age of five who are identified as being at medical or nutritional risk. Pregnant women and infants are given priority. The WIC program is funded through fiscal year 1994 under the Child Nutrition Act of 1966, and is administered at the Federal level by the Food and Nutrition Service of the United States Department of Agriculture. The cost of providing WIC benefits varies depending on the individual served but the average monthly cost for each participant in fiscal year 1989 was $30.27, with administrative costs of $8.07 per participant for a total monthly cost of $38.34 (Jones, pp. 1-2). For fiscal year 1990 appropriations for WIC may be almost $2.126 billion (WIC Newsletter, p. 1).

Within a program of this magnitude, national program evaluations have been authorized and completed, but what is the effectiveness of the program at the local level? What interventions are offered? What interventions are implemented, and what are the participants' nutritional and medical status after one year of participation in the program? Does intervention by means of identifying risk factors, referrals, nutritional education, monitoring of client's status as well as receiving food coupons improve the nutritional/medical status of the individual? These questions will serve as the major focus of research on this nutritional program at the county level.

WIC OVERVIEW

In 1969, a recommendation was made by the White House Conference on Food, Nutrition, and Health that special consideration be given to the nutritional needs of pregnant women, infants, and preschool children. As an indirect result of this recommendation, in 1972, legislation authorizing the Special Supplemental Food Program for Women, Infants, and Children (WIC) was established by Public Law 92-433. The WIC Program is a supplemental food program for low income pregnant women, post partum non-lactating women up to six months after delivery, breastfeeding women up to twelve months after delivery, and infants and children up to their fifth birthday who are determined to be either nutritionally and/or medically at risk. This program operates as an adjunct to health care received by these individuals. The program is funded by the U.S. Department of Agriculture through the states' health departments. Local agencies, such as health departments and non profit organizations, distribute WIC benefits to participants.

WIC was developed to help correct or prevent malnutrition and to help participants obtain necessary medical care. The program provides nutrition and health screening to identify problems, education about

food and nutrition, referrals for health and social services, and food to help improve the participant's diet immediately.

The Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA) distributes the monies and gives administrative direction to the WIC Program. Currently, there are more than 1,500 local WIC projects operating in 84 state agencies and Indian tribes. Legislation and regulations over the years have become increasingly specific in how help can be provided to WIC recipients. WIC has grown from a $20 million dollar allocation in 1974 to $1,160 million in 1983 and has increased considerably since then (Report to the Committee on Agriculture, Nutrition and Forestry, p. i).

Problem

Inadequate income, more than any other factor, determines the amount of hunger and nutrition-related illness in the United States. Malnutrition and inadequate maternal, infant and child health care are two of the most serious problems affecting low-income pregnant women and children. Sufficient and appropriate foods, and the availability of health care are essential during prenatal development and for the first few years of life. Healthy physical and mental development is affected if either proper nutrition or health care is denied during this period. As stated in the National State Directors Meeting on Program Management, "Such denial can make the distinct difference between a healthy, productive life or an unhealthy, nonproductive existence."[1] The National Academy of Sciences has defined an adequate

diet in terms of recommended dietary allowances (RDAs). RDAs for normal, healthy people are adjusted upwards to account for special needs such as pregnancy, breastfeeding, and chronic illness. But, even in normal times, many of America's poor can not afford a diet with sufficient RDAs. This situation becomes so intense at times that pregnant women, infants, and growing children, as well as seniors, are at a very high risk for malnutrition.

According to Brown in his book Living Hungry in America, "Children living in poverty were found to be twice as likely to suffer stunted growth as those not living in poverty."[2] The National Nutrition Surveillance Study conducted by the Center for Disease Control found that, in a selected group of four hundred thousand poor children in thirty-two states, approximately eight and a half percent under the age of six were stunted in growth (Brown, p. 195). They were below the tenth percentile for height and another seven percent suffered from anemia. Generalizing to the entire country, this equates to more than a half a million American children under the age of six are suffering from malnutrition, and this is the tip of the iceberg. In the 1970 Pre School Nutrition Survey, the Hanes Survey and the Department of Health, Education and Welfare Ten-State Nutrition Survey, data showed that for low socioeconomic groups, the overall quality of the diet was poor, low in iron and vitamin A and contained an inadequate intake of calories. The three surveys found that there was an increased incidence of children who were small for their age (National State Directors Meeting on Program Management, p. 49).

The infant mortality rate (IMR) is another measure of nutritional status, as well as one of the most accurate indicators of the public's health. The IMR for affluent Americans has been decreasing over the years but the IMR for many poor has been increasing. In some cases, the IMR was at levels comparable to impoverished Third World Nations.

As stated by Brown:

> While the link between poverty, hunger, and ill-health appears to be irrefutable generally, the infant mortality rate is one of the most shocking indictments of our government's policies toward the poor.[3]

Infant mortality is the worst possible health outcome of inadequate nutrition and poverty. In 1977, a USDA Food Consumption Survey indicated that for pregnant women, caloric intake was at an average of 1500. The RDA's required range as stated in the ninth edition (1979) of Recommended Daily Allowance is 1600-2400 for Women 23 to 50 years of age. The average woman consumes less than the lower limit of RDA and the low income woman consumes even less. Caloric intake during pregnancy must be at a level to ensure adequate weight gain for the pregnancy. A woman with insufficient RDAs and inadequate weight gain during pregnancy increases the risk of having an infant with low birth weight. Low birth weight, associated with infant mortality, is defined as a weight of less than 2,500 grams (about five and a half pounds) at birth; low birth weight is the eighth leading cause of death in our Nation. Like infant mortality, there is an inverse relationship with wealth (Brown, p. 198).

The best method to overcome many potential health dangers is good and frequent medical care combined with a nutritious and adequate diet. If women are given nutritious foods during pregnancy and receive medical attention, more babies will be born with birth weights above 2,500 grams. If the same infants are also supplied with formula and other foods as they mature, then decreasing infant mortality may be a possibility. The same ideology is used in giving non-lactating and breastfeeding women more food--the result being healthier mothers and infants. Finally, if children are given supplemental food packages, then adequate growth may be obtained during those first few critical developmental years.

Major Historical Initiatives That Preceded the Adoption of the WIC Program

Food aid policies and programs have been around since the 1930s. The first food aid policy cycle was from 1933 to 1946, and the executive branch officials dominated all food aid decision making. Under the auspices of President Franklin D. Roosevelt, Agriculture Secretary Henry A. Wallace developed a series of plans to cope with the economic emergency facing the American public, with the chief recipients of these plans were agriculture producer interests (Maney, p. 5).

In 1933, the Congress granted administration officials authority to give payments to agriculture producers in return for taking part of their land out of use. As a side effect of these initiatives, the

federal government began accumulating vast amounts of surplus agricultural commodities.

> Disposal of surplus agricultural products to the rural and urban poor was politically attractive to New Deal policy makers for several reasons. They hoped it would help rebuild normal demand for agricultural products, distract attention from the embarrassing prospect of ever- increasing government owned stockpiles, and assist needy individuals and families.[4]

That is, it intended to subsidize the producer interest directly but help out the needy and unemployed in the process. The food aid programs started in this era layed down the foundation for the programs today with bulk food distribution using state and local relief agencies and donations to institutions.

The second food assistance cycle was from 1946 to 1966. President Eisenhower's administration's principal solution to any problem was to dispose of surplus overseas while groups were using political leverage to push for new programs at home. A reduced price milk program was started during this time. This cycle was the start of proposals for a revived food stamp program which by 1961 had advanced to a prominent position on Congress's agenda, and expansion of food aid efforts were seen as an attractive political option for Kennedy administration officials. The Kennedy administration worked at the problem of poverty and hunger but did not launch an all out effort. A suggestion to that Adminstration was to build on the base of federal programs already in place and target the poor wherever they lived (Maney, p. 47).

During the period of 1962 to 1966, new food assistance programs were covered by three laws. In 1962, Congress added a new section to the National School Lunch Act to provide cash grants-in-aid for programs in low income areas. In 1964, enactment of the Food Stamp Act occurred which was administratively begun in 1961. Finally, in 1966 the Child Nutrition Act added several new programs emphasizing existing school food programs and strengthened the National government's commitment to antipoverty and nutritional aspects (Maney, p. 111).

From 1967 to 1968 pressure was exerted from President Johnson's domestic policy advisors on food aid. Food aid was an important part of social welfare policy for congressional liberals. Two new suggestions were given to increase food programs. One was free coupons for those at the lowest income level and the second was to increase the federal subsidy across the board to provide "a minimum diet to each household" (National Archives, Food Stamp Program) (Maney, p. 105). During this period Johnson "never linked hunger and malnutrition with his administration's concerns about the effects of poverty and refused to mount a full-scale food aid initiative during his term of office".[5]

After Nixon took office, it became clear that the USDA and the White House no longer had a monopoly on the development of new food aid policy initiatives. Congress was now more active. Democrats in Congress held hearings on the effects of hunger and malnutrition. Food stamp program expansion was proposed and presented to Congress.

Food assistance program supportors divided their time between food stamp and child nutrition legislation. Finally in 1972, legislators created several new food assistance programs aimed at different groups. The non-school food program was extended through fiscal year 1975. Authorization was given for $25 million for each of the first two years for a new program of supplemental food for women, infants, and children and nutrition grants to States for the elderly (Maney, p. 121). It was this supplemental food program for women, infants, and children which was to become what we now call WIC.

Legislative Passage--Process and Responsibility

As stated earlier, the WIC program was established in 1972 from the Child Nutrition Act of 1966, Public Law 89-642; 80 Stat. 885. The Child Nutrition Act of 1966 followed other federal assistance programs aimed at improving the diet of needy children. In 1946, the National School Lunch Act was passed authorizing grants-in-aid to States and placed responsibility for further expansion in the educational agency of each State. In 1954, the Special Milk Program authorized cash assistance payments to schools to subsidize the price milk offered to children. In 1961, a major amendment to the 1946 national School Lunch Act was passed seeking to make the lunch program more effective in reaching needy children with free or reduced price lunches. In 1966, the Child Nutrition Act was passed. This Act paved the way for Congress in 1968 to authorize USDA to provide assistance to needy children in a non-school situation, especially pre-school children

with working mothers. By 1970, Public Law 91-248 established a federal minimum family standard for determining eligibility (Congressional Quarterly Almanac, p. 2).

With this background of legislative passage of assistance for needy children, in 1972, the National School Lunch Act was again amended with HR 14896, Public Law 92-433. Enacted in September 26, 1972, it added a new section for fiscal years 1973 and 1974 to provide supplemental food to pregnant and lactating women, infants, and children up to 4 years of age who were determined, by a competent professional, to be at nutritional risk due to inadequate nutrition and income. Cash grants were to be made by the Secretary of Agriculture to health departments or other agencies for the purposes of carrying out the program. For fiscal years 1973 and 1974, $20 million was authorized (Congressional Quarterly Almanac, p. 2).

On November 7, 1973, the National School Lunch Act was amended by Public Law 93-150 which expanded the supplemental food program by increased appropriations and extending the time frame for the program from two to three years. Also added were Indian tribes, bands or groups recognized by the Department of Interior. For fiscal year 1975, $40 million were authorized (U.S. Code Congressional and Administrative News; A3 Congress, p. 624).

The special supplemental food program underwent numerous amendments since its approval in 1972. One of the major amendments occurred in 1974, when Public Law 94-105 added all women for a period of six months post partum and extended the age of participation for

children from up to fours years of age to up to five years of age. State agencies' administrative allowance was increased to 20 percent of program funds and the National Advisory Council for Maternal, Infant and Fetal Nutrition was established. For fiscal years 1976, 1977 and 1978, $250 million was authorized. In 1978, Public Law 95-627, extended WIC through fiscal year 1982, established income guidelines, state plan requirements, funding formula requirements and standards for certification. Other amendments in 1980, 1981, 1984, 1985, and 1986 added more funding appropriations, administrative and operational plans, as well as clarification of terms used in the law. In 1986, Public Law 99-500 and 99-591, continued appropriations for WIC but added priority funds for migrant programs, allocation standards, repayment of certain benefits by participations and numerous administrative services (WIC Program--Legislative History).

MECHANICS OF THE PROGRAM

Purpose of the Program

The purpose of the WIC program is to supply, at no cost to participants, supplemental nutritious foods and nutritional education to low income pregnant and post partum women, infants and children identified as being at a nutritional or medical risk. The ultimate goal of the program is to decrease infant mortality and improve the health and development of infants and children. The Department of Agriculture's Federal Register states: "The Program shall serve as an adjunct to good health care during critical times of growth and development, in order to prevent the occurrence of health problems and to improve the health status of these persons".[6]

Objectives of the Program

WIC's objectives focus on adequate nutrition during pregnancy, infancy and early childhood to increase the likelihood of better fetal and child development, when adequate development is crucial. Other objectives include: providing participant's nutritious food as a supplement to a normal diet; increasing participant's knowledge and positive attitudes towards nutritious foods; encouraging early and

frequent use of prenatal health care; encouraging routine well-child care for infants and children, including the recommended schedule for immunizations; and the permanent improvement of all recipients' eating habits and behaviors (Background of the WIC Program, p. 2).

Funding Mechanism

Formula grants are used to determine assistance level. State health departments, or comparable agencies, Indian tribes, bands or intertribal councils, or groups recognized by the Department of the Interior, or Indian Health Service of the Department of Health and Human Services are eligible for grants. From this initial grant at State level, smaller grants are given to local health departments or public/non profit welfare agencies to carry out the distribution of coupons for the supplement food. "Funds are expended to purchase supplemental foods for participants or to redeem vouchers issued for that purpose."[7] Twenty percent of the Federal funds may be used for State agency administrative costs, while additional administrative support may be obtained by implementation of an approved food cost saving program which increases participation. States are provided funds for food and administration determined by formulas established by the Food and Nutrition Service of the U.S. Department of Agriculture. Local agencies must qualify under state regulations and successfully apply for funds to operate WIC programs. Agencies or States receiving grants must give high priority to areas most in need

of supplemental food. High priority areas have high infant mortality rates, low birth weights and inadequate incomes.

The WIC program has expanded considerably since its inception in 1972. "Authorization has increased from $20 million in 1974 to approximately $1.5 billion in 1985."[8] Monthly participation went from 87,657 persons in fiscal year 1974 to more than 3.14 million persons in fiscal year 1985.

It is this participation level and data that sets forth the allocation formula. The FNS uses state reported participation data, after adjustments are complete to compute the number of persons in each category that are in each nutritional risk priority group. Eighty percent of the funds received by the State are allocated for food. A base amount is given equal to the sum of all funds allocated to the state's agency the preceding fiscal year minus fifty percent of food funds voluntarily returned. The base amount is also increased by an inflation factor as well as adjusted for migrant population participation. Any residual funds are distributed according to priority participation within the state.

The state agency then provides to local agencies all funds made available by the FNS, except those necessary for the State's administration, program services costs, and food costs paid directly. The State ensures that all local agencies have funds to cover food needs. The allocated funds are sufficient to "cover expected local agency administrative and program services costs in a manner which takes into consideration each local agency's need".[9] This includes

factors such as staffing needs, density of population, number of persons serviced and availability of administrative support from other services. "No matching funds are required, but States and local agencies are expected to bear the food and administrative costs in excess of their funds allocation."[10]

Applicant Eligibility

Each state desiring to participate in the WIC Program must submit an annual plan and enter into a written agreement with the Department of Agriculture. No state will be eligible to participate in the WIC program if state or local sales tax are collected on WIC food except in circumstances surrounding Indian entities. The State must also meet federally mandated staffing standards. As stated in the Federal Register:

> Each State agency shall ensure that sufficient staff is available to administer an efficient and effective program, including, but limited to, the functions of nutrition education, certification, food delivery, fiscal reporting, monitoring, and training.[11]

Finally, the State must delegate to local agencies the ability to provide benefits to eligible recipients.

Included in the State's plan must be an outline of goals and objectives for improving operations; a budget for administrative funds and an estimation of food expenditures; an estimation of participation; the required staffing; and an affirmative action plan. Also included in the State's plan is a methodology to provide benefits

to migrant families and Indians; the outreach activities for the program; a coordination plan with other programs; procedures for guidance of local agencies; a description of the State's financial management system; and an explanation of the plans for distribution of funds to the local agencies as well as the food delivery system. Dual participation prevention and detection must be outlined, along with procedures for civil rights and fair hearing procedures for participants. Finally, States must detail how they plan on providing benefits to individuals most in need of benefits, such as women in the first trimester of pregnancy (Federal Register, pp. 5-8).

Local agencies desiring to be a provider of WIC benefits must make application to the State. Local agencies are chosen based on a priority system of the special needs of the population. When an agency is chosen, an agreement with the State is entered into. The agreement includes compliance with all fiscal and operational requirements set forth by State; the staffing of a competent professional authority (CPA) to perform certification procedures; the ability to make available or inform recipients of appropriate health services; a plan for continued efforts for health services; a provision for nutrition education services; implementation of a food delivery system; complete and accurate documentation of funds received; maintenance of records documenting criteria for income standards and nutritional risks; and the assurance of nondiscrimination (Federal Register, pp. 9-11).

A local agency is eligible according to these requirements if it gives health services free or at a reduced cost or arranges for the service to be provided elsewhere, serves a low income population at nutritional risk, and is able to perform measurements and data collection. Records must be maintained and the agency must be a public or private non-profit health or human service agency (Federal Register, pp. 10-11).

Participant Eligiblity

Pregnant, postpartum breastfeeding women, infants and children up to five years of age are eligible if they have a nutritional risk determined by a competent professional authority, meet the requirement that applicants reside within the State's jurisdiction and income criteria set by State in compliance with standards set by USDA. Residency requirements do not apply for Indian State agencies (Federal Register, p. 11).

Nutritional risk is determined by measurements of height/length, weight, and hematological tests for anemia, except for those under six months of age. A breastfeeding woman is determined to be at nutritional risk if her infant has already been identified at risk. An infant is at risk if the mother was a program participant or would have been eligible had she applied; and a participant is eligible if there is the possibility of regression. Conditions such as anemia, under or over weight, abnormal patters of weight gain in a pregnant woman, low birth weight in an infant or stunting in an infant or child

would be examples of risk conditions. Other conditions such as clinical signs of nutritional deficiencies, metabolic disorders, or failure to thrive would be eligible. Dietary deficiencies that impair or endanger the individual's health or inadequate dietary patterns also would qualify. Finally, conditions that predispose persons to inadequate nutrition such as: chronic infections; alcohol or drug abuse; lead poisoning; history of high risk pregnancies; or congenital malformations in infants or children or infants born to women with alcohol or drug abuse histories or mental retardation qualify for WIC benefits (see Appendix A--Risk Codes).

Income criteria are set by the State and determine the final eligibility of an individual. The Federal Register contains the following statement on this issue:

> The state agency may prescribe income guidelines either equaling the income guidelines established under Section 9 of the National School Lunch Act for reduced price school meals or identical to State or local guidelines for free or reduced price health care. However, in conforming program income guidelines to health care guidelines, the State agency shall not establish program guidelines which exceed the guidelines forreduced-price school meals or are less than 100 percent of the revised poverty income guidelines issued annually by the Department of Health and Human Services.[12]

Participant's Benefits

Individuals meeting all requirements for inclusion in the program are entitled to supplemental food packages, nutritional education,

adjunct health care and monitoring, and review of their health/ nutritional status.

Food packages or vouchers for food are designed to provide specific nutrients found to be lacking in the diet of recipients. Packages are determined by the age of the infant/child or the woman's status in regards to being pregnant, breastfeeding, or postpartum. Foods supplied included formulas, infant cereal and juice for infants to a year. For children and women, milk, cereal, juice, cheese, eggs, beans, or peanut butter are supplied. Packages are tailored to meet the needs of the individuals.

Nutrition education is offered at no cost and is designed to be easily understood by all regardless of cultural or ethnic backgrounds. It informs the participants on the selection of food for themselves and their families, as well as breastfeeding information and promotion. "Common forms of nutrition education are counseling, group sessions, and written materials."[13] A required, expected indirect benefit for program participants is the increased and regular use of health care services. These services are not paid for by WIC funds but encouragement is given to all participants to take advantage of other health programs or private providers of services.

As an adjunct to these benefits, continual monitoring and review of the participant's health and nutritional status occurs on a minimum of every six months when the participant becomes recertified or eligible for the program. During the six month interval, the CPA may request additional measurements and hematological checks to monitor

the participant's status. One on one visits may also be set up with a dietitian or with the CPA to do more education or follow up on an initial assessment.

Monitoring and Review of the Program

The program is monitored and reviewed on three levels: national, state and local. At the national level, evaluation of the WIC program was instituted in the November 1978 Child Nutrition Act, and special funding for this purpose was allocated. "State and local agencies have also undertaken various assessments of the program."[14] In the 1988 Federal Register, Consolidation of WIC Regulations, it states that "FNS and each State agency shall establish a management evaluation system in order to assess the accomplishment of program objectives as provided under this part, FNS guidelines, instructions, and the Federal State agreement with the Department."[15] It also states that assistance is provided to the States in performing the evaluations and reviews, setting standards and procedures, and implementing sanction procedures. To accomplish this review and monitoring by the FNS, audits may be performed by state or local agencies.

Implementation in Michigan

The Secretary of Agriculture was assigned responsibility for administration of the WIC program by the law in 1972. In turn, the USDA was given authority for funding oversight, monitoring, and

reviewing the program at the national level. The Senate Committee on Agriculture, Nutrition, and Forestry has jurisdiction over WIC for program evaluation and effectiveness.

The USDA utilizes the Food and Nutrition Service (FNS) as their funding mechanism. There are currently seven regional FNS offices to service the states. The FNS regional office for Michigan is located in Chicago, Illinois and it services most of the Great Lake States.

The WIC program is administered in the State of Michigan by the Department of Public Health through its WIC Division. The WIC Division is divided into three regions serving the state: the northern region, eastern region, and western region. Each region has a consultant assigned to answer questions, monitor, and evaluate local agencies. The WIC Division also contains a vendor relations section that interacts with, monitors, and evaluates the retail food stores that participate in WIC coupon redemption. The state WIC Division provides training for local agencies and holds a yearly WIC conference to discuss new trends, resolution of problems, etc. Finally, the WIC Division performs yearly management evaluations of the local agencies to review records, administrative activities, outreach activities, nutrition education, and civil rights of participants.

There are a total of 51 local agencies participating in the Michigan WIC Program with 228 sites where eligible participants can receive services. There are approximately 147,827 individuals enrolled in the program with participation at approximately 142,298 according to 1988 statistics. 60,054 monthly food packages are

issued, with 44% of the eligible population being served. The participants are made up of 19.6% women, 27.1% infants, and 53.3% children with the following racial/ethnic classification:

29.1% Black
5.2% Hispanic
1.7% Asian/Pacific Islander
0.7% American Indian
63.7% White

The rate of breastfeeding women enrolled is 14% ("State Profile of the WIC Program in Michigan," 1986 data).

The food packages are developed following federal regulations stipulating types of food items and maximum level for each category of participant.

In the "State Profile of the WIC Program" it states the following:

> Michigan Department of Public Health determines limits within the state, a "standard package" which may be tailored, up or down, within the Federal limits according to the individual's nutritional needs and eating patterns.[16]

The average food package cost in 1986 was $33.96 per participant with coupons being redeemed at retail grocery stores ("State Profile of the WIC Program in Michigan").

For fiscal year 1988, the total monies allocated to the State was $63,640,568. The administrative grant amounted to $12,588,138 and the food grant was $51,052,430. Of the $12 million administrative monies, approximately 28.38% of it was used for nutrition education and nutrition services. In 1988, the state of Michigan supplemented the

program with $454,000 in direct cash support ("State Profile of the WIC Program in Michigan").

The local agencies in Michigan sign a contract to render services to participants on a yearly basis. This agreement, beside meeting all the USDA requirements listed in the Federal Register, sets forth the number of participants the agency agrees to serve for the year, which in turn determines the funding the local agency receives. It is here that the actual servicing of participants occurs. Eligibility, determination, nutritional or medical risks, coupon distribution, and nutrition education occurs at this level. Reports are generated at the state level informing the local agency of race/ethnic status of the participants; their priority status; and their classification. Enrollment and participation levels; program abuse or dual participation in other programs are also reported.

The WIC participant has responsibility in the program also. At initial enrollment (certification), the participant must answer questions about their medical history and diet, submit to blood testing for anemia, be weighed and measured, talk to a professional (CPA) about their nutrition and submit proof of income. The participant must undergo this process every six months to be eligible for the program. The exceptions to this requirement are infants who are eligible for the entire year up to their first birthday and pregnant women. Pregnant women must be recertified at six weeks past the birth of her child. In between certification periods, the participant (or legal guardian) must be offered at least two nutrition

education sessions at the time of coupon pick up. If designated by the CPA, the participant may also be scheduled for an individual session with a nutritionist. The WIC participant or guardian must pick up coupons in a timely manner to receive the entire food package; if they do not pick up their coupons for two months, they are automatically terminated from the program. Finally, the WIC participant must abide by all WIC rules including the use of the food coupons. These include who can redeem them, how to redeem them and where to redeem them.

Results of Program

The WIC program has grown substantially from its inception in 1972 with approximately three million participants nation wide and 140,000 in Michigan. Even though these numbers suggest a large program, there is concern that it may only be reaching the tip of the iceburg. In Texas, "of the 814,000 women and children eligible for WIC, for instance, only about 20 percent were being served".[17] Funding has also increased dramatically since passage of Public Law 92-433. The initial allocation was $20 million per year and in the early 1980's it had already reached nearly $200,000 million per year (U.S. Senate Report to the Committee on Agriculture, Nutrition and Forestry, p. 1).

Two of the issues in the development of WIC were infant mortality and low birth weight infants. In 1972, the United States had approximately 60,182 infant deaths out of a birth total of 2,390,583.

In Michigan, the numbers were 2,801 of the 146,855 births that year. "In 1987, there were 38,408 deaths of infants under one year of age. The infant mortality rate of 10.1 infant deaths was the lowest final rate ever recorded for the United States...."[18] Michigan infant deaths dropped to 1,538. In an evaluation conducted in 1983 by the U.S. General Accounting Office (GAO), the effect of WIC on reducing fetal and neonatal mortality was shown to be positive. According to facts submitted, the GAO stated, "The favorable results reported from several evaluations are low in credibility. We consider them to be insufficient to support the assertion that WIC reduces the incidence of fetal and neonatal deaths."[19]

In 1972, infants with birth weights of 2500 grams or less accounted for 118,439 out of the 2,390,583 or five percent of births that year in the United States. In Michigan, infants born with a weight of 2500 grams or less accounted for 11,405 of the 146,855 or eight percent for the same year. In 1987, the U.S. had 3,809,394 births with 238,856 weighing 2500 grams or less, or six percent of the births. Michigan, in the same year had 10,291 or seven percent of the 139,635 births considered low birth weight infants. In the 1983 evaluation by the U.S. General Accounting Office, it found that with six studies that WIC had high or medium quality that supported the assertion that WIC has a positive effect on increasing birth weights of infants whose mothers participated in WIC. A decrease of 16 to 20 percent was seen in the proportion of infants though to have health

risks at birth because of their weight. Mean birth weights were higher also.

Maternal nutrition is not as positive but participation in WIC is associated with some improvements in nutritional well-being, especially in diet, iron, and weight. In reducing cases of anemia, there was limited evidence that WIC helps improve the levels of iron of children. But even with this inconclusive evidence, it appears individuals participating in WIC may be better off than others.

In Brown's book it states:

> In New Mexico, twenty-four percent of the infants and twenty three percent of the older children on WIC are underweight..... Nearly all the pregnant women are anemic, and many have to receive blood transfusions before they deliver. These facts mask an even more unsettling situation, since WIC children and mothers tend to be better off than the poor who are not on the program."[20]

One of the important contributions of the WIC program is its ability to be a feeder program for other programs offered at the Health Departments, Department of Social Services, or other social or education agencies in the communities. It is through the WIC program that children are referred to health screenings, Head Start programs, Protective Services, immunization clinics, or private physicians. Women are referred for prenatal care, Medicaid enrollment, Maternal Support Services, and food stamps or other assistance that is required.

Future Trends

A common practice in the States to generate more food dollars for the WIC program has been to have a competitive open market rebate program whereby each formula manufacturer gives a rebate on each can of formula used in the program. With the rebates, more participants are added to the program. In the Congressional Record from the U.S. Senate of August 15, 1989, it promotes cost savings on infant formula and allows the states to "use a competitive bidding system or any other cost containment measure that yields savings equal to or greater than the savings generated by a competitive bidding system".[21] With this endorsement, some States have entered into contracts with one formula company to be the sole provider of formula for the WIC program. The formula company is chosen by way of sealed bids. Currently, nineteen states have a sole contract provider for formula. In Michigan, an agreement was signed with The Mead Johnson Company in October 1989 and went into effect November 1, 1989. With this agreement, Mead Johnson will provide a rebate to the state and supplies iron-fortified formula to over 95% of non-breast feeding infants in the program. With the rebates, Michigan plans on extending WIC program services to approximately 30,000 additional individuals per month. The State hopes to increase pregnant women, and in doing so reduce infant mortality and low birth weight babies. In the November 11, 1989 Flint Journal; it was reported that President Bush signed legislation on Friday November 10, requiring all states to use

competitive bidding to buy food and formula for the WIC program. By this action, WIC funding will increase in all states and those who need it will be able to participate.

Another trend occurring in Michigan is the cooperation with another Department of Agriculture Program called Project Fresh. With Project Fresh, coupons for fresh vegetables and fruits are given to WIC families in order to help supplement their diet and help local produce growers and vendors. The coupons are redeemed at local farmer's markets. This program is administered by USDA and provides coupons for food only from July to the end of October each year.

Michigan's WIC program has been undergoing a major change since the summer of 1989, when a new computer system was installed and an entire redesign of the program undertaken. One of the major changes has been the introduction of a new form used for certification whereby more demographic information on the client is documented. Not only are the food package types, risk codes, measurements and hematological values gathered, but migrant status, breast feeding information, prenatal care information, prior birth information, education levels of the mother, and substance use data are documented. Nutrition education sessions will be documented and profiles of all clients, individually or as a group, will be available in the future. Standardized forms and questionnaires are being developed in the hope of gathering information to correspond with data needed by the federal government. To facilitate these new data fields and eliminate the enormous batching of forms to be mailed to the state WIC program,

local agencies are to be computerized to generate coupons and input all necessary data. Numerous training sessions are being held to achieve the goals of this system redesign.

The WIC program is one of many programs to help the nation's low income needy. It is an outgrowth of the Child Nutrition Act of 1966 and has grown to proportions unrealized back in the early 1970's. Whether the program is effective in meeting its goal has been questioned. The chief criticism is the inability to reach everyone who needs services, but other complaints are whether we are getting an adequate return for expenditures. But, "by improving the health of infants, the WIC program probably saves the nation substantial amounts of money that would need to be spent treating the infant illnesses that would have occurred without the nutrition improvements".[22]

Also, as stated by Mr. De LaGarza from the committee on Agriculture in 1983, "The primary line of defense against hunger in this country lies in the ongoing federal programs that have proved to be so effective in the past, the Food Stamps Program, Child Nutrition Programs, the Special Supplemental Food Program for Women, Infants, and Children (WIC), and various elderly feeding programs".[23] The final determination of WIC's effectiveness may not be known but to many who participate in it, it is probably the only way they, their infants or children could have close to an adequate diet.

THEORETICAL FRAMEWORK

Basic Concepts of the Research

As stated in the introduction for this paper, the research attempted to answer the following questions about the WIC Program as it is conducted at the Shiawassee County Health Department: What is the effectiveness of the Special Supplemental Food Program for Women, Infants and Children (WIC) at the local level? What interventions are offered; what interventions are followed through; and what is the participant's nutritional and medical status after one year of participation in the program? Does intervention by means of identifying risk factors, referrals, nutritional education, monitoring of client's status as well as receiving food coupons improve the nutritional or medical status of the individual?

Records were reviewed of 100 children who were either newly added to the program or identified as newly added according to the reporting system at the Health Department. Their nutritional and/or medical risks when they started the program, and activity such as education, referrals, etc. were evaluated. A conclusion based on all measurements and associated documentation was formulated and helped to

identify whether the children's status had changed. Improvement was determined by:

- a positive change in hematological or antropometric measurements
- reduction in medical risk codes used
- a less serious nutritional code being used in place of the other risk codes
- on the inability of the health professional to find a risk code and either removing the child from the program or using a fear of regression code.

The fear of regression codes allowed an individual to remain on the program for six additional months when there was no identified risk factor except for possible regression to a former state of health. The evaluation was designed to show whether nutritional and medical status of children improved after participation in WIC for one year. Contributing factors for improvement were also examined.

Variables and Operating Definitions

Research was limited to children added to the WIC Program between November 1988 and August 1989. Subjects were at least one to four years six months of age at the time of entry into the program. The child's health status was discovered by way of a chart review and the risk factors noted. The dependent variable was the children's nutritional and/or medical status as determined by hematological

testing, antropometric measurements, medical conditions that were improved by diet, eating patterns and dietary content.

One of the dependent factors studied was the hematological measurements of the subject. Hematocrits were identified as acceptable, low or deficit. The definition for low and deficit hematocrit as defined by the Michigan Department of Public Health is as follows: children age one to two years of age low readings were 33% and deficit at 31%, children three to four years of age low readings were 34% and deficit at 32%. For the purpose of entry into the program, the WIC Program did not require a delineation between deficit and low for use of risk codes. Antropometric measurements were another variable and were reviewed for acceptable and unacceptable growth of the child. Unacceptable growth (which includes over and under nourishment) was defined as follows: stature for age below the 10th percentile; weight for stature less than the 3rd percentile; stature for age decreased by one channel or more within seven months or less; weight for stature below the 10th percentile; weight for stature decreased by one channel or more within seven month period or less and below the 25th percentile; weight for stature more than the 90th percentile; and weight for stature more than the 97th percentile.

Another dependent variable was the dietary intake of the child. Acceptable and unacceptable dietary status was determined using WIC guidelines for daily servings. Inadequate diet based on a 24 hour recall and/or food frequency consisted of: less than two child size

calcium equivalents/day; less than two child size protein equivalents/ day; less than three child size bread/cereal servings/day; less than two child size fruit/vegetable servings/day; less than one child size serving of vitamin C/day; and less than three child size servings of vitamin A/week.

Another dependent variable was the medical status of the child. Medical conditions which would automatically qualify a child for WIC were reviewed but other risk factors were used for evaluating the effectiveness of program participation, since the medical conditions would not be directly affected by supplemental food. These medical risk factors were chronic gastrointestinal disturbance with expectation to continue; inborn errors of metabolism; metabolic diseases or hormonal disorders; gastrointestinal disease; congenital anomalies or developmental disorders; and food intolerance or allergies. Other medical factors such as: diagnosed failure to thrive; nutritional deficiency; Michigan fish advisory; and diagnosed baby bottle tooth decay will be used in the study as factors for improvement and were considered a dependent variable. Risk factors not identified above but falling under the professional judgment for adding the child to the program were evaluated and noted according to documentation provided.

Following the initial certification for the program, all independent variables affecting the subjects' nutritional and/or medical status were monitored. These included referrals to other health department programs, physicians, other social agencies;

nutritional education; individual counseling; food coupon pick up; special monitoring; and prescribing of supplemental iron.

Referrals were evaluated by looking at each subject's chart and other documentation from the health department to determine what referrals had been made and whether they were followed through by the child's caretaker. This information was placed on the computer spread sheet. Nutritional education encounters were reviewed in regards to the type of class assigned, number of classes assigned, attendance, or one on one education with the registered nurse or nutritionist. Any special request by the professional in the program was noted. Special requests consist of monitoring of the child between times of certification for the program. Hematocrits, weights, heights, and head circumference measurements may have been indicated. The frequency of the special monitoring was noted as well as the caretakers follow through. At the child's six month recertification, medical and nutritional status was again evaluated and recommendations by the professional in the program again tracked.

At the completion of one year of participation on the WIC Program, the child was again required to undergo a medical and nutritional evaluation to ascertain whether his/her status had improved and whether he/she needs to continue in the program. At this time the child's final status was noted.

One of the extraneous variables that affects the outcome of the research is the ability to distinguish the influence of the program from other factors such as transportation, family dynamics,

availability of health care providers, health of other family members, etc. Also, WIC's effectiveness depends on whether the food packages designated for the children are being used by the intended recipients or the recipients' families. Two other factors affect the outcome of the evaluation. These are maturation of the children to exceed the age limits for WIC, and experimental mortality. Experimental mortality is the failure of the caretaker to pick up or redeem coupons, to follow through on referrals, or to relocate in another county. In summary, maturation of the children and experimental mortality caused the data to be incomplete.

Hypothesis Based on the Relationship among All Variables

The hypothesis is that participants in the WIC Program show improvement in medical and/or nutritional status after one year of benefits. This improvement is demonstrated by positive changes in hematological status, antropometric measurements, and medical condition and/or dietary patterns.

Source of Data

One of the sources of data consisted of the Shiawassee County Health Department's MIS activity system generated list of the children age one to four and a half years old at the time of being placed on the program. Updated transaction listing, numerical listing, racial/ethnic reports and high risk participant listing generated by the Michigan Department of Public Health were also used. At the local

health department, the childrens' chart was a major source of data as the risk codes and factors identified were on the Certified Data Entry form and in the progress notes filled out by the professional. Also identified in the progress notes were the referrals made. Depending on the nature of the referral and whether it was an internal health department referral, documentation from the other health department programs were available from the chart review. From the growth charts that are kept in the charts, hematological or measurements were obtained. The individual nutritional education cards were the source of data on attendance and scheduling of nutrition education, but since use of these cards did not start until December 1989, old daily schedules for classes and individual sessions were reviewed. Finally, a review of the nutritional education classes content was completed to see the types of classes offered.

Methods of Data Collection

Data collection consisted of chart reviews, analysis of data from the state health department, analysis of daily activity data kept at the local health department, reviews of nutritional education material, scheduling books, nutritional education cards and personal interviews of the WIC staff. All information was placed on a computer spread sheet. The child's chart number was the identifying method for tracking WIC history. The variables described earlier were listed across the top of the computer sheet. The headings were: client number; birth date; date of add to WIC; risk codes; referrals; follow

through; nutrition class; class attended; recertification date (six month period); and the same information was repeated until the one year (second six month recertification) was completed. The risk factors at that time were evaluated to ascertain if improvement has occurred.

Types of Data Analysis and Comparison

Data analysis consisted of a review of all data placed on the computer spread sheet. The data was displayed using the following:

- listing each case with its variable values and classifications;
- then grouping these cases with similar values and doing an enumeration of the values; and
- developing a frequency distribution from the grouping, along with a percentage distribution.

Bar and line graphs were used as well as statistics to delineate percentages, rates and rates of change.

Previous evaluations of the WIC Program were reviewed for their methodology, outcomes and conclusions. The following reports and evaluations were used:

- the 1976 Select Committee on Nutrition and Human Needs: United States Senate's Medical Evaluation of the Special Supplemental Food Program for Women, Infants and Children;
- the 1980 National State Directors Meeting on Program Management Summary Report: WIC;

- the 1984 Report to the Committee on Agriculture, Nutrition, and Forestry: United States Senate on WIC's Effectiveness;
- the 1987 National WIC Evaluation, Volume I: Summary;
- the 1987 National WIC Evaluation, Volume II: Technical; and
- the 1989 GAO Report to Congressional Requesters on Food Assistance, the National WIC Evaluation: Reporting and Follow-Up Issues.

Other evaluations not noted here were considered in the review process. The conclusions of these evaluations as they relate to the children were noted along with any significant methods of data collecting or analysis.

FINDINGS AND DISCUSSION

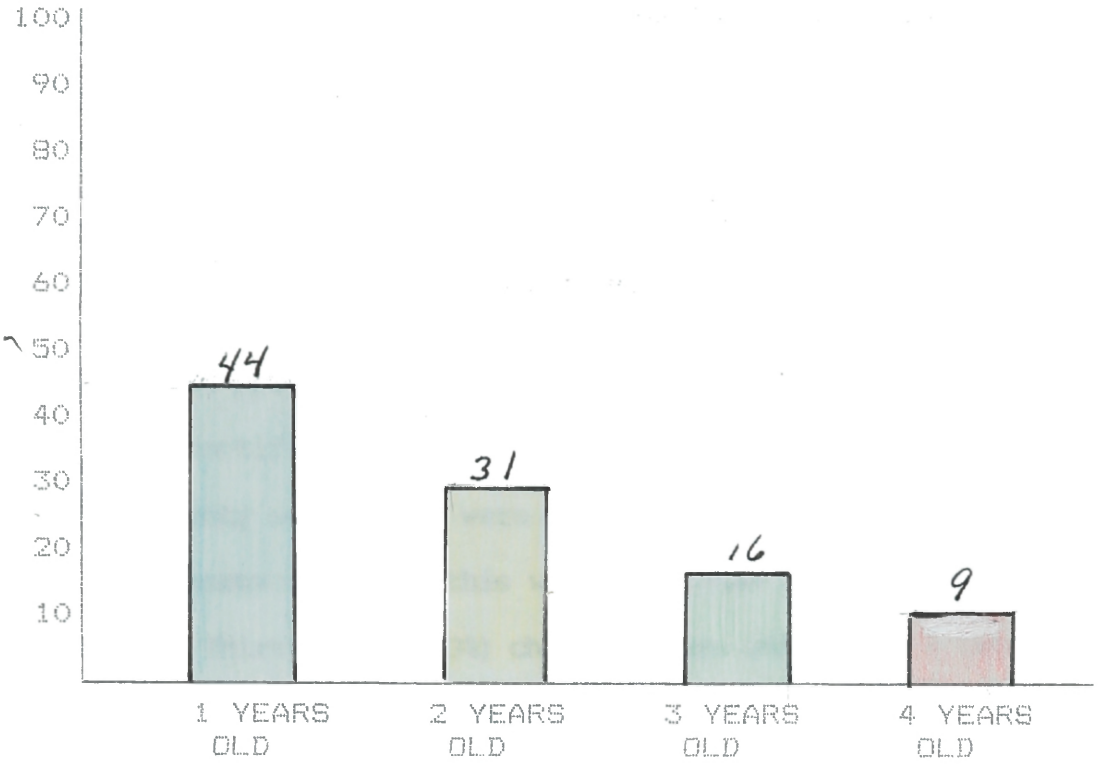
After a report was generated by the MIS Department at the Shiawassee County Health Department, the process of finding information on the children identified began. Some of the individuals identified as children were actually infants at the time of being added to the program and had to be eliminated and new reports had to be generated. This problem was caused by error in data entry of the birth dates. After an age appropriate list had been created, identifying where their charts were remained a problem. The Health Department's filing system is a centralized, numerical file with identifying names and chart numbers kept in a separate filing system. After this initial delay, all charts were found and clients were identified for research as numbers 1-100.

The dates of entry into the WIC Program represented a steady flow of new participants from the November 22, 1988 start date to the middle of May when there was a subsession of entries. At this time, the Health Department instituted the use of a waiting list and prioritizing of individuals. Pregnant women, breastfeeding women and infants were freely added to the program, while children and nonlactating women regardless of risk factors were not added. The

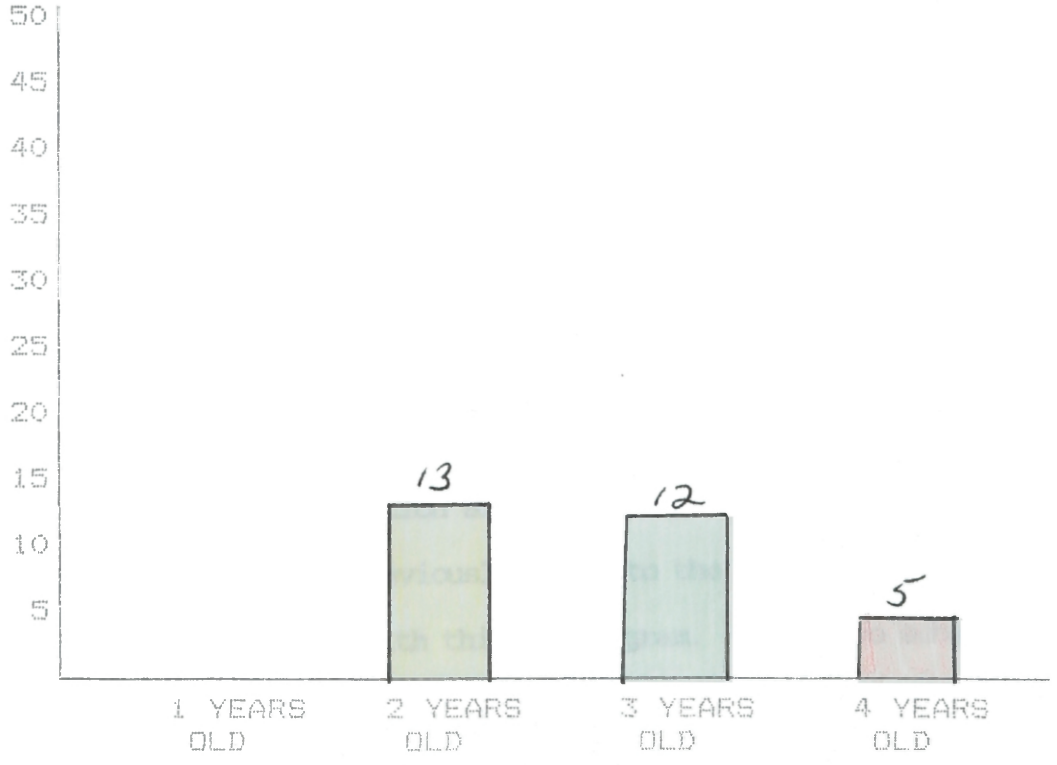
waiting list procedure is initiated when an agency's case load greatly exceeds their agreed upon target or when there is a wait of over one month to get an appointment. The individual birth date, date of adding to waiting list and any risk factors are noted so that when the waiting list is eliminated, they can be given an appointment based on this information. At the time of this waiting list, the Shiawassee WIC Program participants exceeded their targeted case load. This waiting list was in effect until the fall of 1989, but certain age groups of children were being added back to the program starting in August.

At the time of first certification, the age distribution of the children was: forty (44%) were one year of age; thirty one (31%) were two years; sixteen (16%) were three; and nine (9%) were four years of age (Graph #1). This age distribution was consistent with the priority ranking in WIC and the priority status given pregnant women and infants. It would be expected that since one year olds are next in the priority ranking for WIC participation that their age group would also show the most new participants for WIC out of children one to four. As previously stated, a waiting list was put into place during the time selected for this study and children not in the priority categories were placed on the waiting list. At the end of the one year time frame for participation the age distribution was: thirteen (43%) were age two years; twelve (40%) were three years of age; and only five (17%) were four years of age for a total of 30 participants (Graph #2). Participation decreased significantly

GRAPH 1
AGE DISTRIBUTION FIRST CERTIFICATION



GRAPH 2
AGE DISTRIBUTION THIRD CERTIFICATION - ONE YEAR



during this year and will be evaluated further in the review of reasons for terminations.

First Certification

Risk Codes

As stated previously, 100 children were included in the study at their first certification or entry into the WIC Program. Of the 100 children, twenty seven (27%) were added due to hematological reasons (i.e., low hematocrits) and this was designated by a risk code in the 100 series. Thirty three (33%) children were added with a 200 series risk code for unacceptable growth pattern. Thirty two (32%) were given a 300 series medical risk code as their eligibliity factor. Out of the thirty two medical risks given, twenty nine (91%) were given the 340 risk code--which was a subjective code used by the professional to designate a judgment decision for inclusion in the program. The 340 code was used for frequent antibiodic usage affecting dietary patterns; frequent illness; unstable home situation; possible baby bottle mouth; and medical/nutritional/psychosocial problems. Not all reasons appeared to be directly related to nutrition but did not negate the importance of monitoring by the program. Six (6%) received a 400 series, inadequate diet code and two (2%) received other codes in the 700s which signifies fear of regression and meant that the children were previously added to the program but only counted as a new client with this misprogram. These two subjects were

included to determine what their status were at the end of six months and one year time frame (Appendix 1 for risk codes; Graph #3 for risk codes).

Referrals

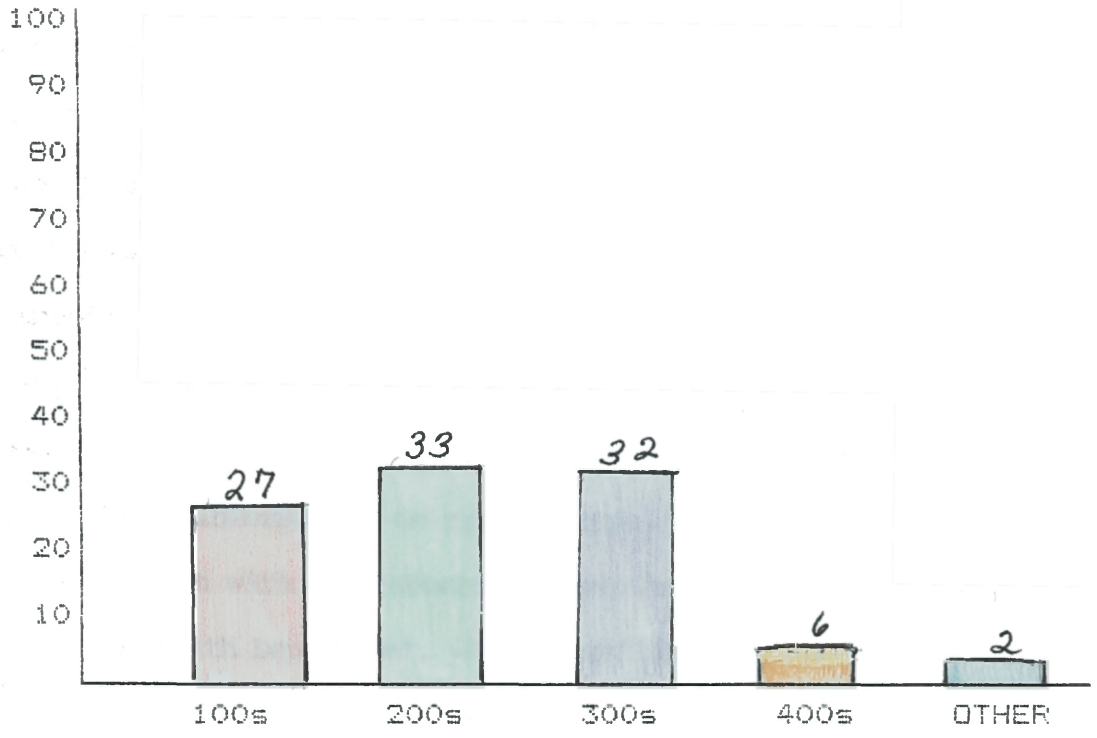
Of the 100 children admitted to the program, fifty one (51%) required and received referrals from the professional certifying them. The majority of the referrals were to the Early, Periodic, Screening, Diagnosis and Treatment Program (EPSDT). This is a Medicaid program for children from birth to age twenty one. A comprehensive screening including the following is completed:

- review of health history
- review of immunization status
- a physical assessment
- urinalysis for sugar and albumin
- microhematocrit test for anemia
- height and weight determination
- head circumference (under two years of age)
- blood lead levels (one-five years of age)
- Denver Developmental Screening Test (up to age six)
- hearing test
- vision test
- sickle cell testing (if not previously done)

EPSDT screening has a periodicity schedule which must be adhered to for billing purposes and determines whether screenings are performed.

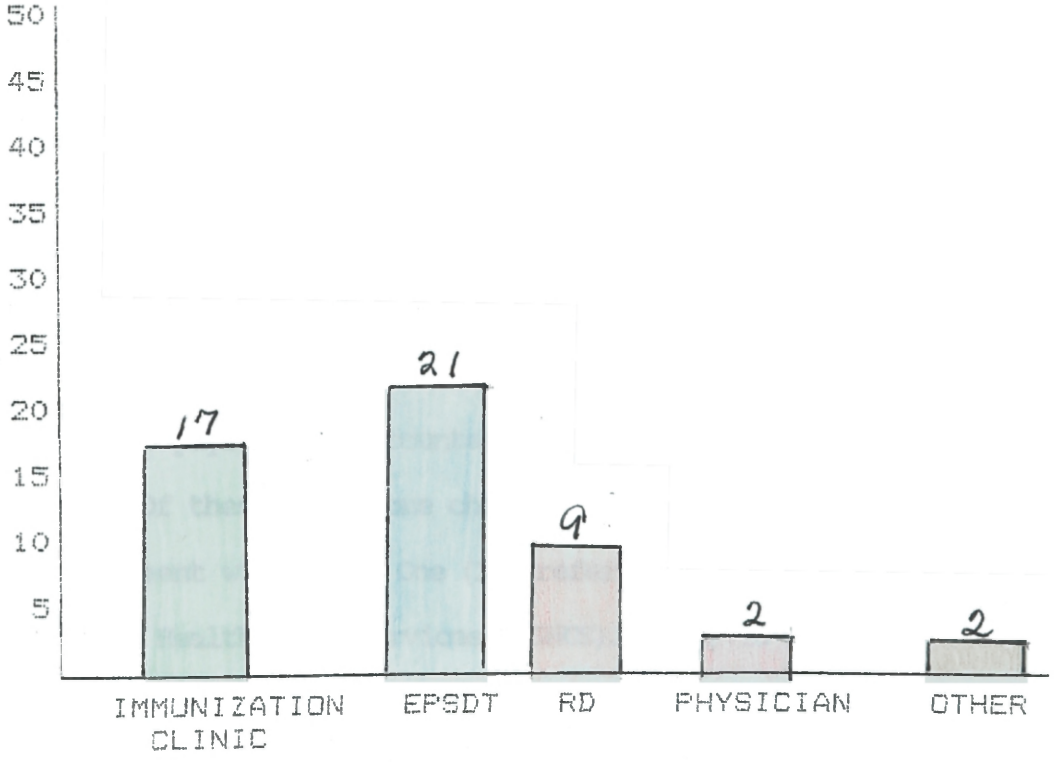
GRAPH 3

FIRST CERTIFICATION RISK CODES (TOTAL 100)



GRAPH 4

REFERRALS -FIRST SIX MONTHS (TOTAL 51)



Of the fifty one children receiving referrals, twenty one (41%) were referred for this service. Fourteen (67%) children kept the referral appointment and had screens completed. For seven (33%), this referral was not followed through.

Immunization clinic was the second highest referred service. Seventeen (33%) children received this referral. Six (35%) of the seventeen children kept their appointment; for one (6%) child, there was questionable information on his/her appointment; and ten (59%) did not follow through with the referral. Immunization clinic is a weekly clinic at the Health Department, whereby children may receive immunizations, at no cost, but appointments must be made to take advantage of this service.

The third most popular referral was to the Registered Dietician (RD). Referrals to the RD are specified for high risk WIC participants and/or other individuals whom the CPA feels would benefit from an individualized one on one nutritional session. Sessions are held in the Health Department or in the home, based on the need of the individual and are scheduled appointments. Nine (18%) referrals were made for this intensive counseling. Two (22%) of the nine appointments were kept, with seven (78%) having no follow through.

Referrals to physicians accounted for only two (4%) of the fifty one referrals. Of these, only one chart (50%) contained documentation that the appointment was kept. One (2%) referral was made to the Children Special Health Care Services (CSHCS). This is a state program to help qualified children, who have a special medical need,

obtain diagnostic treatment, medical care and help in payment for these necessary services. This referral was followed through. The last referral, was made for a recheck of the child's height and weight by the WIC staff. This referral was not kept.

It appears that referrals for medical services or help in payment for services were the ones most likely to be followed through, while referrals for intensive one on one nutritional counseling was not high on the child's caretaker list as necessary or important for the child's welfare. Referrals for immunization clinic, while being a free medical service, also required the child's caretaker to wait weeks for an appointment and appears not to have been perceived as important or necessary as other types of referrals (see Graph 4) or was adversely affected by extraneous variables such as lack of transportation.

Nutrition Education

Every participant or caretaker of the participant in the WIC Program is required to receive at least one opportunity for nutrition education within a six month certification period. Local agencies are allowed to devise nutrition education plans fitting the needs of the participants. Of the 100 children certified, seventy nine (79%) were scheduled for nutrition education. Seven (7%) children caretakers were not scheduled for any education and in fourteen (14%) cases, there was no documentation to render a decision on whether they were or were not scheduled for nutrition education.

The majority of the children records revealed that the 2-5 year old class was the most popular one scheduled. Twenty nine (37%) of the seventy one children scheduled were assigned to this class. This was general nutrition class, covering a variety of topics including: feeding habits, snack foods; smart shopping and fast foods. Eighteen (62%) caretakers attended; five (17%) did not and for six (21%) children there was no available documentation.

The low iron class had the second highest number with eighteen (23%) scheduled. Considering that twenty seven (27%) of the children had risks of anemia and low hematocrit, it was expected that this topic would have a considerable number of the children scheduled for it. Nine (50%) of the eighteen scheduled attended; three (17%) did not and six (33%) there was no documentation.

The third highest was tied between the height/weight class and the 1-2 year old class with each having twelve (15%) of the children scheduled. The height/weight, which was a class on appropriate amounts and types of food had a 50% show rate with six childrens' caretakers attending. One (8%) did not attend and for five (42%), there was no documentation available. The 1-2 year old class was a general nutrition class geared toward caretakers of this age group. There was a 42% show rate for this group, with five attending. Three (25%) did not attend and for five (42%), again there was no documentation available.

The nutrition education classes with the least number of individuals scheduled were feeding family and feeding general. A

general nutrition class; had three (4%) children scheduled. Of these three, feeding family, two (67%) attended the class and one (33%) did not. Feeding children, another general nutrition class, had two (3%) scheduled and both (100%) did not attend their scheduled class. Three (4%) children were identified here as requiring intensive one on one counseling education with the RD. There was no documentation available on these appointments.

Sixteen nutrition education sessions were not kept out of seventy nine scheduled. This represents a 20% no show rate, which is considered good for health department programs which can have rates from 30-40%. Forty nutrition education classes were attended for an overall show rate of 51%. The major problem with the health department's assignment to nutrition education was that for thirty nine individuals, there was no documentation of class attendance or class scheduling. This omittance does not allow for complete data collection (see Graph 5).

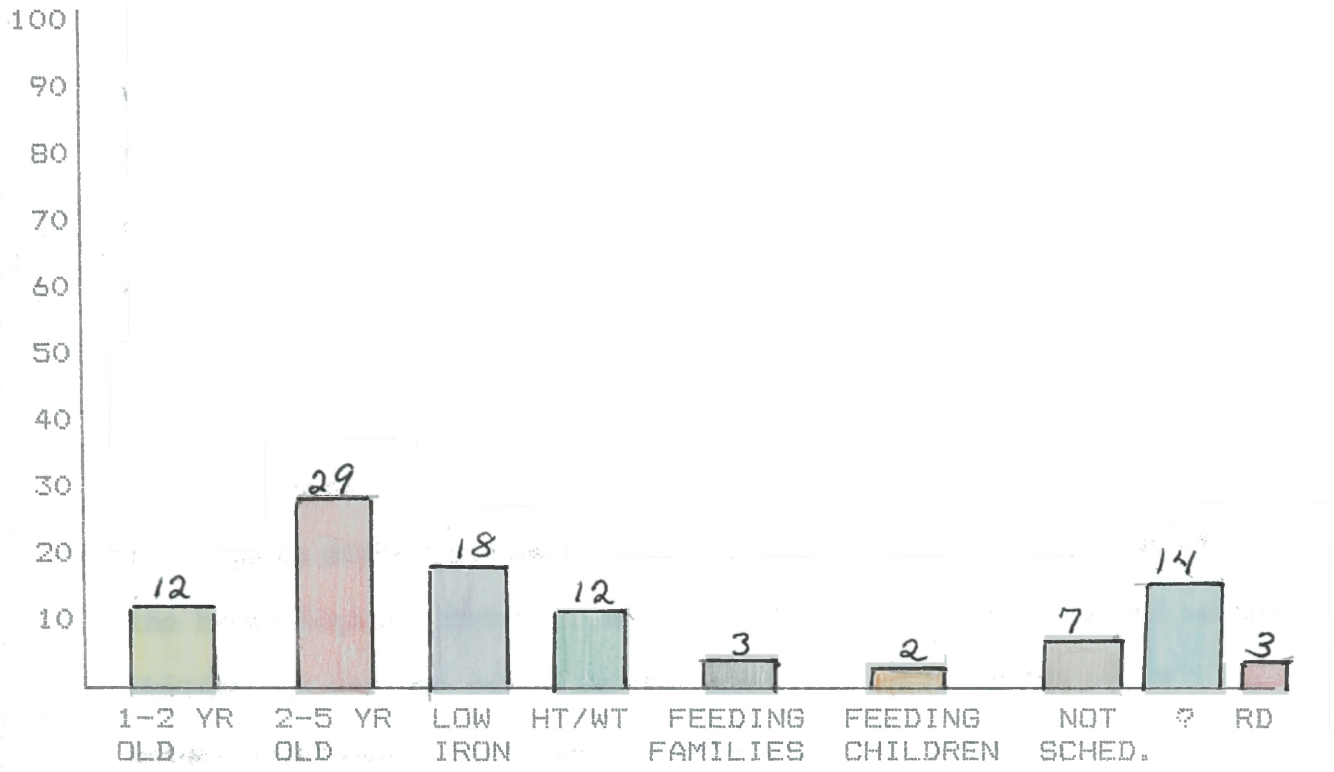
Second Certification--Six Months

Risk Codes

By the end of the first six months, at the time for the second certification, there was a substantial reduction in the number of children participating in the program. Fifty three children were recertified, which was a 47% loss of participants. (Terminations will be discussed at the end of one year time frame.)

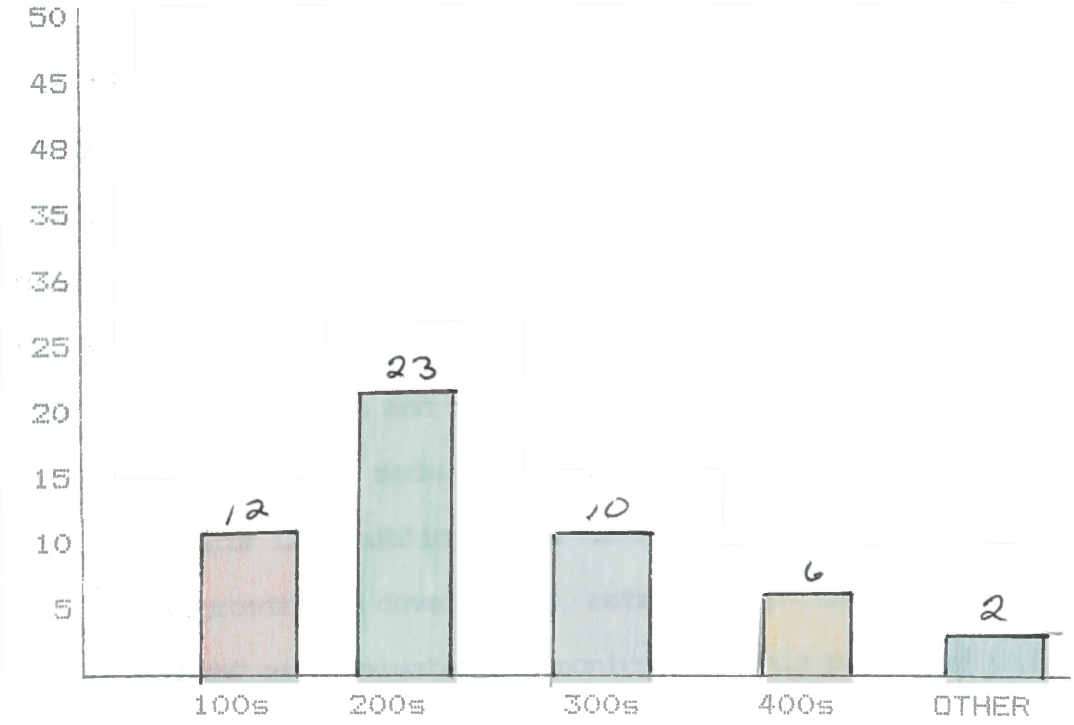
GRAPH 5

NUTRITION EDUCATION - FIRST SIX MONTHS (TOTAL 100)



GRAPH 6

SECOND CERTIFICATION RISK CODES - SIX MONTHS (TOTAL 53)



At six months, the breakdown according to risk codes and factors was as follows: 100 series, twelve (23%) children; 200 series, twenty three (43%) children; 300 series, ten (19%) children with nine (90%) of them receiving the 340 code; 400 series, six (11%) children and other series, 2 (4%) children who received the fear of regression code. Comparing these rates with the first certification, there was a decrease in the percent use of the 100 (hematological) and 300 (medical) codes, while the 200 (unacceptable growth) and 400 (inadequate diet) increased. This was possible due to improvement in the hematological status or medical status (i.e., CPA judgment) of the children or was the result of the decline in participants and not an actual improvement in these two categories (see Graph 6).

Referrals

Twenty nine (57%) of the fifty three children received referrals at this certification. Again, they were to the EPSDT Program, Immunization Clinic, the RD and one to the High Risk Infant Program. Eleven (38%) were referred to EPSDT, with seven (64%) of the referrals being followed through. Immunization clinic received ten (35%) referrals with a show rate of 30% (three children). The RD received seven (24%) of the referrals and two (29%) kept the appointments with her. The last referral was made to the Health Department's High Risk Infant Program. This is a public health nursing home visitation program, whereby growth and development, nutrition, parenting skills and home environment are evaluated and monitored. This program

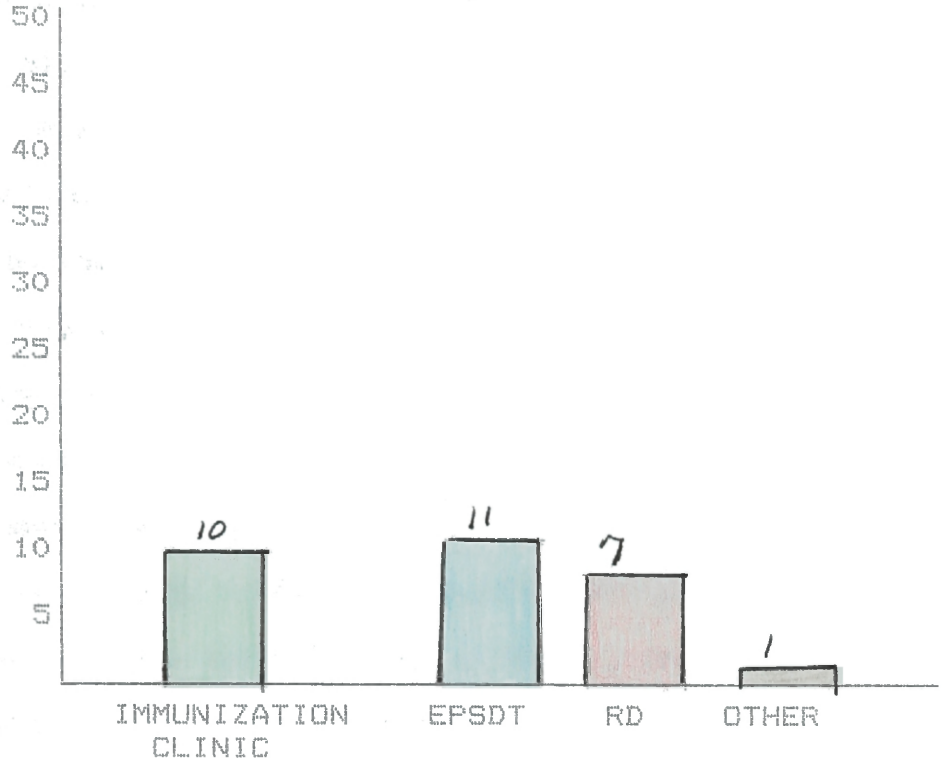
received one (3%) referral and visits were made by a public health nurse.

As in the first certification, EPSDT appeared to be perceived as important by the caretakers, since the show rate was higher than for the other referrals. Again, Immunization clinic and the RD have a large no show rate. The lack of follow through by the caretakers can again be due to many reasons such as perceived lack of importance, lack of transportation or other factors, but since there was no documentation for no shows, these reasons remain speculative (see Graph 7).

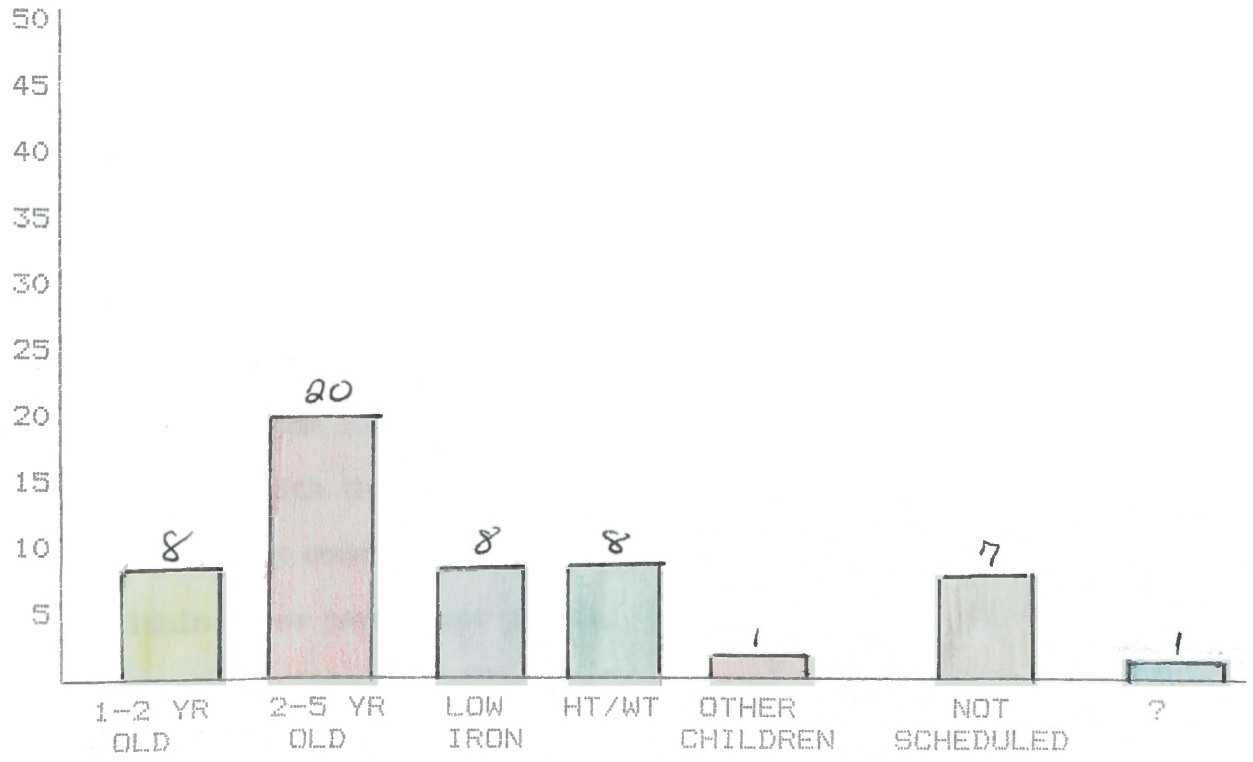
Nutrition Education

Nutrition education was offered to the caretakers of forty five (85%) of the fifty three children recertified. Seven (13%) were not scheduled for any class, while there was only one (2%) where no documentation was available on class scheduling. Again, the 2-5 year old general nutrition class had the highest number of children scheduled for it, with twenty (44%) assigned. Twelve (60%) caretakers attended and for eight (40%) there was no documentation. The height/weight class received eight (18%) children scheduled; three (38%) attended; one (13%) did not and for four (50%), there was no documentation. The low iron class had the same number of children assigned to it as the height/weight class and also, the same statistics for show, no show and no documentation. The 1-2 year old class received eight (18%) assignments; two (25%) were kept; one (13%)

GRAPH 7
REFERRALS - SECOND SIX MONTHS (TOTAL 29)



GRAPH 8
NUTRITION EDUCATION - SECOND SIX MONTHS (TOTAL 53)



was not; and five (63%) had no documentation in their records (see Graph 8).

Compared to the percentage breakdown for the first certification scheduling of classes, there was a drop of 5% in the numbers scheduled for the low iron class. There was slight increases in the 2-5 year old class schedule (7%) and height/weight and the 1-2 year old increase by 3%. The major problem with this certification's nutrition education classes revolve around the undocumented show or no show. For twenty one (47%) of the individuals scheduled, there was no documentation in records on nutrition education cards or on class schedules. This again does not allow for complete data collection or analysis of the entire WIC Program (see Graph 9).

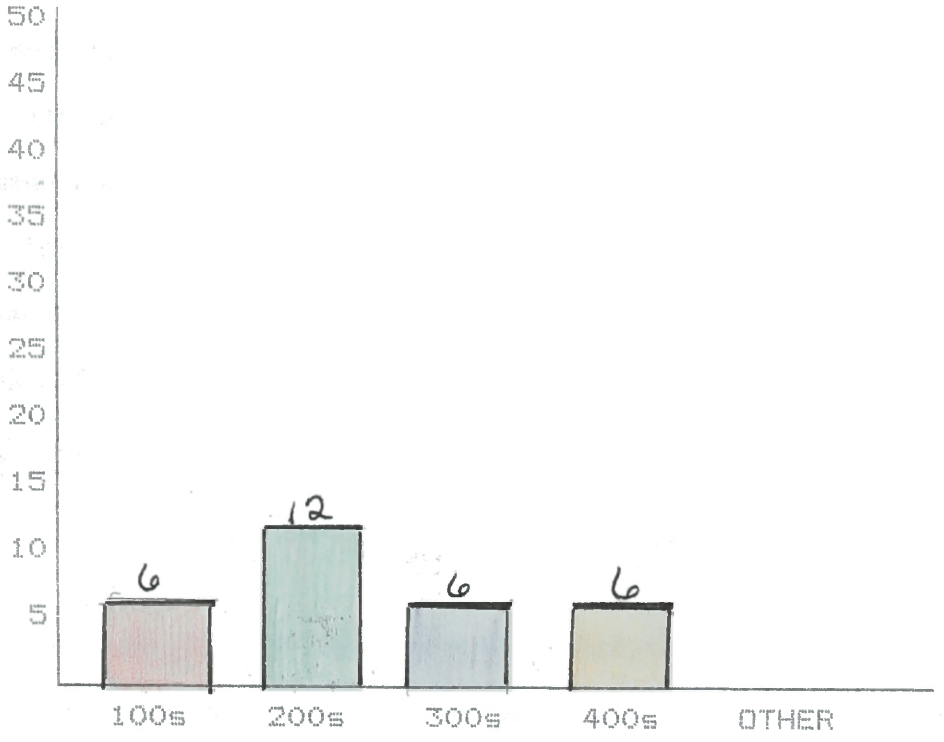
Third Certification--One Year

Risk Codes

By the end of one year participation in WIC, and at the time for the third certification, there was a considerable drop in the number of children taking part in the program. From one hundred initially added, there were only thirty who undergo this certification. From the beginning, there was a steady drop in the percentage of children receiving the 100 series for hematological. There was now six (20%) children with this code. Twelve (40%) children received the 200 series risk code for unacceptable growth and remained basically steady within three percentage points. After the drop for the second

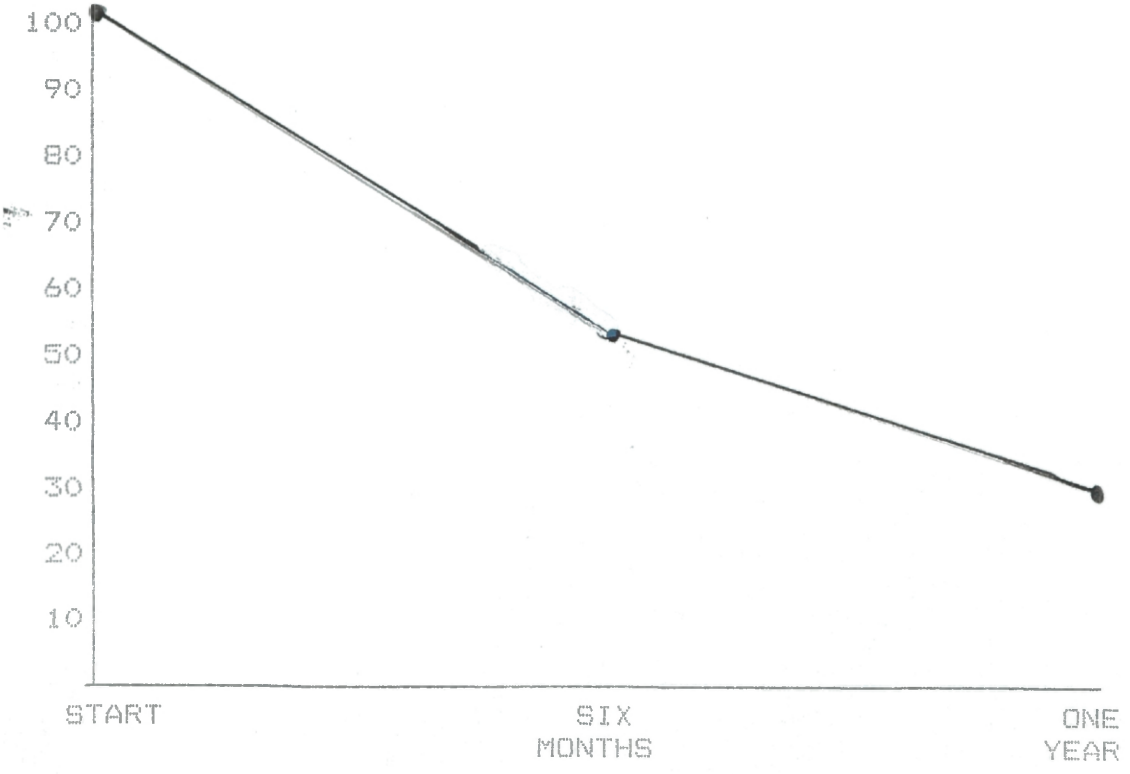
GRAPH 9

THIRD CERTIFICATION RISK CODES - ONE YEAR (TOTAL 30)



GRAPH 10

WIC PARTICIPATION



certification, the percentage of children in the 300 medical series remained steady, with the 340 code being dominant. The 400 risk codes for inadequate diet had the most substantial increase with six (20%) children receiving a nutrition code. This represents an increase from 6% at the first certification to 11% at the second to the 20% level at the third certification. Four children were not represented in this certification as they had not undergone the process at the time of the study (see Graph 10).

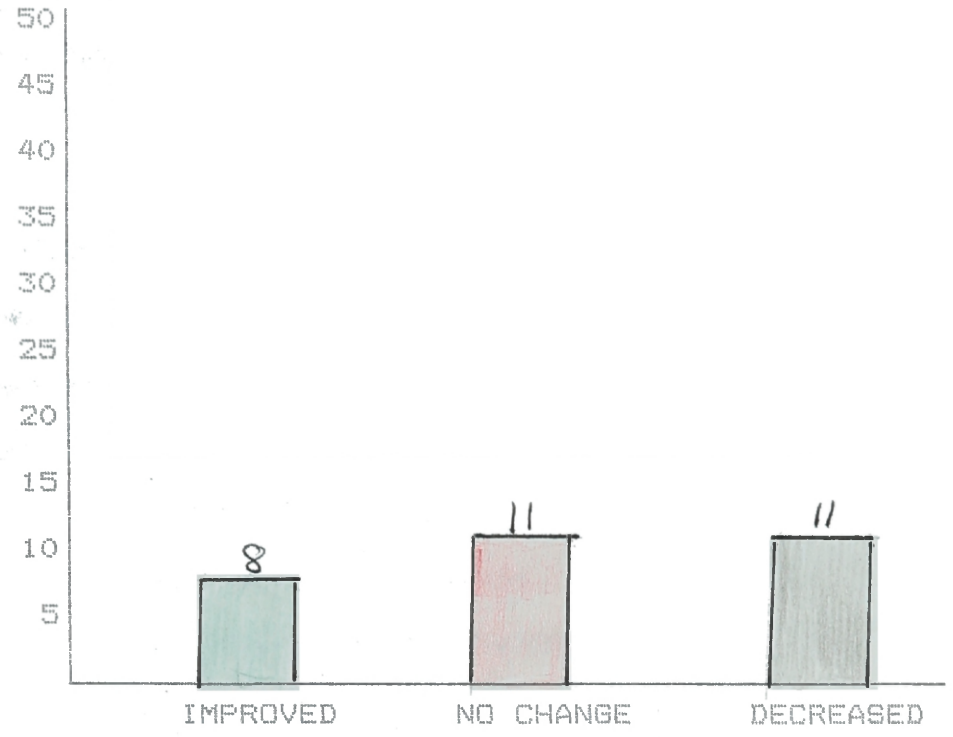
Status at End of One Year

For those children who were still participants of WIC at the end of one year and completed a third certification, an evaluation of their status was rendered. Status was classified as improved, no change or decreased. An improved status was signified by the criteria stated previously: a positive change in hematological standing or antropometric measurements resulting in use of another series code or a less high risk code within that series; reduction in medical codes; a nutritional risk code being used in place of 100-300 series code or the fear of regression code being used. No change status results when the priority code used in the first certification remained the same, and may or may not have had additional risk codes used along with it. A decreased status was designated when the priority code of the first certification was replaced by a high risk code; a 100-300 series if the code was an inadequate diet 400 code; or a fear of regression code replaced by 100-400 series implying risk factors were again found.

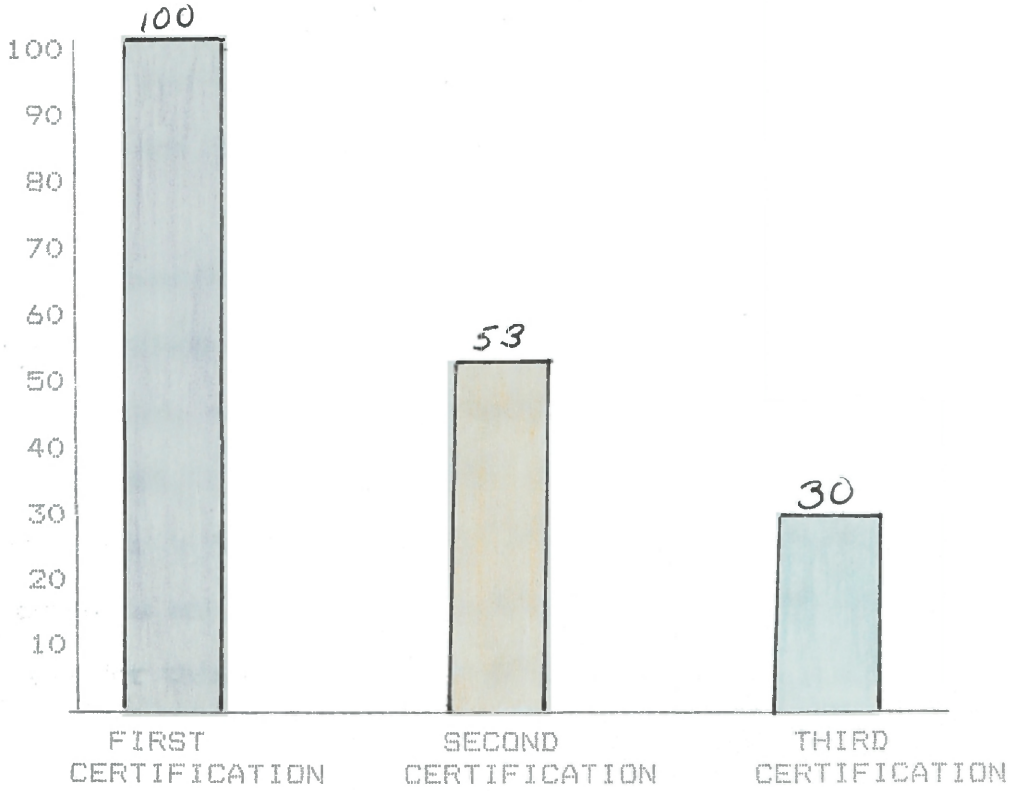
Eight (26%) children's status improved; eleven (37%) children's status remained unchanged; and eleven (37%) children's status decreased (see Graph 11).

An analysis of status after the one year time frame, does not support fully the hypothesis that participants in the WIC Program show improvement in their medical and/or nutritional status after one year of receiving benefits. While it did show 26% of the children completing the year had an improved outcome, 37% remained the same and their medical/nutritional status did not diminish. The 37% whose status decreased was unexpected. A review of this group available documentation shows that of the nine nutrition education classes scheduled, attendance was made at six (67%) of them and for the ten referrals made, seven (70%) were followed through. This contrasts to the group with improved status as seven (77%) out of nine nutrition education classes were attended and all four (100%) referrals were completed. The children with an unchanged status did not differ much from the group with a decreased status. Five (71%) nutrition education sessions out of seven were attended and eight (62%) referrals out of a total of thirteen were kept. The improved group does show more compliance and follow through with program education requirements and referrals, while the unchanged and decreased status groups were more likely to not attend class or keep referral appointments. From all indications and available data, improvement of status in the WIC Program relies on the willingness of the child's

GRAPH 11
STATUS AT END OF ONE YEAR (TOTAL 30)



GRAPH 12
PARTICIPATION LEVELS



caretaker to follow directions, attend nutrition education classes and follow through on referrals.

Terminations

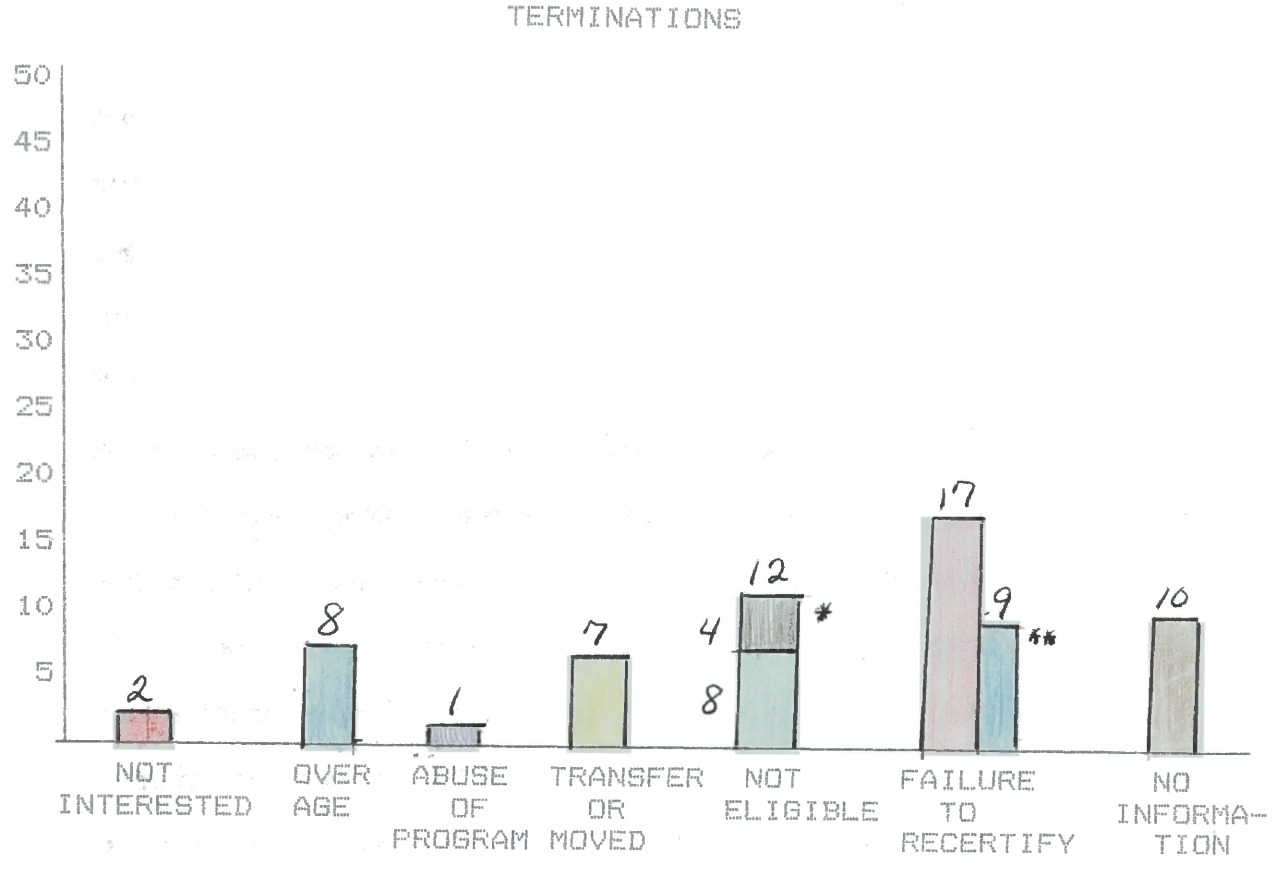
Since there was an extremely large number of children who did not finish the one year participation, I evaluated the attrition rates and reasons for termination from the program. There were nine identified explanations for the sixty six terminations:

- seventeen (26%) failure to recertify
- ten (15%) no information
- nine (14%) failure to pick up coupons
- eight (12%) over age
- eight (12%) not eligible per criteria
- seven (11%) transferred/moved
- four (6%) placed on the waiting list
- two (3%) not interested
- one (2%) abuse of program

(see Graphs 12 and 13)

Failure to recertify and pick up coupons conveys a disinterest or problem involved in coming to the Health Department (i.e., transportation, etc.) and participating in WIC. Again, no information was a problem in understanding the reasons for nonparticipation. In summary, WIC involves active participation by the child's caretaker if improvements are to be made and requires continuation of benefits and services for this difference to occur.

GRAPH 13



* Denotes those children placed on waiting list

** Denotes those children whose caretaker did not pick up coupons

COMPARISONS WITH OTHER EVALUATIONS AND RESEARCH

When the WIC Program was authorized in 1972, one of the congressional mandates was to assess the benefits of the program. In order to fulfill this requirement, the University of North Carolina's Department of Nutrition, School of Public Health was contacted by the Department of Agriculture to render the first medical evaluation. This study occurred between November 28, 1973 and June, 1976. The report was presented to the Senate, August, 1976.

Nineteen program sites in fourteen states participated. Infants and children were examined at time of enrollment and again at six and eleven months. Assessment data included: weight, height and head circumference (growth); dietary intakes; biochemical indices (hematocrit was one parameter). This evaluation also examined women but for comparison with this research the information on them will be omitted. Other data was collected beside the objective laboratory measurements and testing. As stated in the report to the Senate:

> Since the values obtained for most of the measurements which were selected can be influenced by medical, racial, socioeconomic and other environmental variables, as well as by nutritional factors, data relating to such variables as location of residence, household size, race, income and sex were also collected.[24]

A carefully matched group was used as a control to establish baseline conditions for interpretation of data. Means and standard deviation, distributions and percent above or below specified levels were the principal descriptive measures.

Forty one thousand three hundred infants and children were evaluated, with eleven thousand three hundred and ninety reevaluated at six months. Six thousand two hundred fifty six were examined after eleven months of participation. The study found that participation in the WIC Program was associated with an increase in the rate of growth in weight and height for all ages and was greatest in the thirty six to forty one month old children. Children participating in the program were found to have "increased their daily consumption of all nutrients except energy."[25] Anemia was highly prevalent in the infants and children studied, but after six months the incidence of anemia was decreased by 40%. By eleven months, there was a further decrease in the incidence of anemia.

The significance of this study was in describing measurable changes in anthropometric, dietary and biochemical indices. It was pointed out that these may or may not represent improvements to the health and well-being of the participants. The evaluation was concerned with the short term benefits and long term effects on growth, development, morbidity, mortality, behavior and learning are unknown. The overall conclusion was as stated in the report:

> To sum up, the measurable effects of the WIC Program are considered "real" health benefits to the participants because the initial values for

> several of the indices investigated were below the accepted standards and the program moved closer to the standards.[26]

This study looked at short term results but differed from the present study in the use of controls and descriptive analysis of the measurements. It did correspond to the present evaluation's findings in that there was a reduction of hematological incidences (anemia) by six months and eleven or twelve months of participation in the program. There also was a positive correlation in this study and the current research in that WIC participation decreases significantly over the one year time frame. In this study, all secondary services such as nutrition education and referrals were omitted from the evaluation.

In 1980, at the National State Directors Meeting on Program Management, a Summary Report on the Special Supplemental Food Program for Women, Infants and Children was presented. The report was not a study on the effectiveness of WIC but contained excerpts from USDA officials' speeches. Carol Tucker Foreman, the Assistant Secretary of Agriculture for Food and Consumer Services, expounded on the effectiveness of WIC benefits and cited the Center for Disease Control studies which found:

> * Children enrolled in WIC for one year showed considerable improvements in blood values.
>
> * Children with lowest hemoglobin and hematocrit values showed the most improvement.
>
> * Children with low weight for height grew significantly during the first six months of participation.[27]

Also cited were studies in Oregon whereby WIC participation reduced the anemic children caseload from 13 to 1%. In Arizona, there was an 81% reduction in anemia, an 82% reduction in underweight, and a 64% improvement in stature. According to studies cited by Ms. Foreman, again the reduction in hematological (anemia) cases were prevalent in her excerpts as well as in the current research.

The U.S. General Accounting Office (GAO), in 1984, reported to the Senate's Committee on Agriculture, Nutrition and Foresty on the technical and methodological soundness of previous evaluations of the WIC Program. The GAO reviewed and analyzed local, state and national evaluations to determine the strength of their evidence. While the GAO was requested to focus on WIC's effectiveness on miscarriages, stillbirths, neonatal deaths, maternal nutrition and positive pregnancy outcomes as related to the length of WIC participation, there was some review of anemia and mental retardation in infants and children.

In regard to anemia, the GAO found that evidence was insufficient to support conclusively the statement that WIC prevents anemia in infants and children. There was limited evidence from two state studies not identified. WIC may be associated with improving blood iron levels and this was found true for children who were classified as anemic at entry to the program. WIC's effect by length of participation was evaluated and it was discovered that the greatest reduction in children's anemia occurred during the first six months of participation, but this evidence wasn't conclusive.

The GAO, in its review of WIC evaluations found that many documents did not adequately describe the design, execution or analysis of the evaluation. As stated in the report:

> With this information missing, it is difficult to determine the technical adequacy of the findings or the confidence that can be placed in the findings.[28]

The final assessment of the GAO evaluation reveals that the "GAO finds some sound, but not conclusive, evaluative evidence of favorable program effects on birth weights and little credible evidence on several other measures of effectiveness."[29]

The only similarities between this evaluation and the present research was that accurate, complete documentation was problematic in both cases and again, some evidence was generated about WIC reducing the incidence of anemia. The GAO study did look at mental retardation but found no evidence on WIC's effect. This topic of evaluation was unusual for the studies reviewed.

The National WIC Evaluation was conducted in 1987 and covered four component studies, one of which was the Study of Infants and Children. In the Summary, Volume I, it describes the rationale for evaluation as well as findings. Most beneficiaries of WIC benefits were infants and children, yet the least was known about WIC's effect on their health and well being. The change could not be evaluated in a short time span, other than for reduction of anemia. The study found it was difficult to have a truly comparable control group and that:

> Program dropouts, children from noncompliant or uncooperative families, would tend to have adverse outcomes, and their exclusion would bias the results to give overestimates of WIC Program effects.[30]

The hypothesis was that enrollment in the WIC Program would lead to improved diet and use of health services, and to better physical and psychological development. The study evaluated the same measurements for growth, anemia and dietary intake but included use of preventive health services (immunization and well child care).

Dietary conclusions of this study were that WIC benefits improved the quality of diets among children and that improvements were the result of the supplemental food supplied by WIC. Physical growth conclusions were not conclusive. Psychological development was measured and found that children who began WIC after their first birthday had better digit memory than the control group. Anemia reduction was not addressed.

In the National WIC Evaluation, Volume II: Technical, reviewed the four concurrent studies mentioned previously and also reviewed all previous research for historical context. Fourteen past studies were evaluated to ascertain the relationship between WIC benefits and hemoglobin or hematocrit indices. Only four studies used a control group, while in the others, the hematologic indices before and after treatment were compared. The controlled studies were used for infants and pregnant women. For children, the studies revealed a regular trend downward in the proportion of children with low hematocrits,

even after the first follow up visit. But the National Evaulation did preface this fact by stating:

> No conclusions are now possible on the effects of the WIC Program on hematologic indices. Because of their possible importance, any effects of the WIC Program on iron nutrition needs to be better documented and new study strategies tried.[31]

When growth was assessed in relation to receiving WIC benefits, two studies were cited, the Center for Disease Control (CDC) Study of 1978 and the Edozien study of 1976. In the CDC study, there was very little subsequent change compared to the results for anemia. In the Edozien study, the results and data could not be judged at that time. As stated in the National Evaluation: "Thus, as with hematology, evaluating WIC's relationship to child growth is plagued by uncertainty."[32]

Another study reviewed by the National Evaluation was undertaken by the Yale University School of Medicine and was completed in 1978. One hundred and two children who had participated in WIC between 1974 and 1977 were assessed at enrollment into kindergarten. Height, weight and immunization status were reviewed. Their data was compared to two other control groups, once being in their area. The former WIC recipients' immunizations were more up to date but other than that finding no inference could be made due to the limitations of the data.

From the studies mentioned in the National WIC Evaluation, again this corresponds to the current study's findings that anemia and low hematocrit does decrease over the time of participation in WIC. As with the present research, there was no substantial evidence of growth

changes in the time allotted for the studies. One area, whereby ancillary services such as referrals, made a difference was in immunization, but since there was not a control group, it cannot be generalized that the WIC participants in the present study had more up to date immunization schedules than other children.

The last literature reviewed was the GAO National WIC Evaluation: Reporting and Follow-Up Issues. Since there had been generated an interest in determining WIC's impact on children, a feasibility report was completed in February, 1989. This report concluded that a longitudinal study, conducted over five and a half years was feasible. Data from the previous National Evaluation had found some indications that WIC had potential for improving head size, brain growth and perhaps behavioral and cognitive performance. This future study may shed more light on WIC's benefits relating to growth and development, but again reinforces the thought that positive growth determination requires a long term study not a one year evaluation.

CONCLUSION

As stated earlier, the research conducted showed some positive results, such as a decrease in the proportion of children with 100 series (hematological) risk codes being used. A positive correlation in compliance by the caretaker to follow through with referrals and attendance at nutrition education classes with an improvement in the child's status was demonstrated. Since none of the other studies reviewed emphasized the other services performed by the WIC Program (i.e., referrals, education), it was difficult to compare this research with theirs on this aspect. One common theme mentioned in other studies and found to be a significant factor in this research was the attrition rate. At the end of the year only thirty percent of the original recipients still participated in the program. A further study into the reasons for this high dropout rate may be necessary to elucidate the issue. Another common trend in most of the studies performed and especially in this research was the lack of documentation or incomplete data which made results inconclusive. In summary, a one year time frame is inadequate to conduct a comprehensive study of children in the WIC Program. A longitudinal study would be required, but even with this type of study, information must be available, so that tracting and conclusions can have a sound basis.

WIC RISK CODES AND CRITERIA SUMMARY

INFANTS AND CHILDREN

Code	Status	Criteria		
100 Series - Hematological				
		Age	Hct	Hbg
140	I:	0 - 7 days	44% or below	14 gm or below
150	I:	8 - 30 days	40% or below	13 gm or below
160	I:	31 days thru 3 mos.	32% or below	10 gm or below
170	I,C:	4 mos. thru 2 yrs	33% or below	10.5 gm or below
180	C:	3 thru 4 yrs	34% or below	11.3 gm or below
190	I,C:	0 thru 4 yrs	Hematological Conditions	
200 Series - Unacceptable Growth Pattern				
250	IC	Stature or length-for-age below 10th percentile		
251#	I	Weight-for-length or stature at or below the 5th percentile		
252#	C	Weight-for-stature or length less than 3rd percentile		
255	IC	Stature or length-for-age decrease by 1 channel or more within 7 months or less		
260	IC	Weight-for-stature or length below 10th percentile		
265#	IC	Weight-for-stature or length decrease by 1 channel or more within 7 month period or less AND below the 25th percentile		
270	IC	Weight-for-stature or length more than 90th percentile		
275#	C	Weight-for-stature or length more than 97th percentile		
280	I	Low birth weight (5 lb 8 oz (2500 gm) or less)		
300 Series - Medical				
313#	IC	Chronic gastro-intestinal disturbance with expectation to continue		
330#	IC	Diagnosed failure-to-thrive		
331#	IC	Inborn errors of metabolism		
332#	IC	Metabolic diseases or hormonal disorders		
333#	IC	Chronic conditions & diseases		
334#	IC	Gastro-intestinal diseases		
335#	IC	Congenital anomalies or developmental disorders		
336#	IC	Nutritional deficiency (except anemias)		
337#	IC	Food intolerance or allergies (eggs, wheat, lactose, milk, protein and yeast)		
338	IC	Michigan fish advisory		
340	IC	CPA Judgment - client does not require R.D. intervention		
342	IC	Diagnosed Baby Bottle Tooth Decay		
350#	PBN	CPA Judgment - client requires R.D. intervention		

MDPH 5/89

Source: Michigan Department of Public Health
WIC User Guide; 1989