

Comments on the Paper

EARLY WARNING ALARM SYSTEMS OF NUTRITIONAL DETERIORATION IN EMERGENCY PERIODS*

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SUMMARY

The guidelines presented by Drs. Lechat and de Ville de Goyet, in their paper "Early warning alarm systems of nutritional deterioration in emergency periods", are commented.

Utilization of other parameters to be used in relation to the basal evaluation of the nutritional status, the identification and description of vulnerable groups, as well as the environmental and socioeconomic factors is suggested. The usefulness of the proposed indicators is discussed. Finally, preliminary information of a post-disaster surveillance system of the nutritional status currently being conducted in a Guatemalan highland village destroyed by the earthquake of February 4, 1976, is presented.

INTRODUCTION

Dr. Lechat has presented the actual knowledge on the indicators that can be used to predict deterioration of the nutritional status of a given population in emergency situations. In my opinion, the selection of the main indicators, especially of the criteria on precocity and reliability of same are adequate.

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Nevertheless, the work is oriented to predict deterioration of the nutritional status before an emergency state occurs, but no mention is made of the measures to be taken in post-disaster cases. In this regard, it seems convenient to establish surveillance norms adequate for these conditions, particularly during emergency situations of short duration such as earthquakes or floods, since up to this moment their late effects are unknown.

After commenting Dr. Lechat's paper, a preliminary presentation is included on some of the parameters that form part of a surveillance system established for the purpose of determining changes in the nutritional status of a population in the Guatemalan highlands which was destroyed by the earthquake of February 4, 1976.

COMMENTS

With regard to the initial evaluation that must be done in order to learn the type of nutritional problems prevalent in a country, I consider it of utmost importance to learn also the habits, beliefs and knowledge of the affected population, concerning its food pattern. This information may constitute the basis for planning nutritional intervention programs and also for determining the type of foods which should be sent to a population affected by disasters. There are many examples of distribution of foods which do not form part of the dietary pattern of a population in moments of disaster. Recently in Guatemala it was common to observe how vegetable oil was provided to populations where grease is not used for cooking, or wheat meal, where facilities to prepare bread did not exist.

Identification and description of the vulnerable groups must not be based only on groups traditionally considered as such: preschool and school children, pregnant women and lactating mothers. Within each one of these groups, selection must be made of those considered to be more at risk. For example, in the rural areas, the breast-fed child in the weaning process and the child under one year of age living in urban zones where maternal lactation tends to disappear,¹ should receive priority. Other group to which no attention is paid is that of the adult wage-earner agricultural laborer, who is exposed to heavy tasks, thereby forced to use all of his caloric stores. In these cases, it is common to observe clinical malnutrition more in the adult men than in the adult women, in spite of the fact that the dietary intake of the latter is lower than in the former (F. Viteri, personal communication).

In relation to the environment, it is quite common to consider the inhabitants of rural areas as the at-risk groups. Nevertheless, residents of marginal urban areas often are not considered as vulnerable, in spite of the fact that many a time these groups live in situations even worse than those of the rural areas.

Socioeconomic factors are determinants of the nutritional status of a community. Among them crowding should be mentioned, since it contributes to a greater dissemination of infectious agents. Other factor worthy of consideration

is the internal migration produced within a city or the same country which may be the cause of unexpected population increments.

Finally, it is worthwhile mentioning the information sources to obtain data on the nutritional situation of a given area, which, as mentioned by Dr. Lechat, vary from country to country. It is imperative that this approach be of a multi-sectoral nature and that it comprises not only the official sources but also the field informants. The latter aspect makes it necessary for the personnel who obtain the information, to have adequate knowledge of the situation in their working area.

In regard to the level of the indicators, the distribution recommended by WHO is adequate.

Among the indicators related to ecology (level A), the incidence and prevalence of infectious diseases already identified as causal factors of nutritional injuries such as whooping cough, measles and gastroenteritis, can constitute a useful variable which may permit prediction of deterioration of the nutritional status. This acquires more importance when such diseases affect principally those children under three years of age, who are more susceptible to suffer nutritional injury.²⁻⁵ The truth is that the specific nutritional injury of many infectious diseases has not been determined. For example, in 1968 and 1969 in the southern part of Mexico and in Guatemala, El Salvador, Honduras and Nicaragua, a serious bacillar dysentery epidemic caused by the Shiga bacillus (*Shigella A₁*) was observed.^{6,7} This epidemic caused the death of more than 20,000 persons, but the nutritional injury resulting from it was not determined, an omission which could well have caused its lethality.

In countries where protein-calorie malnutrition is prevalent, one must not forget that infectious diseases are a concomitant factor in the nutritional injury. For this reason, its surveillance must be an integral part of a nutritional status surveillance system.

Concerning the indicators of economic nature grouped in level C, I believe that consumption of food by the adult working man should be added to the availability area at family level. The fact that a reduction in his intake were to be determined and that he continued subjected to the same physical activity, could perhaps be a more sensible indicator. An important aspect in this regard would be that of carrying out longitudinal-type surveys at the level of a same group of families, to determine the changes occurring in the course of time, and thus increase the precocity level of this indicator. Also, at this same level, the changes in the breast-feeding pattern and weaning practices could be included as an indicator, since it is known that a reduction in breast feeding and a shortening of the weaning phase, are associated to a deterioration of the nutritional status of the breast-fed child.

It is true that in spite of their high reliability, the indicators included in level D, which are the resultant of the action of the indicators already mentioned, have a very limited precocity as alarm signs. However, in view of the relative easiness

of their implementation, these should form a very important part of a nutritional surveillance system.

SURVEILLANCE OF THE NUTRITIONAL STATUS IN SANTA MARIA CAUQUE, GUATEMALA

For the purpose of measuring the nutritional injury induced in a population by the recent earthquake of February 4, 1976, a surveillance system was organized in the village of Santa María Cauqué, located at a distance of 35 km from the city of Guatemala, and at an altitude of 1,900 meters. This village was totally destroyed and a 5% mortality was observed in a population of 1,600 inhabitants. During the months of February, March and April, the inhabitants of this village lived in inadequate shelters, where crowding and deterioration of personal hygiene and of the environment were observed. During this period, the temperature fell to 4°C. In spite of the fact that the water system was repaired during the first 4 days following the earthquake, water was scarce because it was the dry season of the year. By the end of April and beginning of May the majority of the families had built more ample and sheltered wooden houses or corn-cane dwellings.

The surveillance system includes: a survey of food availability at family level which is carried out every 3 months; weekly visits to all the families with preschool children, lactating mothers and pregnant women, to determine the incidence and duration of infectious diseases; fecal culture in children suffering from diarrhea for identification of enteropathogen bacteriae; study of death causes; updating of the population census every 3 months; in addition, births and deaths are reported every time they occur. Anthropometric measurements of children below five years of age are taken every 3 months to determine the nutritional status of each child. Determination of changes in the breast-feeding and weaning pattern through fortnightly visits to the lactating mothers is also performed. Finally, surveillance of pregnancies, abortions and births plus the study of intrauterine growth, and measurement of newborns within the first 24 hours of life are included.

We shall now present the intrafamily availability of black beans and beef, the consumption of which depends on the purchasing power of the families. Results obtained in 40 families were compared in October, 1976, with those observed in October, 1973 in the same families. The mean bean consumption per person was 42.8 g in 1973 and 50.9 in 1976; the *per capita* mean consumption value of beef was 36.6 in 1973, compared with 42.5 g in 1976. These results are presented in the accompanying Table. As it can be observed, contrary to our expectations no reduction in regard to these two foods was observed. It is important to mention that the survey in question was carried out 8 months after the earthquake, when availability of foods depended totally from the family income. These findings suggest that — up to this moment — the earthquake has not caused any change in the traditional economy of the community.

TABLE 1
AVAILABILITY OF TWO FOODS AMONG 40 FAMILIES
LONGITUDINALLY STUDIED IN SANTA MARIA CAUQUE

| Date | Foods | | | |
|--------------|------------------|-------|-----------------|------|
| | Beans | | Beef | |
| October 1973 | 42.8 | 14.4* | 36.6 | 22.5 |
| October 1976 | 50.9 | 17.4 | 42.5 | 18.7 |
| t | 2.043 (P .10) | | 0.805 (N.S.) | |

* Daily average per person expressed in grams, \pm one standard deviation.

Figure 1 shows the incidence of four infectious diseases observed during the months of January, February, March, April and May, 1976, that is, a month before the earthquake took place and during the four months that followed this event. A decline of two respiratory infectious epidemics, as well as of diarrheal diseases that initiated their course in December of the preceding year, was observed during the month of January. However, it is a curious fact that during the weeks following the earthquake, cases of these two diseases continued to be observed; these increased during the month of March and the first half of April. By the end of this month few cases were reported. Other respiratory infections and diarrheal disease epidemics developed during the month of May, but these were of short duration. It can be assumed that the infectious agents responsible for the two epidemics which were in their final phase in January, found a favorable medium of dissemination as a consequence of the environmental deterioration. On the contrary, the two epidemics that started in the first week of May took less time in disappearing. The factor responsible for this change could well have been the improvement of housing conditions.

In relation to conjunctivitis, no significant increase of cases was observed, although the fact that the profile of the curve was similar to that of respiratory infections called our attention. Contrary to expectations, no important increase in skin infections occurred, in spite of the personal hygiene deterioration.

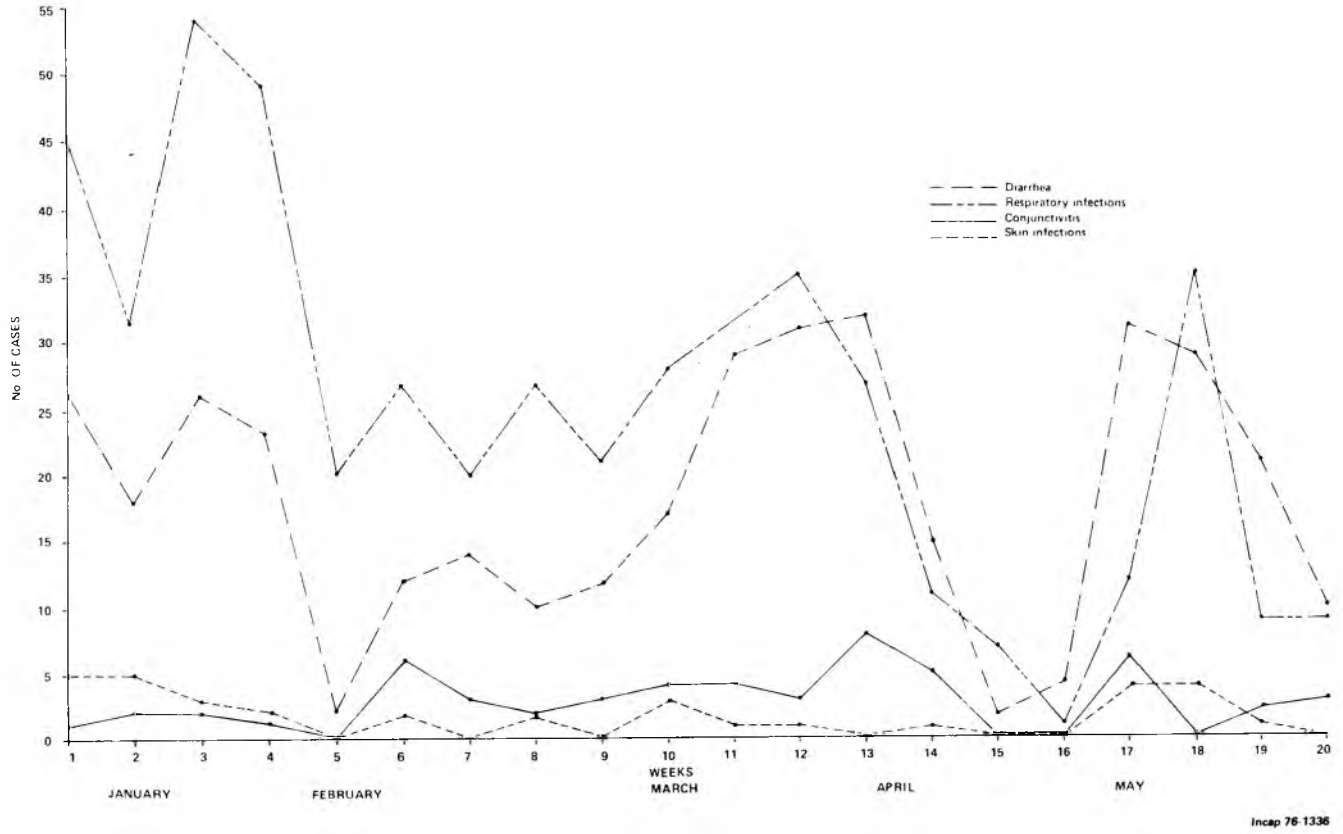


Fig. 1. Surveillance of infectious diseases in preschool children. Santa María Cauqué, January 1 — May 31, 1976.

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Up to the present moment, no nutritional injury has been observed in the preschool children of Santa María Cauqué. Only a clinical protein-calorie malnutrition case has been reported. This is not different from observations of previous years. Neither has any increment of malnutrition cases in other areas affected by the earthquake been reported (Otto Zeissig, personal communication). This information confirms what Dr. Lechat indicated: during emergency situations of short duration, the nutritional injury is minimum. However, surveillance must be maintained for a longer period in order to determine the tardy effects of a disaster such as the one Guatemala suffered.

RESUMEN

SISTEMAS DE ALARMA PRECOZ DE DETERIORO NUTRICIONAL EN PERIODOS DE EMERGENCIA

Se comentan los lineamientos presentados en el trabajo "Sistemas de alarma precoz de deterioro nutricional en períodos de emergencia", de los Dres. Lechat y de Ville de Goyet. Se sugieren otros parámetros a ser utilizados en relación a la evaluación inicial del estado nutricional y en la identificación y descripción de los grupos vulnerables, los factores ambientales y las fuentes de información. También se comenta la utilidad de los indicadores. Finalmente se presenta información preliminar sobre un sistema de vigilancia post-desastre del estado nutricional, en una comunidad del altiplano de Guatemala que fue destruida por el terremoto del 4 de febrero de 1976.

BIBLIOGRAPHY

1. Organización Panamericana de la Salud. *El Valor Incomparable de la Leche Materna*. Washington, D.C., OPS, 1972, 68 p. (Publicación Científica No. 250).
2. Scrimshaw, N. S., C. E. Taylor & J. E. Gordon. *Interactions of Nutrition and Infection*. Geneva, World Health Organization, 1968, 329 p. (WHO Monograph Series No. 57).
3. Mata, L. J. *The Children of Santa María Cauqué: A prospective field study of health and growth*. Cambridge, Mass., The MIT University Press, 1978, 400 p.
4. Mata, L. J., J. J. Urrutia, A. Cáceres & M. A. Guzmán. The biologic environment in a Guatemalan rural community. In: *Proceedings, Western Hemisphere Nutrition Congress III, August 30 - September 2, 1971, Miami Beach, Florida*. Philip L. White (Ed.). Mount Kisko, New York, Futura Publishing Company, Inc., 1972, p. 257-264.

5. Urrutia, J. J. & L. J. Mata. Complicaciones del sarampión: experiencia en una zona rural de Guatemala. *Bol. Of. San. Pan.*, 77: 223-230, 1974.
6. Mata, L. J., E. J. Gangarosa, A. Cáceres, D. R. Perera & M. L. Mejicanos. Epidemic Shiga bacillus dysentery in Central America. I. Etiologic investigations in Guatemala, 1969. *J. Infect. Dis.*, 122:170-180, 1970.
7. Gangarosa, E. J., D. R. Perera, L. J. Mata, C. Mendizábal-Morris, G. Guzmán & L. Barth Reller. Epidemic Shiga bacillus dysentery in Central America. II. Epidemiologic studies in 1969. *J. Infect. Dis.*, 122:181-190, 1970.