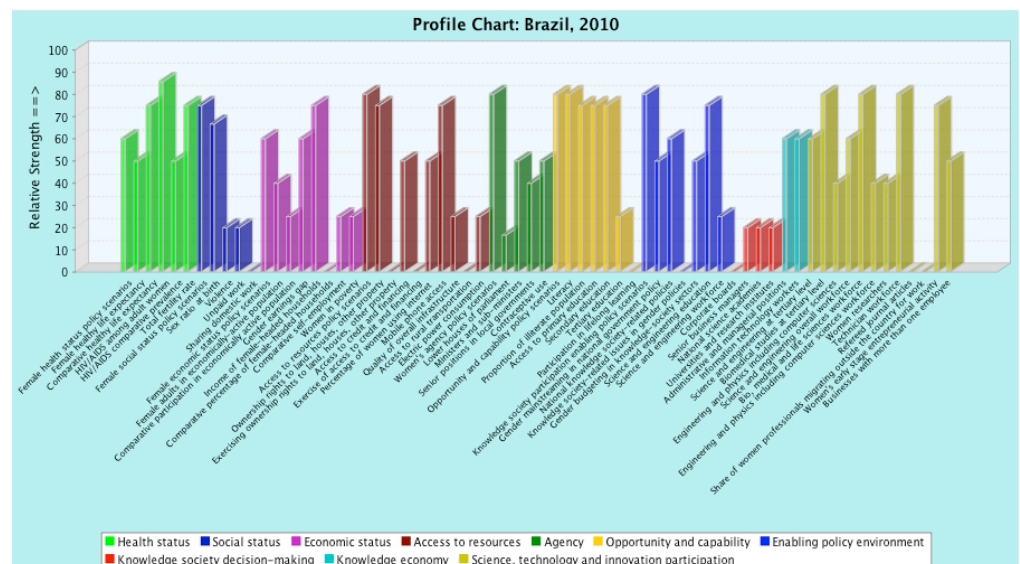
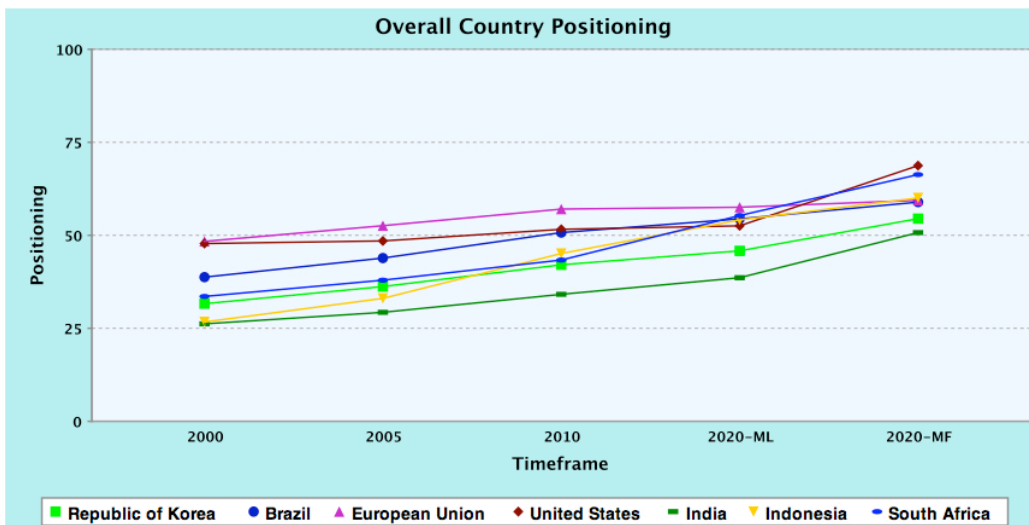


# National Assessments on Gender and Science, Technology and Innovation (STI)

## Scorecard on Gender Equality in the Knowledge Society

### Overall Results, Phase One



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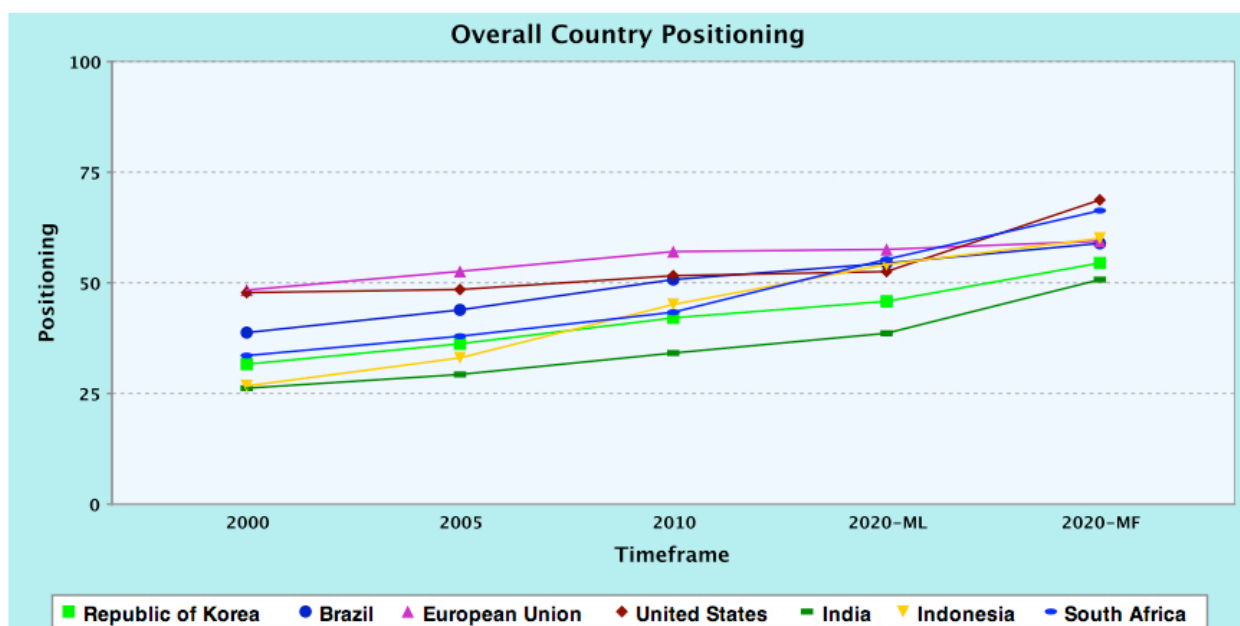
women in global science & technology

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## Overall Results



The **European Union** as a composite ranks first overall, and first or second in every dimension, except opportunity and capability. This is a remarkable result, considering the wide variation among countries in the EU in terms of social support, GDP, and promotion of STI.

The **United States** ranks second overall, but 5th in health, agency, social status. Its high status overall comes from its primary ranking in the opportunity and capability and the knowledge society decision-making dimensions – educational levels of women and positions in private sector and science decision-making levels. It comes in second in economic status and access to resources. The US ranks lowest in enabling policies. While it ranks higher in other sectors, this finding indicates that a more favourable policy environment for the US could be an important strategy towards addressing economic competitors in other parts of the world and a strategy for regenerating economic growth after the economic crisis of 2010.

**Brazil** ranks the highest of the remaining countries, coming in above even the Republic of Korea. It is third overall, first in women's participation in science, technology and innovation, second in health, and third in social status and access to resources. However its low ranking (5th) in opportunity and capability, and knowledge society decision-making show where improvement needs to be made. Brazil is an example of a country with both a highly enabling policy environment for women, as well as implementation strategies.

Although **Indonesia** comes out fourth overall, its actual status is not clear as a result of a paucity of available statistics on the situation of women. Of the countries in this study, Indonesia collects the least sex-disaggregated data, with data unavailable for many of the indicators. Its positive enabling policy environment, though, gives it a strong potential for a positive outcome for women that would be clearer if supporting data were available. The available data gives it a fourth ranking in most sectors, which reflect a steady improvement over the last decade<sup>1</sup>, however current levels of economic status, access to resources, agency, health and social status indicate a need to improve the actual status of women in the country.

**South Africa** ranks fifth overall but first in agency. It ranks highly (#3) in social status, science, technology and innovation participation, and knowledge society decision-making. This is likely a result of a strong educational system, a policy focus on STI, as well as a quota system implemented in various sectors of society to promote diversity of participation by race and gender. Its high rate of HIV in the population puts it last in health, while it ranks fifth in access to resources.

<sup>1</sup> Lack of data for many indicators means that Indonesia's ranking may change as more data and expert analysis are incorporated into the national assessment.

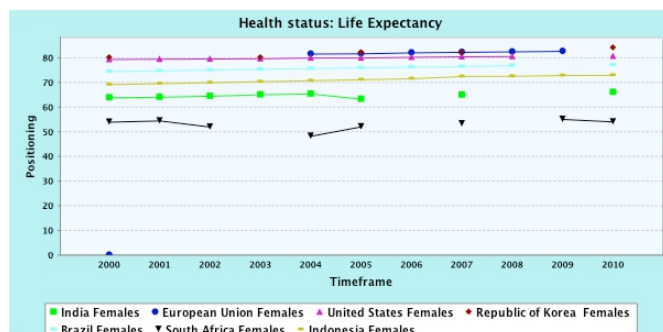
**Republic of Korea** – While it ranks first in health it is last in economic status, and second to last overall. This reflects the situation that even though it ranks third in opportunity and capability – that is, in the levels of females in STI education and in access to resources, it sees a low level of female participation in public life in both public and private sectors. This shows the country has failed to adequately support its women to participate actively in its economic success. It also shows the lack of correlation between a country's GDP and gender equality.

**India** ranks the lowest overall and in most categories, except in economic status; science, technology and innovation participation; and health. While its enabling policy environment is very positive and has been in place for many years, implementation and funding needs to improve greatly before its women can equally benefit from its innovation advantage. There are definite signs of progress, though. It has achieved universal primary education enrollment for example. However, size of the population mitigates against a rate of change as rapid as a country such as Indonesia or Brazil.

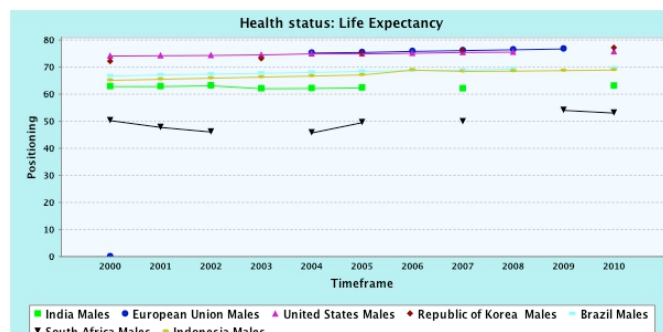
# Scorecard on Gender Equality in the Knowledge Society

## 1. Health Status

### Life expectancy - females

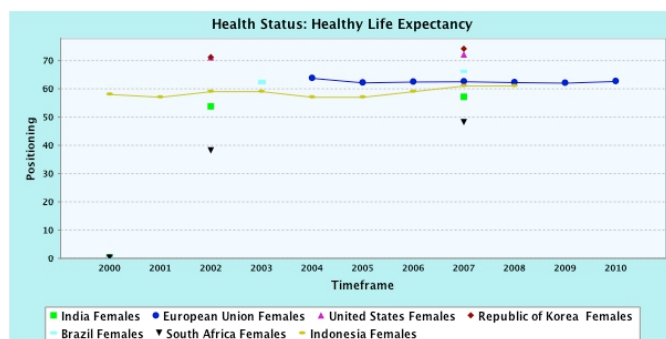


### Life expectancy - males

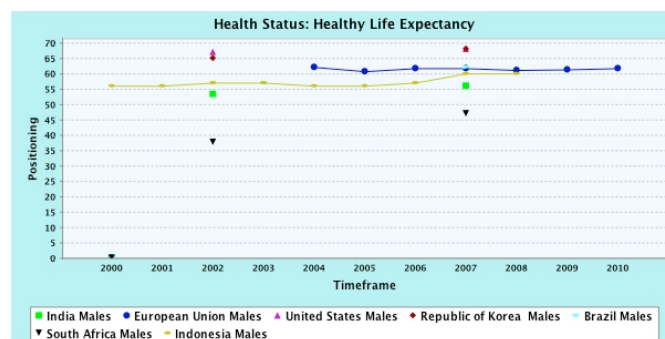


As expected, women live longer than men in all the countries covered. The prevalence of HIV/AIDS leaves both South African males and females with the lowest rates of life expectancy. Korean women are the longest living of any group surveyed—three full decades more than women in South Africa. Women live nearly 10% or more longer than men in the EU (11.3%), Brazil (10.8%) and South Korea (9%).

### Healthy life expectancy - females

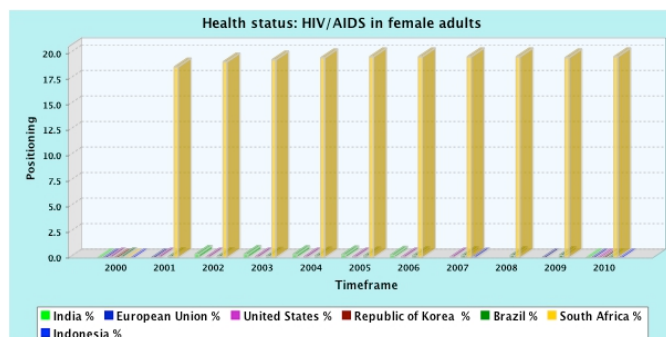


### Healthy life expectancy - males



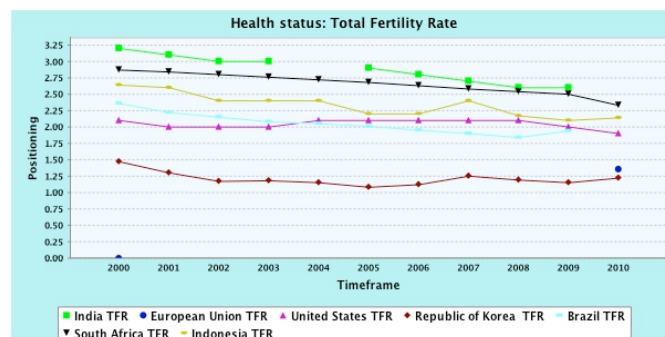
Healthy life expectancy is the average number of years that a person can expect to live in "full health", that is, excluding the years affected by disease and/or injury. HLE numbers are lower by 10-20 years. Differences between women and men are smaller, less than a year in South Africa up to six years in South Korea. South Korean woman are also the healthiest overall.

### HIV/AIDS in female adults



As the statistic measures the prevalence of HIV/AIDS in all adult women, the figure is not high for most countries, except South Africa where it is an alarming 19.7%. Nevertheless, even though in India the figures are below the point of concern of <0.1%, they are significant (though falling) because of the size of the affected population – nearly one million women. Little sex-disaggregated data is available on new infections, an important indicator in targeting at-risk groups.

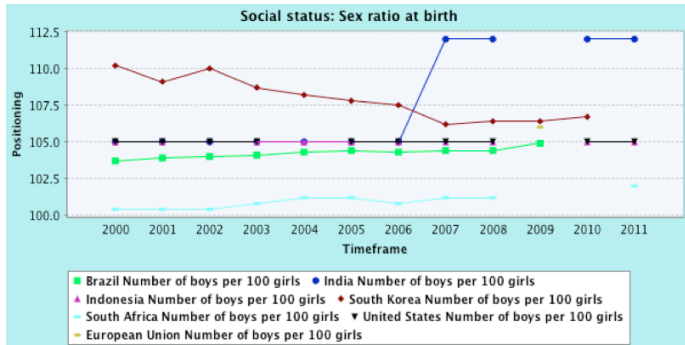
### Total fertility rate



Falling fertility rates correlate with increased female education and labor force participation as well as improved health. Only in India, Indonesia and South Africa are fertility rates above population replacement level. Notably, rates are falling in these three countries and do not exceed 2.6 (with India the highest) in any.

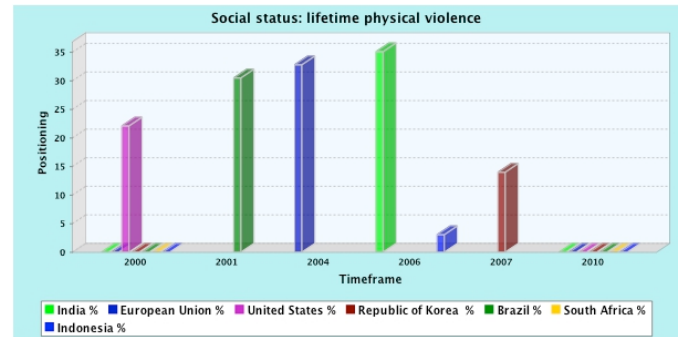
## 2. Social Status

### Sex ratio at birth



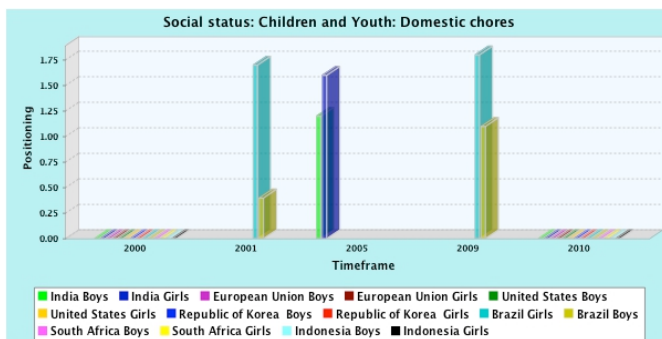
The current worldwide sex ratio at birth is 107 boys to 100 girls. Only India, at 112, had a sex ratio higher than the worldwide ratio of 107:100. All other countries fell below the worldwide ratio, at approximately 105. South Korea was at 106.7 in 2011, having decreased every year from 110.2 in 2000.

### Lifetime physical violence



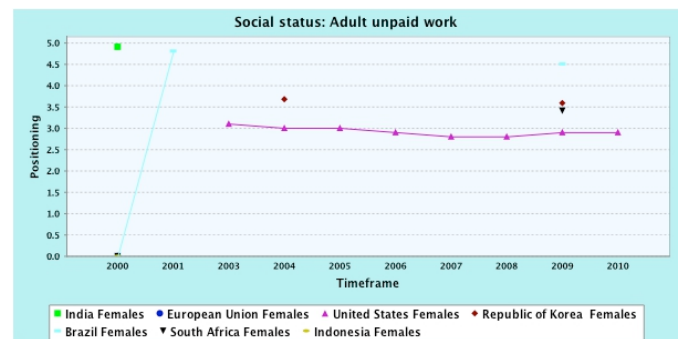
Falling fertility rates correlate with increased female education and labor force participation, as well as improved health. Only in India, Indonesia and South Africa are fertility rates above population replacement level. Notably, rates are falling in these three countries and do not exceed 2.6 (with India the highest).

### Children and youth domestic chores (hours)



While sex-disaggregated data are scarce – only Brazil and India collect it at the national level – this important indicator shows that in those countries reporting data, girls are expected to contribute greater amounts of time to domestic chore than boys, in Brazil, 1.8 vs 1.1 hours per day, and in India, 1.6 vs 1.2.

### Adult unpaid work

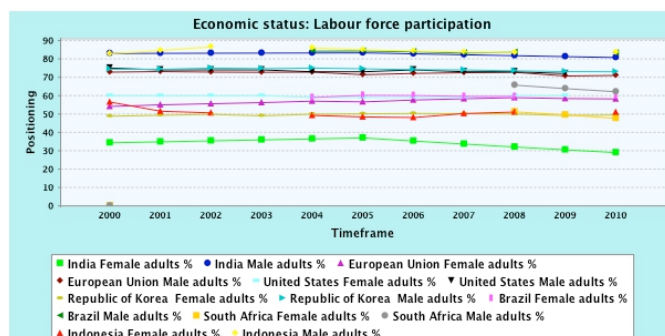


In general, women spend more hours in unpaid work than men. The exception was Brazil where men (with two years data) worked 6.4 hours compared to 4.5 for women. In Korea (where women are a smaller percentage in the paid labor force than in other countries except India), women spent 3.68 hours per day, compared to .68 for men. In South Africa women worked 2 1/3 times more and in the US, twice the number of hours for men.



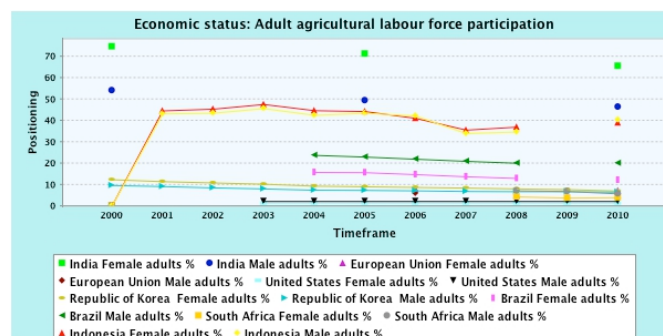
### 3. Economic Status

#### Labour force participation



India has the lowest female-to-male labour force participation ratio at 35.9%, with substantial drops in this ratio over the decade (5% for India, 7% for Indonesia). This may be the result of more women returning to school, higher unemployment among women or more women dropping out of the labour force. The US (83.3%) and EU (82%) show the highest ratio of women to men in the labor force and the biggest gains over the decade. This may indicate that women's employment suffered less from the recent economic crisis. The ratio for Korea was quite high at 67.8% (although low by standards of high income countries). Women's labourforce participation rate is falling in India, South Africa and Indonesia, while in the EU it is growing fast and in Korea, Brazil and the US is comparatively stable. Overall rates for women alone are lowest, again, in India (29%) and highest (at the same level) in Brazil and the US (60%).

#### Agricultural labour force



India sees by far the highest percentage of both men and women in agriculture than any other country, with substantially more women working in this sector – 65% compared to 42% for men. Figures for both men and women are falling, though, reflecting global trends. In Indonesia, agriculture remains a dominant employment sector, with numbers in the 40% range for both men and women. As a high-income industrialized country, 7% of both men and women in Korea work in agriculture, a drop of nearly 50% for women over the decade. Brazil shows a relatively high percentage of both men and women (about 16% overall). South Africa's figures were surprisingly low for both men and women, showing the remnants of apartheid and the effects of labour migration. The overall percentage of men and women is small (3.8% and 5.6% respectively) and falling rapidly. The US and EU show the lowest percentage, with one percent of women and two percent of men.

### 4. Access to Resources

#### Property ownership policies; land; bank loans

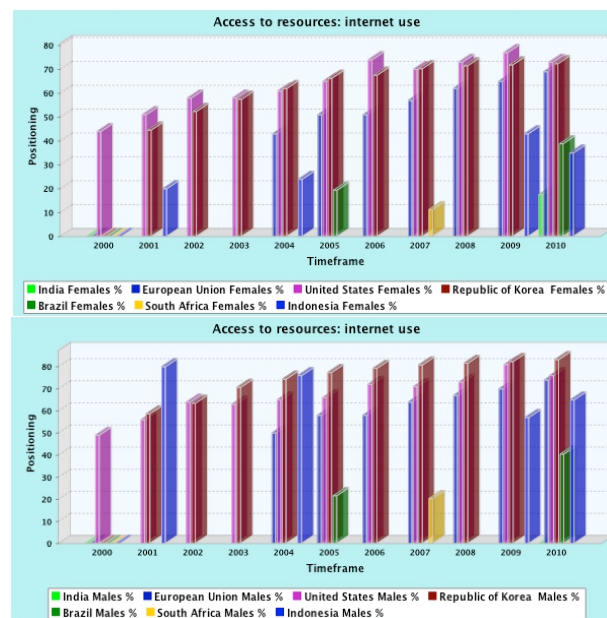
Percentage of women age 15-49 who have a bank or savings account of their own

	Wealth Quintile					Total
	1st	2nd	3rd	4th	5th	
<b>Education</b>						
None	3.4	6.6	9.3	13.1	17.3	7.5
0-4 years	4.1	7.0	10.4	17.0	23.9	11.0
5-9 years	4.8	7.0	10.5	14.4	24.0	13.6
10-11 years	8.1	12.0	12.7	18.9	29.5	22.3
12+ years	16.7	18.2	20.7	26.6	47.3	40.9
<b>Employment</b>						
None	3.0	5.3	8.1	12.5	28.1	14.2
Cash	4.7	9.8	15.0	26.8	56.9	19.7
Non-cash	3.3	6.8	9.9	16.7	27.9	9.0
<b>Total</b>	3.7	7.1	10.5	16.3	33.6	15.1

Source: <http://hetv.org/india/nfhs/index.html>

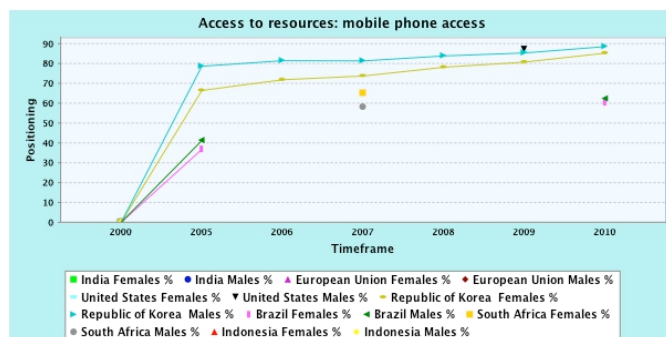
Access and ownership to resources allows women to leverage investments, make decisions about allocation of resources, access credit and financing, and exercise personal decision making power. Currently there is a lack of data in this area. Most countries under study have policies in place which do not necessarily extend to practice. For example, in India women have had the right to own property and take out bank loans for many years, but often do not have the opportunity to exercise these rights. Overall, only 15% of women have bank accounts.

#### Internet use



Internet use is a key indicator of the knowledge society. Results show more males have internet access than females in every country collecting sex-disaggregated data. Isolated data exist for Brazil, India and South Africa, with internet use for both males and females remaining below 50%.

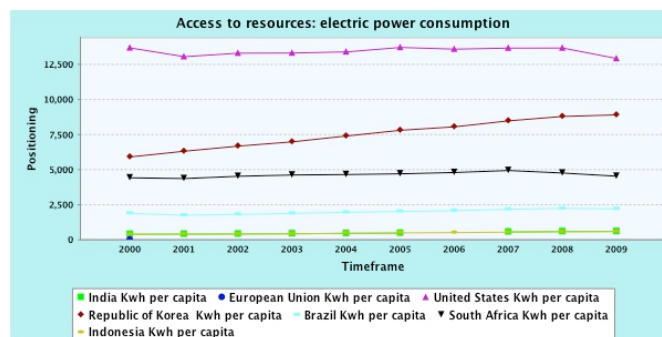
## Mobile phone access



Access to mobile phones is important for entrepreneurship and market activities, e-banking. It also indicates autonomy of women in some cultures, relating to issues of ownership vs. access to the technology. Cell phones are cheaper, more accessible, portable and use less energy than computers – as a result, mobile use should be more universal. However we continue to see gender-based differences in access, including in the more developed countries – US and Republic of Korea.

There is a lack of reliable, sex-disaggregated data for South Africa, India, and Indonesia.

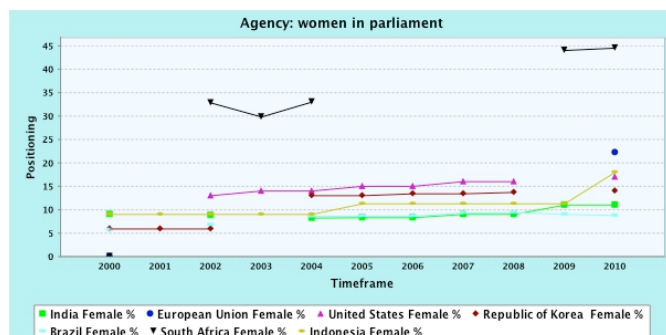
## Infrastructure: electricity and transportation



Little data exist on women's use of and access to infrastructure such as electricity and transportation, a base condition for STI. Electricity and clean and affordable energies allow women to engage in tasks other than obtaining energy for cooking and domestic chores; free up girls to attend school and have fewer detrimental health effects. It is an important precursor for enterprises and employment, for women as well as men: research on the effects of rural electrification on employment in South Africa, found raises female employment within 5 years. Transportation issues involve travel to and from the workplace; security and freedom of movement; and ability to transport goods.

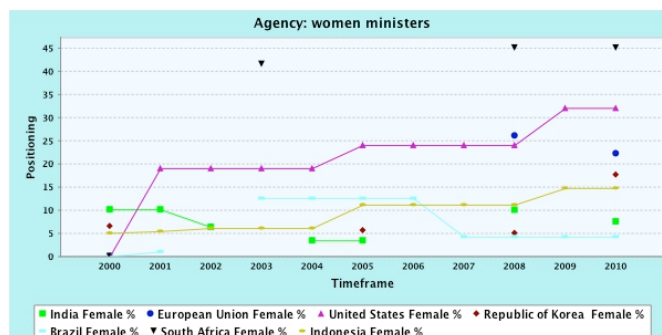
## 5. Agency

### Women in parliament



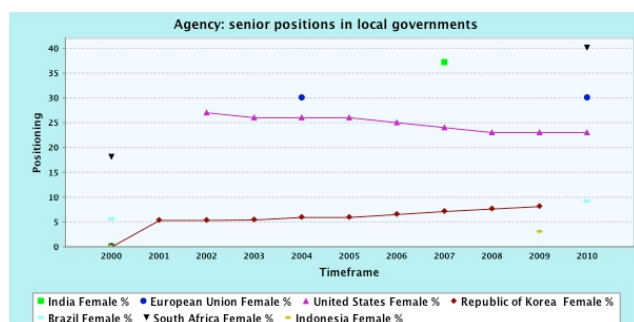
The percentage of female members of lower houses of parliament. South Africa shows by far the highest numbers, moving from one-third earlier in the last decade to almost one half by the end of the decade. Brazil is the lowest at 9.4 percent or less. All of the other countries show low numbers as well, from 11 to 18%. On the positive side, all are showing increases.

### Women ministers



The percentage of government ministers and sub-ministers that are female. South Africa again shows by far the highest ratios, with nearly half of ministerial and sub-ministerial positions held by women. The US did much better in appointed high-level positions than in elected ones, with one-third of cabinet-level positions held by women at the end of the decade. Brazil, India, and Korea remained almost entirely in the single digits. Indonesia showed improvement, with an increase from 5 to 15% over the decade.

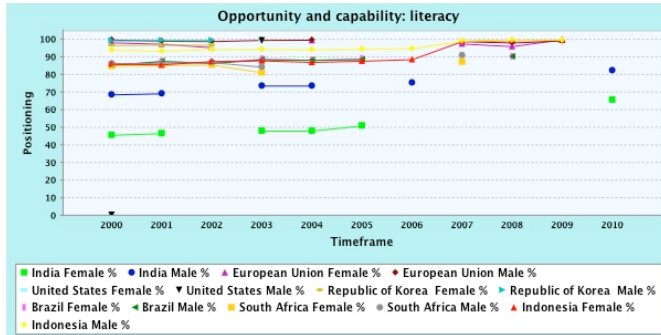
### Senior positions in local governments



As seen here, of the countries under study, only Brazil, the US and the Republic of Korea consistently collect sex-disaggregated data in this area. This is unfortunate, as it is an important indicator – we know from isolated and anecdotal evidence that women are more highly represented at lower levels of government.

## 6. Opportunity and Capability

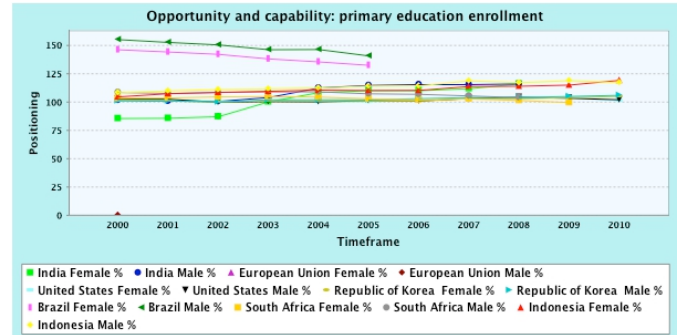
### Literacy



Literacy is an obvious first step in education and indicates the level of functioning in non-educational contexts. This has implications for daily life activities and livelihoods or production activities outside of the household.

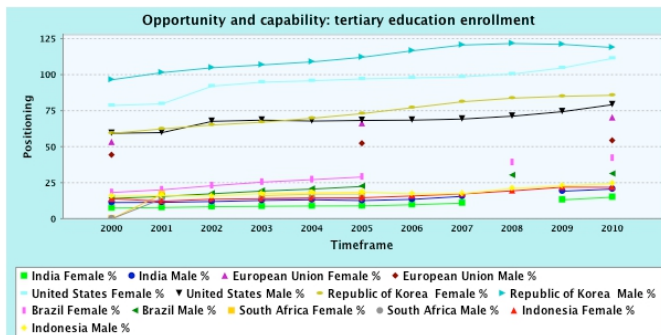
While most countries show close to equal rates of literacy between females and males, we see continuing substantive gender differences in some countries such as India and Indonesia, which tends to accompany a continuing substantial illiterate population in certain countries.

### Primary enrollment



Gross enrolment ratio over 100 per cent implies enrolment of under age and over age corresponding to the particular age group of the class. In general, India has seen the greatest rate of increase. All countries show enrolment of 100% or higher at the primary level and all countries show very close rates of enrolments for both girls and boys, indicating an achievement or near achievement of universal enrolment. In the countries studied, percentages of enrolments of both females and males decrease as the level of education increases. The rates of school retention and success at both primary and secondary levels vary, while quality of education remains a concern.

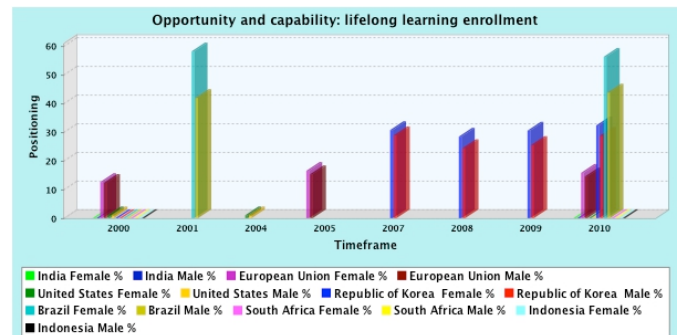
### Tertiary enrollments



We see here that parity decreases as education level increases – in favour of women in EU, USA and Brazil, and in favour of males in the rest of the countries shown here.

High rates at and above 100% (EU and Republic of Korea) probably indicate adults returning to school to increase their educational qualifications among both women and men.

### Lifelong learning



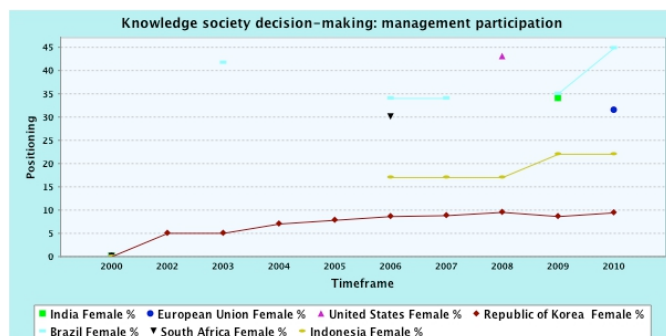
This is an extremely important indicator of a learning society, indicating whether adults can return or continue to education in various forms. Skill development, ongoing education, adult education, and e-learning are all important tools. This indicator is related to internet and ICT access as a major vehicle for lifelong learning. Very little data exist in general, and very little sex-disaggregated data. EU countries may collect more at the national level.

Brazil has the highest level of adult lifelong learning, with Republic of Korea second, with females participating at higher levels than males. In the EU, females and males are effectively tied.



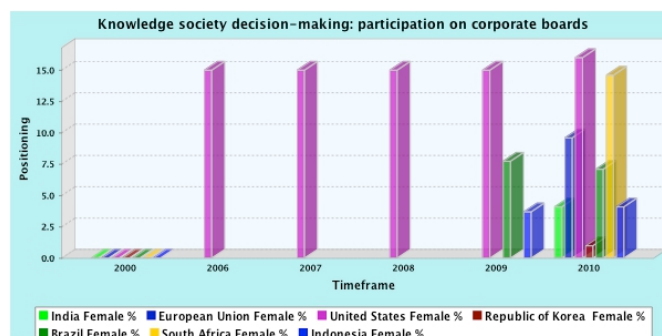
## 7. Knowledge Society Decision Making

### Management participation



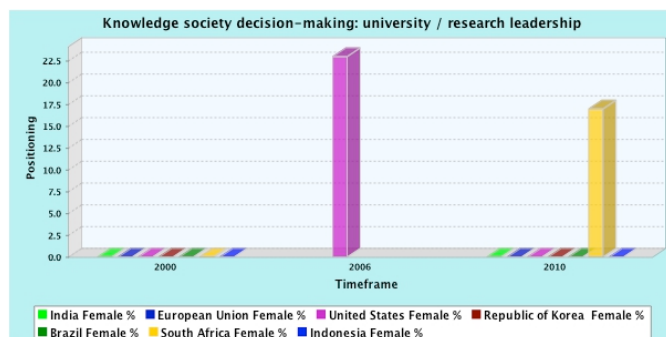
At what rate do women participate in decision making in the knowledge society? To what extent are they able to exercise leadership? This data point indicates the representation of women includes (a) legislative officials and government administrators and (b) managers. In a few countries, the category of managers is divided into corporate and general managers. Brazil, India and the US have the highest rates of females in this category, almost equal with males at 42 and 45%. South Africa and EU follow at around 30%, with Indonesia below 25%, and the Republic of Korea at below 10%. Data are inconclusive.

### Participation on corporate boards



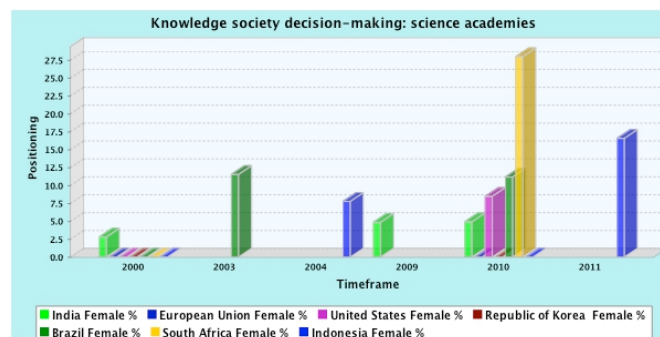
Insufficient data are collected to analyse country trends, but one conclusion is clear. Women's participation on major corporate boards is very low in all the countries surveyed. Only the US (at 15-16%) and South Africa (14.5%) went beyond single digits in any year. The others are between 3.7 and 4.1%, except the Republic of Korea, which comes in at barely 1%.

### University / research leadership



Little data is available on this indicator. Brazil reported 10.9% in 2009 and 13.8% in 2010 of public universities headed by a woman (although public universities represent only about 1/3 of Brazilian universities). The US shows 23% female college presidents in 2006, and South Africa shows 17% in 2011. No country/area showed data on female heads of research institutes.

### Science academies

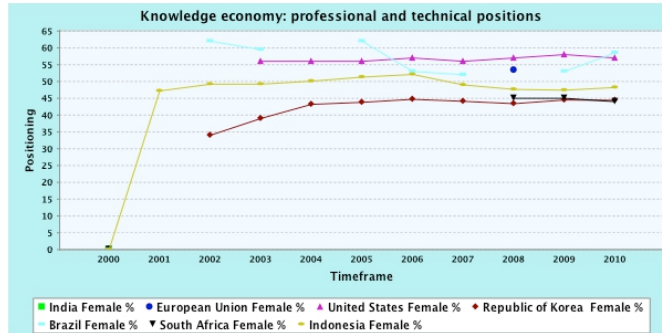


An important indicator of who is recognized as a leader and eminent researcher in the national science community, and who sets the scientific agenda in a country. Academies also work with governments and universities to set policy and models for action.

With the exception of South Africa (28%), female representation in science decision making is similar to that in the corporate sector: most academies see below 12% representation. Yearly data on this would be useful to understand how and whether academies are taking active steps for progress in this area.

## 8. Knowledge Economy

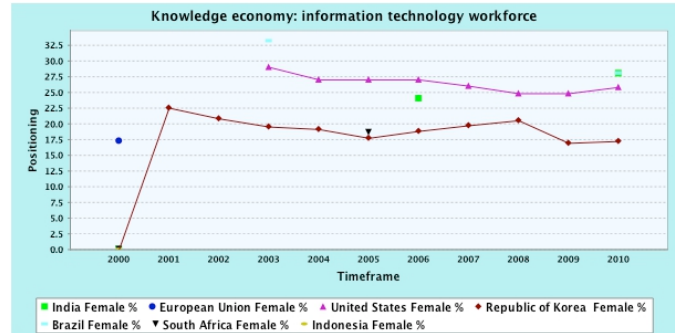
### Professional and technical positions



According to ISCED, this category includes both natural science workers, technology professions, athletes, and those in social, communications and creative arts professions (the majority of females are in the latter). It profiles in a very general way the translation of females into the larger knowledge economy labour force.

Women are represented over 50% in decreasing numbers respectively in Brazil the US and EU, hovering around 50% in Indonesia. Less than 50% of workers in these professions are female in the Republic of Korea, India and South Africa.

### Information technology workforce

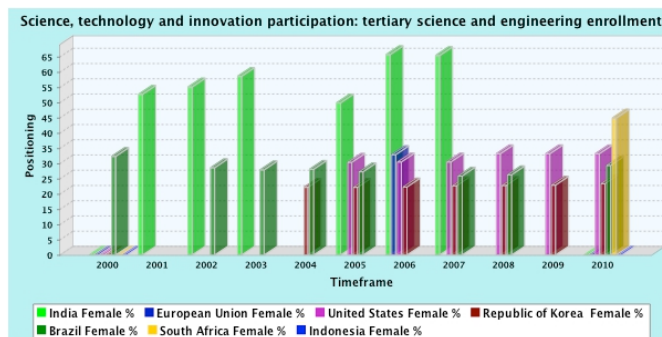


In general, sex-disaggregated data on this indicator are not consistently available – the numbers which do exist show less than 30% representation in the sector, with rates in the US dropping steadily and South Korea showing a drop and slight increase in the last few years – perhaps a result of the financial crisis. This could indicate that women tend to be squeezed out of this sector as jobs are cut. “Last hired, first fired”.

## 9. Science, Technology and Innovation Participation

*Overall women account for a minority of the world's researchers. . . . Despite the growing demand for cross nationally comparable statistics on women in science, national data and their use in policymaking often remain limited (UNESCO 2011). Substantial difficulties exist in comparing across countries without consistent data categorization and analysis.*

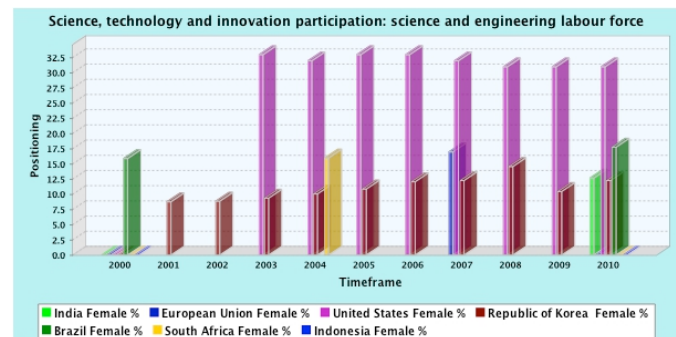
### Science and engineering enrolment



This includes enrolment in all scientific, technological and engineering disciplines. With the exception of the US and EU, data in the study countries are not consistently collected, either longitudinally or in terms of discipline or category. EU and US collect numbers on graduates, while the developing countries collect enrolment data.

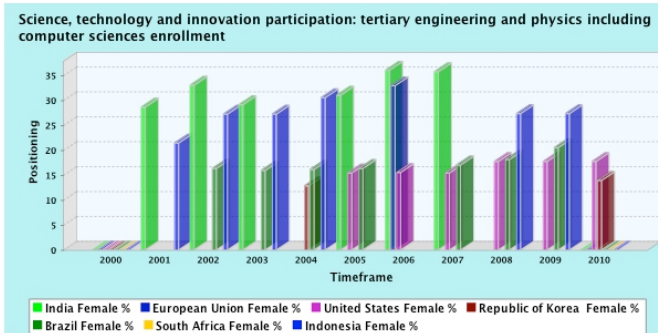
The data for India show high participation due to the very high ratio of women in dentistry, nursing, medicine, ayurvedic and Unani occupations. Brazil numbers appear to have dropped slightly overall, while representation of females is just under 50% in South Africa.

### S&E labour force



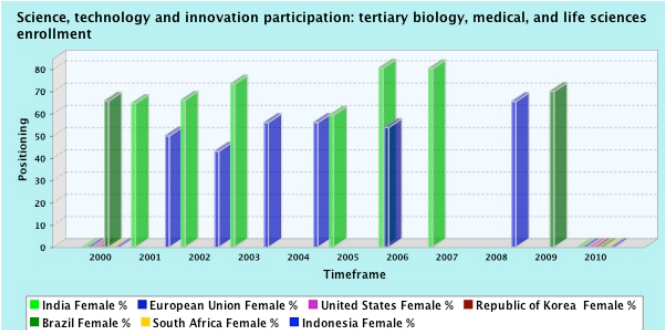
Moving to workforce participation, rates of participation drop in most country, by up to 30 points indicating a substantial loss of females in the transition from education to the S&E labour force. In the US, tertiary enrolment rates are roughly equivalent to labour force participation. However, problems with advancement and retention for females mean their numbers drop at the higher paid and decision making levels (see Knowledge Economy and Knowledge Society Decision Making).

## Engineering and physics (incl computer sciences) enrollment



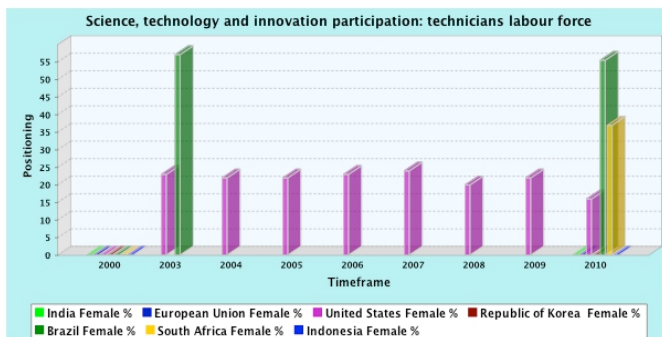
When physics and engineering sciences are considered in isolation, participation rates drop by 30 points. Data for India includes engineering only, no physics.

## Biology, medical and life sciences enrollment



While data is sketchy and numbers difficult to break down, it appears that women's participation in the life sciences is much higher than in other areas of science, with some variation in years of up to 12 percentage points.

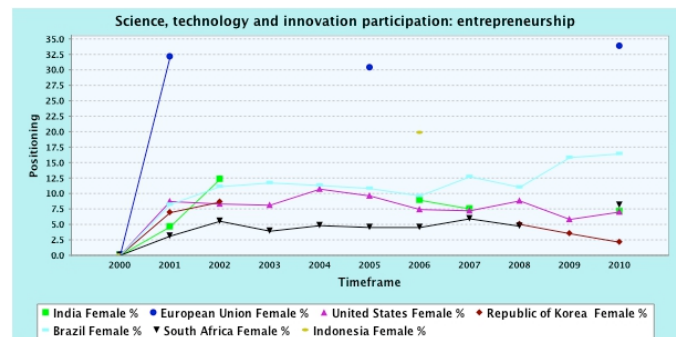
## Technicians labour force



Many females end up as technicians rather than researchers or in higher-level positions. In the universities they often do not advance to higher levels of decision making and tenure at the same rates as males. Indonesia and Brazil have the highest rates, at or just above 50%, with the US showing low numbers, and no data available for South Korea.

There is a particular lack of regular data on this. RICYT in LAC collects some, and the UN groups it with other work, making it harder to disaggregate for STI.

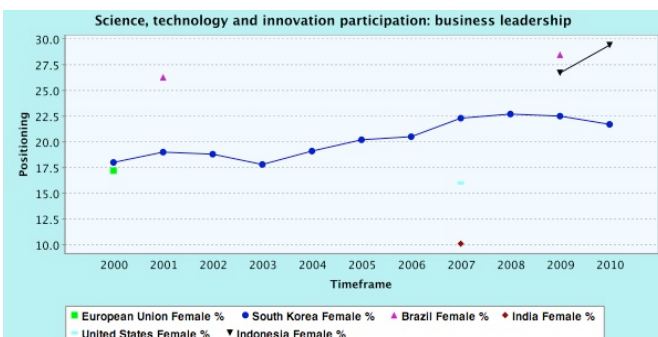
## Entrepreneurship



This is significant because a large percentage of new businesses are science and technology based, especially in the countries under study. The country/region with the highest level of participation by women is the EU at 33.8%, Indonesia follows at 19.8%, followed by Brazil (16.4%) followed by South Africa (8%), India and the US (7%). The Republic of Korea has dropped steadily from 2.1% in 2010 to 3.5% in 2009 and 5% in 2008. These data are quite startling if the figures are correct because the US and India are among the world leaders in entrepreneurial innovation, indicating that half of the population in those countries are among the least engaged in new entrepreneurial activity.

It should be noted that these data is misleading in part, since in many countries informal employment is generally a larger source of employment for women than formal sector activities.

## Business leadership (Businesses of more than one person)



Data show Indonesia at 29.4%, followed by Brazil at 28.5%, Korea at 21.7, EU (data only for 2000) at 17.2, and the US and India with 16 and 10.1% respectively. This is an area with room for substantive improvement in all countries.

