

Childhood Obesity in Dutchess County 2004



**Dutchess County Department of Health
&
Dutchess County Children's Services Council**

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Introduction:

As per the American Obesity Association, the prevalence of overweight in children has increase sharply over the last 2 decades. It has increased from 5% in 1971-1974 in 2-5 year olds to 10.4% in 1999-2000, from 4% to 15.3% in 6-11 years old and from 6% to 15.5% in 12-19 years old for the same decades. The condition is a harbinger of other chronic illnesses such as asthma, Type 2 diabetes, hypertension, and orthopedic complications besides the psychosocial implications to the child in its growing phase of life. All these illnesses have enormous implication of healthcare dollars and life expectancy and quality of life in the years when these children reach their full earning potential.

Obesity in pediatric age group has increases 2-3 folds in the last 3 decades as per the NHANES II and NHANES III

Study Design and Methodology:

The Dutchess County Department of Health (DCDOH) in conjunction with The Children's Services Council and with the cooperation of a large children's healthcare provider in Dutchess County conducted a study to establish the prevalence of obesity in the children. The sample population consisted of children 19 or younger who had seeked healthcare from one of the 4 clinic sites in Dutchess County in 2004.

Nursing students conducted chart reviews on a random sample of patient charts at the provider's research center and entered information in a survey tool developed by the DCDOH. This information was then entered into a Microsoft Access database. Before this database reached the DCDOH the health provider took necessary precautions to mask the personal identifier and maintain confidentiality of the patients. At the DCDOH data was then imported into SAS 9.1.3 (SAS Institute Inc., Cary, NC). Data management processes were performed to correct errors and eliminate invalid data.

The weight and height were used to calculate Body Mass Index (BMI) using the Center for Disease Control and Prevention's (CDC) definition

$$\text{BMI} = \left(\frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \right) \times 703$$

In children and teens, body mass index is used to assess underweight, overweight, and obesity. Children's body fat changes over the years as they grow. Also, girls and boys differ in their body fat as they mature. This is why BMI for children, also referred to as BMI-for-age, is gender and age specific. BMI-for-age is plotted on gender specific growth charts. These charts are used for children and teens 2 – 20 years of age. Data used to produce the United States Growth Charts smoothed percentile curves are contained in ASCII tab-delimited data files representing BMI-for-age specific to gender.

This file was imported into SAS and merged with the study database using age-in-months as a common variable.

For additional information on growth chart please see the link below:

<http://www.cdc.gov/growthcharts/>

The CDC guidelines were followed in establishing the status based on the percentile cutoffs:

Gender specific BMI-for-age:

- i. < 5th percentile is considered ‘Underweight’
- ii. Between 5th percentiles and less than 85th percentile is ‘Normal’
- iii. Between 85th percentile and less than 95th percentile is considered ‘Overweight’ and
- iv. 95th percentile or above is ‘Obese’.

Sample Population representation of the county demographics:

In order to establish that our sample population is representative of the county the following criteria were closely examined:

- About 97.6% (13058) of the sample population were residents of the Dutchess County
- Sample represents about 17% of the total Dutchess County Youth Population
- Please see the GIS map for geographic distribution.
- Gender distribution: There were about 48% females and 52% males in the sample
- Age distribution: The sample population represents about 17% of the total county population under 19 years of age as per the 2000 census. The age distribution is as follows:

Demographics			
Age Group	DC Population (2000 Census)	Study Population	% Of Dutchess Youth Represented In the study
Under 2 Yrs	6612	2269	34.3
2 -5 Yrs	14730	2711	18.4
6-11 Yrs	25224	5066	20.1
12-19 Yrs	32764	3337	10.2
Total	79330	13383	16.9%

- Socio Economic Status (SES): For lack of other more accurate indicators (income race and housing), this study considered the employment status of the parents and insurance type as two indicators of the SES. About 72% of the fathers and 50% of mothers were employed. This resembles the 2000 census information where in about 60% of Dutchess County labor force (consisting of 16 years and older adults excluding homemakers, students and retirees) were employed.

About 20% of the county's children on Medicaid (2004) and 21% on Child Health Plus/Family Health Plus were represented in this sample.

Observations:

There were total 13387 records collected consisting of children between the ages of few months to 19 years of both genders.

There were about 2194 children under 2 years age. For the purpose of this study only those with ages 2 years or older were considered in the analyses as recommended by the CDC, since this is when an accurate stature is reached. Among the over 2 years and older there were total 11191 children, 5363 females and 5828 males.

Overweight and Obese:

About 16.8% of all children in the sample population were overweight and about 18.8% were obese.

Table: Status of obesity:

Status	Number	Percentage of Total
Underweight	367	3.28%
Normal	6838	61.1%
Overweight	1880	16.8%
Obese	2106	18.82%

Table: Status of Obesity by Gender:

Status	% Female Children	% Male Children
Underweight	3.43%	3.14%
Normal	62.15%	60.14%
Overweight	17.06%	16.56%
Obese	17.36%	20.16%
Total	100%	100%

Male children are more likely to be overweight or obese than the female children. This difference was found to be statistically significant ($p < 0.002$).

Table: Status of Obesity by Age Group:

Status	< 6 Yrs (National %)	6 Yrs - 11 Yrs (National %)	12 Yrs – 19 Yrs (National %)
Underweight	4.4%	3.02%	3%
Normal	64.2%	60.74%	59.3%
Overweight	16.1% (10.5%)	16.2% (15%)	18.2% (14.9%)
Obese	16% (10.1%)	20.3% (15.3%)	20% (15.5%)
Total	100%	100%	100%

About 16% of children 6 years and older and about 16.2 % of 6 – 11 years old and 18.2% of 12 years and older were overweight. These findings were statistically significant ($p<0.0001$). National prevalence as per NHANES III indicates a prevalence of overweight in the order of 10.4% for 2-5 years old; 15.3% for 6-11 years old and 15.5% for 12-19 years old.

About 16% of children in the age group less than 6 years, 20.3% of 6-11 years ages and 20% of 12-19 years of age were obese. Comparing these percentages to the national percentages for the age group clearly shows that obesity is much higher in all age groups in Dutchess County children than in the United States.

Socio Economic Indicators:

1. Parents Employment Status:

It is apparent from the table below that when neither parent is employed children are more likely to be overweight or obese (18% and 24% respectively) and this finding was statistically significant ($p<0.0001$). But the number of children falling in this group was fewer.

Table: Parent Employment Status

Status	Both	Just Father	Just Mother	Neither	Unknown
Underweight	3.2%	3.2%	2%	5.3%	4.4%
Normal	62%	64%	59%	52.2%	55.4%
Overweight	17%	17%	19%	18.1%	16%
Obese	18%	16%	20%	24.3%	25%
Total	100%	100%	100%	100%	100%

Although the study attempted to use parents’ employment status as a SES indicator, it raises many questions as to the income level of the families thus classified and whether it is reflective of quality of life and education standards.

2. Health Insurance:

Table: Health Insurance

Status	Medicaid/FHP/ CHP	Private	Self Insured	Others
Underweight	3.7%	3.2%	3.4%	1.4%
Normal	56.2%	63%	60.1%	50%
Overweight	17.4%	16.6%	15.6%	20%
Obese	23%	17%	21%	29%
Total	100%	100%	100%	100%

Those on Medicaid/Family Health Plus/Child Health Plus had a higher percentage of children who were overweight or obese than those on private insurance. The distinction was not very clear in those who were self-insured ($p<0.0001$).

Risk Factors:

1. Family History of Obesity:

Information on this important risk factor was not available for most (99.6%) of the sample. With that limitation in mind, the analysis of our sample population concurs with the research that the chance of children being obese/overweight is higher when there is a family history. About 50% of children with family history of obesity were found to be obese. Statistically this finding was not significant due to the small sample size.

2. Family History of Hypertension:

About 41% of records lacked information on family history of hypertension. Among those with the positive family history about 22% were obese and about 17.6% overweight. In the group without any positive history there were 18% obese and 16.6% overweight. This difference was statistically significant ($p=0.006$).

3. Family History of Diabetes:

Information was missing on 29% of cases. There was a significant ($p<0.0001$) difference in presence of overweight or obese status between those who had history of diabetes (22% obese; 17% overweight) and those who had no history (16.7% obese; 16.5% overweight).

Co-Morbidities:

Co-morbidities were examined in the sample population and cross examined with reference to the BMI.

Table: Risk Factors

Risk Factors Prevalence		
Diseases	At Risk for Overweight & Obese With Disease†	Normal Weights With Disease††
Type 2 Diabetes	0.3%	0.15%
Hypercholesterolemia	2.39%	1.9%
Abnormal GTT	0.55%	0.2%
Hypertension	0.11%	0.08%
Cholelithiasis	0.03%	0.06%

†Percentage of those at risk for overweight & overweight/obese combined

††Percentage of those with Normal Gender specific BMI-for-age

1. Type 2 Diabetes:

Prevalence of Type 2 in low in children is under diagnosed. It is largely associated with obesity. The small number of those diagnosed with the condition made it difficult to analyze. Of those who were diagnosed with Type 2 Diabetes about 52% were either at overweight or obese.

2. Hypercholesterolemia:

About 2.1% had hypercholesterolemia. Of these 41% were either overweight or obese.

3. Abnormal Glucose Tolerance (GTT):

About 0.32% had abnormal GTT; of which 53% were obese and another 8.33% were overweight ($p < 0.0001$).

4. Hypertension:

About 0.16% had hypertension of which 50% were obese and 17% overweight ($p = 0.005$).

Conclusion:

The prevalence of children at risk or overweight in Dutchess County is higher than the national prevalence based on the NHANES III findings.

Similar risk factors exist which predispose this population to the conditions.

The occurrence of co-morbidities with obesity predispose this population to a lifetime of chronic illnesses, issues of quality of life and places an extremely heavy burden on the society in terms of health care spending and future earning potentials.

Recommendations:

To Providers:

1. History taking
2. Strict use of the growth cart and follow-up
3. Talking with parents and children to bring awareness
4. Closer follow-up of overweight and immediate action

To decision makers:

1. Continue monitoring and expand to include other providers in the area
2. Collaborate with partners in planning for control and preventative measures
3. Evaluate the program

To Parents and Community:

1. Be proactive
2. Educate yourself
3. Talk to the physician
4. Teach by example

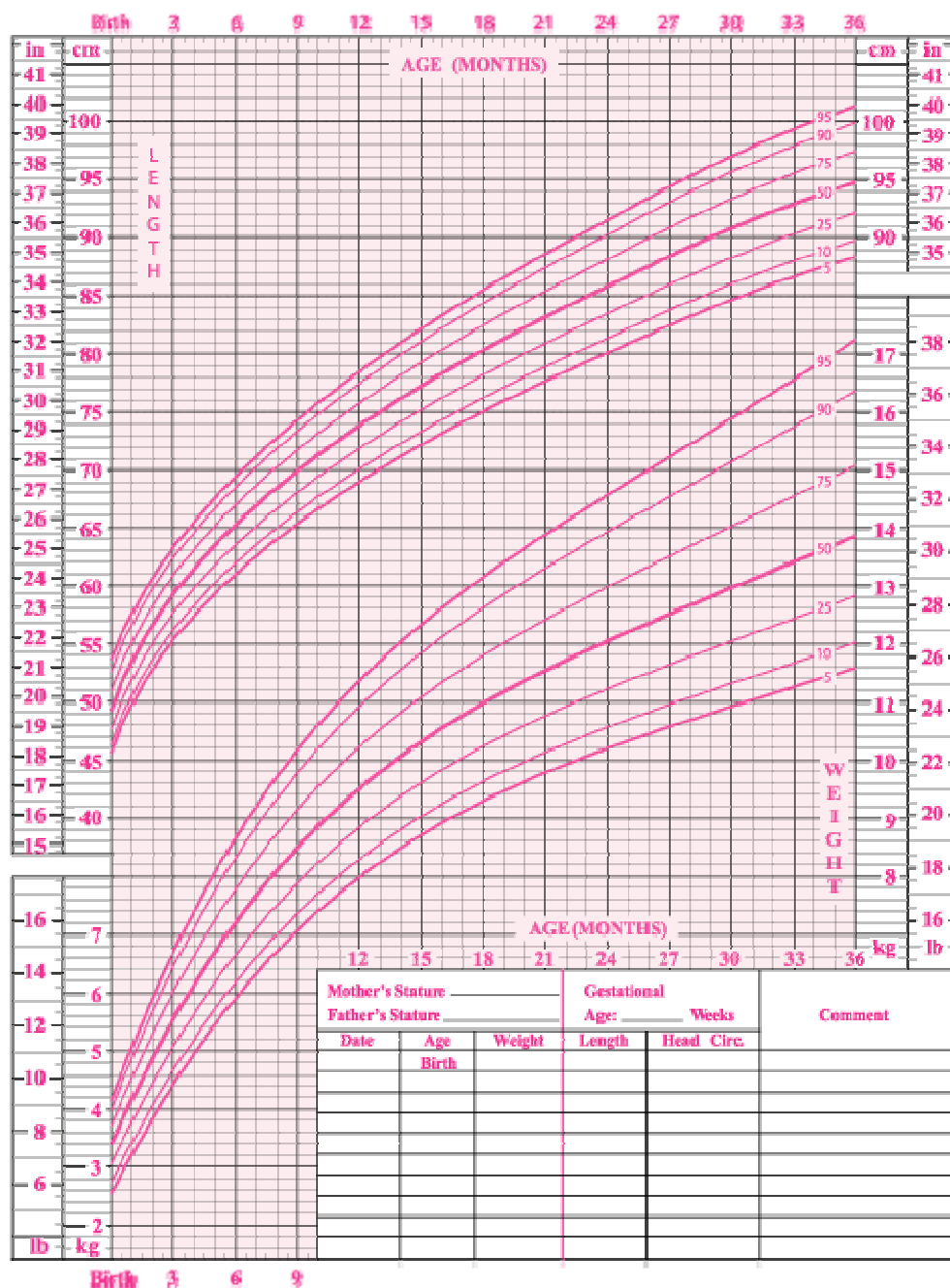
Growth Chart

Appendices:

Birth to 36 months: Girls

Length-for-age and Weight-for-age percentiles

NAME _____



Mother's Stature _____			Gestational Age: _____ Weeks		Comment
Father's Stature _____			Length	Head Circ.	
Date	Age Birth	Weight	Length	Head Circ.	

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000). <http://www.cdc.gov/nchs/data>