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# BEYOND EVERY MAJOR RANKING THERE MUST BE A MAJOR INFORMATION SYSTEM

# SIR World Report 2011

- Third edition of the largest worldwide research ranking, including 3042 institutions
- It includes indicators of output, international collaboration, thematic specialization and scientific impact
- Two new indicators: Specialization Index and Excellence Rate
- It is a Research Evaluation Framework for science policy-makers, research managers, media and general public interested in Science Evaluation

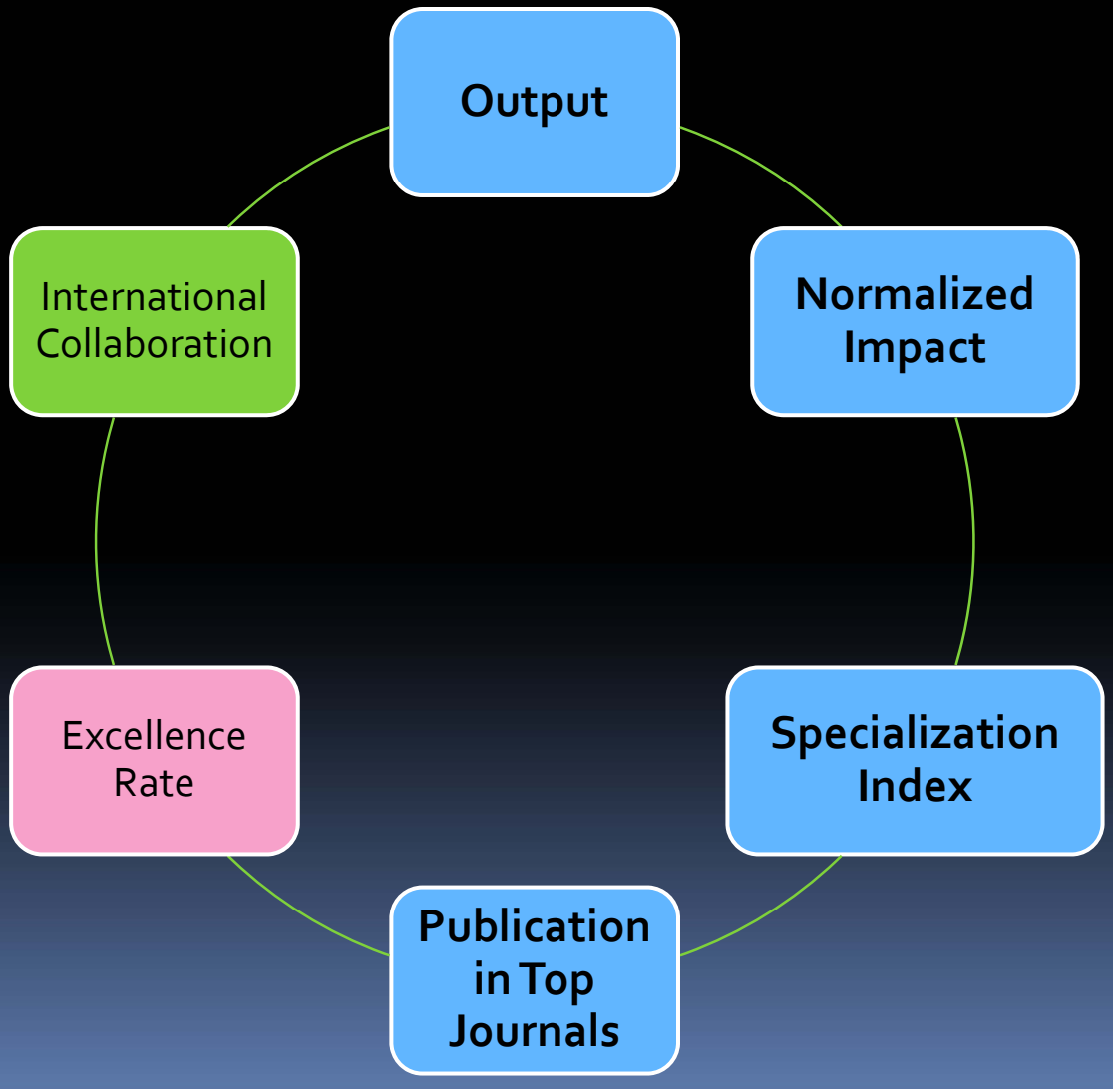
# SIR World Reports

- We do not build a ranking, but characterize Research Institutions using performance indicators
- We just focus on Research. We do not aspire to evaluate entire institutions
- We charactize all type of institutions with research outputs, not only academic ones
- We seek to characterize institutions both from a quantitative and qualitative point of view
- The order and weight of indicators is the result of a decision taken by the user. We just make a proposal.

# SIR World Reports

- Six indicators:
  - Excellence Rate
  - Specialization Index (Gini)
  - Output
  - International Collaboration (%)
  - Normalized Impact (1 = world average)
  - Publication in best journals Q1 (%)
- 1 category, 1 size y 4 qualitative
- Default order: Output

# Indicators SIR



# Specialization Index

- Output distribution by scientific fields
- Referred to the world
- Gini Function
- Categories:
  - Highly specializated institutions
  - Institutions with a low degree of specialization
  - Generalistics institutions

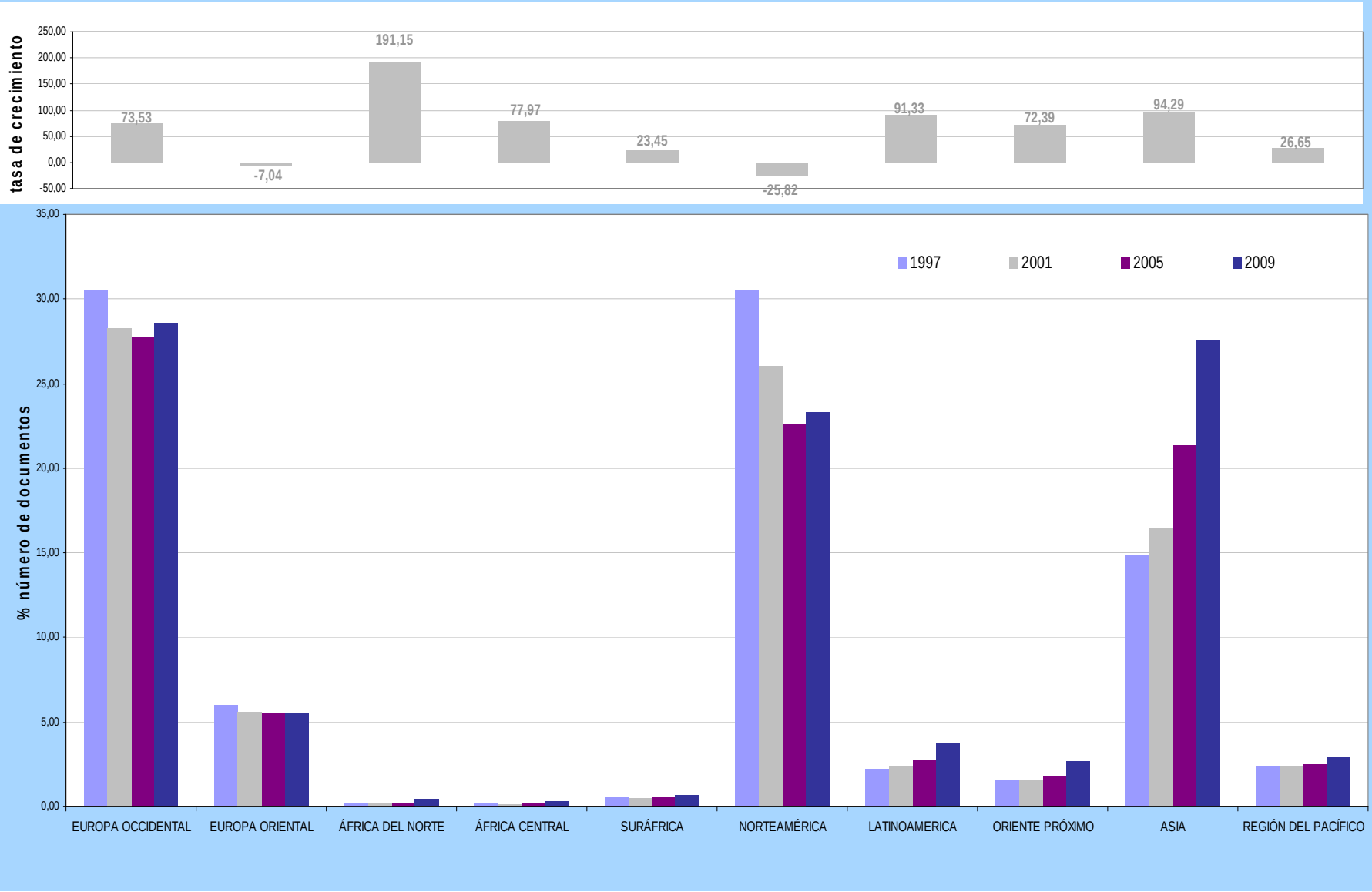
# Excellence Rate

- Proportion of output in the set formed by the 10% of the highly cited papers in their respective fields.
- It represents the capacity of institutions to publish their works in the world excellence.
- It's size-independent.
- It complements the information provided by the indicator NI (it is not affected by low cited papers)
- It correlates quite strongly with Q1

# Output

- Alternatives:
  - Raw output (all document types)
  - Primary output (Only AR, RE, CP)
  - Weighted primary output on observed impact.
- High correlation with institution size
- Distribution bias on countries and world regions

# Regional Distribution of World Scientific Output



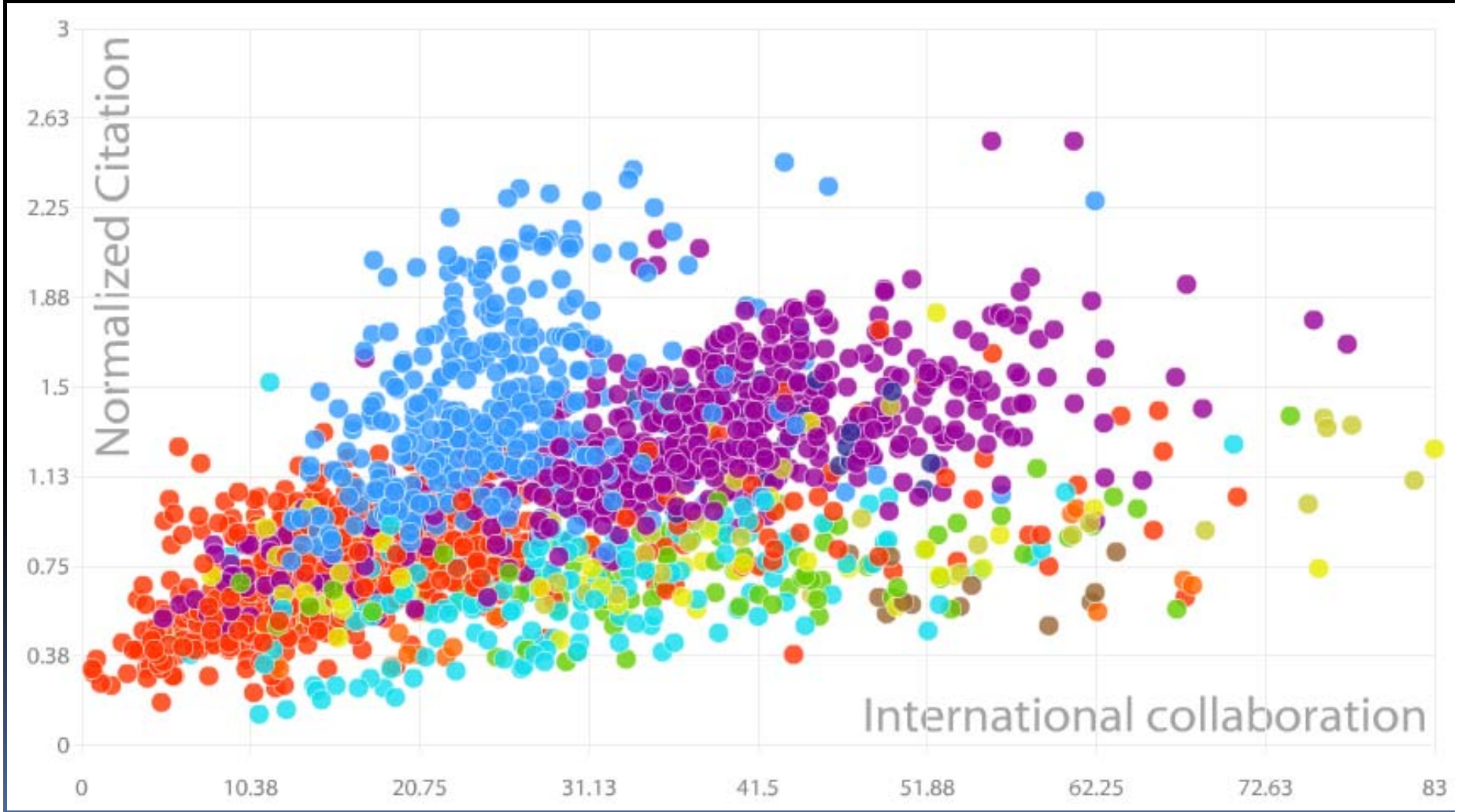
# International Collaboration

- In most countries, it involves higher quality results
- When the number of publications in a country increase, the IC tends to decrease
- USA is one of the countries where the IC has a lower impact than the national output

# Normalized Impact

- The impact is normalized by fields:
  - Crown: "field oriented"
  - Karolinska: "item oriented"
- Independient of institution size
- Indicator of *performance* showing the average visibility of the output
- Strongly correlated to Q1 (publication in top journals)
- It is the bibliometic indicator that best represent the quality of research results

# Correlation among NI, Q1 and IC



# Publication in top journals

- Its a % indicator that shows the output published in the best journals in their respective fields as measured by SJR
- In SIR, it represent the part of output published in first quartile journals.
- It tends to decrease when the output increases due to papers published in journals that have been recently incorporated to the index.

# Qurtile distribution of journlas by the country of publication

| COUNTRY | Q1 | Q2 | Q3 | Q4 | Total |
|---|---|---|---|---|---|
| United States | 2100 | 1444 | 1177 | 923 | 5644 |
| United Kingdom | 1399 | 1094 | 648 | 361 | 3502 |
| Netherlands | 1019 | 575 | 338 | 234 | 2166 |
| Germany | 330 | 345 | 365 | 358 | 1398 |
| China | 34 | 112 | 251 | 145 | 542 |
| France | 43 | 79 | 157 | 163 | 442 |
| Japan | 53 | 91 | 138 | 126 | 408 |
| Italy | 26 | 62 | 104 | 132 | 324 |
| Canada | 53 | 91 | 96 | 64 | 304 |
| Spain | 11 | 54 | 111 | 119 | 295 |
| India | 9 | 41 | 83 | 148 | 281 |
| Switzerland | 89 | 71 | 67 | 45 | 272 |
| Poland | 8 | 51 | 114 | 94 | 267 |
| Australia | 34 | 63 | 80 | 64 | 241 |
| Brazil | 8 | 38 | 115 | 74 | 235 |
| Russian Federation | 3 | 18 | 68 | 99 | 188 |
| Turkey |  | 16 | 45 | 75 | 136 |
| South Korea | 11 | 30 | 40 | 34 | 115 |
| Czech Republic | 1 | 28 | 49 | 34 | 112 |
| Belgium | 5 | 21 | 47 | 29 | 102 |

| COUNTRY | Q1 | Q2 | Q3 | Q4 | Total |
|---|---|---|---|---|---|
| New Zealand | 12 | 14 | 26 | 50 | 102 |
| Croatia | 4 | 12 | 39 | 46 | 101 |
| Hungary | 4 | 19 | 41 | 27 | 91 |
| South Africa | 6 | 23 | 34 | 21 | 84 |
| Romania | 2 | 8 | 27 | 41 | 78 |
| Singapore | 11 | 23 | 29 | 13 | 76 |
| Iran | 1 | 13 | 27 | 32 | 73 |
| Mexico | 1 | 8 | 28 | 34 | 71 |
| Chile | 3 | 12 | 30 | 24 | 69 |
| Pakistan |  | 6 | 20 | 42 | 68 |
| Taiwan | 1 | 16 | 20 | 22 | 59 |
| Greece | 7 | 7 | 19 | 14 | 47 |
| Austria | 2 | 11 | 18 | 14 | 45 |
| Israel | 9 | 15 | 9 | 11 | 44 |
| Slovakia | 2 | 5 | 26 | 10 | 43 |
| Malaysia |  | 7 | 14 | 21 | 42 |
| Sweden | 7 | 11 | 15 | 9 | 42 |
| Argentina |  | 6 | 13 | 22 | 41 |
| Serbia | 1 | 4 | 16 | 19 | 40 |
| Venezuela |  | 3 | 10 | 27 | 40 |

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| WR | RR | CR | Organization | Sector | Country | Region | Output | IC(%) | Q1(%) | NI | Spe | Exc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | Chinese Academy of Sciences | GO | CHN | AS | 144,269 | 21.5 | 40.5 | 0.9 | 0.6 | 11.3 |
| 2 | 1 | 1 | Centre National de la Recherche Scientifique | GO | FRA | WE | 130,977 | 49.0 | 61.9 | 1.4 | 0.5 | 18.7 |
| 3 | 1 | 1 | Russian Academy of Sciences | GO | RUS | EE | 88,907 | 35.0 | 24.2 | 0.5 | 0.7 | 5.9 |
| 4 | 1 | 1 | Harvard University | HE | USA | NA | 69,995 | 34.4 | 79.0 | 2.4 | 0.5 | 35.7 |
| 5 | 2 | 1 | Max Planck Gesellschaft | GO | DEU | WE | 49,987 | 65.0 | 72.2 | 1.8 | 0.7 | 29.3 |
| 6 | 2 | 1 | University of Tokyo | HE | JPN | AS | 48,947 | 26.3 | 56.7 | 1.2 | 0.5 | 17.9 |
| 7 | 2 | 2 | National Institutes of Health United States | HL | USA | NA | 46,819 | 35.3 | 84.3 | 2.3 | 0.7 | 40.1 |
| 8 | 3 | 1 | University of Toronto | HE | CAN | NA | 45,771 | 41.1 | 65.7 | 1.8 | 0.4 | 24.3 |
| 9 | 3 | 1 | Consejo Superior de Investigaciones Cientificas | GO | ESP | WE | 42,087 | 49.4 | 68.8 | 1.4 | 0.6 | 21.9 |
| 10 | 4 | 3 | Johns Hopkins University | HE | USA | NA | 41,399 | 29.8 | 74.5 | 2.1 | 0.6 | 30.1 |
| 11 | 3 | 2 | Tsinghua University | HE | CHN | AS | 41,197 | 18.6 | 26.8 | 0.8 | 0.7 | 6.6 |
| 12 | 5 | 4 | University of Michigan, Ann Arbor | HE | USA | NA | 41,059 | 25.3 | 70.3 | 2.0 | 0.4 | 25.6 |
| 13 | 1 | 1 | Universidade de Sao Paulo | HE | BRA | LA | 40,196 | 24.8 | 39.4 | 0.8 | 0.5 | 9.9 |
| 14 | 4 | 3 | Zhejiang University | HE | CHN | AS | 40,140 | 15.7 | 28.6 | 0.7 | 0.6 | 7.4 |
| 15 | 6 | 5 | University of Washington | HE | USA | NA | 39,428 | 26.2 | 71.7 | 2.1 | 0.4 | 28.6 |
| 16 | 7 | 6 | Partners HealthCare System | HL | USA | NA | 38,096 | 28.5 | 80.7 | 2.6 | 0.7 | 36.5 |
| 17 | 8 | 7 | University of California, Los Angeles | HE | USA | NA | 37,994 | 29.3 | 70.7 | 2.1 | 0.4 | 28.9 |
| 18 | 4 | 1 | Consiglio Nazionale delle Ricerche | GO | ITA | WE | 37,928 | 42.5 | 63.8 | 1.3 | 0.6 | 17.7 |
| 19 | 9 | 8 | Stanford University | HE | USA | NA | 37,885 | 29.5 | 69.8 | 2.3 | 0.4 | 29.1 |
| 20 | 10 | 9 | Veterans Affairs Medical Centers | HL | USA | NA | 36,902 | 16.3 | 77.8 | 2.0 | 0.7 | 30.6 |
| 21 | 5 | 2 | Assistance Publique Hopitaux de Paris | HL | FRA | WE | 36,013 | 24.6 | 49.6 | 1.6 | 0.8 | 21.1 |

# The Ranking and its IS

- The ranking as a derivative of the IS
- The IS provides to the Ranking:
  - An oportunity to refine in context
  - A tool for designing indicators
  - A tool for validating those indicators
  - Answers to the questions generated in the Ranking: why my institution is ranked there?

# ¡Thank you very much!

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