Social project and infant mortality: the Paraisópolis case
Projeto social e mortalidade infantil: o caso Paraisópolis

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ABSTRACT

Objective: To evaluate the impact of the Einstein Program in the Paraisópolis Community, using the infant mortality rate as an indicator that synthesizes and expresses the quality of life in the community.

Methods: The study was carried out at Paraisópolis neighborhood, in Vila Andrade District, Campo Limpo Borough in the city of São Paulo. To compare infant mortality rate in Paraisópolis Community with other selected districts of the city of São Paulo, data from the Municipal Health Secretariat of São Paulo, from 2000 to 2007, were used; other social data were compared with those of selected districts of São Paulo according to social indicators gathered by the Sistema Estadual de Análise de Dados (SEADE).

Results: From 2000 to 2007, the infant mortality rate of Vila Andrade district, decreased from 18.1 deaths per 1,000 live births to 8.2/1,000 live births while in the city of São Paulo, it decreased from 15.8/1,000 to 12.2/1,000 live births. The district ranking in infant mortality rate dropped from 77 to 22. During the study period, healthcare services provided were improved in Campo Limpo by 74%, for outpatients procedures, and 71% for first outpatient visits.

Conclusions: The observed reduction in the infant mortality rate in the Andrade District was definitely an exception and other variables, different from those common to the city, might have influenced the results. The hypothesis that more effective medical services and an increase in that population income could have boosted such result is tangible, and part of this achievement can be attributed to Hospital Israelita Albert Einstein social project.

Keywords: Social responsibility; Infant mortality rate; Quality of life

INTRODUCTION

A widely used indicator to assess health conditions of a certain population is the infant mortality rate (IMR), considered by many as a measure of its quality of life, and, therefore, of its degree of development. This statement is based on the influence that the main determinants of quality of life – food, housing, income, sanitation, and access to health services – exert on the probability of a newborn to survive the first year of life. The development of this indicator occurred in Europe as a response to the improvement in the food, hygiene, and housing conditions in the 19th century as a

Descritores: Responsabilidade social; Coeficiente de mortalidade infantil; Qualidade de vida

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consequence of the progress of agricultural techniques and of the Industrial Revolution. In the 20th century, the important reduction in this indicator is related to the benefits of scientific Medicine and public health(2). In the present setting this phenomenon must have occurred highly correlated with people’s income. The contribution by professor Leser is very important, in that he brought attention to the inverse relation between infant mortality and the actual minimal wage between 1950 and 1970 in the city of São Paulo(3). The falling trend of the IMR in different periods has been more valued than the actual figures(4).

However, according to Gomes, the assumption that a substantial reduction in IMR would be conditioned to the improvement in the quality of life has been challenged based on experiences in Brazil and other countries, where the expressive reduction in the number of infant deaths was correlated to specific interventions by the healthcare system, irrespective of significant changes in the social and economical structures(5). Moreover, according to the same author, in countries with development similar to that of Brazil, the drop in infant mortality was less related to social factors and improvement in quality of life, and more related to the public control of mortality through actions by medical and health services, strengthened by community participation.

When a group of people gets organized to carry out a social project for a needy community, often the first idea emerging is that the best way to help would be bringing medical care to that population. For over 30 years, even before the opening of Hospital Israelita Albert Einstein (HIAE), a group of ladies and some physicians began delivering social and medical care to children of the Paraisópolis slum, at the time. As from 1997, this work was consolidated as the Einstein Program in Paraisópolis Community (PECP, acronym in Portuguese). This medical care program sees ten thousand children aged between zero to ten years old, integrally; this corresponds to 40% of the estimated number of children at this age group living there. The social-educational actions cares for a changing public, encompassing, annually, about 6,000 people in different activities, of variable duration, focused on health education, disease prevention, support to pregnancy, improvement in family income, music, reading, sports and leisure(6). (Figure 1)

After a while, the question in any social investor’s mind is about the result of this work in the quality of life of the target population. Certainly, for those children who were treated for an acute infectious episode, the result is palpable, but which were the results for the collective group? Often, reports of charity organizations show the amount of procedures performed as results, while what one wishes to measure the impact of these procedures on people’s lives. This is even more difficult to assess because it is known that quality of life depends on multiple factors, like diseases, which have multiple causes, despite a known etiologic agent. Have PECP helped changing this community reality in 11 years? Is it possible to state that the program has effectively contributed to improve quality of life of the population? What indicator may assess this contribution?

Considering that IMR is an indicator that synthesizes the quality of life of a population, it should improve as these social determinants do so. If the social determinants change similarly in the entire municipality of São Paulo, then in the district where the results showed to be exceptional, it is likely that some variables not common to the entire territory might have influenced such outcome. Assuming this, this study is justified.

OBJECTIVE
To analyze the IMR in the Vila Andrade district, where Paraisópolis community is located, to discuss the
determinants for this outcome and whether the finding may be attributed to some specific factor of that population.

**METHODS**

The study was carried out at Paraisópolis Community, where HIAE develops its social program at Vila Andrade district, one of the three districts encompassing the borough Campo Limpo, at the Southern part of the city of São Paulo. The resident population of Vila Andrade in the year 2000 was 73,293 people, and that projected for 2007 would have been 93,191, according to the Sistema Estadual de Análise de Dados (SEADE) data. There was a 27.1% growth in this period, larger that the 10.7% in the entire borough. It is estimated that the Paraisópolis Community has from 60,000 to 70,000 inhabitants, accounting for 70% of the district population. The remaining 30% are mainly composed by a very wealthy population, similar to that living in the neighboring district of Morumbi. Thus, the district IMR is predominantly determined by the Paraisópolis Community.

Based on data from the Municipal Health Secretariat of São Paulo (SMS-PMSP) the evolution of the IMR could be verified; the information is available in electronic media for each district, from 2000 to 2007 (7).

The IMR of Vila Andrade was analyzed during this period and compared to the data of two other districts which are part of the Campo Limpo borough (Capão Redondo and Campo Limpo); with the data of two districts with smaller and stable populations, which is different from Vila Andrade; and with selected districts, which in 2000 had between 50 and 150,000 inhabitants and had expressive growth in the last eight years and IMR higher than 15.0/1,000 live newborns, namely Jaraguá, Lageado, Parelheiros, Perus, São Rafael and Vila Jacuí districts.

To check the behavior of other indicators, data on sanitation and access to healthcare services were searched at SEADE (8). These indicators of Vila Andrade were compared with those of Vila Leopoldina, a district in the borough of Lapa, and of Lageado, in the borough of Guaianases, due to similar evolution of the IMR.

**RESULTS**

The IMR in the district of Vila Andrade, between the years 2000 and 2007, declined with the following figures per 1,000 live newborns: 18.1; 17.4; 15.7; 15.7; 16.5; 9.6; 12.8 and 8.2. In the ranking of the 96 districts of the city of São Paulo, it has evolved with the following classification: 77th; 74th; 65th; 71st; 80th; 24th; 55th and 22nd positions, moving from the last to the first quartile.

Figure 2 shows the evolutive data of IMR for the districts of Vila Andrade, Capão Redondo and Campo Limpo.

Two other districts moved from the fourth quartile in 2000 to the first one in 2007, Vila Leopoldina and Barra Funda, both in the borough of Lapa. In Vila Leopoldina, the IMR per 1,000 live newborns, evolved from the year 2000 to 2007 as: 27.9; 23.3; 16.0; 12.8; 16.0; 2.2; 3.8 and 3.8. The IMR at Barra Funda was: 23.7; 15.1; 12.5; 13.6; 12.1; 10.3; 25.9 and 4.4. The population of Vila Leopoldina in 2000 was of 26,874 inhabitants and in 2007, 26,877. Barra Funda had 12,992 inhabitants in the year 2000 and 11,581 in the year 2007. As the number of live newborns is around 400 in Vila Leopoldina and 200 in Barra Funda, a single death above or below would have a significant impact on the IMR, from three to five units for an average of 12.6. Figure 3 shows the IMR evolution in Vila Andrade and selected districts of Vila Leopoldina and Barra Funda.

Two other districts with large population growth and significant improvement in the IMR were also selected. These districts – Jaraguá, Lageado, Parelheiros, Perus, São Rafael and Vila Jacuí – had from 50 to 150 thousand inhabitants, in 2000, and showed significant growth in the last eight years and an IMR higher than 15.0. The district of Jaraguá with 145,327 inhabitants in 2000 and population growth of 21.2% had IMR evolution of 19.9;
16.3; 16.6; 16.4; 19.7; 13.9; 19.2 and 11.2. The district of Lageado had 157,316 inhabitants, grew 14.9%, and its IMR evolved from 19.2; 18.1; 15.4; 15.1; 14.5; 15.9; 16.5 and 11.5. The district of Parelheiros had 102,274 inhabitants, grew 31.7%, and the IMR evolved from 19.4; 18.6; 19.4; 15.6; 15.6; 11.3; 17.3 and 15.3. The district of Perus had 70,428 inhabitants, grew 19.8%, and the IMR evolved from 15.9; 18.9; 17.2; 14.9; 15.6; 14.7; 12.4 and 13.9. The district of São Rafael had 124,731 inhabitants, grew 14.7% and its IMR evolved from 24.1; 18.0; 20.4; 15.3; 12.7; 10.8; 14.6 and 14.3. The district of Vila Jacuí had 141,544 inhabitants and grew 15.1% and IMR evolved from 21.5; 16.1; 14.0; 14.2; 14.3; 11.6; 11.7 and 12.4. None of these selected districts reached IMR below ten in 2007.

Figure 4 shows the IMR evolution in the selected districts of large population growth.

In order for the IMR of Vila Andrade to be considered representative of Paraisópolis, an adjustment of the rate would be necessary. As the district is an extension of Morumbi, the wealthy population of the district might be skewing the coefficient towards improvement. As the population of Paraisópolis represents 70% of the district population, and, assuming that 30% of the inhabitants outside Paraisópolis had IMR similar to that of the district of Morumbi, which is 6.4 deaths per 1,000, then the adjusted IMR will be found by the equation:

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6.4 \times 0.3 + (x \times 0.7) = 8.2 . 1, \text{ where } x = 8.9
\]

Other sanitation indicators and access to health services were also assessed. Table 1 displays some of these social indicators in selected districts according to the SEADE(7).

The growth of healthcare services provided was assessed by data on outpatient production made available at Tabnet(7) for each borough, for the year 2002 (they were not available for the year 2000) and the year 2007. Since the size of the population has changed during this period, the absolute figures were reduced to a common denominator. Considering the population of the borough in the years 2002 and 2007, the concentration of procedures per inhabitant per year was calculated.

In Table 2, the number of outpatient procedures, emergency visits and first time outpatient visits in the selected boroughs, where the districts of Vila Andrade (Campo Limpo), Lageado (Guianases) and Vila Leopoldina (Lapa) are found, are shown.

Table 3. Concentration of outpatient procedures, emergency visits and first time outpatient visits per inhabitant in the year
Table 3 shows the concentration of outpatient procedures, emergency visits and first time outpatient visits per inhabitant in the year.

As the databases are different, no statistical analysis for comparing the results was performed.

**DISCUSSION**

The district of Vila Andrade, in 2000, was on the last quartile, among those showing the worst IMR and, in 2008, moved to be part of the group of districts in the first quartile, of the best IMR. The IMR evolution of these two groups was analyzed and matched to other social-economic indicators, made available by SEADE\(^8\), to try to understand the IMR evolution in Vila Andrade, in comparison to the evolution in other districts, stating hypotheses for the findings. If this evolution is better than that of the other districts, after removing the common factors for the entire city, it was inferred that something different might have contributed to it.

The IMR in the city of São Paulo has been declining steadily since 1973, because of reduction in mortality due to specific causes: diarrhea, sepsis, meningitis, measles, immunizable diseases and other infectious, respiratory tract and nutritional diseases had major reduction. Deaths due to perinatal diseases and congenital malformation had moderate decrease\(^8\).

The drop in IMR is due to general improvement in the quality of life, and the deaths due to congenital malformation or prematurity did not fall in the same proportion. Two other factors must be mentioned due to their indirect effect on IMR: the major decline in fecundity and change in migratory flow. The role of São Paulo as the main Brazilian destination for migrants is being substituted by neighboring municipalities, with consequent decline in the rate of population growth. The districts in the center had negative growth while positive growth was seen in some peripheral districts, where infant mortality remains high in regions where migration contributed for population growth.

According to data of the last eight years, the city of São Paulo had an IMR of 15.8 deaths per 1,000 live newborns in 2000, and evolved with reduction year after year to 12.6 deaths (a 20.2% drop) in 2007. Eight districts had IMR above 20 in the year 2000, while only three had it in 2007. While in 2000, 20 districts had IMR below ten, 31 had this in 2007. Life conditions in the municipality, therefore, have been improving steadily, indicating improvement in some determinants, such as sanitation, income and access to health services.

Such decline in IMR also occurred in the borough of Campo Limpo, encompassing all its districts; however, when comparing the evolution of the indicator with the trend curve, Vila Andrade, is better than Campo Redondo and Campo Limpo, if one considers the angle it makes with the “x” axis.

Could the IMR of Vila Andrade be assumed as representative of Paraisópolis? As the population of Paraisópolis accounts for 70% of the district population, and assuming the hypothesis that 30% of inhabitants out of Paraisópolis have IMR similar to that of the Morumbi district, the adjustment yields a rate of 8.9 deaths per thousand and the corrected IMR was still very good, below ten.

Could this notorious evolution in IMR of Vila Andrade have also occurred in other districts of the city? Other two districts evolved from the fourth quartile, in 2002 to the first one, in 2007; they were Vila Leopoldina and Barra Funda, both from the Lapa borough. These two districts are closer to the capital center and had better sanitation and healthcare infrastructure for longer time than the Southern part of the capital, in addition to having few clusters classified as “slums”, some of which were eliminated because of real-estate business. The IMR evolution of such districts is due to factors likely common to both, because of geographic contiguity, but different from Vila Andrade, with very different characteristics of healthcare services provided and urbanization.

Amplifying the analysis, districts with large population growths and major IMR improvement were studied; however, none reached IMR below 10 in 2007. The trend curves showed consistent reduction, pointing to stability of the indicator. The district of Lageado displays a more similar curve to that of Vila Andrade, while all others tended toward the reversion of IMR drop.

Other social indicators of SEADE\(^8\), sanitation and access to health services were searched. These indicators were compared in the districts of Vila Leopoldina, located in the borough of Lapa, and Lageado, borough of Guaianases, with those of Vila Andrade, because of the similar evolution of IMR. Lageado, in 2000, had some social indicators better than Vila Andrade, such as sewage, trash collection, but income and prenatal care were worse than Vila Andrade. This may indicate that income is an important factor in IMR. It would be interesting to compare the same indicators in 2007, but, unfortunately, the data are not available.

In Vila Andrade, the health services provided have increased by the strategy of family health in the borough of Campo Limpo, of which the HIAE is a partner. This has also happened in the district of Lageado, belonging to the borough of Guaianases.

There was an expressive increase in outpatient procedures provided, between the years 2002 and 2007.
in the three boroughs studied, with the greatest one in Lapa (283%), but not negligible in Campo Limpó (74%) and in Guaiáneas (150%). The number of emergency and first time visits also increased substantially, with the concentration of first time outpatient visits growing more in Lapa (217%), followed by Campo Limpó (71%) and Guaiáneas (50%). This larger growth in Lapa may be explained by the fact that this is a central region, with higher production capacity, attracting people from other regions of the city. The low concentration of emergency visits in Campo Limpó is explained by the fact that the only public hospital in the area (Hospital de Campo Limpó), providing emergency consults for the entire region is not located at the Campo Limpó borough, but at the M’Boi Mirim borough, although the users live in the former borough.

The impressive evolution of IMR in Vila Andrade in the last eight years is due to a set of improvements that occurred in the region. Sanitation assistance was maintained regarding the population growth; income and access to healthcare are two factors which could have influenced, decisively, in the improvement of IMR. As it can be seen, the district of Lageado had also an increase in healthcare services provided. Vila Leopoldina also had an impressive increase in delivery of healthcare services, which might have been the essential factor improving IMR, considering that the other social indicators are quite good. The continuous drop in infant mortality observed in São Paulo between the 1970’s and the 1990’s indicate that the relative decline was higher in the poorer, peripheral area, than in the less poor, central area. This difference is attributed to the greater importance, in peripheral areas, of more deaths due to preventable and controllable causes, indicating improvement in quality of healthcare services. The impact of the expansion of the Family Health Strategies network in reducing IMR is demonstrated in comparative studies such as that of Cruz, especially regarding late mortality, in the towns with greater reach.

Vila Andrade and Lageado had, in 2000, similar social indicators, with a striking difference in income. Lageado has a larger proportion of people with income less than one minimal wage. This may be an important reason for the different IMR evolution, which may be confirmed with the census of 2010. Regarding access to health services, the increase in services provided occurred in the two boroughs where the two districts are located. This greater provision has been decisive for the IMR evolution, if confirmed the hypothesis that the sanitation reach was maintained in the proportion of population growth.

If the district of Lageado effectively represented, on the East Zone, the mirror of Vila Andrade’s population, the IMR evolution should have been closer to those. As it was not, the different evolution might be attributed to something that occurred in Vila Andrade and not in Lageado. Different income evolution is one hypothesis, and the other is that the higher effectiveness in healthcare in one region might have influenced the results, more than in other. Both the income and the higher effectiveness of health actions in Vila Andrade may be a result of social actions of HIAE and other entities working in Paraisópolis, including the Family Health Program (PSF, acronym in Portuguese), managed by the HIAE.

The subjective perception one has is that the quality of life in Paraisópolis has indeed improved, losing the status of “slum” to be transformed into a neighborhood. Recently, a large warehouse was installed and a bank is looking for a place to install a branch. In 2000, the district of Lageado ranked 85th in the IMR and, in 2007 moved to the 42nd position; and Vila Andrade moved from the 77th to the 22nd position, suggesting that something different might have happened.

The positive IMR evolution in the district of Vila Andrade, which includes the community of Paraisópolis is unique among the 96 districts of the capital. From the data analyzed, the trend curve of IMR indicates that in this district the factors determining the coefficient gathered toward a better performance than in other districts. Income may have had a better evolution as well as the effective healthcare actions.

If the evolution of this indicator of Vila Andrade, as observed, had not the result of the impact of social action, the Einstein Program in the Paraisópolis Community could not be celebrated as something that may have made a difference. However, as the indicator shows an impressive evolution compared to that of other districts, one feels reassured that the program has positively influenced the finding.

Study limitations
The present study has some limitations. No statistical analyses of the comparison between results of different health districts were performed. It only displays the raw data obtained, drawing attention, however, to the existence of many similarities among the populations assessed. Other communities could have been chosen but none of them had low IMR like in Vila Andrade.

CONCLUSION
According to the analysis carried out, the IMR was confirmed as an indicator consistently reflecting the evolution of quality of life in a population, but to measure how much such evolution may be attributed to an individual social action is still a challenge. The IMR
evolution in Vila Andrade is consistent with the increase in access to healthcare services and, possibly, in income, which may be confirmed in the upcoming census.

REFERENCES