

Evaluating the Impact of Daycare on Child Development and Parents Welfare

Ricardo Barros - IPEA

Mirela de Carvalho – IETS

Samuel Franco – IETS

Pedro Olinto – Banco Mundial

Andrezza Rosalém - IETS

Rio de Janeiro, December 2009

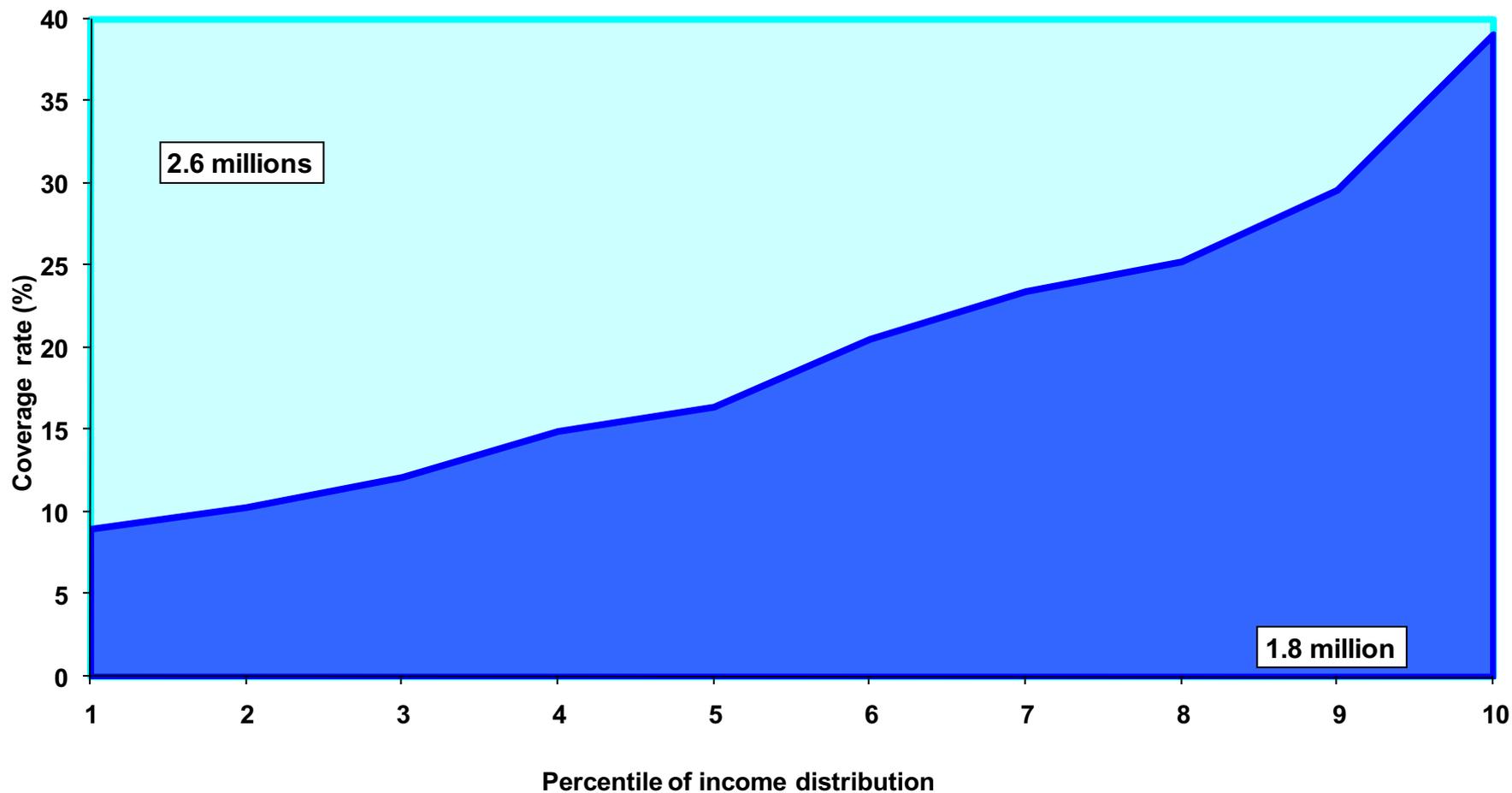
I. Seven Dilemmas

1. *The importance of care versus the importance of public provided care.*
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. Impact on child development *versus* the impact on parents welfare?
4. The need for a minimum level of quality.
5. The cost-benefit ratio relative to other educational levels.
6. Availability of resources and the long run impact.
7. Is there strong complementarities with other social programs?

I. Seven Dilemmas

1. The importance of care *versus* the importance of public provided care.
2. ***Substitutes versus complements? Day care center versus its alternatives (PIM).***
3. Impact on child development *versus* the impact on parents welfare?
4. The need for a minimum level of quality.
5. The cost-benefit ratio relative to other educational levels.
6. Availability of resources and the long run impact.
7. Is there strong complementarities with other social programs?

Coverage rate of 0-3 years old children by percentile of income distribution: Brazil, 2007



Fonte: Estimativas produzidas com base na Pesquisa Nacional por Amostra de Domicílios (PNAD), de 2007.

I. Seven Dilemmas

1. The importance of care *versus* the importance of public provided care.
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. ***Impact on child development versus the impact on parents welfare?***
4. The need for a minimum level of quality.
5. The cost-benefit ratio relative to other educational levels.
6. Availability of resources and the long run impact.
7. Is there strong complementarities with other social programs?

Impact of an extra year of daycare and pre-school on educational performance, labor force participation and income

Outcome	Daycare		Pre-school	
	Coefficient	P-value(%)	Coefficient	P-value(%)
<i>The impact on educational performance</i>				
Finally achieved educational level	-0.07	33	0.63	8
Probability of completing 8th grade	-0.14	63	0.27	0
Probability of completing secondary education	-0.05	85	0.18	1
Probability of going to college	-0.06	91	0.35	0
Probability of having completed 4 th grade before age 14	-9.47	34	0.65	2
Probability of having completed 8 th grade before age 18	7.65	97	0.41	23
Probability of having completing secondary educational before age 25	0.65	6	0.05	9
Probability of entering college before age 25	0.67	18	0.50	2
Repetition rate (ratio between the number of years spent on school and the number of grades completed)	-0.01	80	-0.05	0
<i>The impact on labor market outcomes</i>				
Labor force participation rate (women 25 to 64 years old)	0.67	54	-0.10	16
Occupation rate (women 25 to 64 years old)	0.78	53	-0.07	27
Labor income (men 25 to 64 years old)	-0.06	61	0.06	7

Source: Barros, Ricardo and Mendonça, Rosane. Uma avaliação dos custos e benefícios da educação pré-escolar no Brasil, July, 1999, IPEA.

Note: This study was used as a background paper for: Young, Mary Eming. From Early Child Development to Human Development: Investing in Our Children's Future

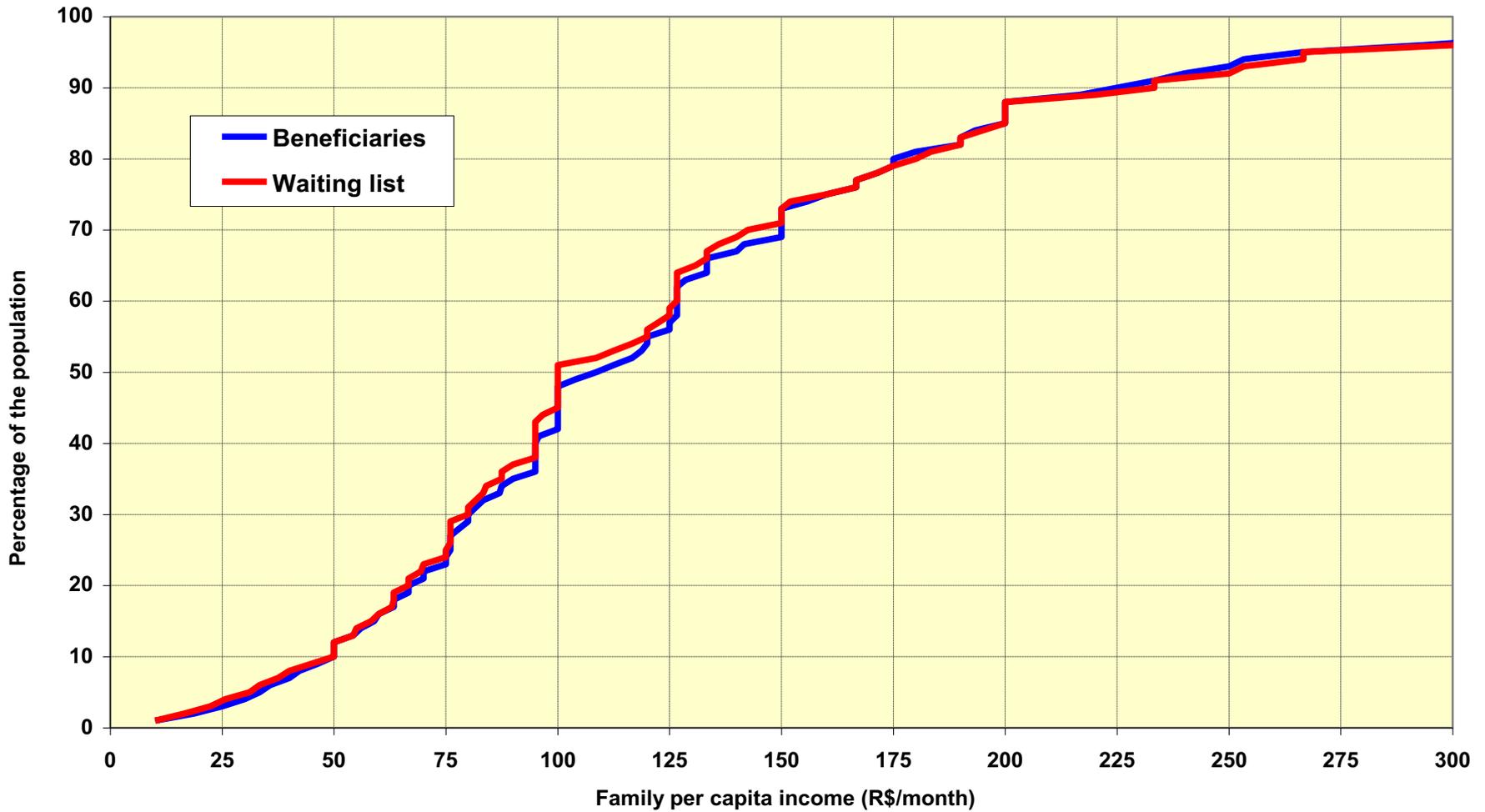
Four alternative interpretations

- Statistically non significant estimates result from the poor quality of the data
- Weak statistical results are caused by fragile identification strategy (problems with internal validity)
- Small impact results from the low quality of daycare services in the past (problems with external validity)
- Daycare really do not have important impacts on child development

Excess demand for Daycare in Rio de Janeiro municipality

Indicator	Value
<i>Coverage rate at the top 10% (%)</i>	55
<i>Average coverage rate (%)</i>	25
<i>Difference (percentage points)</i>	30
<i>Excess demand (thousands)</i>	83
<hr/>	
<i>Municipal vacancies for 2008 (thousands)</i>	12
<i>2008 Applicants for municipal daycare centers (thousands)</i>	25
<i>Applicants per vacancy in municipal daycare centers (2008)</i>	2.1

Family per capita income cumulative distribution



Avaliando o impacto da creche sobre a taxa de ocupação dos responsáveis pela criança

Condição	Taxa de ocupação (%)	Porcentagem frequentando creche	Impacto da creche sobre a taxa de ocupação (pontos percentuais)
Selecionado	45,2	93,9	
Lista de espera	41,1	55,1	
Diferencial	4,2	38,8	10,7

Avaliando o impacto da creche sobre a taxa de ocupação dos responsáveis pela criança

Condição	Taxa de ocupação (%)	Porcentagem frequentando creche	Impacto da creche sobre a taxa de ocupação (pontos percentuais)
Selecionado	45,2	93,9	
Lista de espera	41,1	55,1	
Diferencial	4,2	38,8	(6.8,14.7)

Evaluating the impact on parents level of stress

Status	Average level of stress (%)	Percentage attending daycare centers	Impact of daycare centers on stress (p.p.)
Beneficiaries	44,5	93,9	
Waiting list	45,6	55,1	
Difference	-1,1	38,8	-2,8
Total	45,0	74,7	

I. Seven Dilemmas

1. The importance of care *versus* the importance of public provided care.
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. Impact on child development *versus* the impact on parents welfare?
4. ***The need for a minimum level of quality.***
5. The cost-benefit ratio relative to other educational levels.
6. Availability of resources and the long run impact.
7. Is there strong complementarities with other social programs?

Nature of data collection

- Evaluation of the economic cost of 100 daycare centers in Rio de Janeiro
- Objective evaluation of the quality of these 100 daycare centers (470 items, 15 dimensions, one week of continuous observation)
- Beneficiaries subjective perception of the service quality
- Evaluation of the development of a sample of 10 children per daycare center (total of 1000 children evaluated)
- Collection of information on family socio-economic conditions for each child in the study (household survey)

Average quality of publicly funded daycare centers in Rio de Janeiro municipality, 2001

Dimension	Overall average	Low quality (bottom 20%)	High quality (top 20%)	Quality gap
Synthetic measure	0,43	0,28	0,57	0,29

Infrastructure	0,39	0,27	0,51	0,24
Health and sanitation	0,45	0,27	0,62	0,34
Activities and program structure	0,46	0,26	0,68	0,42
Human resources	0,30	0,16	0,51	0,35
Parents and community relations	0,60	0,33	0,83	0,49

Source: Estimates produced based on the research "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

**Relationship between the logit of daycare center
overall quality indicator, child characteristics and
family background**

- Rio de Janeiro municipality, 2001 -

Variable	Coefficient	P-value (%)
<i>Intercept</i>	-0,272	6
<i>Child characteristics</i>		
Gender (man)	-0,039	21
Race (white)	-0,018	59
<i>Family background</i>		
Presence of the mother	-0,109	15
Years of schooling of the person responsible for the child	0,002	68
Ln family per capita income (R\$/month)	0,017	50
<i>Number of observations</i>	752	
<i>R² - adjusted</i>	0,00	

Source: Estimates produced based on the research "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Distance from home to daycare centers: Rio de Janeiro municipality

Indicator	Value
<i>Average time spent to daycare centers (minutes)¹</i>	14
<hr/>	
<i>Percentage of children taken from home to daycare center at most¹ (%):</i>	
15 minutes	73
30 minutes	96
<hr/>	
<i>Percentage of children applying to daycare centers who live in the same neighborhood the daycare center is located² (%):</i>	84

Source: Estimates produced based on the research "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Source 2: Estimate based on the "Cadastro da Pré-Matrícula das Creches Municipais da Secretaria Municipal de Educação da Cidade do Rio de Janeiro - 2009".

Impact of daycare quality centers on child *overall* development - Rio de Janeiro municipality, 2001 -

Specification	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers in:		P-value (%)
		Months	Standard deviation	
Age of development				
Quality	4,13	1,2	0,17	11
Log quality	1,78	1,3	0,18	9
Logit quality	0,97	1,2	0,17	11
Log age of development				
Quality	0,103	1,3	0,18	17
Log quality	0,043	1,3	0,18	16
Logit quality	0,024	1,2	0,18	17

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parentes, household head years of schooling and per capita income.

Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

Impact of daycare quality centers on child *social* development - Rio de Janeiro municipality, 2001 -

Specification	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)
		Months	Standard deviation	
Age of development				
Quality	7,92	2,3	0,23	3
Log quality	3,11	2,2	0,22	4
Logit quality	1,82	2,2	0,22	3
<hr/>				
Log age of development				
Quality	0,206	1,1	0,11	7
Log quality	0,079	1,1	0,11	9
Logit quality	0,047	1,1	0,11	7

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parentes, household head years of schooling and per capita income.

Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

Impact of daycare quality centers on child *physical* development - Rio de Janeiro municipality, 2001 -

Specification	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)
		Months	Standard deviation	
Age of development				
Quality	1,03	0,3	0,04	70
Log quality	0,00	0,0	0,00	100
Logit quality	0,17	0,2	0,03	78
Log age of development				
Quality	-0,009	1,3	0,18	92
Log quality	-0,017	1,4	0,19	65
Logit quality	-0,004	1,3	0,18	85

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parents, household head years of schooling and per capita income.

Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

Impact of daycare quality centers on child *mental* development - Rio de Janeiro municipality, 2001 -

Specification	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)
		Months	Standard deviation	
Age of development				
Quality	6,06	1,8	0,18	9
Log quality	2,54	1,8	0,18	9
Logit quality	1,44	1,7	0,18	9
<hr/>				
Log age of development				
Quality	0,109	1,5	0,16	30
Log quality	0,045	1,6	0,16	30
Logit quality	0,026	1,5	0,15	30

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parentes, household head years of schooling and per capita income.

Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

Relation between log-cost and quality of daycare centers - Rio de Janeiro municipality, 2001 -

Explanatory variables	Coefficient	P-value (%)	Coefficient	P-value (%)
Intercept	8,55	0	8,61	0
<hr style="border-top: 1px dashed black;"/>				
<i>Daycare size</i>				
Log daycare size	-0,34	0	-0,37	0
<i>Synthetic indicator of quality</i>	-	-	1,9	0
<i>Quality dimensions</i>				
Infrastructure	1,4	1	-	-
Health and sanitation	-0,5	27	-	-
Activities and program structure	0,4	21	-	-
Human resources	1,5	0	-	-
Parents and community relations	-0,4	6	-	-
<hr style="border-top: 1px dashed black;"/>				
Number of observations	109		109	
<hr style="border-top: 1px dashed black;"/>				
Adjusted R2	0,4785		0,325	

Source: Estimates produced based on the Survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: Dependent variable: Log of unitary cost.

**Impact of daycare quality centers on child development
- Rio de Janeiro municipality, 2001 -**

Dimension	Overall				Social				Physical				Mental			
	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers in:		P-value (%)	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		P-value (%)
		Months	Standard deviation			Months	Standard deviation			Months	Standard deviation			Months	Standard deviation	
Infrastructure	-3,74	-0,9	-0,13	36	15,71	3,8	0,38	1	9,76	2,4	0,33	2	4,92	1,2	0,12	39
Health and sanitation	-4,97	-1,7	-0,24	17	-8,11	-2,8	-0,28	11	-8,66	-3,0	-0,41	2	-8,55	-2,9	-0,30	9
Activities and program structure	5,86	2,5	0,35	3	7,60	3,2	0,32	4	-0,04	0,0	0,00	99	7,49	3,1	0,32	5
Human resources	4,78	1,7	0,24	6	-2,07	-0,7	-0,07	55	5,74	2,0	0,28	3	3,28	1,2	0,12	35
Parents and community relations	-0,37	-0,2	-0,03	84	-1,83	-0,9	-0,09	47	-1,29	-0,6	-0,09	50	-1,04	-0,5	-0,05	68

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parentes, household head years of schooling and per capita income.

Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

Relation between log-cost and quality of daycare centers - Rio de Janeiro municipality, 2001 -

Explanatory variables	Coefficient	P-value (%)	Coefficient	P-value (%)
Intercept	8,55	0	8,61	0
<hr style="border-top: 1px dashed black;"/>				
<i>Daycare size</i>				
Log daycare size	-0,34	0	-0,37	0
<i>Synthetic indicator of quality</i>	-	-	1,9	0
<i>Quality dimensions</i>				
Infrastructure	1,4	1	-	-
Health and sanitation	-0,5	27	-	-
Activities and program structure	0,4	21	-	-
Human resources	1,5	0	-	-
Parents and community relations	-0,4	6	-	-
<hr style="border-top: 1px dashed black;"/>				
Number of observations	109		109	
<hr style="border-top: 1px dashed black;"/>				
Adjusted R2	0,4785		0,325	

Source: Estimates produced based on the Survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: Dependent variable: Log of unitary cost.

Impact of daycare quality centers on child development - Rio de Janeiro municipality, 2001 -

Dimension	Overall				Social				Physical				Mental			
	Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers in:			Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers			Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers			Regression coefficient	Impact of attending high quality as opposed to low quality daycare centers		
		P-value (%)	Months	Standard deviation		P-value (%)	Months	Standard deviation		P-value (%)	Months	Standard deviation		P-value (%)	Months	Standard deviation
Building	-5,12	-1,7	-0,24	8	-2,38	-0,8	-0,08	57	1,59	0,5	0,07	61	-0,33	-0,1	-0,01	94
Safety and health	5,89	2,0	0,29	2	8,53	2,9	0,30	2	3,07	1,1	0,15	26	2,63	0,9	0,09	47
Furniture and equipment	-6,31	-2,7	-0,38	3	2,56	1,1	0,11	52	0,67	0,3	0,04	82	-2,14	-0,9	-0,09	59
Space	4,38	0,8	0,11	33	5,61	1,0	0,10	38	0,60	0,1	0,01	90	10,79	1,9	0,20	9
Cleaning	0,62	0,2	0,03	85	3,91	1,4	0,14	40	0,39	0,1	0,02	91	-8,71	-3,2	-0,32	6
Personal care	-1,54	-0,6	-0,08	64	-6,19	-2,2	-0,22	18	-3,71	-1,3	-0,18	28	6,92	2,5	0,25	13
Health and safety practices	-3,59	-1,5	-0,21	23	-3,57	-1,5	-0,15	40	-2,59	-1,1	-0,15	41	-6,01	-2,5	-0,26	15
Communication and comprehension practices	4,83	2,6	0,36	3	5,45	2,9	0,29	8	1,00	0,5	0,07	67	6,64	3,5	0,36	3
Psychomotor practices	0,17	0,1	0,01	93	4,23	2,5	0,25	10	2,04	1,2	0,16	28	0,03	0,0	0,00	99
Creative practices	5,24	2,1	0,29	8	6,14	2,4	0,24	14	5,59	2,2	0,30	7	-1,98	-0,8	-0,08	63
Social development	-5,48	-3,0	-0,42	2	-4,36	-2,4	-0,24	19	-2,60	-1,4	-0,19	29	-3,22	-1,8	-0,18	33
Program structure	7,24	3,4	0,48	0	-1,79	-0,8	-0,08	62	-4,88	-2,3	-0,31	7	7,03	3,3	0,33	5
Educator's needs	1,12	0,5	0,07	58	-0,14	-0,1	-0,01	96	6,70	3,1	0,43	0	-1,19	-0,6	-0,06	68
Human resources	4,82	1,6	0,23	6	-1,55	-0,5	-0,05	67	-1,87	-0,6	-0,09	49	7,50	2,5	0,25	4
Family and community relations	-1,88	-0,9	-0,13	34	-3,68	-1,8	-0,18	18	-3,02	-1,5	-0,20	14	-0,64	-0,3	-0,03	82

Source: Estimates based on the survey "Evaluation of Daycare Services in the Municipality of Rio de Janeiro, 2001".

Note 1: The model includes controls for child age, gender and race, presence of parentes, household head years of schooling and per capita income.

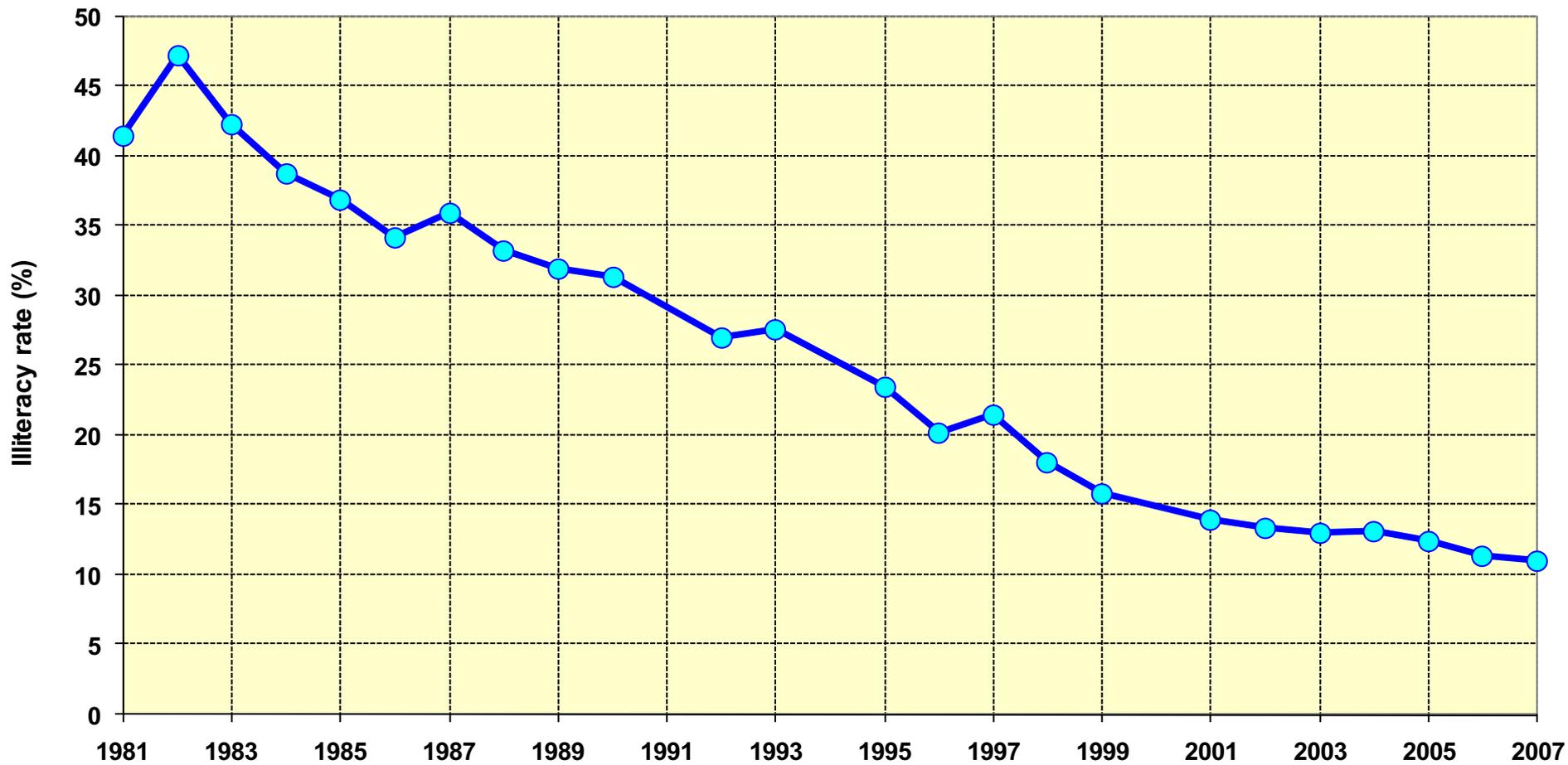
Note 2: Sample size: 752 children.

Note 3: R2 range from 0.64 to 0.66.

I. Seven Dilemmas

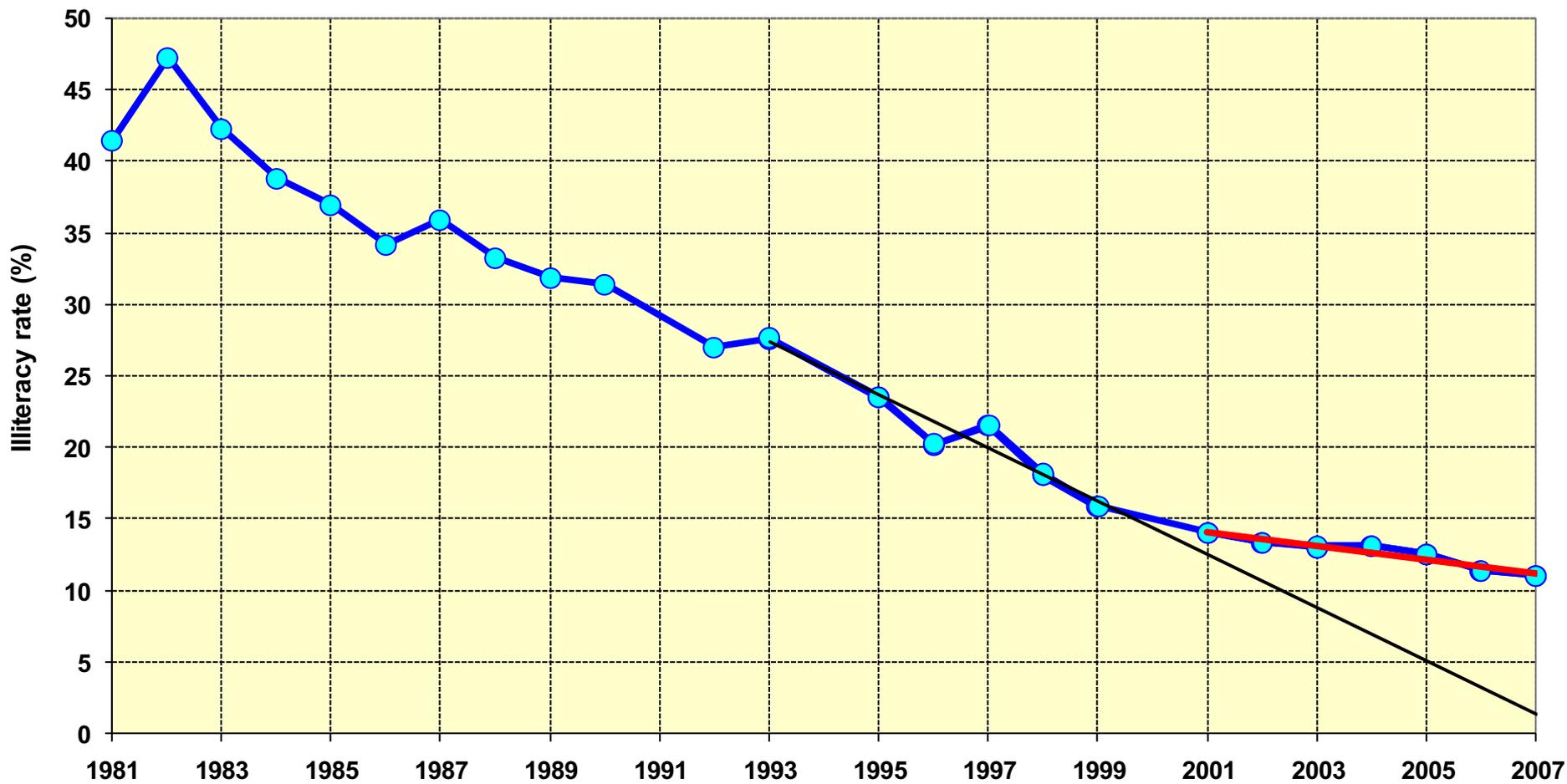
1. The importance of care *versus* the importance of public provided care.
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. Impact on child development *versus* the impact on parents welfare?
4. The need for a minimum level of quality.
5. ***The cost-benefit ratio relative to other educational levels.***
6. Availability of resources and the long run impact.
7. Is there strong complementarities with other social programs?

Evolution of illiteracy rate among children 8 to 9 years old



Fonte: Estimativas produzidas com base na Pesquisa Nacional por Amostra de Domicílios (PNAD), de 1981 a 2007.

Evolution of illiteracy rate among children 8 to 9 years old



Fonte: Estimativas produzidas com base na Pesquisa Nacional por Amostra de Domicílios (PNAD), de 1981 a 2007.

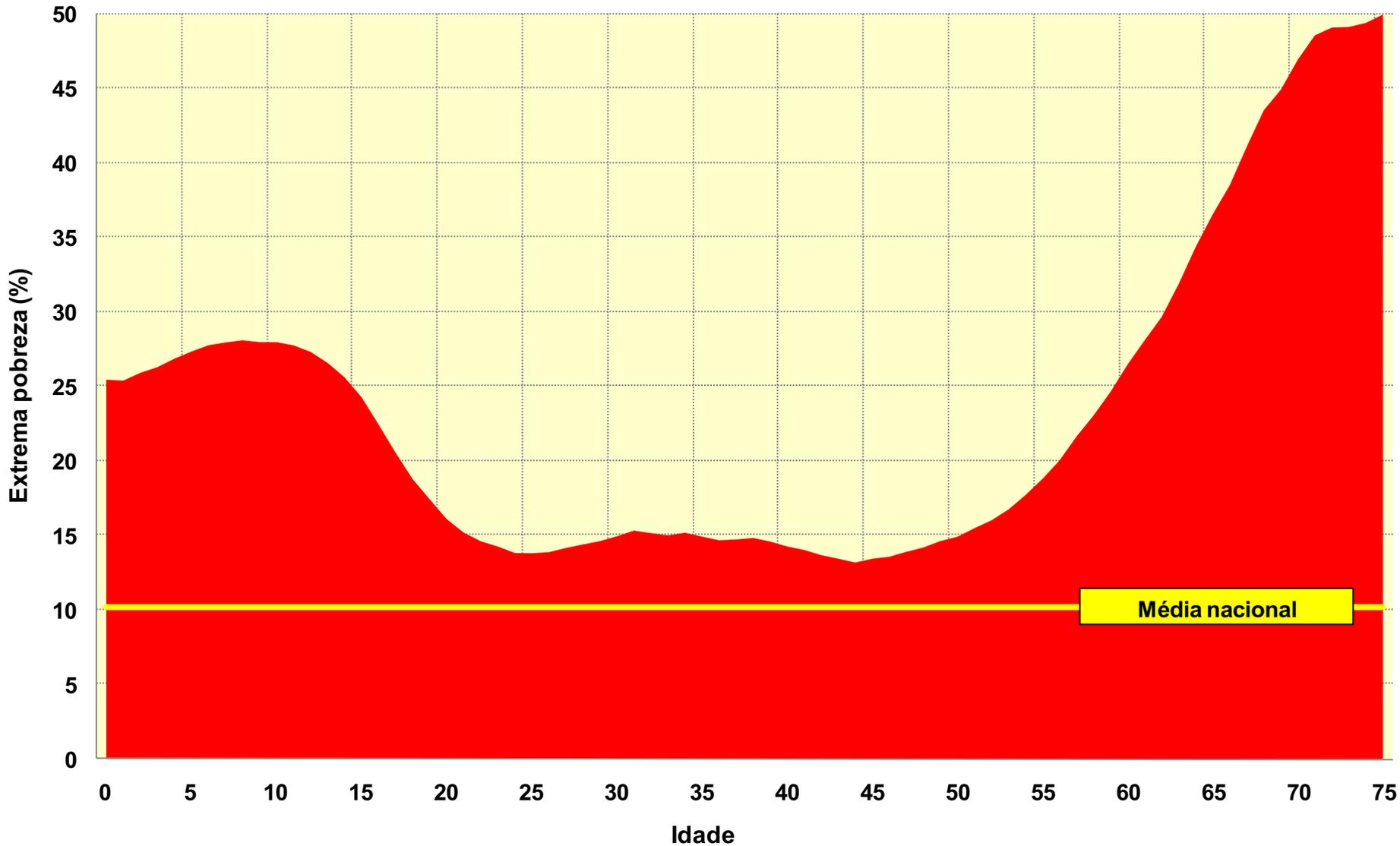
I. Seven Dilemmas

1. The importance of care *versus* the importance of public provided care.
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. Impact on child development *versus* the impact on parents welfare?
4. The need for a minimum level of quality.
5. The cost-benefit ratio relative to other educational levels.
6. ***Availability of resources and the long run impact.***
7. Is there strong complementarities with other social programs?

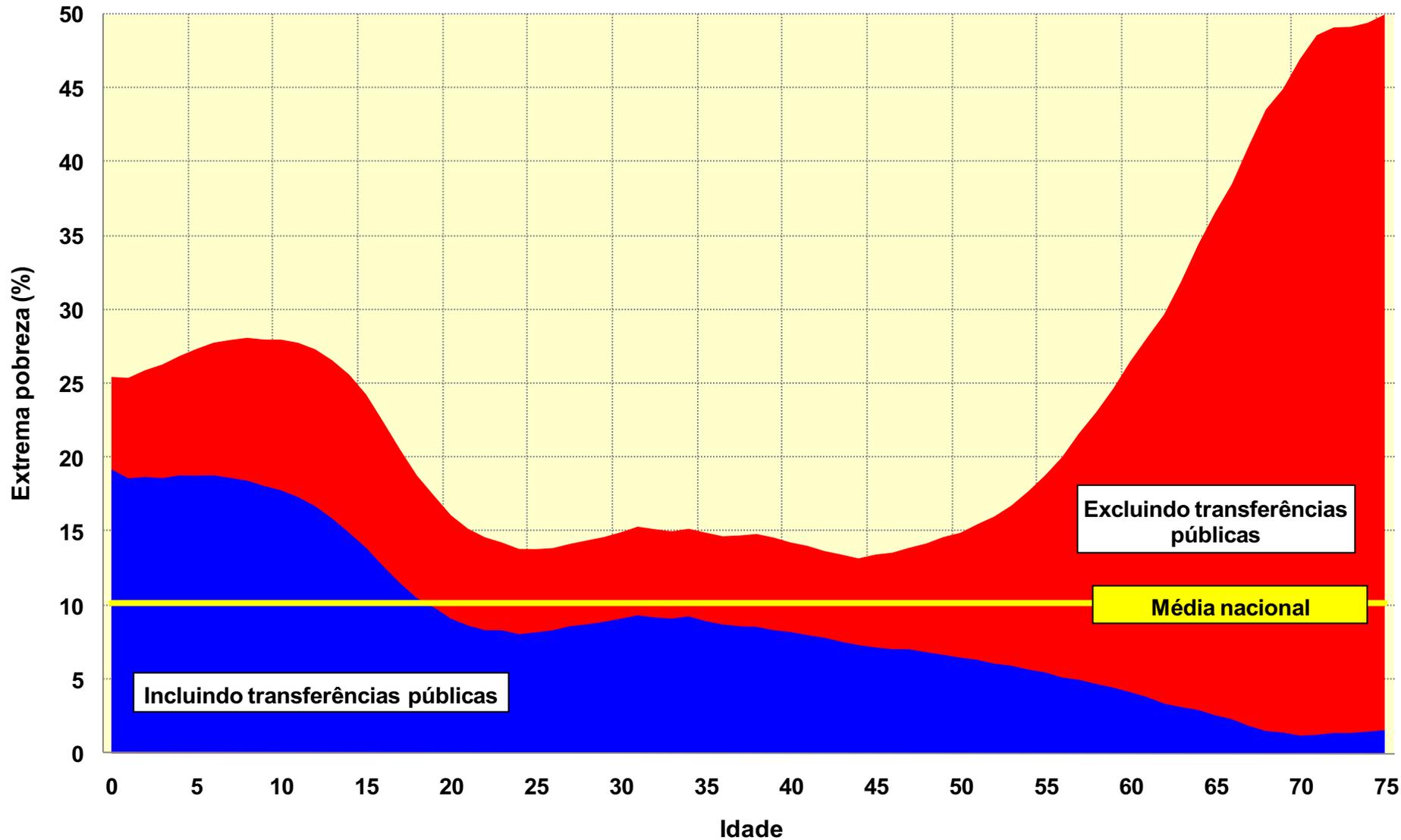
I. Seven Dilemmas

1. The importance of care *versus* the importance of public provided care.
2. Substitutes *versus* complements? Day care center *versus* its alternatives (PIM).
3. Impact on child development *versus* the impact on parents welfare?
4. The need for a minimum level of quality.
5. The cost-benefit ratio relative to other educational levels.
6. Availability of resources and the long run impact.
7. ***Is there strong complementarities with other social programs?***

Extrema pobreza por idade: Brasil, 2007



Extrema pobreza por idade: Brasil, 2007



Extrema pobreza durante o ciclo da vida: Brasil, 2007

