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INFANT MORTALITY IN PORTO RICO¹

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The fragility of human life during its initial years has received the special attention of physicians, sociologists, and statesmen in all civilized countries of the world.

The future of communities, the fortitude of those generations which are to follow the present, depends largely on the conditions under which the newcomers, those at present entering the world, commence their arduous journey along Life's path.

Porto Rico is no exception to the foregoing rule. Eminent persons who have preceded us in our professional mission have time and again centered their efforts on the protection of the tender shoots springing from man's sociological tree, and have often prescribed causes and warned against pitfalls. It behooves us to resume their task.

With this object in view, we must first familiarize ourselves with the terms of the problem, with the solution of which we are intrusted. Systematic study, painstaking research and the collection of data constitute the advisable procedure at the present time. Such a course has been and is being utilized by those performing like functions under our government, and has in turn laid the basis for the campaign intended in the suppression of the evils expressed.

Infant mortality is high in Porto Rico, as is also the birth rate. We refer here to infant mortality as meaning deaths occurring during the first year of life as compared with the number of births during the same year. Our people are extremely prolific; but the death rate of their offspring is most excessive. It is like a machine at full speed with an enormous energy waste; a frightful loss of production. It is a matter of quantity at the expense of quality. The figures showing death of children, from one to five years; those

¹ Read before the Annual Meeting of the Porto Rico Medical Association on December 14, 1924.

showing mortality in general; our record during the war, which showed a percentage of cripples duplicating that found in the continental United States; the figures resulting from the medical inspection of schools, both inside and outside of San Juan, when a general examination of our children was effected, are only too eloquent. Our human capital is a matter of quantity; it is not one of sterling worth but of dross and dregs.

While the total number of cases of infant mortality registered in the United States for the year 1918 amounted to 101 per thousand (U. S. Registration Area), a figure which since then has been considerably reduced, and while New Zealand shows 48.4 per thousand, Porto Rico showed 142 deaths for every thousand births during the fiscal year 1918-19. From that time up to the fiscal year just ended, infant mortality has fluctuated as follows:

Fiscal year	Total number of births	Deaths under one year of age	Infant mortality—rate per thousand
1919-20-----	50,729	7,434	146
1920-21-----	47,961	7,786	162
1921-22-----	52,033	7,951	152
1922-23-----	50,348	7,218	143
1923-24-----	51,722	6,642	128

During the year 1923-24 the death rate among children has been considerably less than during the five preceding years, notwithstanding the continued high birth rate. As compared with last year we have had a reduction of 10.5 per cent which is quiet encouraging. If we could progressively sustain such a proportional reduction for two years we would approach the figures corresponding to the United States; and if we could thus proceed for ten consecutive years we would be on a par with New Zealand. Our optimism does not soar to such altitudes; our social, racial and economic conditions permit of no such rapid progress. Even though our progress is less rapid, we must continue under way, and it is therefore essential that difficulties to be overcome be pointed out.

During the fiscal year 1923-24 the number of demises among children under one year of age amounted to 6,642. According to the international classification of causes of death this number is distributed in the following groups:

Summary of Deaths Among Children Under One Year of Age, 1923-24

Causes of death	Number of deaths
I. Epidemic, endemic and infectious diseases-----	342
II. General diseases not already included-----	476
III. Diseases of the nervous system-----	147
IV. Diseases of the circulatory system-----	11
V. Diseases of the respiratory system-----	1,092
VI. Diseases of the digestive apparatus-----	2,217
VII. Diseases of the genito-urinary system-----	75
VIII. Diseases of the skin and celular tissues-----	2
IX. Diseases of the organs of motion-----	2
X. Deformity-----	102
XI. Early infancy diseases-----	1,814
XII. Affections produced by external causes-----	78
XIII. Diseases poorly defined-----	284
Total-----	6,642

Gastro-intestinal diseases produced the greatest number of deaths; then come diseases of early infancy, followed by those of the respiratory apparatus. These three groups aggregate 5,123 deaths; that is, 75 per cent of all the cases of infant mortality. The five principal causes of death, in their order of importance are specifically as follows: Diarrhea and enteritis, 2,097; congenital debility, 1,082; acute bronchitis, 547; infantile tetanus, 503, and rickets, 449.

Diarrhea and Enteritis.—If two thousand out of six thousand deaths are caused by diarrhea and enteritis; it may be said that of approximately every three children born in Porto Rico who die under one year of age, one dies as a result of digestive disorders. In a brief article, the result of my two years' experience at the infants' clinics supported by the Red Cross at the Workingmen's Quarter, recently appeared in the editorial column of our Bulletin, I stated that I had found in said quarter, that babies of our community are seldom nourished entirely with their mothers' milk, but rather with artificial or mixed feeding. This is being confirmed at our dispensaries, as will soon be shown by our statistics.

The reasons offered are generally as follows:

1. That the mother's milk alone does not sustain the child.
2. That fixed hours can not be observed, as the mother is required to earn a living in the factories.
3. That it is necessary to "educate the child's stomach."
4. That the mother's milk does not agree with the child.
5. That the mother's milk supply has become exhausted.



Child affected with marasmus, generally and erroneously termed rickets.

The supply of cow's milk is limited, frequently adulterated (in spite of the efforts of the Department), and, moreover, is usually boiled for consumption. God forbid that I advise the discontinuance of this protective measure, as necessary as it is indispensable, so long as our method of milk production is not greatly improved and until milk can be kept without fear of the development therein of the bacteria so easily propagated in our perpetually warm temperature. Nevertheless, the boiling of milk alters its composition and specially neutralizes or destroys vitamine "C" which is a preventive of scurvy and is thermolabile.

We find therefore that milk adulterated with water is doubly dangerous, or rather suffers the following changes: First, its nourishing properties are diminished and its wealth of vitamine "A," soluble in grease, is especially reduced; and second, it is deprived of vitamine "C" through the necessary boiling process to protect it against contamination. In addition to this we also have the ever-serious risk surrounding artificial feeding, no matter how carefully performed. We must agree then, that mortality from gastro-enteritis should be no surprise to us. The scarcity of cow's milk has become so general that we know of many cases where farmers have had to go to town to secure the milk that they were unable to obtain in the country, a fact which explains why the use of condensed milk has become so universal. We are informed that the commercial value of condensed milk imported last year in Porto Rico amounted to \$476,728. Just what the long-continued use of condensed milk means to the development and viability of our children, especially as regards the vitamins above mentioned, will certainly not escape your comprehension.

There are instances throughout our rural districts in which neither pure nor adulterated cow's milk, fresh or boiled, condensed milk, nor any other kind of milk, is given to the child in place of mother's milk; but a gruel composed of rice, yams, or any other fecula slovenly prepared constituting the child's only nourishment. Even the milk produced by women whose diet consists chiefly of rice, bread fruit, plantains, codfish and black coffee is lacking in a just proportion of protein, hydro-carbons, fats, salts, and vitamins. In the Philippines, one of the chief causes of infant mortality is shown to be infantile *beri-beri*, produced by the milk of women whose principal food is hulled rice. We should now like to ascertain whether the hidden maladies of some of our rural children bear any relationship to infantile *beri-beri*, scurvy, or any of the diseases arising from

privation or avitaminosis, that now begin to peer through the mist which surrounds them. Such an investigation, which has scarcely been commenced, is most necessary for our intensive and extensive child-welfare campaign, thanks to which a knowledge of dietetics will be imparted to all Porto Rican mothers.

Congenital Debility.—Death due to congenital debility is closely related to the other causes mentioned. The number of children born so weak that they were unable to live amounted to 1,082. Is it racial degeneration, hereditary disease, mistaken diagnosis? At the prenatal clinics we daily find an alarming proportion of *syphilitic* mothers. And when it is not *syphilis* it is waste because of *uncinariasis*, tuberculosis and what not.

Acute Bronchitis.—This comes largely from the same causes of mortality as have already been mentioned, that is, from diminished resistance due to said gastro-enteritis and congenital debility; to which may be added neglect as well as a lack of protection from inclemencies of the weather, causes to which acute bronchitis in general as well as the greater part of pulmonary disorders may be attributed. The disease is prevalent and requires undivided attention.

Infantile Tetanus.—This brings up the old questions concerning the ignorant midwife, since the great majority of our country and many of our city children as well are received upon their arrival in the world by inexpert hands that are seldom free from grime and contamination. This old evil still continues, and it is to offset it that we have prenatal clinics, visiting nurses, and the distribution of free prophylactic packages; against it are directed the public health measures already initiated. The Department of Health, through its clinics, provides prophylactic packages to all pregnant women about to give birth, but in many cases the package is left untouched inasmuch as the person supposed to use it would not know how to apply it.

Rickets.—The last of these five captains of deaths is the one appearing in our vital statistics as rickets, which last year caused 449 deaths. It might be mentioned that in the group covering from one to two years it is credited with 682 deaths (the second cause in point of magnitude); in the group including from two to five it caused 471 deaths (also the second cause in point of magnitude), and in the general statistics it appears as the cause of 1,708 deaths, thereby holding the third place as regards magnitude.

We announce our firm belief that those who certified to those deaths made a serious mistake. Rickets, in truth, very seldom proves fatal. In the year 1920 in the death registration area in the United States rickets showed a death rate of 0.6 per 100,000. If this were true, our case would be sufficiently extraordinary as to call for an investigation by the medical profession of the world. Rickets is really an ailment peculiar to temperate countries and is of doubtful etiology; but which in the light of recent investigation appears to be attributable to a lack of the actinic action of ultra-violet rays; it is a bone disease which frequently marks indelibly the physical appearance of the person who has suffered from it. In the land of sunshine where children live enveloped in the direct rays of the sun, where bow-legs and hunchbacks are the rare exception, is it possible that rickets should cause 1,708 deaths? I believe and hope, gentlemen, that this rickets of ours may prove to be but marasmus, atropia, hereditary syphilis and miliary tuberculosis. If such is the case it is now high time that those making such a blunder should rectify the error in order that those who study our statistics may receive true impressions therefrom.

Children die from diseases, but other causes originating within the social system, and independent of the ills to which flesh is heir, are to blame for infant mortality. These causes may be summed up in the form of illegitimacy, neglect of minors, prostitution, lack of hygienic dwellings, the paralyzation of industry, etc. I do not intend to enter upon their study at this time, but I do wish to say in closing my remarks that in addition to the other means employed,—that is to say prenatal institutions, children's clinics, visiting nurses, prophylactic packages, clinics for the treatment of venereal diseases as well as tuberculosis—in our Health Department we now have another weapon in the form of a Social Medicine Council whose duty is to carefully study these problems, and which is, excluding myself, composed of persons of high mental equipment.

In a country where infant mortality constitutes the most salient feature of vital statistics; where gastro-enteritis in children under two years of age is the principal cause of death; where the wrongly named rickets constitutes the third cause following tuberculosis, which is the second; the most arduous task in the way of reducing the general death rate must be that aimed at the reduction of infant

mortality; not merely because by reducing the former the latter would be diminished, but because the results obtained in generations thus protected could be no other than that of greater resistance to the invasion of tuberculosis, which as is well known generally makes its inroads during the early years of life. Supposing this to be instrumental in eventually reducing the tuberculosis toll, it would undoubtedly effect an additional reduction in the general death rate; and by thus attacking the three chief causes of death (gastro-enteritis, marasmus and tuberculosis), an indirect attack would be made also on other diseases the spread of which is subject to the greater or less resistance of the human organism; and the effect on the general death rate would constitute a great reduction, which means that the percentage of longevity would be increased much to the encouragement of those who are to live after us.

The insurance companies established in this country recently reduced their premiums to much lower figures in view of the decrease in the number of deaths registered in recent years. And not only shall we equal but improve the statistics of temperate countries, free as we are from winter's perils, in our advantageous position which blesses us with perpetual spring. To this end our program is to be a vast scheme of child improvement. In commencing this task we appeal to the physicians of Porto Rico for their advice, coöperation and criticism.