



# R&D Briefing

## Increasing Investment:

### A Further Perspective on Worldwide R&D Expenditure

Global pharmaceutical R&D expenditure 1986-1996

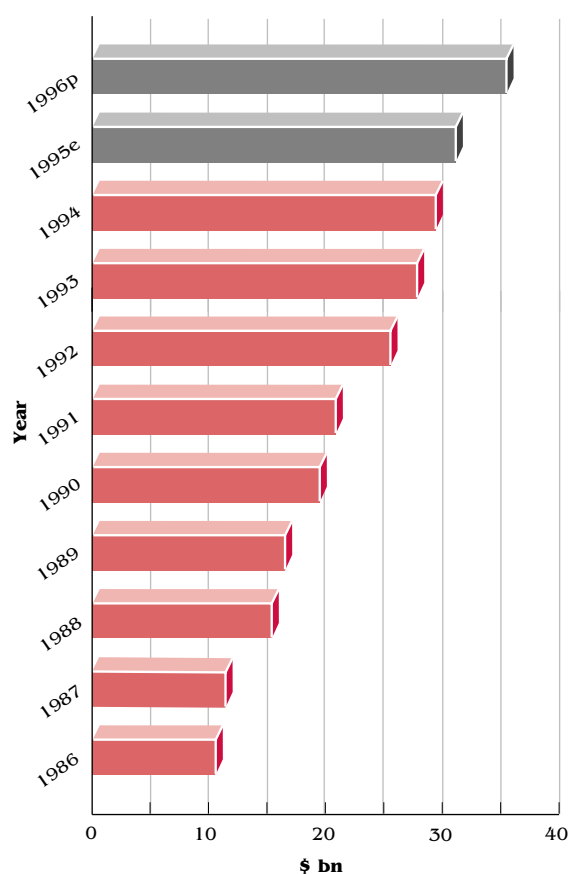


Figure 1 Global R&D expenditure (excluding capital) rose from US\$ 10.9 bn in 1986 to US\$ 29.4 bn in 1994. Global R&D expenditure for 1995 is estimated (e) to have been US\$ 32.2 bn and, assuming similar growth, is projected (p) to have been US\$ 35.3 bn in 1996. The mean year on year increase was 12.8%. However, this increase varied from a peak of 21.1% between 1987 and 1988 to 7.3% between 1992 and 1993. The estimated increase from 1994 to 1995 was 9.5%.

- Successful pharmaceutical research and development involves long-term planning and regular review of R&D strategies. To achieve this, accurate data on global R&D expenditure are essential.
- Does this expenditure reflect a worldwide commitment to pharmaceutical R&D? What are current global and regional trends? Has the balance between R&D expenditure and pharmaceutical sales remained constant?
- To provide an up-to-date insight into these questions, CMR International conducted a survey among 16 industry associations from around the world, taking into account recent industry expansion in Pacific Rim countries.
- Together with information on total sales of ethical pharmaceuticals and staffing levels within R&D, the results of this survey demonstrate increasing industry investment in R&D.

## Perspective

Pharmaceutical R&D is unique in being financed largely by reinvestment of company profits from pharmaceutical sales. Current and accurate information on total R&D expenditure, comprising capital expenditure and revenue R&D expenditure, is invaluable for strategic planning.

To update previous CMR International surveys among industry associations on this topic, three types of information were sought in a questionnaire-based survey:

- Comprehensive international R&D expenditure data;
- Sales of ethical pharmaceuticals;
- Industry staffing levels in major countries involved in pharmaceutical R&D.

## Industry Association Data

Sixteen industry associations in 15 countries, namely Australia, Belgium, Canada, Denmark, France, Germany (2 associations), Italy, Japan, Korea, the Netherlands, Spain, Sweden, Switzerland, the UK, and the USA, were

invited to participate in this survey; all responded. For the first time data were collected from industry associations in Korea and Australia. All figures were converted to US\$.

## Global R&D Expenditure

Globally, pharmaceutical R&D expenditure (excluding capital) rose steadily during the period 1986-94 (Figure 1) and was estimated to have reached US\$ 32.2 bn in 1995. Assuming a similar growth rate to that seen between 1994-95 (estimated at 9.5%), R&D expenditure for 1996 is projected to have been US\$ 35.3 bn.

This trend reflects an increasing and continuing commitment by the pharmaceutical industry to research and development and is in line with the results of previous CMR International surveys.

## Regional Trends

R&D expenditure rose in almost all countries during the period 1986-94, indicating their importance as major centres for research and development. At a regional level, Europe has the highest expenditure on pharmaceutical R&D, having spent US\$ 11.6 bn in 1994.

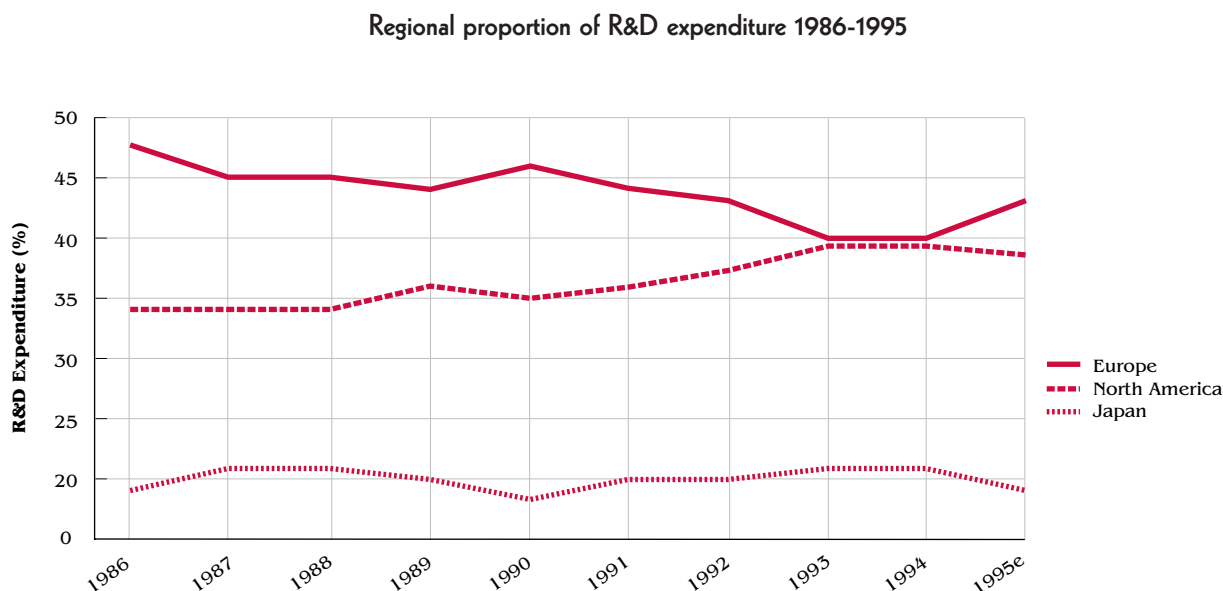


Figure 2 Following a period of little change in the division of R&D expenditure between the three regions during the period 1986 to 1990, there was a decrease in the proportion of R&D expenditure (excluding capital) in Europe between 1990 and 1993 (46% in 1990, 40% in 1993). During the same period R&D expenditure in North America increased from 35% to 39%.

Total pharmaceutical sales 1986-1995

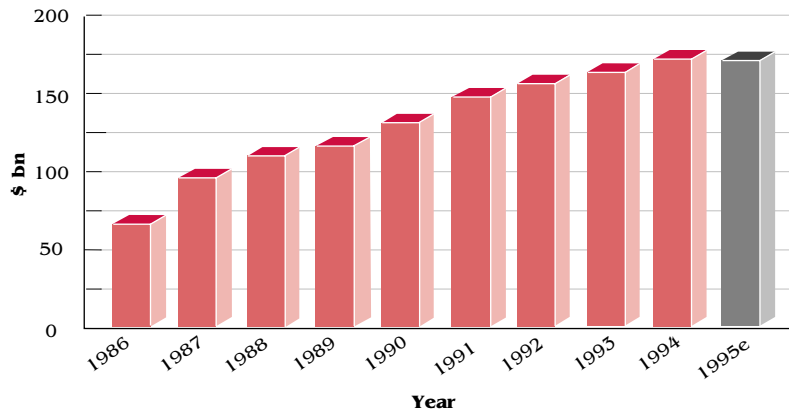


Figure 3 Total sales of all pharmaceuticals in the countries of the industry associations rose throughout the period 1986-94, although at a slower rate during the 1990s than had been seen previously. No increase is expected for 1995, when total pharmaceutical sales in these 15 countries are estimated to have been US\$ 174.4 bn.

Examination of indexed figures for R&D expenditure, which minimise the effect of exchange rate fluctuations, indicates that indexed growth is greatest in those countries with a small pharmaceutical industry base (Australia, Denmark, Korea, the Netherlands, Spain). In particular Australia and Korea, included in the survey for the first time, both experienced significant growth in 1993 and 1994.

Of the five countries with the largest pharmaceutical industry base, namely the UK, the USA, France, Germany and Japan, indexed growth was greater in the UK than elsewhere.

A regional breakdown of pharmaceutical R&D expenditure (excluding capital) for the three major regions, Europe, Japan and North America, shows a

period of little change up to 1990 (Figure 2). Thereafter, until 1993, R&D expenditure as a proportion of the total expenditure for all three regions showed a decrease in Europe, and remained constant in Japan, while in North America the proportion increased.

### Pharmaceutical Sales

Total sales of all pharmaceuticals in the countries of the industry associations rose throughout the period 1986-94, although at a slower rate during the 1990s than had been seen previously. Sales reached US\$ 177.3 bn in 1994; this represents an increase from 1986 of US\$ 109.1 bn (Figure 3). No increase is expected for 1995, when total pharmaceutical sales in these 15 countries are estimated to have been US\$ 174.4 bn.

Location of the Industry Associations



## Pharmaceutical R&D expenditure per R&D employee in 1994

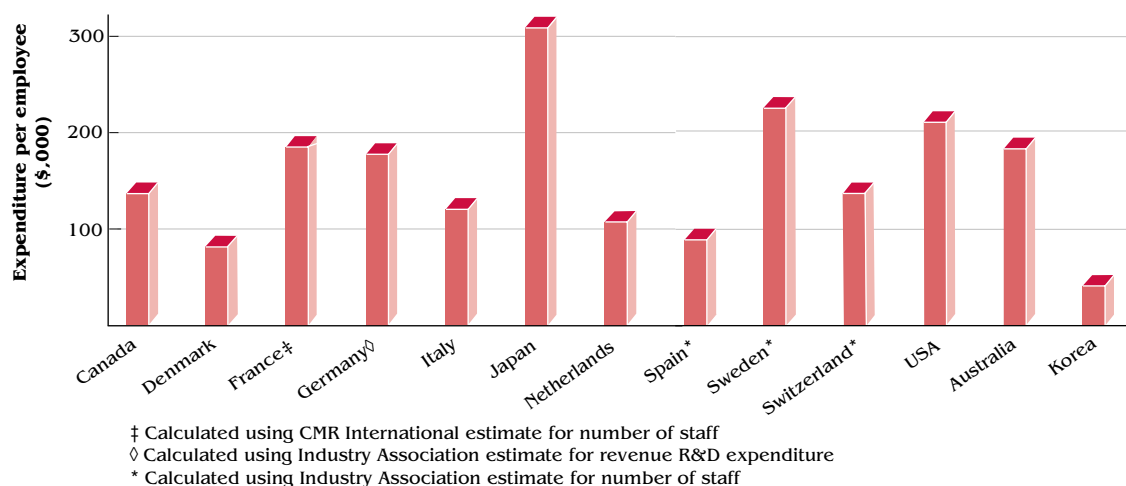


Figure 4 On average, the industry spent US\$ 220,740 on pharmaceutical R&D per employee in 1994. Between 1990 and 1994 Japan had the highest level of spending per staff member, followed by Sweden and the USA.

Global R&D expenditure (excluding capital), when expressed as a percentage of sales in the 15 countries, shows a steady rise up to 1993, reaching a plateau in 1994. (Based on estimated figures, a rise to 18% for 1995 is predicted.) Growth in this ratio reflects a greater percentage increase in R&D expenditure than in total sales. However, in order to obtain more accurate figures for Global R&D : Sales ratios, it is necessary to also include sales from those countries that do not have a strong R&D base (not covered by this survey). Relating the global R&D expenditure obtained in this survey to worldwide sales data from IMS indicates a Ratio of 12%.

### R&D Staffing

Fourteen of the industry associations provided information on the number of personnel employed in

pharmaceutical R&D; this ranged from around 700 in Australia to almost 50,000 in the USA in 1994.

On average, the industry spent US\$ 220,740 on pharmaceutical R&D per employee in 1994. Between 1990 and 1994 Japan had the highest level of spending per staff member, followed by Sweden and the USA (Figure 4).

### Regular Updates

CMR International surveys of pharmaceutical industry associations are conducted on a regular basis, and thus provide valuable data on which to base comparisons between the pharmaceutical producing countries.

Copies of the full report, "Worldwide Pharmaceutical R&D Expenditure 1986-1996" which contains 49 pages, 11 figures and tables, and 2 appendices, can be obtained at a cost per copy of:

Non-sponsoring organisations	£500
Sponsoring pharmaceutical companies	FREE

These can be ordered, quoting reference number CMR97-81R from Shaida Dorabjee, Research Services Manager, at Centre for Medicines Research International.

(All cheques should be payable to Centre for Medicines Research International. Non-UK cheques should be in sterling and drawn on a London bank.)

July 1997

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