Socioeconomic inequalities and mortality trends in BRICS, 1990–2010

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Objective To explore the presence and magnitude of – and change in – socioeconomic and health inequalities between and within Brazil, the Russian Federation, India, China and South Africa – the countries known as BRICS – between 1990 and 2010.

Methods Comparable data on socioeconomic and health indicators, at both country and primary subnational levels, were obtained from publicly available sources. Health inequalities between and within countries were identified and summarized by using standard gap and gradient metrics.

Findings Four of the BRICS countries showed increases in both income level and income inequality between 1990 and 2010. The exception was Brazil, where income inequality decreased over the same period. Between-country inequalities in level of education and access to sanitation remained mostly unchanged but the largest between-country difference in mean life expectancy increased, from 9 years in 1990 to 20 years in 2010. Throughout the study period, there was disproportionality in the burden of disease between BRICS. However, the national infant mortality rate fell substantially over the study period in all five countries. In Brazil and China, the magnitude of subnational income-related inequalities in infant mortality, both absolute and relative, also decreased substantially.

Conclusion Despite the economic prosperity and general improvements in health seen since 1990, profound inequalities in health persist both within and between BRICS. However, the substantial reductions observed – within Brazil and China – in the inequalities in income-related levels of infant mortality are encouraging.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

One of the most pressing issues in the global agenda for health development is the pervasiveness of inequality. The World Economic Forum recently identified widening economic inequality as the second most important worldwide trend of global concern.[1] Besides its deleterious effects on economic growth and poverty reduction, such inequality is morally questionable: it drives social exclusion, erodes the social fabric and threatens security on a global scale.[2] As revealed by the World Health Organization's Commission on Social Determinants of Health, extreme economic inequality drives other social inequalities.[3] Moreover, income inequalities are a conspicuous determinant of health inequalities and – if income inequalities are judged by society as unjust and avoidable – health inequities.[4,5] As recently emphasized by *The Lancet*–University of Oslo Commission on Global Governance for Health, health inequities "cannot be addressed within the health sector, by technical measures, or at the national level alone, but require global political solutions".[6]

Since 2001, the world has directed much attention to five emerging economies: Brazil, the Russian Federation, India, China and South Africa, the countries known as BRICS. Together, these countries account for 40% of the world's population and 25% of the world's gross domestic product.[7,8] As a group, they are beginning to challenge the developed economies for dominance in global economics, politics and governance.[9]

BRICS have declared health collaboration a priority and many policy-makers see BRICS as a reshaper of global health and international health cooperation. Two concepts –"health as a human right" and "health in all policies" – permeate much of BRICS' engagement in global health.[10,11] It seems possible that BRICS could leverage their unique resources and expertise in support of the global elimination of health inequities. We were therefore interested in assessing the economic and health inequalities that existed between and within these countries and following the temporal trends in such inequalities since 1990. We first investigated the magnitude of – and changes in – social and total health inequalities between BRICS. We then investigated the magnitude of – and changes in – income-related inequalities in infant mortality – used here as a summary measure of population health[12] – within each of the countries.

Methods

Data acquisition

For each of the BRICS countries, for the years 1990 and 2010, we retrieved comparable data on relevant issues from publicly accessible sources. These data included economic indicators, such as purchasing power, inflation-adjusted gross domestic product per capita[13] and the Gini coefficient,[14] educational indicators, such as the age-specific number of years of education attained,[15] and environmental indicators, such as use of improved sources of drinking water and sanitation facilities.[16] We also investigated demographic variables, such as the size of the rural[17] and total populations and life expectancy,[18] and health indicators, such as age-standardized disability-adjusted life-years (DALYs) for communicable, maternal, neonatal and nutritional disorders, noncommunicable diseases and injuries,[19] and infant, child and maternal mortality rates.[20] For each BRICS country, for the year 2008, we obtained global income inequality curves[21] from Branko Milanović (Development Research Group, The World

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Bank, Washington DC, United States of America). Income per capita, live births, population size and infant mortality rate for the years 2000 and 2010 were also investigated at the primary subnational level[22–42] – i.e. for the 26 states and one federal district of Brazil, the 31 provinces of China, the 31 states of India, the 79 regions of the Russian Federation and the nine provinces of South Africa. For China for the year 2010, infant mortality rates in each province were imputed from the categories of infant mortality reported by the United Nations Children's Fund[36] and weighted so that their mean value matched the mean value reported for China as a whole.

Data analyses

The generation and assessment of evidence on total and income-related inequalities in health were based on Turkey's principle of exploratory data analysis – i.e. pattern extraction[43] – and made use of standard inequality gap and gradient methods and metrics.[44,45]

Total inequalities in health between the five BRICS countries, in both 1990 and 2010, were summarized as absolute and relative gap measures for non-ordinal groups – i.e. highest–lowest differences and ratios.

For each of the BRICS countries, income-related inequalities in infant mortality for the years 2000 and 2010 were analysed – at the primary subnational level – in three ways. First, we generated an abridged distribution of subnational units, by quartiles of income per capita, and computed the absolute gap measure for ordinal groups – i.e. Kuznets absolute index – by subtracting the population-weighted infant mortality rate of the poorest quartile from the corresponding value for the richest quartile. The corresponding relative gap measure – i.e. Kuznets relative index – was calculated by dividing the population-weighted infant mortality rate of the poorest quartile by the corresponding value for the richest quartile. Second, we computed the slope index of inequality by regressing the infant mortality rates on the corresponding values for relative social position, as defined by log-transformed income.[46] We used weighted least squares regression – applying Maddala's procedure – to account for the heteroskedasticity of the aggregated data.[47] Finally, we computed the relative health concentration index by fitting a Lorenz concentration curve equation[48] – by nonlinear optimization – to the observed cumulative relative distributions of population – ranked by income and infant mortality across subnational units – and numerically integrating the area under the curve. These analyses were performed in Excel (Microsoft, Redmond, USA) using the Regression Analysis ToolPak and Solver add-ins (Microsoft).

Results

Social and health inequalities between countries

Each of the BRICS countries differed notably in terms of both income – measured as gross domestic product per capita – and income inequality – measured as the Gini coefficient (Table 1). In both 1990 and 2010, the Russian Federation had the highest income per capita and India the lowest. Although there was no evidence that the absolute inequality in income between these two countries changed between 1990 and 2010, the relative inequality between them fell from 5.9 to 2.8. Between 1990 and 2010, China experienced the highest income growth (300%). However, over that period, China also experienced one of the highest growths in income inequality and its Gini coefficient increased from 32.7 to 47.8. The Russian Federation experienced an even greater percentage growth in income inequality, since its Gini coefficient increased from 25.9 to 42.2 over the same period. Brazil was the only country that saw a decrease in its Gini coefficient between 1990 and 2010. Despite these temporal changes, South Africa and Brazil were the most income-inequitable of the BRICS countries in both 1990 and 2010.

Milanović's curves indicated that four of the BRICS countries – all except the Russian Federation – had very deep levels of income inequality in 2008 (Fig. 1). Income distributions in that year spanned 97 global income percentiles in Brazil and South Africa, 96 in China, 75 in India and 52 in the Russian Federation.

Similar patterns of inequality were observed in the other social variables that we investigated (Table 1). In general, the Russian Federation showed the most favourable situation and India the least favourable. In 1990 and 2009, for example, the mean number of years that a woman then aged 25–34 years had spent in education was 4- and 2.5-fold higher, respectively, in the Russian Federation than in India. However, an Indian woman aged 25–34 years in 2010 was likely to have experienced a much longer mean period in education than an Indian woman with similar age in 1990: 5.6 versus 2.9 years. As for access to improved water and sanitation, both the absolute and relative inequalities decreased between 1990 and 2010 – an effect that was particularly evident in China. By 2010, the prevalence of open defecation remained high in India but had become relatively low in the other four BRICS countries.

In both 1990 and 2010, there were marked total health inequalities between BRICS. The maximum absolute inequality in life expectancy at birth went up from 9 years in 1990 – between India and the Russian Federation – to 20 years in 2010 – between China and South Africa. Mean life expectancy at birth in South Africa was 6.6 years shorter in 2010 than in 1990. In the Russian Federation, mean life expectancy at birth in 2010 was very similar to that in 1990. In China, Brazil and India, however, mean life expectancy at birth in 2010 was, respectively, 5.4, 6.5 and 7.0 years greater than in 1990 (Table 1). Between-country inequalities in the burden of disease – particularly in the burden due to communicable diseases – generally widened over our study period. For example, relative inequality in the DALYs lost to communicable diseases increased from 6.9 in 1990 – between India and the Russian Federation – to 12.4 in 2010 – between South Africa and China.

Total inequalities in maternal and child health between BRICS narrowed in absolute terms but widened in relative terms between 1990 and 2010 (Table 1). Absolute inequalities in maternal mortality went down from 526 excess maternal deaths per 100 000 live births in 1990 – between India and the Russian Federation – to 266 such deaths per 100 000 live births in 2010 – between South Africa and the Russian Federation. In 1990, both China and India had levels of maternal mortality that were three times higher than the values recorded in 2010. When we investigated absolute inequalities in the rates of infant and child mortality in 1990, we found that – per 1000 live births – there were 58 excess deaths of infants aged less than 1 year and 87 excess deaths of children aged less than 5 years. In 2010, however, the corresponding values were lower, at 38 and 51 excess deaths per 1000 live births, respectively. In both 1990 and 2010, the greatest between-country differences in the rates of both infant and child mortality were those between India and the Russian Federation. Between 1990 and 2010, Brazil produced the largest reductions in infant (69%) and child mortality (71%), followed by China (65% and 67%, respectively).

Table 1. **Economic and health indicators, Brazil, the Russian Federation, India, China and South Africa (BRICS), 1990 and 2010**

Indicator and source reference	Year	Country				
		Brazil	Russian Federation	India	China	South Africa
Economic indicators[13,14]						
GDP (1990-constant i$ per capita)	1990	4 920.1	7 778.7	1 308.8	1 870.9	3 833.8
	2010	6 728.8	9 111.5	3 298.9	7 679.9	4 789.4
Gini coefficient	1990	60.4	25.9	31.2	32.7	63.0
	2010	52.7	42.2	33.9	47.8	66.5
Mean years of education for individuals aged 25–34 years[15]						
Male	1990	5.9	11.6	5.9	7.3	7.6
	2009	8.3	13.2	8.1	9.3	10.2
Female	1990	6.2	11.6	2.9	5.7	7.4
	2009	9.3	13.8	5.6	8.9	10.4
Water and sanitation[16]						
Access to improved drinking water (%)	1990	88.5	93.2	70.3	66.7	82.6
	2010	96.9	97.0	90.7	91.5	91.4
Access to improved sanitation (%)	1990	66.8	73.8	17.7	23.7	63.9
	2010	80.3	70.4	34.2	64.8	73.8
Prevalence of open defecation (%)	1990	16.7	1.0	74.5	7.1	13.2
	2010	4.0	1.0	50.8	0.8	7.0
Demographics[17,18]						
Total population (thousands)	1990	149 648	148 149	868 891	1 165 429	36 793
	2010	195 210	143 618	1 205 625	1 359 821	51 452
Rural population (%)	1990	26.1	26.6	74.5	73.6	48.0
	2010	15.7	26.3	69.1	50.8	38.5
Life expectancy at birth (years)	1990	66.7	67.6	58.7	69.5	61.8
	2010	73.2	67.6	65.7	74.9	55.2
Burden of disease[19]						
Communicable diseases (DALYs per 100 000 inhabitants)	1990	10 779.2	4 521.2	31 294.6	7 897.2	16 444.1
	2010	5 077.1	4 880.6	17 365.6	2 843.8	35 202.9
Noncommunicable diseases (DALYs per 100 000 inhabitants)	1990	22 989.0	26 144.4	27 249.7	22 358.9	25 525.6
	2010	20 125.0	25 779.1	23 356.3	17 021.8	21 897.3
Injuries (DALYs per 100 000 inhabitants)	1990	4 618.1	6 585.4	5 267.5	4 371.5	5 475.1
	2010	4 014.2	6 171.8	5 137.8	2 940.0	5 011.5
Maternal, child and infant mortality[a,20]						
Maternal mortality (deaths per 100 000 live births)	1990	120.0	74.0	600.0	120.0	250.0
	2010	56.0	34.0	200.0	37.0	300.0
Infant mortality (deaths per 1000 live births)	1990	48.8	23.0	81.0	38.7	48.2
	2010	15.0	10.3	48.6	13.7	35.5
Child mortality (deaths per 1000 live births)	1990	58.0	27.3	114.2	48.9	62.3
	2010	16.8	12.5	63.4	15.9	52.6

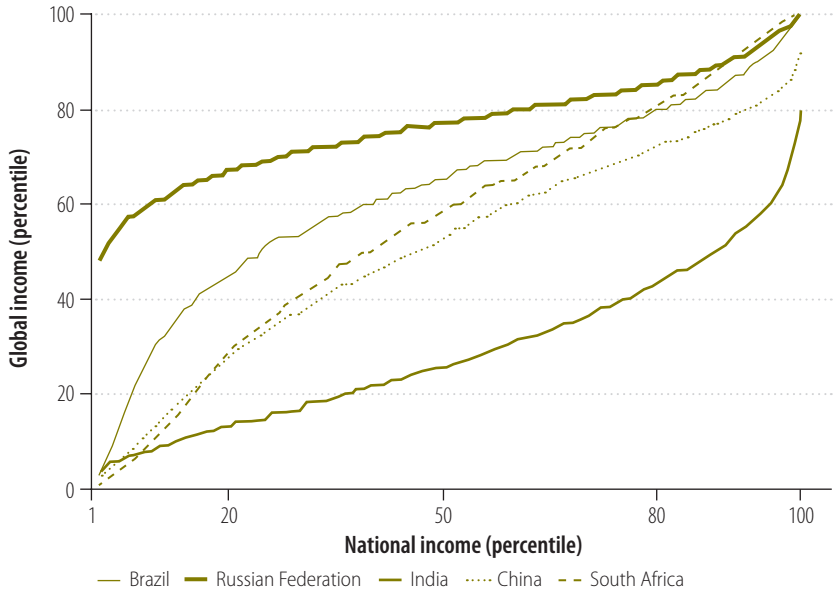
DALYs: disability-adjusted life-years; GDP: gross domestic product; 1990-constant i$: 1990-constant international (Geary-Khamis) dollars.
[a] The data shown for infant and child mortality relate to individuals aged less than 1 year and less than 5 years, respectively.

The world's median rate of infant mortality gradually fell between 1990 and 2010, from 36 to 17 infant deaths per 1000 live births (Fig. 2). Over the same period, the rates of infant mortality in India and the Russian Federation followed a very similar trend – although the values recorded were in the highest and lowest quartiles of the global values, respectively. The corresponding rates recorded in Brazil and China fell more steeply than the global median values. These rates began above the global median in 1990 but fell below it in 2010. In South Africa, the rate of infant mortality increased between 1996 – when the rate was close to the global median value – and 2004 – when the rate was well above the global median value.

Infant mortality inequalities within countries

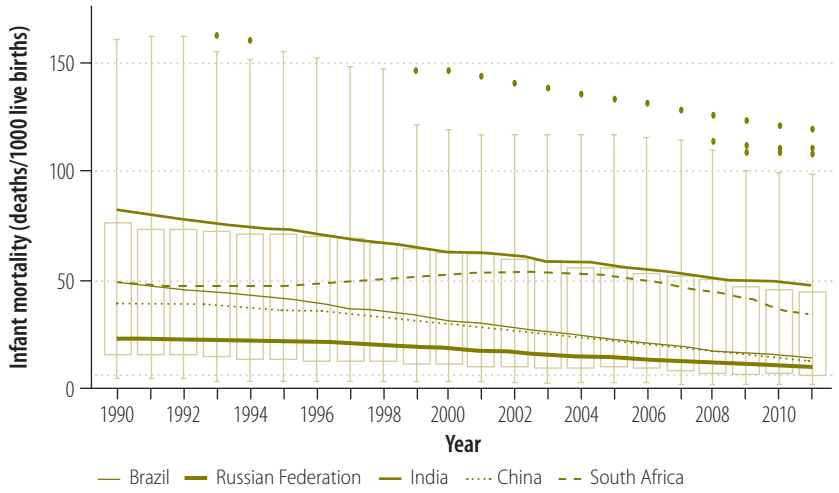
Table 2 presents summary metrics of income-related inequalities in infant mortality – at the primary subnational level of each BRICS country – in 2000 and 2010. In the decade beginning in 2000, both Brazil and China showed reductions in the magnitude of such inequalities, in both absolute and relative terms. Between 2000 and 2010, the gap in infant mortality between the poorest and the richest quartiles decreased from 18.5 to 7.2 excess deaths per 1000 live births in Brazil and from 24.5 to 5.1 excess deaths per 1000 live births in China. In relative terms, these changes represented a reduction in inequality from 2.0 to 1.6 in Brazil and from 3.2 to 1.8 in China. Across the

Fig. 1. **Income inequality in Brazil, the Russian Federation, India, China and South Africa (BRICS), 2008**



Note: To show income inequality, Milanović curves were produced by plotting the national income distribution of each country – in percentiles – against the world income distribution – also in percentiles. All the data came from household surveys (B Milanović, unpublished observations).

Fig. 2. **Infant mortality rates, Brazil, China, India, the Russian Federation and South Africa, 1990–2010**



Note: The "box-and-whisker" plots behind the plotted lines summarize the global distribution of the corresponding infant mortality rates. The horizontal bars, boxes, whiskers and dots indicate global medians, interquartile ranges, minimum and maximum values (excluding outliers) and outliers, respectively.

social gradient defined by income, these observed reductions in inequality equated to 10 and 20 infant deaths averted per 1000 live births, respectively. In relative terms, these changes were consistent with reductions in the proportion of all infant deaths occurring among the poorest 20% of the population, from 30% to 26% in Brazil and from 35% to 25% in China. At the subnational levels that we investigated, the changes seen in both absolute and relative income-related inequalities in infant mortality in India, the Russian Federation and South Africa between 2000 and 2010 were negligible. Appendix A (available at: http://www1.paho.org/appendix/Appendix%20A%20BLT.14.127977.pdf) shows the health inequality gradients, regression lines and concentration curves of income inequality in infant mortality for each BRICS country in 2000 and 2010.

Discussion

We have documented certain socioeconomic and health inequalities between BRICS – as well as income-related inequalities in infant mortality within each of the countries – over time. At least two broad patterns are evident. One is that, despite the sustained economic growth of all five BRICS countries over the last two decades, sizeable and persistent social and health inequalities exist between and within BRICS. The other is that substantial reductions in health inequalities – particularly in income-related inequalities in infant survival – are only taking place in some of the BRICS countries, even though all of the countries have seen remarkable declines in infant mortality since 2000.

BRICS experienced increasing economic prosperity between 1990 and 2010. With only one exception, this positive economic growth was associated with a major increase in income inequality – i.e. a widening of the gap between rich and poor. The exception was Brazil. As Brazil's economy grew after 1990 there was a substantial decline in income inequality. The country's Gini coefficient fell from 60.4 in 1990 to 52.7 in 2010. Despite this desirable trend, Brazil's Gini coefficient in 2010 was the second highest of the five coefficients for BRICS. Although China and the Russian Federation saw the two largest increases in income inequality over the 20-year period that we assessed, in 2008 there was less income inequality in the Russian Federation than in the other four BRICS countries. In 2008, only 2% of the citizens of the Russian Federation – but 25% of the population of Brazil, 42% of the population of South Africa, 47% of the population of China and 88% of the population of India – had incomes below the fiftieth percentile of the global income distribution, indicating that they were among the poorest 50% of the world's population.

Not surprisingly, the magnitude of the income inequality observed in BRICS between 1990 and 2010 – and the temporal trends seen in that magnitude – were mirrored in the other social determinants of health that we explored, such as level of education and access to improved water and sanitation services. Despite some evidence of improvements in the deter-

Table 2. **Income-related inequalities in infant mortality, Brazil, the Russian Federation, India, China and South Africa (BRICS), 2000 and 2010**

Inequality summary measure	Brazil		Russian Federation		India		China		South Africa	
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Kuznets index[a]										
Absolute	18.5	7.2	3.0	3.3	27.1	24.8	24.5	5.1	19.4	−7.0
Relative	2.0	1.6	1.2	1.5	1.5	1.8	3.2	1.8	1.5	0.8
Income gradient metric										
Slope index of inequality	−16.4	−6.6	−3.6	−3.3	−18.4	−16.9	−23.8	−3.1	−11.8	9.4
Relative concentration index	−0.17	−0.11	−0.05	−0.08	−0.11	−0.13	−0.26	−0.09	−0.08	0.04

[a] A bottom–top income quartile gap metric.

minants of health, many major problems remain. For example, although India has been steadily reducing the prevalence of illiteracy among its women, almost half of female Indians aged more than 15 years in 2010 had received no school education at that time. In 2010, almost half of all Indians still defecated in the open.

The detrimental direct association between increasing mean income per capita and increasing socioeconomic inequality – as observed in most of the BRICS countries – is commonly observed worldwide.[1,2] Given the massive size of the BRICS economies, it is reasonable to contend that whatever happens within BRICS may give shape to – and, perhaps, actually drive – global trends. Economic effects exert a profound impact on social cohesion and the perpetuation of socioeconomic inequalities in health.[3,6] Inequalities in population health can be generated by various mechanisms, such as biological factors, personal preferences, choices and behaviours, access to health care and an individual's position in the social hierarchy – whether that position is defined by wealth, gender, occupation, education or other social stratifiers.[3–5]

Globally, much of the infant mortality is now considered to be avoidable, via improvements in health care.[12] National and subnational levels of infant mortality can therefore be used as indicators of the level of access to health services and can shed light on the etiology of health inequalities and the social inequities that perpetuate such inequalities. Our study showed within-country income-related inequalities in infant mortality in all five of the BRICS countries. Perhaps more importantly, it also showed substantial reductions in such inequalities in Brazil and China between 2000 and 2010 – at a time when income inequality was decreasing in Brazil and increasing in China. In 2000, Brazil's Gini coefficient was decreasing from a very high value, whereas China's Gini coefficient was going up from a relatively low value. Together, these observations indicate that the relationship between income inequality and infant mortality inequality in Brazil involved a different mechanism to that involved in China. In China, following the economic reforms of the 1980s, major efforts were made to promote universal maternal and child health care.[49,50] In Brazil, although some similar efforts were made, more emphasis was placed on progressive policies of income redistribution – and it is these policies that may have had the greater beneficial effect on inequities in maternal and child health.[51,52] Lack or loss of income can be a tough barrier to the attainment of universal health care and lead to marginal exclusion.[53–55] A recent report of the Asian Development Bank calls for conditional cash transfers to reduce income inequality and improve access to health services in China.[56]

Our results indicate the presence, at state level, of a steep income gradient in infant mortality in India between 2000 and 2010. Although there is some evidence that the level of such income-related inequity in infant mortality fell over this period, the change was quite small. A district-level assessment of *Janani Suraksha Yojana* – India's programme of conditional cash transfers, which was designed to improve child survival – indicated that substandard targeting had led to the programme having only a small benefit.[57] Across the 79 regions of the Russian Federation, our analysis of income-related inequality in infant mortality only showed the presence of a weak income gradient – the combined result of low income inequality and low levels of infant mortality.

The apparent lack of an income gradient in infant mortality in South Africa may need further exploration. It could be a reflection of the success of the Child Support Grant programme. This programme of conditional cash transfers, which was launched in 1998, is targeted at poor children irrespective of their household arrangements. However, the apparent absence of income inequalities in infant mortality contrasts sharply with some major problems in South Africa, such as extremely high levels of income inequality, the second highest rate of infant mortality among BRICS, a major epidemic of infection with human immunodeficiency virus and decreasing life expectancy. All of these problems tend to be disproportionately represented among the more socially disadvantaged.[58]

This study has several limitations. We relied on secondary data for our analyses. Although these data were taken from standardized sources, we cannot rule out information bias due to differential misclassification and the varying quality of information collection in the five BRICS countries. It was not possible to assess the reliability of our results at the subnational level or to adjust for potential differential errors over time and across the units of analysis. We also ignored most of the historical, political, economic and cultural characteristics that distinguish each of the BRICS countries from the other four. Given the exploratory nature of the study, its findings will need to be confirmed in further research.

Despite its shortcomings, our study points to the persistence of socioeconomic and health inequalities between and within BRICS. It illustrates the need to act on the social determinants of health if universal health coverage is ever to be achieved. BRICS help shape global

agendas on health and sustainable development and these countries may well lead the global action needed to achieve health equity. ■

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ملخص

الفوارق الاجتماعية والاقتصادية والاتجاهات المتعلقة بالوفيات في تجمع "بريك" (BRICS)، من 1990 إلى 2010

الغرض استكشاف وجود الفوارق الاجتماعية والاقتصادية والصحية بين البرازيل والاتحاد الروسي والهند والصين وجنوب أفريقيا – البلدان المعروفة بتجمع "بريك" (BRICS) – وداخلها في الفترة من 1990 إلى 2010 وحجمها والتغير الذي طرأ عليها.

الطريقة تم الحصول على بيانات قابلة للمقارنة عن المؤشرات الاجتماعية والاقتصادية والصحية، على الصعيدين القطري ودون الوطني الأساسي من المصادر المتاحة للعامة. وتم تحديد الفوارق الصحية بين البلدان وداخلها وتم تلخيصها عن طريق استخدام الثغرة المعيارية والقياسات المتدرجة.

النتائج أظهرت أربعة من بلدان تجمع "بريك" زيادات في كل من مستوى الدخل والتفاوت في الدخل بين عامي 1990 و2010. وكان الاستثناء من تلك البلدان البرازيل، حيث انخفض التفاوت في الدخل على مدار الفترة ذاتها. وظلت الفوارق بين البلدان في مستوى التعليم والوصول إلى خدمات الإصحاح في الغالب دون تغيير، ولكن أكبر اختلاف بين البلدان في متوسط العمر المأمول زاد من 9 سنوات في عام 1990 إلى 20 سنة في عام 2010. وكان هناك، طوال فترة الدراسة، عدم تناسب في عبء المرض بين بلدان تجمع "بريك". ومع ذلك، انخفض معدل وفيات الرضع على الصعيد الوطني بشكل كبير على مدار فترة الدراسة في جميع البلدان الخمس. وفي البرازيل والصين، انخفض أيضاً حجم الفوارق ذات الصلة بالدخل على الصعيد دون الوطني في معدل وفيات الرضع، المطلق والنسبي على حد سواء، بشكل كبير.

الاستنتاج على الرغم من الرخاء الاقتصادي والتحسينات العامة في الصحة التي لوحظت منذ عام 1990، ما زالت هناك فوارق عميقة في الصحة داخل بلدان تجمع "بريك" وفيما بينها. إلا أن الانخفاضات الكبيرة التي لوحظت – في البرازيل والصين – في الفوارق في مستويات وفيات الرضع ذات الصلة بالدخل مشجعة في هذا الصدد.

摘要

1990-2010 年金砖国家社会经济不均衡和死亡率趋势

目的 探讨 1990 年至 2010 年巴西、俄罗斯联邦、印度、中国和南非（又称 BRICS）等金砖国家之间和内部的社会经济和卫生不均衡的存在和量级以及变化。

方法 从公开来源获取国家和主要地方级别上社会经济和健康指标方面的可比数据。使用标准差距和梯度指标识别和总结国家之间和内部的卫生不均衡情况。

结果 金砖五国中有四国在 1990 和 2010 年之间收入水平和收入不均衡情况都有所加剧。只有巴西例外，在同一时期收入不均衡情况减缓。国家之间教育水平和医疗环境可获得性不均衡情况基本上保持不变，但是国家之间平均预期寿命最大差别增加，从 1990 年的 9 年提高到 2010 年的 20 年。在整个研究期间，金砖五国之间的疾病负担比例失调。但是，在研究期间所有五个国家的全国婴儿死亡率显著降低。在巴西和中国，婴儿死亡率的地方级收入相关不均衡的量级（绝对和相对）也显著降低。

结论 尽管 1990 年以来经济繁荣发展，医疗条件普遍改善，BRICS 国家内部和之间依然存在深刻的卫生不均衡状况。然而，在巴西和中国，在收入相关婴儿死亡率水平方面观察到不均衡性显著降低的情况令人振奋。

Résumé

Inégalités socioéconomiques et tendances de la mortalité dans le groupe BRICS, 1990-2010

Objectif Étudier la présence et l'importance – et les variations – des inégalités socioéconomiques et sanitaires entre et à l'intérieur du Brésil, de la Fédération de Russie, de l'Inde, de la Chine et de l'Afrique du Sud – les pays connus sous le nom de BRICS – entre 1990 et 2010.

Méthodes Des données comparables sur les indicateurs socioéconomiques et sanitaires, à la fois aux niveaux national et infranational primaire, ont été tirées de sources accessibles au public. Les inégalités sanitaires entre et à l'intérieur des pays ont été identifiées et synthétisées à l'aide des écarts types et des mesures de gradient.

Résultats Quatre pays du groupe BRICS ont montré des augmentations à la fois du niveau des revenus et des inégalités des revenus entre 1990 et 2010. L'exception a été le Brésil, où l'inégalité des revenus a diminué sur la même période. Les inégalités entre les pays dans le niveau de l'éducation et l'accès aux installations sanitaires n'ont pratiquement pas changé, mais la différence la plus marquée entre les pays dans l'espérance de vie moyenne a augmenté, passant de 9 ans en 1990 à 20 ans en 2010. Sur toute la période de l'étude, la charge de morbidité était disproportionnée entre les pays du groupe BRICS. Cependant, le taux national de mortalité infantile a considérablement chuté pendant la période d'étude dans l'ensemble des 5 pays. Au Brésil et en Chine, l'importance des inégalités infranationales en matière de mortalité infantile, à la fois absolue et relative, qui sont liées aux revenus, a également considérablement diminué.

Conclusion Malgré la prospérité économique et les améliorations générales en matière de santé observées depuis 1990, de profondes inégalités en matière de santé persistent à la fois entre et à l'intérieur des pays du groupe BRICS. Cependant, les importantes diminutions observées dans les inégalités – à l'intérieur du Brésil et de la Chine –en matière de taux de mortalité infantile, qui sont liées aux revenus, sont encourageantes.

Резюме

Социально-экономическое неравенство и тенденции Социально-экономическое неравенство и тенденции смертности в странах БРИКС, 1990-2010 гг.

Цель Исследовать наличие, размеры и изменения в социально-экономическом неравенстве и неравенстве в оказании услуг здравоохранения в Бразилии, Российской Федерации, Индии, Китае и Южной Африке (странах БРИКС), как внутри стран, так и между ними, за период 1990-2010 гг.

Методы Сопоставимые данные по показателям социально-экономического развития и здоровья как на уровне стран, так и на первичных субнациональных уровнях, были получены из открытых источников. Неравенство в оказании услуг здравоохранения между странами и внутри стран определялось и обобщалось с использованием стандартных методик определения социального неравенства и градиента.

Результаты В четырех странах БРИКС наблюдалось увеличение как уровня, так и неравенства доходов в период с 1990-го по 2010-й годы. Исключение составила Бразилия, где неравенство в доходах снизилось за тот же период. Неравенство между странами в уровне образования и доступа к средствам санитарии в основном осталось неизменным, но наибольшая разница в средней продолжительности жизни между странами увеличилась с 9 лет в 1990 году до 20 лет в 2010 году. На протяжении всего периода исследования между странами БРИКС наблюдалась диспропорция в бремени заболеваний. Тем не менее, национальный уровень младенческой смертности существенно снизился за период исследования во всех пяти странах. В Бразилии и Китае субнациональные уровни младенческой смертности, связанные с неравенством в доходах, также существенно снизились как в абсолютных, так и относительных показателях.

Вывод Несмотря на экономическое процветание и общее улучшение здоровья населения, наблюдаемые с 1990 года, внутри и между странами БРИКС сохраняется глубокое неравенство в оказании услуг здравоохранения. Тем не менее, наблюдаемое в Бразилии и Китае значительное сокращение младенческой смертности, связанное с неравенством в уровне доходов, является обнадеживающим.

Resumen

Las desigualdades socioeconómicas y las tendencias de la mortalidad en los países BRICS, 1990–2010

Objetivo Explorar la presencia y magnitud, así como los cambios en las desigualdades socioeconómicas y sanitarias entre y dentro de Brasil, la Federación de Rusia, India, China y Sudáfrica, los países conocidos como BRICS, entre 1990 y 2010.

Métodos Se analizaron fuentes accesibles al público para obtener datos comparables sobre los indicadores socioeconómicos y de salud tanto a nivel nacional como subnacional primario. Se identificaron y resumieron las desigualdades sanitarias entre países con ayuda de métricas de brecha estándar y de gradiente.

Resultados Cuatro de los países BRICS mostraron incrementos tanto a nivel de ingresos como de desigualdad de ingresos entre 1990 y 2010. La excepción fue Brasil, donde la desigualdad de ingresos se redujo en el mismo periodo. Las desigualdades entre los países a nivel educativo y de acceso a la sanidad permanecieron en su mayoría sin cambios, si bien la diferencia entre países relativa a la esperanza media de vida más grande aumentó de 9 años en 1990 a 20 años en el año 2010. A lo largo del periodo de estudio se observó una desproporción en la carga de la enfermedad en los BRICS. Sin embargo, la tasa de mortalidad infantil nacional se redujo sustancialmente durante el periodo de estudio en los cinco países. En Brasil y China, la magnitud de las desigualdades relacionadas con los ingresos a nivel subnacional en la mortalidad infantil, tanto en términos absolutos como relativos, también se redujo sustancialmente.

Conclusión A pesar de la prosperidad económica y la mejora general de la salud que se observa desde 1990, aún persisten desigualdades muy importantes en materia de salud tanto dentro, como entre los países BRICS. Sin embargo, las reducciones sustanciales de las desigualdades a nivel de ingresos de la mortalidad infantil observadas en Brasil y China son alentadoras.

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