SEASONAL VARIATIONS OF ANTHROPOMETRY AND ILLNESS FOR SEGALESE CHILDREN

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INTRODUCTION.

A longitudinal study on nutritional determinants and growth was conducted in Senegal on 105 children. They were followed fortnightly for 18 months between December 1988 and August 1990. The study site was located in a Sahelian region of Senegal: the rainy season lasts from July to October with an average rainfall of 300 mm.

METHODS.

The study included three cohorts of 35 children (average ages at recruitment equalled 10 days, 12 months and 24 months).

Weight and illness data were collected every two weeks and height once a month.

Weight was measured with a precision of 20 grams.

Height was measured with a board graduated in millimetre in a recumbant position up to 23 months, then in standing position for children of 24 months and over.

During fortnightly visits to the families, a medical assistant, after interrogating mother and examining her child, noted the presence and duration of fever, anorexia, diarrhoea and coughing.

Weight and height increments of the children were calculated from consecutive measurements of weight and height and are expressed in grams and millimetres per day.

RESULTS.

Height and weight values related to age are low compared to the NCHS reference population, with the difference in the two population increasing from 0 to 43 months.

The average **weight to height** index values is near NCHS index values for children aged 0-11 months. Values decrease stabilizing at a "-1 Zscore" for children between 16 and 21 months. After 21 months the weight to height index increases *(fig.1)*.

Increments of weight and of height, independent of NCHS standards, allow intra and inter-individual comparaisons. They are used for this analysis. The values of these increments are strongly related to age. Age groups where the influence of age is weak were separated.

Children from **13** to **43** months constitute a group that can be regarded as homogenous; means are not significantly different according to a one way analysis of variance. These children have an average weight gain of **5** grams per day. The seasonal effect is important *(figure 2)*:

during February and March (a cool period of the dry season) and between June and August (the beginning of rainy season which corresponds to the traditional "food shortage period"), when average **weight gain** is less than **2** grams per day.

Weight increases to **10** grams per day from September until January included *(end of the rainy season and the crops season)*.

Increases in height are much more difficult to interpret because they regularly depend on age; the seasonal differences are low. On average, children over two and half years old grow **8** mm per month throughout the year except from September to October when growth averages **4** mm per month.

Days of illness per child vary from one period to another: it is greater than **6** days per month in February and during all the rainy season, July to October, and less than **5** days during the other month of the year.

Diarrhea, followed by anorexia and coughing are the most of total types of illness.

Days of illness are not normally distributed. Spearman rank correlation coefficient analysis indicates that *(table 1)*:

-throughout the year, anorexia and /or diarrhea are inversly correlated to weight increment; the coefficient varies between 0.2 and 0.4.

-there is a significant inverse relationship between weight increment and infection (number of days of fever) in February.

-there is a significant inverse relationship between weight increment and diarrhea during the rainy season (July to October).

CONCLUSION.

Weight increment is less than **2 g** during February and March and from June to August. Annual average weight gain per month is **5.0 g** instead of **5.8 g**, the weight increment of the NCHS group.

Days of illness also increases in February and March and during all the rainy season months but does not explain the variations in weight increment during the year.

Food avaibility, which is lowest during September and October, does not explain alone monthly differences in weight increment.

We believe that the **activities of women** and the time they have for food preparation may help to explain the trends found in this study.

WHZ
by six months. Lambaye (Senegal)

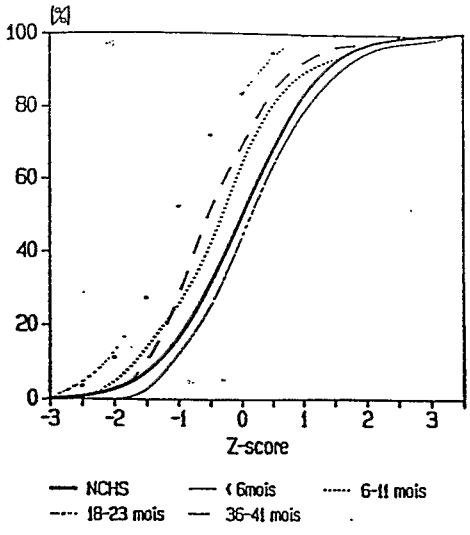

Figure 1

Evolution of the weight increment
by periods in the year

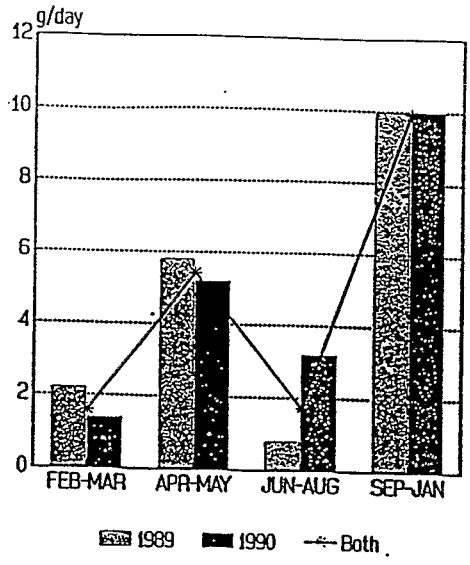

Figure 2

Number of days for illness
per month

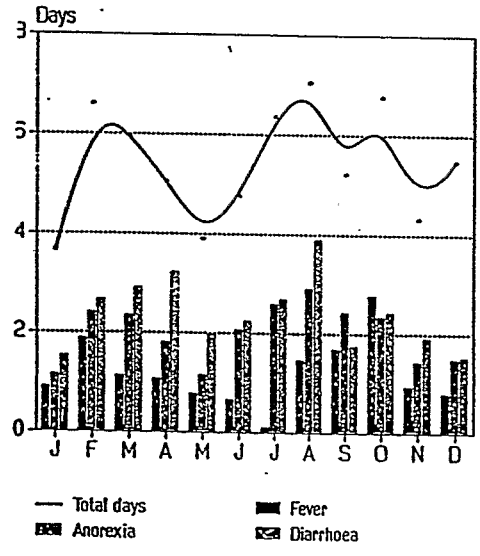

Figure 3

Comparaison of weight increment with
the number of days of illness

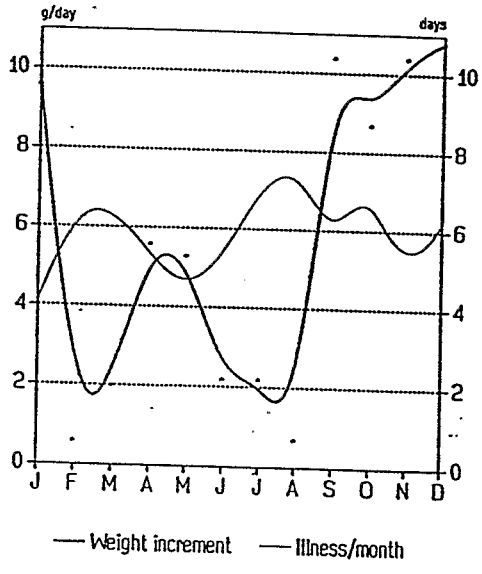

Figure 4

Tableau 1: Number of days of morbidity, weight gradients and correlation coefficients between them.

MONTH	N.	N.M.	W.G.	Coef.
January	198	0.9	9.7	0.22(A); 0.22(D)
February	200	1.7	0.6	0.24(A); 0.22(F)
March	242	1.5	2.2	0.28(D)
April	294	1.2	5.6	0.23(A)
May	318	1.0	5.3	0.25(D)
June	250	1.2	2.2	0.34(A); 0.20(D)
July	251	1.6	2.1	
August	183	1.7	0.7	0.31(D); 0.22(A)
September	120	1.3	10.4	0.41(A); 0.33(D); 0.23(F)
October	119	1.7	8.7	0.27(D)
November	126	1.1	10.4	0.24(A)
December	133	1.4	10.8	0.30(A)

N. = number of cases.
N.M. = number of total days of morbidity.
W.G. = weight gradient in g./day.
Coef.= correlation coefficient of Spearman above 0.2.
A = number of days of anorexia.
D = number of days of diarrhea.
F = number of days of fever.