How many Researchers are there in the World

... and why we should care

NBER Investments in Early Career Scientists: Data and Research Gaps
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Is it

14 million full-time equivalent researchers

97 million people who do R&D as a primary or secondary job activity
Most innovation indicators are based on firm-level data. Rather than trying to measure the success of innovative outcomes, though, it is crucial to focus instead on whether the process is being engaged. If teams working on innovation are doing the right kinds of activities, then it is important to trust that results will follow.

--A Markham, Inc. 2017
Research Intensity → Researcher Density
STEP 1: Scope and Principles

- Global scope for data coverage
- Comparability between countries
- Open data
Dataset: 105 countries that had GERD, tertiary education, and researcher variable coverage during 2014-2018
R&D is defined (Frascati Manual, 2015) to “comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge.” R&D includes basic and applied research and experimental development.

R&D personnel include all persons engaged directly in R&D, whether directly employed or external contributors, as well as those providing direct services for the R&D activities such as R&D managers, administrators, technicians and clerical staff. R&D personnel perform scientific and technical work for an R&D project (setting up and carrying out experiments or surveys, building prototypes, etc.); plan and manage R&D projects; prepare interim and final reports for R&D projects; provide internal services for R&D projects (e.g. dedicated computing or library and documentation work), and provide support for the administration of the financial and personnel aspects of R&D projects.

R&D personnel excludes individuals undertaking indirect support or ancillary activities in R&D-performing units, such as specific services to R&D provided by central computer departments and libraries, services by central finance and personnel departments dealing with R&D projects and R&D personnel, and the provision of services for security, cleaning, maintenance, canteens, etc., to R&D-performing units.
All Tertiary Education
637,830,736 awarded
+198,758,924 enrolled

R&D Personnel
14,303,153 FTE

Researchers
8,409,578 FTE

Doctorates
11,533,132 awarded
+2,749,104 enrolled
14m R&D personnel FTEs in the world (UNESCO)
STEP 3: Count Individuals

All Tertiary Educated
48,223,282 people

R&D as Primary or Secondary activity
9,486,494 people

R&D as Primary Activity
3,432,264 people

- 64% ISCED 6
- 27% ISCED 7
- 9% ISCED 8

- 21% Education Sector
- 12% Government Sector
- 67% Business Sector

25% Engineering
14% Computer and Mathematics
12% Management
8.1% Life Sciences
7.1% Physical Sciences
6.8% Writers, Editors, Historians, Press
35m (97m) R&D personnel in the world

- North America (2): 4.27m
- Latin America and Caribbean (15): 2.94m
- Europe and Central Asia (non-Schengen, not EU) (11): 2.17m
- Middle East and Africa (27): 2.17m
- East Asia, Pacific, and South Asia (19): 17.4m
- European Union and Schengen Area (31): 5.72m
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In summary

- Researcher density is a meaningful measure of innovation capacity.
- It shows the number of people who are actively engaged in research, who can be recruited into innovative projects as needed to solve tough problems.
- The issue is not measuring innovation as an end in itself, but rather the ability to engage in innovative processes as a means to solve problems as they arise.