E-HEALTH IN LATIN AMERICA AND THE CARIBBEAN: CHALLENGES AND OPPORTUNITIES

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E-HEALTH PERSPECTIVES IN LATIN AMERICA AND THE CARIBBEAN

- DRIVING FORCES AND BARRIERS
- HEALTH SECTOR CHARACTERISTICS
- ICT INFRASTRUCTURE AND MARKET
- IMPLEMENTATION ISSUES

- **DRIVING FORCES AND BARRIERS**
- HEALTH SECTOR CHARACTERISTICS
- ICT INFRASTRUCTURE AND MARKET
- IMPLEMENTATION ISSUES

HEALTH SECTOR TREND-SETTERS IN LAC (1)

SATISFACTION, QUALITY, AND EFFICIENCY

- *DISSATISFACTION WITH HEALTHCARE SYSTEM* (CHOICE, ACCESS, QUALITY, CONTINUITY, LONG-TERM PROVIDER RELATIONSHIP)
- *INCREASING DEMAND* (DEMOCRATIZATION PROCESSES)
- *ANTICIPATION OF NEEDS*, DEMAND FOR *CUSTOMER SERVICE*, *"MADE TO MEASURE" CARE*, AND *CONVENIENCE*
- *EFFICIENCY OF ADMINISTRATIVE PROCESSES* (ELIGIBILITY,CLAIMS, REIMBURSEMENT, PROCUREMENT AND SUPPLY MANAGEMENT)
- *LOGISTICS OF HEALTHCARE / COOPERATION IS A PRIORITY* (DYNAMIC SCHEDULING, DATA COMMUNICATION)

HEALTH SECTOR TREND-SETTERS IN LAC (2)

INCREASING DATA REQUIREMENTS OF HEALTH PRACTICE

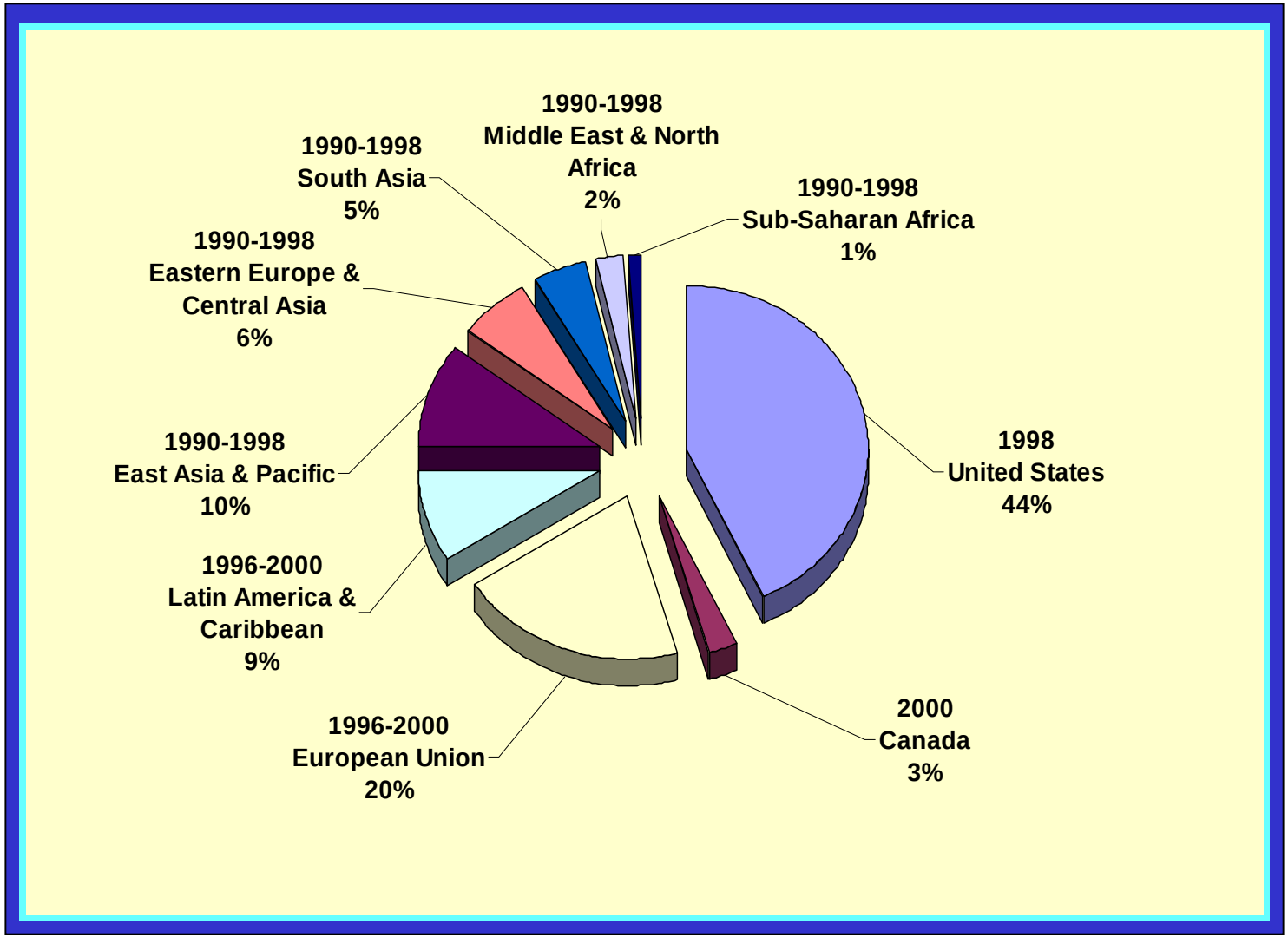
- **NEED FOR *DETAILED DATA AND INFORMATION* (DISTRIBUTED MULTIDISCIPLINARY PRACTICE, IMPROVED DOCUMENTATION, ERROR REDUCTION, ACCOUNTABILITY, AND TRANSPARENCY)**
- ***RETRIEVAL OF STRUCTURED AND UNSTRUCTURED HEALTH DATA***
- ***ACCESS TO BIOMEDICAL KNOWLEDGE* (REFERENCE, PROTOCOLS OF CARE, REGISTRIES, KNOWLEDGE BASES, EVIDENCE-BASED PRACTICE, CONSUMER PARTICIPATION)**
- ***INTERNET-BASED APPLICATIONS* (INFORMATION DISSEMINATION, DISTANT EDUCATION, EHR, REMOTE CARE)**

HEALTH SECTOR TREND-SETTERS IN LAC (3)

COST RECOVERY AND CONTAINMENT

- *HEALTH IS ONE OF THE LARGEST SECTORS OF THE ECONOMY*
- *LIMITED NUMBER OF CONDITIONS* ACCOUNT FOR MOST HEALTHCARE EXPENDITURES
- IN HIGH INCOME AND MIDDLE INCOME COUNTRIES *40%* OF THE POPULATION HAVE ONE OR MORE *CHRONIC CONDITIONS*
- *CHRONIC CONDITIONS* ACCOUNT FOR MORE THAN *2/3 OF HEALTH CARE EXPENDITURES*
- HEALTH PROBLEMS ARE *MAJOR IMPEDIMENT TO SOCIAL AND ECONOMIC DEVELOPMENT*
- URGENCY TO CONTAIN HEALTHCARE *COSTS*

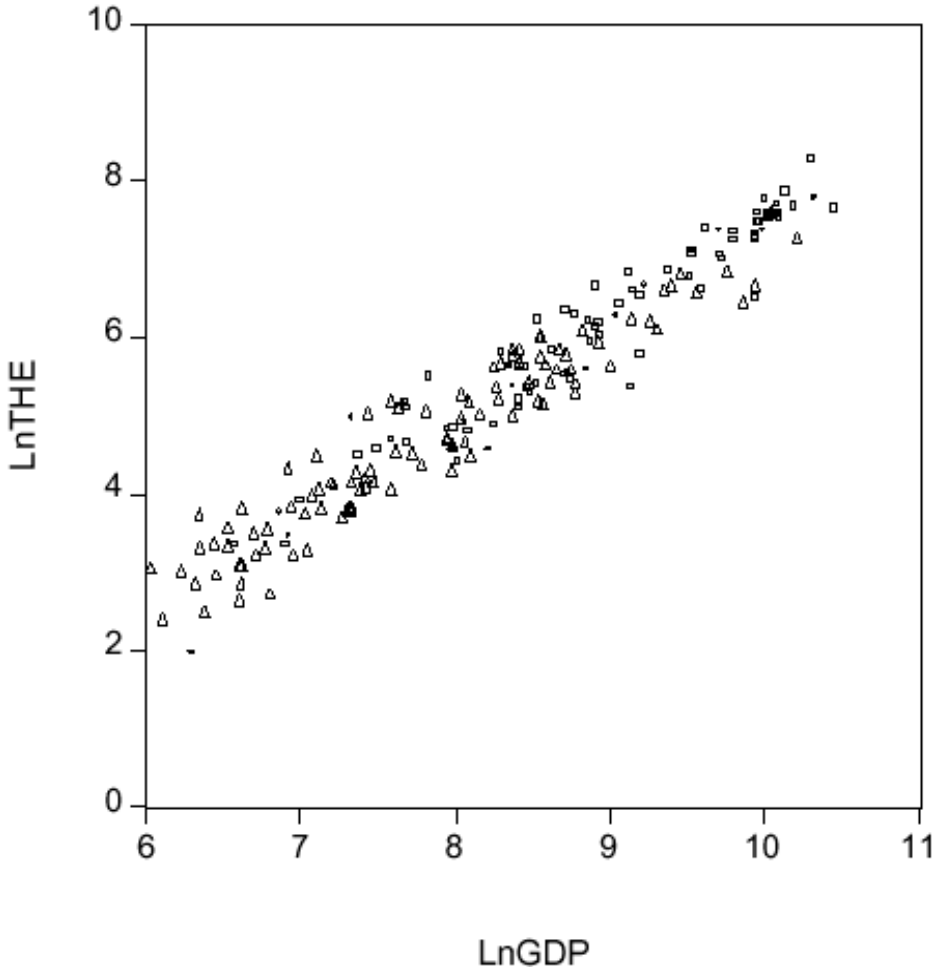
THE GLOBAL MARKET FOR HEALTH GOODS AND SERVICES (1)



Source: Casas, JA Trade in Health Services in the Americas: Trends and Opportunities, PAHO/WHO, 2001

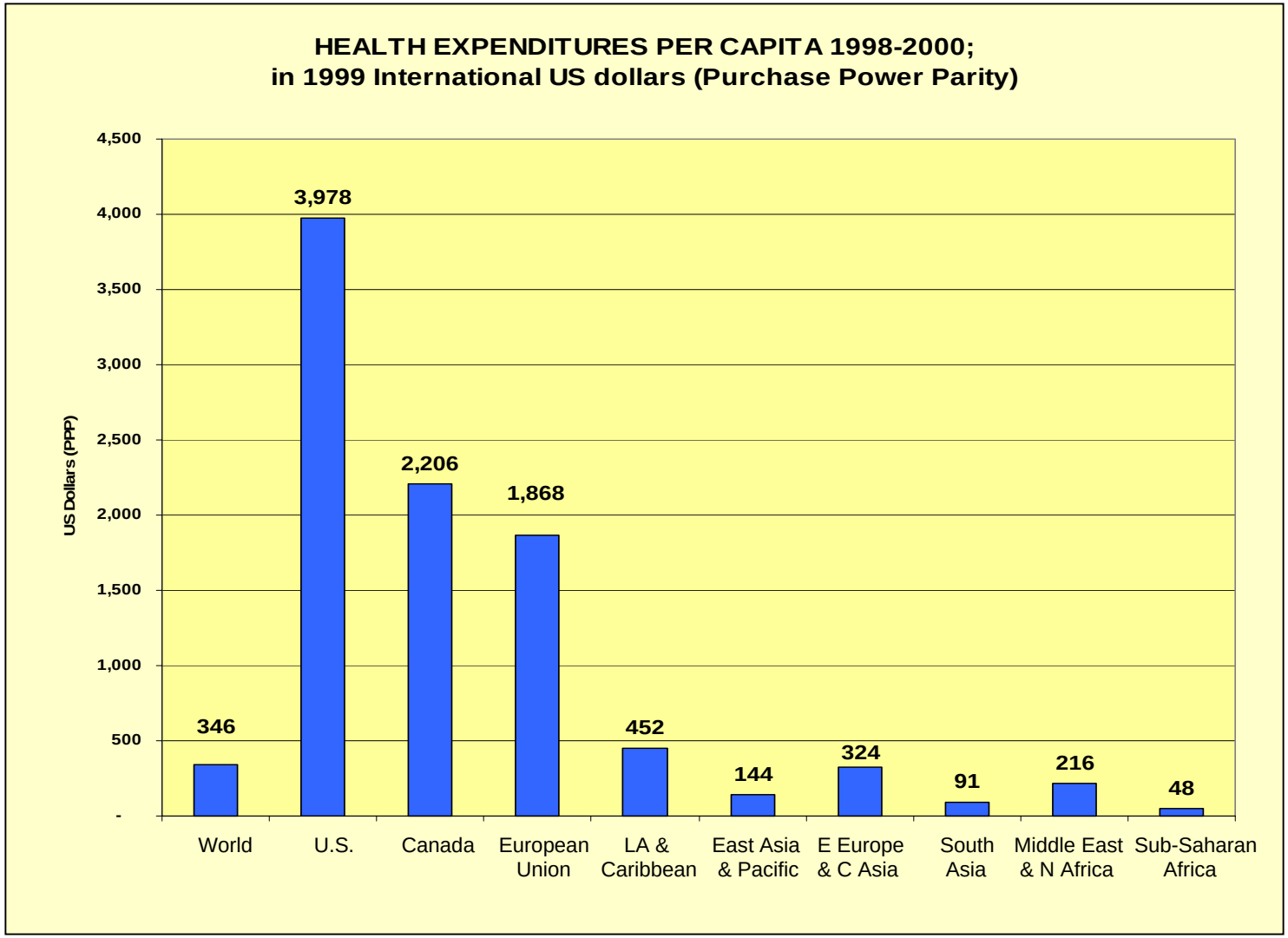
THE GLOBAL MARKET FOR HEALTH GOODS AND SERVICES (2)

Total Health Expenditure x GDP Per Capita (191 Countries)



***Source*: Casas, JA Trade in Health Services in the Americas: Trends and Opportunities, PAHO/WHO, 2001**

THE GLOBAL MARKET FOR HEALTH GOODS AND SERVICES (3)



***Source*: Casas, JA Trade in Health Services in the Americas: Trends and Opportunities, PAHO/WHO, 2001**

THE CHANGING PRACTICE ENVIRONMENT

Current Approach

- Care based on visits
- Professional autonomy
- Professionals control care
- Provider “owns” records
- Decision based on experience
- Safety is individual issue
- Privacy is individual issue
- No transparency of operations
- The system reacts to needs
- Cost not controlled
- Independent providers

New Model

- Continuous relationships
- Customized patient care
- Patient is source of control
- Information flows freely
- Evidence-based decisions
- Safety is a system property
- Privacy is a system property
- Transparency is necessary
- Needs are anticipated
- Control costs
- Cooperation is required

THE “CONNECTED CONSUMER”

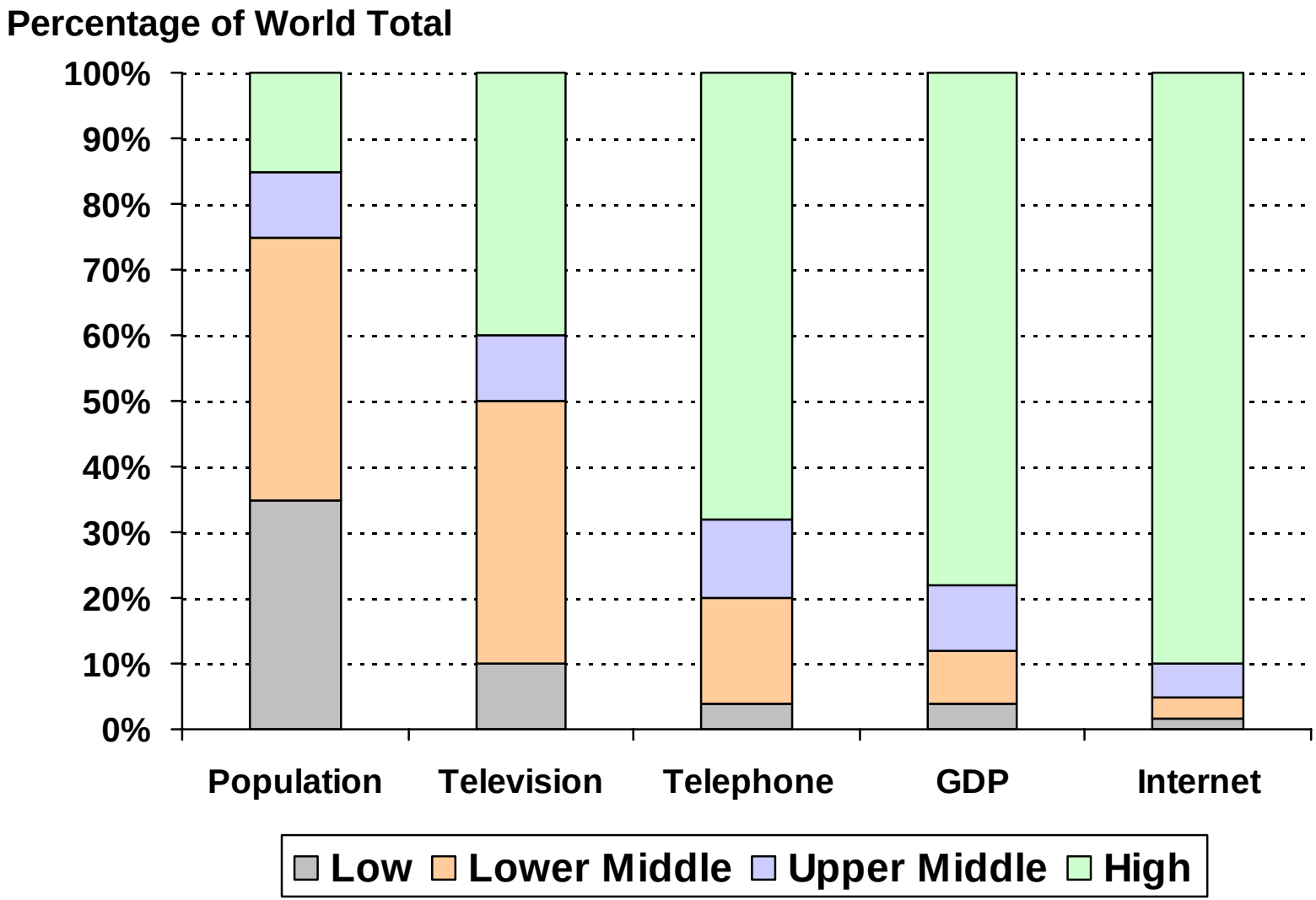
- WELLNESS AND MEDICAL INFORMATION
- SHOPPING FOR PROVIDERS AND SERVICES
- RISK ASSESSMENT TESTING
- BUYING PHARMACEUTICALS AND HEALTH PRODUCTS
- COMMUNICATION WITH SPECIAL INTEREST GROUPS
- E-MAILING TO PROVIDERS AND INSURERS

TECHNOLOGY BARRIERS (1)

INFORMATION TECHNOLOGY INFRASTRUCTURE

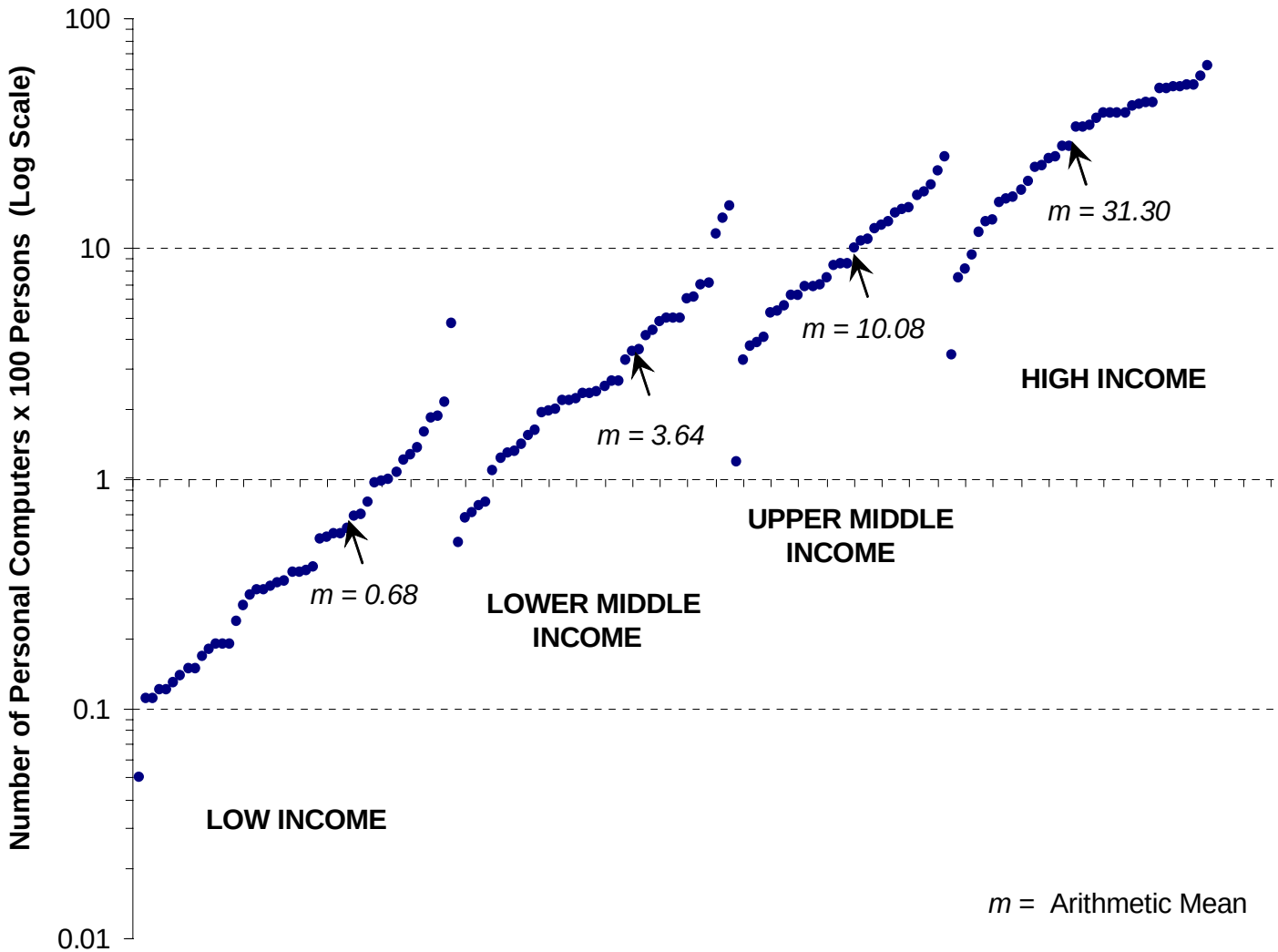
- *TECHNICAL RESOURCES AND WEB DEMOGRAPHICS*
- DATA AND COMMUNICATION *STANDARDS*
- TECHNOLOGICAL INNOVATION X ACTUAL *USE GAP*
- *OPEN x PROPRIETARY* ARCHITECTURE
- *COST-BENEFIT JUSTIFICATION*

THE DEVELOPMENT / ANALOG / DIGITAL DIVIDES BY INCOME



Source: Digital Opportunities Taskforce (DOT Force), 2000

Ownership of Personal Computers in 155 Countries Categorized by Level of Income (Data from: International Telecommunication Union, World Telecom Indicators 2002)



THE RESEARCH & DEVELOPMENT DIVIDE BY REGION

SELECTED TECHNOLOGY INPUTS BY REGION (1992-1997)

Region	R&D as % of GDP	Technicians per 10^6 pop	Scientists per 10^6 pop	GPD per capita
OECD	1.8	1,326.1	2,649.1	20,113.5
Eastern Europe & FSR	0.9	577.2	1,841.3	4,027.4
East Asia	0.8	235.8	1,026.0	6,270.6
Latin America & Caribbean	0.5	205.4	656.6	5,635.8
Middle East	0.4	177.8	521.0	8,941.5
Sub-Saharan Africa	0.2	76.1	324.3	1,971.5
South Asia	0.8	59.5	161.0	1,764.3

Source: **Rodríguez F and Wilson E (InfoDev , World Bank 2000) modified**

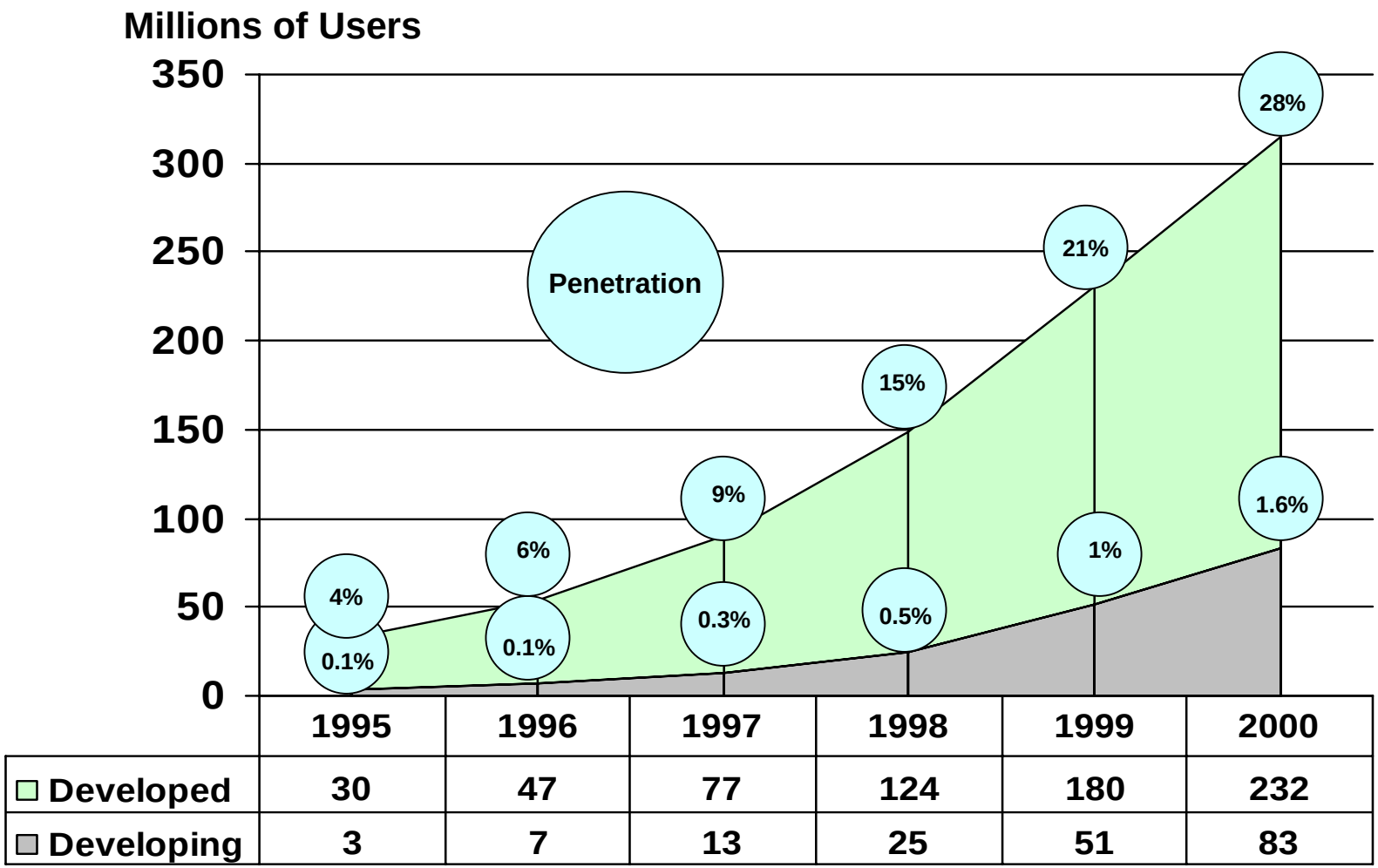
NATIONAL INVESTMENT CAPACITY IS A MAJOR PROBLEM

Expenditure on Information and Communication Technologies in Selected Countries

Country	ICT Expenditure Per Capita in US$ (2000)	ICT Expenditure as % of GDP (2000)	Country	ICT Expenditure Per Capita in US$ (2000)	ICT Expenditure as % of GDP (2000)
Argentina	317	4.1	Hungary	431	8.7
Australia	1,992	9.7	Italy	1,068	5.7
Austria	1,697	7.2	Japan	3,118	8.3
Belgium	1,769	8.0	Mexico	189	3.2
Brazil	289	8.4	Norway	2,445	6.9
Canada	1,911	8.4	Russia	63	3.7
Chile	360	7.8	Singapore	2,104	9.7
China	46	5.4	Spain	731	5.1
Colombia	228	12.0	Sweden	2,674	10.4
Finland	1,835	7.8	United Kingdom	2,187	9.1
France	1,916	8.7	United States	2,296	8.1
Germany	1,798	7.9	Venezuela	196	3.9

Source: World Bank, 2002 World Development Report

GLOBAL INTERNET USERS

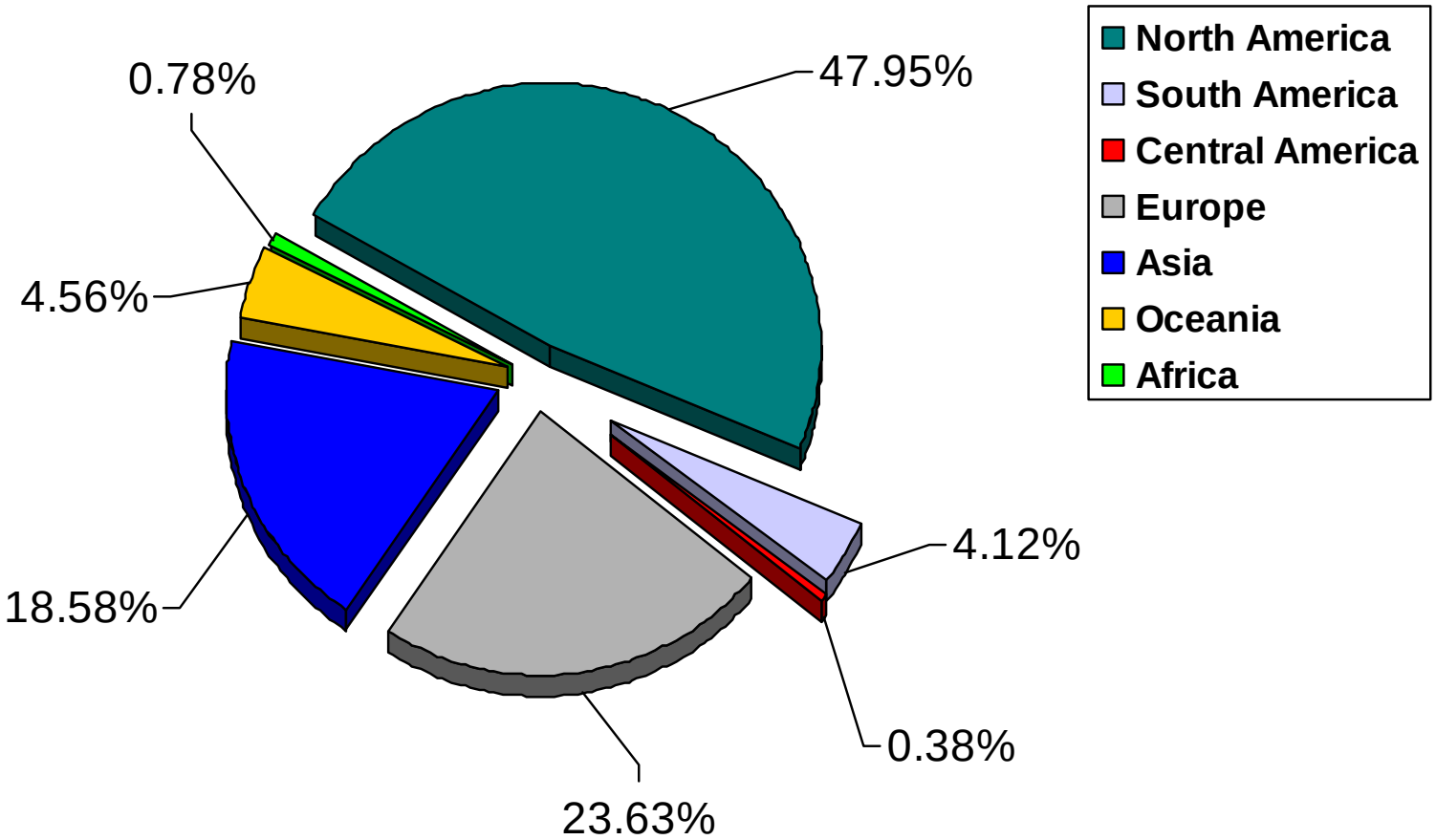


	1995	1996	1997	1998	1999	2000
Developed	30	47	77	124	180	232
Developing	3	7	13	25	51	83

Source: International Telecommunication Union, 2000

GLOBAL INTERNET USERS (APRIL 2001)

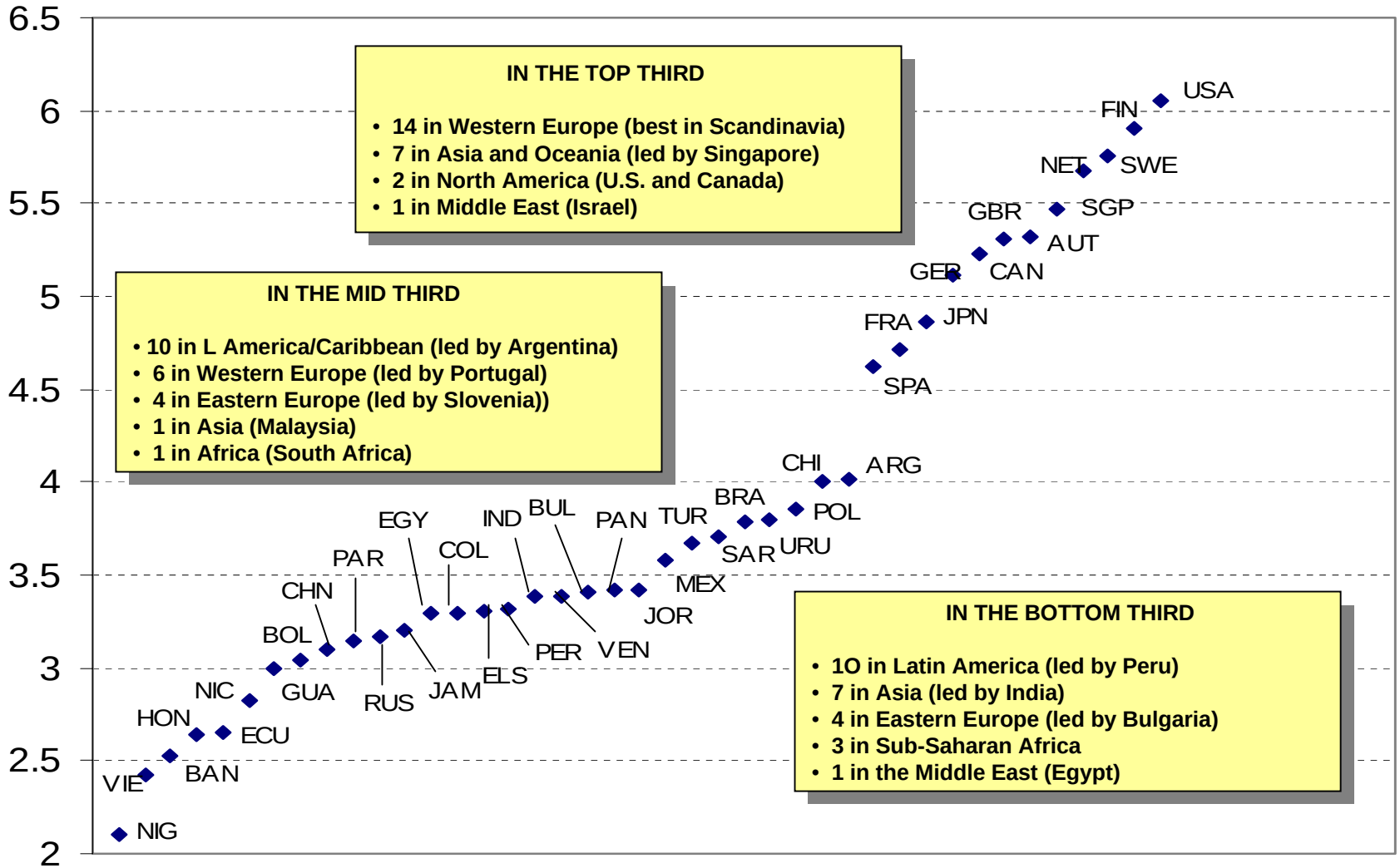
TOTAL NUMBER OF USERS 427,213,610



***Source*: www.netsizer.com**

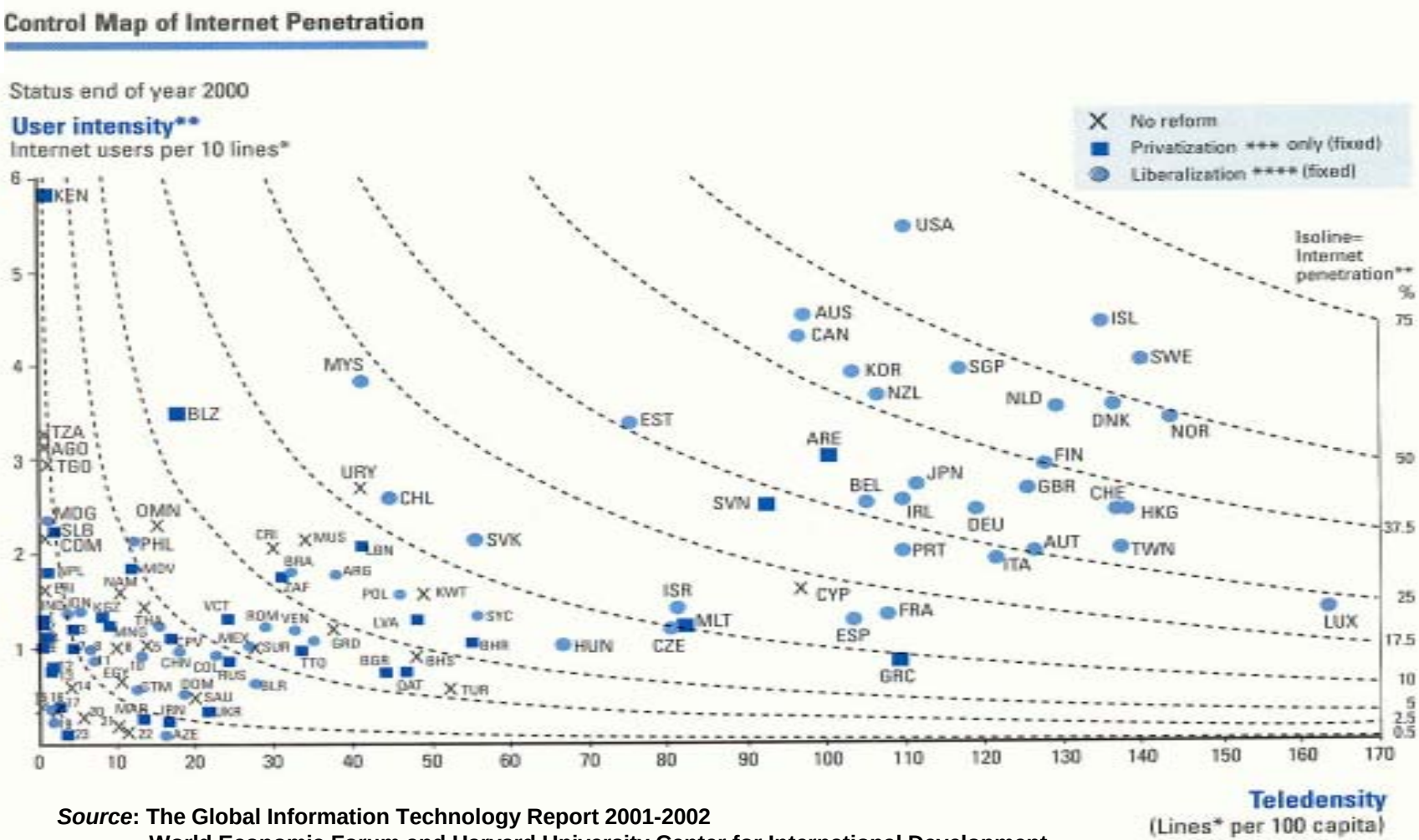
NETWORKED READINESS INDEX (75 Countries)

Access & Infrastructure) / Policy & Business Environment / Learning & Opportunities / Economy)



***Source*: The Global Information Technology Report 2001-2002 (Modified to shown only selected countries)**
World Economic Forum and Harvard University Center for International Development

TELEPHONE LINES DENSITY AND INTERNET USAGE



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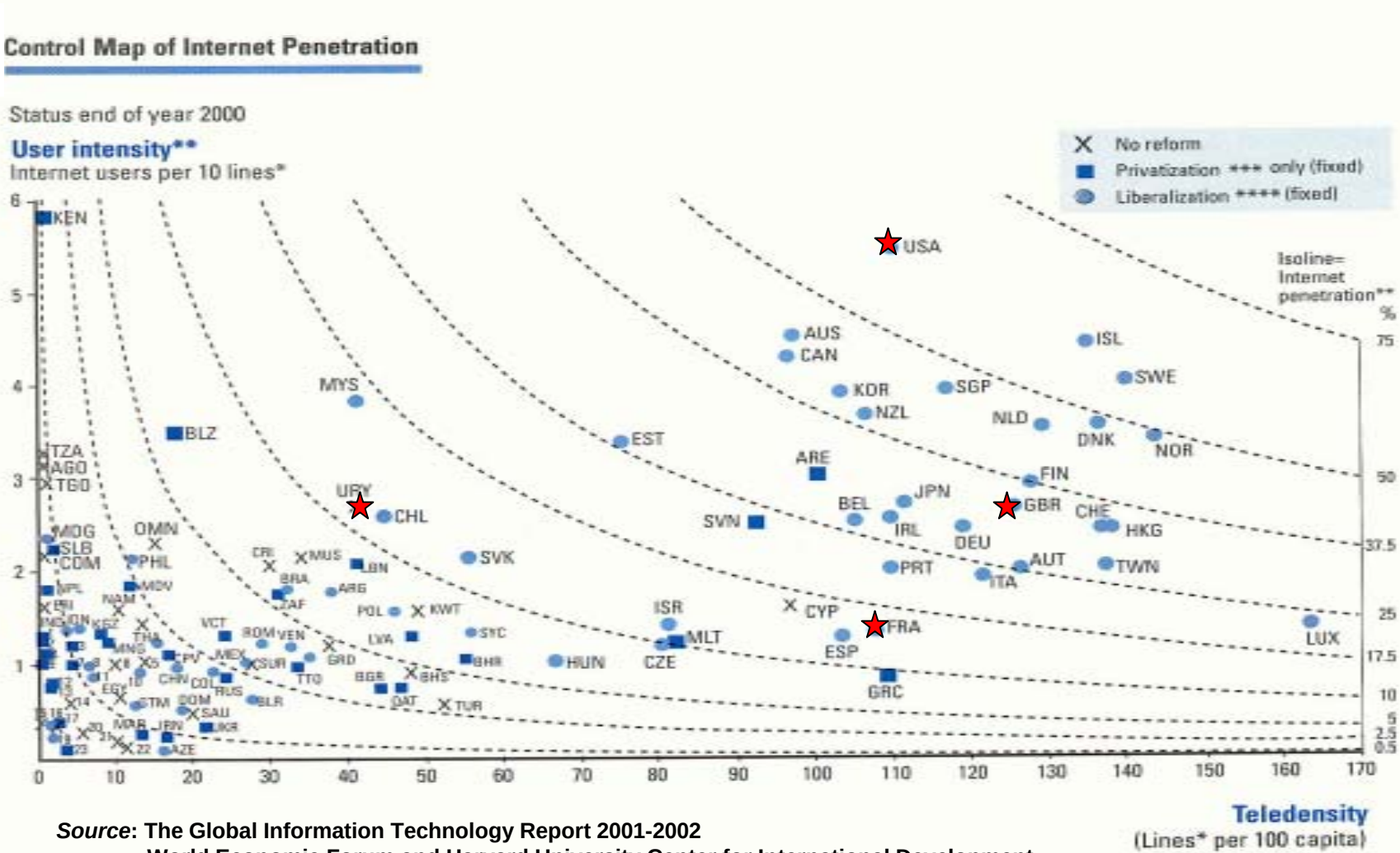
*** Fixed and mobile subscriptions**
**** Based on individual user who access the Internet at least once a month**

TELEPHONE LINES DENSITY AND INTERNET USAGE



***Source*: The Global Information Technology Report 2001-2002**
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TECHNOLOGY BARRIERS (2)

INFORMATION TECHNOLOGY DEPLOYMENT

- *INTEGRATION IN THE WORK ENVIRONMENT*
- *PROJECT MANAGEMENT AND EDUCATION / TRAINING* **OF HEALTH PROFESSIONALS**
- *ACCESS* **TO RELIABLE APPLICATIONS PRODUCTS AND SERVICES (INTEGRATION, CUSTOMER SUPPORT, TRAINING)**
- *VENDOR DEPENDENCY*

Technology Exports, Royalties, and Licenses Payments for the Year 2000 for Selected Countries. (Source: World Bank, 2002 Development Indicators)

Countries	High Technology Exports as % of All Manufactured Products Exported	Royalties and Licenses Income in Millions of US$	Royalties and Licenses Payments in Millions of US$	Royalties and Licenses Balance in Millions of US$	Gross National Income in Billions US$	Royalties and Licenses Balance as % of GNI
Argentina	9	13	458	-445	276.2	-0.16
Bolivia		2	5	-3	8.2	-0.04
Brazil	19	126	1,415	-1,289	610.1	-0.21
Chile	3	102	44	58	69.8	0.08
Colombia	7	4	71	-67	85.3	-0.08
Costa Rica		1	31	-30	14.5	-0.21
Dominican Republic			30	-30	17.8	-0.17
Ecuador	6		62	-62	15.3	-0.41
El Salvador	6	2	20	-18	12.6	-0.14
Honduras	2	0	10	-10	5.5	-0.18
Jamaica	0	6	41	-35	6.9	-0.51
Mexico	22	43	407	-364	497	-0.07
Panama	0	0	30	-30	9.3	-0.32
Peru	3		57	-57	53.4	-0.11
Uruguay	2		11	-11	20	-0.06
World						
Low and Middle Income	16	1,873	11,064	-9,191		
East Asia & Pacific	25	784	5,409	-4,625		
Europe and Central Asia	10	313	1,753	-1,440		
Latin America & Caribbean	16	501	2,666	-2,165		
Middle East & North Africa	1	106	614	-508		
South Asia	3	87	338	-251		
Sub-Saharan Africa	8	82	283	-201		
High Income	22	70,321	62,988	7,333		
European Community	16	11,019	23,422	-12,403		
United States	34	38,030	16,100	21,930		
Japan	28	10,227	11,007	-780		

HEALTH SECTOR BARRIERS (1)

NEED RECOGNITION

- **DISSEMINATION STILL LIMITED = *HEALTH SECTOR LAGS BEHIND* OTHER SECTORS**
- **MANY *PUBLIC HEALTH ORGANIZATIONS ARE NOT TAKING ADVANTAGE OF ICT OPPORTUNITIES***
- **ROLE IN *COMPETITIVENESS* AND *ORGANIZATIONAL SURVIVAL* IN THE NEW HEALTHCARE ENVIRONMENT**
- **MOST EXISTING INFORMATION SYSTEMS ARE *INADEQUATE TO THE NEW MODELS OF HEALTHCARE* = "STATISTICAL-EPIDEMIOLOGICAL PARADIGM"**

HEALTH SECTOR BARRIERS (2)

REQUIREMENTS SPECIFICATION

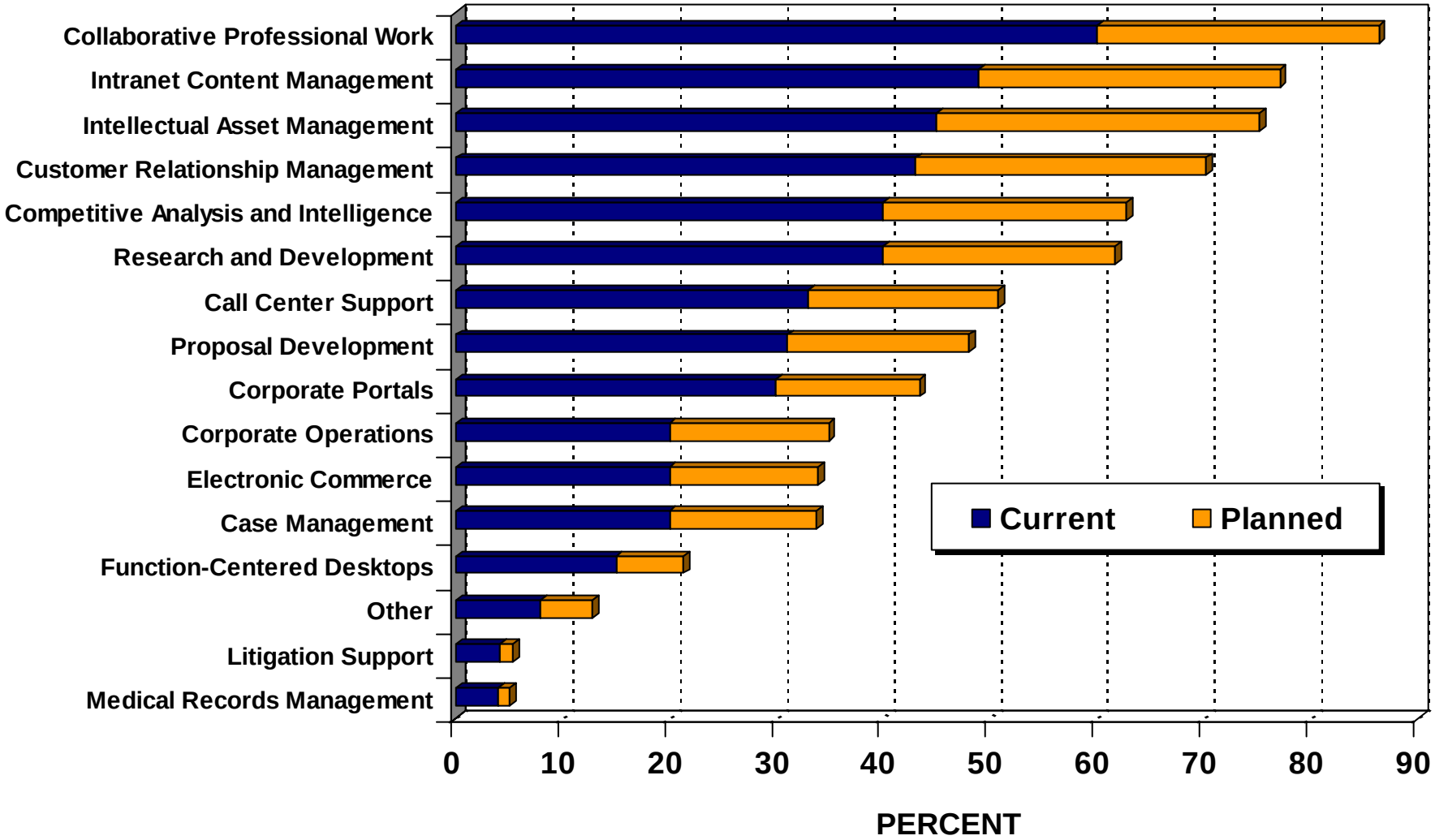
- ***LOW DEFINITION LEVEL OF CONTENTS*** **(DELIVERABLES) OF HEALTH INTERVENTIONS**
- **DETERMINATION OF *OBJECTIVES* AND *FUNCTIONALITIES* (*COMPLEXITY AND VARIETY* OF TECHNICAL CONTENTS)**
- **CONFLICTS IN DEFINING *MINIMUM DATA SETS* FOR OPERATIONAL MANAGEMENT AND CLINICAL DECISION-MAKING**
- **HEALTHCARE ORGANIZATIONS AND PROVIDERS TEND TO SEE THEIR OWN DATA AS THE ONLY *GOOD AND VALID DATA***

HEALTH SECTOR BARRIERS (3)

ORGANIZATIONAL AND POLICY-RELATED

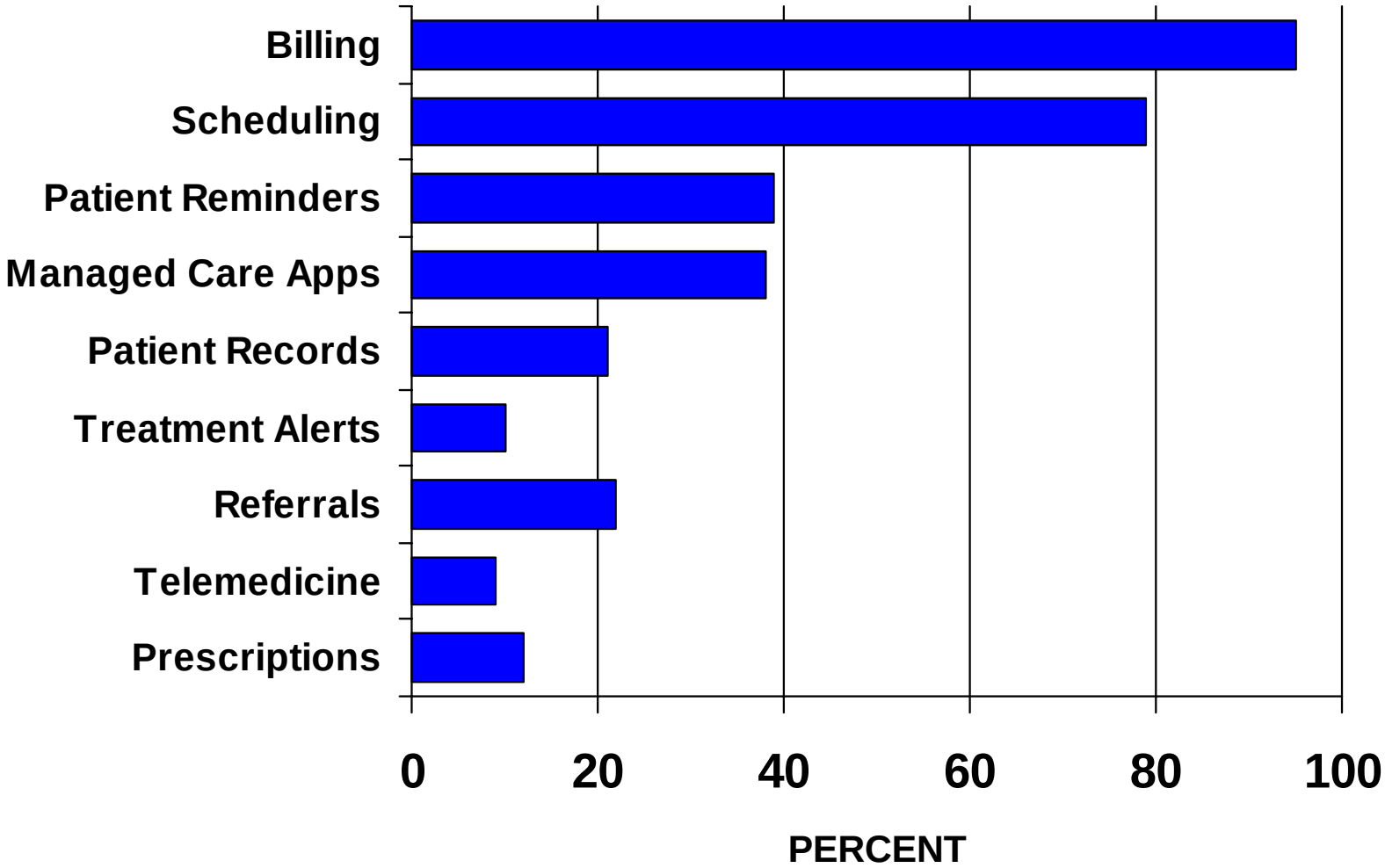
- *INFRASTRUCTURE, INVESTMENT SUSTAINABILITY,* **AND** *DEPLOYMENT CAPABILITY*
- *DISTRUST* **OF HEALTH PROFESSIONALS IN OFF-SITE DATA STORAGE AND ACCESS CONTROL**
- *NATIONAL POLICIES AND STRATEGIES* **FOR THE STANDARDIZATION AND COST-EFFECTIVE USE OF TECHNOLOGY AND INFORMATION**
- *CONSISTENCY AND CONTINUITY OF POLITICAL SUPPORT*

AREAS OF KNOWLEDGE MANAGEMENT APPLICATIONS



Source: U.S. Market, The Delphi Group, 2000

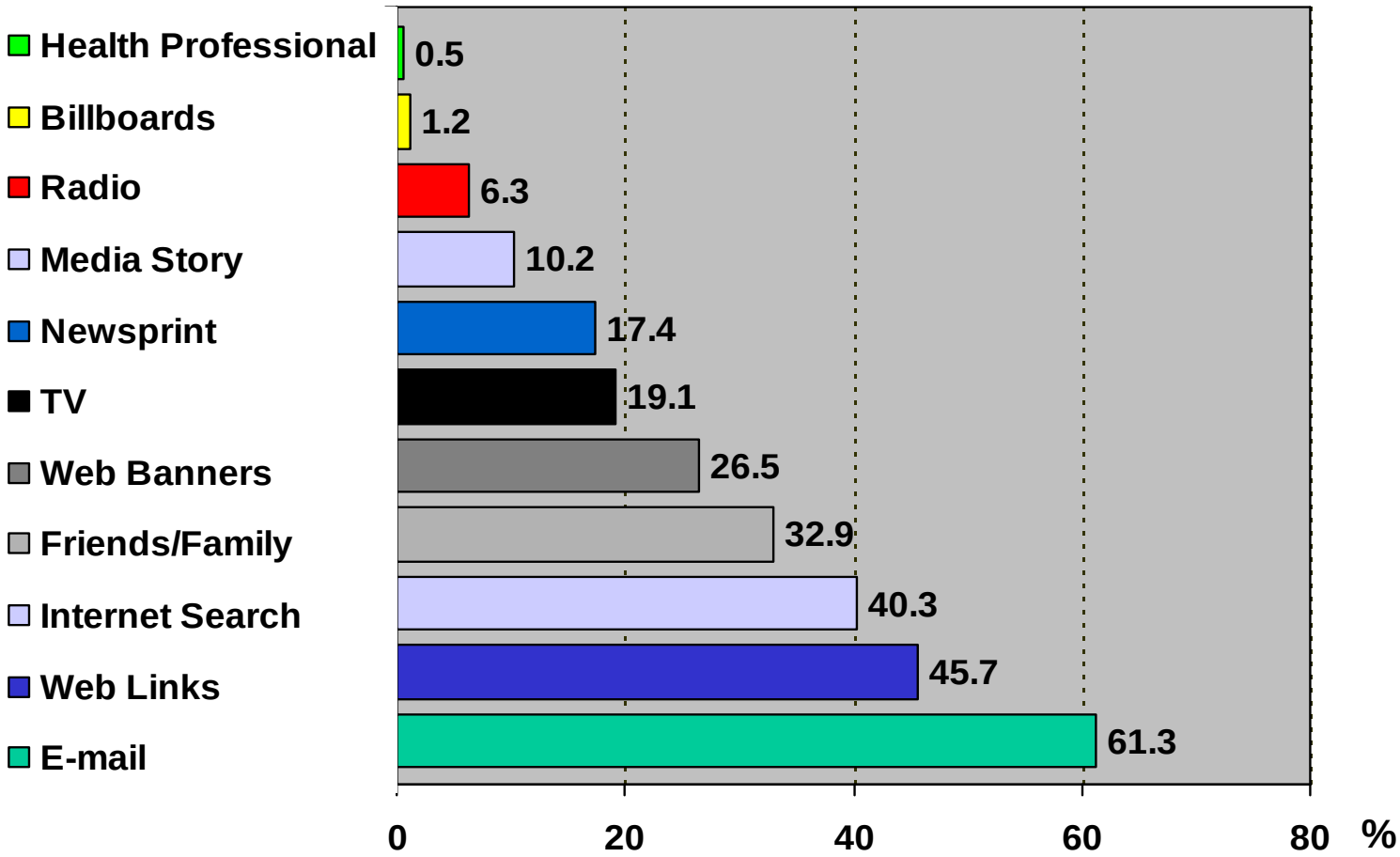
U.S. PHYSICIANS USE OF COMPUTERS (2000)



Source: Pricewaterhouse Coopers Modern Physician 2000

SOURCES OF INFORMATION ABOUT NEW HEALTH WEB SITES

HOW THE PUBLIC LEARNS ABOUT HEALTH INFORMATION IN THE WEB



U.S. Survey by Gómez Advisors, Inc. , 2000

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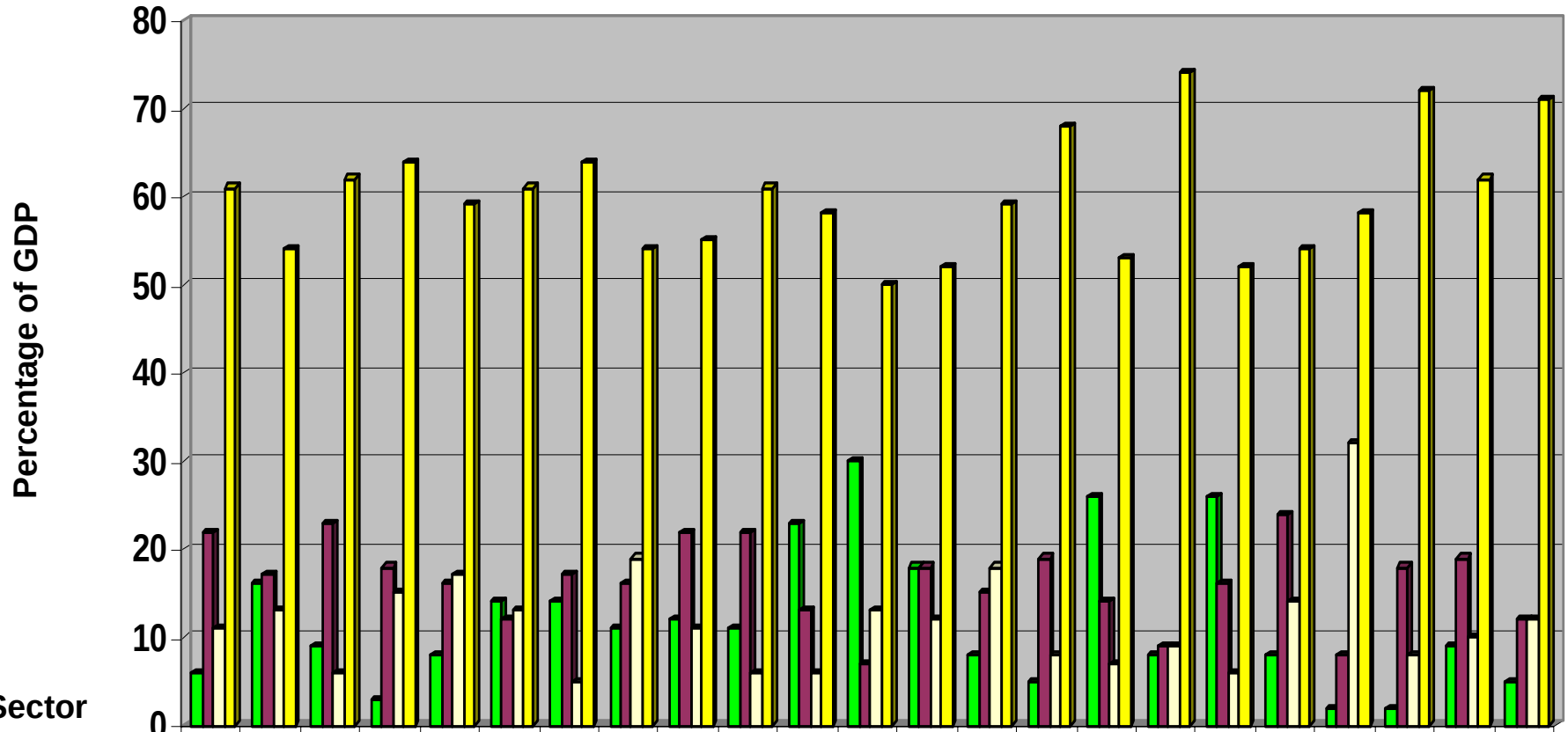
HEALTH SECTOR IN LATIN AMERICA & THE CARIBBEAN

- WESTERN BIOMEDICAL / SOCIAL SECURITY MODELS
- 80% URBANIZATION / LARGE URBAN AREAS
- BURDEN OF DISEASE: COMMUNICABLE DISEASES, MATERNAL AND PERINATAL CONDITIONS, LIFE-STYLE (HIV/TOBACCO/ALCOHOL), CHRONIC-DEGENERATIVE AND CARDIOVASCULAR DISEASES, RESPIRATORY CONDITIONS, INJURIES
- INADEQUATE INFRASTRUCTURE, FACILITY AND SERVICES DISTRIBUTION, POOR ACCESS, AND LOW QUALITY
- LOW INVESTMENT AND INCREASING COSTS ARE A MAJOR IMPEDIMENTS TO THE DEVELOPMENT OF THE HEALTH SECTOR
- HEALTH SECTOR REFORM

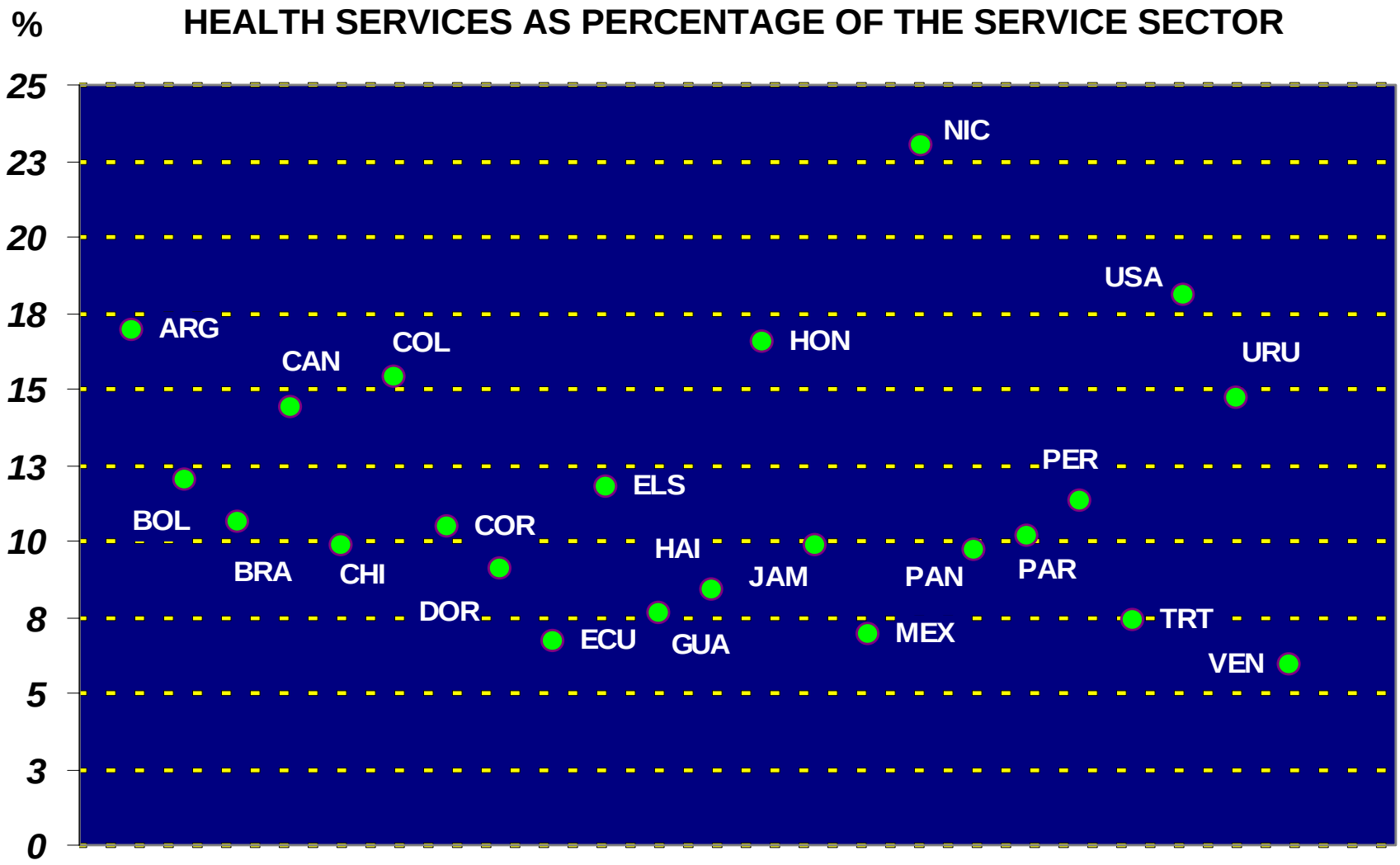
DISTRIBUTION OF GROSS DOMESTIC PRODUCT BY SECTOR, 1999



	ARG	BOL	BRA	CAN	CHI	COL	COR	DOR	ECU	ELS	GUA	HAI	HON	JAM	MEX	NIC	PAN	PAR	PER	TRT	USA	URU	VEN
Agriculture	6	16	9	3	8	14	14	11	12	11	23	30	18	8	5	26	8	26	8	2	2	9	5
Ind/Manufc	22	17	23	18	16	12	17	16	22	22	13	7	18	15	19	14	9	16	24	8	18	19	12
Ind/Non-Manufc	11	13	6	15	17	13	5	19	11	6	6	13	12	18	8	7	9	6	14	32	8	10	12
Services	61	54	62	64	59	61	64	54	55	61	58	50	52	59	68	53	74	52	54	58	72	62	71

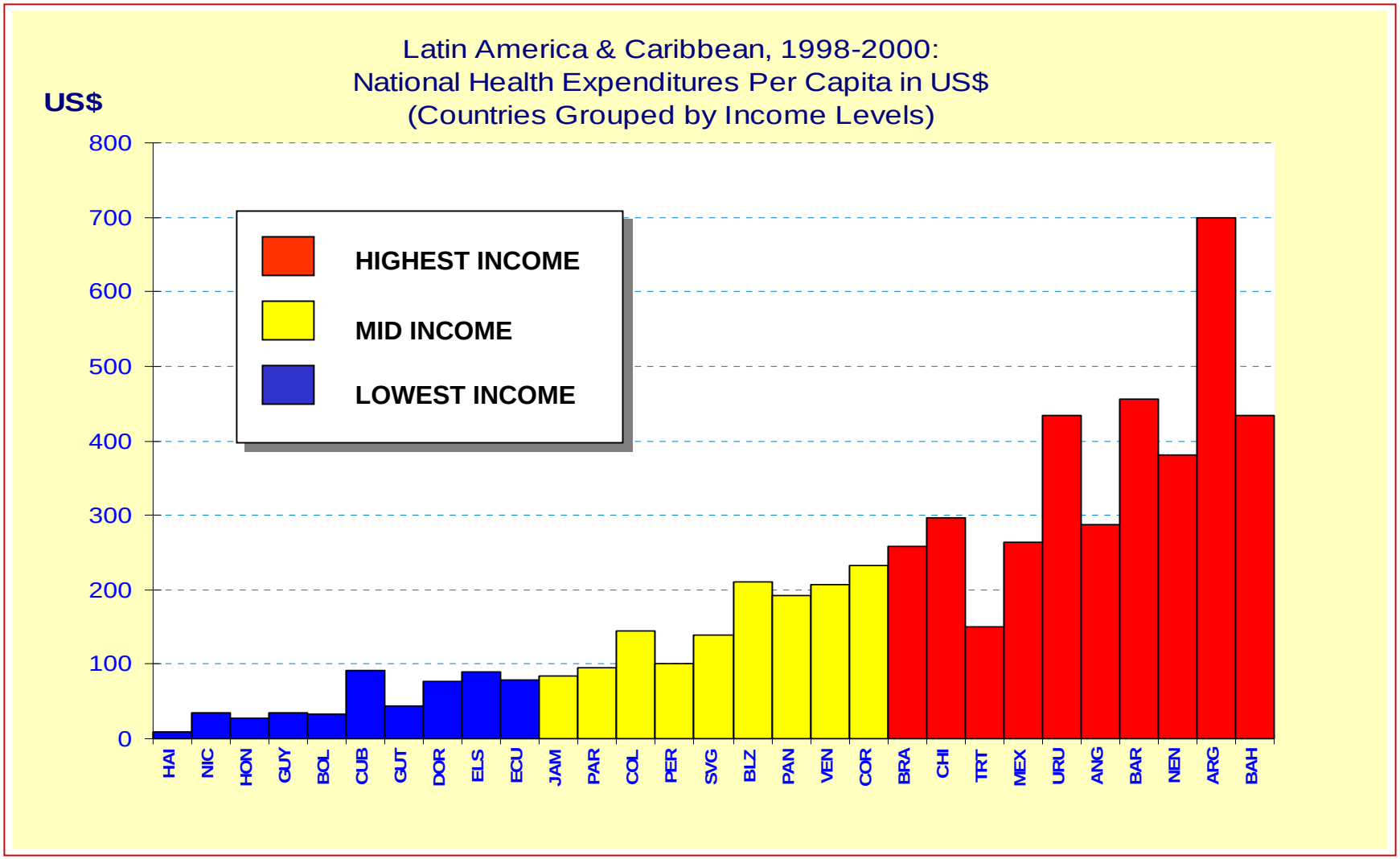
***Source*: World Bank, World Development Indicators 1999**

HEALTH CONTRIBUTION TO THE SERVICES SECTOR



Source: World Bank, World Development Indicators 1999

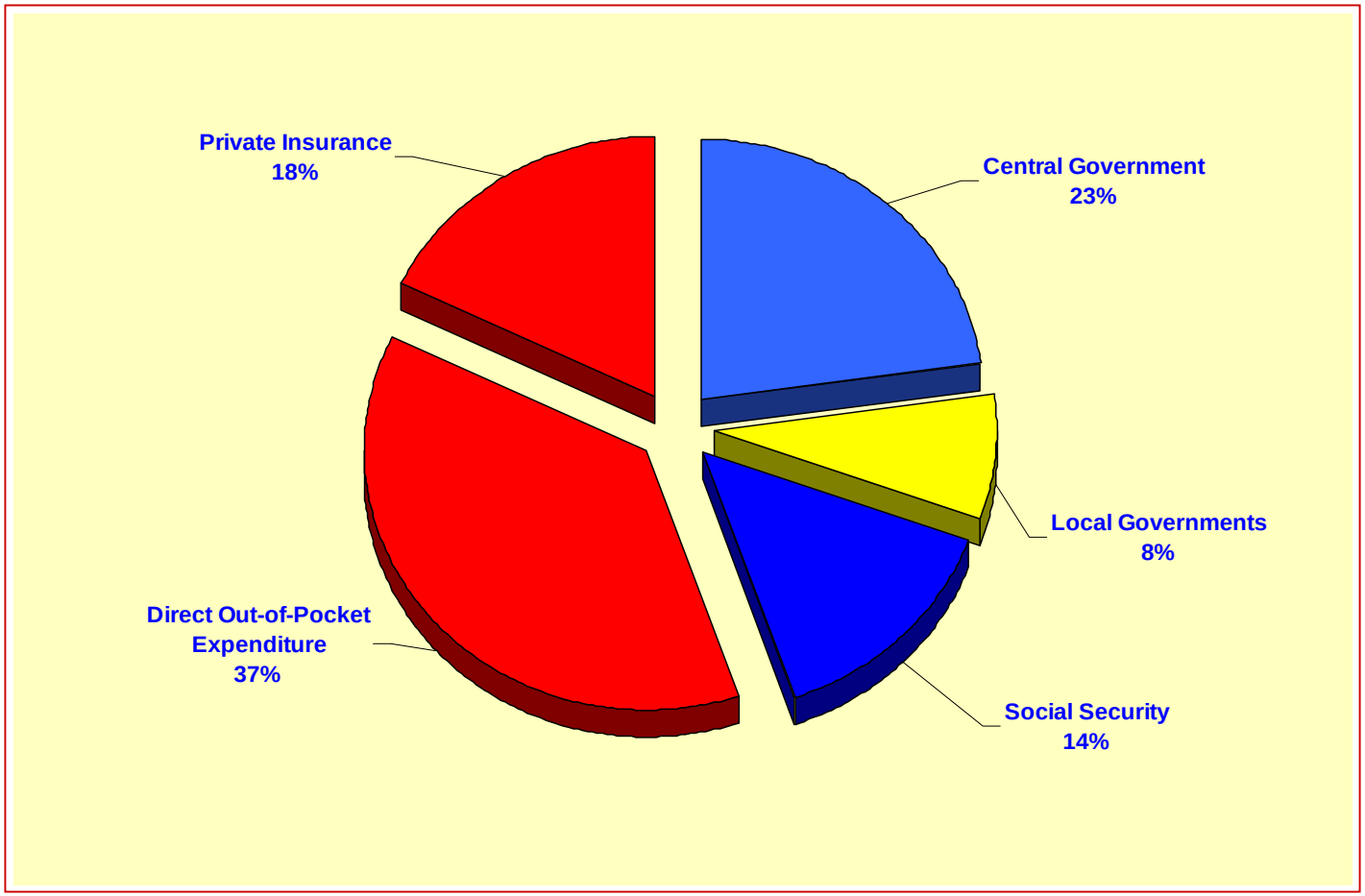
THE LATIN AMERICAN & CARIBBEAN MARKET



***Source*: Casas, JA Trade in Health Services in the Americas: Trends and Opportunities, PAHO/WHO, 2001**

THE LATIN AMERICAN & CARIBBEAN MARKET

PUBLIC AND PRIVATE COMPOSITION OF HEALTH EXPENDITURES (1998-2000)



***Source*: Casas, JA Trade in Health Services in the Americas: Trends and Opportunities, PAHO/WHO, 2001**

HOSPITAL MARKET

Hospital Size in Latin America and the Caribbean by Number of Beds
(Source: PAHO Directory of Latin America and Caribbean Hospitals, 1996-1997)

Number of Beds	Hospitals		Beds Available	
	Number	Percent	Number	Percent
1-50	10,027	60.5	219,383	20.0
51-100	2,615	15.8	189,559	17.3
101-200	1,703	10.3	242,770	22.1
201-300	544	3.3	133,225	12.1
301-400	242	1.5	84,811	7.7
401-500	133	0.8	58,951	5.4
501-1000	186	1.1	126,169	11.5
>1000	29	0.2	43,097	3.9
Sub-Total	5,479	93.4		
No Data	1,087	6.5		
Total	16,566	100.0	1,097,965	100.0

HOSPITAL MARKET

Legal Ownership of 16,566 Hospitals and Computerized Information Systems in Latin America and the Caribbean, period 1995-1997 (Source: PAHO Directory of Latin American and Caribbean Hospitals Database)

OWNERSHIP CLASS	HOSPITAL GROUPS							
	ALL FACILITIES		NO COMPUTERS			WITH COMPUTERS		
	Number	Percent	Number	Percent		Number	Percent	
				In Class	In Group		In Class	In Group
Public Non-Social Security	6,498	39.22	5,099	78.47	44.98	1,399	21.52	26.74
Public Social Security	876	5.29	438	50.00	3.86	438	50.00	8.37
Private	7,783	46.98	4,924	63.26	43.43	2,859	36.73	54.66
Philanthropic	1,284	7.75	779	60.66	6.87	505	39.33	9.65
Military	125	0.75	96	76.80	0.84	29	23.20	0.55
Total	16,566	100.0	11,336	---	100.00	5,230	---	100.00

31.6% HAVE COMPUTERS, OF THOSE ABOUT 54.6% ARE PRIVATE

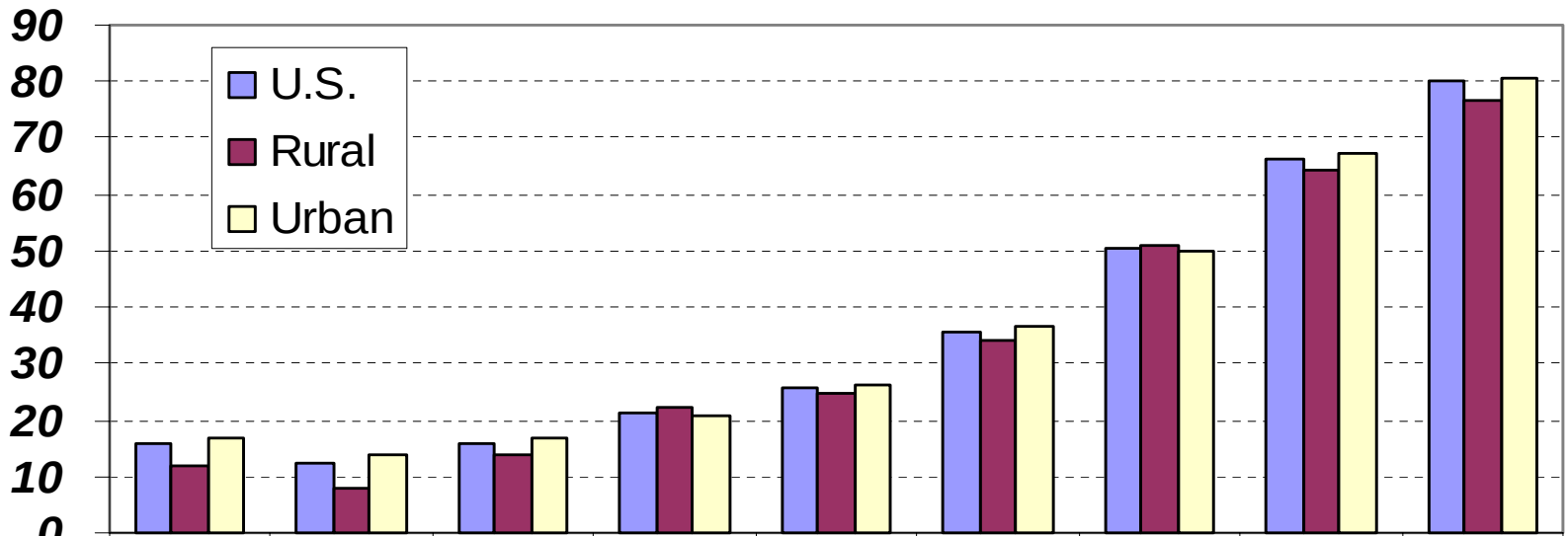
- DRIVING FORCES AND BARRIERS
- HEALTH SECTOR CHARACTERISTICS
- **ICT INFRASTRUCTURE AND MARKET**
- IMPLEMENTATION ISSUES

LIMITATIONS OF INFORMATION TECHNOLOGY METRICS

- LACK OF STANDARDIZED DEFINITIONS FOR IT COMPONENTS
- DATA ON IT RARELY COLLECTED ON A SYSTEMATIC BASIS
- ABSENCE OF COST DATA
- INFORMATRION ON HOW IT IS BEING ACTUALLY USED
- LACK OF EVALUATION OF POSITIVE AND NEGATIVE IMPACTS
- RAPIDLY CHANGING TECHNOLOGY

THE INCOME BARRIER (1)

PERCENT OF U.S. HOUSEHOLDS WITH COMPUTER BY LEVEL OF INCOME (1998)



	Under 5,000	5,000-9,999	10,000-14,999	15,000-19,999	20,000-24,999	25,000-34,999	35,000-49,999	50,000-74,999	75,000 +
U.S.	15.9	12.3	15.9	21.2	25.7	35.8	50.2	66.3	79.9
Rural	11.9	8.1	13.8	22.1	24.7	34.0	51.0	64.2	76.5
Urban	16.9	13.6	16.6	20.8	26.1	36.5	50.0	67.1	80.8

Source: U.S. National Telecommunication and Information Agency, DOC, 1999

THE INCOME BARRIER (2)

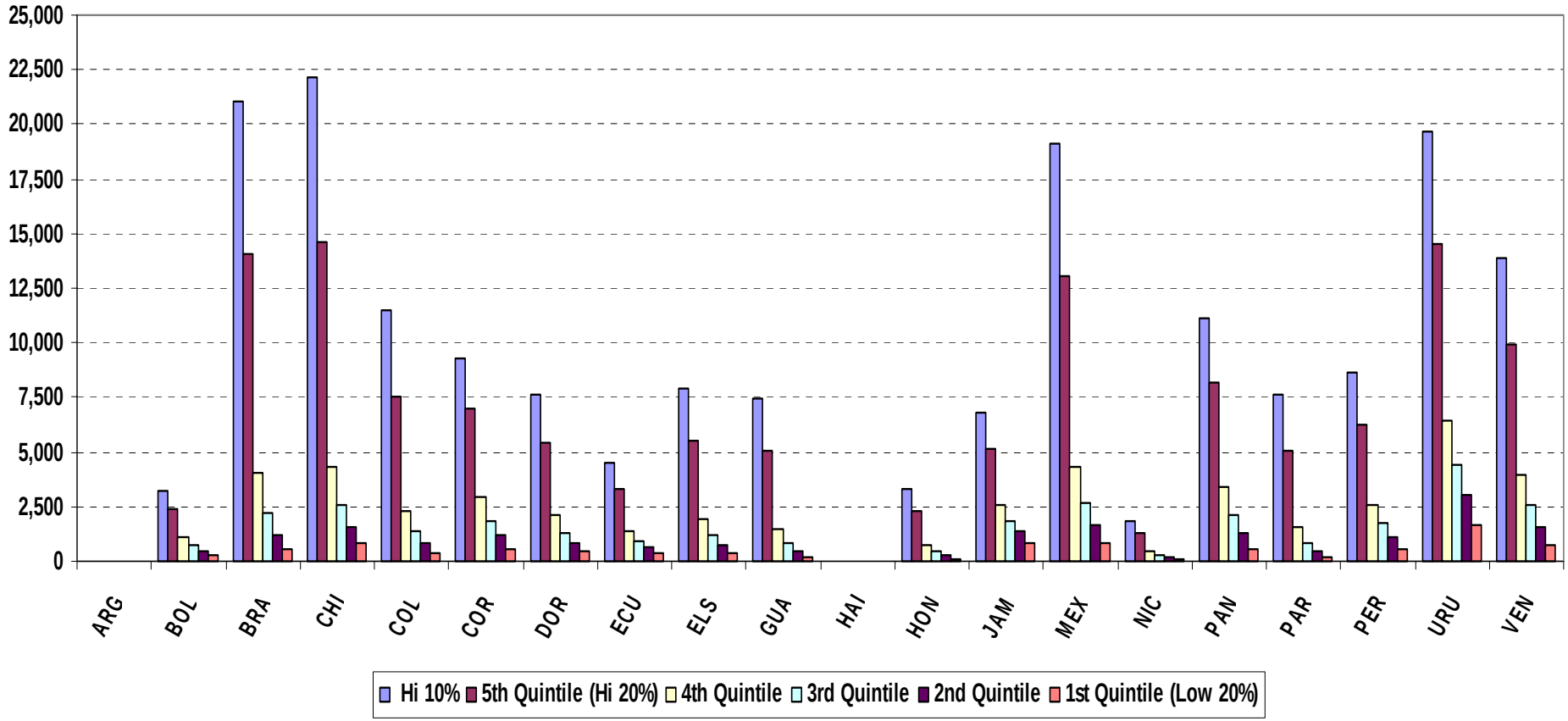
SELECTED COUNTRIES - GNP PER CAPITA BY POPULATION QUINTILES (1999)

	BRA	CAN	CHI	COL	DOR	ECU	GUA	HON	MEX	NIC	PAR	URU	USA	VEN
Hi Q	14,105	37,661	14,629	7,563	5,404	3,307	5,013	2,265	13,021	1,298	5,079	14,539	70,190	9,938
4th Q	4,046	22,041	4,341	2,285	2,073	1,417	1,480	769	4,296	470	1,522	6,472	33,885	3,968
3rd Q	2,211	16,483	2,614	1,378	1,318	945	835	457	2,640	296	871	4,455	23,598	2,545
2nd Q	1,216	12,362	1,583	820	835	625	462	277	1,611	188	480	3,010	15,883	1,572
Lo Q	553	7,187	839	373	433	359	167	133	805	99	187	1,626	7,866	692

Source: Data from the World Bank Development Report, 2000

THE INCOME BARRIER (3)

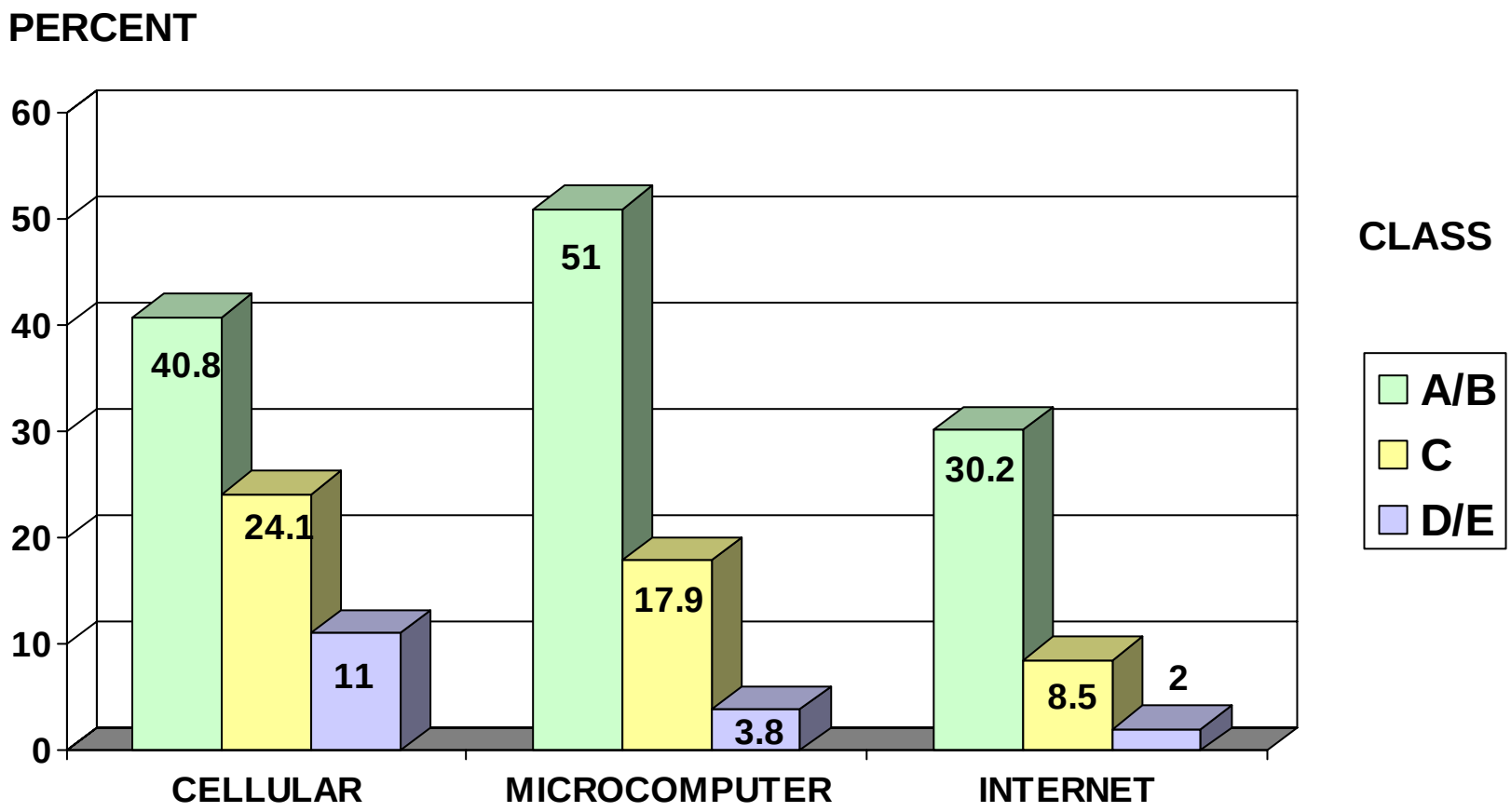
SELECTED COUNTRIES - GNP PER CAPITA BY POPULATION QUINTILES (1999)



Source: Data from the World Bank Development Report, 2000

THE INCOME BARRIER (3)

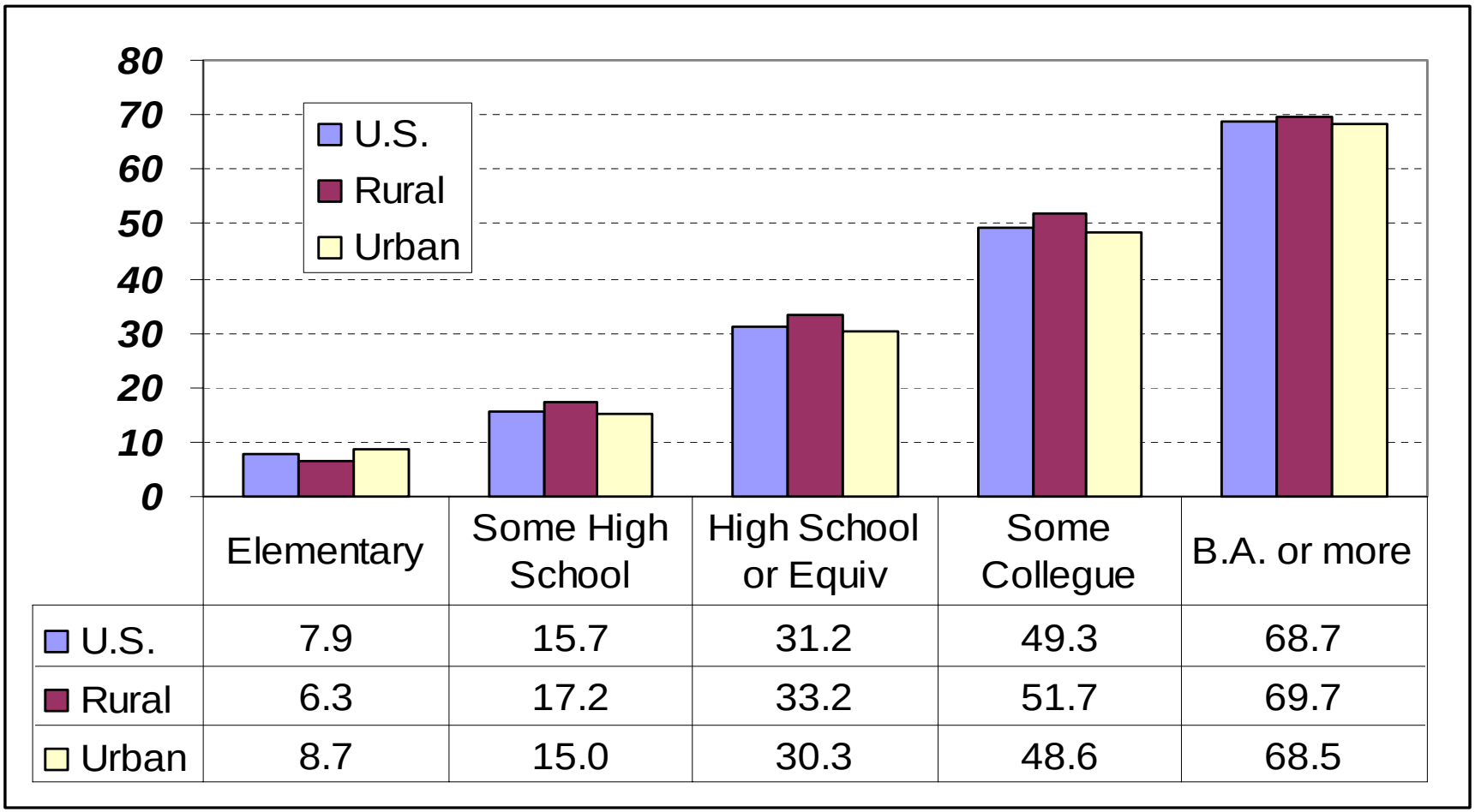
BRAZIL - CELLULAR TELEPHONY AND COMPUTERS USE BY SOCIAL CLASS



Source: *Ministry of Health, Brazil (1999)*

THE EDUCATIONAL BARRIER

PERCENT OF U.S. HOUSEHOLDS WITH COMPUTER BY LEVEL OF EDUCATION (1998)

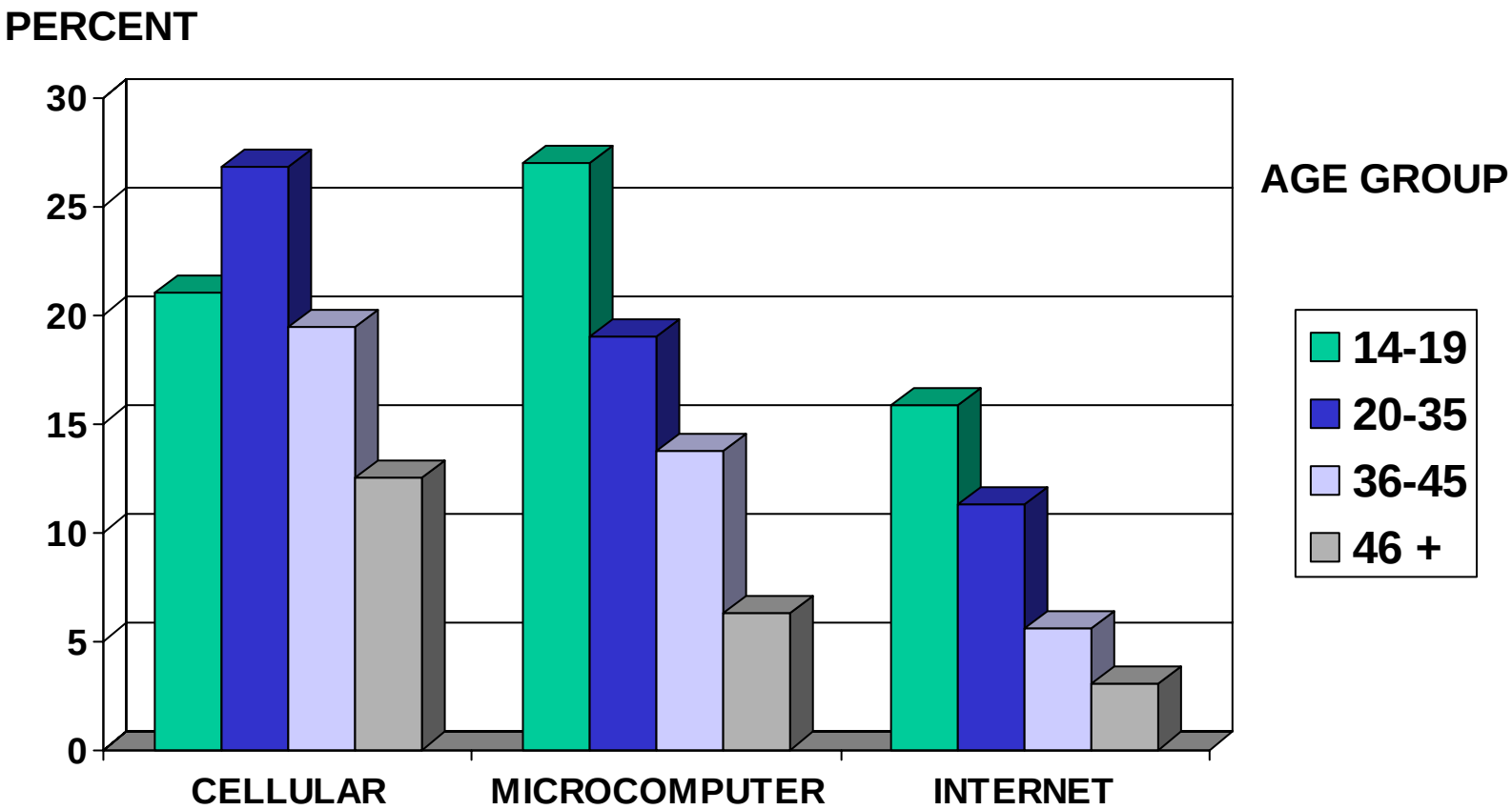


	Elementary	Some High School	High School or Equiv	Some Collegue	B.A. or more
U.S.	7.9	15.7	31.2	49.3	68.7
Rural	6.3	17.2	33.2	51.7	69.7
Urban	8.7	15.0	30.3	48.6	68.5

Source: U.S. National Telecommunication and Information Agency, DOC, 1999

THE GENERATION GAP

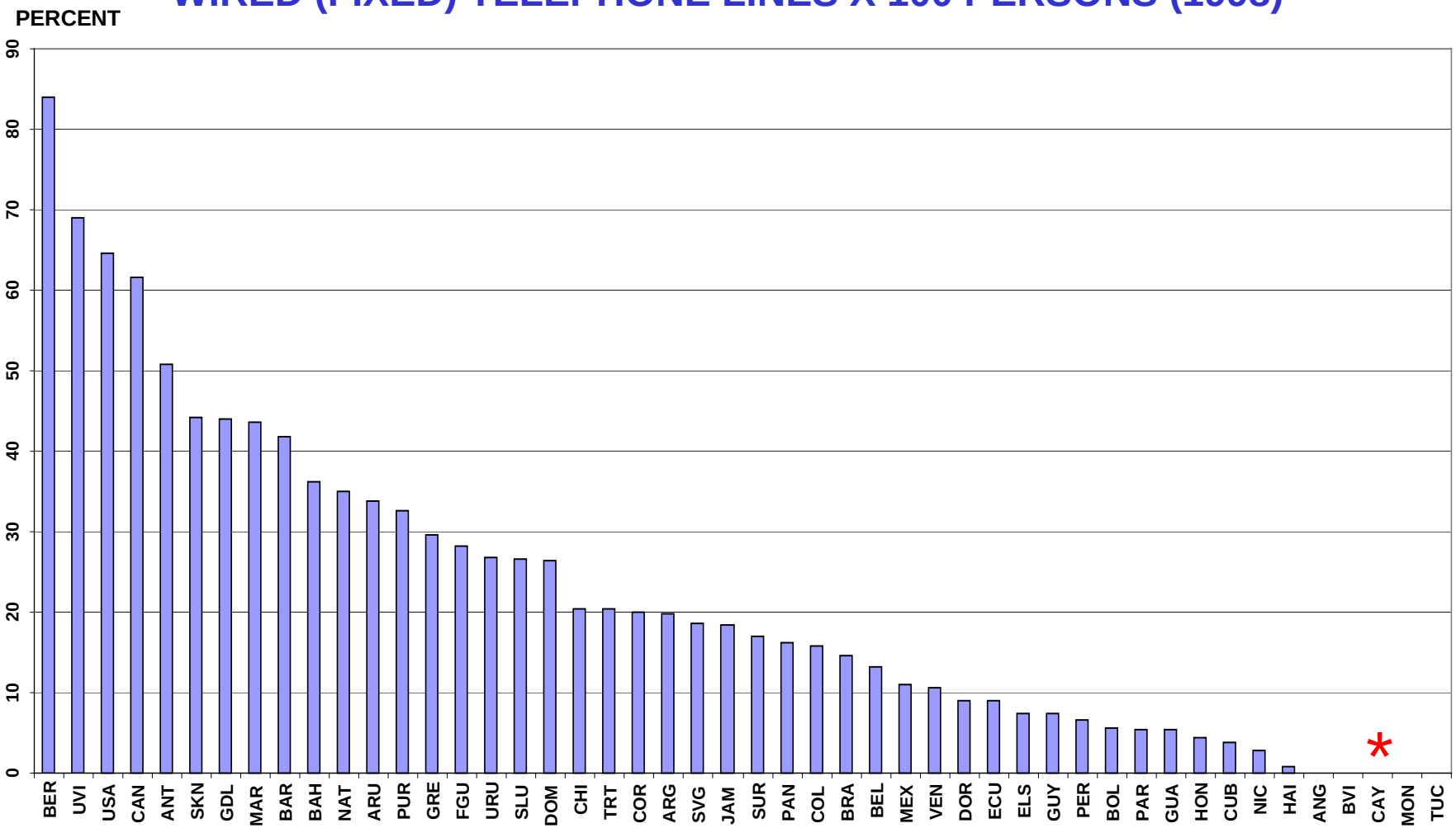
BRAZIL - CELLULAR TELEPHONY AND COMPUTERS USE BY AGE GROUP



Source: *Ministry of Health, Brazil (1999)*

TELECOM INFRASTRUCTURE

WIRED (FIXED) TELEPHONE LINES X 100 PERSONS (1998)

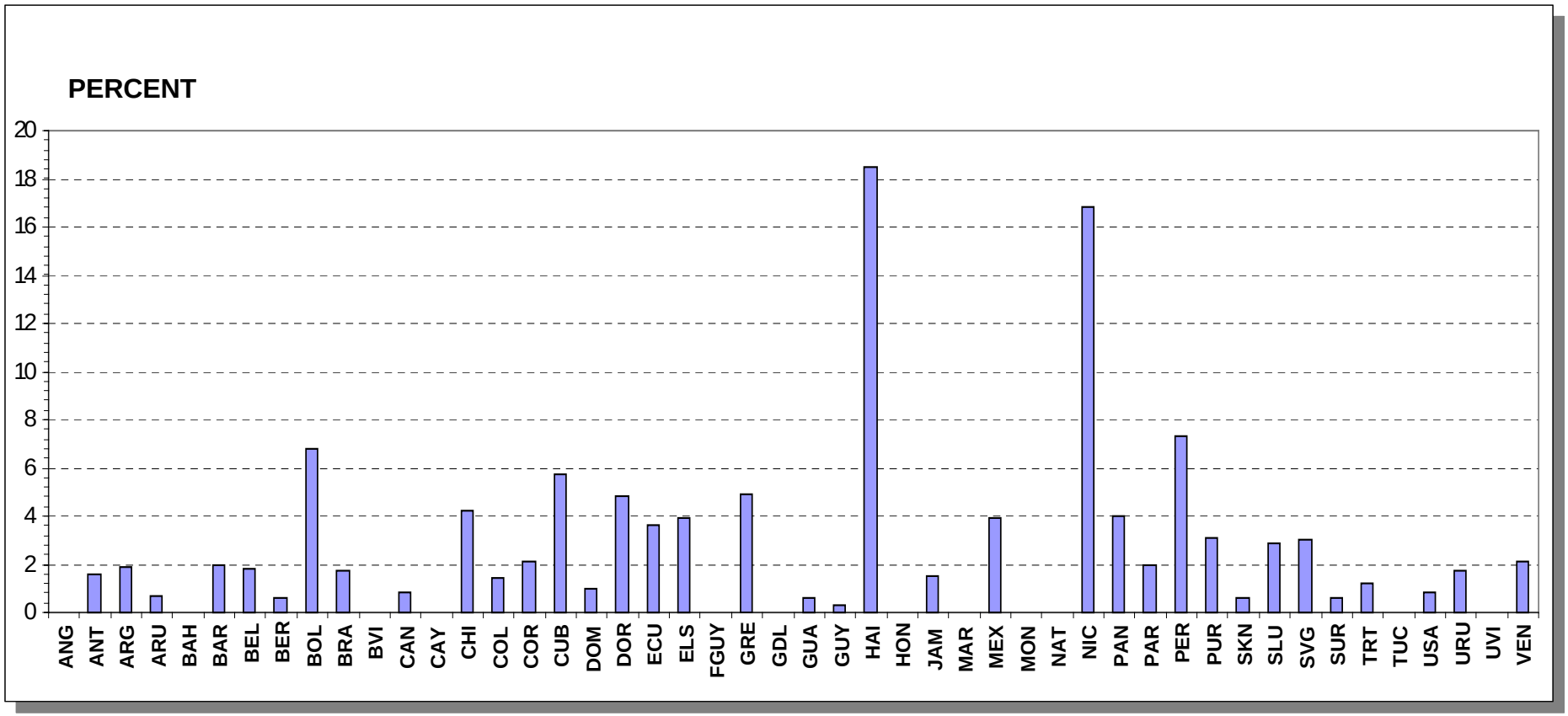


* No Data

Source: International Telecommunication Union, 2000

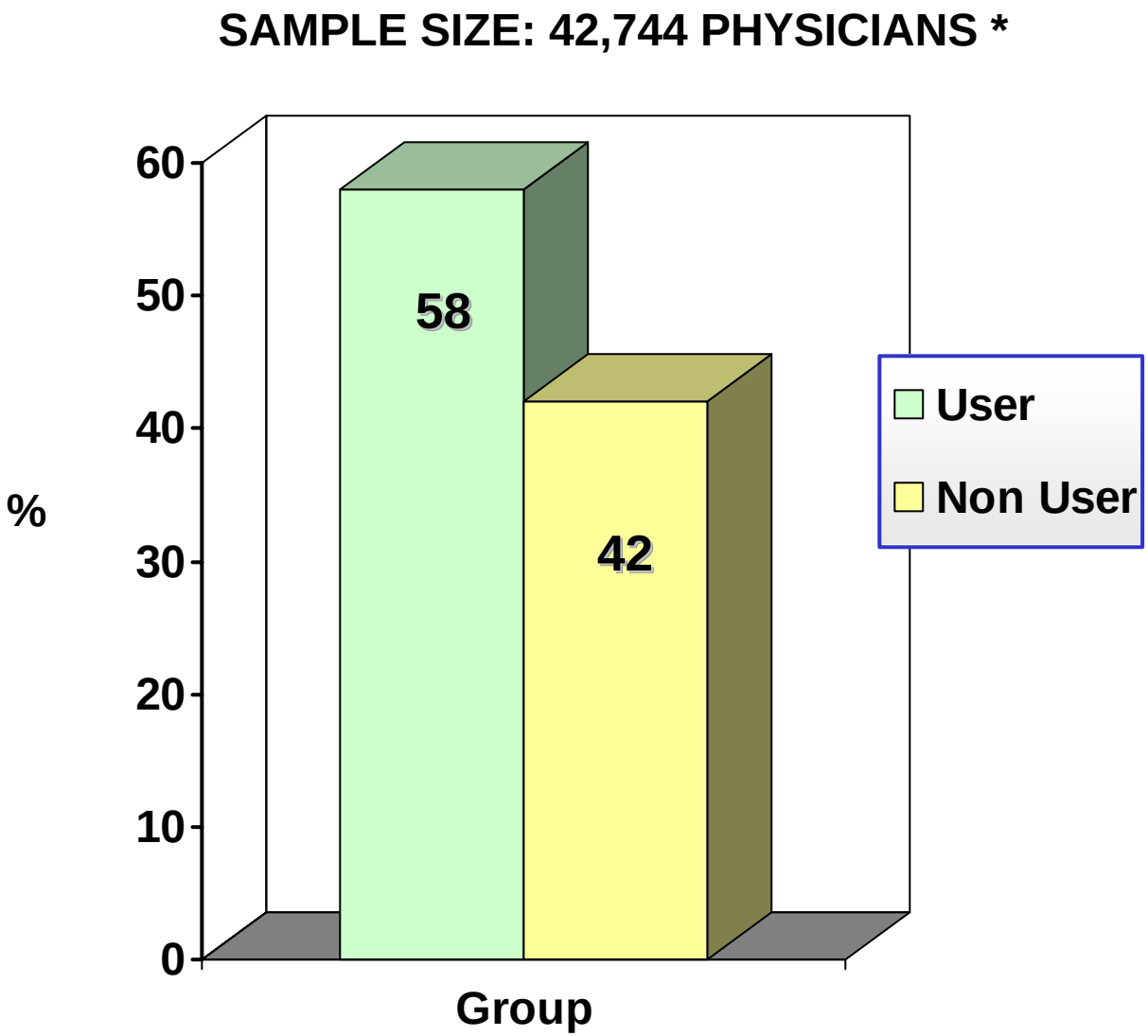
COST OF WIRED CONNECTION

ANNUAL RESIDENTIAL SUBSCRIPTION AS PERCENTAGE OF GNP x CAPITA (1997)



***Source*: International Telecommunication Union and PAHO Basic Indicators**

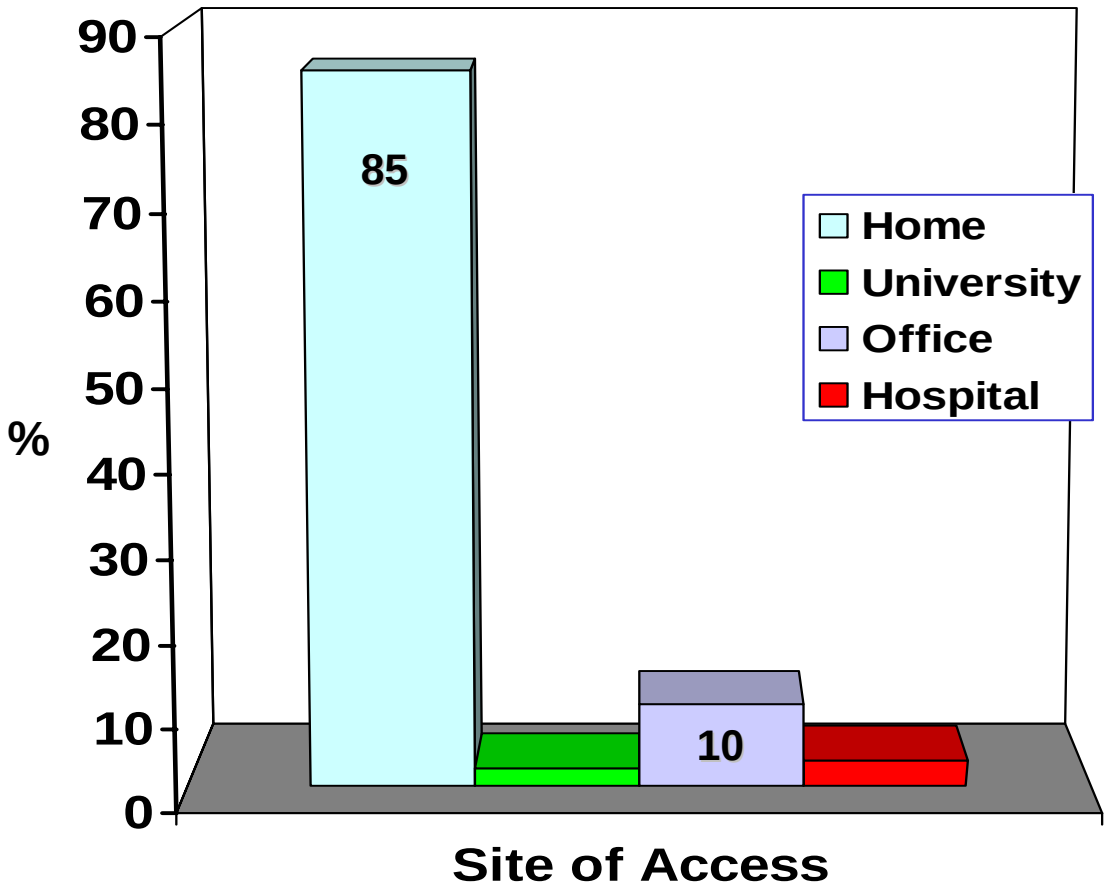
INTERNET USE - PHYSICIANS IN BRAZIL (1)



1999 SURVEY (In 1996 there were 205,828 physicians)

INTERNET USE - PHYSICIANS IN BRAZIL (2)

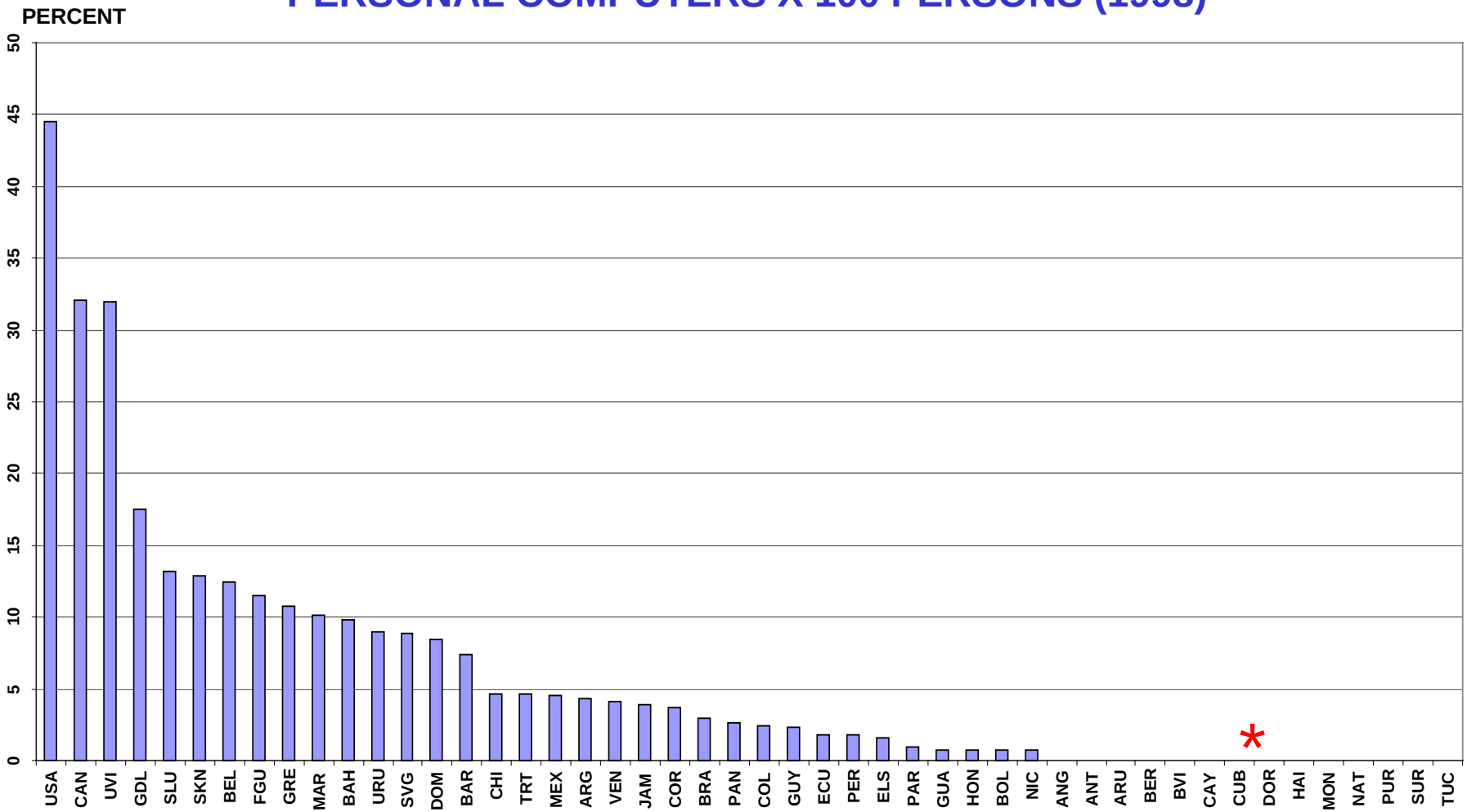
SAMPLE SIZE: 24,603 PHYSICIANS
LOCATION FROM WHERE INTERNET IS ACCESSED



1999 SURVEY (In 1996 there were 205,828 physicians)

DIGITAL INFRASTRUCTURE (1)

PERSONAL COMPUTERS X 100 PERSONS (1998)

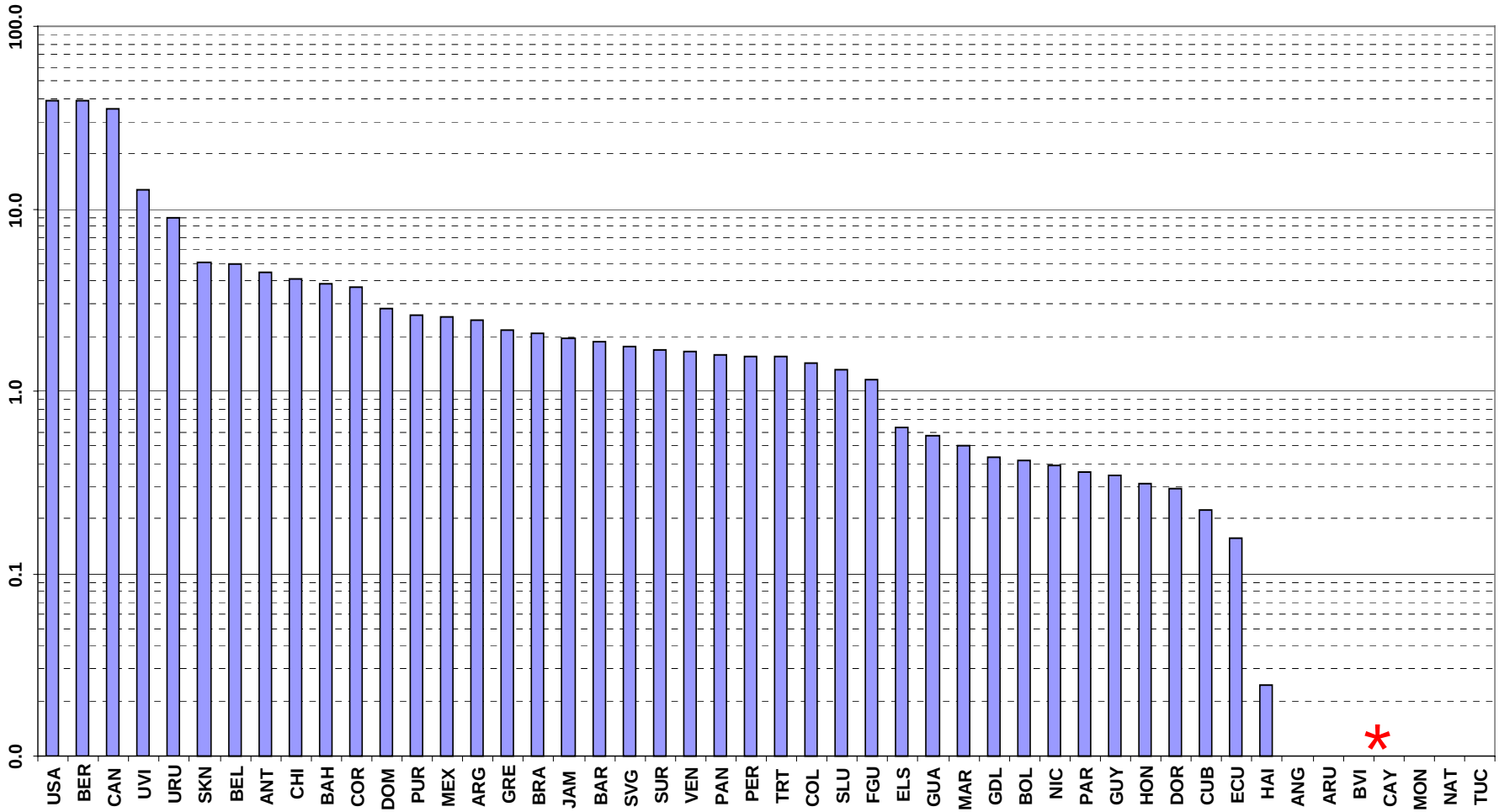


* No Data

Source: International Telecommunication Union, 2000

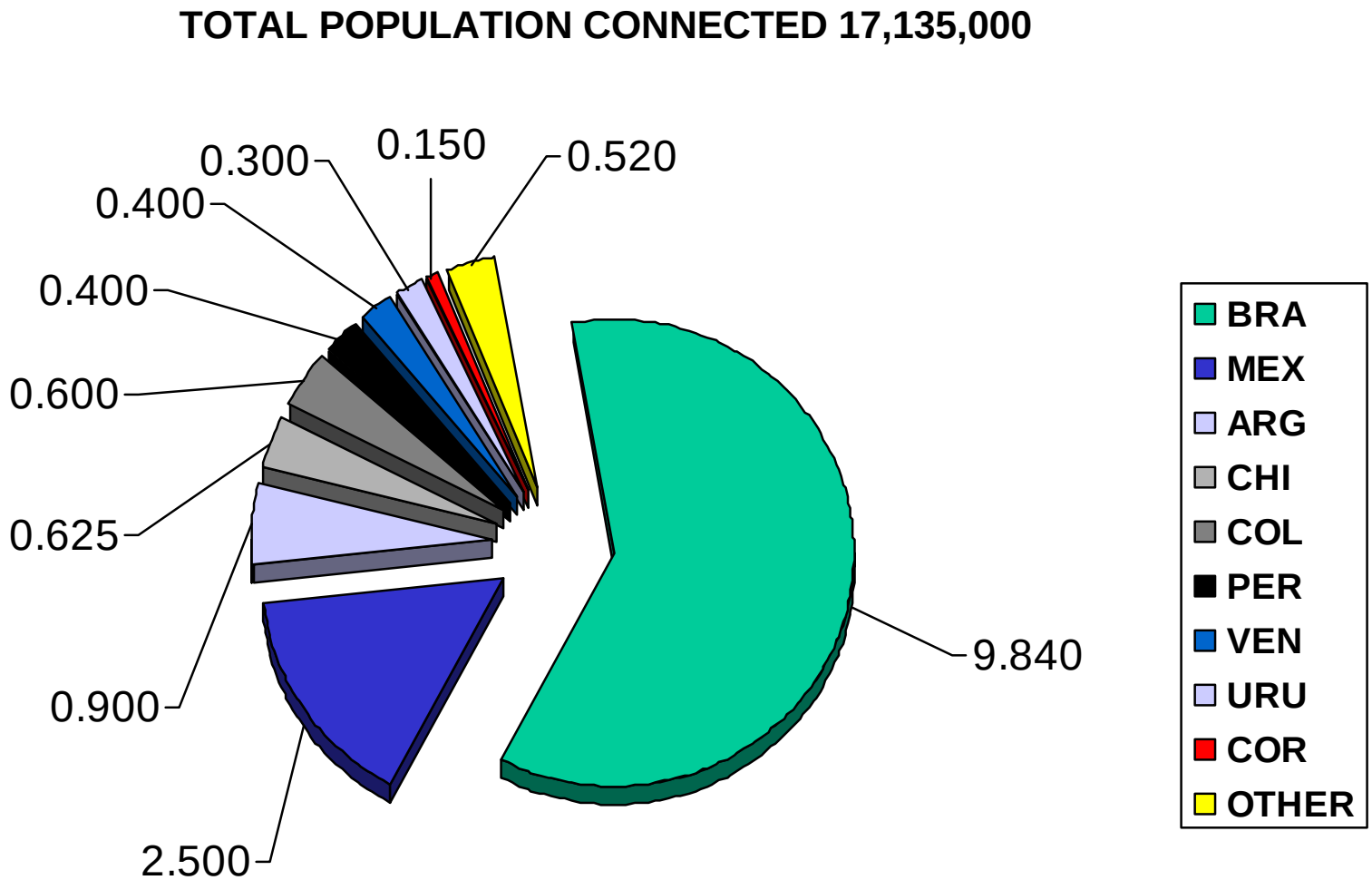
DIGITAL INFRASTRUCTURE (2)

INTERNET CONNECTIVITY X 100 PERSONS (1999)



Source: International Telecommunication Union, 2000

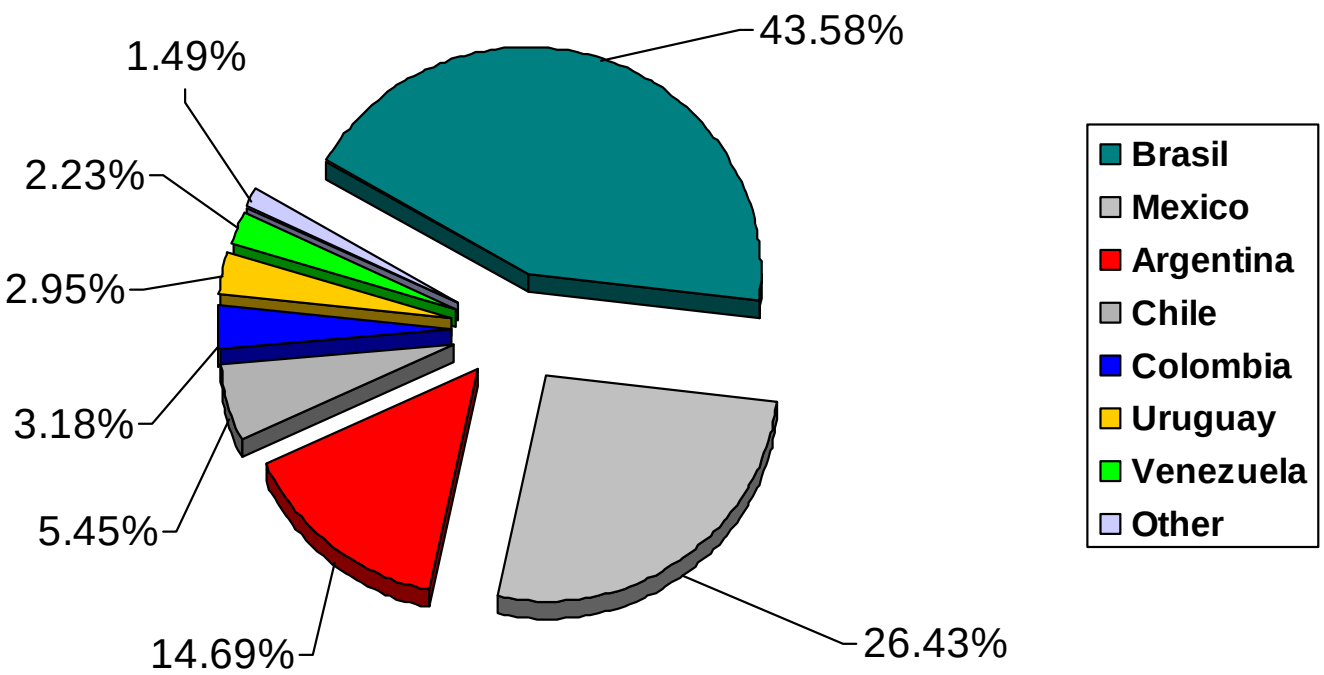
INTERNET USERS IN LATIN AMERICA & CARIBBEAN (2000) IN MILLIONS



Source: NUA *Internet Surveys*

INTERNET HOSTS IN SOUTH, CENTRAL AMERICA & CARIBBEAN

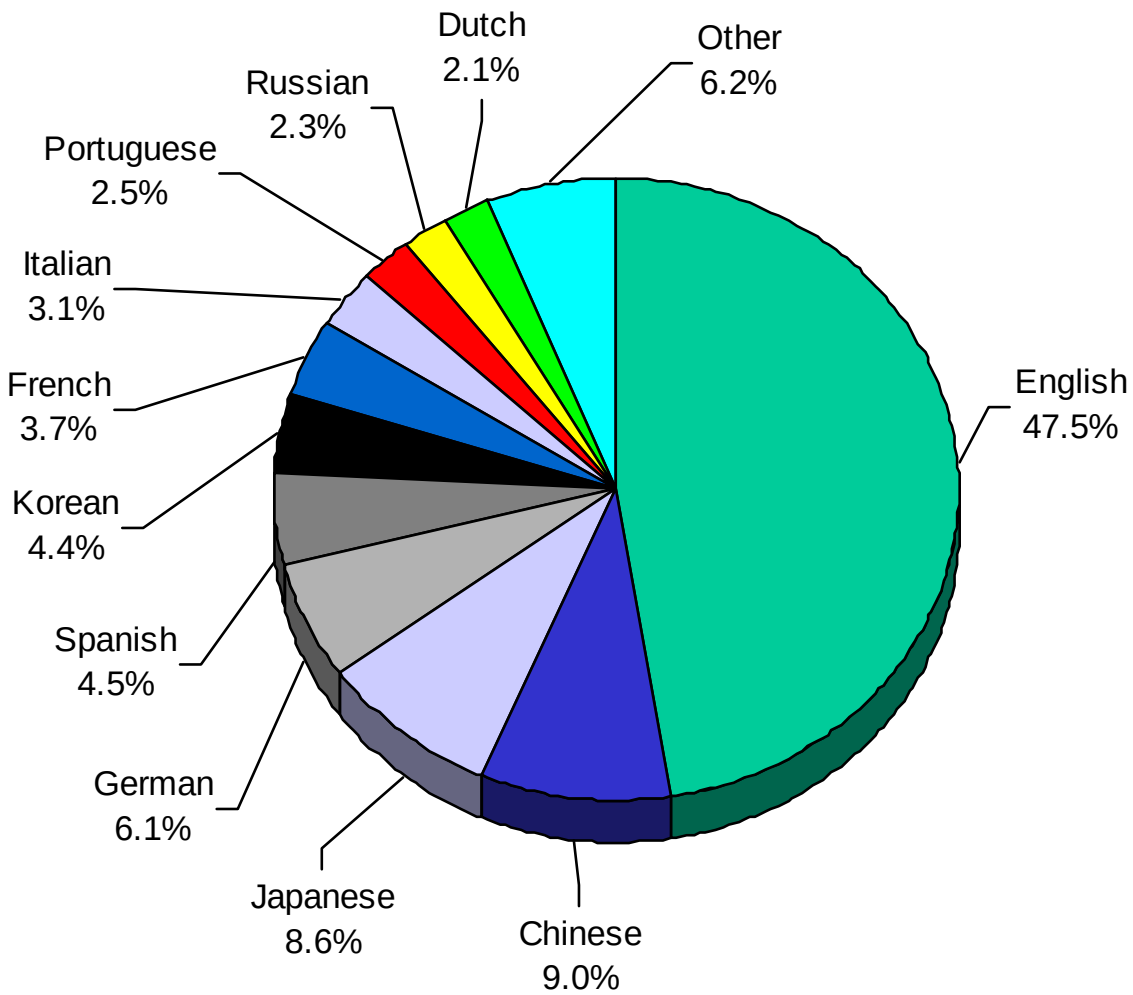
TOTAL NUMBER OF HOSTS 1,825,760 (APRIL 2001)



Source: www.netsizer.com

INTERNET USE - LANGUAGE

NUMBER OF NATIVE SPEAKERS ONLINE (MARCH 2001)



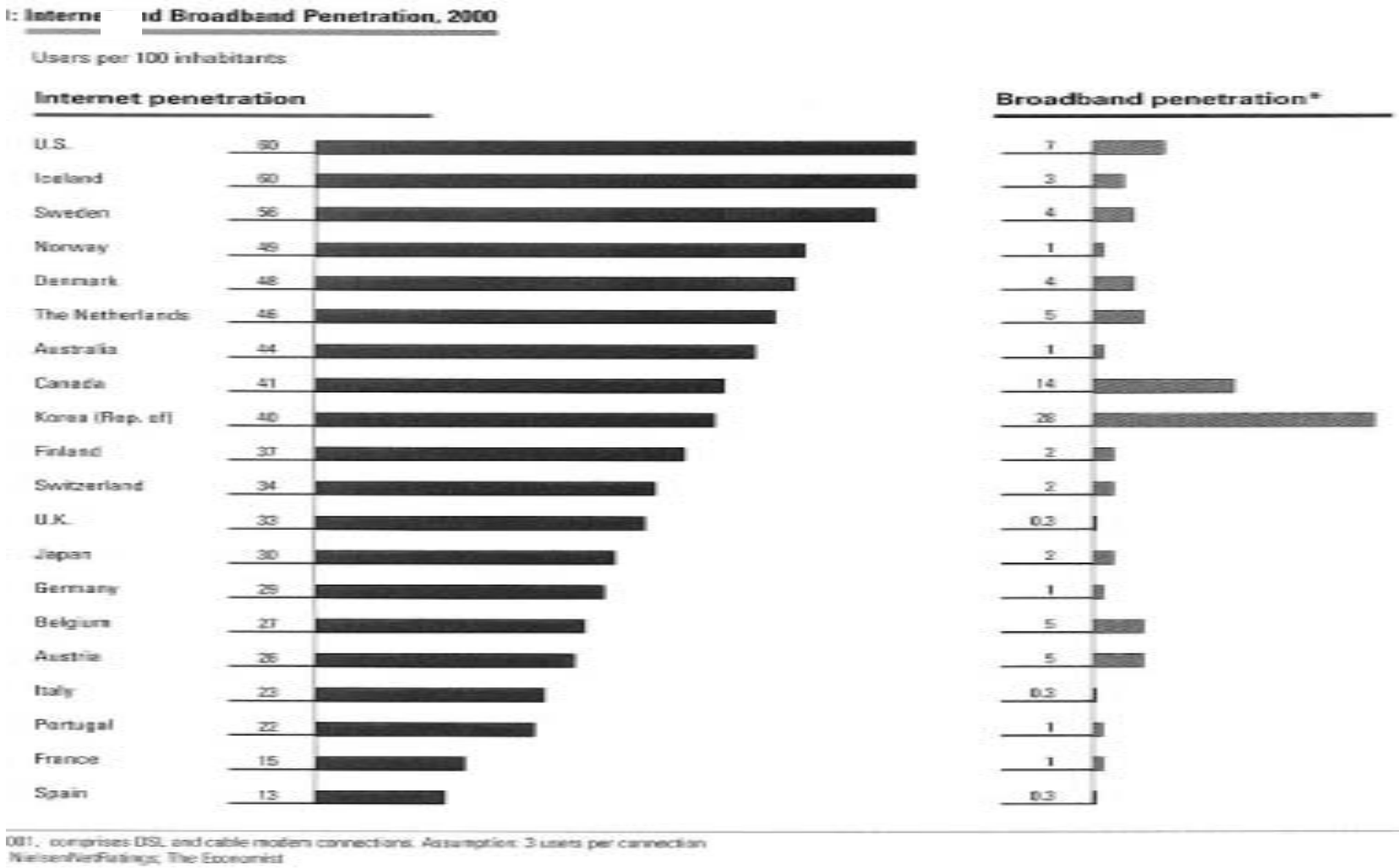
Source: ***Global Reach, Internet Statistics***

NETWORK ACCESS SPEED

Connectivity Speed in Selected Countries of Latin America (Source: Harte-Hanks CI Technology Database, 2001)

Countries	Organizations with Access > 56 Kbps
Mexico	42%
Peru	39%
Chile	37%
Brazil	33%
Argentina	31%
Colombia	31%
Venezuela	27%
Ecuador	22%
Regional Average	35%

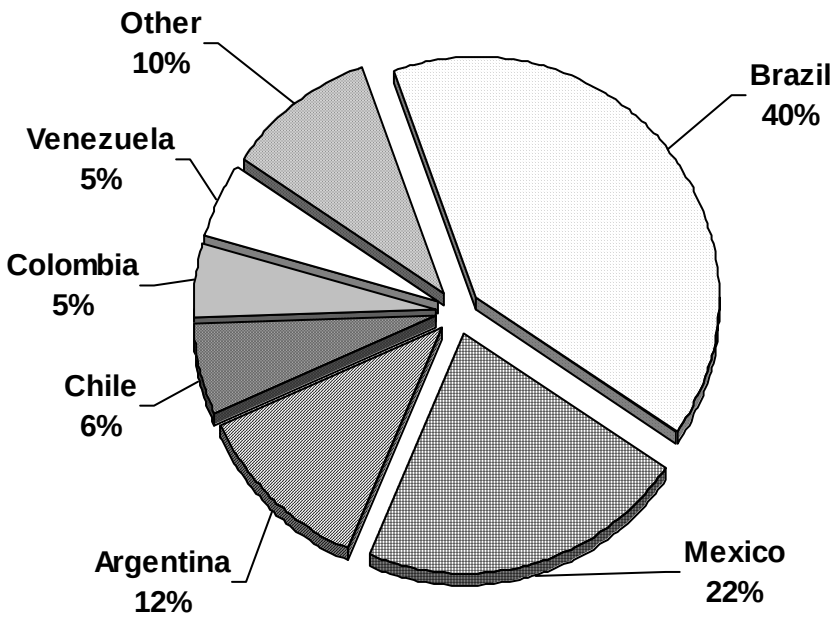
DEVELOPED COUNTRIES / BROADBAND PENETRATION



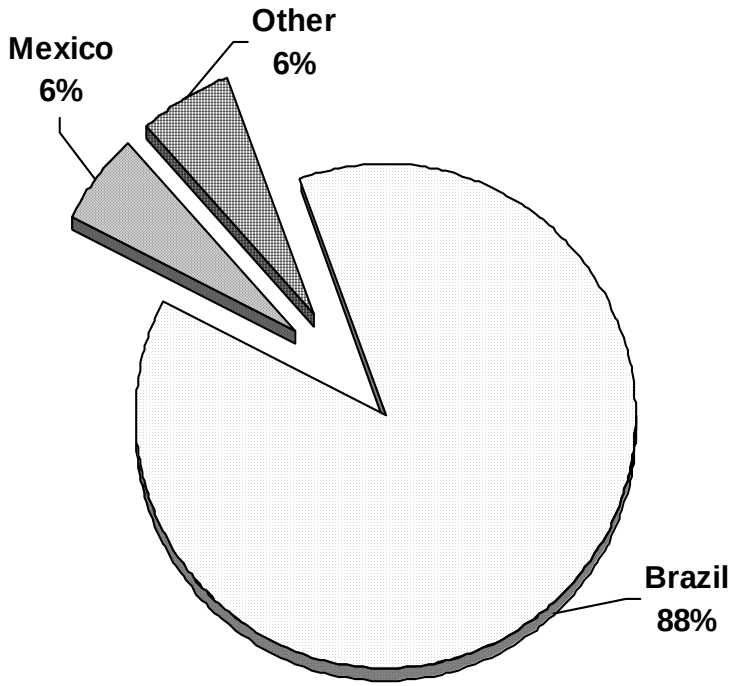
001., comprises DSL and cable modem connections. Assumption: 3 users per connection
NielsenNetRatings; The Economist

E-MARKET IN LATIN AMERICA

SHARE OF REGIONAL e-MARKET

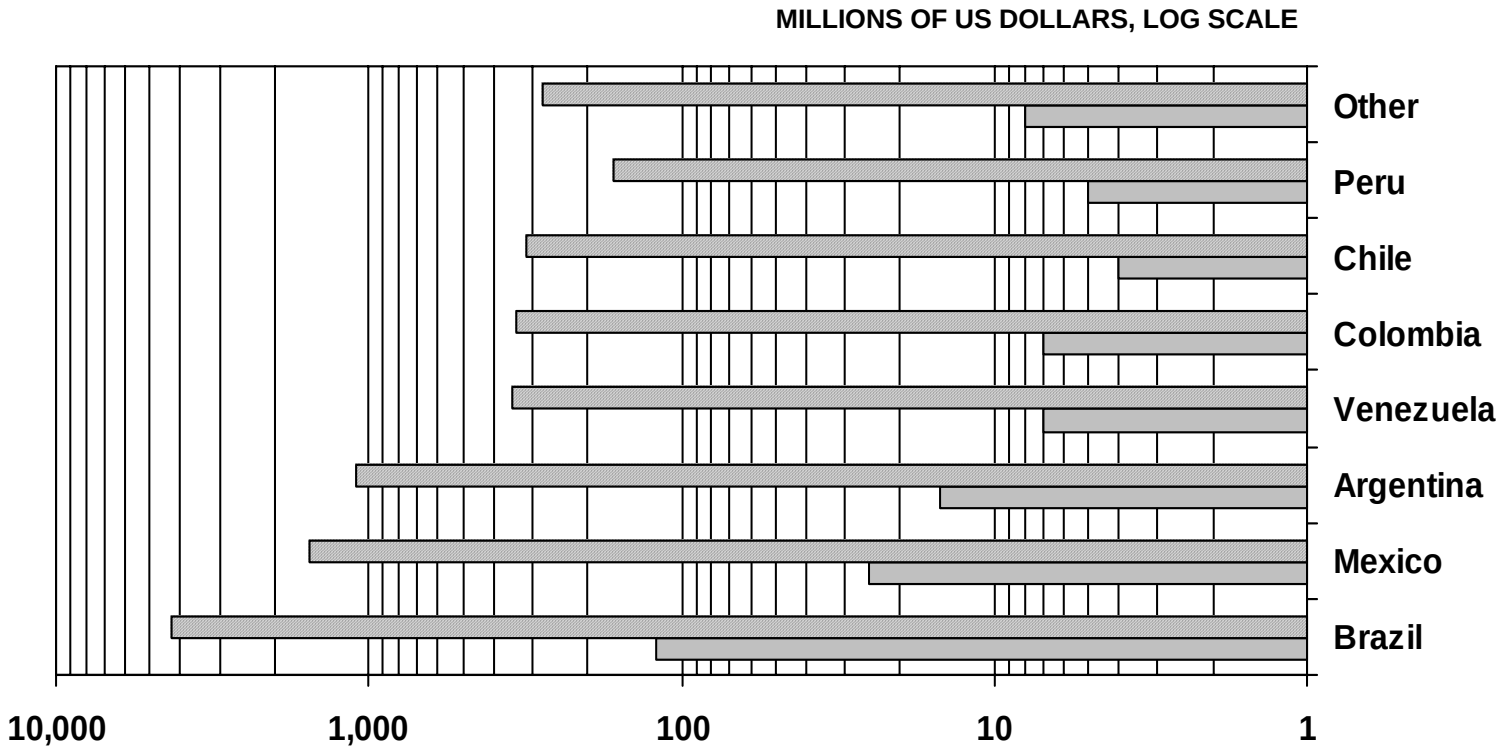


PERCENTAGE OF e-COMMERCE SPENDING



Source: www.xplane.com, 2000

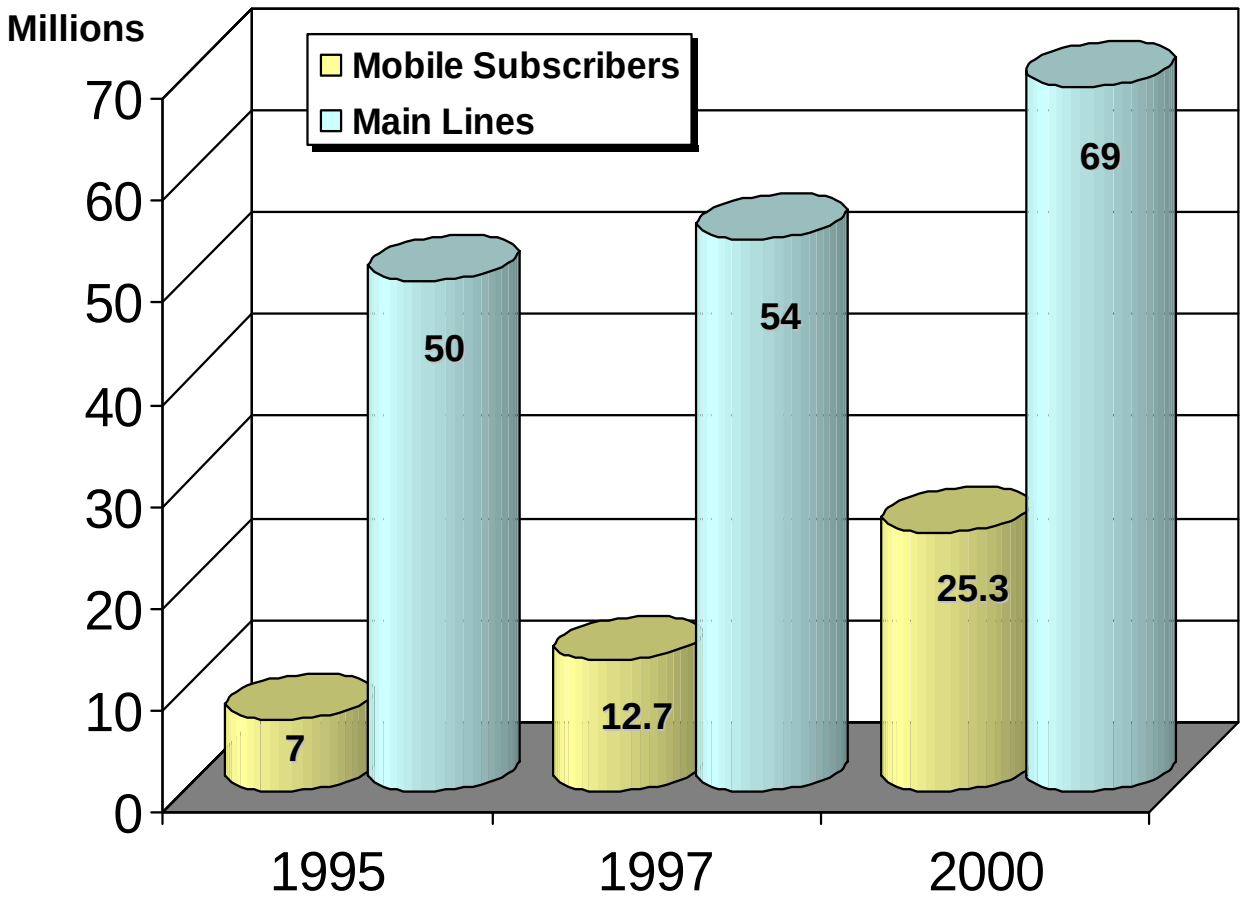
E-MARKET IN LATIN AMERICA



	Brazil	Mexico	Argentina	Venezuela	Colombia	Chile	Peru	Other
2005	4,256	1,542	1,094	348	336	312	164	277
1999	121	25	15	7	7	4	5	8

Source: www.xplane.com, 2000

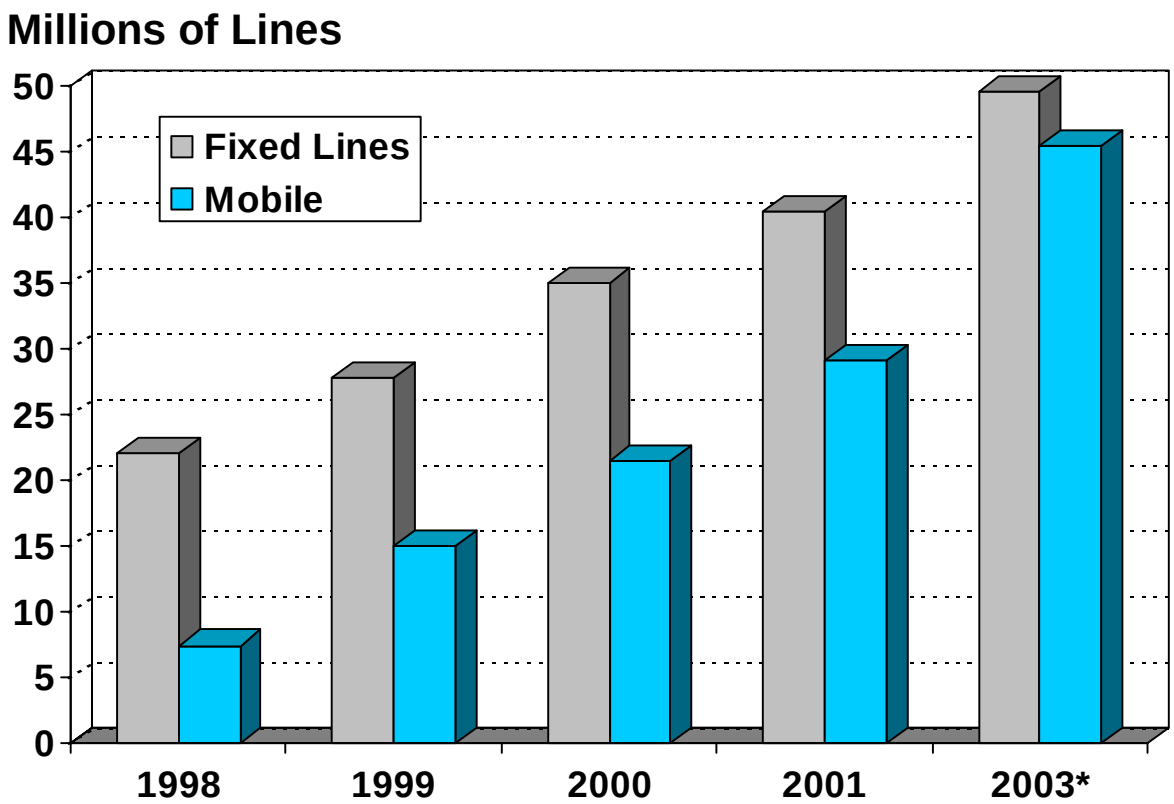
LATIN AMERICAN AND CARIBBEAN TELECOMMUNICATIONS MARKET



Source: International Telecommunication Union, Jan 2000

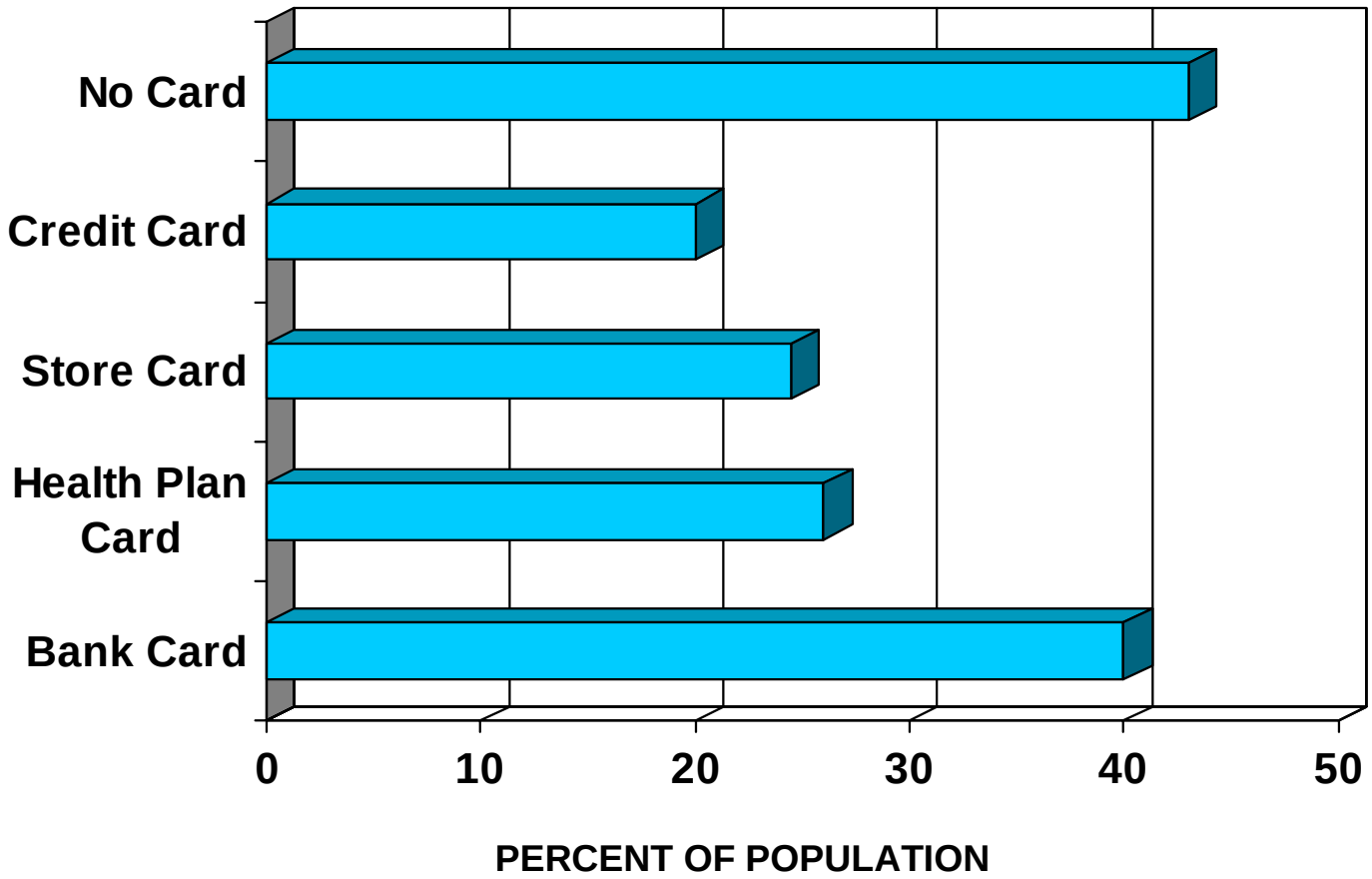
TELEPHONY INSTALLATION - BRAZIL

Privatization of Telecommunication Markets have Resulted in Expansion of Infrastructure - In Brazil, in a Period of Four Years the Telephony Density Increased from 13.6 Fixed and 4.5 Mobile Lines per 100 People to 28.5 and 26.2 Respectively



Source: ANATEL, 2000

BRAZIL - MAGNETIC/BAR CODE/SMART CARD USE



Source: *Ministry of Health, Brazil (1999)*

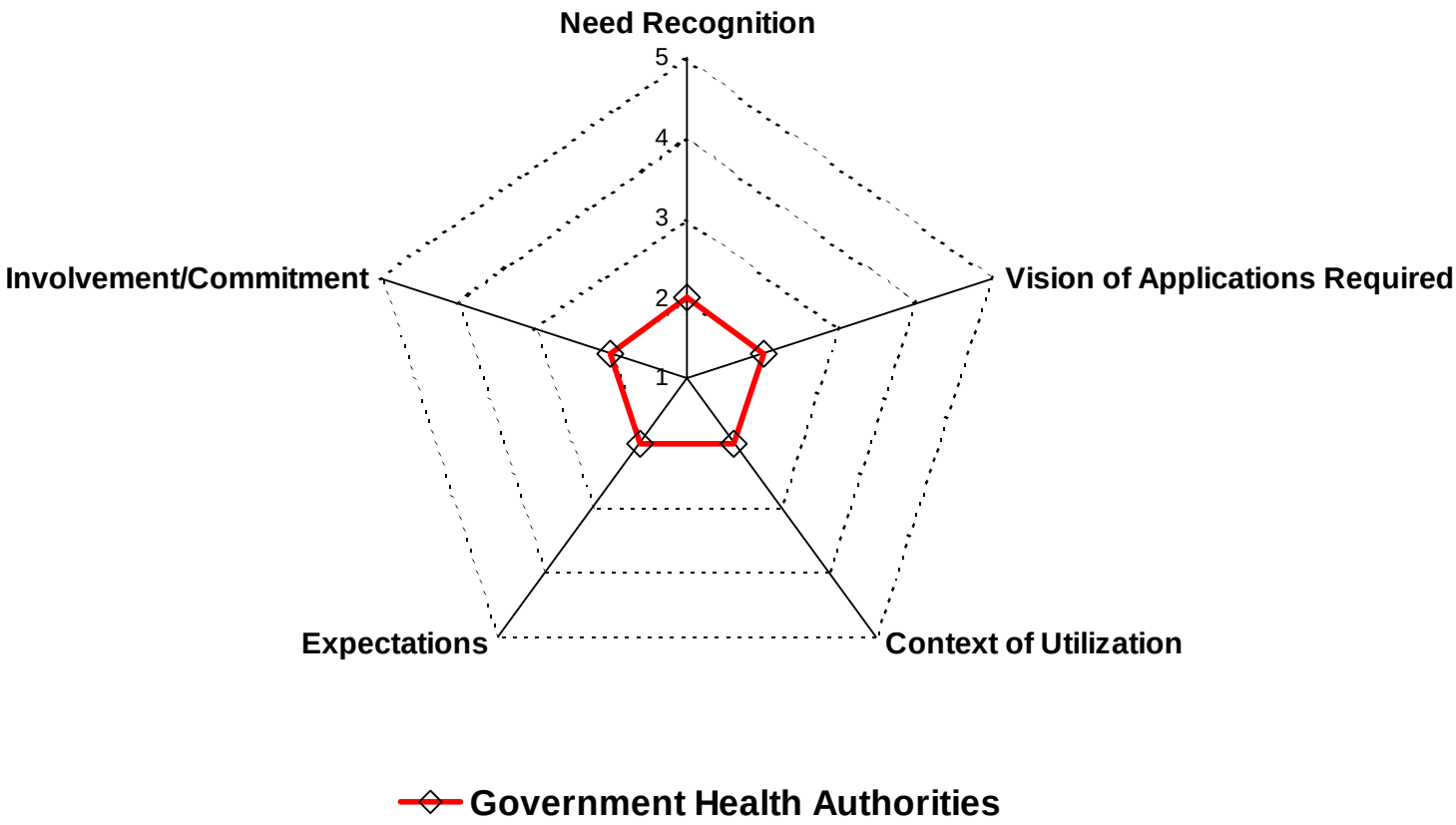
- DRIVING FORCES AND BARRIERS
- HEALTH SECTOR CHARACTERISTICS
- ICT INFRASTRUCTURE AND MARKET
- **IMPLEMENTATION ISSUES**

EXPERIENCES IN LATIN AMERICA & THE CARIBBEAN

- MANY *UNCOORDINATED* PRIVATE AND PUBLIC SECTOR INITIATIVES
- MAJOR *PUBLIC SECTOR PROJECTS*
  (ARGENTINA, BRAZIL, CHILE, COSTA RICA, CUBA, MEXICO, PERU)
- POORLY *ALIGNED* TO INSTITUTIONAL GOALS, IMPROVEMENT OF HEALTH AND EXPECTATIONS OF PROVIDERS, CLIENTS, PAYERS, AND REGULATORS
- *SUMMIT OF THE AMERICAS 1996 AND 2000, FLORIANÓPOLIS (2000), BRASÍLIA (2000), RIO GROUP/EUROPEAN UNION (2001)*

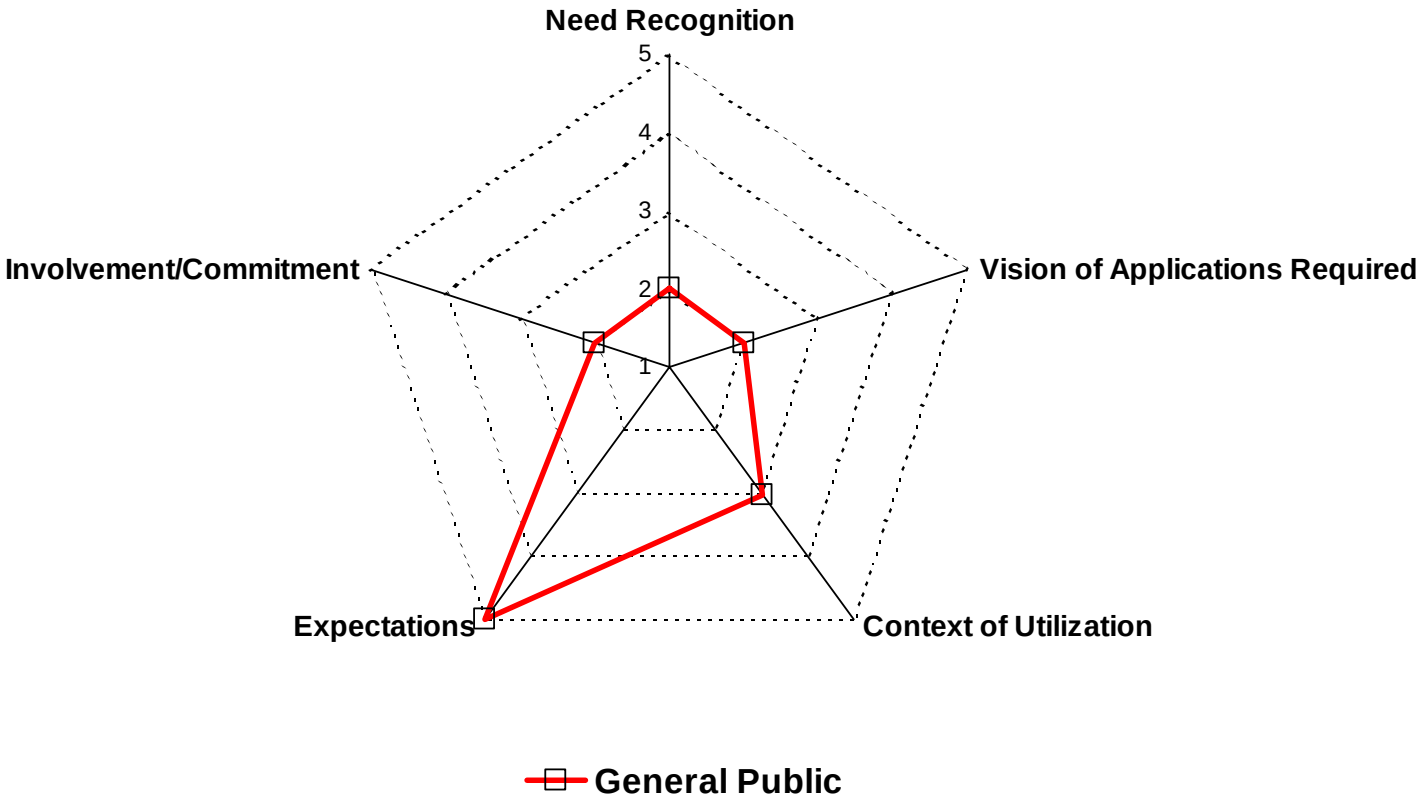
STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Constrained by statistical / epidemiology paradigm
Vision of Required Applications	Highly aggregated data of mortality, morbidity, and utilization
Context of Utilization	Lagging behind all other sectors
Expectations	Uninformed regarding ICT opportunities
Involvement and Commitment	Lack of continuity and sustainability Staff not engaged



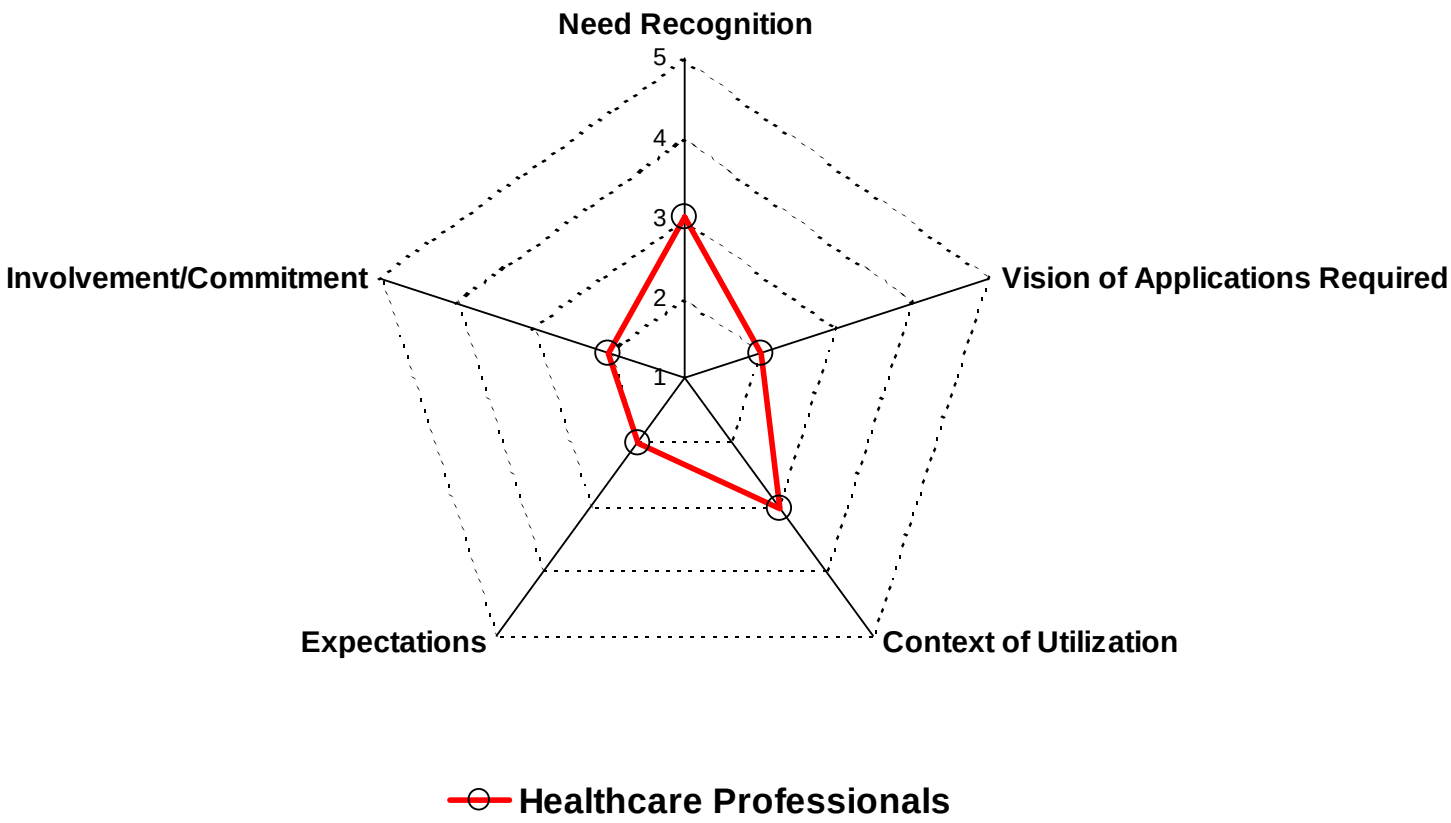
STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Focus on personal health needs and beliefs
Vision of Required Applications	Poor recognition of interactions and limited recognition of managerial applications
Context of Utilization	Big picture lacking
Expectations	Excessive expectations
Involvement and Commitment	Economic, cultural and educational barriers



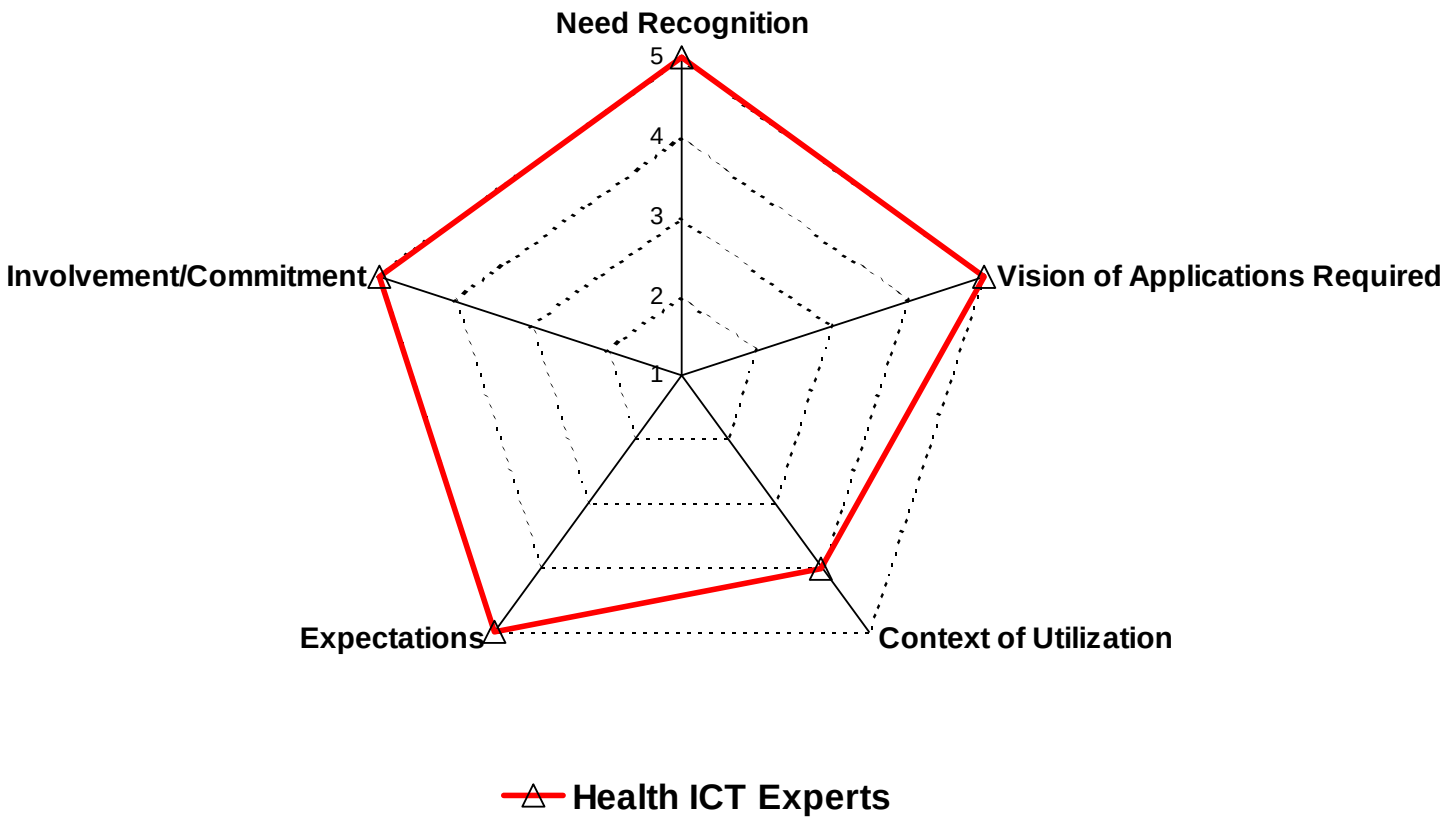
STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Focus on specialized clinical applications or utilization niches
Vision of Required Applications	Poor recognition of interactions and limited recognition of managerial applications
Context of Utilization	Big picture lacking
Expectations	Skeptical and uninformed regarding ICT opportunities
Involvement and Commitment	Passive and poorly engaged



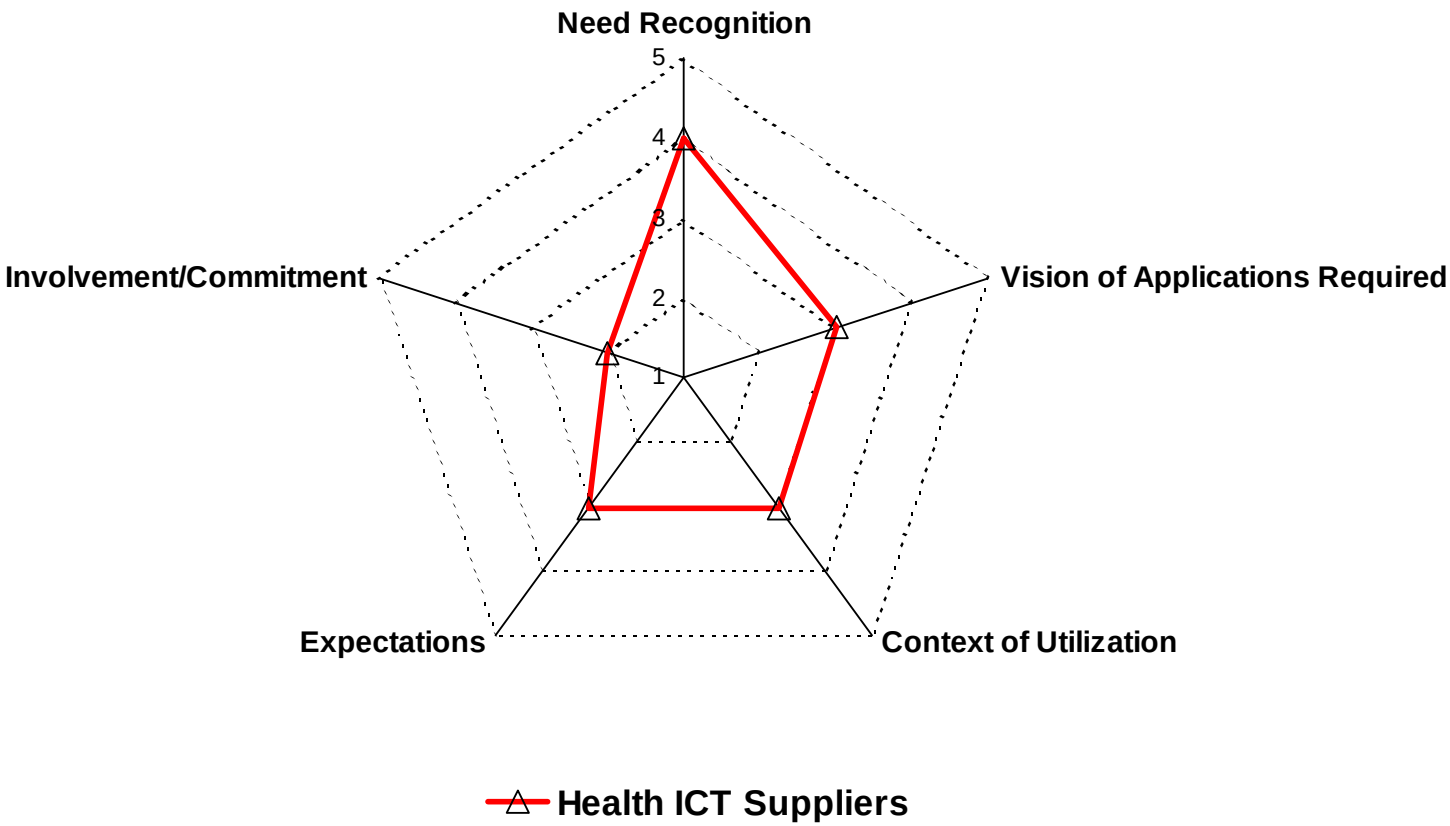
STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Clear and balanced perspective
Vision of Required Applications	Excellent recognition or requirements
Context of Utilization	Understand the complexity of needs
Expectations	Most vocal and optimistic
Involvement and Commitment	Drivers for adoption



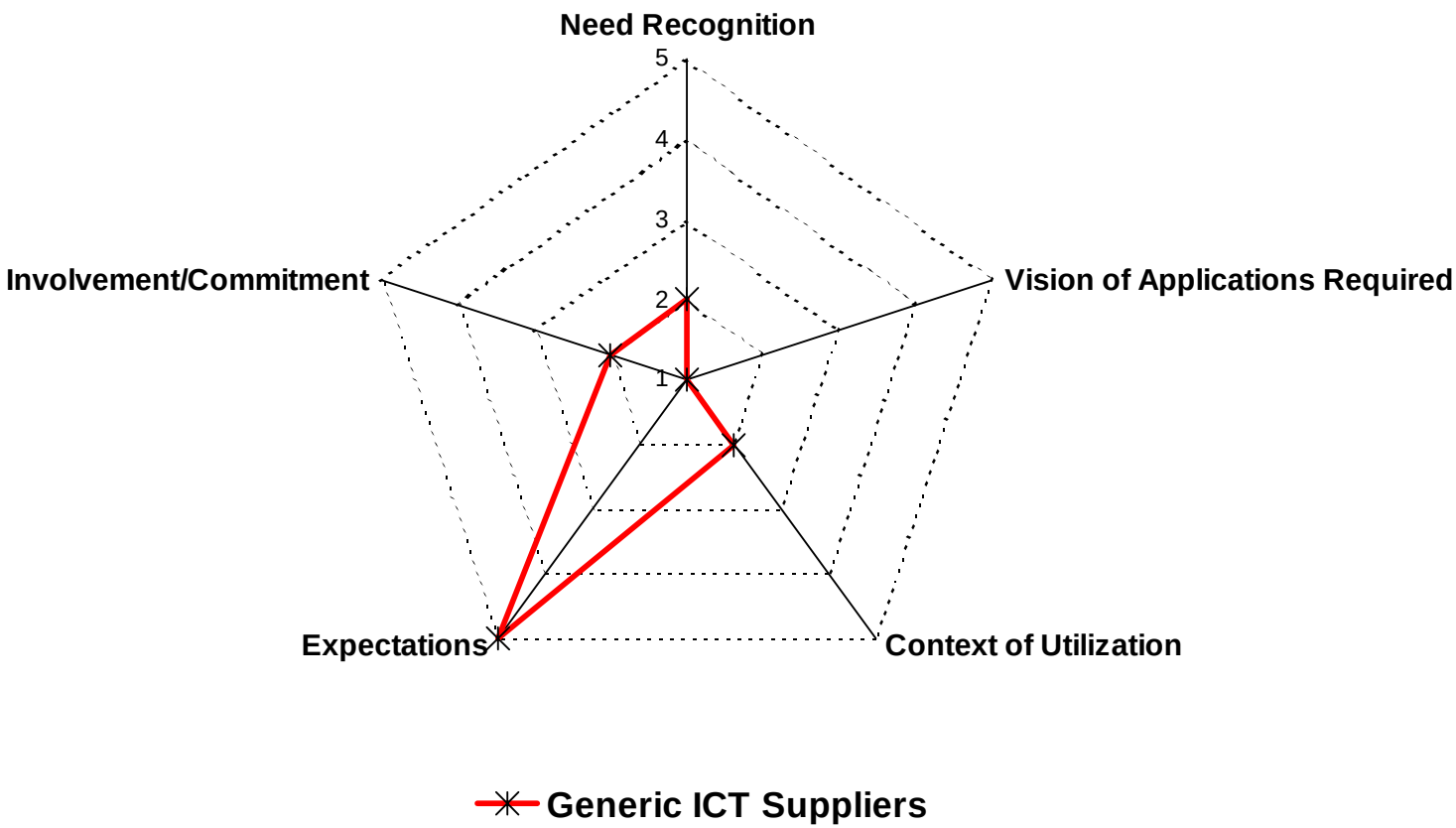
STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Feel restricted due to lack of broad understanding of needs
Vision of Required Applications	Commercial interest directs promotion of own products and services
Context of Utilization	Underestimate complexity of health products
Expectations	Pessimistic regarding progress in next 5-10 years
Involvement and Commitment	Do not see health market as providing return on investment



STAKEHOLDERS HAVE DIFFERENT PERSPECTIVES AND MOTIVATIONS

Need Recognition	Fail to distinguish between clerical, administrative, and clinical processes
Vision of Required Applications	Perceive applications as commodities supporting standardized processes
Context of Utilization	Poor understanding on how health systems operate
Expectations	Optimistic as result of e-Commerce and other sectors adoption of ICT
Involvement and Commitment	Drivers for adoption



IMPLEMENTATION IN LATIN AMERICA & CARIBBEAN (1)

- ***RELIABILITY OF SERVICE*** **DEPENDENT ON QUALITY OF NETWORK AND INFORMATION TECHNOLOGY INFRASTRUCTURE**
- **ELECTRONIC TRANSACTIONS REQUIRE SUBSTANTIAL AMOUNT OF *DETAILED OPERATIONAL INFORMATION* BEFORE AN "E-ARCHITECTURE" CAN BE EFFECTIVELY IMPLEMENTED**
- **TECHNOLOGICAL *BEGINNING-TO-END SOLUTION*, LINKING DIFFERENT PLATFORMS, LEGACY AND PROPRIETARY SYSTEMS INVOLVING PROVIDER, INSURER, PAYER, PATIENT AND EMPLOYER DATA**
- ***ORGANIZATIONS AND PROVIDERS WITH COMPUTERIZED INFORMATION SYSTEMS*** **IN PLACE, MUST FIGURE OUT HOW TO LINK INTO THE NEW APPLICATIONS, INCORPORATE ITS LEGACY SYSTEMS, OR START ANEW**

IMPLEMENTATION IN LATIN AMERICA & CARIBBEAN (2)

- ***INFRASTRUCTURE*** **AND** ***"PREPAREDNESS": ANALOG/DIGITAL DIVIDES*** **ARE CONSEQUENCE OF INEQUITIES THAT MUST BE BRIDGED**
- ***INCENTIVE THROUGH REGULATION***
- **MECHANISMS AND PROCESSES FOR** ***CONSENSUS*** **AND ACTION WITH** ***HIGH-LEVEL POLITICAL SUPPORT***
- ***LEADERSHIP*** **AND CONTINUITY AND SUSTAINABILITY OF** ***INVESTMENT***
- ***BEST PRACTICES, AVOIDANCE OF REDUNDANCIES*** **AND AVOIDANCE OF** ***DOWNSIDE ASPECTS OF POWER CONCENTRATION***
- ***RETURN ON INVESTMENT*** **THAT JUSTIFIES CAPITAL INVESTMENT AND OPERATIONAL COSTS**

IMPLEMENTATION IN LATIN AMERICA & CARIBBEAN (3)

- ✓ **GROWING MARKET WITH *GREAT POTENTIAL* BUT *IDENTIFICATION OF OPPORTUNITIES AND MARKET DEVELOPMENT MAY BE A LONG AND DIFFICULT PROCESS***
- ✓ **E-HEALTH DEVELOPMENT NEEDS *INTEGRATION* OF TECHNOLOGY, GEOGRAPHY, CULTURE, LANGUAGE, AND….HEALTHCARE SYSTEMS**
- ✓ ***NO SINGLE "COOKBOOK" OR "TRANSLATED" SOLUTION***
- ✓ ***COST-EFFECTIVE* AND *COUNTRY-DIFFERENTIATED* SOLUTIONS**
- ✓ **PROACTIVE ROLE OF THE *INTERNATIONAL COMMUNITY***
  - **G-8 Digital Opportunity Task Force (Okinawa Charter)**
  - **U.N. Health InterNetwork Initiative**
  - **World Bank InfoDev**
  - **U.N. Economic and Social Council (ECOSOC)**
  - **U.N. ICT Taskforce**

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