



## Overview of women status in science

THE BOSTON CONSULTING GROUP



# Executive summary: Overview of today's global situation

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## **Over the 14 countries analyzed worldwide, 2 distinct groups emerge regarding women's status in science**

- "Women in Science advanced countries" (France, UK, Spain, Germany, US, Japan, China) with a high level of schooling and a fair integration of women into society in general and more specifically into the scientific world
- "Women in Science emerging countries" (Brazil, Argentina, India, Indonesia, Morocco, Egypt, South Africa) with a low level of schooling and a weak integration of women outside of the domestic sphere

**Given low level of maturity of second group, immediate launch of a science focused schooling initiative only valuable for "Women in Science advanced countries", therefore being the focus of our study**

**In these countries over the past decade, share of women among science researchers has improved by 12% (+3pt, from 26% to 29%) but gender parity is still far from being reached**

- A first representation gap of women in science arises as early as Bachelor level (32%) and continues throughout the scientific career (11% of women in top academic positions)
- Moreover, a second representation gap occurs across all academic levels: women choose primarily health-related scientific studies vs. engineering and general science

**Overall today, a girl graduating from high school has in average a 35% probability to enroll in a scientific Bachelor, a 18% probability to graduate Bachelor, a 8% probability to graduate Master and a 2% probability to be a science Doctor**








- Those probabilities are respectively 77%, 37%, 19% and 6% for a boy

**Reaching gender parity would enable an additional pool of 300k women to graduate as science Doctors each year**








- Which means a pool of +3M potential female researcher within ~15 to 20 years

# Over the 14 countries analyzed worldwide, 2 distinct groups emerge regarding women's status in science

## Women in science advanced countries

	<i>Literacy rate</i>	<i>Gender inequality index<sup>1</sup></i>	<i>Share of women among researchers</i>
 France	99%	0.106	26%
 Germany	99%	0.085	25%
 Spain	99%	0.117	38%
 UK	99%	0.209	38%
 US	99%	0.299	35%
 Japan	99%	0.123	14%
 China	96%	0.209	25%

## Women in science emerging countries

	<i>Literacy rate</i>	<i>Gender inequality index<sup>1</sup></i>	<i>Share of pop. attending at most primary school</i>
 Brazil	90%	0.449	45%
 Argentina	98%	0.372	68%
 South Africa	88%	0.490	N/A
 Morocco	70%	0.510	68%
 Egypt	66%	N/A	61%
 India	74%	0.617	61%
 Indonesia	92%	0.505	52%

1. UNDP index capturing the loss of achievement due to gender inequality using three dimensions: reproductive health, empowerment, and labor market participation 2010 data

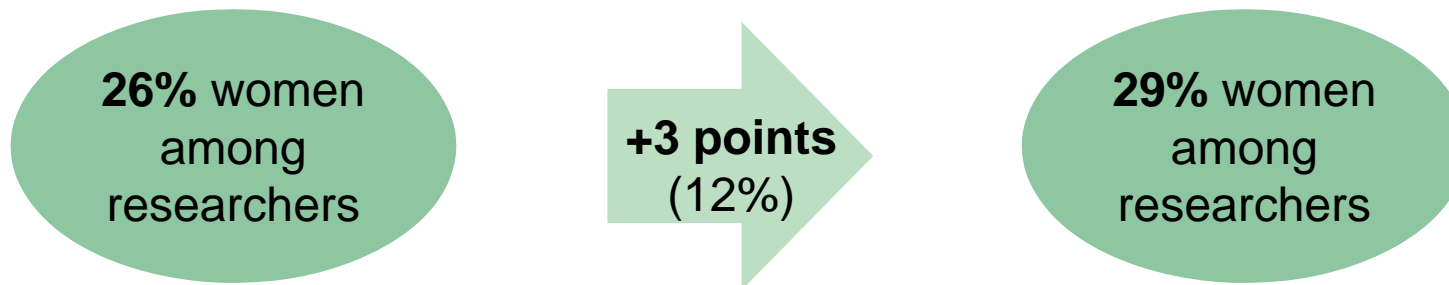
Source: Human development report 2011, wikipedia, census, Education at a glance 2011, Population projected by level of education for Egypt

# Over the past decade, +12% in share of women among science researchers but parity still far from being reached



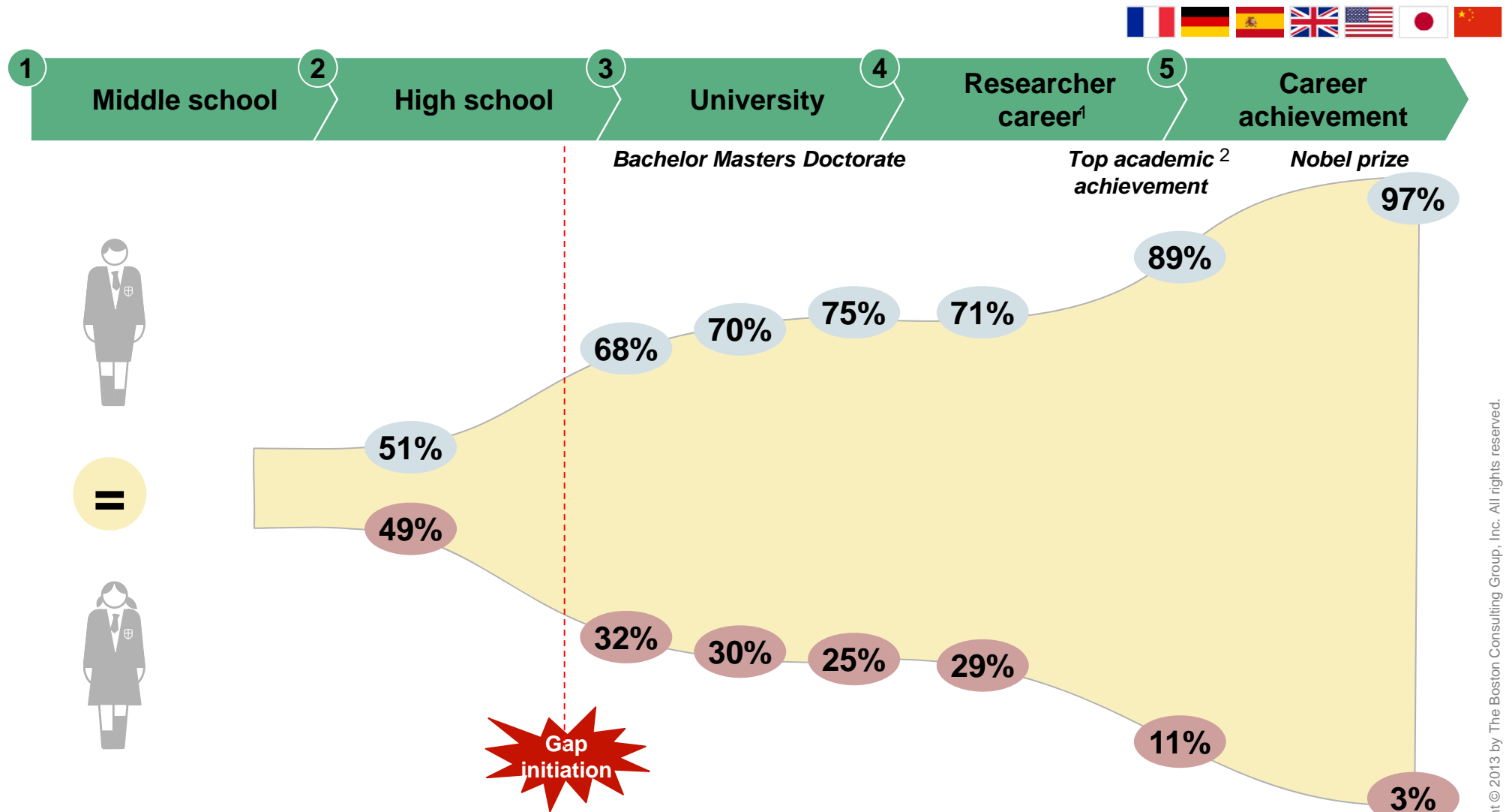
End of the 1990's

Beginning of 2010's



**Need to tackle the issue by identifying its root cause**

# First representation gap of women in science arises as early as Bachelor level and continues throughout the scientific career



1. Are considered as researcher professionals engaged in the conception or creation of new knowledge, products, processes, methods and sciences and also the management of the project concerned; management being also included in researcher oversized data especially for China 2. Data only available for EU-27  
 BCG analysis, China targets 10 major universities not entire country  
 Source: UNESCO, national statistic bureau, China confidential BCG study, BGG analysis

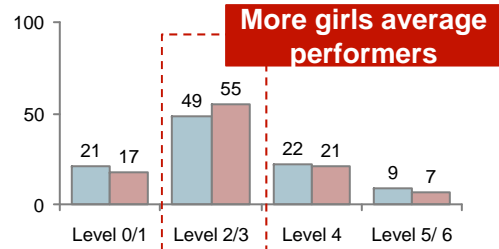
# Similar scientific performances for boys and girls aged 15

Science performances

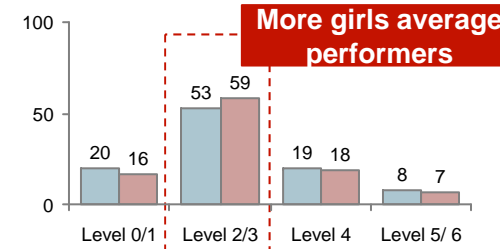
Science performances



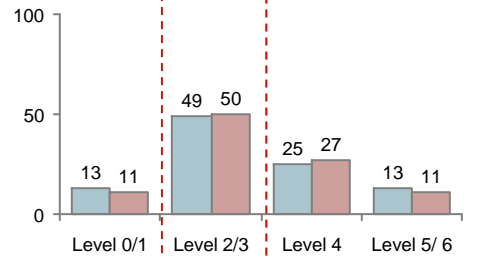
France



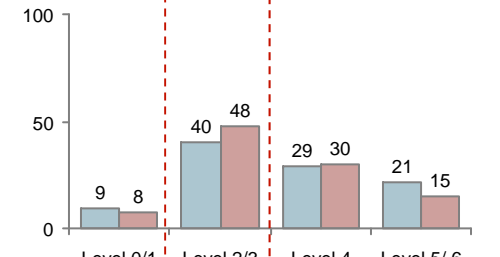
US



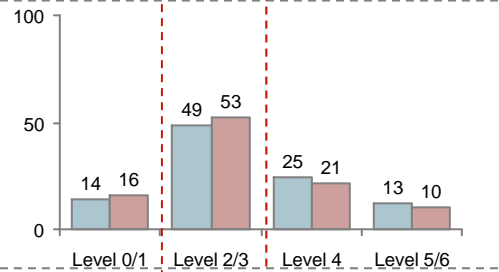
Germany



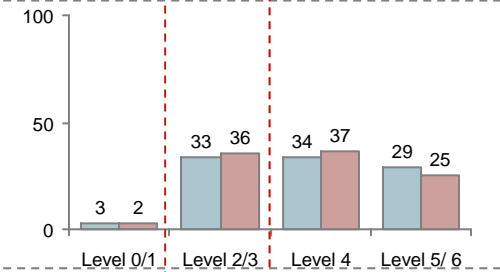
Japan



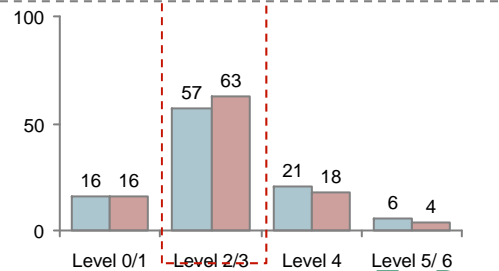
UK



Shanghai

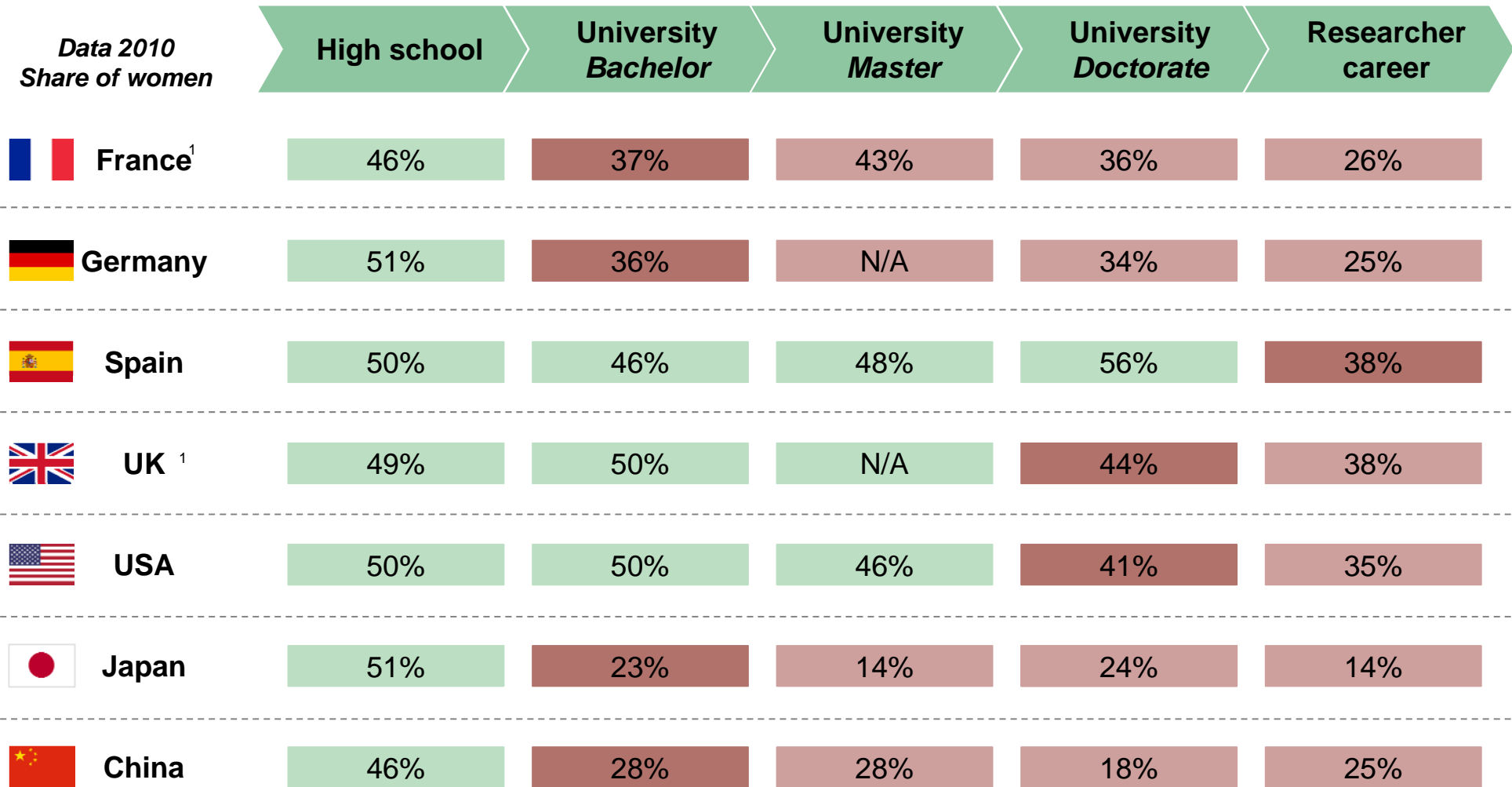


Spain



Source: PISA 2012


2  
3  
4 After high school, regular drop-off of women, from first specialization at Bachelor level to top academic position



1. First specialization occurs in high school 2. Gap occurs when loss >5 points or share becomes <40%  
Data France, UK, Japan 2011, data China 2012  
Source: INSEE, local ministries of Education, Eurostat, Destatis, UNESCO, China confidential BCG study, BCG analysis

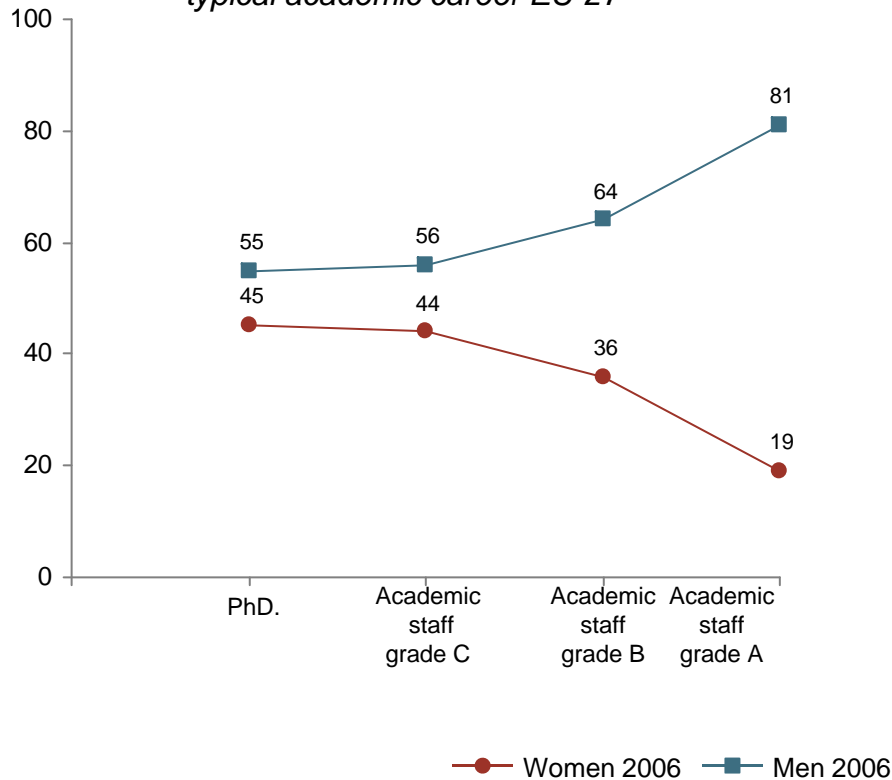
Moment when  
gap<sup>2</sup> occurs

# Resulting in only 11% women among top academic positions

European scope 

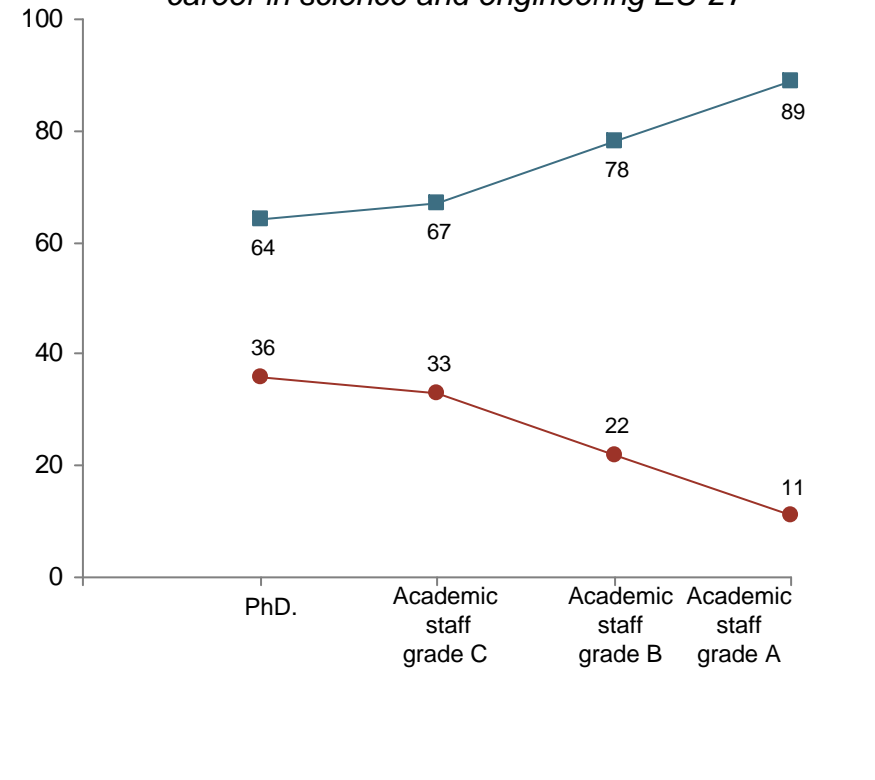
**Vertical segregation towards women present across all academic fields...**

2006: Proportion of men and women in typical academic career EU-27



**...particularly marked in science and engineering fields with a faster pace of improvement**

2006: Proportion of men and women in typical academic career in science and engineering EU-27

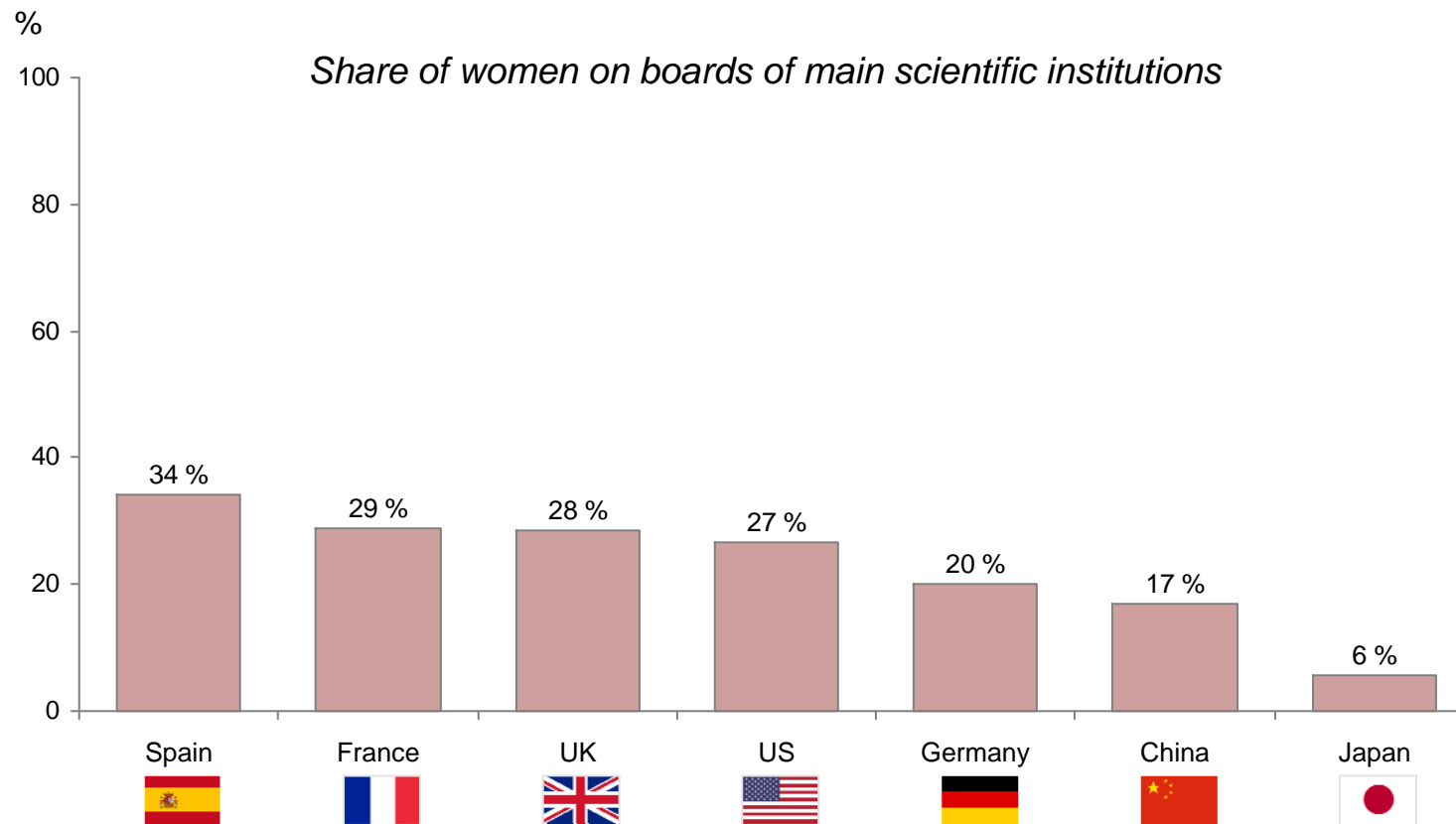


Source: UNESCO



## 5

# Unequal representation of women on boards of main scientific institutions



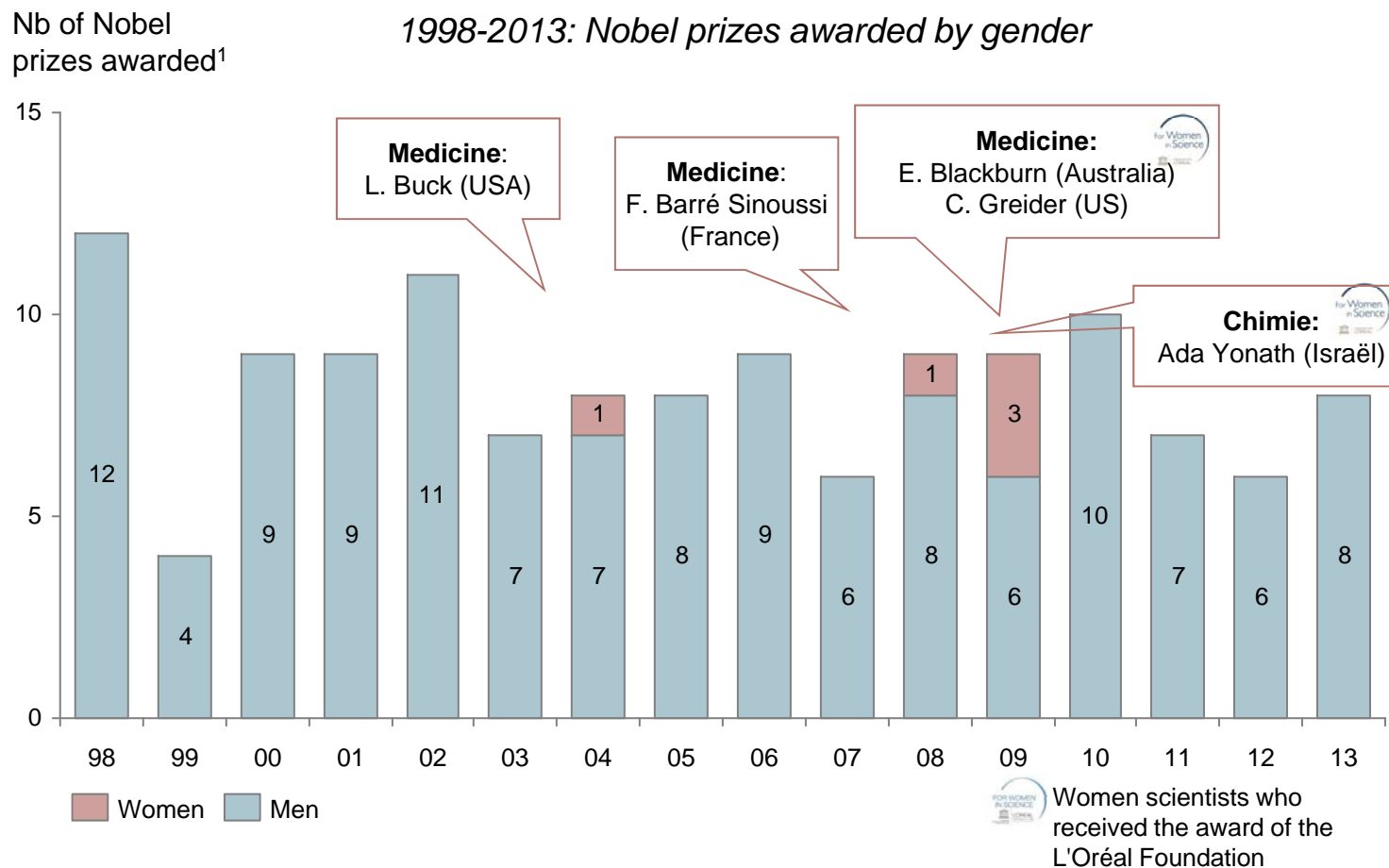
Note: Total number of board members and scientific institution varies considerably between countries  
Source: BCG analysis

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# Dramatic under representation among science Nobel Prize winners: ~3.5% of Nobel prizes awarded to women



5 Nobel prizes awarded to women out of 132 (~3.5%)



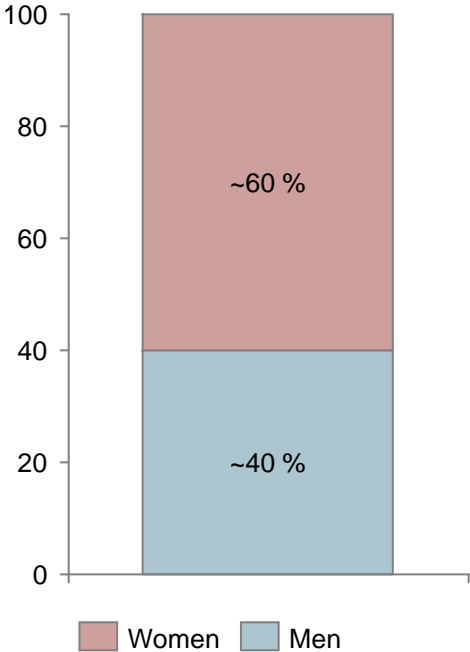
1. Including Fields Medall awarded every 4 years  
 Source: nobelprize.org

# Second representation gap occurs across all academic levels: women choose primarily health-related scientific studies



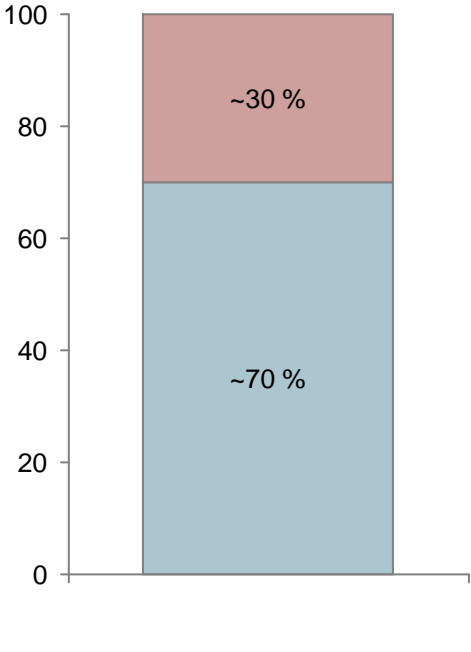
**Healthcare studies**  
1st year bachelor

1999-2009 trend



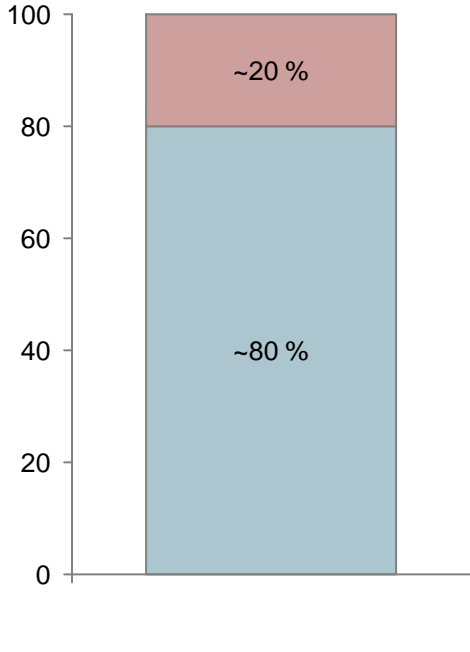
**General science studies**  
1st year bachelor

1999-2009 trend



**Engineering studies**  
1st year bachelor

1999-2009 trend

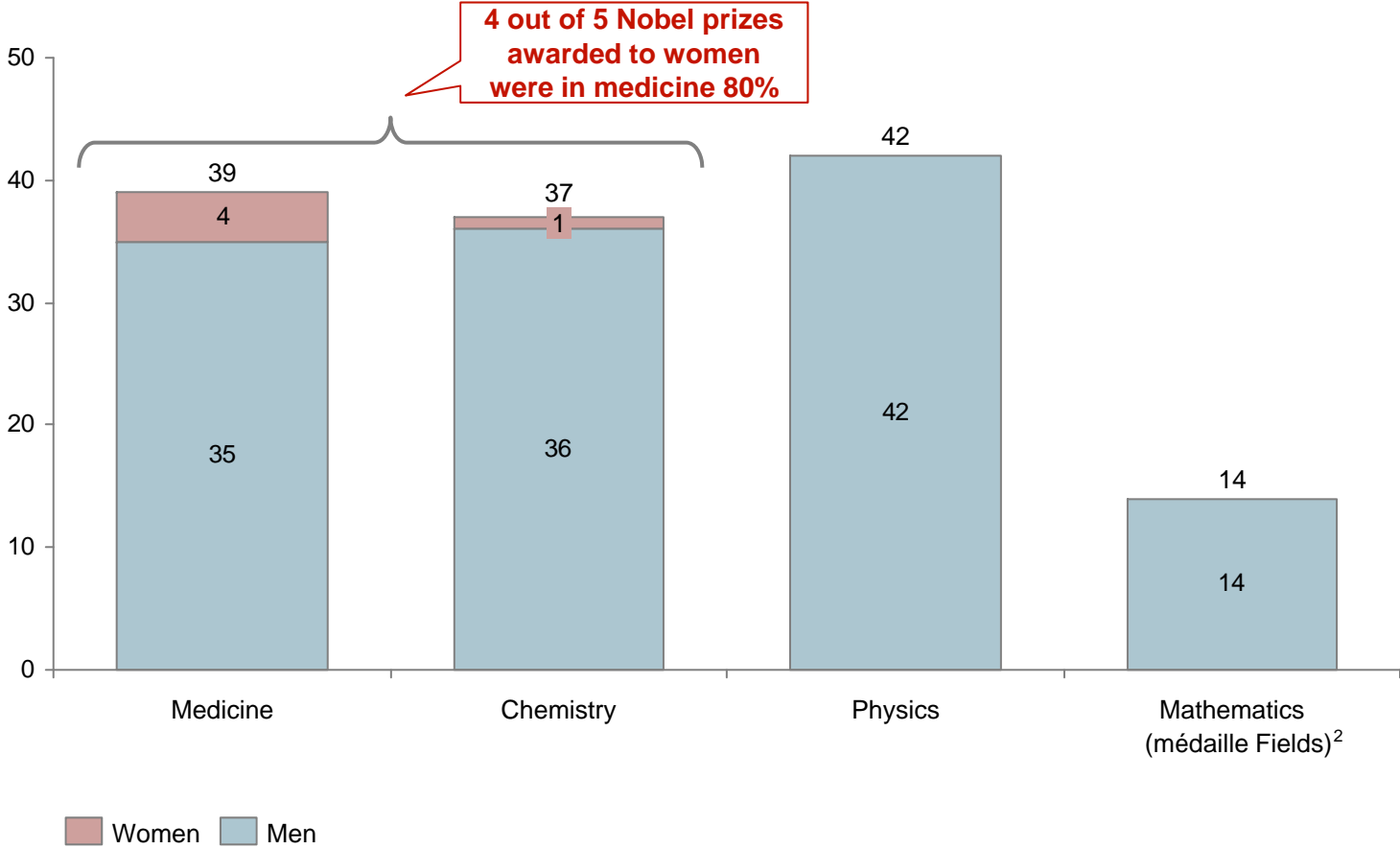


Note: Healthcare studies include med school, pharmaceutical school, nurse and mid-wife, physiotherapist; general science study include physics, chemistry, mathematical, computing science; engineering study include manufacturing, construction, general engineering  
Source: Eurostat, China confidential BCG study, BCG analysis

# Among the (few) Nobel prizes awarded to women, 80% were in medicine

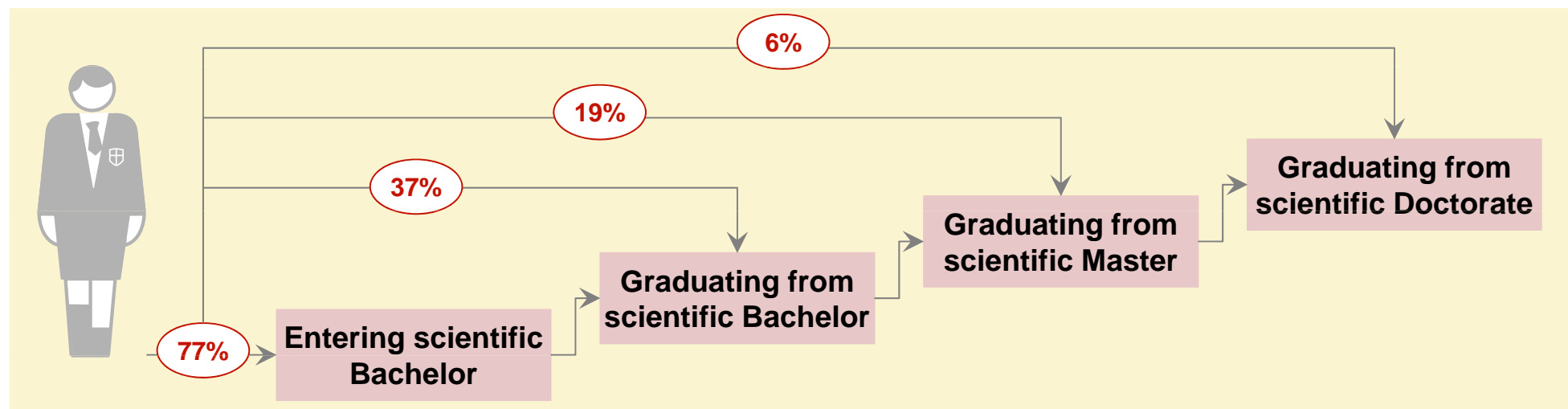
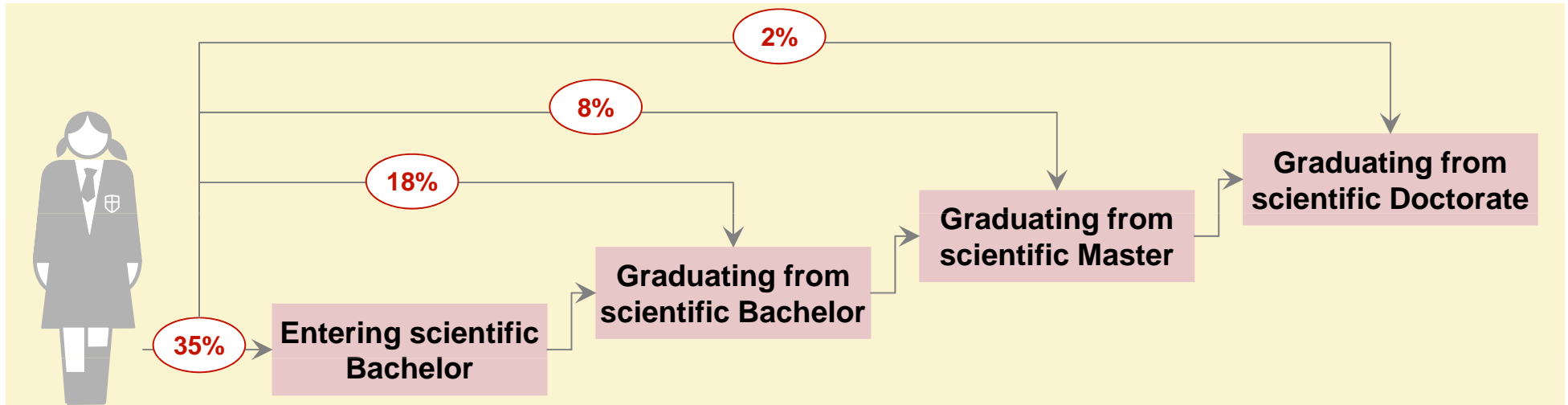


1998-2013: Split of Nobel prizes per field and per gender



1. Including Fields Medal 2. Fields Medal awarded every 4 years  
Source: nobelprize.org

# Today, a girl graduating from high school has in average a 2% probability to be a science Doctor vs. 6% for a boy



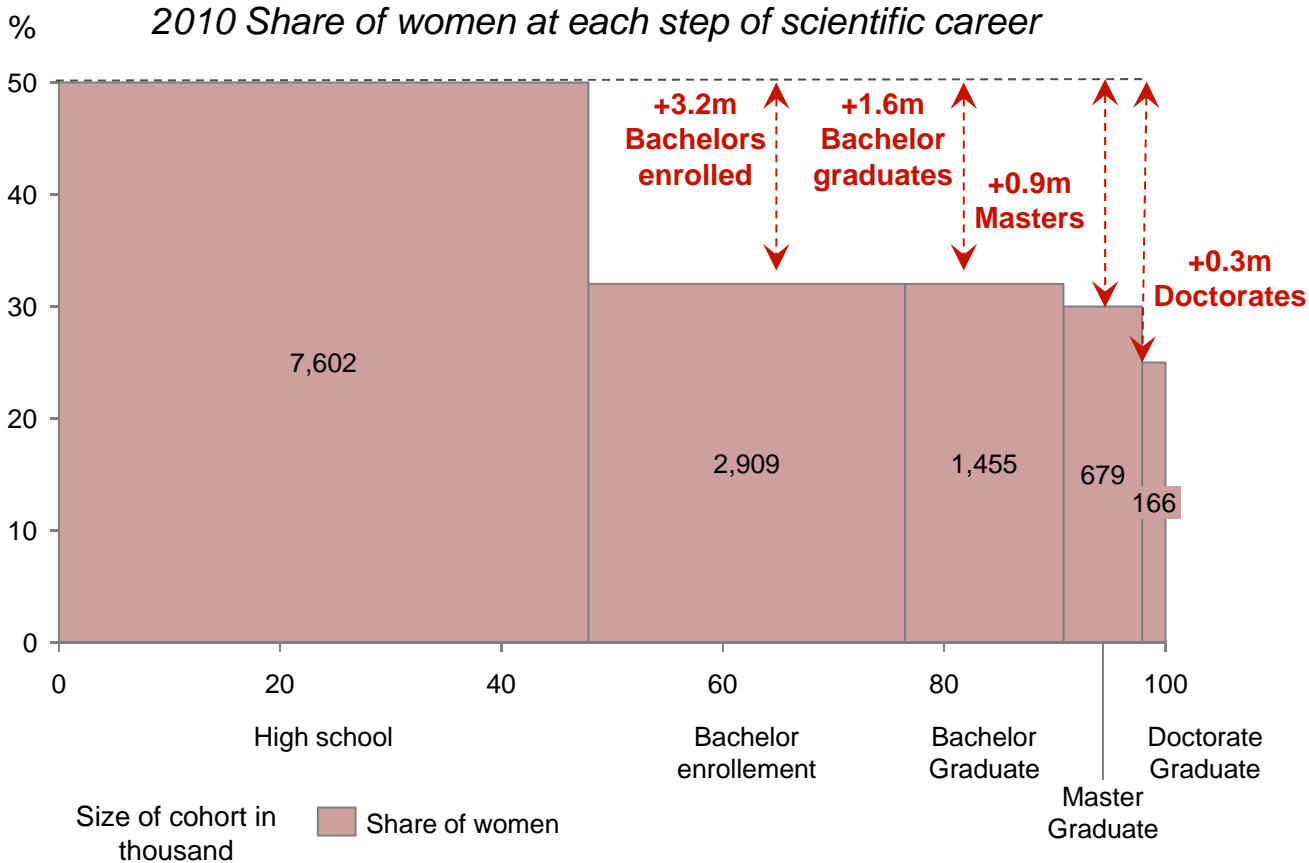
Source: UNESCO, national statistic bureau, China confidential BCG study, BCG analysis

# Reaching gender parity would enable an additional pool of 300k women to graduate as science Doctors each year



**+300 000 women Doctorates if parity was achieved today at all levels**

**~15-20 years from now**



**+3 million potential researchers**

Note: If gender parity is reach total size of cohort increases  
 Source: INSEE, local ministries of Education, Eurostat, Destatis, BCG analysis

# Contacts

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