
Research, Development and Innovation in Health: Problems Regarding the Developing World

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Global Expenditures in Health Research

Based on Global Forum projections between 1998 - 2003 and taking into account the observed mean increase (~ 8% per year), we figure the total amount of expenditures for 2008 in,

US\$ 185 billion

Publications and health R&D expenditures. The world assimetry.

Wealthy countries

Papers – 90,4% (1992 -2001)

R&D expenditures – 97% (2003)

Other countries

Papers – 9,6%

R&D expenditures – 3,3%

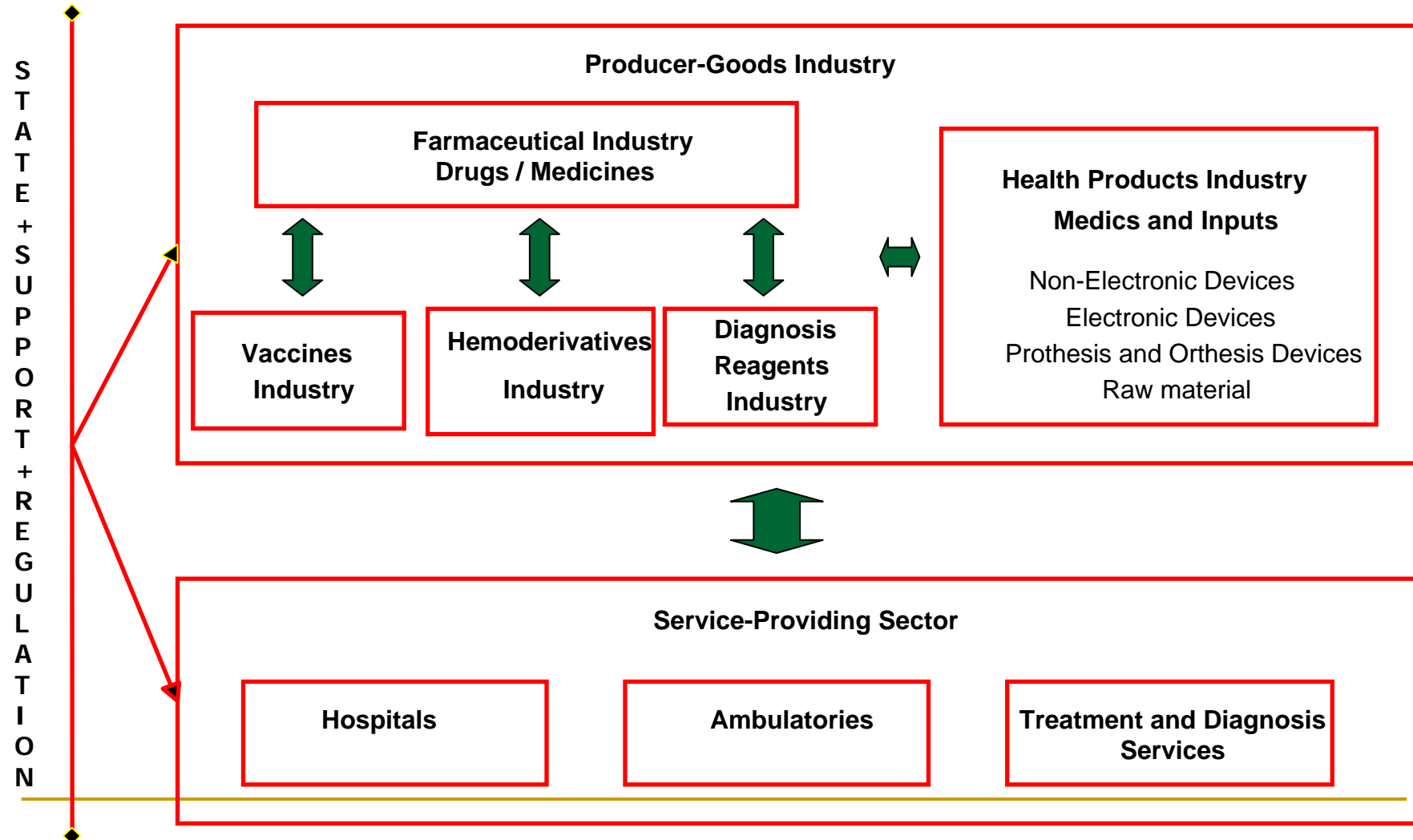
The main characteristic in the North-South relations in the field of health research is an enormous asymmetry in terms of research capacity, critical mass and financial resources.

Health Innovation and Research in Developing Countries – Four essential challenges

- Health as a social policy and health as a development tool
 - Health research and health policy.
 - Industrial policy and governmental purchases.
 - Intellectual property, health research and innovation policy.
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Health Industrial Complex

Morphology



Source: Gadelha, 2003


Basic Information regarding the Health Productive Chain in Brazil

- ~ US\$ 100 billion (~ 8% of 2007 GDP)
 - Employs circa 10% of the population (~19 million people).
 - 77.000 health facilities
 - Pharma Market of ~ R\$ 25 billion (~US\$ 15 billion).
 - Market for Health-related Devices ~ R\$ 8 billion.
 - Market for vaccines, diagnostics and hemoderivatives ~ R\$ 3 billion.
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Basic Information regarding the Health Productive Chain in Brazil - 2

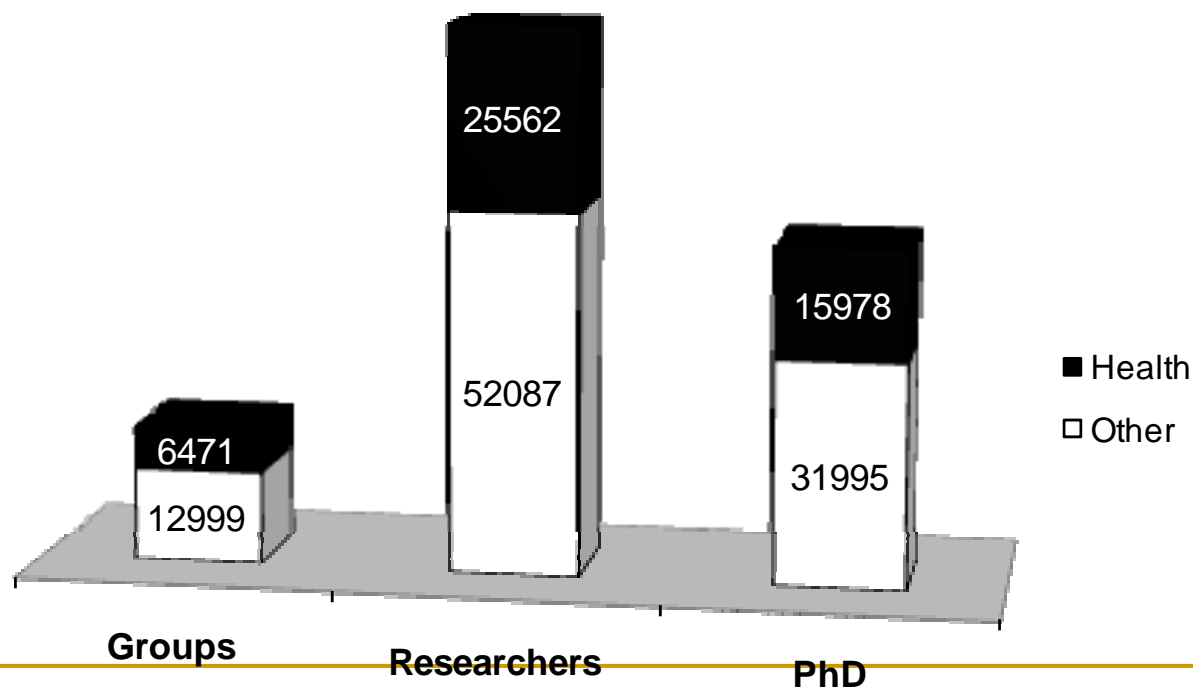
- 2,3 billion ambulatory procedures.
 - 11,3 million hospitalizations
 - > 90% of high-complexity procedures (complex surgeries, radio- and chemotherapy, etc.)
 - 27.000 teams of the Programme for Family Health - PSF (92% of the counties)
 - National Immunization Programme – PNI: 130 million annual dosis.
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Expenditures in Health Research by Sources Brazil, 2000-2002 (US\$)

SOURCES	2000-2002	Annual Mean	%
<i>FEDERAL GOVERNMENT</i>	680.449.513	226.816.504	39,6
Ministry of Health	97.907.787	32.635.929	5,7
Ministry of Science & Technology	153.165.909	51.055.303	8,9
Ministry of Education	429.375.817	143.125.272	25,0
<i>STATE GOVERNMENTS</i>	571.479.120	190.493.040	33,2
State Education and S&T Secretaries	412.450.191	137.483.397	24,0
State Research Support Agencies	159.028.929	53.009.643	9,2
<i>PUBLIC SECTOR</i>	1.251.928.633	417.309.544	72,8
<i>PRIVATE SECTOR</i>	406.928.244	135.642.748	23,7
<i>INTERNATIONAL ORGANIZATIONS</i>	60.468.724	20.156.241 	3,5
<i>TOTAL</i>	1.719.325.601	573.108.534	100,0

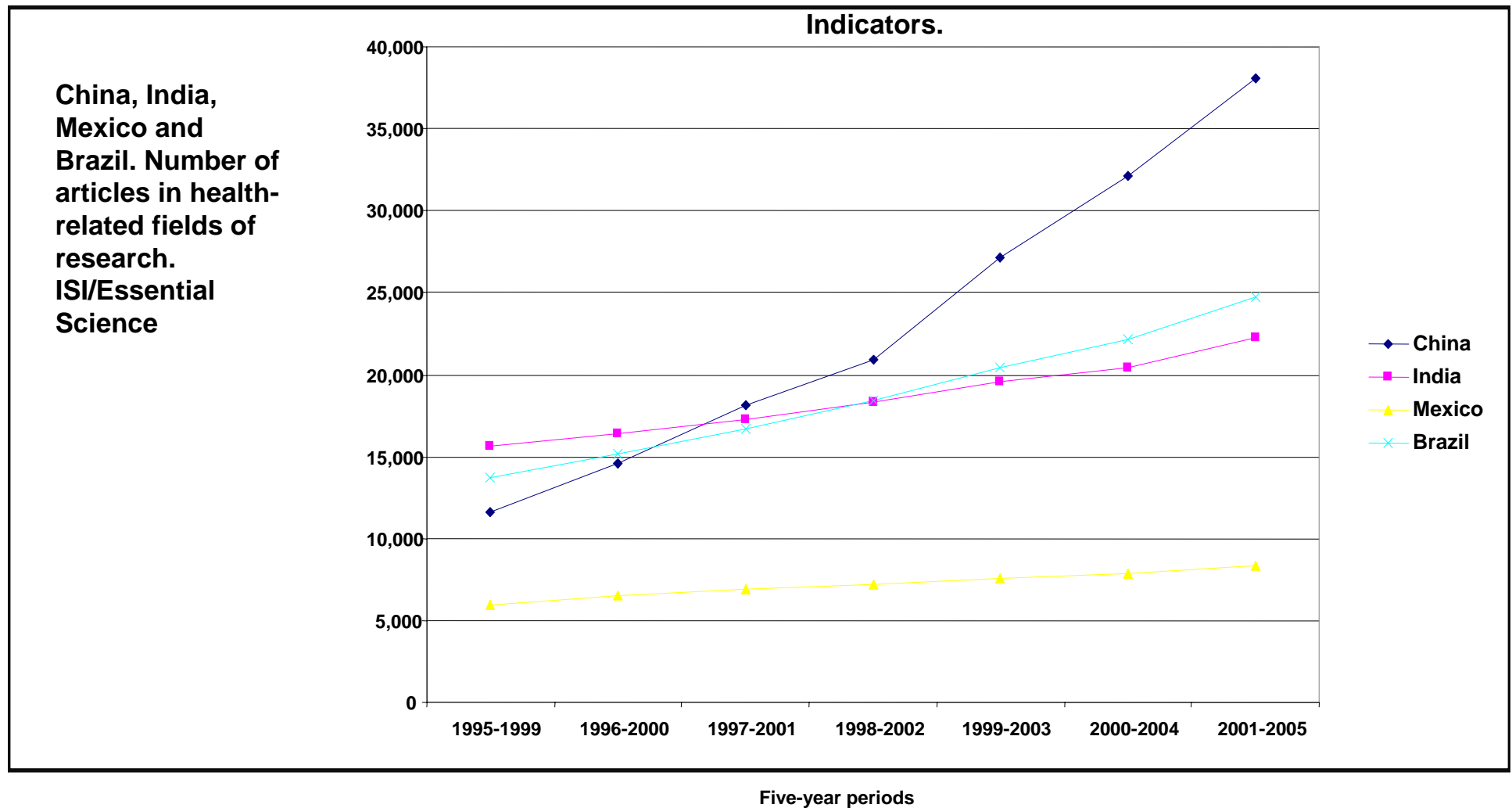
A General Overview of Health Research in Brazil. Universities and Research Institutes (2004)

**The National Effort in Health Research. Groups and
Researchers with and without Health
Activities. Brazil, 2004**

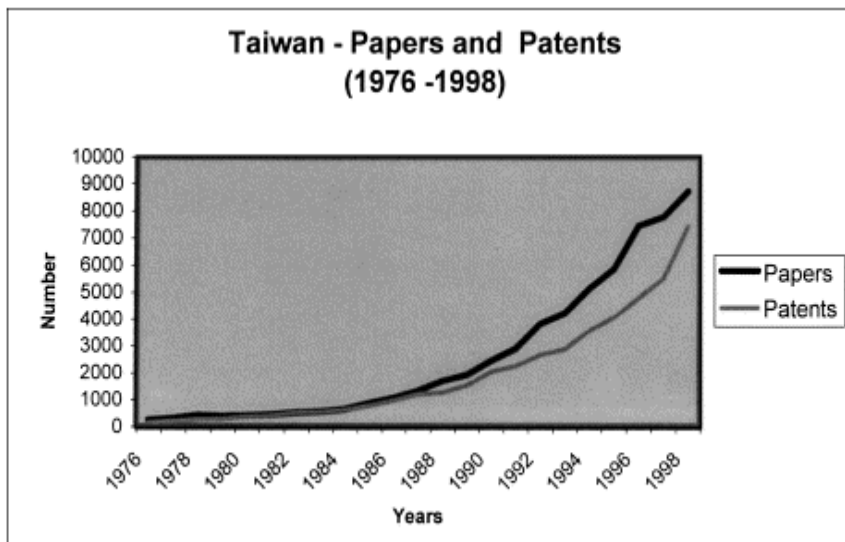


Source: CNPq - Directory
of Research Groups in
Brazil <www.cnpq.br>

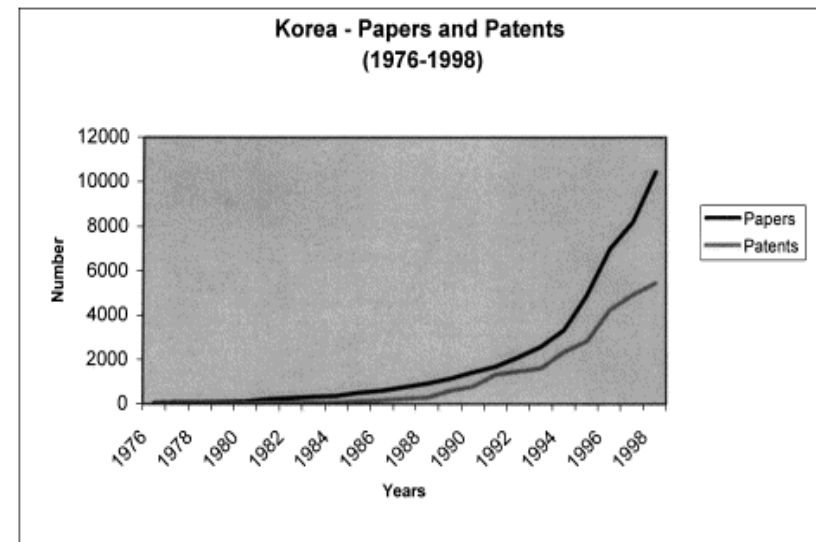
Increased number of health-related scientific articles published in four countries (1995-2005)



The Industrial Bottleneck: Evolution of S&T Production: Taiwan and Korea



SOURCE: ISI and USPTO (Rapini, 2000)

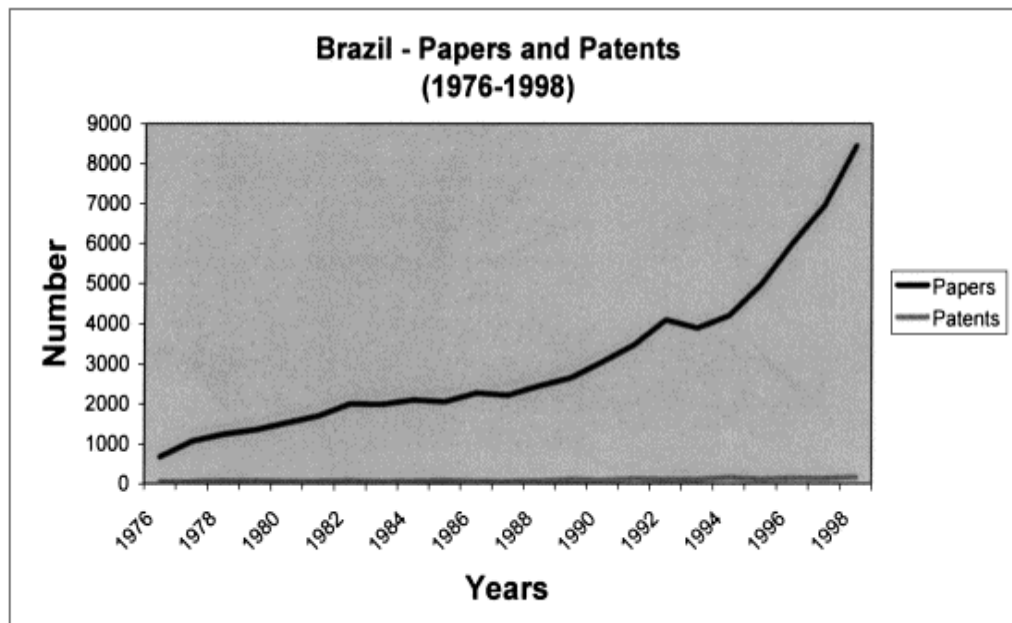


SOURCE: ISI and USPTO (Rapini, 2000)

Source: Rapini, M.S. (2000) Uma investigação sobre a relação de Granger-causalidade entre ciência e tecnologia para países em catching-up e para o Brasil. *Monografia de Graduação*. FACE/UFMG, Belo Horizonte.

Cited in: A. T. Bernardes and E. D. Albuquerque. Cross-over, thresholds, and interactions, between science and technology: lessons for less-developed countries. *Research Policy* 32 (5):865-885, 2003.

The Industrial Bottleneck: Evolution of S&T Production: Brazil



SOURCE: ISI and USPTO (Rapini, 2000)

South Korea and Taiwan

- S&T evolved in parallel

Brazil

- Little correlation between the increase in S&T

Source: Rapini, M.S. (2000) Uma investigação sobre a relação de Granger-causalidade entre ciência e tecnologia para países em catching-up e para o Brasil. *Monografia de Graduação*. FACE/UFMG, Belo Horizonte.

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Trade Balance in the Health Industry Complex by Sector - 2006

Figures in US Dollars - Current FOB

SECTORS	TOTAL		
	Exports	Imports	Balance
Devices/Materials	358.906.969,00	1.265.277.397,00	(906.370.428,00)
Non-Electronic Devices	1.259.775,00	23.889.137,00	(22.629.362,00)
Electronic Devices	144.457.896,00	724.791.860,00	(580.333.964,00)
Prothesis/Orthesis	11.604.458,00	96.015.597,00	(84.411.139,00)
[Mat. Consumo]	201.584.840,00	420.580.803,00	(218.995.963,00)
Vaccines	8.122.229,00	160.611.372,00	(152.489.143,00)
Diagnosis reagents	5.368.476,00	145.073.773,00	(139.705.297,00)
Hemoderivatives	2.908.094,00	431.686.456,00	(428.778.362,00)
Medicines	435.085.514,00	1.742.431.056,00	(1.307.345.542,00)
Drugs	271.531.226,00	1.267.839.088,00	(996.307.862,00)
Other Products*	2.971.034,00	59.565.010,00	(56.593.976,00)
TOTAL	1.084.893.542,00	5.072.484.152,00	(3.987.590.610,00)

Source: Gadelha (2008), based on a survey conducted in the Alice Network (SECEX/MDIC)

* Sera and Toxines

Main Farmaceutical Firms in Brazil – 2006: Increase in Domestic Participation

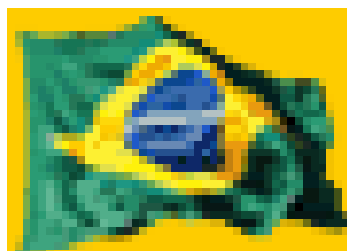
Ranking	Firm	Market-share	Origin of the capital
1	ACHE	6,94	National
2	SANOFI-AVENTIS	6,81	Foreign
3	EMS SIGMA PHARMA	5,10	National
4	PFIZER	4,97	Foreign
5	NOVARTIS	4,77	Foreign
6	MEDLEY	3,70	National
7	BOEHRINGER ING	2,94	Foreign
8	SCHERING PLOUGH	2,91	Foreign
9	EUROFARMA	2,77	National
10	SCHERING DO BRASIL	2,74	Foreign
	Total	43,65	

Health Innovation and Research in Developing Countries – Four Essential Aspects

- Health as a social policy and health as a development tool
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PETROBRAS



Defesa

Ministério da Defesa

Saúde

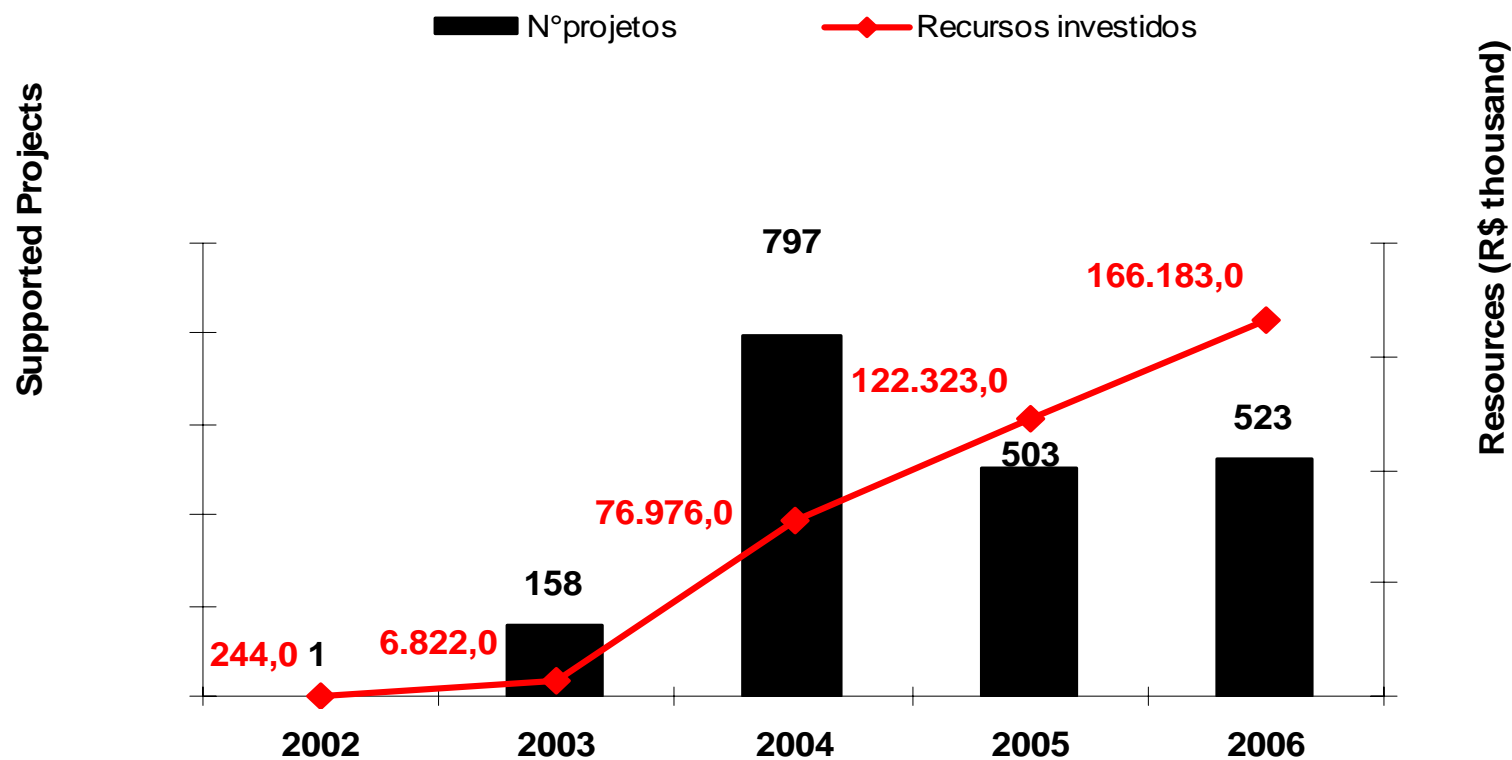
Ministério da Saúde

2003 - 2006

- **Establishment of the Secretariat of Science, Technology and Strategic Inputs and its three Departments**

Financial Support for Health Research

Increase in the number of research proposals supported and financial resources invested. DECIT/Ministry of Health. Brazil 2002-2006



Challenges for 2007-2010

Guidelines

1. To reduce the vulnerability of the Brazilian social policy through the strengthening of the Health Industrial Complex (HIC) and Innovation by means of the linkage between the objectives of SUS and the necessary transformation of the national productive and innovative structure.
2. Based on the strengthening of the innovative capacity, to increase competition between public and private firms of the HIC, building capacity to face global competition and promoting a vigorous process of imports substitution of health products and inputs of greater knowledge density which may be of priority need for the health of the Brazilian people.

Programa

MAIS SAÚDE

DIREITO DE TODOS



The challenges for 2007-2010

Research and development in universities and research institutes

- **Clinical research (financial support and regulation – CEPs/CONEP) and Health Technology Appraisal (CITEC and technological incorporation)**
 - **Knowledge management (evidences for stakeholders and health professionals)**
 - **Research for SUS (tighter federative pact).**
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The challenges for 2007-2010

Financial support for innovation and the strengthening the productive capacity in firms of the Health Industrial Complex

- **Actions towards the public productive sector (medicines, vaccines, diagnosis kits and hemoderivatives).**
 - **Actions towards the private sector (farmochemicals, medicines, medical and diagnostic devices).**
 - **The use of the purchasing power of the Ministry of Health as a technological policy tool for the promotion of innovation and the strengthening of SUS**
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Challenges for the Use of the Public Purchasing Power in Developing Countries

- ✓ The lack of legislation supportive to the use of the State purchasing power as an industrial policy tool
- ✓ The exclusive focus on the principles of economicity, competitiveness, isonomy and efficiency of public purchases which impede/restricts the use of the purchasing power as a policy for financial support.
- ✓ The lack of capacity amongst public agents to use the purchasing power as a development tool (lack of professional bureaucracy and lack of a directed capacity-building process)
- ✓ The costs and the bureaucratic complexities of procurement procedures, which do not allow the use of the necessary flexibilities for the full use of purchasing power.

Challenges for the Use of the Public Purchasing Power in Developing Countries – 2

- Tax inequalities increasing the price of the domestic production.
 - Lack of market guarantees for strategic products.
 - Sanitary regulations that provide privilege to imported products.
 - Political impediments for the full application of the TRIPS Agreement safeguards.
 - Intellectual property policies that benefit developed countries (TRIPS Plus discussions).
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Proposal of a Global Strategy and Plan of Action for IP, Innovation and Public Health

- Resolution WHA60.30: landmark
 - Creation and effective implementation of the Inter-Governmental Working Group (IGWG) on Public Health, Innovation and Intellectual Property
 - Technical and financial support to regional meetings aimed at defining specific priorities
 - Proposes the negotiation of a Global Strategy and a Plan of Action to set up a framework for needs-driven essential health research and development
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Proposal of a Global Strategy and Plan of Action for IP, Innovation and Public Health

■ Main elements

- Support the creation of national systems of health research and the establishment of national health R&D priorities
 - Development of innovative capacities in developing countries
 - Support to technology transfers
 - Recommendations on the support to innovation and on better access to health products and services in developing countries
 - Likelihood of R&D incentive funds and mechanisms
 - Stronger WHO role in negotiations over intellectual property and access to health products and services
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Proposal of a Global Strategy and Plan of Action for IP, Innovation and Public Health

- Brazilian position
 - Strengthen national health R&D systems
 - Support capacity-building for R&D and technology incorporation
 - Foster the creation of other mechanisms to promote R&D
 - Promote the establishment of global funds to support needs-driven health R&D in developing countries
 - Strengthen the WHO role over issues concerning IPR and Public Health
 - Support the establishment of national systems for delivery and access to health products and services
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The End

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