

Frontier Research in Medical Sciences by Greeks: Regional Disparities in Greece, Cyprus and Australia

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ATINER Conference

June 27-28, 2011

Background

MOTIVATION

- Qualitative indicators of education & medical innovation
- Little is known about within-nation inequalities re: quality of education and participation in scientific knowledge
- Do regional disparities in knowledge creation matter for development?
- How interested are modern “Greeks” in medical research?

LITERATURE Focus

- Huge interest in education-health-growth nexus
- Aggregate quantitative indicators of education
- Qualitative measures of **pupil** education → TIMSS/PISA scores
- Very noisy patent/citation indicators

This study

- Globally, how do small countries like Greece and Cyprus compare re: scientific research in life sciences and medicines?
- What is the **quality** of such research in Greece and Cyprus?
- Does scientific knowledge flow evenly within Greece & Cyprus?
- How do researchers of Greek ancestry perform in Australia?

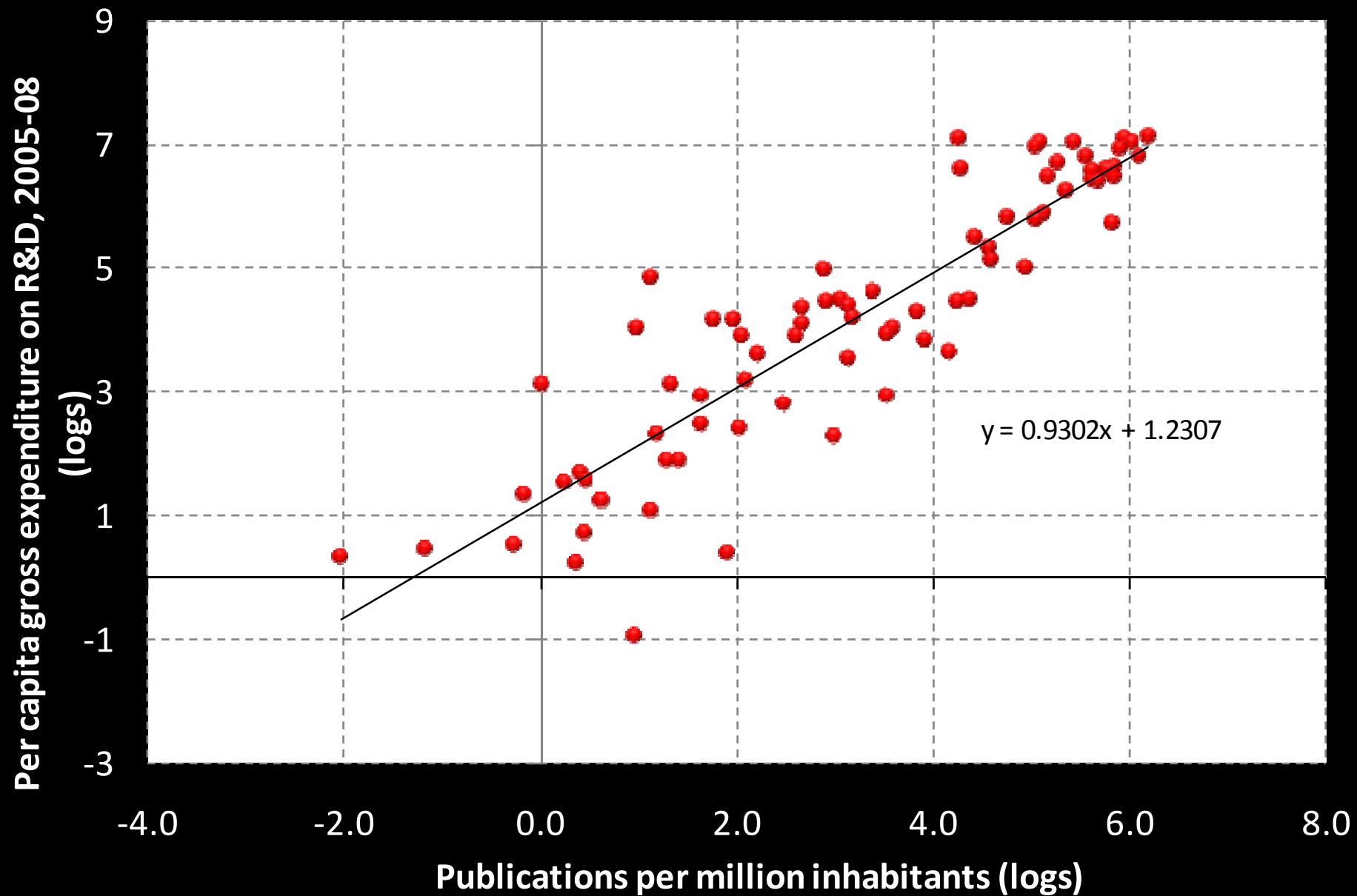
- DATA: SCOPUS; Eurostat; OECD Health Data; WDI; WHO

- KEY INDICATORS
 1. per capita publications in journals & books in life-sciences
 2. non-self, forward citations per publication (4 years window)

- ESTIMATION:
unconditional quantile decomposition of citations gap between Greeks and non-Greeks in Australia

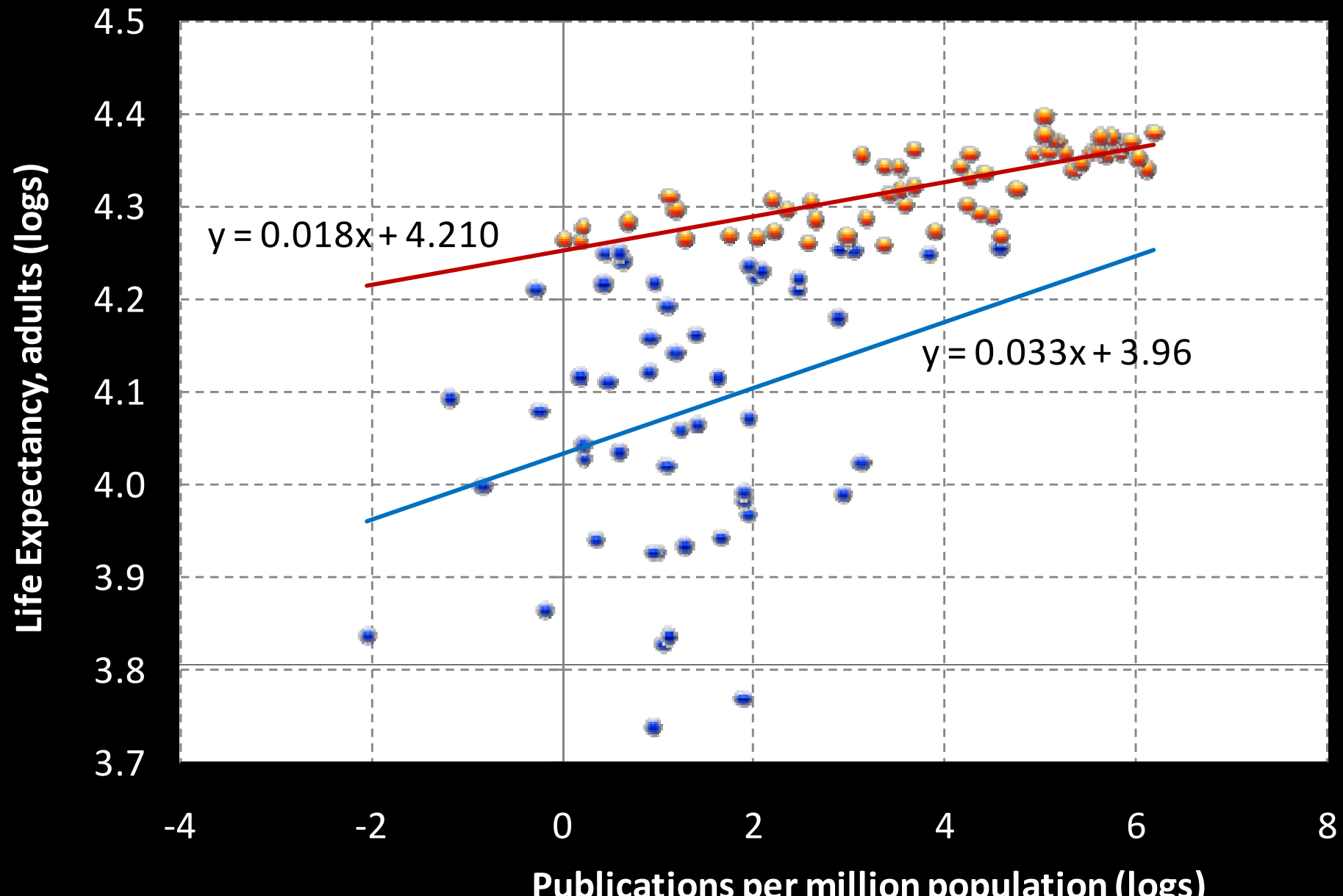
A Science - Health Link

- Medical scientific research strongly correlates with GERD



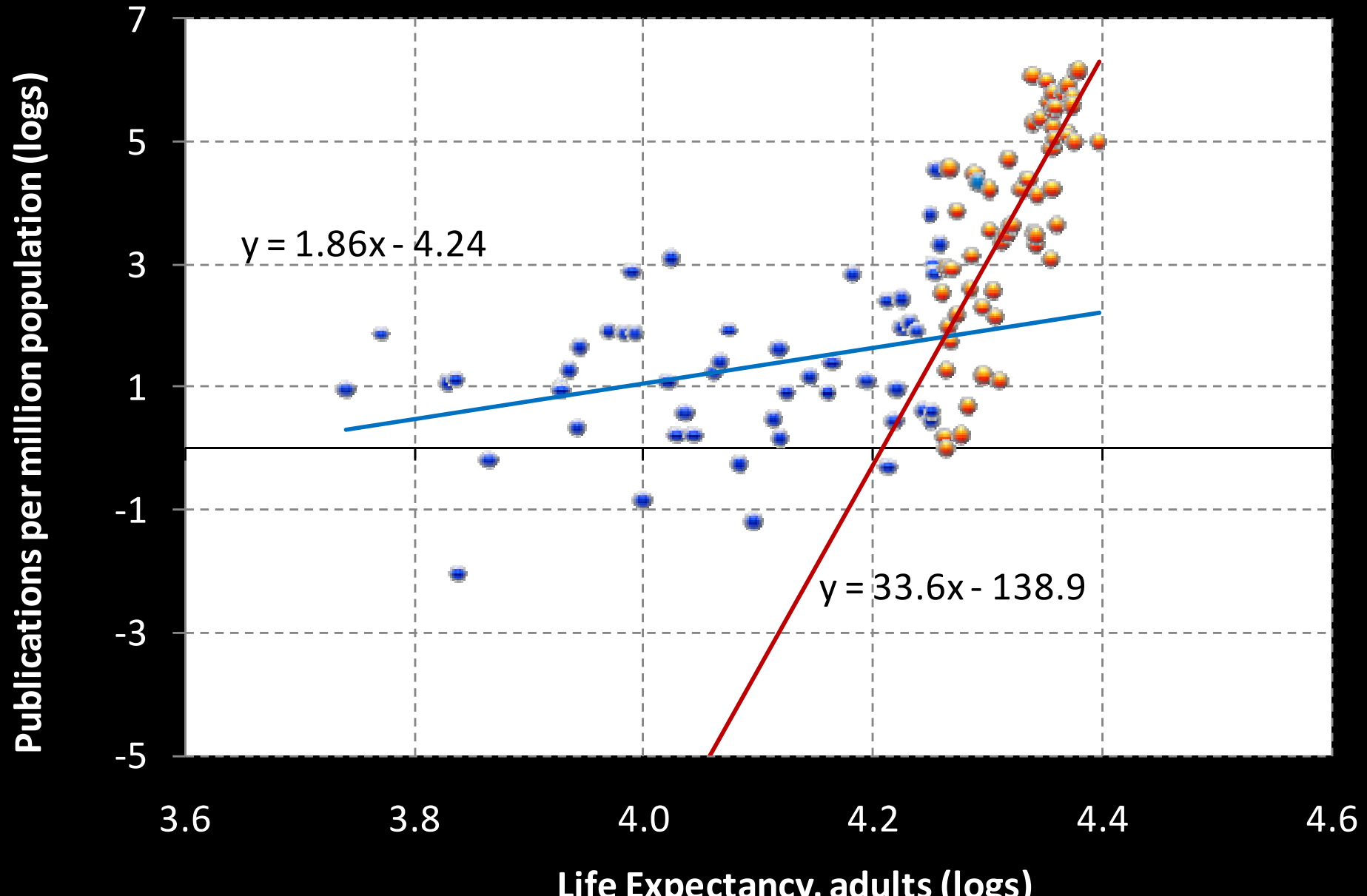
A Science - Health Link

- Non-linear effect of medical research on life expectancy?



A Science - Health Link

- Non-linear effect of life expectancy on medical research?

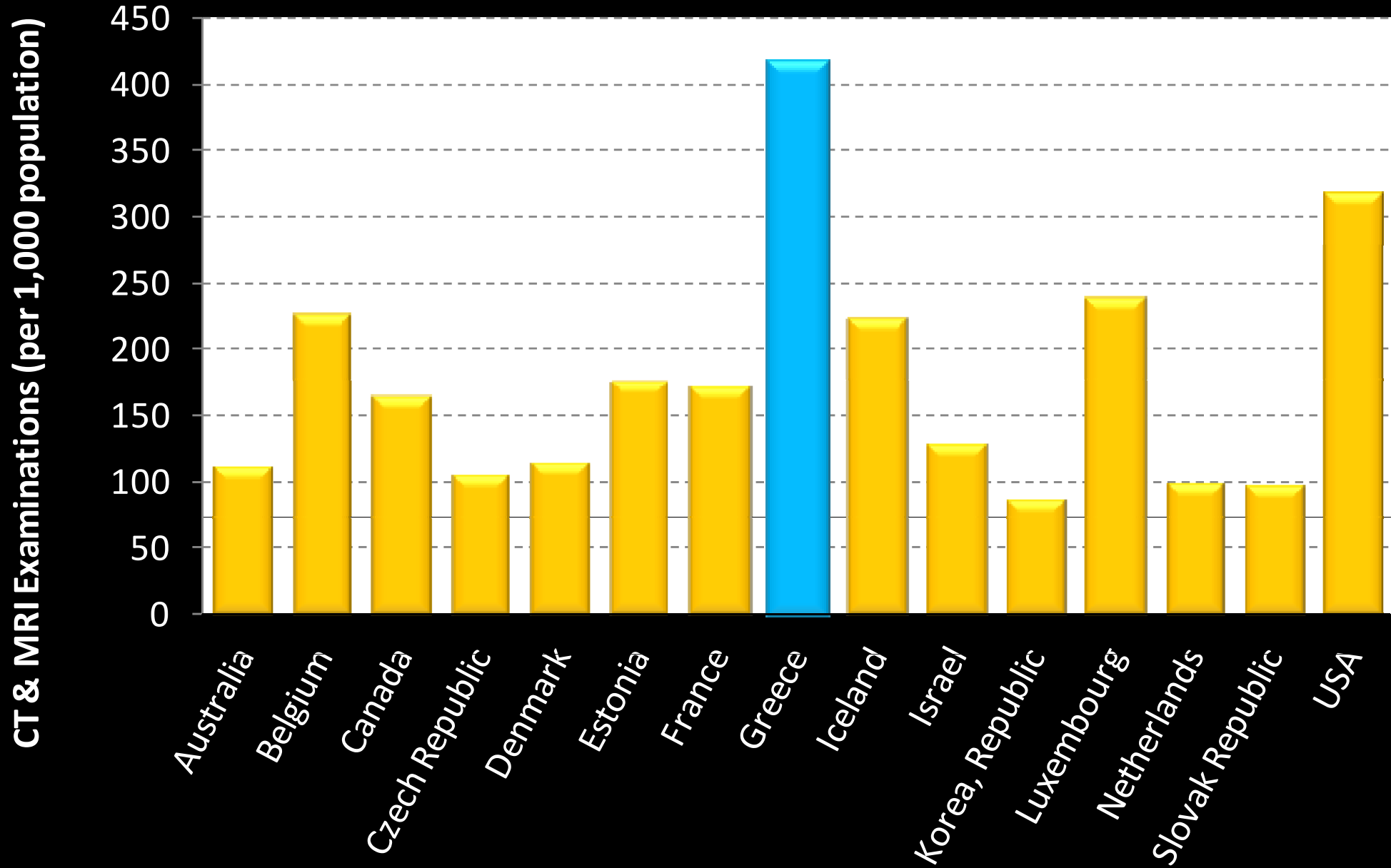


The Geography of Medical Sciences (100 nations)

| Country | 1990-94 | Rank | 2005-09 | Rank | Country | 1990-94 | Rank | 2005-09 | Rank |
|----------------|---------|------|---------|------|------------------|---------|------|---------|------|
| Sweden | 319.2 | 1 | 571.1 | 2 | Colombia | 1.1 | 76 | 12.7 | 63 |
| Israel | 311.4 | 2 | 385.8 | 9 | Papua New Guinea | 1.1 | 77 | 3.7 | 88 |
| Switzerland | 259.6 | 3 | 627.6 | 1 | Ecuador | 1.1 | 78 | 6.3 | 77 |
| Denmark | 259.2 | 4 | 556.1 | 3 | Peru | 1.0 | 79 | 6.6 | 76 |
| Finland | 236.0 | 5 | 463.2 | 5 | Tanzania | 1.0 | 80 | 4.8 | 82 |
| Netherlands | 226.5 | 6 | 444.7 | 6 | China | 0.9 | 81 | 17.7 | 58 |
| United Kingdom | 205.9 | 7 | 346.5 | 12 | Ghana | 0.9 | 82 | 5.9 | 78 |
| Canada | 198.4 | 8 | 369.6 | 10 | Guatemala | 0.8 | 83 | 2.4 | 94 |
| Norway | 187.3 | 9 | 474.8 | 4 | Nicaragua | 0.8 | 84 | 3.8 | 87 |
| United States | 184.9 | 10 | 254.9 | 16 | Sudan | 0.8 | 85 | 2.3 | 95 |
| Australia | 181.3 | 11 | 414.8 | 8 | Syria | 0.7 | 86 | 2.9 | 90 |
| New Zealand | 158.5 | 12 | 437.5 | 7 | Bolivia | 0.7 | 87 | 6.8 | 75 |
| Belgium | 143.0 | 13 | 361.1 | 11 | Ethiopia | 0.7 | 88 | 2.1 | 97 |
| France | 130.2 | 14 | 201.5 | 20 | Philippines | 0.7 | 89 | 2.1 | 96 |
| Austria | 127.1 | 15 | 308.2 | 13 | Uganda | 0.7 | 90 | 5.8 | 79 |
| Japan | 115.3 | 16 | 157.8 | 25 | Pakistan | 0.7 | 91 | 5.3 | 80 |
| Germany | 113.1 | 17 | 226.6 | 18 | Rwanda | 0.6 | 92 | 1.6 | 99 |
| Italy | 104.5 | 18 | 194.8 | 21 | Iran | 0.6 | 93 | 36.0 | 46 |
| Ireland | 89.9 | 19 | 304.1 | 14 | Paraguay | 0.6 | 94 | 3.1 | 89 |
| Spain | 83.0 | 20 | 214.3 | 19 | Algeria | 0.5 | 95 | 4.8 | 83 |
| Singapore | 61.9 | 21 | 261.7 | 15 | Mongolia | 0.5 | 96 | 10.3 | 66 |
| Hungary | 44.9 | 22 | 130.3 | 29 | Mozambique | 0.1 | 97 | 1.6 | 98 |
| Greece | 42.6 | 23 | 228.3 | 17 | Indonesia | 0.1 | 98 | 1.0 | 100 |
| Kuwait | 36.3 | 24 | 76.2 | 35 | Vietnam | 0.1 | 99 | 2.5 | 93 |
| Taiwan | 35.8 | 25 | 174.3 | 23 | Laos | 0.1 | 100 | 4.4 | 85 |

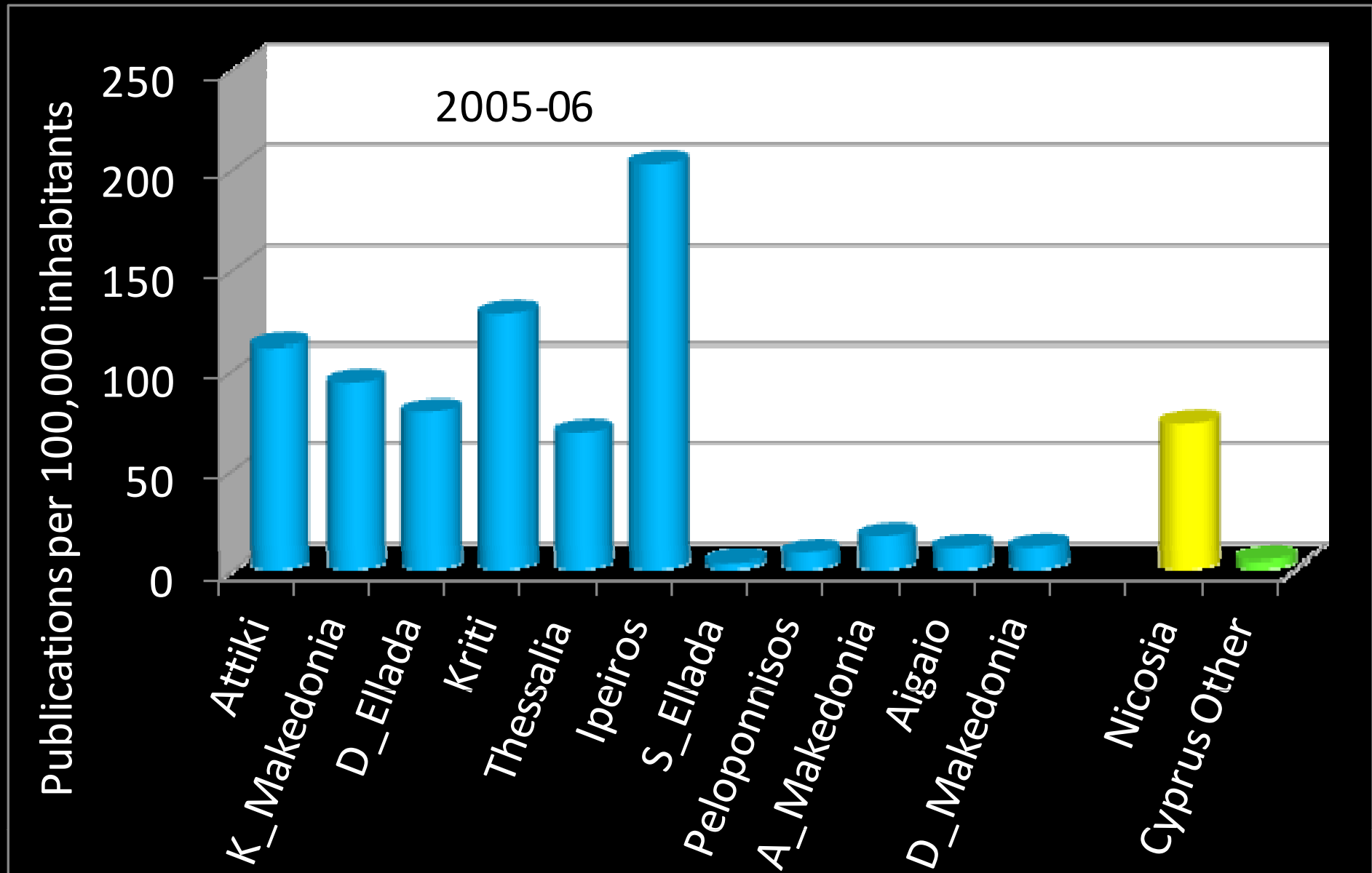
New Medical Technology in the OECD

- Sharp differences in the use of CT & MRI diagnostics



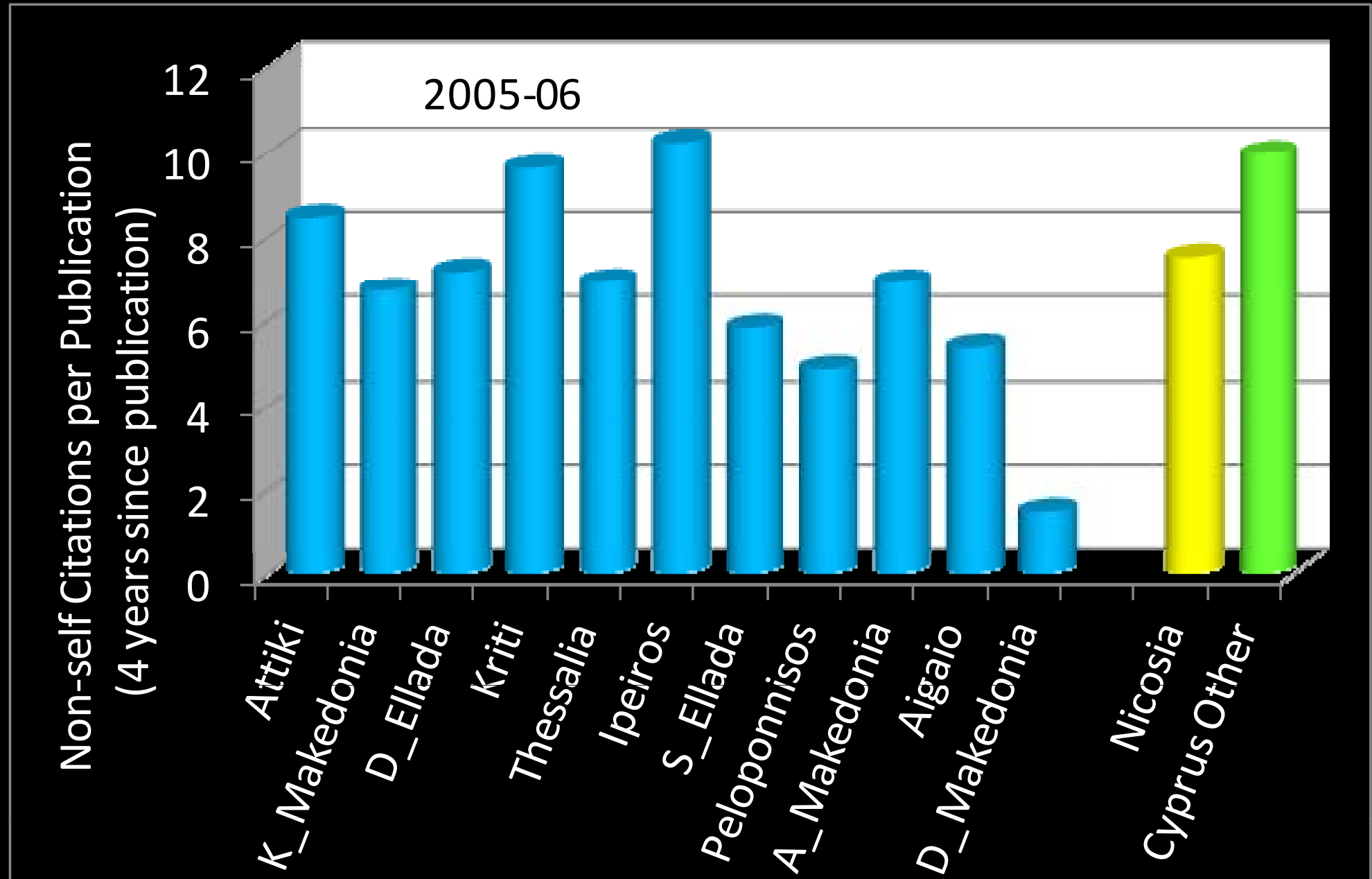
Medical Research in Regional Greece & Cyprus

- Major regional disparities; Ipeiros is the leader



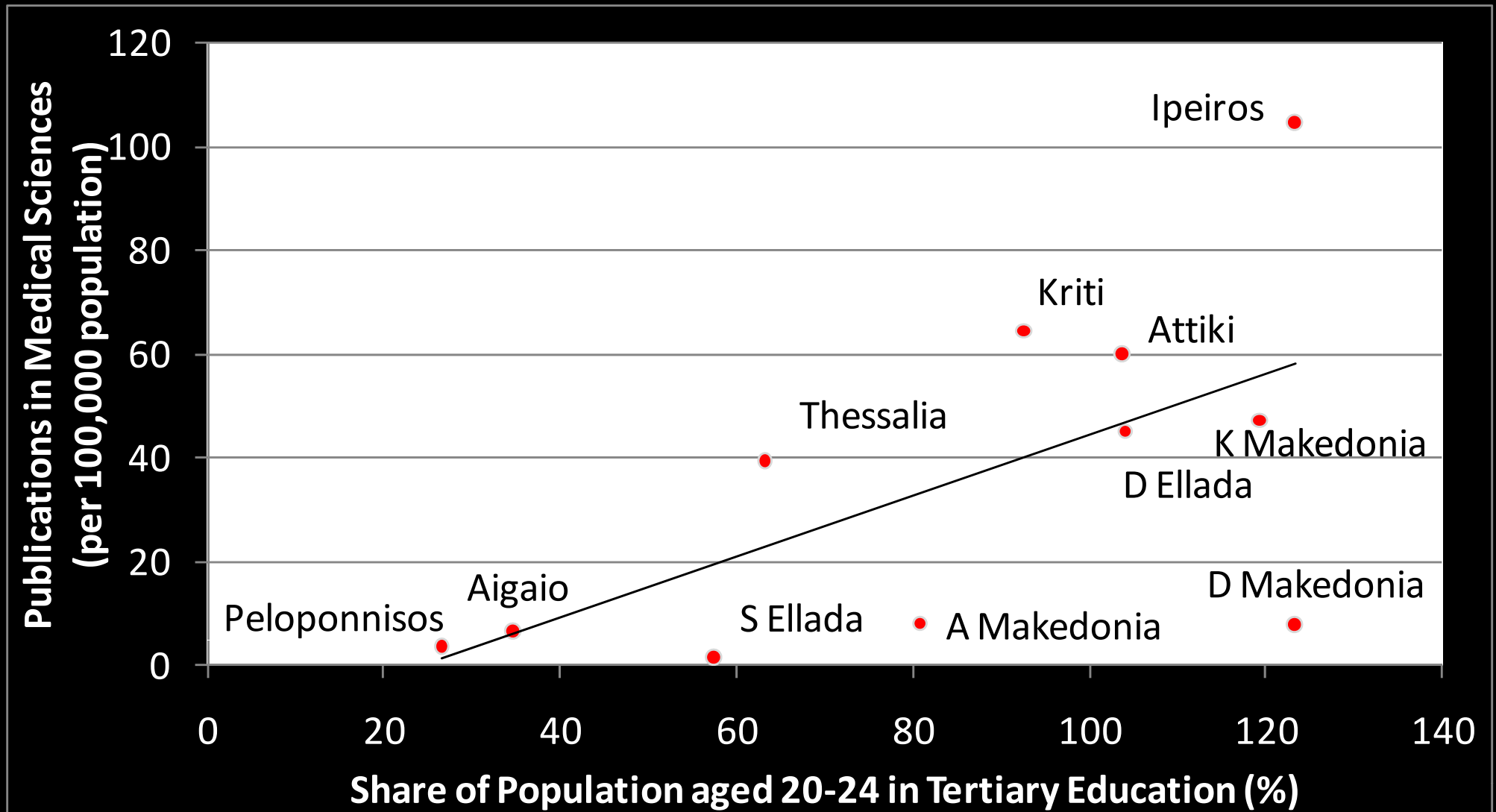
Quality of Medical Research in Greece & Cyprus

- LEADERS: Ipeiros & Kriti (Greece) & Regional Cyprus



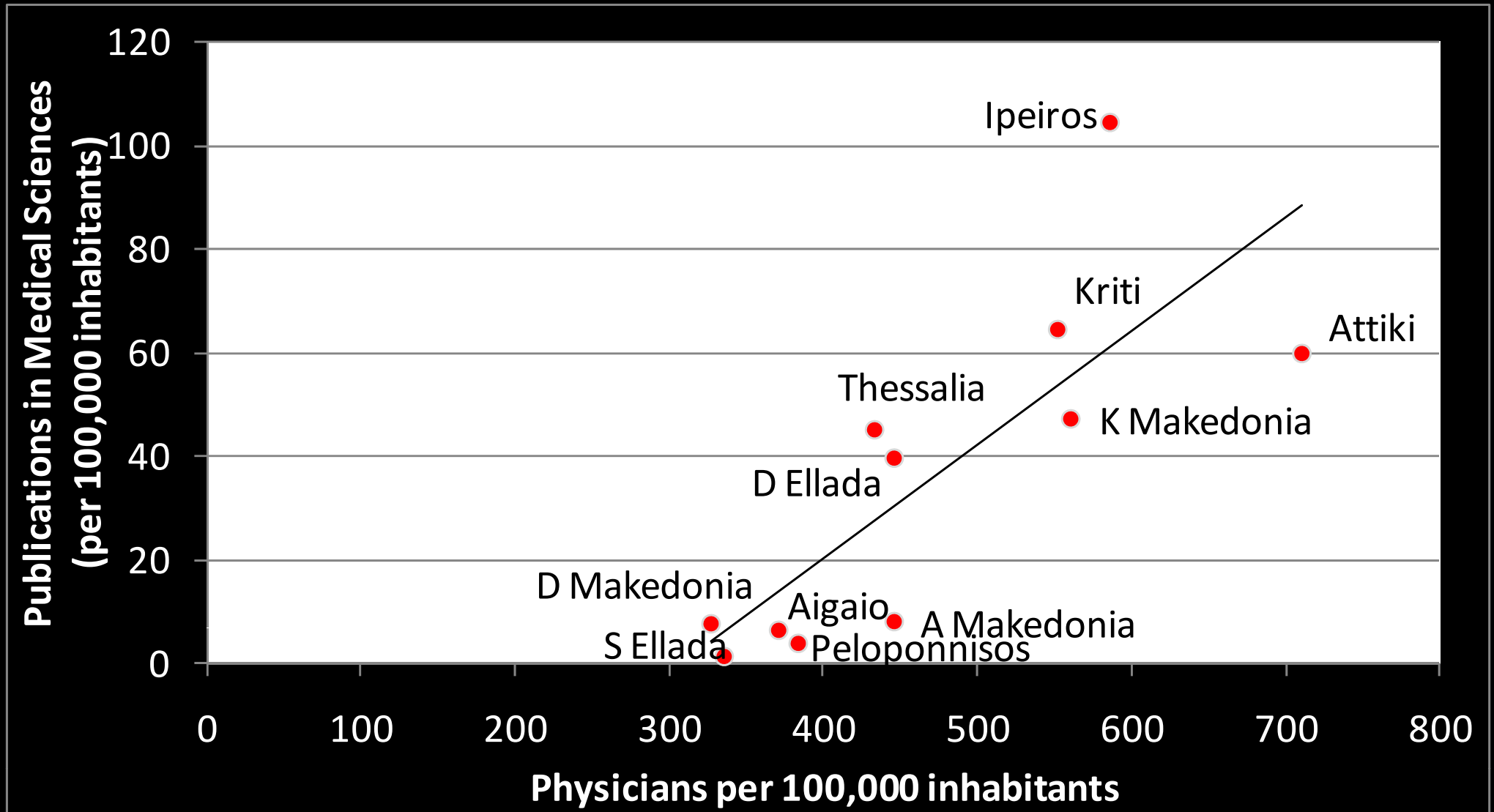
Why the Regional Disparities in Greece?

- Is it differences in educational attainment?



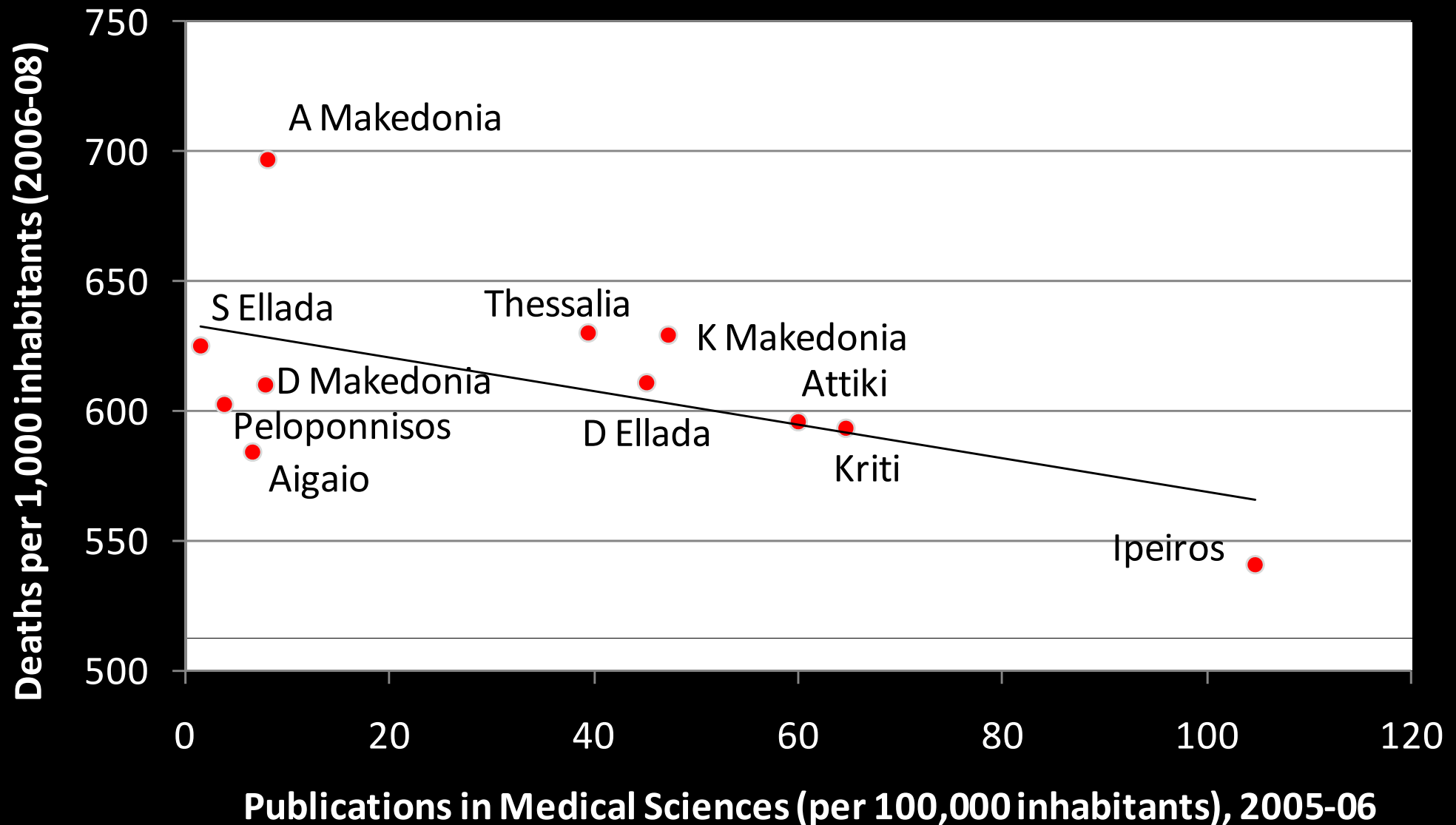
Why the Regional Disparities in Greece?

- Is it the concentration of medical practitioners?

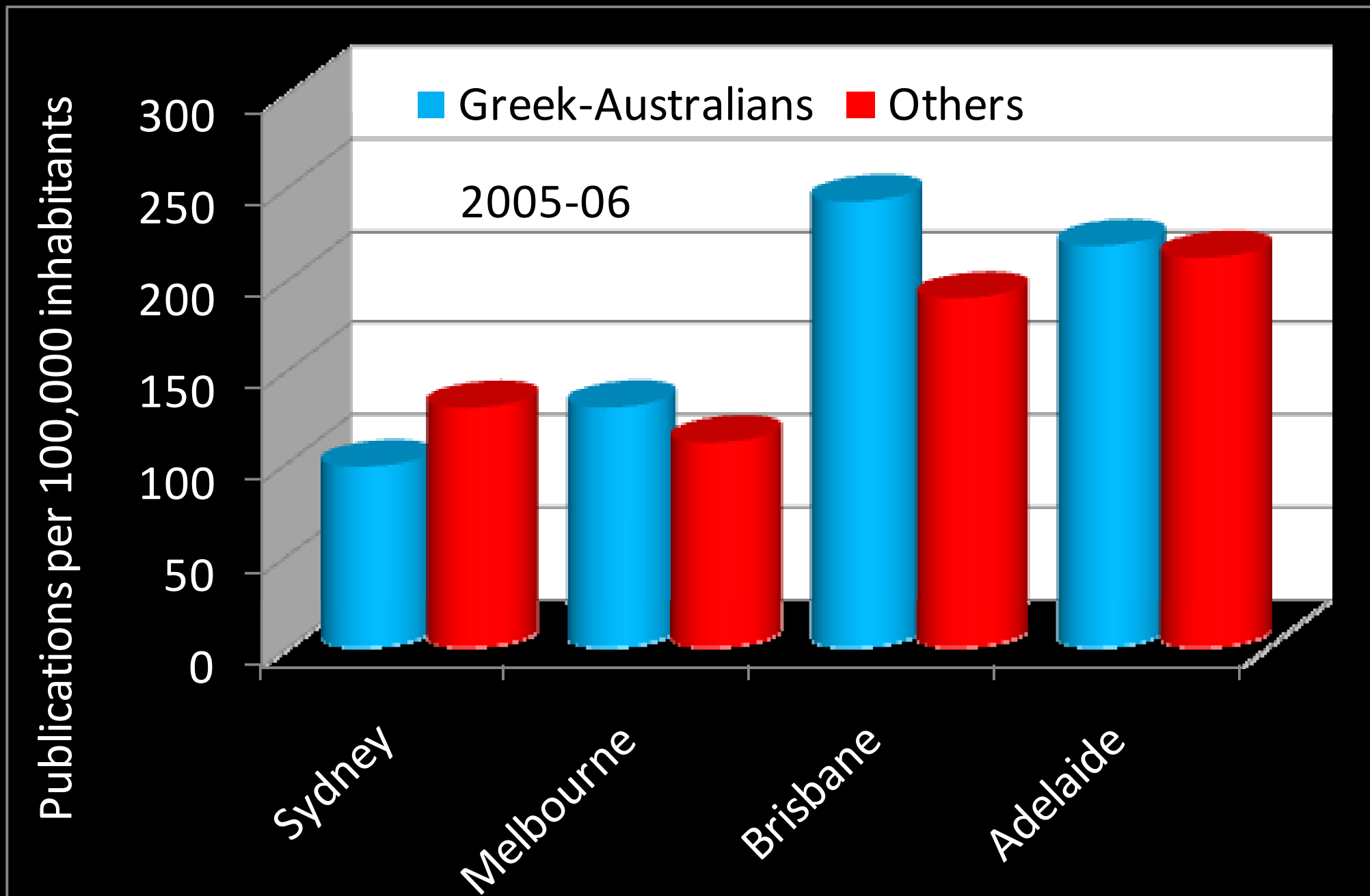


Regional Medical Sciences in Greece

- Does it make a difference for regional health?

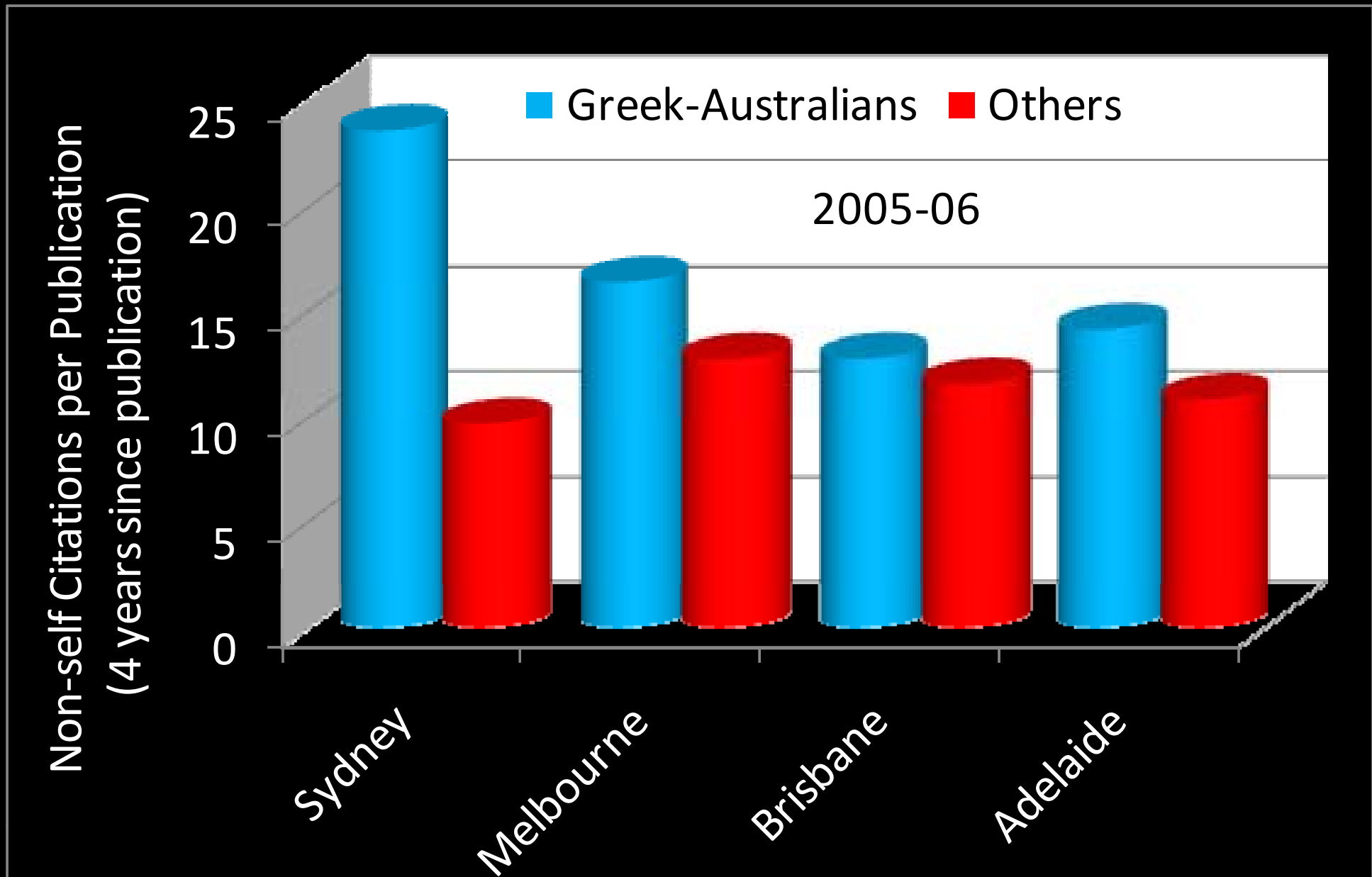


How do "Greek" scientists perform in Australia?



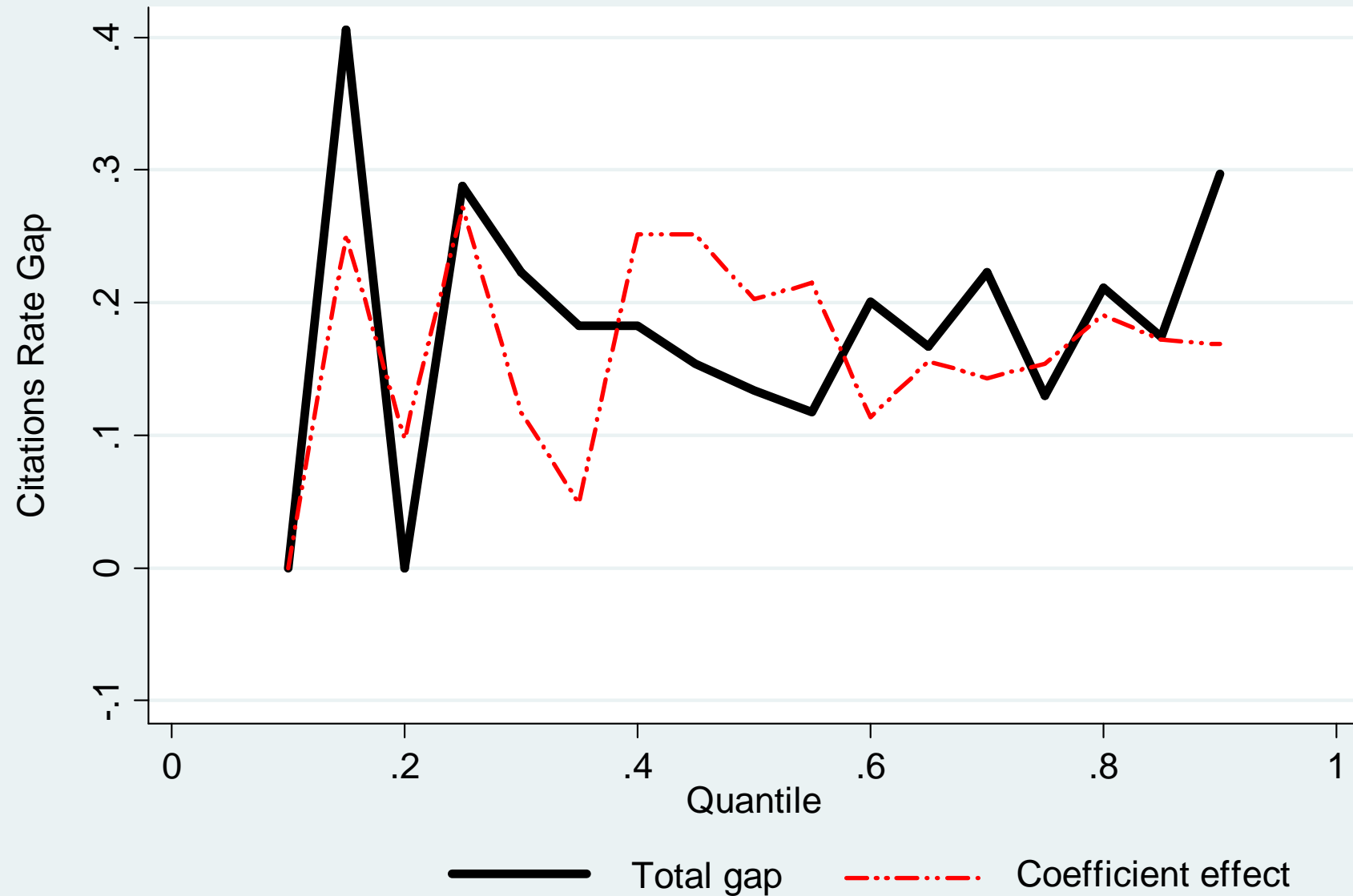
Quality of Research for “Greeks” in Australia?

- Statistically sign. differences in Sydney, Melbourne, Adelaide



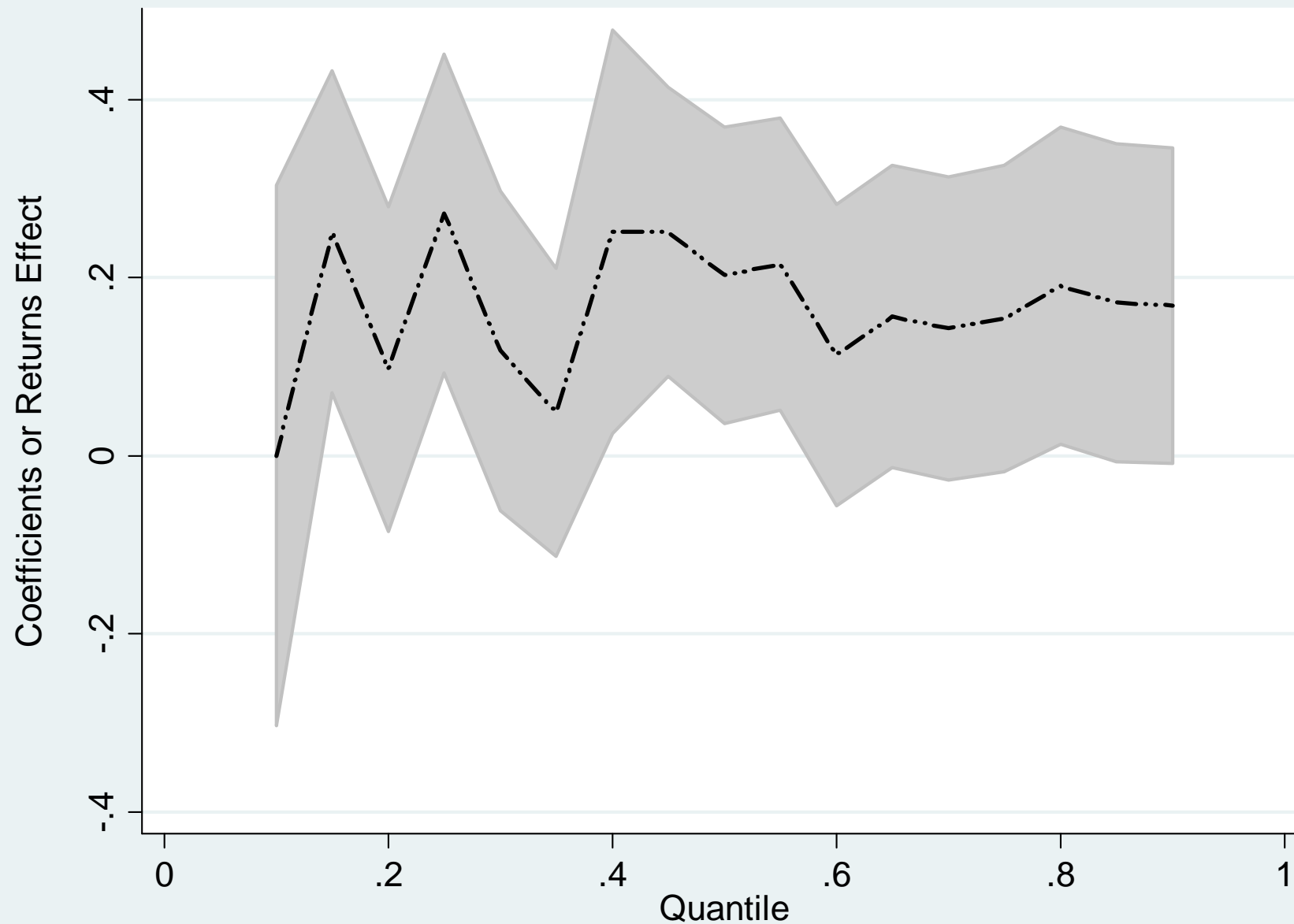
Quantile decomposition of Citation Rates: “Greeks”

Melly (2005) Decomposition (semi-parametric & robust to heteroskedasticity)



Quantile decomposition of Citation Rates: “Greeks”

Results: Gap is mainly due to coefficient differences (ie., better quality)



Summary of Results

- Scientific research in the field of life-sciences and medicines is a key element of medical innovation & health status
- Greece has a high world standing in medical research
- Major cross-country and regional differences exist in Greece, Cyprus and Australia in medical scientific research
- Regions far from the capital are leaders in medical research in both Greece (i.e., Ipeiros & Kriti) and Cyprus
- Research in medical sciences in less developed regions seems to have a **larger** impact on health (eg. Life Expectancy)
→ Implications: \$1 goes further in less-developed regions
- Greek-Australian scientists have been at the frontier of medical research in Australia