

Gastroenterology in Italy

Sir

In Italy, the discipline of gastroenterology has witnessed an enormous development in the last twenty years, thanks to the paramount advances in technology and pharmacology^{1,2}. The body of scientific production and communication by Italian research workers has progressively increased and the financial support for research should be based, more and more, on the availability of bibliometric measures which allow scientific Authorities to quantify and weigh the results of funding.

We decided to carry out an analysis of papers published in 1995 in about 40 medical journals considered as pertinent to gastroenterology by the Institute for Scientific Information (ISI) and correlated them with the source country population and its gross domestic product (GDP). The ratios between a produced item and the country population and/or its GDP are well-established econometric indexes, which reflect the popularity and the diffusion of these items within a given population and do not take into account the specific costs of the same items³. The impact factor (IF) of the journal of publication was considered an indirect estimate of the scientific quality of the paper. It was defined as the ratio between the number of all journal citations to articles

published in the previous 2 years and the total number of articles published in those 2 years by a specific journal. Data from articles published in gastroenterological journals were downloaded from Current Contents/Life Science and Current Contents/Clinical Medicine (1995-1997 actual years). Only bibliographic items with an ISSN and nominal edition year 1995 were selected. Duplicate items were identified and deleted. All peer-reviewed papers, including editorials, reviews, technical notes and letters to the editor were included in this study. Journal supplements containing abstracts or meeting reports were excluded from the analysis. Updated data are shown on the Internet site www.cilnews.unige.it. Our methodology has been validated in two previous papers^{4,5}.

As shown in Table I, 6,462 papers were published in the gastroenterological literature during 1995. Of these, 2,996 (46%) originated from the European Community (EC) and 1,826 (28%) from the United States (US). All EC countries were represented except Luxembourg. The leading countries in Europe in terms of output were the UK (19.9%), France (18.2%), Germany (14.4%) and Italy (13.4%).

The mean IF of papers from the EC in gastroenterological journals was 2.27 in comparison with 3.15 for the US. The

Table I. Comparison of gastroenterological scientific production in different countries (1995).

State	Hits (n)	Mean quality	Hits (%)	IF (%)	Hits/inhab.	IF/inhab.	Hits/GDP	IF/GDP	Hits% Sp/All	IF% Sp/All	Hits% All
Austria	39	2.15	1.3	1.2	4.86	10.49	0.21	0.45	1.80	1.49	1.9
Belgium	119	2.05	4.0	3.6	11.92	24.50	0.56	1.15	3.53	2.84	2.9
Denmark	85	2.29	2.8	2.9	16.51	37.88	0.62	1.42	2.94	2.82	2.5
Finland	44	2.85	1.5	1.8	8.80	25.15	0.46	1.32	1.63	1.89	2.3
France	546	2.09	18.2	16.8	9.64	20.24	0.43	0.90	3.15	2.63	14.9
Germany	430	2.10	14.4	13.3	5.28	11.12	0.22	0.47	2.12	1.74	17.5
Greece	41	1.49	1.4	0.9	3.99	5.96	0.54	0.80	4.16	3.93	0.8
Ireland	28	2.20	0.9	0.9	7.94	17.48	0.63	1.39	3.41	3.57	0.7
Italy	401	2.43	13.4	14.3	7.01	17.06	0.34	0.83	3.57	3.60	9.7
The Netherlands	159	2.39	5.3	5.6	10.51	25.18	0.50	1.21	2.11	1.66	6.5
Norway	55	2.08	1.8	1.7	12.79	26.66	0.48	1.01	3.30	3.20	1.4
Portugal	11	3.12	0.4	0.5	1.11	3.48	0.14	0.44	2.82	4.43	0.3
Spain	287	1.82	9.6	7.7	7.40	13.55	0.54	0.99	4.39	3.61	5.6
Sweden	156	2.50	5.2	5.7	17.94	44.88	0.72	1.80	2.47	2.51	5.4
UK	595	2.63	19.9	23.0	10.22	26.96	0.56	1.50	1.86	1.39	27.5
EC	2,996	2.27	100	100	8.04	18.29	0.40	0.91	2.58	2.10	100
US	1,826	3.15			7.00	22.10	0.28	0.89	1.54	1.22	
World	6,462	2.48			1.29	3.21	0.26	0.66	2.09	1.65	

Hits: papers and letters; IF: impact factor; mean quality: sum of IFs of hits/number of hits; hits/: $100 * (\text{hits of the country of interest}) / (\text{sum of hits of European Community})$; IF%: $100 * (\text{sum of IFs of the country of interest}) / (\text{sum of IFs of European Community})$; Inhabitants: million inhabitants; GDP: billion US\$ of gross domestic product.

world IF for gastroenterological papers was 2.48. Among EC nations, Portugal ranked first with a mean IF of 3.12, followed by Finland (2.85) the UK (2.63), Sweden (2.5), Italy (2.43) and The Netherlands (2.39). However, the highest percent IF pertained to the UK⁽²³⁾, followed by France (16.8), Italy (14.3) and Germany (13.3).

The ratio between the IFs of gastroenterological journals and all medical literature shows that a value exceeding 1, indicating that in a given country gastroenterological papers reached a higher IF than the remaining medical literature, is present in all European countries and US. In some nations this ratio is even higher than 3, such as in Portugal, Greece, Italy, Spain and Ireland.

The highest ratio between number of gastroenterological papers and GDP pertained to Sweden (1.80), followed by the UK (1.50), Denmark (1.42) and Ireland (1.42), while the highest ratio between IF and inhabitants pertained to Denmark (37.88), followed by the UK (26.96), Norway (26.66), The Netherlands (25.18) and Finland (25.15).

It must be pointed out that our analysis took into account only those journals classified as gastroenterological, and did not endeavour to tackle the complicated task of identifying the wealth of gut and hepatic research studies appearing in other categories covering general arguments (e.g., medicine, pharmacology, etc.).

In summary, our analysis of the gastroenterological scientific production in Europe and the US during the year 1995 shows that this discipline represents a large part of medical research. The Italian gastroenterological output ranks the highest in Europe in terms of number of papers and mean

IF level. The ratio of scientific production per GDP and inhabitants, however, is not high and deserves to be improved.

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Digest Liver Dis 2000;32:264-5

Submitted March 13, 2000

Revised April 4, 2000

Accepted April 10, 2000

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